Transpower New Zealand Ltd
IPP Proposal for RCP2

Review of points raised in submissions on the Draft Decision for

The Commerce Commission

Strata Energy Consulting Limited
and
Energy Market Consulting Associates

19 August 2014

This report has been prepared to assist the New Zealand Commerce Commission (the Commission) with its determination of an individual price-quality path (IPP) for Transpower New Zealand Limited (Transpower).

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About Strata

Strata Energy Consulting Limited specialises in providing services relating to the energy industry and energy utilisation. The Company, which was established in 2003, provides advice to clients through its own resources and through a network of Associate organisations. Strata Energy Consulting has completed work on a wide range of topics for clients in the energy sector both in New Zealand and overseas.

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1 Introduction

1.1 Purpose of this report

1 Transpower New Zealand Limited (Transpower) provided a submission in response to the Commerce Commission's (Commission) draft decision on its Individual Price-quality Path (IPP) proposal for Regulatory Control Period 2 (RCP2) 2015-2020. A number of other parties have also provided submissions.

2 The purpose of this report is to provide advice to the Commission on specific areas of the submissions received. The report provides a summary of Strata Energy Consulting Limited's (Strata) advice for the Commission.

3 We cover the specific questions the Commission has requested us to address in the following sequence:

(a) Enhancement and Development (E&D) base capex;

(b) Replacement and Refurbishment (R&R) base capex, including Transpower's proposed Asset Health Incentive Scheme;

(c) Information systems technology (IST) base capex;

(d) IST opex; and

(e) Corporate opex.

4 For practical and analytical reasons, our technical assessment refers to certain line items or specific aspects of the proposed expenditure, while our over-arching objective is to advise on an allowance for an aggregate level of controllable opex. Our findings are based on a balance of evidence and an unbiased balance of probability and are not provided as advice for 'approval' to incur expenditure, either in aggregate or in regards to particular items of expenditure put forward by the business in support of its revenue proposal.

2 Headlines

2.1 Section introduction

5 In this section we provide a headline view of our recommendations.

2.2 Base capex

2.2.1 Enhancement an Development capex

6 Following our review of the detailed project information provided by Transpower and the feedback received from other submitters, we consider that a total of $95.1m would meet the expenditure objective for Enhancement and Development (E&D) base capex for RCP2.

7 This represents:

(a) a reduction of $4.3m (4%) from the total included in Transpower's submission on the Commission's draft decision; and

(b) a reduction of $28.7m (23%) from the total included by Transpower in its original IPP proposal.

2.2.2 Replacement and Refurbishment capex

8 We consider that Transpower's proposed asset health incentive mechanism is insufficiently robust to be accepted.

9 In accordance with our previous advice to the Commission for its Draft Decision, we consider that a 5% downward adjustment should be applied to Replacement and Refurbishment (R&R) capex, unless:

(a) a volumetric incentive mechanism is implemented to address issues we have raised regarding deliverability of the R&R programmes;

(b) Transpower's proposed asset health incentive mechanism is run as a business improvement pilot during RCP2; and

(c) both 'frozen and unfrozen' asset health models are provided to the Commission together with periodic reporting on material variances.

2.2.3 Information Systems Technology capex

10 The $15.1m proposed for the transmission pricing methodology (TPM) project should be removed from the RCP2 programme.

11 We consider that Transpower's proposed IST expenditure has not been fully justified and the 'productivity adjustment' applied by Transpower is insufficient to negate our view that actual expenditure will be lower.

12 We therefore propose retention of our downward adjustment of 2.5% to achieve what we believe will result in a prudent and efficient basis for Transpower's RCP2 IST capex.

2.3 Information Systems Technology opex

13 Our review of Transpower's submission has confirmed our view that the 2% ($4.8m) reduction recommended in our advice to the Commission for the Draft Decision is justified based upon further consideration of the following factors:

(a) despite incorporating savings in its forward RCP2 opex forecast from its RCP1 Information Systems Technology (IST) initiatives, Transpower does not appear to be efficient in this area when compared with its most relevant peers; and

(b) Transpower has demonstrated that it is capable of securing IST opex savings through contract negotiations (and other approaches) and has identified opportunities it intends to pursue.

14 We recommend retaining the 2% ($4.8m) reduction to Transpower's proposed IST opex forecast.

2.4 Corporate opex

15 We recommend a downward adjustment to Corporate opex of $24.4m as summarised below.

Vacancy rates

16 On vacancy rates, based on additional information provided by Transpower that it has included a 3.4%, ($9.1m) vacancy rate in deriving its personnel cost forecast, we consider that no further adjustment should be made.

Reduced personnel costs

17 Based on the further information provided by Transpower, no adjustment to Corporate opex is proposed on the basis of benefits realisation from RCP1 improvement initiatives.

18 We agree with Transpower that it is not appropriate to make productivity adjustments to take into account improvement opportunities that may arise and be realised in RCP2 as these are handled under the Incremental Rolling Incentive Scheme (IRIS). Strata's focus when considering adjustments has been to assess improvements that have been made during RCP1 and consider if the impact of these existing improvements have been fully taken into account in the forecasts for RCP2.

Capitalisation

19 On capitalisation, we understand that the Commission is satisfied that Transpower's application of its capitalisation approach is appropriate. Based on this, we consider that no adjustment should be made to Corporate opex for capitalisation.

Consultancy costs

20 On consultancy costs, we propose a 20% reduction of $1.6m p.a. (or $8m over the RCP2 period) to the consultancy and contractor component of Departmental opex, for the following reasons:

(a) Transpower has advised that it intends to place more reliance on its own resources to undertake change initiatives in RCP2[1]; and

(b) Transpower has identified a strategy to reduce the pressure on subject matter experts (SMEs) in the preparation of RCP3. This will reduce the need for consultants and contractors to temporarily back-fill Transpower positions in 2017/18 and 2018/19.

Office relocation

21 On office relocation, from the information available we conclude that:

(a) consolidation of the three Wellington office premises to one location during the RCP period is likely to be the preferred option for Transpower; and

(b) while it will be the Transpower Board's decision, the preferred option should only proceed if the relocation/consolidation option has a strong positive NVP (over 5-10 years) and there is no material net opex increase required as a result of relocation (i.e. compared to staying at Transpower House).

22 Our estimate of the net opex increase over RCP2 incurred at its present location (assuming Transpower does not relocate) is $0.9m p.a. from 2017/18 – 2019/20 inclusive (i.e. a total of $2.7m). We therefore propose an allowance of $2.7m for the base case of Transpower remaining at its current location over RCP2 rather than the $6.0m forecast – a reduction of $3.3m.

Investigations

23 On investigations, we have reconsidered our earlier conclusions taking into account information provided in Transpower's submission. We have concluded the following points:

(a) *Asset investigations:* having reconsidered the conclusion we reached for the Draft Decision, and taking further account of the

[1] *MP01-Main Proposal,* Transpower, Section 9.3.1, p114.

increased expectations placed on Transpower, we now consider that reducing the investigations allowance for asset investigations is likely to be counterproductive;

(b) *Innovation:* we believe this remains an area in which Transpower may reduce its opex by being extremely judicious with its expenditure, however we propose leaving this as a decision for Transpower to take;

(c) *Business improvements:* on balance, we consider that reducing the research and business improvements could be counterproductive as it may reduce Transpower's ability to extract value from important business improvement activities; and

(d) *IST investigations:* Transpower provided no further information in support of its proposed expenditure in this category. Accordingly, we recommend an adjustment of -$1.5m (-23%) to IST investigations.

Ancillary services

24 On ancillary services, we confirm the view expressed in our previous report to the Commission that we believe Transpower's forecasting methodology is appropriate and we agree with Transpower's position that it has explored all reasonable avenues to limit the costs of ancillary services.

3 Enhancement & Development base capex

3.1 Section introduction

25 In this section we provide a summary of our review of the submissions received by the Commission that are relevant to Transpower's E&D base capex proposal.

26 The Draft Decision proposed a reduction to Transpower's E&D base capex forecast from $123.8m included in Transpower's original IPP proposal, to $56.6m recommended by Strata. This level of reduction was determined by examining the rationale and supporting information provided by Transpower in its IPP proposal, relevant to the projects described in Portfolio Overview Documents (PODs) PD30 – PD44. It thus represented a bottom-up review process.

27 As noted in our technical advisor report to the Commission,[2] we initially undertook a detailed bottom-up review of a small sample of the projects in PD30 – PD44. In this review we developed concerns with aspects of the rationale and information provided in support of the sample projects and subsequently decided to review each of the 15 E&D base capex portfolios (which included 25 individual project components in total).

28 Having completed this review, we considered that 46% of the E&D base capex expenditure proposed by Transpower's would meet the expenditure objective.[3] Accordingly, we recommended adjustments to the E&D base capex allowance to the Commission.

3.2 Review of submissions relevant to Enhancement & Development base capex

3.2.1 Submitters

29 The Commission received five submissions relevant to E&D base capex. As expected, Transpower has provided a detailed submission on this part of its RCP2 proposal.

30 Submissions were also received from:

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[2] *Technical Advisor report on the Transpower New Zealand Ltd IPP Proposal for RCP2*, 16 May 2014, Strata Energy Consulting Ltd (the 'Strata report'),

[3] See Strata report, Table 7 for detail of the recommended adjustments for each project.

(a) Counties Power (comments relevant to PD30 – Otahuhu – Wiri transmission capacity);

(b) Pacific Aluminium on behalf of Rio Tinto Alcan (New Zealand) Limited and New Zealand Aluminium Smelters Limited (comments relevant to demand forecasting, the level of proposed capex given flat demand, support for E&D base capex reductions made in the draft decision);

(c) EnerNoc (comments in support of using demand response (DR) for network capex deferral); and

(d) Port Taranaki (a late submission relating to PD37 – North Taranaki transmission capacity). The Commission extended the submission deadline to 25 July 2014 to accommodate this submission. Port Taranaki supported Transpower's proposed withdrawal from the ex-power station site from what is now port land at New Plymouth.

3.2.2 Transpower's submission

31 Transpower has provided its views relevant to E&D base capex in the following submission documents:

(a) *Response to IPP Draft Decision*, 27 June 2014;

(b) *Enhancement and Development Base Capex – Response to Draft Decision*, 25 June 2014;

(c) Updated PODs for the following subset of E&D base capex projects:

(i) PD30 – Otahuhu-Wiri Transmission Capacity;

(ii) PD33 – Bus Section Fault Reliability;

(iii) PD37 – North Taranaki Transmission Capacity;

(iv) PD41 – Hororata and Kimberley Voltage Quality;

(v) PD42 – Islington Spare Transformer Switchgear;

(vi) PD43 – Haywards Local Service Third Incomer;

(vii) PD44 – E&D Other;

(d) responses to relevant follow-up questions asked by the Commission; and

(e) various other consequential references, for example in updated financial summary schedules.

3.2.3 Key submission themes

Transpower's submission

32 In its submission, Transpower stated that a reduction to the E&D base capex provision it included in its IPP proposal (i.e. $123.8m) would (amongst other perceived risks and consequences):

> *restrict [its] ability to efficiently manage [its] E&D portfolio and to respond to changing circumstances on the Grid.*[4]

33 Nevertheless, having considered the project-by-project evaluations provided in the draft decision, Transpower now considers that it could manage its E&D portfolio with a reduced E&D base capex allowance of $99.4m (which represents a 20% reduction from the allowance it originally proposed for E&D base capex).

34 Given the information asymmetry faced by the Commission and its technical advisors, we consider a bottom-up review of a capex category that has been put together on a bottom-up project by project basis provides an objective review option. The best indicator of the scope, cost and timing of future demand-driven projects is provided by reviewing the short list of projects drawn from Transpower's current Annual Planning Report (APR) that Transpower considers has the greatest likelihood of receiving all necessary approvals relevant to expenditures anticipated within RCP2.

35 Thus, we would expect that a review of the documentation submitted in support of the 25 projects in the 15 portfolios that make up the RCP2 E&D base capex forecast would reasonably demonstrate the need for estimated cost of and likely timing for the forecast programme of development work.

36 In reviewing this documentation, we made allowances for the uncertainties inherent in planning relatively large expenditures (up to $20m per portfolio) out to 2019/20. Nevertheless, in many cases, we considered that the quantity and quality of supporting information fell short of a standard that would allow an external reviewer familiar with transmission network planning to understand the need for estimated cost of and likely timing of these projects.

37 Transpower has responded in its submission with seven updated E&D PODs. In this section, we include detail of our review of each of these PODs.

38 In its submission, Transpower stressed the importance of looking at the expenditure category at an overview level (i.e. top-down), but has provided no guidance as to how it has developed its own assessment of the top-down "right amount" or how this might be externally reviewed. While we have a relatively limited frame of reference for determining an appropriate

[4] Transpower's *Response to IPP Draft Decision*, section 3.2.

portfolio allowance covering E&D base capex at a category level, we can make, and have made, relevant macro-level observations in respect of:

(a) the recent, current and projected level of demand growth (which is a primary driver of E&D base capex);

(b) the recent level of expenditure in this capex category, adjusted to provide a fair comparison of expenditures between RCPs; and

(c) Transpower's demonstrated track record in converting plans (scopes, budgets, timeframes) into commissioned assets.

39 We have considered each of these factors in providing technical advice to the Commission, in particular noting:

(a) the flat prevailing demand growth since the onset of the 2008 global economic downturn, including observing that no analysis had been included in Transpower's IPP proposal or submission that might account for the apparent recent divergence between electricity demand growth and GDP growth. We concluded that Transpower's projections of demand growth looked to be optimistic;[5]

(b) the relatively low level of recent and current E&D base capex project work, providing a pipeline issue in respect of gearing up for planned increased levels of expenditure forecast in RCP2;[6] and

(c) that at times, projects have had issues in conversion from plan to delivery.

40 In summary, without having significantly more information that would allow a more informed top-down view of the appropriate level of allowance within the E&D base capex category, we maintain the view that reviewing each of the proposed projects on its merits, using the information provided in the IPP proposal and subsequent submissions on the Commission's draft decision, is appropriate. We consider this is the most objective means of developing confidence that the forecast represents the best possible current view of the likely expenditure in the forthcoming RCP, recognising that needs will change as new information comes to hand.

Submissions from other parties

41 The submissions provided by other parties tend to reflect either high-level views relating to the overall scope and forecast cost of the E&D base capex category or make specific points about specific projects included in the IPP proposal.

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[5] For the detail supporting this conclusion, please refer to the Strata report, paragraphs 296 – 304.

[6] This is also evident in the fact that most of the projects in this portfolio are currently at a BC1 stage of development. It will take a considerable amount of time to work through the subsequent planning stages, particularly where the projects are complex.

42 We have considered the high level comments and our views have been adequately covered in the preceding section relating to Transpower's view of Strata's approach to reviewing this expenditure category.

43 We have considered each of the more detailed views in the context of the specific project to which they relate. These can be seen in our detailed views relating to the 'in play' PODs, included in section 3.4. For example, Counties Power's views relating to PD30 Otahuhu – Wiri Transmission Capacity have been considered in our review of that project.

3.3 Approach taken to review the updated Enhancement & Development Portfolio Overview Documents

44 We have noted the projects where Transpower has agreed with our earlier recommendations. In total, these provide a net reduction of $24.4m in the E&D base capex category, made up of:

(a) a total reduction of $35.05m; less

(b) provision for an additional $10.65m within PD37 that reflects an expanded scope from the project originally included in Transpower's IPP proposal for PD37.

45 We have considered the project-specific points made in all relevant submissions. In the main, this has involved considering seven updated PODs submitted by Transpower and additional comments Transpower made in respect of PD39 Southland Reactive Power Support.

46 In our view, the updated PODs represent a significant improvement when read alongside the original PODs included in Transpower's IPP proposal. We commend Transpower for carefully considering and responding to our recommendations. In general, the updated PODs:

(a) more clearly establish project needs, including providing relevant context (such as the outcome of customer consultation) to better inform an external review;

(b) set out a more comprehensive range of solution options, including the timing implications of each;

(c) provide a clear rationale for selection of the preferred option, including high-level analysis of costs and benefits; and

(d) break down sub-project costs more clearly.

47 We retain concerns relating to a small number of the E&D projects. Our detailed findings on each of the 'in play' PODs are provided below.

3.4 E&D base capex review summaries

3.4.1 PD30 – Otahuhu – Wiri Transmission Capacity

48 Transpower's updated POD and Counties Power's submission have provided further information relating to PD30. In the updated PD30, Transpower has more clearly described a classic parallel overloading issue involving the 220 kV and 110 kV circuits between Hamilton and Otahuhu. This is a transmission architecture issue that has commonly encountered precedents within meshed transmission networks: lower voltage transmission circuits eventually overload when operated in parallel with higher voltage, higher capacity (lower impedance) circuits.

49 Classical network development strategy as inter-regional power transfer increases requires that the lower voltage network is progressively converted to provide a radial sub-transmission role, by removing the lower capacity parallel links. This may be achieved:

(a) operationally (normally open circuit breakers);

(b) as part of a post-contingency special protection scheme (open specific circuit breakers as necessary to remove from service the parallel link under overload conditions); or

(c) by permanent network reconfiguration (including removal of redundant sections of the lower voltage circuits not required for radial supply).

50 A complication in determining the appropriate network reconfiguration relates to providing capacity and security to points of supply along the lower voltage routes. In New Zealand's case, this complexity has both technical and commercial aspects:

(a) technical, in the sense of providing connections to the transmission network that meet the local distributor's capacity and security needs and afford a longer term development path based on the best available forecasting information; and

(b) commercial, in the sense that the transmission pricing methodology in current use classifies Transpower's network assets as either connection assets (charged customer-specifically) or interconnection assets (not charged customer-specifically but as part of a pool of wider grid assets).

51 Counties Power's submission provides evidence of the commercial complexity outlined above. The following quoted sections are relevant:

> *[Counties Power's] 110kV transmission network has been built, in part, with a view to lowering costs at the Bombay substation. These savings are made through the removal of the 110kV/33kV transformers and associated infrastructure. Under the proposed*

PD30 solution these savings may be lost if Counties Power is charged connection charges for the substation upgrade.[7]

Counties Power's account manager and pricing manager have advised that they expect that no additional charges will be levied on Counties Power; however, Transpower will not guarantee this will be the final outcome. Consequently, Counties Power is supporting a solution with no visibility of the costs to Counties Power.[8]

If Counties Power was charged the connection cost for this investment then effectively the people of the Counties region would be paying for a transmission upgrade for the benefit of Auckland consumers upstream (i.e. cross subsidizing Vector's consumers). Consequently, Counties Power opposes Transpower's proposed PD30 investment if the connection charges are not classified as interconnection assets.[9]

52 It is not clear to us whether this provides customer support or opposition to the PD30 expenditure of $18m that would (if Transpower implements its currently preferred option) create a 220/110 kV interconnection point at Bombay substation. Such support appears to hinge on whether Counties Power would face higher transmission charges or not.

53 Nevertheless, all Electricity Industry Participation Code (Code) participants (including Transpower and distributors) are required to comply with the Code. The purpose of Subpart 6 of Part 12 of the Code includes provisions that (amongst other things):

(a) establish processes for the identification of investments in the grid, and alternatives to such investments, to ensure efficient decision-making on the use of and upgrades to the grid; and

(b) specify the circumstances in which Transpower may permanently or temporarily remove interconnection assets from service or reconfigure the grid.[10]

54 Counties Power's submission indicates that it is self-interested, leading in this case to a preference for grid development options that would maximise the pool of assets in and around Bombay substation that would become (or remain) classified as interconnection assets.

55 We have sought to outline the likely technical and economic development path that considers both network and supply needs along the Arapuni/Hamilton – Bombay – Wiri – Otahuhu 110 kV line route. In our view, the steps in this process would likely include the following considerations:

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[7] Counties Power submission, top of page 4.
[8] Counties Power submission, bottom of page 4.
[9] Counties Power submission, bottom of section 8, page 5.
[10] Code, clause 12.105 (c) and (d).

(a) at the date when Transpower considers the parallel 110 kV overloading issue would put it in breach of the Grid Reliability Standards, switch open the BOB-WIR circuits, at least during the periods in which contingent overloading is an identified issue.[11] This would break the parallel 110 kV link, which is the primary transmission problem, but Wiri and Bombay firm supply capacity would also need to be considered (see steps (b) to (e) below). Transpower has indicated that this arrangement would have significant loss reduction benefits as inter-regional power transfer is moved to 220 kV (and possibly, eventually, 400 kV) circuits. While the switching could be automated with a SPS, at the $1.5m cost for this component estimated by Transpower (which seems very high compared with the frequently quoted $0.3m for other SPS installations – but note that we have no further information that explains this), this is probably not justifiable. Manual switching should be satisfactory, avoiding $1.5m of E&D base capex. All or part of the redundant BOB-WIR circuits could eventually be removed or sold;

(b) agree an upper bound for the 33 kV firm capacity at Wiri with Vector.[12] This is probably in the range 100 – 150 MVA,[13] depending on the largest conductor that can be cost-effectively hung on the OTA-WIR double circuit towers. Once this limit is approached by Wiri demand, consider options for a new GXP and/or transfer Wiri demand growth to other points within the Vector distribution network. Work with Vector to develop an optimal long-term development path;

(c) at optimal lifecycle dates, replace WIR T1 and T2 (> 40 year old units) with new supply transformers matched to the inbound circuit maximum design capacity. A transformer-ended feeder arrangement would appear to be cost-effective and sufficient;

(d) agree the upper-bound 110 kV firm capacity at Bombay with Counties Power, in two stages:

(i) the firm capacity available from the existing 110 kV circuits inbound from Hamilton and Arapuni (which also includes existing supply at 33 kV, which we understand is to be phased out by 2020[14]), which may be upgradable if the ARI-BOB circuit is bussed at Hamilton;

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[11] PD 30 indicates in the 'needs identification' table on page 2 that contingent overloading under high Auckland generation could be an issue from 2014, that is, from now.

[12] Each grid connection point has a natural upper bound to the amount of power that can be economically transferred (i.e. supplied or injected) through it. This limit is variously determined by consideration of relevant offtake/injection and/or local network considerations.

[13] 100 MVA is the approximate winter capacity of each of the two existing circuits. 120 MVA is the forecast 2029 peak demand provided in the 2014 APR. 150 MVA is an educated guess.

[14] *2014 Annual Planning Report*, Transpower, March 2014, Table 8-1.

(ii) the firm capacity ultimately available through one or two new 220/110 kV interconnecting/supply transformer(s) at Bombay; and

(e) time the installation of 220/110 kV interconnection/supply transformers at Bombay to meet Counties Power's firm capacity needs. Possibly, in the future, remove or sell all or part of the southern inbound 110 kV circuits into Bombay once firm interconnecting transformer capacity is installed.

56 Based on the Bombay peak demand forecast provided in the 2014 APR, inbound circuit firm capacity is likely to be reached sometime around 2016. Thus, the case for the first Bombay supply/interconnector within RCP2 appears to be sound.

57 The $3.2m included in PD30 for a Wiri tee – Wiri capacity upgrade is not substantiated by the information included in PD30. We understand this is a very short double circuit tee section traversing the Auckland southern motorway (1 span). It is possible that the provision anticipates replacing the overhead tee circuits with underground cables, or perhaps it requires elaborate and expensive motorway safety scaffolding and operational costs, but this is not explained or further justified. The need and cost is also not explained in the supporting document *Options Analysis – Otahuhu-Wiri Transmission Constraint*, Transpower, 26 June 2014.

58 We therefore recommend rejecting the Wiri tee – Wiri capacity upgrade component of PD30.

Recommendation

59 Accept the project component that provides for the installation of one 220/110 kV interconnecting bank at Bombay within RCP2 (option 4b).

60 Reject the forecast expenditure associated with the proposed Wiri tee – Wiri capacity upgrade component ($3.2m).

61 Note that Wiri supply transformer replacements/upgrades will be agreed with Vector at the appropriate time and not require E&D base capex.

3.4.2 PD33 – Bus Section Fault Reliability

62 PD33 provides for solutions to three identified bus section security deficiencies at Haywards, Bunnythorpe and Mt Roskill substations.

63 Our advice on PD33 relates only to the Mt Roskill component of the project, for which Transpower has submitted an updated POD. We have previously provided recommendations in respect of the two other components of this project.[15]

[15] Strata Technical Report, Annex A.4.

64 As originally scoped, the Mt Roskill project provided for additional security by creating three 110 kV bus sections. Our concerns with this project were that:

(a) the 2013 APR noted that Vector had not (at least at the date of Transpower IPP proposal) requested additional security beyond that provided by the current arrangement and noted that further investment would be customer driven;[16] and

(b) it was not clear how a three-bus section arrangement had been arrived at as providing the optimal solution over other possible arrangements.

65 The updated PD33 submitted by Transpower states that additional security at Mt Roskill beyond the current level is, in fact, supported by Vector. The 2014 APR in section 8.9.1 provides a consistent statement in respect of Vector's support. We have sighted correspondence relevant to this interaction with Vector.[17]

66 Assuming the customer does in fact want upgraded security, our advice to the Commission expressed further concern that it was not clear how a three-bus section arrangement had been arrived at as providing the optimal solution over other possible arrangements. Without additional supporting information, we did not support inclusion of the Mt Roskill component within the PD33 forecast.

67 The updated PD33 now provides for a single bus section circuit breaker and states that the two-bus section arrangement that would be created would (in conjunction with post-contingency load management by Vector) meet the Grid Reliability Standards. A reduced provision of $4.46m for the Mt Roskill component was included in Transpower's submission.

68 A two-bus section arrangement is the simplest upgrade from a single bus section arrangement, alleviating our earlier concerns around the proposal to create three 110 kV bus sections at Mt Roskill in RCP2. Along with the clear expression of customer support now provided, we accordingly support inclusion of the Mt Roskill component of PD33.

Recommendation

69 Accept the expenditure associated with the Mt Roskill component of PD33 ($4.46m).

3.4.3 PD37 – North Taranaki Transmission Capacity

70 In Transpower's original IPP proposal, this project provided for an early upgrade option associated with end-of-life replacements of the Stratford

[16] 2013 APR, page 126.
[17] Email exchange between J Welch and G Ancell, 17-18 March 2014.

and New Plymouth interconnecting transformers forecast to be required in RCP3.

71 The original IPP proposal forecast expenditure for PD37 spanned across RCP2 and RCP3, with $3.03m forecast for RCP2. The preferred option was to install a new 200 MVA transformer at Stratford to operate, initially at least, alongside the existing 100 MVA bank.

72 In its submission, Transpower has fundamentally reconsidered this project, citing updated information now available to it. The key updates appear to be:

(a) that Transpower acknowledges that the original proposal did not address the issue it sought to resolve (i.e. overloading of the Carrington Street – Stratford circuit and low 33 kV voltage at Huirangi, if New Plymouth T8 is out of service); and

(b) that Port Taranaki, the new owner of the ex-NPL power station site on which Transpower's NPL substation is located, would "*… like [Transpower] to leave as soon as possible and plans to demolish parts of the site affecting [Transpower's] control room*".[18] Transpower states that it is in discussions with the site owner (Port Taranaki).

73 Transpower has now accepted that it needs to remove its equipment from the ex-power station site at the port and has increased its RCP2 provision for PD37 by $10.65m (that is, from $3.03m to $13.68m) to achieve this outcome by 2018.

74 We have considered the needs and options analyses provided by Transpower in its updated PD37 document and, while we have some reservations with some of the detail, we broadly accept that an early withdrawal from the ex-power station site is likely to represent the best overall solution from a regional development perspective. The key points in reaching this conclusion are as follows:

(a) it has been made clear to Transpower by Port Taranaki that there is no requirement to retain a possible future generation connection option at the port;

(b) remaining at the ex-power station site will be costly for Transpower as significant future costs are likely. Port Taranaki has made it clear that it will seek to pass on all transmission-related tenant costs it faces to Transpower;

(c) the updated PD37 provided the results of a cost benefit analysis that establishes Transpower's preferred option as the most likely economic alternative. We accept this conclusion based on the information we have reviewed;

[18] Updated PD37, need identification table, page 1.

(d) the replacement 220/110 kV interconnecting transformer for NPL T8 can be placed at Stratford, so long as adequate 110 kV transmission capacity is provided to the New Plymouth area GXPs (chiefly to Carrington Street substation, which is the main transmission terminal for the area). New Plymouth area current and future load is adequately primarily supplied from a high-capacity 110 kV double circuit line from Stratford, subject to there being sufficient 220/110 kV interconnection capacity at Stratford, augmented with 110 kV-connected generation within the region; and

(e) an alternative 33 kV supply to Powerco's Moturoa zone substation is feasible, although from submissions, there is no clear agreement as to which party should fund the new 33 kV cables (estimated to cost $5m).

75 Accordingly, we support the allowance of $13.68m within RCP2 which will provide an early replacement for NPL T8 (to be located at SFD) and repurpose the 220 kV NPL-SFD A line for operation at 110 kV and connection onto the CST-NPL A line. An optimal location for the new bridge section needed to connect the two lines will need further consideration of option feasibility and avoided maintenance costs (since the lines run adjacent to each other for several kilometres into the port site, several bridge location options will likely exist).

76 Transpower explained in the updated PD37 that the overall project will require more than $13.68m in RCP2. In respect of this, Transpower:

(a) intends to transfer $2.4m from its R&R allowance to reflect an avoided R&R cost; and

(b) has not provided for an estimated $5m to install new 33 kV cables to Moturoa. We note there is a risk that Transpower will ultimately face this cost, given that submissions have not identified any other willing benefactors.

Recommendation

77 Accept the provision of $13.68m in RCP2 for early replacement of NPL T8 and withdrawal from the ex-power station site at Port Taranaki.

3.4.4 PD39 – Southland Reactive Power Support

78 In its submission, Transpower has commented on the Commission's draft decision to reject the expenditure associated with PD39.[19] In our view, the case for advancing the replacement and upgrade of two existing 50 MVAr

[19] *Enhancement and Development Base Capex – Response to Draft Decision*, Transpower, 25 June 2014, section 4.1.10.

capacitor banks at North Makarewa by 4 years[20] had not been made in the IPP proposal.

79 Transpower's submission comments provided a restatement of its view that the case for bringing forward $1.7m by 4 years is justified but provided no additional rationale.

80 We requested further clarification of this project from Transpower.[21] Transpower's responses provided further rationale for its preference to advance part of the expenditure planned under this project from RCP3 to RCP2 relating to the need in RCP3 to replace the existing C1 and C3 capacitor banks at North Makarewa.

81 Transpower considers that the option of undertaking this work in conjunction with its plan to install a third capacitor bank at the same substation would have lower net costs. In its responses, Transpower has identified that advancing the replacement and upgrade of C1 and C3 will cost $314k (early asset replacement) but realise $432k of savings through running both components of the project concurrently. These estimates appear to be reasonable.

82 Accordingly, we are satisfied that a net benefit will accrue in support of Transpower's preferred option.

Recommendation

83 Accept the allowance of $6.0m to install a new 70 MVAr capacitor bank at North Makarewa substation by 2018 and concurrently replace and upgrade the existing C1 and C3 capacitor banks at that substation to each provide 70 MVAr of reactive power.

3.4.5 PD41 – Hororata and Kimberley Voltage Quality

84 This project provides for new reactive power support in the section of the 66 kV network between Islington and Hororata substations. Transpower's preferred option is to install 3 x 9 MVAr static capacitor banks at Hororata in 2015/16.

85 The investment is justified on the basis of a net market benefit test, which has been undertaken using estimated values in the updated PD41. The project benefits are assessed as being in the range $4 – 6m, against a project cost of the preferred solution of $3.36m. Transpower considers that it has conservatively stated the net benefits.

86 While the underlying level of peak demand growth at Hororata and Kimberley is relatively modest, the possible addition of a third drier at the milk processing plant supplied from Kimberley would, if committed as

[20] The capacitor bank replacements/upgrades are scheduled for 2020/21. The proposal would bring these forward to start in 2016/17 to coincide with the provision of an additional capacitor bank at North Makarewa.
[21] Questions Q90 and Q93 to Transpower from the Commission.

anticipated, provide a significant step change in demand. This anticipated step change in demand has been included in the assumptions underpinning the cost benefit analysis that supports this project.

87 Management of system voltage, particularly at times of high local demand and low Coleridge generation, is already difficult and Transpower and Orion have entered into a Wider Area Voltage agreement that provides for operation of the local 66 kV network at lower than normal system voltage.

88 Taken together, these factors are symptomatic of a section of the 66 kV network in need of voltage support within the near future.

89 Voltage support can be provided in a number of ways and PD41 identifies the most likely options. It is possible that a combination of options may provide higher net benefits than the currently preferred option and we expect that the project development and approvals process will evaluate these as more information becomes available.

90 For the reasons stated in PD41, we accept that new static voltage support plant is likely to be justified early in RCP2. Accordingly, we support the provision of $3.36m of E&D base capex in 2015/16.

Recommendation

91 Accept the expenditure provision to install static voltage support plant at Hororata, at an estimated $3.36m.

3.4.6 PD42 – Islington Spare Transformer Switchgear

92 As originally scoped in Transpower's IPP proposal, this project provided for installation of the new spare 220/66 kV interconnecting transformer at Islington by providing switchgear, protection and a neutral earthing transformer and operating the transformer on hot standby (that is, with one circuit breaker open and the other closed).

93 We outlined three concerns with this project in our report and recommended its deletion from the RCP2 E&D base capex allowance.

94 Transpower has submitted an updated PD42 (confusingly, this is still titled Islington Spare Transformer Switchgear), which now provides for a new option that would provide for installation of a SPS that would reconfigure the network and shed some load in the event of an n-2 contingency. Orion has expressed support for this proposal.[22]

95 We have the following concerns about this proposal:

(a) the project would provide n-2 security, which exceeds the Grid Reliability Standards (GRS);

[22] While Orion supported the proposal, no information has been provided as to MainPower's view.

(b) in support of this project, Transpower has assessed around $1m of net benefits based on double contingency events that have return periods on the order of 1 in 200 years;

(c) PD41 states that Orion can transfer load from Islington to Bromley but it does not further quantify this capability. We understand that Orion has a long-term objective to build the capability to supply its peak demand through either Islington or Bromley if the other GXP should completely fail in a single event.[23] While this development may or may not eventuate, providing security beyond the GRS is a customer-specific investment matter;

(d) the equivalent cost of the original proposal ($0.5m) to install switchgear is no longer an option in the updated PD42. There is no explanation provided as to why this option is no longer considered to be feasible; and

(e) similarly, it is stated that ISL T3 and T7 are due for replacement in the relatively near term (early 2020's). We would have expected to see in PD42 an option that considered advancing the replacement of these interconnecting transformers, including with larger capacity units (or an explanation as to why the option is not feasible or desirable).

96 For these reasons, PD42 remains unsubstantiated in our view. If a case can be made for expenditure to avoid such a double contingency at Islington, we expect that similar proposals would be justifiable (or at least considered) for Otahuhu and Haywards and possibly other major grid supply nodes that have multiple interconnecting transformers.

Recommendation

97 Reject the expenditure proposed for PD42.

3.4.7 PD43 – Haywards Local Service Third Incomer

98 This project provides for installation of a third 11 kV local service incomer, supplying the synchronous condenser auxiliaries at Haywards. The proposed arrangement would increase 11 kV supply bus security to an n-2 level.

99 Our earlier concerns related to provision of a poor cost benefit analysis and a lack of consideration of solution alternatives. To some extent, having considered the information provided in the updated PD43, we retain our concerns.

100 Transpower has reconsidered the benefits for this project. It has dropped the previous approach (which relied on a contingent event with a return

[23] This was included in Orion's CPP proposal, considered by the Commission in 2013.

period of around 2700 years) and substituted this with a constraint-driven benefit at an estimated $0.9m.

101 We continue to hold reservations over the quality of this analysis. For example, why would a local service outage be routinely planned at periods of high HVDC transfer? Sufficient outage windows (perhaps coinciding with primary HVDC plant maintenance) to provide for maintenance of secondary systems are likely to exist.

102 We also have concerns related to the sequence of events that would trigger an AUFLS event. In our earlier recommendation, we speculated that a sudden loss of local service supply would be unlikely to warrant an instantaneous condenser trip to address a developing over-temperature condition. In the updated PD43, Transpower indicated that in fact a 60 second delay is provided before an HVDC runback is initiated. In our view, this 60 second window is not well utilised from a design perspective. While we claim no specific experience in HVDC protection design, a reasonable question arises as to whether a better runback strategy (one that would avoid an AUFLS event) would be feasible, given the 60-second window available. Thus, we retain our concern relating to consideration of alternative solutions.

103 For these reasons we retain our reservations over inclusion of the expenditure associated with PD43 in E&D base capex.

Recommendation

104 Reject the expenditure proposed for PD43.

3.4.8 PD44 – E&D Other

105 PD44, as originally submitted, provided for five miscellaneous projects:

(a) Christchurch reactive power controller (RPC);

(b) north of Huapai transmission security;

(c) de-rate Bombay capacitor;

(d) Real Time Digital Simulator (RTDS) upgrade; and

(e) supply transformer minor enhancement project.

106 Having considered the information provided to justify these projects, we supported the expenditure associated with parts (d) and (e) but did not support the expenditure associated with parts (a), (b) and (c).[24]

107 In its submission, Transpower has withdrawn the expenditure associated with parts (b) and (c) and provided additional information in support of part (a) – Christchurch RPC.[25]

[24] Strata report, Annex A.

108 In support of the Christchurch RPC, Transpower has provided new information that explains the need for this component of PD44. We have considered this new information and concluded that the proposed expenditure is justified in association with plans to replace Bromley T5 and T6 within RCP2 with units suitable for inclusion within the RPC scheme. We therefore support inclusion of $0.59m across 2018/19 and 2019/20.

Recommendation

109 Accept the expenditure associated with the updated PD44.

3.5 Final recommendations on E&D base capex

Forecast expenditure adjustments

110 We consider that $95.1m would constitute prudent and efficient expenditure for E&D base capex.

111 This represents:

(a) a reduction of $4.3m (4%) from the total included in Transpower's submission on the Commission's draft decision; and

(b) a reduction of $28.7m (23%) from the total included by Transpower in its original IPP proposal.

112 Table 1 provides a breakdown of the recommended adjustments by portfolio.

Table 1 RCP2 adjusted Enhancement & Development forecast

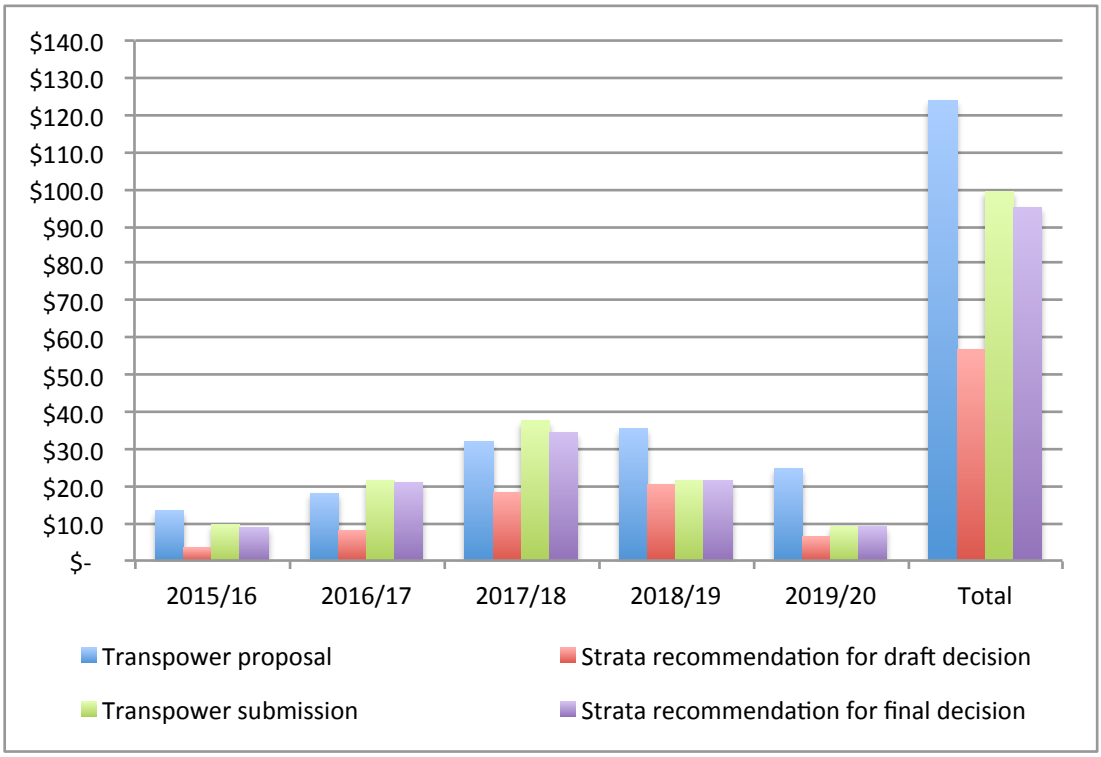
		Transpower submission						Recommended adjustment (final decision)					
POD reference	E&D Project	2015/16	2016/17	2017/18	2018/19	2019/20	Total	2015/16	2016/17	2017/18	2018/19	2019/20	Adjusted Total
PD30	Otahuhu-Wiri Transmission Capacity	$ 2.5	$ 8.7	$ 6.8	$ -	$ -	**$ 18.0**	$ 2.5	$ 8.7	$ 3.6	$ -	$ -	**$ 14.8**
PD31	Relieve Generation Constraints	$ -	$ -	$ 1.5	$ 3.7	$ 0.8	**$ 6.1**	$ -	$ -	$ 1.5	$ 3.7	$ 0.8	**$ 6.1**
PD32	Upper North Island Reactive Support 2012 - 2020	$ -	$ -	$ 3.9	$ 4.1	$ 0.0	**$ 8.0**	$ -	$ -	$ 3.9	$ 4.1	$ 0.0	**$ 8.0**
PD33	Bus Section Fault Reliability	$ -	$ -	$ 3.2	$ 5.4	$ 2.3	**$ 10.9**	$ -	$ -	$ 3.2	$ 5.4	$ 2.3	**$ 10.9**
PD34	Wellington Supply Security	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD35	Otahuhu and Penrose Interconnection Capacity	$ -	$ -	$ 1.9	$ 7.1	$ 2.0	**$ 10.9**	$ -	$ -	$ 1.9	$ 7.1	$ 2.0	**$ 10.9**
PD36	Bunnythorpe Interconnection Capacity	$ 0.1	$ 3.1	$ 5.6	$ -	$ -	**$ 8.8**	$ 0.1	$ 3.1	$ 5.6	$ -	$ -	**$ 8.8**
PD37	North Taranaki Transmission Capacity	$ -	$ 4.2	$ 9.5	$ -	$ -	**$ 13.7**	$ -	$ 4.2	$ 9.5	$ -	$ -	**$ 13.7**
PD38	Timaru Interconnecting Transformers Capacity	$ -	$ -	$ -	$ -	$ 2.5	**$ 2.5**	$ -	$ -	$ -	$ -	$ 2.5	**$ 2.5**
PD39	Southland Reactive Power Support	$ -	$ 2.1	$ 3.8	$ -	$ -	**$ 6.0**	$ -	$ 2.1	$ 3.8	$ -	$ -	**$ 6.0**
PD40	High Impact Low Probability Event Mitigation	$ 2.8	$ 2.9	$ 1.5	$ 1.0	$ 1.0	**$ 9.2**	$ 2.8	$ 2.9	$ 1.5	$ 1.0	$ 1.0	**$ 9.2**
PD41	Hororata and Kimberley Voltage Quality	$ 3.4	$ -	$ -	$ -	$ -	**$ 3.4**	$ 3.4	$ -	$ -	$ -	$ -	**$ 3.4**
PD42	Islington Spare Transformer Switchgear	$ -	$ 0.5	$ -	$ -	$ -	**$ 0.5**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD43	Haywards Local Service Third Incomer	$ 0.6	$ -	$ -	$ -	$ -	**$ 0.6**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD44	E&D Other	$ 0.2	$ 0.1	$ -	$ 0.2	$ 0.4	**$ 0.9**	$ 0.2	$ 0.1	$ -	$ 0.2	$ 0.4	**$ 0.9**
	Total	**$ 9.6**	**$ 21.6**	**$ 37.6**	**$ 21.6**	**$ 9.1**	**$ 99.4**	**$ 9.0**	**$ 21.1**	**$ 34.4**	**$ 21.6**	**$ 9.1**	**$ 95.1**

For a larger copy of the table please see Annex A.

[25] *Enhancement and Development Base Capex – Response to Draft Decision*, Transpower, 25 June 2014, section 4.1.15 and also the updated PD44 – E&D Other.

113 The proposed and adjusted forecasts are represented graphically in Figure 1.

Figure 1 RCP2 E&D forecast proposed and adjusted ($m)



4 Refurbishment and replacement capex

4.1 Section introduction

114 In this section we provide a summary of our review of the points raised in Transpower's submission regarding R&R Capex. In particular, we provide an opinion on specific areas of the proposed Asset Health Incentives.

4.2 Transpower's submission comments on R&R capex

4.2.1 Cost estimation bias, deliverability and roll-over

115 In its submission, Transpower raised what it considered to be inconsistencies between the Draft Decision and the Strata report concerning cost estimation and projects rolling over into RCP3.[26] Transpower had concerns if the perceived bias towards overestimation was a factor in the Commission's proposed reductions.

116 In its report to the Commission, Strata noted that while Transpower management had addressed 'productivity improvements' through the application of a 7.5% downward adjustment to Grid and IST base capex, the Transpower board had identified the potential for inherent over estimation bias in bottom-up forecasting.[27] In addition, the board discussed the need for a 'deliverability factor' to take into account the deliverability of the proposed expenditure at a portfolio level.

117 In the proposal and in formal responses from Transpower we observed that:

the Board considered that a 7.5% adjustment was appropriate for over estimation and deliverability correction; and

(a) management considered that a 7.5% 'productivity adjustment' was appropriate to account for the application of prudent decision-making.

118 Strata's reviews of asset health models indicated a likelihood of roll-outs (i.e. non-completion within the RCP) of projects from RCP2 to RCP3 due to reasons other than productivity gains (e.g. inability to undertake the work). This is quite a different issue to Transpower's 'productivity adjustment' but our findings are aligned with the Board's concerns regarding deliverability.

[26] Transpower submission section 2.7.2.
[27] Strata report, paragraphs 249 to 256.

119 The indication from the asset fleet reviews is that this level is likely to be in the order of 5 – 10%.

120 On balance, Strata considered that an additional adjustment at the lower end of the range was appropriate and accordingly recommended a 5% downwards adjustment. In making this recommendation we considered that the adjustment would primarily address the roll-out (deliverability) concerns but also, to some extent address overestimation bias in asset health models. It was for these reasons that we considered that the introduction of an asset health incentive measure could be proposed as an alternative to the downwards adjustment.

4.2.2 Across the board adjustments

121 In section 3.1.1 of its submission Transpower sets out its views on the inappropriateness of what it calls 'across the board' adjustments because:

(a) *It has been applied to 21 portfolios, each of which has different forecasting approaches and potential delivery risks;*

(b) *By applying our own 'productivity adjustment' we have already made a commitment to deliver efficiencies in Grid Capex;*

(c) *Our challenge round process already reduced the scope of our programmes to a prudent level; and*

(d) *Constraining R&R programmes may lead to increased asset-related risk and the potential for deteriorating reliability for our customers.*

122 As Transpower notes, its management had applied an 'across the board' productivity adjustment. Importantly, we sought information on how this adjustment had been calculated and the analysis that management had undertaken to establish the level of productivity adjustment. Transpower's response included the following points:

(a) *This was done at an aggregate level given the flexibility to reprioritise expenditure across portfolios (substitution) under the IPP;*

(b) *Overall, we consider that the assessment and approval of forecast expenditure is not a mechanistic process – it necessarily involves the exercise of judgement supported by specialist knowledge; and*

(c) *The people involved in specifying and approving the adjustment, including members of our Board, CEO, senior management team and portfolio owners have the qualifications, skills and experience necessary to ensure effective governance of our forecasts (this is discussed further in our response to Q004). They concluded that a*

7.5% reduction was achievable and would provide an appropriate incentive and target for productivity improvements during RCP2.[28]

123 The position that Transpower has presented in its submission is that, despite its resources, access to information and available time, it was appropriate for its management to apply an 'across the board' adjustment to take into account expected productivity gains. Yet it claims that it is inappropriate for the Commission and its advisors with more limited access to resources, information and time to take the same approach for a deliverability adjustment.

124 As Transpower notes in its submission, an across the board adjustment at an aggregate level allows the business flexibility. We also agree with Transpower that establishing adjustments is not a mechanistic process and requires the exercise of judgement and experience.

125 Strata has seen nothing in Transpower's submission that offers a persuasive argument that the recommended downward adjustment of 5%, as discussed in paragraph 120, is inappropriate.

4.2.3 Substation management systems

126 Transpower has reassessed its proposed SMS proposal in light of the comments in the Draft Decision. The alternative roll-out plan in Transpower's submission is more conservative and is generally aligned with that recommended by Strata and included in the Draft Decision.

127 Strata recommends that the Commission adopts Transpower's revised SMS plan in its Final Decision.

4.3 Transpower's proposed Asset Health Incentives

128 In its review of Transpower's R&R expenditure forecast, Strata advised the Commission that an asset health performance measure and incentive scheme could be considered as an alternative to the application of an estimation bias and deliverability adjustment, as Strata proposed for R&R capex.

129 We envisaged that the asset health performance measure and incentive scheme would be based on delivery of the asset health levels in 2020 that Transpower used to support its forecast expenditures. We also considered that the proposed measure would need to:

(a) address how changes to asset condition data and models occurring during the RCP will be accounted for;

(b) provide flexibility to make efficient adjustments within RCP2 (for example, an efficient capex/opex trade-off allowing deferral of an asset replacement); and

[28] Transpower's response to Q003.

(c) include a material financial incentive for Transpower to deliver the grid in the condition it has proposed its expenditures should deliver by the end of the RCP.

130 In its Response to the IPP Draft Decision (the response), Transpower has proposed an asset health incentive scheme (the proposed scheme) that is generally aligned with the type of scheme that we envisaged. The proposed scheme:

(a) is based on the difference between the asset health (measured as remaining asset life) starting point and the forecast end point. Caps and collars are derived from these values. The start and end point data is 'frozen' at the values used to establish the expenditure forecast. The algorithms within the model are also frozen. Through this method, any changes in asset condition data and models occurring during RCP2 do not affect the proposed measure;

(b) allows Transpower flexibility to make changes to its proposed R&R programme during RCP2. Transpower will continue to develop and update its asset data in 'unfrozen' models. The unfrozen models will be used for actual management of the asset fleets; and

(c) includes an incentive which, on a net basis (e.g. across all asset fleets), removes the ability for Transpower to receive benefit for failing to deliver its proposed R&R programme.

131 Overall, Strata agrees with the Commission that the proposed scheme is a positive development and is generally aligned with the guidance provided in the Draft Decision.

132 Notwithstanding the above comment, Strata has concerns with some of the detail of the proposed measure that Transpower has outlined in subsequent discussions. These concerns are that:

(a) Transpower has requested that during RCP2, it can request changes to the frozen data (a 'refresher') where it can be shown that the incentive scheme has incentivised suboptimal asset management decisions or to update asset health data;

(b) Transpower will provide the Commission with the frozen model only; and

(c) the proposed scheme covers only three asset fleets.

133 Transpower's response to our question on the detailed implementation of the Asset Health Incentive Mechanism has identified to us that its adoption may present significant financial risks to Transpower and has the potential to incentivise suboptimal decisions. To address these issues Transpower has proposed a refresher that can be used to reset the frozen model.

134 Given that the use of an asset health measure is innovative, quite complex and untested, it would be preferable if Transpower had proposed a

mechanism that minimised the potential for and impact of undesirable effects. Strata considers that this aspect of the response should have been given careful consideration in Transpower's submission including a range of options to manage the potential issues.

4.3.1 Options identified

135 We have identified three options that could be taken to manage a lower risk pathway for the introduction of asset health performance incentive measures.

Option 1 - The refresher

136 The refresher would minimise the risks that the frozen model becomes so significantly out of step with the current view of the network condition that it may penalise Transpower for making optimal asset management decisions. In effect, the refresher would bring the frozen and unfrozen models into closer alignment.

137 While we are comfortable with the concept and intent of the refresher proposed by Transpower, if it was adopted we would like to see strong limitations placed around its use. This would mean that only one refresher can be used during the RCP, and changes would be fully supported and justified. In addition, the Commission would need to have full visibility of all differences between the 'frozen and unfrozen' models.

138 A key consideration for the Commission is the regulatory provisions through which a mid RCP refresher can be assessed and approved. An additional consideration is the potential for the existence of a refresher to neutralise the incentive i.e. take away the risk, take away the incentive.

Option 2 - Information only

139 Transpower has proposed the use of asset health measures for only three of its asset fleets. The selected fleets are the ones that have the most mature asset health data. For other fleets, delivery against volumetric quantities (i.e. numbers of assets to be replaced) is proposed. Volumetric measures do not present the same level of risks as those apparent in the proposed asset health measures.

140 One option is to use volumetric measures for all asset fleets. This would address the concerns we identified regarding deliverability and roll over of a proportion of the proposed expenditure. However, taking a purely volumetric approach would not provide the required focus on the delivery of the asset health profile delivery that the expenditure forecast was predicated on.

141 To make asset health delivery visible, a volumetric incentive measure could be augmented by a requirement on Transpower to provide the asset heath incentive data, as proposed by Transpower, but for information only. This could be considered to be part of the reporting on progress towards improved asset management practices.

Option 3 - Hybrid

142 It is possible to retain the asset health incentive mechanism proposed by Transpower but through a more cautious approach that provides a learning pathway through the initial implementation. This option utilises the volumetric measure for the largest proportion of the incentive but retains a proportion for the asset health incentive mechanism.

143 For example, 70% of the incentive could be provided through a volumetric measure (as proposed for other asset fleets) the remaining 30% would be for achievement of the asset health targets (including provision of appropriate caps and collars).

144 The hybrid approach should reduce the risks for Transpower and remove any need for a refresher. The volumetric component will address the deliverability issue and the asset health measure will provide some incentive to deliver the network in the expected condition at the end of RCP2.

4.3.2 Assessment of options

145 Given the innovative nature of the asset health measure and the continuing uncertainty regarding the quality and maturity of Transpower's asset health data, we recommend caution when applying an incentive regime. It would be wise to implement the measure through a transition path that appropriately manages the risks, yet at the same time provides some incentive to continue the development of the asset health measure.

146 Both the information only and hybrid options provide for transition, learning and development through RCP2. While the hybrid option provides some incentive for delivery of forecast asset health, it may present some challenges due to increased complexity of the compliance, reporting and monitoring required.

147 The information addresses the deliverability issue (through the volumetric incentive measure); it can be applied to all asset fleets and does not have the compliance complexity of the other two options. If this option is chosen it will be important to provide strong direction and guidance to Transpower on the requirement for continued development and reporting of the asset health measures. The intention that asset health will be used for an incentive scheme in RCP3 should be clearly understood by Transpower.

4.3.3 Reporting on asset health management

148 Regarding our second point, we have a firm view that Transpower should be required to provide annual updates of both the 'frozen and unfrozen' models. We consider that the visibility of the differences between the forecast and actual positions provided by viewing both models would be vital for the assessment of how the scheme is working during the RCP and the behaviour that it is incentivising.

149 The above view has been reinforced through recent workshop formal responses received from Transpower and in its responses to information

requests. Transpower's concern regarding risks of potential divergence between the frozen and unfrozen models has increased our concerns regarding Transpower's claims that three of its asset fleet models were sufficiently mature. Given that in its proposal Transpower relied heavily on its asset health models to support the proposed replacement capex it is a concern that doubts have been raised regarding the use of asset health as a performance measure.

150 For the above reason we have concluded that Transpower must be required to operate the asset health mechanism as a pilot alongside the volumetric measures. The periodic reporting to the Commission of both models will be essential for the removal of on-going concerns regarding the integrity of Transpower's asset data and on the justifications for material changes between planned and actual expenditure. It will also provide much improved assessment of the reasons for variances due to substitutions within and between asset fleets.

151 Transpower has informed us that it considers that it is only required to provide the 'frozen' model for the purposes of the proposed asset health measure. Strata's firm view is that this is insufficient to allow the Commission to monitor the application of the scheme during RCP2 and to obtain a wider view on the impact of variations between forecast and actual expenditure.

152 Strata's recommendation is that, in the absence of the requirement to provide the proposed asset health models and information, the proposed 5% reduction in replacement capex should still be applied. However, if both the volumetric incentive and the asset health mechanism pilot are implemented then, on balance, we consider that the downward adjustment of 5% can be waived.

4.3.4 Conclusions on the proposed asset health incentive scheme

153 Due to the risks identified by Transpower inherent in its current asset health data and models, it would be inappropriate to accept Transpower's proposed asset health measure for an incentive based scheme. Strata consider that it is appropriate to use a volumetric basis for such a scheme.

In our view, whichever option is chosen, the Commission should require Transpower to provide the 'unfrozen' data and algorithms for all asset fleets and implement its proposed asset health incentive scheme as a pilot during RCP2. Throughout RCP2 Transpower should be required to provide reasons for any material differences as part of the annual reporting on business improvements[29].

[29] Strata has taken this into account in our consideration of an adjustment for business improvement opex.

5 IST base capex

5.1 Summary of points made by Transpower

154 There are two key aspects to Transpower's response to the Draft Decision in relation to IST capital expenditure:

(a) qualified acceptance of the removal of the imposed $15.1m allocation for the system upgrade to implement a revision of the Transmission Pricing Methodology (TPM); and

(b) rejection of the 2.5% ($4.7m) efficiency/prudency adjustment to its proposed IST capex portfolio as there is insufficient justification.

5.1.1 Transmission Pricing Methodology

155 Transpower acknowledges that consultation with the Electricity Authority has been underway for some time and that there is sufficient uncertainty as to the need for the project and the timing to warrant the removal of the allocation from the proposed IST portfolio.

156 Transpower flags its intention to seek agreement from the Commerce Commission to recover required expenditure during RCP2 before committing such expenditure.

5.1.2 Prudency/efficiency reduction

157 Transpower restates the drivers of IST Capex as including:

(a) 'refresh/capacity expansion Capex allows us to maintain benefits from established systems;

(b) compliance and risk mitigation projects manage residual risk within the business; and

(c) cost saving/avoidance projects seek to reduce our IST Opex.[30]

158 Transpower does not consider the 2.5% reduction to be appropriate for the following reasons:

(a) its original proposal already incorporated a 7.5% productivity adjustment which allows sufficient allocation for the proposed projects only if each is delivered at 'optimal efficiency';[31]

[30] Response to IPP Draft Decision, *Section 4.1.1,* p23.
[31] Response to IPP Draft Decision, *Section 4.1.1,* p23.

(b) the further reduction would lead to 'cuts that may lead to our systems deteriorating, becoming more expensive to maintain and reduced levels of business capability;'[32]

(c) due to Transpower's reluctance to further reduce expenditure on 'refresh/capacity expansion' or 'compliance/risk mitigation' projects, the $4.7m reduction would have to come from the capex/opex trade-off projects, which would have 'negative implications in the longer term'; and

(d) in Transpower's view, Strata gave an overall positive assessment of Transpower's IST Capex programme and forecasting process.

5.2 New and confirmed information

5.2.1 Transmission Pricing Methodology (TPM)

159 Further to its conditional acceptance of the Draft Decision to remove the $15.1m from the IST Capex allocation, Transpower advises that:

(a) it will be necessary to extend the life of the existing platform at an estimated capital cost of $1.5m if the TPM upgrade does not proceed; and

(b) no provision has been made for this work in its RCP2 forecast and if this work is to be undertaken within the current forecast, the Commission's proposed 2.5% prudency reduction makes it more onerous.[33]

5.2.2 Prudency/efficiency reduction

160 Transpower confirms that it believes that its proposed IST Capex programme is appropriate. Transpower advises that it was subjected to rigorous internal and external challenge and has already had a challenging productivity adjustment applied.

161 Transpower does acknowledge that:

(a) 'it is more difficult to estimate the costs and benefits of transformational IST programmes than transmission systems upgrades or replacements'; and

(b) 'the current rapid changes in technology make predictions in costs and benefits over 3-5 year timeframes more difficult'.[34]

162 Transpower mitigates against these uncertainties by managing risks and benefits at a 'whole of portfolio level as well as at project level'.[35]

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[32] Response to IPP Draft Decision, *Section 4.1.1,* p23.
[33] Response to IPP Draft Decision, *Section 4.1.2,* p24.
[34] Response to IPP Draft Decision, *Section 4.1.1,* p24.

163 Finally, Transpower advises that it is now implementing improved benefits measurement and analysis, but advises that forecasting tangible benefits will continue to contain a level of uncertainty due to variance in the technology landscape.

5.3 Assessment

5.3.1 Transmission Pricing Methodology

164 Based on the information available, we remain of the view that Transpower's $15.1m for the TPM project should be removed as there is insufficient certainty that it will proceed within the RCP2 period or that $15.1m will be required.

165 We accept Transpower's assertion that if the upgrade is not required, it will need to extend the life of the existing platform, however the estimate of $1.5m is not substantiated and we would expect Transpower to manage the upgrade within its budget (if it is required) as it represents less than 1% of total proposed IST expenditure.

5.3.2 Prudency/efficiency reduction

166 The Draft Decision highlighted our expectations for the IST Capex programme in moving from investment primarily in building new capability to one of maintaining capability established by past investment, including:

(a) reduced capex in RCP2;

(b) a high net benefits hurdle rate for further investment in further 'capability building' investments;

(c) careful consideration of opex/capex trade-offs; and

(d) demonstrated realisation of tangible and intangible benefits from RCP1 expenditure.

Transpower's IST strategy and cost estimation methodology

167 We made a number of observations about Transpower's IST strategy and cost estimation methodology in our initial report and assessed:

(a) the overall IST strategy appears to be sound; and

(b) that, *when implemented in full,* the IST capex estimation approach appears to be sound.

168 Our significant concern, which Transpower has not ameliorated in its Response to the IPP Draft Decision, is that the cost estimates are at an early stage and that there is a significant risk of over estimation (a view

[35] Response to IPP Draft Decision, *Section 4.1.1,* p24.

which Transpower shares[36]). Unlike Transpower, we do not find that its 'productivity adjustment' (as defined by Transpower) is sufficient to offset that risk which is 'typically associated with medium-to-long term bottom-up expenditure forecasts.'

169 Transpower acknowledges that optimisation of its plans achieved through its existing standard business practices will deliver efficiencies during RCP2, with the following factors identified as leading to reductions in IST Capex:

- *some identified needs being met with alternative (lower cost) project solutions;*
- *efficiency savings in our procurement and delivery processes;*
- *improved asset management and innovation allowing service performance targets to be met at lower cost;*
- *increased levels of asset divestment; and*
- *improvements to our cost estimation and risk management processes reducing the potential for cost overruns.*[37]

170 We remain in agreement with Transpower's self-assessment that there is overestimation bias inherent in its forecast.

171 Project costs have been estimated up to 7 years in advance of their ultimate delivery. Not only is there the significant possibility that the project scope and timing will or can prudently be changed over this period, but we also agree with Transpower's self-assessment that:

'…*we cannot predict with certainty what technologies we will be commissioning in 3-5 years' time or the exact techniques that we will use to deliver them'.*[38]

172 It is reasonable to conclude that the required technologies will be more cost efficient in 3-5-7 years than now and that forecast expenditure should reflect this by reducing the potential for undue overestimation bias.

Portfolio Optimisation

173 In broad terms, the RCP2 IST portfolio was characterised by Transpower as comprising two categories of expenditure:

(a) capability building (25% of total expenditure or ~$53m); and

(b) capability maintaining (75%, or ~$158m).

174 Transpower updated this advice, identifying that only $28.8m of the capability building expenditure was directly related to cost reduction or avoidance initiatives.[39]

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[36] Response to IPP Draft Decision, *Section 4.1.1,* p24.
[37] Transpower response to Commerce Commission Information Request Q003, 23 December 2013.
[38] *Transpower Expenditure Proposal*, Section 4.3.3, p27-28, December 2013.

175 Transpower's portfolio selection and productivity adjustment process was derived from applying the skills and experience from its personnel, building on a bottom-up analysis of what is required during RCP2 to address the business drivers. However, in our view, this is not a robust enough approach to support its claim that it has now been optimised to a level that 'requires all proposed projects to be implemented at optimal efficiency.'

176 Ultimately, our view remains that individual 'capability building' projects should only be committed by Transpower to proceed to the delivery phase if the following conditions are satisfied:

(a) it can fully utilise the new systems already in place (egg. with sufficient training, etc);

(b) it has determined what it really needs next based on rigorous risk/benefit and dependency analysis;

(c) it has identified when it needs to do the work to unlock the benefits; and

(d) it has the organisational capacity to be able to derive the benefits in a reasonable time.

177 The capability maintaining projects are largely driven by the IST Refresh Policy which is predicated on securing the lowest overall cost and performance risk trade-off by replacing assets in accordance with vendor lifecycle recommendations. This is a conservative, but an increasingly common strategy in the utilities industry. However, it is possible that a detailed risk/benefit assessment during the course of RCP2 may reveal higher priority projects, possibly leading to deferral of the lower-risk refresh projects given that deliverability constraints may arise.

178 In summary, in our opinion, it requires a leap of faith in the absence of robust business cases (including the absence of options analyses and cost/benefit analyses) to declare that the portfolio has been fully optimised.

Portfolio management

179 We have seen evidence through its RCP1 IST Capex programme delivery that Transpower is capable of managing its expenditure within a fixed budget. We are equally confident that Transpower will be able to manage its expenditure within its RCP2 IST capex allocation.

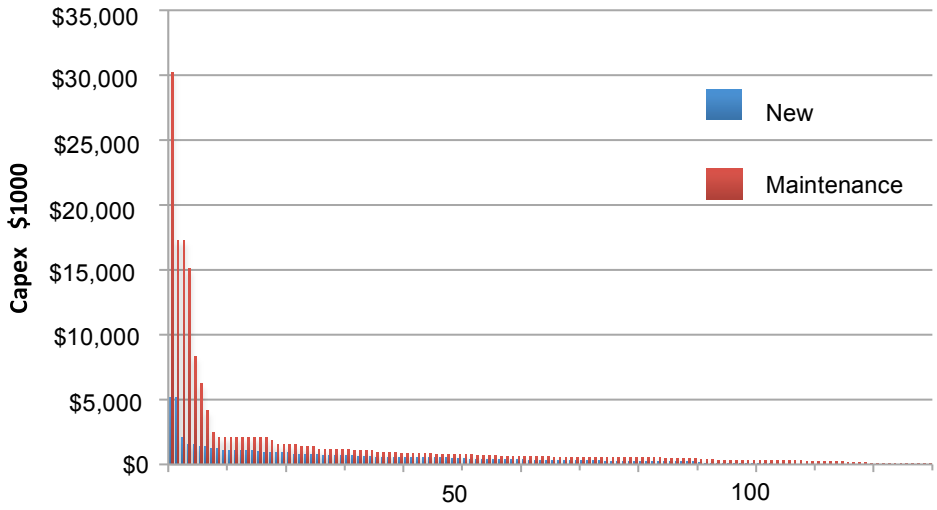
180 What is also evident is that in RCP1, there was a great deal of project churn (through project roll-ins and roll-outs) and project cost variation (from initial estimate to the delivered cost). This pattern of churn and cost variation can be reasonably expected to be repeated in RCP2 because of the early development stage of the majority of projects (e.g. lacking rigorous design and cost estimation), and the nature of IST projects.

[39] Transpower response to Commerce Commission question 053, 31 March 2014.

181 As noted above, typically, if there are resource capability or time constraints, the capability building (or cost savings/avoidance) initiatives will rightly be deferred in favour of compliance, risk mitigation/resilience or, possibly 'refresh' driven projects.

Figure 2 shows the high number of minor projects proposed for RCP2. This also indicates the potential for amalgamation or deferral of some smaller projects as projects mature through their development cycle (due to reduced need and/or benefits on closer consideration).

Figure 2 Transpower IST Capex – capability building (new) and capability maintaining (Maintenance) projects in RCP2



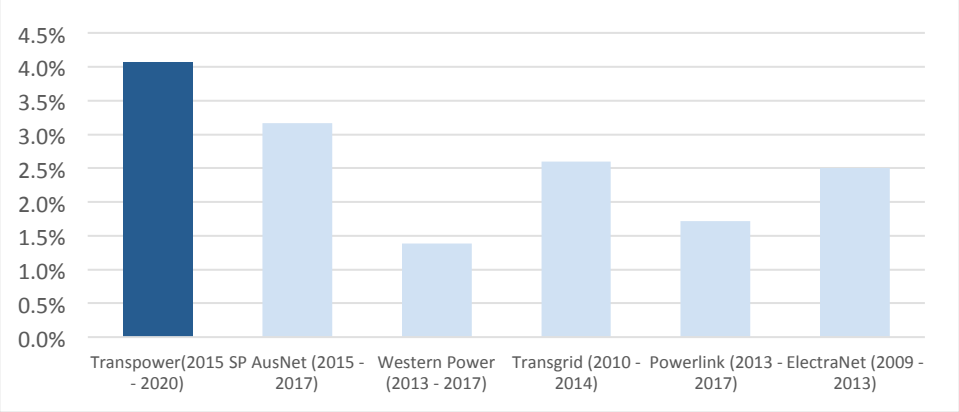
Source: reproduced from Lewis and Butler, Report on ICT Capex for Transpower RCP2, Figure 1, p7, Oct 2013

IST Capex benchmarking

182 In its response, Transpower noted that neither Strata (in its report) nor the Commission (in its Draft Decision) included benchmarking analysis to support its observation that comparison with Australian TNSPs would provide useful benchmarking information. The Commission has asked Strata to provide some examples of benchmarking with Transpower's Australian peers.

183 Figure 3 shows a comparison of Transpower's proposed RCP2 IST capex/total corporate revenue against the results for six Australian TNSPs. At 4%, Transpower is proposing a significantly higher proportion of IST expenditure than the comparison businesses.

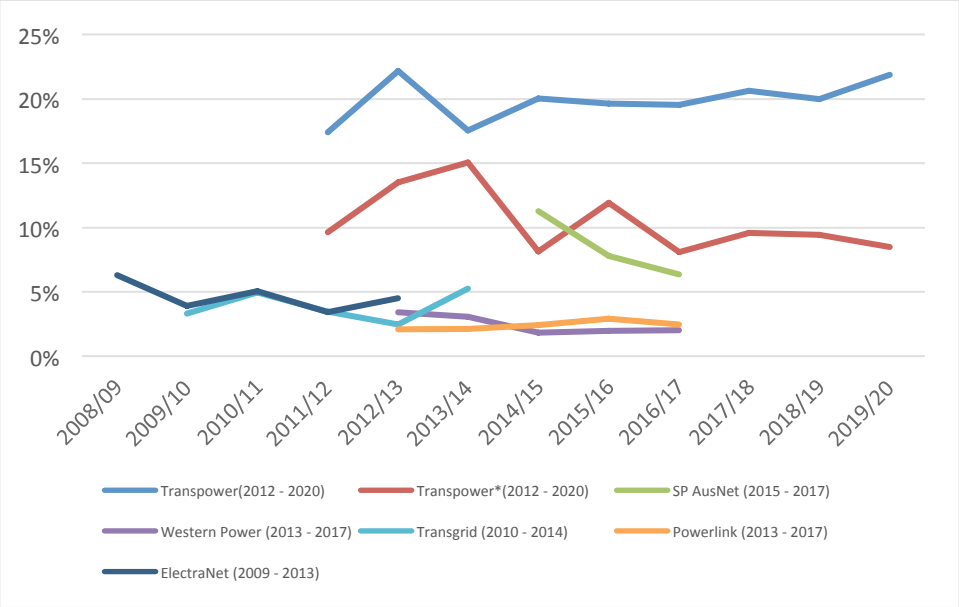
Figure 3: IST Capex/revenue comparison with Australian TNSPs



Sources: 1. EMCa, Report to AER, SP AusNet Revenue Determination: Technical Review Findings on SP AusNet's Revenue Proposal and 2. Transpower's Expenditure Proposal, December 2013

184 Figure 4 shows the ratio of IST capex/Total capex forecasts for Transpower and six Australian TNSPs. Again, Transpower proposes IST expenditure which is well above the ratios from the selection of Australian TNSPs, noting the lower of the two Transpower results is the most directly comparable with its peers.

Figure 4: IST Capex/total capex comparison with Australian TNSPs



* Transpower IST excluding operational communications expenditure, being:

- Telecommunications (Shared Comms infrastructure, Substation Shared Infrastructure)
- Transmission systems (IT SCADA/RTS, IT Time Series)
- Transmission systems (IT Meter Data Management, IT Transmission systems plan)

Sources: 1. EMCa, Report to AER, SP AusNet Revenue Determination: Technical Review Findings on SP AusNet's Revenue Proposal and 2. Transpower's Expenditure Proposal, December 2013

185 If this was Transpower's first RCP of elevated expenditure in response to its IST drivers and strategy, the elevated level of expenditure compared to its peers would be less alarming. However, Transpower spent $204m in RCP1, an average of $51m pa, which is 20% higher than the proposed

RCP2 expenditure level. In the 'capability maintaining' phase that it is entering, we would expect it to benchmark at or below its peers.

186 In undertaking benchmarking analysis we are always mindful of placing too much reliance on benchmark results given the variability of conditions and inputs between businesses. Nonetheless, the gap between Transpower's proposed IST capex expenditure (normalised via total revenue and exclusion of operational communications expenditure) is significantly higher than the sample of Australian TNSPs. We therefore view this as a strong indicator that the forecast high level of expenditure during RCP2 compared to Australian peers indicates that the proposed programme is over-estimated, and/or suboptimal and/or overly ambitious, and is therefore not fully justifiable.

Transpower's Productivity Adjustment

187 Transpower made a subjectively based, across-the-board 'productivity adjustment' to its initial RCP2 IST Capex forecast:

'…the impact of expected productivity improvements across IST and Grid Capex is not precisely quantifiable. We estimated the potential improvements.'[40]

188 We accepted Transpower's testimony that it had made a net productivity adjustment to its IST Capex programme of 7.5% ($19m) and on this basis, we recommended a further adjustment of 2.5%. While a 7.5% adjustment appears to have been made to aggregate Grid and IST Capex, it appears that due to late increases in some IST category elements, the net adjustment to IST was only 5%.[41]

189 We consider that, in accordance with Transpower management's intentions for the productivity adjustment, when calculating the final allowance figure for the Final Decision, the Commission should ensure that the full 7.5% is deducted from the total IST Capex programme.

5.4 Observations

190 We made the observation in our original report that 'the expectation of owners/shareholders and the Board is that there will be significant tangible benefits from IST investment, in addition to multiple intangible benefits.'[42]

191 Submissions from electricity customers have reinforced the importance of prudent cost management by Transpower to limit increases in network

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[40] Transpower response to Commerce Commission Information Request Q003, 23 December 2013.

[41] The adjustment from a starting forecast of $253m in July 2013 (Transpower, *IST CEO Challenge 2 July 2013* provided in Transpower response to Commerce Commission Information Request Q004, 23 December 2013) and removal of $30.2m for the Data Centre project (Transpower, *Board paper – Data Centre* Strategy, 14 Nov 2013 provided in Transpower response to Commerce Commission Information Request Q004, 23 December 2013) should have resulted in a final forecast of $206m. However the final figure was $210.7m.

[42] Report to the Commerce Commission, paragraph 452.

costs. This places the onus on Transpower to only incur expenditure that will have a valued impact on customer performance or will reduce the cost of service (preferably both).

192 It is not credible for Transpower to claim that it has optimised the cost and content of its proposed IST portfolio (including the productivity adjustment) given the historically volatile IST project portfolio composition and in the absence of:

(a) a robust portfolio optimisation approach (i.e. to reduce the subjectivity of the outcome);

(b) capability-building projects with approved business cases (which is not unusual at this stage of the next RCP) as this undermines Transpower's conviction that it is prudent to undertake all of the proposed IST projects; and

(c) a historically volatile IST portfolio project composition.

193 Transpower *has* demonstrated that it is capable of progressively adjusting its portfolio to achieve the target budget.

5.5 Overall findings on IST Capex

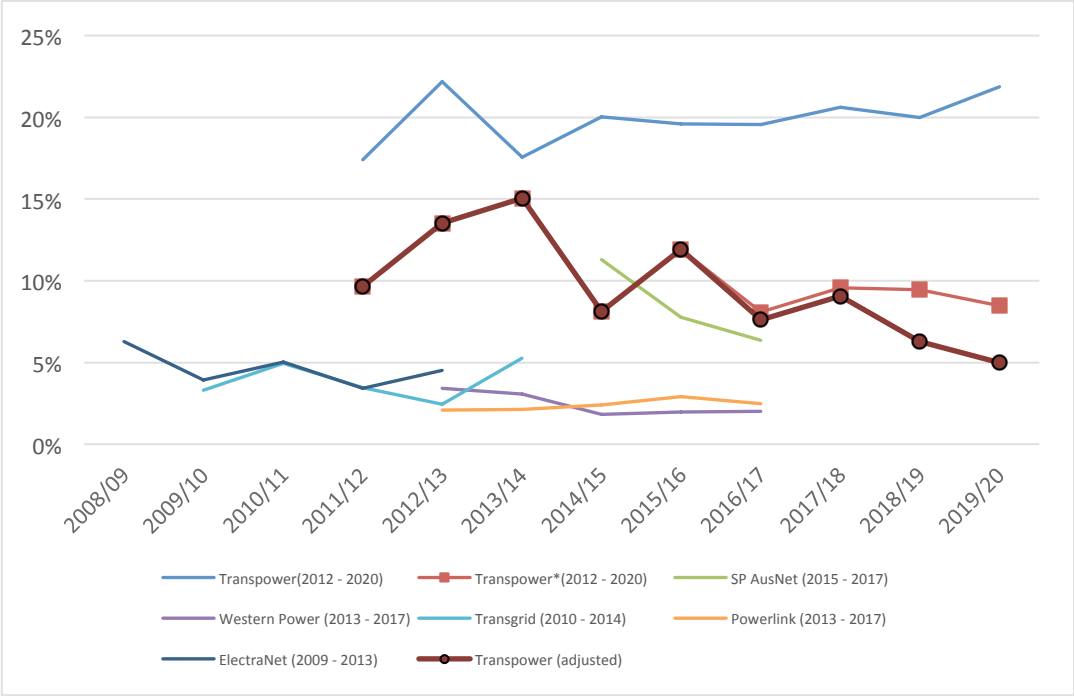
194 The $15.1m proposed for the TPM project should be removed from the RCP2 programme.

195 Transpower's proposed IST expenditure has not been fully justified and the Transpower applied 'productivity adjustment' of 5% (not the claimed 7.5%) is insufficient to negate our opinion that actual expenditure will be lower as already implemented strategies, processes and other improvements will deliver further savings to Transpower's IST Capex expenditure forecast (derived in 2013) during the next 7 years (i.e. from 2015/16-2019/20).

196 We therefore propose retention of our adjustment of 2.5% to achieve what we believe will result in a prudent and efficient basis for Transpower's RCP2 IST capex.

197 Figure 5 shows the results of the recommended adjustments. With the adjustments, by 2019/20, Transpower's IST capex expenditure should be more in line with its peers (as a percentage of total capex).

Figure 5: IST Capex/total capex comparison with Australian TNSPs with recommended adjustments to Transpower's IST capex[43]



* Refer to description of the excluded expenditure in the previous figure

[43] Adjustments: Remove $15.1m TPM upgrade expenditure assumed to be incurred in 2018/9-2019/20deduct $4.8m savings adjustment assumed to be attained equally over the period 2016/17-2019/20.

6 IST Opex

6.1 Summary of points made by Transpower

198 Transpower considers the 2% ($4.8m) 'across the board' reduction to its proposed IST opex forecast to be inappropriate as Strata's analysis does not explain or justify the application or level of the reduction.

199 Transpower's particular concerns are that:

(a) the adjustment is applied indiscriminately;

(b) the impact of the decision to outsource data hosting to a service provider and the steps Transpower has taken to minimise the overall impact of this increase has not been taken into account by Strata;

(c) the steps Transpower has taken to secure savings to telecoms support, maintenance costs and security services has not be taken into account by Strata;

(d) Strata's assessment that there are opportunities for opex savings during contract renegotiations are speculative; and

(e) no issues were raised with Transpower's benchmarking analysis.

6.2 Additional and confirmed information

200 Transpower has provided information to demonstrate that its original forecasts have already incorporated material cost savings targets.[44] The aggregate saving is 6% ($14.7m) of total IST opex. These target savings are to be derived from:

(a) Telecom and Networking: $7.5m through reduced leased services; and

(b) Shared Services: $5.4m through reduced server management costs and $1.8m via reduced licence costs.

201 Transpower confirmed its message from its main proposal that the IST opex plans and forecasts were subject to robust internal challenge and external benchmarking and its conclusion that expected upward cost pressures meant a 'productivity adjustment' was inappropriate.

[44] *Response to IPP Draft Decision*, Transpower, Section 4.2, Table 8, p25.

6.3 Assessment

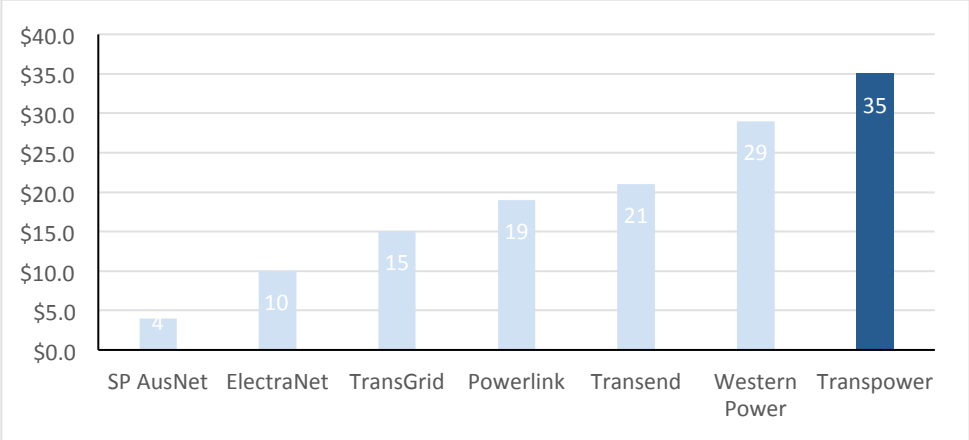
202 Transpower noted our observation in our Report to the Commission that benchmarking with Australian transmission utilities would be of benefit as we viewed the comparison with other businesses in New Zealand to be inconclusive. In the absence of additional information from Transpower in its Response, we have undertaken benchmarking analysis.

6.3.1 IST Opex benchmarking

Network IST Opex benchmarking

203 Figure 6 shows the network operating expenditure for 2013/14 for a number of TNSPs, including Transpower. For Transpower, this cost category includes grid operating centres, IST for grid maintenance communications as well as people and performance allocations.[45] So while it is not a pure representation of IST opex, it is the most relevant opex category identified by Parsons Brinkerhoff (PB) for Transpower in its benchmarking report. Based on the definition of Network operations in PB's report, IST opex represents a significant proportion of Transpower's annual network operations.[46] For these two reasons, we therefore consider it to be a reasonable proxy for comparison of IST opex amongst Transpower's peers.

Figure 6: Network operating expenditure for 2013/14 ($NZm)



Source: EMCa graph, derived from Parsons Brinkerhoff CR01 – Operating Expenditure Benchmarking report, Oct 2013

204 Clearly, Transpower is forecast to incur the highest absolute network operations expenditure amongst the benchmarking cohort established by PB. This indicates that Transpower's IST expenditure is excessive.

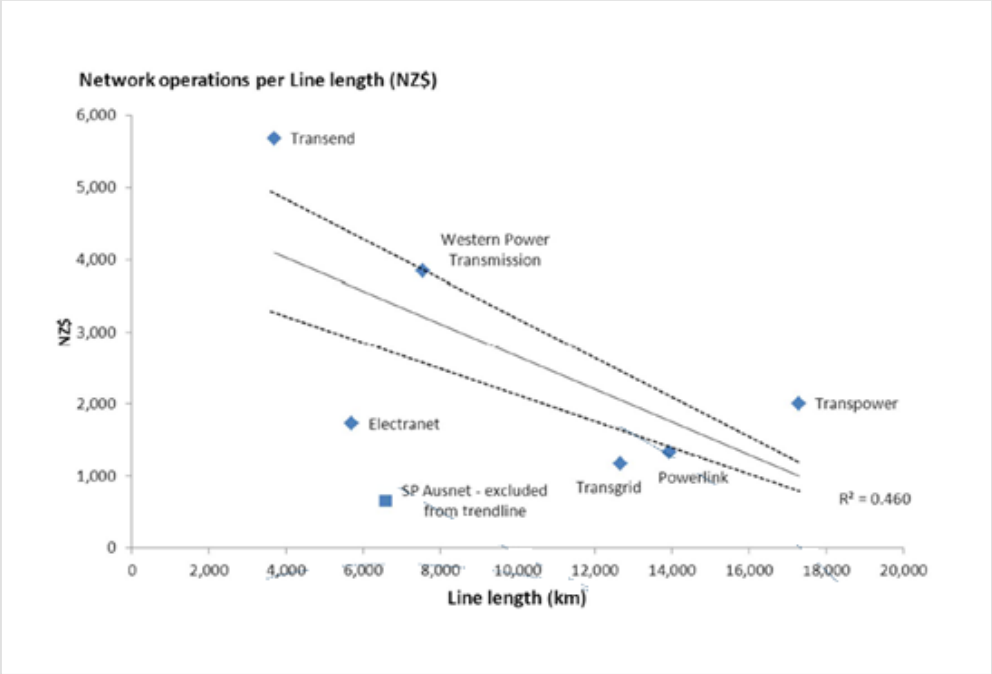
[45] Parsons Brinckerhoff included "IST for maintenance and operations" which has been identified as network IT expenditure. This is in keeping with the approach used by of Australian TNSPs that includes SCADA and associated communication costs as part of network operations costs.

[46] Transpower's telecommunications services opex was circa $26.5m in 2013/14 or about 75% of 'networks operations expenditure'. In turn telecommunications opex was about 60% of total 2013/14 IST opex.

205 In an attempt to provide a benchmarking factor that takes into account the relatively large span of Transpower's network operations, PB produced Figure 3.g (page 21 of its report), reproduced here as Figure 7.

206 Despite this 'normalisation' approach, Transpower's network operation expenditure (and therefore IST opex) appears to be comparatively higher than its Australian peers. PB is of the opinion that the result is distorted by the cost of Transpower's communications network given that Transpower leases 85% of its fibre network (which represents over 51% of its network operating costs).[47], Western Power, Transend and Powerlink also follow this strategy and are therefore considered by PB as more relevant comparisons.[48]

Figure 7: Network operations benchmark



Source: Reproduced from Parsons Brinkerhoff CR01 – Operating Expenditure Benchmarking report, February 2014. Note: The ellipses on the original PB graph that were used to explain groupings of data have been removed to improve the clarity of the graph.

207 Even with this further filter on the comparison, Transpower is not on the hypothetical efficient frontier derived by PB for companies following the same communications strategy.[49]

208 PB seeks to explain this outcome by referring to Transpower's long transmission line length (even though this is the normalising factor), low energy density, and large number of substations (indicating remoteness of much of its network), and two-island challenge and the mountainous terrain as contributing factors. PB therefore reached the conclusion that

[47] Source: *Operating Expenditure Benchmarking report*, Parsons Brinkerhoff CR01 Oct 2013, Section 3.5, p21.

[48] The other TNSPs own and hence capitalise their communications infrastructure costs.

[49] Represented by the linear line of best fit (R^2 = 0.512).

Transpower's network operations costs are comparable to Australian TNSPs that utilise leased communications facilities.

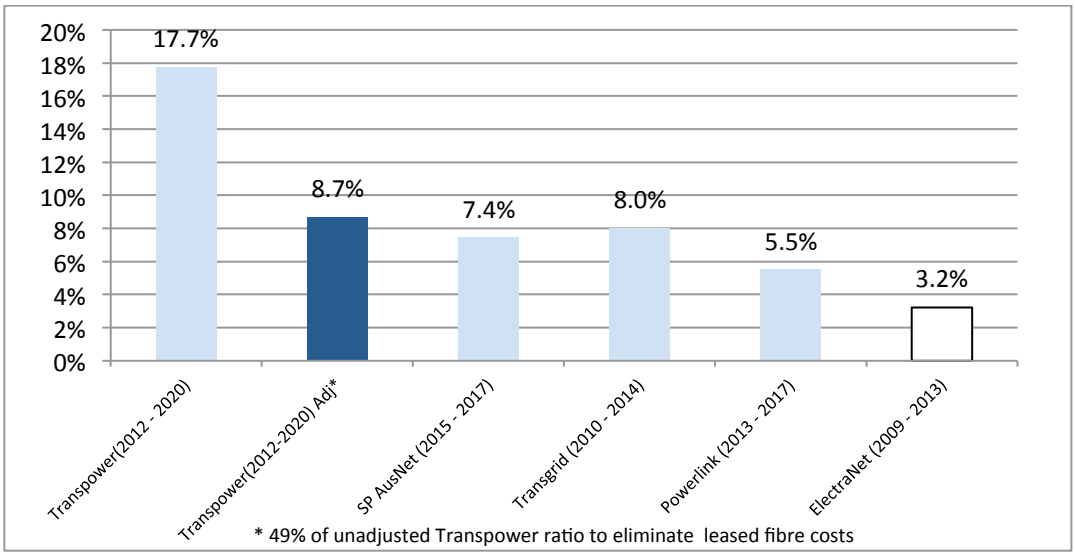
209 However, Western Power, for example, has a lower energy density per substation than Transpower and certainly operates a geographically diverse and remote network. Neither Transpower nor PB has satisfactorily explained why Western Power appears to be at a superior operating point to Transpower in 2013/14. Furthermore, Western Power is currently embarking on a rigorous operating cost reduction programme as required by both the Western Australian Economic Regulation Authority, and its owner in recognition of inherent operational inefficiencies.

IST Opex benchmarking

210 Figure 8 shows Transpower's IST opex/Total opex ratio compared to peer Australian utilities. As pointed out in PB's report (as is the case with all benchmarking analyses), there are many factors which need to be taken into account when attempting to understand why Transpower's IST forecast expenditure is so high. The adjusted value of 8.7% for Transpower seeks to provide a more directly comparable ratio by extracting the additional operating cost due to Transpower's fibre lease strategy.

211 The primary message from Figure 8 is that Transpower's IST costs (net of fibre lease) do not appear to be excessively high compared to the peer group provided, but it supports the conclusion from the other indicators discussed above that indicate that Transpower's IST opex expenditure is too high.[50]

Figure 8: IST Opex as a proportion of total opex (average)



Source: Derived by Strata from publically available AER information

[50] Noting that comparable information from Transend and Western Power was not available and that ElectraNet remains an outlier.

212 We accept that the extent of the multi-year contracts that Transpower has entered into in RCP1 for various IST services limits the extent to which further savings can be made.

6.3.2 Incorporated savings and savings targets

213 We acknowledge the additional information provided by Transpower on how it has achieved operational savings and how it has incorporated material operational savings targets into its forecasts.

214 However, as explained in more detail below:

(a) we see this as evidence that operational improvements Transpower has made during the course of RCP1 will produce opex reductions in RCP2 that should have been taken into account when forecasting the expenditure; and

(b) based on the benchmarking analysis, Transpower needs to find further savings to reach a prudent and efficient IST opex level.

6.3.3 Opportunities for further savings from RCP1

215 Transpower has criticised our view that there are opportunities during RCP2 for IST opex reductions. Yet in its original Expenditure Proposal, Transpower states:

'An important consideration for Corporate Services Opex during RCP2 is the opportunity to replace internally provided services with those from third-party service providers, whether outsourced hosting or sourced over the Internet from 'cloud' providers. Our forecast reflects our current (insourced) approach. However, we will further explore these alternatives to determine if their costs and levels of service offer an advantage.'

216 We interpret the information provided in Table 8 (IST Opex – Example of Cost Saving Targets) of its Response that the identified $14.5m savings is a subset (or 'examples') of the potential savings.

217 Transpower's RCP expenditure on IST Corporate Services Opex is ~$18m, so even a 5% reduction in this cost category would contribute almost 20% to the 2% IST opex reduction target in the Draft Decision.

218 Transpower has chosen to aggressively pursue an outsourcing approach for many of its services and operations, including IST. It has regular opportunities to revisit its own/insource versus lease/outsource and chose the optimal cost/performance path.

219 Indeed Transpower provided new information in its IPP response that shows it is capable of securing 'significant' savings through renegotiation with its telecoms service provider.[51]

[51] *Response to IPP Draft Decision*, Transpower, Section 4.2, p25.

220 Furthermore, Transpower also provided evidence that it has reduced support costs for security devices by 'substantially limiting the forecast increases in the number of security devices now required to ensure safe services.'

221 We see no evidence from information provided by Transpower that it cannot progressively and materially reduce its operating costs. Opportunities will occur from already implemented improvements, for example through:

(a) changes made in strategy (e.g. from lease to own);

(b) improvements in the scoping of its requirements;

(c) more focused performance requirements; and

(d) more effective procurement strategy.

6.3.4 Basis for the adjustment

Across the Board

222 We believe recommending an 'across the board' adjustment rather than specifying individual category reductions is appropriate as it gives Transpower the opportunity to assess the most prudent approach to operating within the adjusted IST opex allocation. It is not our role to determine individual sources of savings or to set out a detailed work plan.

Quantum of adjustment

223 As discussed in our Report to the Commission and reinforced in the assessment in Section 6.3, we believe the 2% ($4.8m) reduction is justified based upon consideration of the following factors:

(a) despite incorporating savings in its forward RCP2 opex forecast from its RCP1 IST initiatives, Transpower does not appear to be efficient in this area compared to even its most relevant peers

(b) Transpower has demonstrated that it is capable of securing IST opex savings through contract negotiations (and other approaches) and has identified opportunities which it will pursue.

224 When reaching the above conclusion on an appropriate adjustment, we have taken into account that Transpower has selected and implemented a number of IST strategies which appear to provide a limit on the extent of improvement that can be expected in RCP2 (including the data centre strategy and fibre communications lease costs). Had this not been the case, our recommended adjustment would have been higher than 2%.

6.4 Overall findings on IST Opex

225 We recommend retaining the 2% ($4.8m) reduction to Transpower's proposed IST opex forecast.

7 Corporate Opex

7.1 Draft Decision and Strata's review scope

226 The Commerce Commission's Draft Decision recommended a $57.4m reduction in the Corporate opex allowance. The adjustment had several components that contributed to the total. From Strata's review, the following key reasons were identified to support our view that Transpower's proposal was excessive:

(a) insufficient cost-reduction focus, particularly in Departmental opex and given the largely unquantified productivity benefits from RCP1 investment;

(b) insufficient justification for the new corporate head office; and

(c) an Investigations opex forecast at the same average level as for RCP1 despite a lack of evidence that the same amount of investigative work is required.

227 In addition, the Commission has proposed removing the self-insurance allowance.

228 This section revisits the following categories of Corporate opex proposed by Transpower:

(a) Departmental, including the proposed relocation from Transpower House;

(b) Investigations; and

(c) Ancillary services.

229 Insurance matters are out of scope.

7.2 Summary of Transpower's response to the Draft Decision

230 Transpower does not accept that the Draft Decision is justified on the following grounds:

(a) a significant proportion of Corporate opex is effectively fixed or directly related to the day-to-day delivery and operation of the Grid; significant reduction in these areas would lead to unacceptable risks to safety, reliability, and the deliverability of Transpower's Capex programme;

(b) Strata's report is inconsistent with the Commission's position on productivity adjustments and the IRIS mechanism; and

(c) Strata's report relies on high-level and incorrect assumptions or conclusions relating to 'Non-Grid' activities, application of the vacancy

rate, asset investigations, and Wellington Street Head Office relocation.

7.3 Assessment

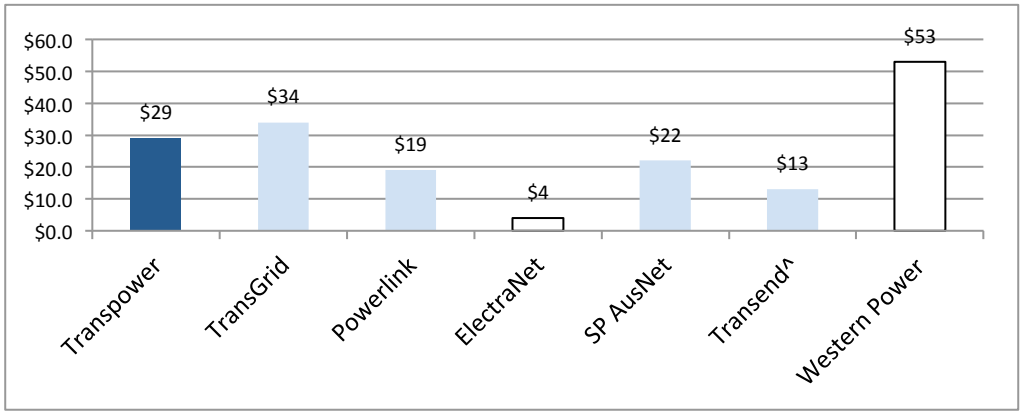
7.3.1 Benchmarking analysis

231 As noted at paragraph 158, the following benchmarking examples are provided as examples to address Transpower's comments on benchmarking in its submission.

232 PB was commissioned by Transpower to undertake an Operating Expenditure benchmarking analysis. Drawing from information presented in this report, Figure 9 presents a snapshot comparison of corporate expenditure forecast by Transpower and for five TNSP's for 2013/14.[52,53]

233 With the exception of Western Power,[54] Transpower has the second highest corporate expenditure of the selection of TNSPs.

Figure 9: Corporate expenditure for 2013/14 (NZ$m)



Source: Parsons Brinkerhoff, Operating Expenditure Benchmarking – Final Report, Tables 3-b, p15 Oct 2013

234 PB notes that Transpower leases its office space and will therefore incur higher corporate operating expenditure than if it owned its accommodation. PB concludes that Transpower would otherwise benchmark favourably against the other TNSPs. This is an overly simplistic approach to rationalising Transpower's higher Corporate opex as there are a number of

[52] Transpower's 2013/14 Corporate opex expenditure forecast is commensurate with the annual average forecast expenditure for RCP2.

[53] The figures include adjustments undertaken by PB to provide a more equitable basis for comparison than the raw opex numbers – refer to Section 2.3.1 of PB's Benchmarking Report.

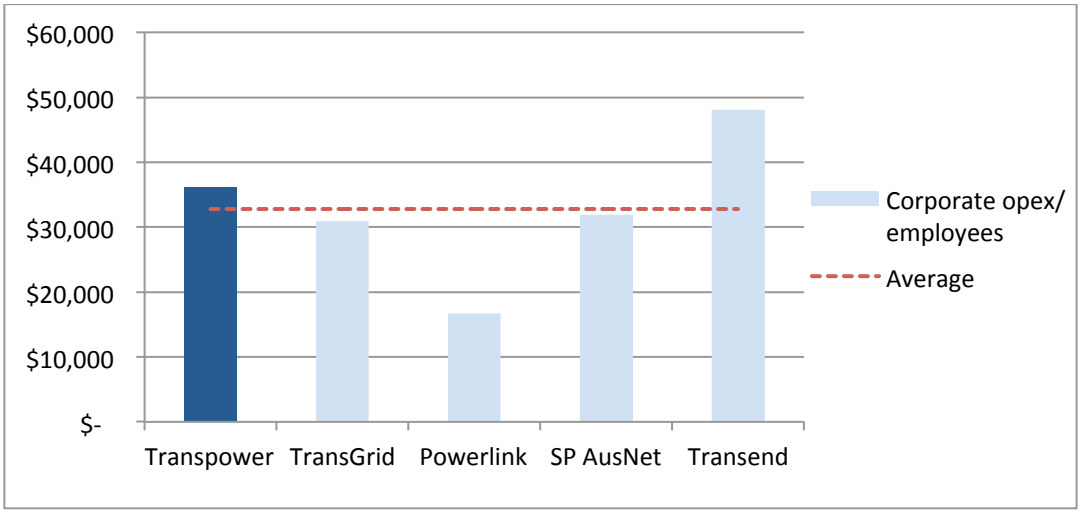
[54] PB's report presents data for Western Power Transmission, however for reasons discussed in PB's report (Section 3.2), the Western Power corporate expenditure of $53m is an outlier that is most reasonably excluded from analyses. Similarly, ElectraNet also presents as an outlier and for reasons also discussed in PB's report is also excluded from the analysis.

strategies and factors which contribute to a business' corporate opex expenditure – the accommodation strategy is just one, and absolute figures are not the best indication of efficiency.

235 As PB observes, it is more informative to study a benchmark that takes into account the scale of the organisations. Figure 10 shows the corporate opex comparison on a per employee basis. The rule of thumb is that scale economies favour larger staff numbers in this metric, with Powerlink (1,137 staff) and TransGrid (1100 staff) having some advantage over Transpower (801 staff). However this is unlikely to be a determining factor in relative opex levels as SP AusNet, for example, has only 690 staff and yet has a lower corporate opex/employee ratio than Transpower.

236 PB undertook a similar benchmarking exercise and concluded that Transpower can be considered to be comparable with its referable Australian peers. Transpower's result ($36,205/employee) is within 10% of the average ($32,771/employee). In our view, however, this result is distorted somewhat by Transend's relatively high ratio of $48,148/employee which is due in part to its relatively small headcount (270).

Figure 10: Comparison of Corporate opex per employee (NZ$, 2013/14)



Source: Strata analysis of information in Parsons Brinkerhoff, Operating Expenditure Benchmarking – Final Report, Tables 2-c and 3-a, Oct 2013.

237 Our view is that the benchmarking analysis above, combined with that presented by PB in its report, indicate[55] that Transpower's Corporate opex is relatively high.

[55] We concur with PB's cautionary advice (Section 2.4 of its Report) in the use of benchmark results such as these which are necessarily drawn from a small number of comparative TNSPs: the benchmarking results are not definitive as there remain uncertainties with the data definitions and differences in the TNSPs' internal and external operating environments and the extent of direct relevance of the numerators chosen here.

7.3.2 Departmental costs

238 Transpower's Departmental Opex forecast of $417.7m over 5 years is primarily driven by personnel costs (69% or $305m), with 14% ($58.5m) for consultants and contractors.[56]

239 Transpower has forecast a small reduction in Departmental FTEs over the course of RCP2 and rejected our view that there was considerable scope for reducing Departmental opex. Each of the key issues concerning Transpower's forecast is discussed in this sub-section taking into account new and confirmed information from Transpower.

Vacancy Rate

240 We observed that, typically, organisations operate with a 'standing' vacancy rate of between 3-5% due to the lag between turnover (from various sources) and recruitment. Eliminating the vacancy rate from budgets is a source of opex reduction for businesses that are motivated to reduce costs to end consumers.

241 In its Response to the Draft Decision, Transpower advised that it had included a -3.4%, $9.1m ($1.8m pa) adjustment to its Departmental opex to eliminate its vacancy provision for staff. Transpower based its reduction on its average vacancy rate in RCP1.[57]

242 On this basis, no further adjustment is required on the basis of excess vacancy rate provisions.

Redundancy provisions

243 Transpower has confirmed that it has included a $14.5m ($2.9m pa) over RCP2 redundancy provision. This represents approximately 200 people being made redundant over RCP2[58].

244 This appears to be at odds with:

a) the proposed net reduction in head count of only five people over the course of RCP2; and

b) the People Capability Strategy of recruit, develop and retain – no large scale redundancy program is envisaged.[59]

245 We acknowledge that in the course of a five year period in addition to natural attrition (i.e. through voluntary resignations/retirement), it may be necessary to offer some redundancies (e.g. as a result of structural and other changes that legitimately give rise to such expenditure).

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[56] *Response to Information Request Q013*, Transpower.
[57] *Response to IPP Draft Decision*, Transpower, Section 5.3.3, p33.
[58] Assuming $75k pp on average .
[59] Transpower, *People Capability Strategy*, *Section 3,* p24.

246 In our opinion, a provision for circa 40 redundancies pa ($2.9m pa) is unjustified, but an allowance of $0.6m pa (sufficient for 8-10 redundancies pa) is reasonable. This represents a recommended -$11.6m adjustment.

Reduced personnel costs from improvement initiatives

247 We also observed in our Report that, based on testimony from Transpower, it had initiated a number of initiatives in RCP1 that would generate efficiencies and other cost reductions that would lead to Departmental opex reductions. However, Transpower actually exceeded its budget due to higher than forecast costs to undertake improvement initiatives and to prepare the RCP2 proposal.[60]

248 Importantly, Transpower did not indicate that it had not or would not realise the aforementioned efficiencies and cost reductions.

249 Putting aside the step increases that Transpower has identified (they are discussed below), our expectation was that its recurrent personnel costs would reduce from the following primary sources:

(a) efficiency gains from the millions of dollars of improvement initiatives already invested by Transpower in RCP1; and

(b) divestment of assets which should result in a decrease in staff.

250 Transpower explained its reluctance to significantly reduce its opex forecast because of its experience in RCP1 of the costs of meeting regulatory requirements. Strata did not accept that Transpower's speculations about future regulatory demands on them[61] are a valid reason for not making significant reductions in its RCP forecast.

251 In its Response to the Draft Decision, Transpower provided the following comments:

(a) RCP1 initiatives will not materially reduce Corporate Opex;[62] and

(b) extracting productivity-based adjustments from the RCP2 improvement initiatives is inconsistent with the Commission's position on productivity adjustments and the IRIS mechanism.[63]

252 In the absence of concrete information from Transpower, we determined that Departmental opex should be able to be reduced without assigning a precise quantum to the reduction. We have considered the reduction in opex from a different but related angle under the Business Improvements category of Investigation opex in section 7.3.3 Investigations.

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[60] *Response to Information Request Q013*, Transpower p4.

[61] Transpower offer two potential sources of increase in Departmental opex: a significant change in transmission pricing methodology and additional regulatory reporting and compliance requirements or different regulatory arrangements, Transpower Response to Information Request Q013 p5.

[62] Transpower further advise that the $0.34m pa savings that will accrue from RCP1 initiatives has been included in its RCP2 submission (Transpower, *Response to DD, Section 5.3.1*, p32).

[63] *Response to DD* Transpower Section 5.3, p30-32.

253 Based on the further information provided by Transpower, no adjustment to Corporate opex is proposed on the basis of benefits realisation from RCP1 improvement initiatives.

254 Regarding Transpower's second comment on IRIS, we agree with Transpower that it is not appropriate to make productivity adjustments to take into account improvement opportunities that may arise and be realised in RCP2. Strata's focus when considering adjustments has been to assess improvements that have been made during RCP1 and consider if the existing improvements have been fully taken into account in the forecasts for RCP2.

255 Strata notes that at paragraph 592 (b) of its RCP2 Technical Report that reductions in opex were attributed to:

(a) extracting the full benefits of business improvement initiatives and investment in staff capability, retention and recruitment undertaken in RCP1;

(b) extracting benefits from proposed business improvement initiatives and investment in staff capability, retention and recruitment proposed to be undertaken in RCP2;

(c) a more rigorous focus on the proportion of activity spent on augmenting and improving the performance of the existing asset base compared with non-grid activities; and

(d) eliminating the average vacancy rate from the Departmental cost assumption on the basis that there will always be a 3 – 5% active vacancy level.

256 We understand from submissions that the structure of and text of subparagraphs (a) and (b) are insufficiently clear in setting out the basis of our proposed adjustments. The following revision clarifies our approach to attributing opex reductions:

(a) extracting the benefits of business improvement initiatives and investment in staff capability, retention and recruitment realised in RCP1, that will continue through RCP2; and

(b) extracting additional benefits from business improvement initiatives and investment in staff capability, retention and recruitment, implemented in RCP1, which will be realised in RCP2.

257 Opex reductions which will be realised during RCP2 from as yet unimplemented improvement initiatives are handled under IRIS and are not taken into account in our proposed adjustments and were not assessed nor incorporated in our recommended -10% adjustment in Strata's report to the Commission.

Apparently low capitalisation rate

258 In our opinion, Transpower's capitalisation rate seemed low and led us to question whether or not its staff were working on the 'right' activities and if there was a legitimate opportunity to capitalise more personnel time (e.g. through improved timesheet discipline).

259 Transpower has responded with additional information and confirmation that it believes its capitalisation approach and its application of the approach are both robust.[64]

260 However, in our experience, the capitalisation rate for Grid Development at 23% and Grid Projects at 83% are low.

261 Based on Transpower's advice, it appears that its capitalisation policy requires it to retain as 'Invex' (Investigations opex) all but the expenditure on the chosen option for projects that are approved and delivered. We understand that Transpower has provided to the Commission details on how it applies the capitalisation. We understand that the Commission is satisfied that Transpower's position on the point of capitalisation is correct.

262 Based on the above, we consider that no adjustment should be made to Corporate opex for capitalisation.

Consultant and Contractor Costs

263 As discussed above, Transpower underestimated the cost of undertaking its RCP1 initiatives and the cost of preparing its RCP2 proposal. Additional cost is attributed to the need to use '... *significant specialist external contractor and consultant resource to undertake much of the work.'* Transpower attributes this forecasting error as a function of the compressed timeframe of the remainder period of RCP1 (three years) overloading its own subject matter experts.

264 In developing its RCP2 submission, it assumed a temporary step increase of circa $2.3m for preparation of its RCP3 submission based on its assumption that there will be a lower burden on the business in RCP2.[65]

265 We implicitly accepted this temporary step increase in Departmental costs and noted that the reduction in expenditure was an appropriate trend. However, excluding the RCP submission preparation cost, it appears that there is very little underlying reduction in contractor and consultancy expenditure through to 2018/19.

266 We propose a 20% reduction of $1.6m pa or ($8m over the RCP2 period) for the consultancy and contractor component of Departmental opex for the following reasons:

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[64] For example; Table 10 of its Response to the IPP Draft Decision, p33.
[65] *PD54 CS Departmental,* Transpower, 15 Nov 2013, p4.

(a) Transpower has advised that it intends to place more reliance on its own resources to undertake change initiatives in RCP2[66]; and

(b) it has identified a strategy to reduce the pressure on SMEs in the preparation of RCP3; in turn, reducing the need for consultants and contractors to temporarily back-fill their positions in 2017/18-2018/19.

Office relocation

267 This is Transpower's second proposed source of a step change to Departmental opex. Transpower allows approximately $2m pa from 2017/18 onward in its submission to account for the increased net operating costs associated with its proposed move from Transpower House to new premises in Wellington CBD.[67]

268 In its Response, Transpower did confirm that:

(a) it recognises the imperative and opportunity to reduce the total required work space through more efficient space utilisation;

(b) the existing Transpower head office building may not be suitable for long term lease because of its seismic compliance rating;

(c) its net operating increase was in comparison to existing rents – which it expects to rise; and

(d) the incentive regime provides sufficient reason for Transpower to secure a cost-effective arrangement.

269 Transpower has still not provided a business case for our review. We have however been provided with new and confirmed information in response to information requests.

270 From the information available, we conclude that:

(a) consolidation of the three Wellington office premises to one location during the RCP period is likely to be the preferred option for Transpower; and

(b) the preferred option should only be accepted by the Board (and Transpower's owner) if the relocation / consolidation option has a strong positive NPV (over 5-10 years) and there is no material net opex increase required as a result of relocation (i.e. compared to staying at Transpower House).

271 Again, based on the information provided, we estimate that remaining at Transpower House will lead to increased operating (and capital) expenses

[66] *MP01-Main Proposal,* Transpower, Section 9.3.1, p114.
[67] Based on the step change observed in Figure 76 of our first Report to the Commission.

over the course of RCP2. We estimate a rental increase of $100-120/m^2 from the time necessary building refurbishments are completed by the owner.[68] We expect Transpower will be able to reduce the floor area required for the staff currently occupying Transpower House (through more modern, open plan floor layouts, for example). Our estimate of the net opex increase over RCP2 incurred at its present location if Transpower does not relocate is $0.9m pa from 2017/18-2019/20 ($2.7m).

272 We therefore propose an allowance of $2.7m for the base case of Transpower remaining at its current location over RCP2 rather than the $6.0m forecast – a reduction of $3.3m.

People capability strategy

273 Transpower has confirmed that its regulated Transmission headcount is forecast to reduce by 19 FTE during the last two years of RCP1 to 500 FTEs and that a further reduction of 5 FTE (1%) is forecast to occur by 2019/20.[69]

274 The People and Capability Plan notes that the size of Major Projects and Grid Projects should vary with investments in the Grid.[70] Most of the staff reductions in RCP1 derive from reductions in Major Projects staff. With the reduced capital project activity that we recommend in Section 2 of this report, we expect that there are further opportunities to reduce staff levels (starting with contractors) in these two areas.

275 We also believe that the IST function's size should be able to be varied with activity levels. Average annual IST expenditure in RCP2 will be at least 20% lower than in RCP1. When combined with the strategy for RCP2 of *'…moving from a period of major investment in new capability to one of maintaining capability established by past investment'*[71], we believe there is an opportunity for Transpower to reduce head count in the IST function for the duration of RCP2 without a material impact on the business. Cognisant of the arguments put forward in Appendix E of the People Capability Strategy, we have confined our recommended IST opex reduction to the IST investigations category (as discussed below).

276 The People Capability Strategy identifies six sources of increased productivity and reduced headcount in the Corporate Services function.[72] Nonetheless, no change to the head count for this function over the course

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[68] The estimate is based on (i) the assumption that the owner will need to recoup his investment through higher rent, (ii) a comparison of the current rental rate and the discounted rate Transpower should be able to secure for a long term lease commensurate with the upgraded quality of the refurbished building (upper B-grade), (iii) the building refurbishment being completed by mid-2017, (iv) the owner covering any opex costs incurred by Transpower during the refurbishment, such as temporary office rent and moving costs, but not any indirect costs such as loss of productivity.

[69] *Response to IPP Draft Decision*, Transpower, Section 5.1, p28.

[70] *BR01 People Capability Strategy*, Transpower, Appendix E, p49-51.

[71] *RP*, Transpower, Section 3.1, p87.

[72] *BR01 People Capability Strategy,* Transpower, Appendix E, p52.

of RCP2 has been forecast by Transpower.[73] We accept that these are speculative and that Transpower intends to pursue these initiatives during the course of RCP2.

7.3.3 Investigations

277 In our Report to the Commission, we questioned Transpower's assertion that an identical level of $10.9m pa ($54.3m total) for Investigations would be required in RCP2 given that:

(a) the original RCP1 forecast was 14% higher than forecast due to 'the requirements for investigations dictated by the optimal timing and sequencing of major capital work.'[74] We were not provided with sufficient evidence by Transpower to justify a similarly high level of expenditure due to such expected requirements in RCP2;

(b) we recommended 12% less Grid-related capital project activity in RCP2 compared to Transpower's forecast; because of the direct link between the capital works programme and investigations, we assumed a reduction in Invex; and

(c) Transpower proposed a circa 20% reduction in IST capital expenditure in RCP and that expenditure will be dominated by refresh/upgrades of existing systems. In our view, this should lead to fewer requirements for IST-related investigations.

278 On this basis, we noted that a 20% ($10.9m) reduction across the four categories of Investigations opex should be possible without compromising Transpower's ability to undertake the investigations it reasonably needs to undertake during RCP2.

279 In the sub-sections below, we consider the proposed expenditure in each category of Investigations expenditure drawing on new and confirmed information from Transpower.

Asset Investigations

280 Transpower proposes spending $3.4m pa ($17.0m total) in RCP2 investigating the optimum solutions for major capital projects (MCP) and the '*underlying program of enhancement and development and bespoke refurbishment and replacement capital expenditure.*' Transpower's proposed expenditure is '*2.2% of average annual expenditure, which is in line with current levels*.'[75]

281 In its Response to the Commission's IPP Draft Decision, Transpower reaffirms its view that while there is a reduction in MCPs in RCP2, the primary driver of asset investigations costs is Grid capex plans (R&R and

[73] The same document also refers to the same speculative upside risk from 'a radical change to transmission pricing' and other changed regulatory compliance obligations.
[74] *POD55, CS Investigations,* Transpower, p4.
[75] *PD55 - CS Investigations,* Transpower p4.

E&D), and it expects Grid capex to be relatively constant through the period. Therefore, it requires the $17.0m for asset investigations as forecast.

282 We have reconsidered our conclusion formed for the Draft Decision, taking further account of the increased expectations placed on Transpower regarding the risks it bears on MCP cost over runs. This includes the need to improve the scoping, options analysis and cost estimates. On this basis, we consider that reducing opex for asset investigations is likely to be counterproductive.

Innovation

283 In its original proposal, Transpower proposed $2.1m pa ($10.5m total) expenditure on trialling and testing new technologies or systems and undertaking research on specific grid issues. Transpower advised that this was comparable to international peers.[76]

284 Transpower did not provide any further information supporting its proposed expenditure as it understood our comments about the Investigations category to be directed at the Asset Investigations and Business Improvements categories.

285 We believe this remains an area for Transpower to reduce its opex by being extremely judicious with its expenditure, but we propose leaving this as a decision for Transpower to take.

Business Improvement

286 Transpower proposed expenditure of $4.1m pa (which it appears was based on its average RCP2 expenditure levels) in its original proposal.

287 In its Response to the IPP Draft Decision, Transpower does not provide further justification of the expenditure – it confirms that '*it expects the extent of RCP2 initiatives to be similar to those undertaken in RCP1'* and that the effort required would be similar.[77]

288 In our view, while there is insufficient justification for expenditure of $20.5m, the probable impact of reducing Transpower's ability to undertake business improvements and innovations is not desirable. This is particularly the case for improvements that the Commission are keen to see implemented, for example in asset management practices.

289 On balance, we consider that reducing the research and business improvements could be counter-productive as it may reduce Transpower's ability to extract value from important business improvement activities.

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[76] *PD55 - CS Investigations,* Transpower p5.
[77] *Response to IPP Draft Decision*, Transpower, Section 5.4.2, p35.

IST Investigations[78]

290 Transpower based its forecast IST investigations expenditure of about $1.3m pa on an assumed total IST spend of $55m pa (i.e. about 2.5% of capital spend).[79] Transpower's submission actually forecast an average annual IST expenditure of $42m pa, which would imply an IST investigations budget of about $1m using Transpower's ratio.

291 Transpower did not provide any further information supporting its proposed expenditure in this category as it understood our comments to be directed at the Asset Investigations and Business Improvement categories.

292 We have provided an updated recommendation in this report to reduce total IST capex by 5% or $186m (after deducting the $15.1m TPM programme allocation). Using Transpower's ratio of 2.5%, this would result in a reduction in IST investigations in the order of $1.5m over RCP2.

7.3.4 Ancillary services costs

293 Transpower confirms in its Response that the procurement of ancillary services is governed by the Ancillary Services Procurement Plan, developed by the System Operator and approved by the Electricity Authority.

294 We confirm the view expressed in our Report to the Commission that we believe Transpower's forecasting methodology is appropriate and we agree with Transpower's position that it has explored all reasonable avenues to limit the cost of ancillary services.

295 We therefore concur with Transpower that any Corporate opex adjustment we propose to the Commission should be mindful of the fixed nature of ancillary services costs.

[78] Reference is made here to IST Investigations to be consistent with the nomenclature used in this report; Transpower refers to ICT investigations in its Response to the IPP Draft Decision and in PD55.
[79] *PD55 – CS Investigations*, Transpower, p5.

7.4 Overall findings on Corporate opex

296 Table 2 provides a summary of our recommended adjustments for Corporate opex.

Table 2: Summary of Corporate opex recommended adjustments

Category	Sub-category	Adjustment
Departmental opex	Vacancy rate	-$0.0m
	Redundancy	-11.6m
	Capitalisation rate	$0.0m
	Consultants/contractors	-$8.0m
	Office relocation	-$3.3m
Investigations	Asset	$0.0m
	Innovation	$0.0m
	Business improvement	$0.0m
	IST	-$1.5m
Ancillary services		-$0.0m
TOTAL		-$24.4m

Annex A RCP2 adjusted Enhancement & Development forecast

		Transpower submission						Recommended adjustment (final decision)					
POD reference	E&D Project	2015/16	2016/17	2017/18	2018/19	2019/20	Total	2015/16	2016/17	2017/18	2018/19	2019/20	Adjusted Total
PD30	Otahuhu-Wiri Transmission Capacity	$ 2.5	$ 8.7	$ 6.8	$ -	$ -	**$ 18.0**	$ 2.5	$ 8.7	$ 3.6	$ -	$ -	**$ 14.8**
PD31	Relieve Generation Constraints	$ -	$ -	$ 1.5	$ 3.7	$ 0.8	**$ 6.1**	$ -	$ -	$ 1.5	$ 3.7	$ 0.8	**$ 6.1**
PD32	Upper North Island Reactive Support 2012 - 2020	$ -	$ -	$ 3.9	$ 4.1	$ 0.0	**$ 8.0**	$ -	$ -	$ 3.9	$ 4.1	$ 0.0	**$ 8.0**
PD33	Bus Section Fault Reliability	$ -	$ -	$ 3.2	$ 5.4	$ 2.3	**$ 10.9**	$ -	$ -	$ 3.2	$ 5.4	$ 2.3	**$ 10.9**
PD34	Wellington Supply Security	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD35	Otahuhu and Penrose Interconnection Capacity	$ -	$ -	$ 1.9	$ 7.1	$ 2.0	**$ 10.9**	$ -	$ -	$ 1.9	$ 7.1	$ 2.0	**$ 10.9**
PD36	Bunnythorpe Interconnection Capacity	$ 0.1	$ 3.1	$ 5.6	$ -	$ -	**$ 8.8**	$ 0.1	$ 3.1	$ 5.6	$ -	$ -	**$ 8.8**
PD37	North Taranaki Transmission Capacity	$ -	$ 4.2	$ 9.5	$ -	$ -	**$ 13.7**	$ -	$ 4.2	$ 9.5	$ -	$ -	**$ 13.7**
PD38	Timaru Interconnecting Transformers Capacity	$ -	$ -	$ -	$ -	$ 2.5	**$ 2.5**	$ -	$ -	$ -	$ -	$ 2.5	**$ 2.5**
PD39	Southland Reactive Power Support	$ -	$ 2.1	$ 3.8	$ -	$ -	**$ 6.0**	$ -	$ 2.1	$ 3.8	$ -	$ -	**$ 6.0**
PD40	High Impact Low Probability Event Mitigation	$ 2.8	$ 2.9	$ 1.5	$ 1.0	$ 1.0	**$ 9.2**	$ 2.8	$ 2.9	$ 1.5	$ 1.0	$ 1.0	**$ 9.2**
PD41	Hororata and Kimberley Voltage Quality	$ 3.4	$ -	$ -	$ -	$ -	**$ 3.4**	$ 3.4	$ -	$ -	$ -	$ -	**$ 3.4**
PD42	Islington Spare Transformer Switchgear	$ -	$ 0.5	$ -	$ -	$ -	**$ 0.5**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD43	Haywards Local Service Third Incomer	$ 0.6	$ -	$ -	$ -	$ -	**$ 0.6**	$ -	$ -	$ -	$ -	$ -	**$ -**
PD44	E&D Other	$ 0.2	$ 0.1	$ -	$ 0.2	$ 0.4	**$ 0.9**	$ 0.2	$ 0.1	$ -	$ 0.2	$ 0.4	**$ 0.9**
	Total	**$ 9.6**	**$ 21.6**	**$ 37.6**	**$ 21.6**	**$ 9.1**	**$ 99.4**	**$ 9.0**	**$ 21.1**	**$ 34.4**	**$ 21.6**	**$ 9.1**	**$ 95.1**