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Transpower's individual price-quality path for the next regulatory control period

Issues paper

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Associated documents

Publication date	Reference	Title
28 February 2017	1178-2560	*Transpower Input Methodologies Determination 2010* [2012] NZCC 17, as amended and consolidated as at 28 February 2017
28 November 2018	978-1-869456-27-6	*Transpower Individual Price-Quality Path Determination 2015* [2014] NZCC 35, as amended and consolidated as at 26 November 2018
1 June 2018	978-1-869456-39-9	*Transpower Capital Expenditure Input Methodology determination 2012* [2012] NZCC 2, as amended and consolidated as at 1 June 2018
25 October 2018	978-1-869456-63-4	Our process, framework and approach for setting Transpower's expenditure allowances, quality standards and individual price-quality path for 2020 to 2025

Commerce Commission
Wellington, New Zealand

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Executive Summary

Purpose of this paper

X1 We are in the process of setting Transpower's expenditure allowances and quality standards, as part of determining Transpower's individual price-quality path (**IPP**) for the next regulatory control period (**RCP**), to apply from 1 April 2020 to 31 March 2025 (**RCP3**).[1]

X2 On 23 November 2018 we received a proposal from Transpower setting out its forecast expenditure and proposed performance measures for RCP3.[2] Alongside its proposal, Transpower also submitted a report from Synergies Economic Consulting and GHD Advisory (the **Verifier**) setting out an independent verification opinion on Transpower's RCP3 proposal.[3]

X3 In assessing Transpower's proposal, we are guided by whether the proposal is consistent with an expenditure outcome which represents the efficient costs of a prudent supplier of electricity transmission services.[4] This concept is consistent with the purpose of Part 4 of the Commerce Act 1986 (**Part 4**), which is also a required consideration under the capex evaluation criteria in the Transpower Capital Expenditure Input Methodology (**Capex IM**).[5]

X4 In applying this concept, we consider that a 'prudent supplier' is a supplier whose planning and performance standards reflect Good Electricity Industry Practice (**GEIP**). A useful definition of GEIP, in relation to electricity transmission services, is found in the Electricity Industry Participation Code 2010 (**Code**).[6]

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1 Our working assumption is that a five-year term for RCP3 is likely to apply. We will be considering whether any variation from this should be made.

2 Transpower "Securing our Energy Future 2020 – 2025 Regulatory Control Period 3: RCP3 Proposal" (November 2018); and additional supporting material available at: https://www.transpower.co.nz/keeping-you-connected/industry/rcp3/rcp3-proposal-securing-our-energy-future-2020-%E2%80%93-2025.

3 Synergies Economic Consulting & GHD Advisory "Independent Verification Report – Transpower's RCP3 Expenditure Proposal (2020-25)" (12 October 2018).

4 Commerce Commission "Our process, framework and approach for setting Transpower's expenditure allowances, quality standards and individual price-quality path for 2020 to 2025" (25 October 2018), at 13.

5 *Transpower Capital Expenditure Input Methodology Determination 2012* [2012] NZCC 2, as amended, at [6.1.1(2)(b)].

6 'Good electricity industry practice' is defined in Part 1 of the Code as: **good electricity industry practice** in relation to transmission, means the exercise of that degree of skill, diligence, prudence, foresight and economic management, as determined by reference to good international practice, which would reasonably be expected from a skilled and experienced **asset** owner engaged in the management of a transmission network under conditions comparable to those applicable to the **grid** consistent with applicable law, safety and environmental protection. The determination is to take into account factors such as the relative size, duty, age and technological status of the relevant transmission network and the applicable law [bold terms in original].

X5 We have undertaken an initial review of Transpower's RCP3 proposal and the associated independent verification report, and we have identified a number of issues on which we would like to hear your views. We have also identified areas where we intend to carry out further work on Transpower's proposal, and where we have already issued requests for information (**RFIs**) to Transpower to enable us to do that work (see Table 4 and Table 5 in Chapter 3).

X6 Your views will help us identify where to undertake more detailed reviews of Transpower's proposal before consulting on our draft decision to be released in May 2019. However, you may submit on any matter relevant to Transpower's RCP3 proposal.

X7 Submissions on this paper are due 28 February 2019, and cross-submissions are due 7 March 2019.

Considering RCP3 issues in the context of longer-term challenges

X8 In its RCP3 proposal, Transpower noted that it expects the near-term forecast for electricity demand and investments required for asset replacement and renewal in RCP3 to be relatively stable, but it sees significant uplifts in demand and investment in RCP4 and beyond.

X9 In response to the challenges associated with those forecasts beyond RCP3, Transpower noted areas where it intends to focus its efforts in RCP3. Although the main focus of this paper is on the issues we need to address to make our decisions for the setting of the RCP3 price-quality path, we also look at some implications for RCP3 of those longer-term challenges. For example, we discuss:

X9.1 Transpower's approach to forecasting growth-related expenditure (enhancement and development (**E&D**) capital expenditure (**capex**));

X9.2 the implications of the expected ramp-up in asset replacement and renewal expenditure in the regulatory period from 1 April 2025 to 31 March 2030 (**RCP4**) and beyond for Transpower's asset management capability;

X9.3 Transpower's response to anticipated emerging workforce constraints;

X9.4 Transpower's proposed revenue path design; and

X9.5 Transpower's approach to customer consultation for RCP3, including how this approach could be developed further during RCP3 and how risk considerations could support consultation on the price/quality trade-off.

Customer engagement

X10 Transpower's approach to customer consultation is one of the key focus areas for our review of the RCP3 proposal. We expected Transpower to take into account customers' preferences in shaping its RCP3 proposal, and to effectively engage with stakeholders *during* RCP3, including when it considers transmission alternatives and prioritises projects.

X11 We acknowledge Transpower's efforts to:

X11.1 integrate stakeholder engagement into its 'business as usual' activities;[7]

X11.2 implement initiatives such as the establishment of its Consumer Advisory Panel and the release of Te Mauri Hiko;[8, 9] and

X11.3 commit to developing its approach to customer consultation further.[10]

X12 In this paper we seek feedback on the extent to which Transpower's customers consider they have had an opportunity to genuinely engage with Transpower on the content of the RCP3 proposal. We also seek views on how we see Transpower developing its customer engagement further.

Quality standards and performance measures

X13 The quality standards and grid output measures that we set provide incentives for the level of service quality that Transpower will provide during RCP3. We discuss Transpower's proposed RCP3 grid output measures and the implications for stakeholders and consumers.

X14 Transpower's quality standards and grid output measures are intended to balance incentives for Transpower to reduce expenditure while providing services at the quality consumers demand.

X15 Transpower has refined and rationalised its service performance measures after considerable consultation with industry. However, it has not consulted on the incentive arrangements or quality standards that accompany these. We seek your views about the incentives and how Transpower has proposed to set the revenue at risk for each of its grid output measures, as well as appropriate quality standards.

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7 Above n 3, at 90.

8 For information on Transpower's Consumer Advisory Panel, see: https://www.transpower.co.nz/keeping-you-connected/consumer-advisory-panel.

9 Transpower "Te Mauri Hiko Energy Futures" (2018), available at: https://www.transpower.co.nz/resources/te-mauri-hiko-energy-futures.

10 Above n 2, at 36.

Asset management

X16 We expect that a prudent and efficient transmission asset owner is one that understands the health and criticality of its assets, and that uses this understanding to directly inform its decision making on expenditure and the likely impact of asset outages.

X17 Asset health reflects the likelihood of an asset failing due to its assessed condition, while asset criticality reflects the consequence of the asset failing, ie, how it affects network reliability and consumer supply.

X18 Improving the accuracy of expenditure forecasting is one reason we are so focussed on asset health modelling. This is particularly relevant to the IPP reset for RCP3 where expenditure approval is being sought in 2018/2019. Better asset health models lead to more confidence that Transpower's expenditure forecasts can be relied upon.

X19 Over RCP2 Transpower has taken steps to improve its asset health and condition assessment practices in different asset classes, and its understanding of asset criticality across the asset fleet.[11]

X20 However, we consider there are still a number of areas in which Transpower can improve its asset health and condition assessment practices, particularly given its forecast of a large uplift in asset replacement capex in RCP4 and RCP5.

X21 Some submitters have suggested that Transpower should prioritise this aspect of its work programme and that it has not adequately delivered on the initiatives we set out in RCP2.[12]

X22 We agree that Transpower should have a continuous focus on improving its asset health models and criticality understanding to better inform its expenditure forecasts and investment decision-making processes, and that by the end of the RCP3 period this aspect of the asset management practice should be well-developed.

X23 To this end we are testing ideas about how we might encourage Transpower to progress this work as a priority during RCP3, and we are proposing several options to do this. Our preferred option at this stage is to require independent verification part-way through RCP3 to report on progress in this area.

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[11] Transpower "Initiatives Plan Update" (March 2016), available at: https://www.transpower.co.nz/sites/default/files/plain-page/attachments/Regulatory%20Initiatives%20Plan%20-%20March%202016%20Update.pdf.

[12] MEUG "Transpower IPP 2020 – Process, Framework and Approach Paper" (15 November 2018), at [4(a)].

Base capex

X24 Transpower is proposing a 5% increase in RCP3 base capex ($1,202 million)[13] when compared to RCP2 ($1,144 million). Transpower has indicated that it is seeking approval to include an estimated $135 million of possible projects in the IPP schedule for listed projects for RCP3 and an estimated $178 million of major capex proposals (**MCPs**) that may be submitted to us during the RCP3 period.

X25 While the Verifier largely agreed that the majority of Transpower's base capex forecast was prudent having regard to GEIP, it raised issues we will test with Transpower as we carry out our review of the RCP3 base capex proposal. We will consider these issues, as well as any others we identify, as we continue to analyse the proposal material.

Operating expenditure

X26 In developing its proposed RCP3 operating expenditure (**opex**) forecasts, Transpower has used a base-step-trend forecasting methodology, which extrapolates from the expenditure in a base year, using historic trends.[14] In assessing the efficiency of its base level opex, Transpower has undertaken historical trend analysis. It has considered a proposed base level opex efficient if it was in line with the average expenditure of some of the preceding years.

X27 Implicit in this assumption is that historical expenditures (ie, 'revealed costs') should be reflective of efficient costs if there is an effective incentive mechanism in place that incentivises a supplier of regulated services to actively pursue efficiency gains. A range of such incentive mechanisms apply to Transpower, with the incremental rolling incentive scheme (**IRIS**) applying to Transpower's opex.

X28 The Verifier reviewed all of Transpower's proposed opex ($1,343 million). It considered $1,229 million of the expenditure to be consistent with GEIP, and that the remaining $114 million requires our further scrutiny. Importantly, the Verifier was not able to confirm that Transpower's proposed base level opex is cost efficient.

X29 While we consider that most of Transpower's proposed adjustments to the base year expenditure (for example, for atypical expenditure) reflect the efficient costs of a prudent supplier, we have yet to form our view on whether the base year expenditure itself is cost efficient. We seek your views on this, as well as the forecast trend, in the context of how it positions Transpower to meet future challenges.

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[13] Dollar figures are 2017/18 dollars, unless otherwise noted.

[14] With the exception of its preventive maintenance category, which is built up from unit costs, tested in a competitive market, work schedules from its asset management information system, and insurance, which is derived from broker and actuarial forecasts.

X30 We also consider Transpower's insurance opex in Attachment A to this paper. This expenditure was outside of the Verifier's terms of reference. While we consider insuring key assets to be prudent, we have yet to form a view on whether Transpower's proposed insurance opex is consistent with GEIP, and we seek your views.

Deliverability

X31 A relevant question is Transpower's ability to deliver the increased level of work expected in RCP4 and subsequent RCPs. Deliverability is already expected to be a constraint in RCP3, and is expected to continue to be an issue going forward. We understand from feedback from Transpower's customer consultation on the RCP3 proposal that Transpower's stakeholders have concerns about Transpower's ability to fully deliver upon necessary work in future.

X32 If Transpower does not have the capability to deliver upon this work, deferral may produce an undesirable change in the risk profile of the asset base. In this context, maintaining an available workforce and specialist skills base might be prudent.

X33 In developing its proposed RCP3 expenditure, Transpower's proposal outlines its consideration and consultation on deliverability risks, particularly those relating to resourcing, as resource constraints can impact on work volumes and the timing of works.

X34 To minimise the amount of works to be deferred into subsequent regulatory periods, Transpower indicated it will be "looking at ways for the organisation to create efficiencies in the planning and delivery process that allow a greater throughput of works". We have asked Transpower to provide in its submission on this paper more details on how it intends to achieve the efficiency gains that would enable it to undertake all the works it considers necessary in RCP3, notwithstanding the deliverability adjustments.

Revenue path

X35 Transpower proposed nominal total forecast revenue of $4,419 million for RCP3, which in nominal terms represents a 6.6% reduction from its total revenue in RCP2. This reduction is largely driven by an assumption of a lower weighted average cost of capital (**WACC**). This puts downward pressure on Transpower's total forecast capital charge, and offsets the revenue impact of proposed higher base capex and opex allowances on Transpower's total forecast revenue in RCP3.

X36 Transpower has proposed that its RCP3 revenue based on annual building blocks would be smoothed over the five years of RCP3, exclusive of the revenue effects of listed projects and major capex projects. We understand that Transpower's stakeholders have expressed mixed views when Transpower consulted on revenue path smoothing.

X37 We consider Transpower's proposed approach to intra-period smoothing between the years in RCP3 is sensible, as it contributes to pricing predictability. We note, however, that Transpower has not proposed any form of inter-period smoothing between regulatory periods, and this is a more complex issue. Total forecast revenues for both Transpower's high-voltage alternating current (**HVAC**) and high-voltage direct current (**HVDC**) networks have downwards step changes of varying magnitudes in between RCP2 and RCP3 as well as a step up between RCP3 and an indicative revenue path for RCP4 for each network, based on current forecasts.

X38 We see merit in Transpower's proposal to move to an approach where wash-up amounts and annual incentive amounts are accumulated for RCP3 in the EV account, but with its balance only applied to Transpower's total forecast revenues when we reset the IPP for RCP4 in 2024.[15] Such an approach could reduce IPP compliance costs and further contribute to pricing predictability during RCP3. While this may result in a build-up of the EV account balance (in favour of either Transpower or its customers) to levels that could be more likely to result in price shocks when we set Transpower's total forecast revenues for RCP4, this could be addressed by Transpower annually disclosing information that would give its "customers advance warning of the revenue impact of accumulated EV account entries and of the resulting revenue that is likely to be applied under the transmission pricing methodology".[16]

[15] The EV account is used to account for under/over-recovered revenues until the next available pricing year, with balances carried forward being adjusted at the WACC rate. These balances include annual revenue-path wash-up calculations and incentive calculations that have not yet been recovered from or returned to Transpower in revenue calculations.

[16] Above n 2, at 49.

Chapter 1 **Introduction**

Purpose of this paper

1.1 We are in the process of setting Transpower's expenditure allowances and quality standards, as part of determining Transpower's individual price-quality path (**IPP**) for the next regulatory control period (**RCP**), to apply from 1 April 2020 to 31 March 2025 (**RCP3**).[17]

1.2 We have undertaken an initial review of Transpower's RCP3 proposal and the associated independent verification report, and we have identified a number of issues on which we would like to hear your views.[18]

1.3 Your views will assist us in identifying where to undertake more detailed reviews of Transpower's proposal before consulting on our draft decision to be released in May, and publishing the final IPP determination in November of this year.

Transpower's individual price-quality path

1.4 Transpower is the owner and operator of New Zealand's national transmission grid. As the system operator, Transpower also manages the real-time operation of the grid.

1.5 Under Part 4 of the Commerce Act 1986 (the **Act**), the Commerce Commission is responsible for determining an IPP for the electricity lines services provided by Transpower.[19] The IPP that we determine for RCP3 will set out the forecast revenue that Transpower may receive for providing electricity transmission services over that period, and the level of quality it must provide to consumers.

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[17] Our working assumption is that a five-year term for RCP3 is likely to apply. We will be considering whether any variation from this should be made.

[18] Transpower's main proposal document and the independent verification report are available on our website at: https://comcom.govt.nz/regulated-industries/electricity-lines/electricity-transmission/transpowers-price-quality-path/setting-transpowers-price-quality-path-from-2020#projecttab. Transpower has also published these documents on its website, along with additional supporting material, at: https://www.transpower.co.nz/keeping-you-connected/industry/rcp3/rcp3-proposal-securing-our-energy-future-2020-%E2%80%93-2025.

[19] The IPP provisions of s 53ZC of the Act apply to Transpower by way of an Order in Council under s 52N. Electricity lines services include both transmission services and system operator services. However, Transpower's system operator services are not covered by our IPP determination. This is because we consider the existence of a separate arm's-length contract between Transpower and the Electricity Authority for these services results in outcomes consistent with those that would be observed in a workably competitive market. Also, the IPP determination does not cover revenue from 'new investment contracts', which are contracts for transmission services between Transpower and another party where the party that is contracting with Transpower agrees in writing that the terms and conditions are reasonable or reflect workable or effective competition for the provision of the goods and services.

Transpower's proposal and verification report

1.6 On 23 November 2018 we received a proposal from Transpower setting out its forecast expenditure and proposed performance measures for RCP3. Alongside its proposal, Transpower also submitted a report from Synergies Economic Consulting and GHD Advisory (the **Verifier**) setting out an independent verification opinion on Transpower's RCP3 proposal.[20]

1.7 Our task now is to evaluate Transpower's proposal and set Transpower's IPP by 28 November 2019.

Structure of this paper

1.8 This paper outlines our initial observations on the key issues for the IPP reset, and sets out some questions to guide you in drafting your responses to the issues.

1.9 Details of each chapter are set out in Table 1 below.

Table 1 Structure of this paper

Section	Title	Description
Chapter 1	Introduction	Sets out the purpose of this paper, what it covers, how it is structured, how you can provide your feedback, and the next steps.
Chapter 2	Our process, framework and approach	Summarises our focus areas for the IPP reset, discusses issues raised in submissions on our process, framework and approach paper, our initial responses to those submissions, and how we intend to seek further information from Transpower.
Chapter 3	Overview of Transpower's proposal and the Verifier's findings	Provides an overview of Transpower's RCP3 proposal and the Verifier's findings. Also provides further context for the IPP reset including Transpower's longer-term views on electricity demand and required levels of investment.
Chapter 4	Customer consultation	Seeks your views on the effectiveness of Transpower's customer consultation and any areas for improvement.
Chapter 5	Grid output measures and quality standards	Seeks your views to help inform our assessment of Transpower's RCP3 proposal material, and to assist us in setting effective grid output measures and quality standards for RCP3 and beyond.

[20] An overview of Transpower's proposal and the verification report is provided in Chapter 3.

Chapter 6	Asset management	Seeks your views on Transpower's current asset management practices and how these will affect the RCP3 period. Also discusses specific areas that we are likely to explore further with Transpower in preparation for the RCP4 and RCP5 periods.
Chapter 7	Base capex forecast	Seeks your views on potential issues with Transpower's RCP3 base capex forecast. Also discusses specific areas that we are likely to explore further with Transpower in setting the RCP3 base capex allowance and other RCP3 expenditure in preparation for RCP4 and RCP5.
Chapter 8	Operating expenditure	Seeks your views on the overall efficiency of Transpower's opex and, in particular, the proposed expenditure in the asset management and operations (**AM&O**) portfolio.
Chapter 9	Deliverability	Seeks your views on how Transpower has addressed deliverability risks for RCP3 expenditure and outputs.
Chapter 10	Revenue path	Seeks your views on whether Transpower's revenue path should be smoothed to reduce year-on-year variations in revenue, and on whether Transpower should accumulate wash-up and incentive amounts and spread their recovery or repayment over RCP4.
Attachment A	Insurance	Seeks your views on Transpower's insurance approach, and what you would expect of a prudent transmission operator.

How you can provide your feedback on the matters discussed in this paper

1.10 This issues paper highlights only a number of focus areas and specific issues relating to Transpower's RCP3 proposal, and sets out some targeted questions on those issues. However, you may submit on any matter relevant to Transpower's RCP3 proposal. You are invited to provide your written views within the timeframes set out below:

1.10.1 Submissions are due by **5pm, Thursday 28 February 2019**; and

1.10.2 Cross-submissions on matters raised in submissions by other parties are due by **5pm, Thursday 7 March 2019**.

1.11 You should address your responses to:

Dane Gunnell (Manager, Price-quality Regulation)
c/o regulation.branch@comcom.govt.nz

1.12 Please include “Transpower IPP 2020 – Issues Paper” in the subject line. We prefer responses to be provided in a file format suitable for word processing, in addition to PDF file format.

Requests for confidentiality

1.13 We intend to publish all submissions on our website. This is an important step, as it allows us to test all information received from stakeholders in a fully transparent way, including through cross-submissions.

1.14 However, we recognise that there may be cases where submitters wish to provide us with confidential information in a submission.

1.15 Any confidential information in a submission should be clearly marked and preferably included in an appendix. When confidential information is provided in a submission or if you wish the published electronic copies to be ‘locked’, you should supply both confidential and public versions of your submissions. The responsibility for ensuring that confidential information is not included in a public version of a submission rests with the submitter.

1.16 Submitters must also explain the basis for any claims that information is confidential. Where commercial sensitivity is asserted, submitters must explain why the publication of the information would be likely to unreasonably prejudice their commercial position or that of another person who is the subject of the information.

Next steps

1.17 Following our consideration of submissions and cross-submissions on this paper, the next steps are for us to publish our draft decisions in May 2019. These draft decisions will include:

1.17.1 Transpower’s expenditure allowances, quality standards, and compliance obligations;

1.17.2 the design of the revenue path, including potential smoothing of the revenue path; and

1.17.3 a draft IPP determination published for technical submissions.

1.18 As we set out in our process, framework and approach paper, the indicative dates for our IPP reset process are provided in Table 2 below.[21]

Table 2 Indicative dates for our IPP reset process

Indicative date	Process step
7 February 2019	Issues paper on Transpower's RCP3 proposal published
28 February 2019	Submissions due on our issues paper
7 March 2019	Cross-submissions due on our issues paper
30 May 2019	Draft decisions on expenditure allowances, quality standards, compliance obligations and revenue path design published for submissions Draft IPP determination published for technical submissions
27 June 2019	Submissions due on our draft decisions Technical submissions due on our draft IPP determination
11 July 2019	Cross-submissions due on our draft decisions and our draft IPP determination
29 August 2019	Final decisions on expenditure allowances, quality standards, compliance obligations and the revenue path design published Revised draft IPP determination published for information only, subject only to revenue path updates to come later for the Transpower weighted average cost of capital (**WACC**) in October
12 September 2019	Draft information request provided to Transpower to calculate the forecast maximum allowable revenue (**MAR**) for RCP3
3 October 2019	Information request issued to Transpower to calculate the forecast MAR for RCP3
10 October 2019	Transpower WACC published
31 October 2019	Transpower's forecast MAR for RCP3 to be provided by Transpower to the Commission
14 November 2019	Final IPP determination and companion paper published
28 November 2019	Last statutory date to publish IPP determination

[21] Commerce Commission "Our process, framework and approach for setting Transpower's expenditure allowances, quality standards and individual price-quality path for 2020 to 2025" (25 October 2018), at 9.

Chapter 2 Our process, framework and approach

Purpose of this chapter

2.1 The purpose of this chapter is to:

2.1.1 summarise our high-level approach to assessing Transpower's base capex proposal, and our focus areas for the IPP reset, which we initially proposed in our process, framework and approach paper;[22]

2.1.2 discuss issues raised in submissions on our process, framework and approach paper, and explain how we intend to respond; and

2.1.3 explain how we intend to seek further information from Transpower as we undertake our evaluation of its proposal and set the expenditure allowances.

Our process, framework and approach paper

2.2 We published and consulted on our process, framework and approach paper from 25 October to 15 November 2018.[23]

2.3 The paper set out and consulted on:

2.3.1 our proposed process and indicative dates for the IPP reset, including opportunities for stakeholders to provide submissions;

2.3.2 our regulatory framework, covering the relevant requirements of Part 4 of the Act and the relevant input methodologies (**IMs**);

2.3.3 our view on Transpower's progress under our regulatory regime, our proposed focus areas for the RCP3 IPP reset, and our longer-term view for regulating Transpower;

2.3.4 our proposed approach to assessing Transpower's forecast expenditures for RCP3, including the process of setting expenditure allowances, how we intend to apply the 'proportionate scrutiny' principle, how the Verifier's findings will help shape our assessment, and the tools we intend using through this process; and

[22] Above n 21, at 24-31.
[23] Above n 21.

2.3.5 our proposed approach to setting Transpower's forecast MAR and the total forecast revenues for each pricing year in RCP3, and how we intend to present this information to stakeholders.

Assessing Transpower's base capex proposal

2.4 In resetting the IPP, we must make decisions that promote the purpose of Part 4, as stated in s 52A:

> … to promote the long-term benefit of consumers … by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services –
>
> (a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and
>
> (b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and
>
> (c) share with consumers the benefits of efficiency gains in the supply of the regulated good or services, including through lower prices; and
>
> (d) are limited in their ability to extract excessive profits.

2.5 In assessing Transpower's base capex proposal, we will be guided by whether the proposal is consistent with an expenditure outcome which represents the efficient costs of a prudent supplier of electricity transmission services.[24] This concept is consistent with the Part 4 purpose, which is also a required consideration under the capex evaluation criteria in the Transpower Capital Expenditure Input Methodology (**Capex IM**).[25]

[24] Above n 21, at 13.

[25] *Transpower Capital Expenditure Input Methodology Determination 2012* [2012] NZCC 2, as amended, at [6.1.1(2)(b)].

2.6 In applying this concept, we consider that a 'prudent supplier' is a supplier whose planning and performance standards reflect Good Electricity Industry Practice (**GEIP**). A useful definition of GEIP, in relation to electricity transmission services, is found in the Electricity Industry Participation Code 2010 (**Code**).[26]

2.7 In defining the breadth and depth of our assessment of Transpower's proposal, we intend applying 'proportionate scrutiny' to Transpower's forecast expenditures.

2.8 In broad terms, 'proportionate scrutiny' means that we will apply the level of scrutiny that is commensurate with potential price and quality impacts of forecast expenditures on Transpower's customers and where we consider the benefits of such scrutiny to customers outweigh the associated costs over time.[27] Where appropriate, we use a process of incrementally higher levels of scrutiny if the lower levels of scrutiny are insufficient.

Our focus areas for the IPP reset

2.9 As we set out in our process, framework and approach paper, our proposed focus areas for the RCP3 IPP and for monitoring Transpower's performance during RCP3 are:[28]

2.9.1 Setting appropriate expenditure allowances;

2.9.2 Asset health and criticality;

2.9.3 Transpower's engagement with customers;[29]

2.9.4 Revenue-linked performance measures; and

2.9.5 Revenue and pricing impacts.

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[26] 'Good electricity industry practice' is defined in Part 1 of the Code as: **good electricity industry practice** in relation to transmission, means the exercise of that degree of skill, diligence, prudence, foresight and economic management, as determined by reference to good international practice, which would reasonably be expected from a skilled and experienced **asset** owner engaged in the management of a transmission network under conditions comparable to those applicable to the **grid** consistent with applicable law, safety and environmental protection. The determination is to take into account factors such as the relative size, duty, age and technological status of the relevant transmission network and the applicable law [bold terms in original].

[27] These costs can be immediate costs on us or Transpower. For example, additional analysis we undertake or further evidence Transpower has to provide.

[28] Above n 21, at 24-31.

[29] For clarification, we note that when we mention 'customers' in this paper, we refer only to Transpower's customers, including electricity distribution businesses, generators and major electricity users, that are directly connected to Transpower's transmission network.

2.10 Each of these is summarised below. Further details on our focus areas can be found in Chapter 4 of our process, framework and approach paper.

Setting appropriate expenditure allowances

2.11 Setting appropriate expenditure allowances for Transpower in RCP3 is a key focus for us as the operating expenditure (**opex**) and capital expenditure (**capex**) allowances will impact on the revenue Transpower will be able to recover from its customers in RCP3 and beyond.

2.12 In setting these allowances we aim to ensure they are consistent with:

2.12.1 an expenditure outcome that reflects the efficient cost of a prudent supplier; and

2.12.2 the relevant criteria specified in the Capex IM.[30]

2.13 In Chapter 7 and Chapter 8 of this paper, we seek feedback on aspects of Transpower's proposed base capex forecast and opex forecast. In Chapter 9, we seek feedback on how Transpower has addressed deliverability risks for RCP3 expenditure (and outputs).

Asset health and criticality

2.14 In Chapter 6 of this paper, we seek feedback on how Transpower is developing and implementing its risk-based asset management approach. Two foundation inputs into an asset risk framework are asset health (or condition) and asset criticality. 'Asset health' reflects the likelihood of particular assets failing, while 'asset criticality' reflects the consequences of the relevant assets failing.

2.15 We consider that a prudent and efficient transmission asset owner is one that understands the health and criticality of its assets, and uses this understanding to directly inform its decision making on expenditure and the likely impact of asset outages.

2.16 Having a risk-based asset management approach that includes both asset health and criticality considerations should improve Transpower's expenditure decision-making process. It would be more robust and defendable as prioritising investments across the grid would be done in a more consistent and predictable way.

[30] Schedule A of the Capex IM.

Transpower's engagement with customers

2.17 Transpower's approach to customer consultation is one of the key focus areas for our review of the RCP3 proposal. We expected Transpower to take into account customers' preferences in shaping its RCP3 proposal, and to effectively engage with stakeholders *during* RCP3, including when it considers transmission alternatives and prioritises projects.

2.18 In Chapter 4 of this paper, we seek feedback on the extent to which Transpower's customers consider they have had an opportunity to genuinely engage with Transpower and potentially influence the content of the RCP3 proposal. Your views will help us to refine our process for the IPP reset and to decide whether to impose additional consultation or reporting requirements on Transpower during RCP3.

Revenue-linked grid output performance measures

2.19 In Chapter 5 of this paper we seek feedback on the grid output performance measures and quality standards that Transpower will be subject to in RCP3, how these measures compare to those in RCP2, and the direction we would like to see Transpower take for RCP4 and beyond.

2.20 We also seek feedback on how Transpower has proposed to link the performance measures to revenue, where appropriate. Revenue linkage seeks to reward Transpower for exceeding the grid output targets and penalise it if its performance is worse than the targets. In setting the revenue linkages, we will aim to ensure they strike an appropriate balance with the incentives to achieve cost efficiencies under our expenditure schemes (ie, to avoid a perverse incentive for Transpower to reduce costs through a reduction in quality).

2.21 We are required to determine quality standards for Transpower for the purposes of compliance with the Act.[31] We propose several options on how we may set these quality standards and seek your feedback on setting appropriate measures and how these relate with the grid output performance measures.

Revenue and pricing impacts

2.22 At the draft decision stage, we intend to consult on the impact of Transpower's forecast expenditures in RCP3 on the revenue that Transpower will be allowed to recover from its customers.

[31] Section 53M of the Act.

2.23 Our consultation will cover both the immediate impact on revenue in transitioning from RCP2 to RCP3, as well as the estimated subsequent impact in transitioning from RCP3 to RCP4. We also cover how smoothing prices from year to year within RCP3 will affect the yearly revenue Transpower collects from its customers, and whether Transpower should accumulate wash-up amounts and incentive amounts and collect (or repay) these over RCP4.

2.24 We consider that creating transparency around the impact of Transpower's forecast expenditures in RCP3 on revenue is an important component of consultation, as understanding this linkage enables interested parties to form a view on:

2.24.1 whether Transpower's revenue allowances between RCPs should be smoothed to mitigate the impact of any potential step changes; and

2.24.2 if Transpower's revenue allowances were smoothed, the extent of such smoothing.

2.25 In Chapter 10 of this paper, we seek feedback on some smoothing options and on treatment of wash-up amounts and incentive amounts.

Issues raised in submissions on our process, framework and approach paper

2.26 We received submissions on our process, framework and approach paper from four parties:[32]

2.26.1 Genesis;

2.26.2 Meridian;

2.26.3 Major Electricity Users' Group (**MEUG**); and

2.26.4 Vector.

2.27 In response to these submissions, Transpower subsequently provided the Commission with a letter setting out Transpower's perspectives on a number of points raised.[33]

2.28 Submissions relating to the issues identified in this paper are discussed in the relevant chapters.

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[32] The submissions are available on our website at: https://comcom.govt.nz/regulated-industries/electricity-lines/electricity-transmission/transpowers-price-quality-path/setting-transpowers-price-quality-path-from-2020#projecttab.

[33] Transpower "Submissions – Transpower IPP reset process, framework and approach" (18 December 2018).

2.29 Submissions that are not related to the issues identified in this paper are summarised in Table 3 below, along with our initial responses.

Table 3 Submissions on process, framework and approach paper

Submissions	Our initial responses
<u>Part 4 purpose and consumer outcomes</u> Meridian considered the Commission should explain and quantify the link between RCP3 decisions and the Part 4 purpose, including how they will: - drive outcomes consistent with those produce in competitive markets; - deliver benefits to consumers; and - ensure Transpower shares efficiencies with consumers.[34] Meridian also considered the Commission should make the impact of Transpower's revenues on consumers a key part of its analysis and consultation.[35] Vector was also concerned about the impact of Transpower's revenues on consumers, suggesting affordability should be considered by the Commission in setting the IPP for RCP3.[36] However, Transpower considered that Vector's chart showing price changes for each major electricity supply chain element was misleading.[37]	As we set out in Chapter 3 of our process, framework and approach paper, our decisions for the IPP reset must promote the Part 4 purpose. We intend to explain how they will do this in our draft and final decision papers. Our process, framework and approach paper also described how we intend to consider the impact of Transpower's revenues on consumers (Chapter 6). Transpower has provided the Commission with a breakdown of forecast transmission charges at a grid exit point (**GXP**) level and on a per customer basis, which will enable us to present the impacts on Transpower's customers, and the impacts of our electricity distribution business (**EDB**) default price-quality path (**DPP**) reset decisions in 2019, which will both flow through to electricity consumers.[38] To the extent our draft decisions in May 2019 result in revised expenditure forecasts and/or a differently smoothed revenue path, we will request Transpower to update its forecast charges. Regarding concerns about affordability and increases in transmission charges over the past 10 years, our role is to consider the extent to which Transpower's revenue recovers expenditure that reflects the efficient costs of a prudent supplier, consistent with the Part 4 purpose. We will also consider how we might be able to smooth the revenue path to mitigate the risk of price shocks to Transpower's customers and end-use consumers.

[34] Meridian "Transpower IPP 2020 – Process, Framework and Approach Paper" (15 November 2018), at 1.
[35] Above n 34, at 1-2.
[36] Vector "Transpower Process Framework and Approach for Setting Expenditure Allowances, Quality Standards and Individual Price Path for 2020 to 2025 – Vector comments" (15 November 2018), at 3 and 7.
[37] Above n 33, at 2-3.
[38] We are currently in the process of setting the DPP that will apply to EDBs from 1 April 2020.

Submissions	Our initial responses
Verification and proportionate scrutiny MEUG submitted that the piloting of an independent verifier for this reset should be reviewed after the November 2019 final IPP decisions are made. It considers that while there may be benefits of using a Verifier to ease the Commission's work with concurrent important workstreams, the downside is a potential for loss of contact with Transpower to better understand what drives the company.[39] Meridian requested a copy of the Engagement Agreement between Transpower and the Verifier, so it could understand the level of care applied by the Verifier in completing its task, and the obligations on Transpower in terms of accuracy and completeness of information provided to the Verifier.[40] Meridian submitted that, in its view, implicit in the concept of 'proportionate scrutiny' is the idea that the Commission believes it is only required or appropriate for it to apply scrutiny to Transpower's proposals where the anticipated benefits to customers outweigh the associated costs either to the Commission or Transpower. Meridian queried whether this is a correct conceptualisation by the Commission of its role.[41] Genesis supported the 'prudent supplier' test, and the Commission using proportionate scrutiny to forecast expenditures for RCP3.[42]	We intend to undertake a review of the verification pilot following completion of our IPP reset decisions. We will seek stakeholder feedback as part of this review. At this stage, we do not agree that the use of a Verifier has resulted in the Commission losing contact with Transpower. On the contrary, we consider that the verification process has given us additional perspectives on Transpower's business and RCP3 proposal. By maintaining close contact with both the Verifier and Transpower throughout the verification process, we gained valuable insights ahead of receiving Transpower's RCP3 proposal, that we did not achieve during that phase for the RCP2 IPP reset. As we noted in Attachment B of our process, framework and approach paper, the Verifier's findings will help inform the scope of our review of Transpower's proposal, which will increase the effectiveness and efficiency of the IPP reset process. We consider that the Verifier has identified a number of useful, relevant considerations (outlined in Chapter 3 below) to this effect. However, the verification process is certainly not exhaustive in this respect, and we intend to take account of all relevant considerations raised by submitters in the IPP reset—the final decision for which ultimately rests with the Commission. In practice, and as noted above, proportionate scrutiny means that we will apply scrutiny that is commensurate with potential price and quality impacts of forecast expenditures on Transpower's customers, and where we consider the long-term benefits of such scrutiny to consumers outweigh the associated costs.[43] We consider that this approach is consistent with the Part 4 purpose and will enable us to give due consideration to all relevant considerations. We note that Transpower has now published the Engagement Agreement between itself and the Verifier on its website.

Submissions	Our initial responses
Demand-growth forecasts MEUG and Vector expressed concerns about Transpower's forecast demand growth. MEUG noted that Transpower's forecast demand-growth estimates are significantly higher than those of other organisations, and was not confident there are incentives on Transpower to develop a balanced view on the range of feasible demand scenarios.[44] MEUG was also concerned about the potential impacts of Transpower's forecasts being wrong, and suggested there is a case to consider a four-year, rather than a five-year period for RCP3.[45] Vector also considered Transpower's demand forecasts were out of step with those of other organisations and suggested the Commission should test these.[46] Transpower noted it has not used the Te Mauri Hiko demand-growth scenarios in planning for its RCP3 proposal or in its Asset Management Plan (**AMP**), as the Te Mauri Hiko scenarios are for longer-term planning.[47]	We note the Verifier's findings that Transpower's demand scenarios appear reasonably plausible, and Transpower's forecast demand for RCP3 under three of the four scenarios is moderate and aligned.[48] Any significant growth is expected to happen from RCP4 onwards, with no direct implications for RCP3. If stakeholders want further information on the demand forecasts used for RCP3 or on demand-growth forecasts for RCP4 and beyond, they should engage directly with Transpower.

39 MEUG "Transpower IPP 2020 – Process, Framework and Approach Paper" (15 November 2018), at [4(f)].
40 Above n 34, at 2.
41 Above n 34, at 2.
42 Genesis "Our process, framework and approach for setting Transpower's expenditure allowances, quality standards and individual price-quality path for 2020-25" (15 November 2018), at 2.
43 Above n 21, at [5.6].
44 Above n 39, at [4(d)].
45 Above n 39, at [4(c)].
46 Above n 36, at 7.
47 Above n 33, at 3.
48 Synergies Economic Consulting & GHD Advisory "Independent Verification Report – Transpower's RCP3 Expenditure Proposal (2020-25)" (12 October 2018), at 51.

Submissions	Our initial responses
<u>Large re-conductoring projects</u> Contact, Fonterra, Genesis, Mercury, MEUG and Northpower supported Transpower's proposed use of the listed project mechanism for large re-conductoring projects.[49, 50] For addressing re-conductoring delivery risk: • Genesis and Fonterra supported the use of the low incentive rate mechanism, instead of deferral, and Mercury was also open to this;[51] while • Contact, Meridian, and MEUG did not support the use of the low incentive rate mechanism.[52]	We will take these views into account when evaluating Transpower's proposal.

[49] Genesis, above n 42, at 6; Contact "Securing our Energy Future 2020-2025 – Draft Proposal for Consultation" (31 August 2018), at 5; Fonterra "Submission to Transpower NZ Ltd: Regulatory Control Period 3 Draft Proposal for Consultation" (August 2018), at 7-8; Genesis "Securing our Energy Future 2020 – 2025" (31 August 2018), at 4; Mercury "Securing our Energy Future 2020-2025" (3 September 2018), at 4; Major Energy Users' Group "Draft RCP3 proposal" (31 August 2018), at 6; Northpower "Submission on Transpower's draft RCP3 proposal" (31 August 2018), at 5.

[50] The complete list of submitters on Transpower's RCP3 consultation was Contact Energy, Counties Power, Fonterra, Genesis, Infrastructure New Zealand, Mercury, Meridian, MEUG, Northpower, Orion and Vector.

[51] Genesis, above n 42, at 6; Genesis "Securing our Energy Future 2020 – 2025", above n 49, at 4; Fonterra, above n 49, at 8.

[52] Contact, above n 49, at 5; Meridian "'Securing our Energy Future 2020-2025' Draft RCP3 Transpower Proposals – Meridian Submission" (31 August 2018), at 6; Major Energy Users' Group, above n 49, at 6.

Submissions	Our initial responses
Consideration of transmissions alternatives for base capex MEUG suggested the Commission should assess whether Transpower should have considered transmission alternatives for base capex and, where Transpower had done so, whether these were adequately considered.[53]	We considered this during our recent Capex IM review, and ultimately decided not to impose requirements for Transpower to consider transmission alternatives for base capex.[54] We required Transpower to provide information on the forecast investments during RCP3 that are likely to have the greatest opportunity for transmission alternatives.[55] Transpower has provided this information in the material accompanying its RCP3 proposal, along with references to where these are discussed further in the Transmission Planning Report (**TPR**).[56] As discussed further in Chapter 4 below, we are also considering requiring Transpower to report annually during RCP3 in relation to its actual base capex on: - whether it has consulted with stakeholders (including customers) and, if so, how it has consulted; - how effective it considers that consultation has been; and - how satisfied stakeholders were with the engagement process based on the views expressed by stakeholders.

[53] Above n 39, at [4(g)].

[54] Commerce Commission "Transpower capex input methodology review – Decision and reasons" (29 March 2018), at [293-323].

[55] Notice under s 53ZD of the Act dated 15 May 2018. The notice is available on our website at: https://comcom.govt.nz/regulated-industries/electricity-lines/electricity-transmission/transpowers-price-quality-path/setting-transpowers-price-quality-path-from-2020#projecttab.

[56] Transpower "RT04 Information Schedules" (November 2018); Transpower "Transmission Planning Report" (October 2018). These documents are available on Transpower's website at: https://www.transpower.co.nz/keeping-you-connected/industry/rcp3/rcp3-proposal-securing-our-energy-future-2020-%E2%80%93-2025.

Submissions	Our initial responses
Treatment of revaluations Vector submitted that there is no justifiable reason for Transpower's RCP revenue profile to be determined on a different basis to EDBs, and that they should treat revaluations the same.[57] Transpower noted that both approaches to regulated asset base (**RAB**) indexing are net present value (**NPV**) equivalent and consistent with upfront financial capital maintenance. Transpower also considered that this is out of scope for the IPP reset.[58]	We considered this issue during our 2015/16 IM review.[59] In summary, both approaches are intended to provide EDBs and Transpower with an equivalent expectation of being able to earn at least normal returns, prior to their revenue paths being set. Although changing Transpower's RAB to be inflation-indexed would have reduced Transpower's exposure to the risk that out-turn inflation differs from the inflation expectation inherent in the nominal cost of capital used to set Transpower's allowable revenue, one of the key concerns raised during the IM review was about the complexity and compliance costs for Transpower of making a change. In comparison with EDBs, Transpower's regulatory approach relies more heavily on consistency with generally accepted accounting principles (**GAAP**). Please see our 2015/16 IM review reasons paper for further details. We will be able to reconsider the issue at the next IM review, and any change would affect RCP4.

[57] Above n 36, at 4.

[58] Above n 33, at 3.

[59] Commerce Commission "Input Methodologies review decisions – Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower" (20 December 2016), at [241-324], available at https://comcom.govt.nz/__data/assets/pdf_file/0018/60534/Input-methodologies-review-decisions-Topic-paper-1-Form-of-control-and-RAB-indexation-for-EDBs-GPBs-and-Transpower-20-December-2016.pdf.

Submissions	Our initial responses
Setting appropriate expenditure allowances Vector considered that Transpower has been consistently earning revenues in excess of its allowable return and that there is no evidence that this can be attributed to efficiency improvements.[60] Transpower noted that incentive regulation provides commercial incentives for regulated suppliers to improve efficiency. If costs reduce below the levels the approved expenditure allowance, the reward is an above normal return. Transpower considered that transparency on achieved and planned efficiency improvements should give stakeholders comfort the regime is working.[61]	Transpower is subject to an opex incentive under the incremental rolling incentive scheme (**IRIS**) mechanism in the Transpower IMs and is subject to capex incentives in the Capex IM. Transpower realises the benefits of those incentives through economic value (**EV**) adjustments in its forecast MAR (ie, through annual revenue adjustments). It is therefore not unusual for Transpower to be deriving revenues in excess of its regulated return when it is working to achieve the incentives. In each case the incentive rates result in sharing of the benefits of that achievement with customers. Key to effective incentives (and the efficiency improvements Vector is referring to) is that the opex and capex settings for the upcoming RCP are based on efficient values. For example, to help us set the opex allowances for RCP3 under the base-step-trend approach,[62] we have requested Strata Energy Consulting (**Strata**) to work with us to establish that there is evidence that in the base level of opex Transpower has achieved efficiency from its past efficiency initiatives and that it has an ongoing process for identifying and capturing further efficiencies in the future.
Revenue recovery risk Vector submitted that the obligation on EDBs to pass through transmission charges to their customers results in Transpower facing no revenue recovery risk, as this is inappropriately shifted to EDBs.[63] Transpower noted that the changes that would be needed to implement these arrangements sit within the Electricity Authority's jurisdiction, rather than the Commerce Commission or Part 4. There would be transaction costs, the treatment of which would have to be resolved by the Commission.[64]	From 2020 EDBs will be subject to a revenue cap, so any such risk will be significantly mitigated.

[60] Above n 36, at 6.
[61] Above n 33, at 4-5.
[62] Above n 21, at 69.
[63] Above n 36, at 5.

Submissions	Our initial responses
Low carbon Genesis considered that, in planning for RCP3, the Commission should anticipate the considerable investment and resourcing that will be required to ensure the transmission system is ready to enable New Zealand's transition to a low emissions economy.[65] Genesis suggested that this should also be addressed outside the scope of the IPP reset and as such, is advocating for change to the National Policy Statement and broader resource consenting framework, including considering how transmission corridors could be more efficiently developed.[66] Transpower agreed with Genesis on these points.[67]	We do not consider this will significantly affect RCP3, except to the extent we need to be mindful of Transpower's capability to deal with circumstances in RCP4 and beyond.

[64] Above n 33, at 4.
[65] Above n 42, at 1, 3 and 4.
[66] Above n 42, at 1, 3 and 4.
[67] Above n 33, at 3.

How we intend to seek further information from Transpower

2.30 We have noted throughout this paper some areas where we have asked Transpower to provide additional information. To promote transparency and to give you an opportunity to comment on this information as part of your cross-submissions, we have asked Transpower to provide that information in its submission on this paper.

2.31 As we work through our evaluation and set the expenditure allowances for Transpower for RCP3, we have already sought, and will continue to seek, further information from Transpower to support our analysis. Where appropriate, and where we think this would be of interest to stakeholders, we will also publish this information.

2.32 We have also engaged Strata to initially provide us with its expert input on four discrete focus matters:

2.32.1 Given Transpower's switch from the RCP2 aspirational values in the grid output measures to proposed RCP3 values that are based on historical trends, we have asked Strata to provide a sense check on the targets, caps and collars of the proposed RCP3 measures. This will include, for example, whether the proposed measures are challenging, but within Transpower's ability to meet them, and whether we should retain symmetric measures (ie, where caps and collars specify symmetric ranges and incentive rates from the target in each case) (see Chapter 5).

2.32.2 In view of the relative importance of the asset health measures, we have asked Strata to advise us on Transpower's proposal that the measures should be revenue linked for RCP3 (see Chapter 5).

2.32.3 We have asked Strata to review Transpower's evidence that it has achieved efficiency of expenditure from its RCP2 and prior initiatives, and that Transpower is able to demonstrate an ongoing process for identifying and capturing further efficiencies in RCP3. This will look, in particular, at the base level of the AM&O opex (see Chapter 8).

2.32.4 We have asked Strata to review Transpower's methodology for establishing the proposed RCP3 allowance for enhancement and development (**E&D**) base capex. Transpower has elected not to use the base capex adjustment method that we established in our review of the Capex IM and we want to find out which of Transpower's proposed methodology, the adjustment method in the Capex IM, or a combination of both (ie, a hybrid approach), is likely to give the most effective outcome across RCP3 (see Chapter 7).

2.33 Strata has already commenced its work on these matters by requesting necessary information from Transpower to enable it to form its opinions.

Chapter 3 Overview of Transpower's proposal and the Verifier's findings

Purpose of this chapter

3.1 This chapter provides an overview of key aspects of Transpower's RCP3 proposal and the Verifier's findings, as a starting point for interested parties to understand Transpower's proposal, and as a guide to where they can find more in-depth information. We summarise Transpower's revenue proposal, its proposed opex and capex, proposed quality standards and performance measures, and the Verifier's findings and recommendations on these. This chapter also provides further context for the IPP reset including Transpower's longer-term views on electricity demand and required levels of investment.

3.2 Some of the matters outlined in this chapter are covered in more depth in particular chapters in this paper, where we highlight our thinking to date on these matters and seek your input. Transpower's RCP3 proposal and the Verifier's full report can be found on our website and on Transpower's website.[68]

Transpower's RCP3 proposal

Transpower sees uplifts in demand and investment post RCP3

3.3 In its RCP3 proposal, Transpower noted it expects the near-term forecast for electricity demand and investments required for asset replacement and renewal (**R&R**) in RCP3 to be relatively stable, but Transpower sees potential significant uplifts in demand and investment in RCP4 and beyond.[69]

[68] Above n 18.

[69] Transpower "Securing our Energy Future 2020 – 2025 Regulatory Control Period 3: RCP3 Proposal" (November 2018) at 16.

Figure 1 Transpower's long-term demand forecast[70]

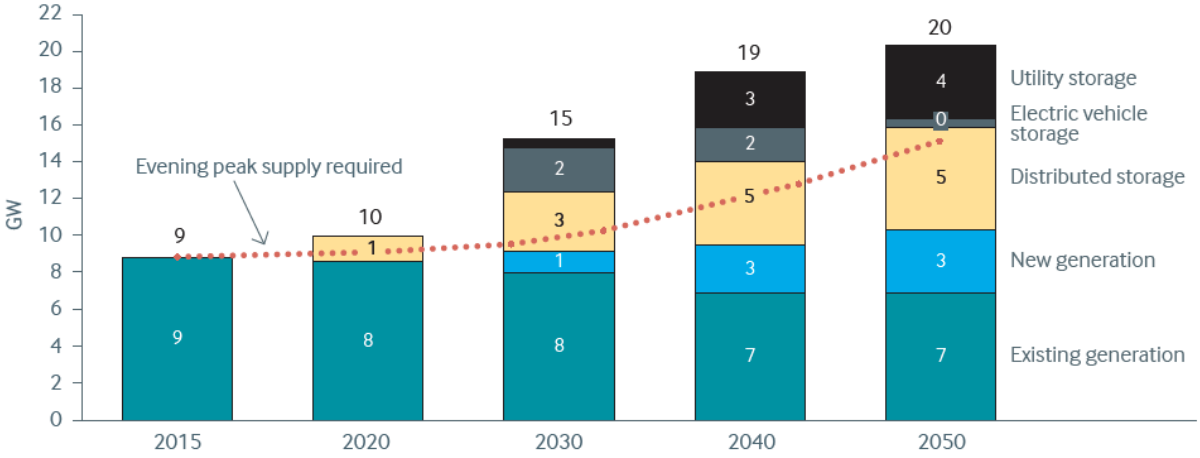
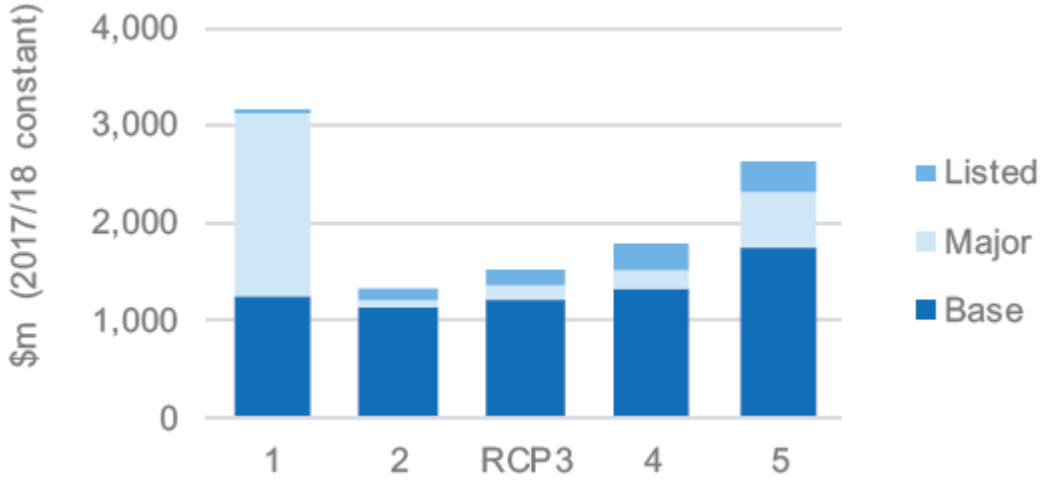


Figure 2 Transpower's long-term asset renewal and replacement forecast[71]



3.4 In response to the challenges associated with the above forecasts, Transpower noted a few areas where it intends to focus its efforts, and included implications for its RCP3 proposal. Amongst others, these are:[72]

- The grid has a stable outlook – demand growth continues to be low but could accelerate towards the end of RCP3. Consequently, we are proposing limited growth related investment during RCP3.

- Asset renewal demands are increasing – programmes of work such as tower painting, reconductoring and grid maintenance will grow in RCP3 and beyond due to the age and condition profile of lines built during the network expansion after the 1950s. We need to invest during RCP3 to optimise work beyond RCP3.

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70 Above n 69, at 16.
71 Above n 69, at 17.
72 Above n 69, at 15.

- Workforce capacity constraints are emerging – we anticipate that our work programme in RCP3 will encounter capacity constraints in the lines mechanic, protection technician and maintenance areas, and have amended our proposal accordingly. We will need to resolve these constraints to support asset renewal demands beyond RCP3.

- The cost of electricity remains important – the cost of electricity is a critical issue for our customers and wider stakeholders. We have a part to play in managing our expenditure and supporting the efficiency of the wider power system. Our proposal builds in the benefits of cost reduction initiatives and explicitly considers the balance between the price and quality of our services.

We seek your views on Transpower's response to its long-term challenges

3.5 In this paper, we discuss some of the implications for RCP3 of Transpower's long-term challenges. We focus in particular on the extent to which Transpower has proposed to address these long-term challenges in its RCP3 proposal. For example, we discuss:

3.5.1 in Chapter 4, Transpower's approach to customer consultation for RCP3, including how this approach could be developed further during RCP3 and how risk considerations could support consultation on the price/quality trade-off;

3.5.2 in Chapter 6, the implications of the expected ramp-up in asset R&R expenditure in RCP4 and beyond for Transpower's asset management capability;

3.5.3 in Chapter 7, Transpower's approach to forecasting growth-related expenditure (E&D capex);

3.5.4 in Chapter 9, Transpower's response to anticipated emerging workforce constraints; and

3.5.5 in Chapter 10, Transpower's proposed revenue path design.

3.6 We acknowledge these areas have long-term implications and will likely pose much greater challenges to Transpower, the wider industry and New Zealanders beyond RCP3. However, we note that, as part of our IPP reset decisions, we will focus on areas that are directly relevant for RCP3.

3.7 We therefore suggest that when you submit on Transpower's response to its long-term challenges, you focus your efforts on areas where these challenges have direct expenditure or quality standard implications for RCP3.[73]

Transpower's revenue proposal

3.8 Transpower proposes nominal total forecast revenue of $4,419 million for RCP3, which in nominal terms represents a 6.6% reduction from its total revenue in RCP2.[74, 75] This reduction is largely driven by an assumption of a lower WACC, which Transpower forecasts as 5.50% in RCP3.[76] This lower assumption puts downward pressure on Transpower's total forecast capital charge, and offsets the revenue impact of proposed higher base capex and opex allowances on Transpower's total forecast revenue in RCP3.

3.9 In contrast to RCP2, where Transpower's forecast MAR was based directly on an annual 'building blocks' calculation, Transpower has proposed that its RCP3 revenue based on annual building blocks would be smoothed over the five years of RCP3, exclusive of the revenue effects of listed and major projects.[77] We understand that Transpower's stakeholders have expressed mixed views when Transpower consulted on revenue path smoothing.

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[73] For example, we understand Transpower's long-term demand forecasting is of significant public interest, but the immediate outlook for RCP3 is relatively stable. Any views submitted on Transpower's long-term demand forecasting should therefore include a reference as to why this is relevant context for us in setting Transpower's IPP for RCP3.

[75] Above n 69, at 2.

[75] Above n 69, at 2.

[76] The WACC we used to set Transpower's total forecast capital charge in RCP2 was 7.19%. Transpower's revenue path proposal is only indicative, as it is based on Transpower's non-binding current assumption of WACC. We will set the WACC applying to the IPP for RCP3 in October 2019. As an indicative example, the latest WACC estimate we published for information disclosure purposes in July 2018 shows the 67th percentile WACC as 5.16% (see https://comcom.govt.nz/__data/assets/pdf_file/0028/91189/2018-NZCC-11-Cost-of-capital-determination-Transpower,-GPBs-and-Airports-ID-31-July-2018.PDF).

[77] Above n 69, at 49.

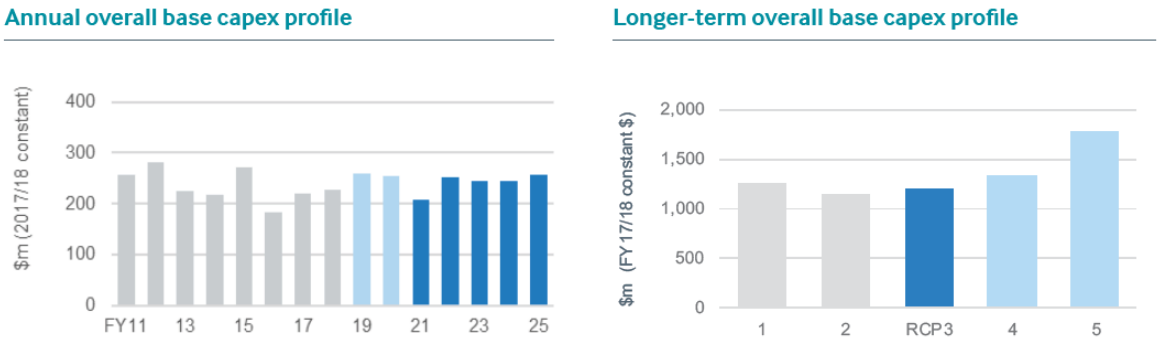
Transpower's expenditure proposal

Capital expenditure

3.10 Transpower has proposed capex (base capex and listed projects[78]) of $1,337 million in RCP3. This is an increase of 7% from the RCP2 capex of $1,248 million.[79] The proposed capex is a combination of $1,202 million base capex (up 5% from RCP2) and $135 million of listed projects (up 30% from RCP2). Transpower forecasts its base capex to continue to increase over RCP4 and RCP5. This is set out in Figure 3 below.

3.11 Major capex is not included in the RCP3 proposal, as it is subject to a separate approval process under the Capex IM. However, Transpower has indicated that it has $178 million of major capex that it will seek approval for during RCP3 if required.[80] Major capex is also expected to continue to increase over RCP4 and RCP5. Transpower's longer-term view of base, listed and major capex is set out in in Figure 4 below.

Figure 3 Annual and longer-term view of base capex profile[81]



[78] Listed projects are base capex projects specified in the Capex IM that are sufficiently uncertain that they are not included in the proposed $1,202 million base capex expenditure allowance, but may be introduced into that allowance during RCP3 if conditions are met. The total proposed expenditure of $135 million for listed projects is only indicative until those conditions are met on a project-by-project basis.

[79] Above n 69, at 3.

[80] Above n 69, at 3.

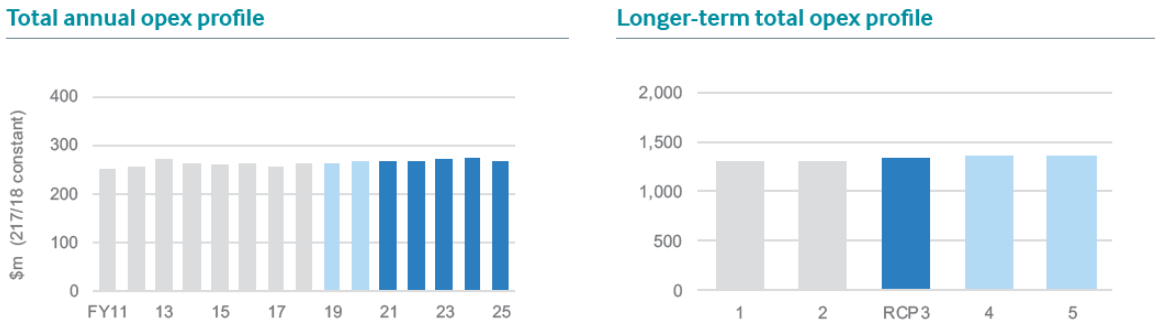
[81] Above n 69, at 37.

Figure 4 Annual and longer-term view of capex profile[82]

Operating expenditure

3.12 Transpower's RCP3 opex forecast of $1,343 million represents an increase of $37 million (2.9%), over RCP2. Transpower's opex is expected to be slightly higher than RCP3 in RCP4 and RCP5, as set out in Figure 5 below.

Figure 5 Annual and longer-term view of opex profile[83]



Transpower has proposed grid output targets and incentives

3.13 Transpower has proposed 14 grid output targets. These include measures of the number and duration of interruptions, and availability of the high-voltage direct current (**HVDC**) link. It proposes that these targets be linked to an economic incentive/penalty of up to 2% of forecast revenue ($64.5 million nominal, plus or minus, across RCP3).[84]

3.14 Transpower has also proposed five asset health targets. It proposes an incentive/penalty of up to 0.8% of forecast revenue and 6.8% of proposed capex ($26.4 million nominal, plus or minus, across RCP3).[85]

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82 Above n 69, at 39.
83 Above n 69, at 40.
84 Above n 69, at 45-46.
85 Above n 69, at 46 and 48.

The Verifier considered Transpower's proposed expenditure

3.15 The Verifier reviewed the majority of Transpower's proposed opex and base capex. We note that in some cases the Verifier highlighted that there is room for improvements in Transpower's practices, but concluded that the relevant expenditure the Verifier had reviewed was nonetheless consistent with GEIP, given that GEIP is about good practice and not necessarily best practice.

3.16 The Verifier reviewed all $1,343 million of Transpower's proposed RCP3 opex. It considered 92% ($1,229 million) would be consistent with GEIP. The Verifier considered the remaining 8% ($114 million) of opex to be 'prudent', however it considered more information was needed in order to determine its consistency with GEIP.[86]

3.17 The Verifier reviewed 86% ($1,036 million) of Transpower's proposed $1,202 million of base capex, including all of Transpower's identified programmes.[87] It considered all of the reviewed capex would be consistent with GEIP.

3.18 The Verifier's findings are summarised by expenditure category (for opex) and asset category (for capex) in Table 4 and Table 5 below. The tables compare the RCP2 spend with the proposed RCP3 spend. The tables also show where we and Strata will carry out further work on Transpower's proposal and where we have already issued requests for information (**RFIs**) to Transpower to enable us to do that work.

3.19 In addition to the RFIs which we have issued to Transpower on specific expenditure (as shown in the tables), we have also provided the following more general requests:

3.19.1 Information to help us better understand the efficiency of the cost estimating methods and data sources used by Transpower in preparing its proposal;

3.19.2 Estimates of how Transpower's proposed grid output measures would have performed if they had been used in RCP2;

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[86] This was a combination of $88 million of proposed insurance opex and $26 million in step changes within the predictive maintenance portfolio. The Verifier considered an actuarial report would be required to assess the consistency of the insurance opex with GEIP, and that additional information on the source of the predictive maintenance step changes was needed. Transpower has provided us with an actuarial report and is in the process of providing us with additional information relating to the step changes.

[87] Identified programmes are base capex projects or programmes of work which are forecast to be undertaken by Transpower in the next regulatory period (in this case, RCP3), and they are selected by reference to categories or criteria agreed between the Commission and Transpower under clause 2.2.1 of the Capex IM, prior to Transpower submitting its expenditure proposal.

3.19.3 Analysis undertaken by Transpower to conclude on the incentive strength (ie, 50% of value of lost load (**VoLL**)) for the proposed performance measures;

3.19.4 Transpower's customer engagement strategy, to help us better understand the extent and effectiveness of Transpower's ongoing engagement with its customers;

3.19.5 Information to help us understand the effect that stakeholder feedback and the Verifier's opinion has had on the final RCP3 proposal submitted to us by Transpower (ie, the $247 million decrease in forecast revenue in the proposal versus the revenue as set out in Transpower's consultation paper); and

3.19.6 Transpower's indicative modelling of the potential impact of RAB indexation for RCP4 and RCP5, to enable us to get an early indication of the materiality and complexity of the impact on Transpower's revenues of such a future change.

Table 4 Summary of Verifier's findings on Transpower's proposed operating expenditure

Portfolio	RCP3 (proposal)	RCP2[88]	Difference		Verifier reviewed	Meets GEIP	Verifier comments	Requests for information issued	Further work has been scoped
			$	%					
Grid Opex									
Preventive maintenance	$198.8m	$194.0m	$4.8m	2.5%	✓	$198.8m	_		
Predictive maintenance	$335.9m	$280.9m	$55.0m	19.6%	✓	$309.9m	Base year and some step changes consistent with GEIP. Three step changes ($26.0m) unable to be certified as consistent with GEIP.	RFI has been issued to verify the efficiency of $26.0m of predictive maintenance.	Further work to review the background to the three step changes that comprise the $26.0m.
Corrective maintenance	$15.0m	$24.4m	($9.4m)	-38.5%	✓	$15.0m	_		
Proactive maintenance	$2.5m	$2.7m	($0.2m)	-7.4 %	✓	$2.5m	_		

[88] Actual RCP2 expenditure for 2015/16 to 2017/18, and forecast for 2018/19 and 2019/20.

Portfolio	RCP3 (proposal)	RCP2[88]	Difference		Verifier reviewed	Meets GEIP	Verifier comments	Requests for information issued	Further work has been scoped
			$	%					
Maintenance deliverability adjustment	($29.1m)	_	($29.1m)	N/A	✓	_	Transpower should be targeting efficiency improvements to offset this deliverability constraint.[89]	1. RFI has been issued to find out how Transpower proposes to create efficiencies in the planning and delivery process that allow a greater throughput of works. 2. RFI issued to identify any impact of deferral of work from RCP2 into RCP3.	We have asked Transpower to provide this information in its submission on this paper to enable other stakeholders to provide their views on Transpower's ideas in their cross-submissions.
AM&O	$309.5m	$302.6m	$6.9m	2.3%	✓	$309.5m	The number of full-time equivalent staff resources (**FTEs**) involved in maintenance planning was unable to be certified as consistent with GEIP.	RFI has been issued around efficiencies built into the base year assumptions for the opex base-step-trend forecasting.	Strata has been engaged to look further at this proposed expenditure.

[89] We note that Transpower is aiming to achieve efficiency improvements and deliver the intended outputs. We discuss this in Chapter 9.

Portfolio	RCP3 (proposal)	RCP2[88]	Difference		Verifier reviewed	Meets GEIP	Verifier comments	Requests for information issued	Further work has been scoped
			$	%					
Non-grid Opex									
Information and Communications Technology (**ICT**) opex	$195.9m	$191.6m	$4.3m	2.2%	✓	$195.9m	_	RFI has been issued for ICT strategy documents.	Further work to better understand the ICT expenditure forecasts and the benefits that ICT investment will provide.
Business support opex	$226.5m	$237.3m	($10.8m)	-4.6%	✓	$226.5m	_		
Insurance	$88.0m	$72.1m	$15.9m	22.1%	✓	_	Evaluating the efficiency of the insurance proposal requires specialist actuarial expertise, outside the Verifier's area of expertise.[90]	RFI has been issued for the financial statements of the reinsurance subsidiary company.	Further work to assess the efficiency of Transpower's proposed insurance opex.
Total	**$1,342.9m**	**$1,305.6m**	**$37.3m**	**2.9%**	**100%**	**$1,228.9m**			

[90] The Verifier has nonetheless provided a useful discussion of Transpower's insurance coverage and considers the proposed expenditure prudent.

Table 5 Summary of Verifier's findings on Transpower's proposed base capital expenditure

Portfolio	RCP3 (proposal)	RCP2[91]	Difference		Verifier reviewed	Meets GEIP	Verifier comments / notes	Requests for information issued	Further work has been scoped
			($)	(%)					
Grid capex									
Renewal									
AC Substations	$180.4m	$301.7m	($121.3m)	-40.2%	Partially	$102.2m	Expenditure reviewed by the Verifier meets GEIP.		No further work has been scoped, on the basis that this is a mature area of capex development, the Verifier tested a large sample of proposed expenditure, and the Verifier did not identify any issues with Transpower's approach to forecasting.
ACS Buildings and Grounds	$39.5m	$31.4m	$8.1m	25.8%	✓	$39.5m			

[91] Actual RCP2 expenditure for 2015/16 to 2017/18, and forecast for 2018/19 and 2019/20.

Portfolio	RCP3 (proposal)	RCP2[91]	Difference		Verifier reviewed	Meets GEIP	Verifier comments / notes	Requests for information issued	Further work has been scoped
			($)	(%)					
Transmission Lines	$452.7m	$351.3m	$101.4m	28.9%	Partially	$398.9m	Expenditure reviewed by the Verifier meets GEIP.	RFI issued to request Transpower's estimate of the extent of coverage of customer consultation on base capex during RCP3 under the current rules in the Capex IM.	The results of this analysis may enable us to estimate whether the consultation with customers on large scale replacement projects will be adequate when Transpower comes to deal with the forecast large increases in conductor replacements in RCP4.
HVDC & Reactive assets	$104.1m	$36.8m	$67.3m	182.9%	✓	$104.1m	Given amount of expenditure and uncertainty of forecast cost, satisfies criteria for listed projects.		
Secondary assets	$200.2m	$125.0m	$75.2m	60.2%	✓	$200.2m			
Adjustment (unallocated)	($14.0)[92]	_	($14.0)	N/A	×	_			

[92] This is composed of ($10 million) due to price-quality trade-offs in renewal spending that is not yet allocated to a particular category, and ($4 million) due to cost efficiencies in benefits driven ICT capex that is expected to drive savings in renewal capex.

Portfolio	RCP3 (proposal)	RCP2[91]	Difference		Verifier reviewed	Meets GEIP	Verifier comments / notes	Requests for information issued	Further work has been scoped
			($)	(%)					
Enhancement & Development									
E&D	$76.4m	$97.5m	($21.1m)	-21.6%	✓	$76.4m	Recommend Commission reviews Transpower's new forecasting methodology and business rules.		Strata has been engaged to look further at the E&D methodology.
Non-grid Capex									
ICT Capex									
Asset management systems	$18.6m	$23.3m	($4.8m)	-20.2%	✓	$18.6m		1. RFI issued to understand the asset condition data accuracy issues identified by the Verifier. 2. RFI issued to request an explanation on how and when Transpower intends to develop its asset health and criticality framework into a risk-based tool.	This will help identify whether Transpower is taking the right steps towards enhancing its asset management tools and engaging on network risk with its customers.
Corporate systems	$12.6m	$19.0m	($6.4m)	-33.7%	×	_			
ICT shared services	$19.2m	$30.7m	($11.5m)	-37.5%	×	_			

Portfolio		RCP3 (proposal)	RCP2[91]	Difference		Verifier reviewed	Meets GEIP	Verifier comments / notes	Requests for information issued	Further work has been scoped
				($)	**(%)**					
	IT Telecoms, Network and Security Services	$48.8m	$64.7m	($16.0m)	-24.6%	✓	$48.8m			
	Transmission systems	$47.0m	$31.8m	$15.2m	47.8%	✓	$47.0m			
	Business support capex									
	Business support capex	$17.1m	$30.4m	($13.3m)	-43.8%	×	_			
Total		**$1202.4m**	**$1143.6m**	**$58.8m**	**5.2%**	**86.1%**	**$1035.5m**			

The Verifier reviewed other elements of Transpower's proposal

3.20 The Verifier also reviewed other elements of Transpower's RCP3 proposal in addition to the proposed expenditure. Most relevant for this paper, the Verifier commented on Transpower's approach to:

3.20.1 customer consultation;

3.20.2 setting performance measures;

3.20.3 managing its asset base; and

3.20.4 deliverability of its proposed RCP3 work programme.

3.21 In a summary of its views on the above elements of the RCP3 proposal, the Verifier made the following comments.

3.22 Regarding the extent to which Transpower's proposal reflects stakeholder feedback, the Verifier said:[93]

> Transpower engaged with its customers in August 2018 regarding its full RCP3 proposal, including on price-quality testing and the proposed grid output targets. This engagement may have some impact on RCP3 expenditure, so we are not able to fully satisfy ourselves at this point that GEIP regarding stakeholder feedback is met.
>
> However, we believe Transpower has been genuine in its engagement with stakeholders over the RCP3 proposal development process and note that stakeholder feedback can be conflicting such that full consistency is not achievable.

3.23 Regarding the extent of Transpower's stakeholder consultation, the Verifier said:[94]

> Transpower has consulted extensively on its existing and potential new grid output measures, which has informed several changes it is proposing to make to the measures for RCP3, including a new 'return to service' measure.
>
> We consider the proposed RCP3 grid output measures reflect the effectiveness of Transpower's stakeholder consultation on service performance issues.

[93] Above n 48, at 12.
[94] Above n 48, at 11.

Based on the information we have been provided and assuming no material changes arising from the August 2018 stakeholder engagement, we consider that Transpower's proposed grid output measures for RCP3 satisfy the expenditure outcome having regard to GEIP. This is because the proposed measures address the areas of service performance that we consider are likely to be of most concern to energy consumers including, most importantly, those consumers directly connected to the Grid.

3.24 Regarding the consistency of Transpower's practice with good asset management practices, the Verifier said:[95]

Transpower's asset health modelling is in its early stages, based on the Ofgem approach and now common across all distribution network operators in the UK. It currently provides a good qualitative guide but requires improved asset condition data for five nominated measures - power transformers, OD circuit breakers, insulators, conductors, tower painting - to better inform the OAA stage of Transpower's Decision Framework, and to eventually quantify the impact of changes to risk for changes in works delivery scheduling and completion.

…

Asset management systems have been followed in developing the RCP3 expenditure forecasts and it is evident that Transpower is adjusting/deferring work where necessary to ensure deliverability of the proposed capital programme.

However, we can see a potential adverse impact of this approach in tower painting and conductor replacement where current systems are implying a big uplift in RCP4 and beyond. The solution in part may lie with increased data gathering to ensure any investment decisions are based on current Condition Assessment/asset health modelling and risk assessments, not legacy data.

3.25 Regarding the effectiveness of Transpower's governance processes, the Verifier said:[96]

Transpower's governance framework regarding deliverability of its proposed RCP3 total expenditure programme represents GEIP.

It considers external service provider capability and capacity in programming works and facilitates development of mitigation strategies when delivery constraints are found. Transpower also applies procedures to maximise the utilisation of external service providers.

There are good examples of RCP2 mitigation strategies for known problems and pre-planning for RCP3 projects.

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[95] Above n 48, at 9.
[96] Above n 48, at 10.

However, significant tower painting & re-conductoring programmes foreshadowed during RCP4 will require early resource planning at the beginning of RCP3. Transpower has flagged its intention to widen the current deliverability review to bridge RCPs to address issues, such as sharp forecast increases in portfolio work.

3.26 We summarise and discuss the Verifier's respective findings on these topics in more detail in the relevant chapters of this paper.

Summary of the areas the Verifier considers we should focus on

3.27 The Verifier recommended that we focus particularly closely on the following areas in reviewing the RCP3 proposal:

3.27.1 Asset health models and new asset health grid output measures and associated targets;

3.27.2 Changes in some grid performance (reliability) and asset performance targets for RCP3, including adjustments made to the historical data used to set RCP3 targets and individual customer impacts;

3.27.3 RCP3 forecasting methodology and business rules for the E&D capex programme;

3.27.4 Insurance step change;

3.27.5 2018/19 base level of expenditure for the AM&O opex programme;

3.27.6 Whether the HVDC upgrade project should be treated as a listed project in RCP3; and

3.27.7 The longer-term preliminary deliverability plans for tower painting and re-conductoring in RCP4 and RCP5.

Our view

3.28 Applying proportionate scrutiny to Transpower's RCP3 proposal and taking into account the recommendations from the Verifier, we consider the main areas of focus for us in the next stage of the RCP3 reset should be:

3.28.1 Customer consultation (see Chapter 4);

3.28.2 Quality standards and grid output measures (see Chapter 5);

3.28.3 Asset management (see Chapter 6);

3.28.4 Transpower's new E&D forecasting methodology (see Chapter 7);

3.28.5 Step change of $26 million in proposed predictive maintenance opex (see Chapter 8);

3.28.6 Efficiency of Transpower's proposed AM&O opex (also discussed in Chapter 8);

3.28.7 Deliverability of proposed expenditure (see Chapter 9);

3.28.8 Revenue path smoothing (see Chapter 10); and

3.28.9 Insurance opex (see Attachment A).

Chapter 4 **Customer consultation**

Purpose of this chapter

4.1 The purpose of this chapter is to seek your views on the effectiveness of Transpower's customer consultation and any areas for improvement.

4.2 Your views will help us to refine our process for the IPP reset and to decide whether to impose additional consultation or reporting requirements on Transpower during RCP3.

4.3 In our process, framework and approach paper we identified Transpower's approach to customer consultation as one of the focus areas for our review of the RCP3 proposal.[97, 98] We indicated that while our scope for actively shaping Transpower's customer engagement for each reset is limited (as the Transpower IMs do not specify customer engagement requirements in the way the IMs for customised price-quality paths (**CPPs**) do for CPP applicants), we expected to see the following in Transpower's RCP3 proposal:

4.3.1 we wanted to see clear evidence of how Transpower has considered customer preferences in shaping its expenditure forecasts and proposed quality measures and targets (revenue linked where applicable) for RCP3; and

4.3.2 we expected Transpower to develop a customer engagement model where customer preferences drive the grid output targets, where appropriate, and where those targets define the expenditure proposal. This includes providing for transparent engagement on the trade-off Transpower's customers have to make in weighing-up the amount of risk they are prepared to accept in exchange for the price they have to pay for transmission services (Transpower's revenues).

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97 Above n 21, at [4.25-4.31].

98 We also included in the Terms of Reference (**TOR**) for the Verifier a requirement for it to provide an opinion on the extent and effectiveness of Transpower's consultation with its stakeholders, and on the extent to which Transpower's proposal was consistent with the feedback Transpower received from its stakeholders (Commerce Commission "Terms of reference for verification of Transpower's RCP3 proposal" (16 April 2018), at [4.5-4.6], available at: https://comcom.govt.nz/__data/assets/pdf_file/0021/91272/Independent-verification-for-RCP3-Terms-of-reference-16-April-2018.PDF).

4.4 We note that effective customer engagement will become even more important in preparing for RCP4 and beyond, as the anticipated increase in expenditures in those periods flow through to Transpower's customers in transmission prices, and ultimately to end-use consumers.

4.5 In this chapter we discuss the following two areas relating to customer consultation for RCP3:

4.5.1 the effectiveness of Transpower's consultation with customers in preparing its RCP3 proposal; and

4.5.2 expectations on Transpower to consult with stakeholders *during* RCP3, including how Transpower will consider transmission alternatives in its customer engagement and project prioritisation.

The effectiveness of Transpower's consultation in preparing its RCP3 proposal

Transpower consulted with its customers in preparing its RCP3 proposal

4.6 Transpower's customer consultation was an ongoing process running alongside and informing the preparation of its RCP3 proposal.

4.7 In its main proposal document, Transpower explained that its "engagement spans proposal inputs, analysis and overall outcome".[99] It listed key components such as:[100]

4.7.1 surveys and interviews for customers to help inform Transpower's estimation of the VoLL;[101]

4.7.2 joint planning of regional network development with electricity distribution businesses and other customers including through engagement on Transpower's annual TPR process;[102]

4.7.3 disclosures of the annual Integrated Transmission Plan (**ITP**) Narrative and the AMP;[103]

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[99] Above n 69, at 29.

[100] Above n 69, at 29-30.

[101] Transpower "Value of Lost Load Study" (November 2018), available at: https://www.transpower.co.nz/resources/value-lost-load-voll-study.

[102] Transpower "Transmission Planning Report", above n 56.

[103] Transpower "Integrated Transmission Plan Narrative " (2017), available at: https://www.transpower.co.nz/industry/regulatory-control-periods/rcp2/updates; Transpower "Asset Management Plan" (October 2018), available at: https://www.transpower.co.nz/keeping-you-connected/industry/rcp3/rcp3-proposal-securing-our-energy-future-2020-%E2%80%93-2025.

4.7.4 engagement on strategic environment through publication of strategic context for the New Zealand power sector, comprising releases such as Transmission Tomorrow and Te Mauri Hiko;[104] and

4.7.5 the Auckland Strategy.[105]

4.8 Transpower engaged most directly on its RCP3 proposal in its consultation on the output measure development and the proposal consultation where it consulted, at a high level, on all relevant aspects of its draft RCP3 proposal. Transpower described these consultation events as follows:[106]

> • Output measure development – we have refreshed our service measures for RCP3 and developed targets through a series of focus group meetings and engagement papers published in October 2016, April 2017, and June 2018. We have developed asset health outputs through a pilot reporting programme that included consultation in October 2017 and June 2018 and disclosures in 2017 and 2018.
>
> • Proposal consultation – we consulted on a draft of our proposal in August 2018. The aim of the consultation was to seek broad input on the proposal overall and targeted input on price-quality balance, grid outputs, and regulatory choices. Stakeholder submissions helped us finalise our proposal.

4.9 A key part of this final consultation step was testing what Transpower refers to as the 'price-quality balance'. Transpower explained that this was intended to "result in a proposal that strikes an appropriate balance between overall cost and quality". Transpower noted that price-quality testing "proved an important component to our internal challenge and governance processes and formed a key part of August 2018 consultation on our draft proposal. The price-quality framework and submissions on price-quality balance were key inputs to decisions on our final proposal".[107]

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[104] Transpower "Transmission Tomorrow: Powering New Zealand Today and Tomorrow" (2016), available at: https://www.transpower.co.nz/resources/transmission-tomorrow-2016-0; Transpower "Te Mauri Hiko Energy Futures" (2018), available at: https://www.transpower.co.nz/resources/te-mauri-hiko-energy-futures.

[105] Transpower "Powering Auckland's Future" (2018), available at: https://www.transpower.co.nz/resources/auckland-strategy-final-report.

[106] Above n 69, at 29-30.

[107] Above n 69, at 27.

Our views on key issues relating to Transpower's customer consultation in preparing its RCP3 proposal

4.10 While there are limitations to what can be achieved through consultation, we still consider Transpower's customer consultation in preparing its RCP3 proposal could have been improved. Specifically:[108]

4.10.1 Transpower's consultation lacked clearly defined outcomes, and some meaningful and quantifiable success measures that could have been used to assess its effectiveness;

4.10.2 Transpower's consultation did not seek views from its customers on the amount of risk they are prepared to accept in exchange for the price they have to pay for transmission services; and

4.10.3 Transpower's main consultation event was held rather late in the process of developing the proposal, which meant there may have been little scope to significantly shape the proposal based on customer feedback.

4.11 Each of these areas are discussed further below.

Transpower's consultation should be more outcome-focussed

4.12 The Verifier found it challenging to form a definite view on the effectiveness of Transpower's consultation, as it considered the consultation lacked clearly defined outcomes accompanied with some meaningful and quantifiable success measures the Verifier could have used to assess its effectiveness.

4.13 Overall, the Verifier's view was that Transpower's consultation had been moderately effective. In its report, the Verifier commented:[109]

> Our opinion is that Transpower's consultation has been moderately effective to-date.
>
> We have found assessing the effectiveness of Transpower's consultation challenging, as it has no documented consultation objectives or success measures. As previously noted, Transpower integrates stakeholder engagement into its 'business as usual' activities, rather than managing it as a distinct work stream with its own objectives, strategy, tactics and success measures. While this is effective for day-to-day operations, it is our opinion that major engagement projects (such as consultation for the RCP3 service measures refresh) benefit from a more structured approach.

[108] Transpower acknowledged these findings in its main proposal document and has committed to developing its approach to customer consultation further in that regard (above n 69, at 36).

[109] Above n 48, at 90.

> It is our opinion that had Transpower identified engagement as a key work stream supporting the multiple RCP3-related projects and planned and managed this work stream independently of those projects, consultation would have been more effective and success easy to measure.

4.14 The Verifier considered that Transpower's consultation was very focussed on outputs – ie, activities such as identifying what would be communicated, when, to which audience, and through which channel. However, Transpower failed to articulate and quantify appropriate outcomes – ie, what it was seeking to achieve through its consultation with customers.

4.15 The Verifier further explained that an outcomes-focussed consultation usually includes:

4.15.1 the relevant business objectives;

4.15.2 the consultation objectives that support such business objectives (which should be specific, measurable, achievable, realistic, time based); and

4.15.3 relevant success measures for each objective.

4.16 The Verifier suggested that any identified outputs in the form of activities should be outlined in the context of how they help to achieve each of these objectives.

Transpower's testing of the price-quality balance was less effective than it could have been

4.17 The Verifier concluded that Transpower's consultation did not seek views from its customers on the amount of risk they would be prepared to accept in exchange for the price they would have to pay for transmission services.

4.18 The Verifier considered Transpower's price-quality testing to be "well-intentioned", but had doubts that it could effectively play the role it intended consultation to have. In particular, the Verifier considered that:[110]

> what Transpower appears to be doing is quantifying the revenue/price effects of re-calibrating its network risk tolerances, by reducing or increasing expenditure in certain programmes (eg re-conductoring, ICT), with only a qualitative assessment made of the effect on the various quality dimensions of service. Hence, there is no quantification of the economic consequences of changing risk tolerances.

[110] Above n 48, at 383-384.

> We recognise the difficulty of quantifying explicit price-quality trade-offs. This includes because modest cuts in expenditure can be made with little or no immediate or short-term impact on service performance or asset health. It may only be over a longer period when the cumulative effects of the expenditure cuts are revealed through service degradation and/or it becomes apparent that a bow wave of 'catch-up' work is required to prevent further and highly disruptive service degradation presenting.
>
> Considering these difficulties, there is a risk that because Transpower's price-quality testing is effectively being applied as a final gateway to determine the RCP3 forecasts, it creates the potential for the process to override the risk assessments (and price-quality testing) previously incorporated into asset management and planning decisions and ultimately the RCP3 baseline expenditure forecasts. In practice, we are concerned that the high level price-quality testing as it is currently developed lacks the rigour to play this role.
>
> …
>
> Importantly, this issue links back to Transpower's asset health modelling development initiatives over RCP2, which are attempting to quantify and link network-related risk tolerances to the economic consequences of these risks, including safety, reliability and environmental. We consider this asset modelling approach is likely to be a more powerful tool in the longer term to robustly assess price-quality trade-offs than the proposed high-level RCP3 price-quality testing. This would also allow the embedding of the price-quality testing in Transpower's asset management decision-making framework.

Transpower's main consultation event was held late in the process

4.19 We share the Verifier's views set out above on Transpower's consultation in preparing its RCP3 proposal.

4.20 We are also concerned about the sequencing of Transpower's customer consultation, as the main consultation event was held rather late in the process (August 2018). Our concern is that, at such a late stage in the process, customers were presented with a well-defined draft proposal and there was potentially little scope to significantly shape it based on customer feedback.

4.21 An alternative approach could have been for Transpower to have held two main consultation events, one at the start of the proposal preparation process followed by a second event consulting on the draft proposal. We consider such an approach may have allowed more scope for Transpower's customers to actively shape the direction and details of the RCP3 proposal. The way Transpower consulted on its draft proposal may have only allowed for some rather minor changes to the RCP3 proposal shortly before it was finalised.

We are seeking feedback to inform our further work in this area

4.22 To inform our further work in this area, we seek feedback from stakeholders on the extent to which the concerns described in paragraphs 4.12 to 4.21 should be addressed through:

4.22.1 our consultation during the IPP reset process for RCP3, particularly in terms of setting performance measures; and

4.22.2 Transpower's consultation obligations during RCP3.

Expectations on Transpower to consult with stakeholders *during* RCP3

Concerns raised about Transpower's consultation processes during regulatory periods

4.23 Some stakeholders have raised concerns previously about Transpower's consultation processes during regulatory periods. For example, during the Capex IM review, we received submissions calling for more transparency on Transpower's investment decisions and clearer information about potential opportunities for transmission alternatives. A number of submitters in that process suggested that the Capex IM should require Transpower to consult with stakeholders on transmission alternatives for both base capex and major capex.[111]

4.24 Stakeholders also raised similar concerns about our recent consultation on the development of CPP proposals for EDBs. Submitters on our open letter that sought feedback on our recent CPP processes provided views on the framework for customer consultation applicable to a CPP applicant.[112] This included views on whether we should be involved early to help ensure Transpower's approach to consultation aligns with customer expectations, whether there should be prescriptive rules (or just principles) underpinning consultation, or whether the CPP applicant should determine such a framework itself.

4.25 We ultimately decided not to set formal consultation requirements for CPP applicants' consideration of alternatives, although we did indicate we would reconsider this issue during the planning phase for the next CPP application.

[111] Above n 54, at [293-294].

[112] These submissions are available on our website at: https://comcom.govt.nz/regulated-industries/electricity-lines/projects/wellington-electricitys-20182021-cpp.

Transpower's consultation with stakeholders

4.26 While we acknowledge the concerns described above, we also note that larger elements of Transpower's forecast expenditure will be covered by existing consultation requirements in the Capex IM, which we have summarised in Table 6 below.

Table 6 Transpower's current consultation requirements during a regulatory period

Consultation requirements	Capex IM clauses	Consultation scope	Forecast amount
Major capex projects (approval process separate from base capex approval)	3.3.1(3)(a), 3.3.6, 3.3.7, 3.3.8, 3.3.9, 8.1.1,8.1.3	To be agreed between Transpower and Commerce Commission	$178 million
Listed capex projects (identified as part of the IPP setting process, but separate approval process)	3.2.1(b), 3.2.3(2)(h), 8.1.1, 8.1.2	To be commensurate with the proposed project's or programme's nature	$135 million
Base capex projects/programmes over $20 million submitted for approval during RCP3	3.2.1(b), 8.1.2	To be commensurate with the proposed project's or programme's nature	$80 million to $120 million
Total base capex proposal (including listed projects)			$1,337 million
Total base and major capex proposal			$1,515 million

4.27 In addition, as we previously noted in our Capex IM review reasons paper, we consider that Transpower provides a significant amount of information about the ongoing needs of the network in its network planning report and ITP.[113] Transpower's submission on our Capex IM review draft decisions stated that Transpower was also working on improving its communication and engagement with stakeholders, and that Transpower was using multiple channels for this, such as existing information disclosure documents, annual reports, and stakeholder and industry events.[114]

[113] Above n 54, at [315].
[114] Transpower "Capex IM draft decisions cross-submission" (16 January 2018), at 2.

4.28 We acknowledge Transpower's efforts to:

4.28.1 integrate stakeholder engagement into its 'business as usual' activities;[115]

4.28.2 implement initiatives such as the establishment of its Consumer Advisory Panel and the release of Te Mauri Hiko;[116, 117] and

4.28.3 commit to developing its approach to customer consultation further.[118]

4.29 We have asked Transpower to provide in its submission on this paper a detailed explanation of Transpower's ongoing engagement with its customers throughout the regulatory period, including its customer engagement strategy.

4.30 While our Capex IM review decision was to retain the existing consultation requirements for both base capex and major capex, we noted our intention to consider changing Transpower's information disclosure requirements to require it to report annually on the following matters in relation to its actual base capex:[119]

4.30.1 whether Transpower consulted with stakeholders (including customers) and, if so, how it consulted;

4.30.2 how effective Transpower considers that consultation was; and

4.30.3 how satisfied stakeholders were with the consultation process based on the views they expressed.

4.31 We are also considering whether we should require Transpower to report on significant capex projects after their implementation, ie, a post-project review.

We are seeking your views on Transpower's customer consultation

Key questions for stakeholders

4.32 We welcome your views on the overall effectiveness of Transpower's customer consultation that has:

4.32.1 informed Transpower's RCP3 proposal; and

4.32.2 informed Transpower's base capex spending decisions throughout RCP2.

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[115] Above n 48, at 90.
[116] For information on Transpower's Consumer Advisory Panel, see: https://www.transpower.co.nz/keeping-you-connected/consumer-advisory-panel.
[117] Transpower "Te Mauri Hiko Energy Futures", above n 104.
[118] Above n 69, at 36.
[119] Above n 54, at [306].

4.33 We are interested to hear whether you consider you had opportunities to engage effectively with Transpower and, more specifically, influence Transpower's decisions around the content of its RCP3 proposal and how Transpower has and will spend its base capex allowance during RCP2.

4.34 If you consider there were gaps in Transpower's consultation process for its RCP3 proposal, how might our proposed process for the IPP reset allow you to adequately provide your views on your key issues of interest?

4.35 We also want to hear from you if you have suggestions on how Transpower can improve its customer consultation during RCP3, in prioritising how it will spend its base capex allowance.

4.36 Some specific questions we would like you to consider in preparing your submission are:

4.36.1 In preparing its RCP3 proposal, how effectively did Transpower test with customers the price-quality balance, considering that:

4.36.1.1 transmission revenues in RCP3 are rather insensitive to changes in the capex profile; and

4.36.1.2 an expenditure forecast may only manifest in changed quality outcomes many years into the future, while expenditures made many years ago may only start to become evident in quality outcomes now?

4.36.2 How effectively has Transpower has engaged with stakeholders during RCP2?

4.36.3 Would you support changes to Transpower's information disclosure requirements as set out in paragraphs 4.30 and 4.31 above?

Chapter 5 Quality standards and grid output measures

Purpose of this chapter

5.1 This chapter is focussed on Transpower's quality standards and grid output measures and their associated reporting requirements. It explains why these are important for ensuring that Transpower has incentives to provide services at a quality that reflects consumers' demands.

5.2 The quality standards and grid output measures provide incentives for the level of service quality that Transpower will provide during RCP3. We discuss Transpower's proposed RCP3 grid output measures and the implications for stakeholders and consumers.

5.3 Transpower's quality standards and grid output measures are intended to balance incentives for Transpower to reduce expenditure while providing services at the quality consumers demand.

5.4 In this chapter we discuss:

5.4.1 our requirement to set quality standards and our ability to set quality incentives;

5.4.2 Transpower's requirement to provide us with its RCP3 grid output measures proposal and our requirement to assess the proposed measures;

5.4.3 Transpower's proposed RCP3 grid output measures;

5.4.4 the Verifier's view of Transpower's proposed RCP3 grid output measures; and

5.4.5 our view of Transpower's proposed RCP3 grid output measures.

5.5 At the end of this chapter we pose questions that seek your views to help inform our assessment of Transpower's RCP3 proposal material. This will help us in setting effective grid output measures and quality standards for RCP3 and beyond.

We must set quality standards and may set quality incentives for Transpower

5.6 As part of determining Transpower's IPP, we must set quality standards, and those standards are enforceable under the Act.[120] We determine how the quality standards we set for Transpower are prescribed, but those standards must be based on, and be consistent with, any quality standards for Transpower as set by the Electricity Authority under the Code.[121]

5.7 In addition, we may set incentives for Transpower to maintain or improve its quality of supply, and those incentives may, without limitation, be financial or non-financial. For example, financial incentives could include revenue-linked rewards and penalties if Transpower exceeds or fails to meet quality standards, and/or consumer compensation schemes where Transpower is required to pay compensation amounts for failing to meet standards of performance. Non-financial incentives could include additional reporting requirements if Transpower fails to meet a quality standard.[122]

5.8 We may also provide non-financial incentives for Transpower to maintain or improve quality of supply by requiring Transpower to disclose information about its performance more generally.[123] Such information disclosure requirements could be included in the IPP determination or in the information disclosure (**ID**) determination applying to Transpower.

5.9 In setting the quality standards, quality incentives, or quality-related disclosure requirements, we are primarily seeking to provide Transpower with incentives to provide services at a quality that reflects consumer demands, in line with the Part 4 purpose.

[120] Sections 53M(3), 87 and 87B of the Act. If the court orders Transpower to pay a penalty for contravening a quality standard under s 87, the court may, in addition, order Transpower to pay compensation to any 'aggrieved person', ie, a person who has suffered, or is likely to suffer, loss or damage as a result of the contravention (s 87A of the Act).

[121] Section 54V(6) of the Act.

[122] Section 53M(2) of the Act.

[123] Section 53C(2)(i) of the Act.

Transpower is required to propose grid output measures and we must assess them

5.10 Consistent with our ability to set incentives for maintaining quality that consumers demand, the Capex IM requires Transpower to propose, and us to set, measures relating to quality referred to as 'grid output measures'.[124]

5.11 The Capex IM provides for two types of grid output measures: revenue linked, and non-revenue linked. Under any revenue-linked grid output measure, Transpower will be financially rewarded for outperforming performance targets and penalised for underperforming performance targets.

5.12 For the revenue-linked grid output measures, we determine:[125]

5.12.1 grid output targets;

5.12.2 caps – to limit the amount of positive revenue adjustment;

5.12.3 collars – to limit the amount of negative revenue adjustment; and

5.12.4 grid output incentive rates – the amount of money at risk for each unit of output between the cap and the collar.

5.13 Non-revenue linked measures might include, for example, specific asset health and condition reporting, or asset replacement volume targets. Transpower could be provided with the flexibility to develop and vary these measures and be required to report on them annually.

5.14 In addition to setting grid output measures, we will also determine which elements of those measures will be quality standards for the purposes of compliance with the Act. Quality standards set by us may differ from the grid output measures proposed by Transpower, and Transpower is not required to propose any quality standards to be associated with its grid output measures in its proposal.

[124] Clauses 2.2.1(3) and 2.2.2 of the Capex IM. We must apply the criteria in Schedule A, clauses A5-A7 of the Capex IM, which include the extent to which each measure is a recognised measure of risk in the supply and performance of electricity transmission services, and the relationship between the grid output measure and expenditure by Transpower.

[125] Clause 2.2.2(1)(d) of the Capex IM.

5.15 For revenue-linked grid output measures, Transpower will be rewarded for outperforming the performance targets, while being penalised for underperforming under the incentive scheme.[126] We may set the associated quality standard at the level of the target, collar or cap, or at any other level which we consider sets an appropriate mandatory standard to provide additional incentive through the risk of enforcement action under the Act.

5.16 Therefore, it would be possible in a case of underperformance for Transpower to be exposed to both a financial penalty under the grid output measure for the underperformance and a statutory penalty under the Act for non-compliance with the standard. The extent of that dual effect will depend on the relationship between the value used to set the quality standard and the values set for the target and the collar under the grid output measure.

5.17 For the current RCP, RCP2, Transpower's quality standards were set at the level of the grid output target. However, for RCP3 we are open to setting quality standards at different levels than the target.

5.18 For instance, under the quality incentive scheme it might be appropriate to set the collar for a particular grid output measure at one level, to potentially limit the extent of Transpower's financial exposure under the scheme, but the quality standard for that measure at a less stringent level. Doing so could recognise that performance at the collar would not be of sufficient concern to warrant potential enforcement action. Nonetheless, the quality standard for that measure would be set at a level to ensure there is some further check on particularly poor performance—ie, performance significantly worse than that reflected by the collar.

Transpower's proposed grid output measures for RCP3

5.19 Grid output measures are proposed every five years by Transpower and set by us as part of the IPP reset. In its RCP3 proposal Transpower refers to the grid output measures as service performance measures and asset health measures. Service performance measures are those which are directly related to the performance of grid assets as they affect asset availability, customer supply reliability, and the electricity market, while asset health measures are assessments of asset condition.

[126] The incentive reward or penalty applies up until the cap or collar is reached and where no further reward or penalty will apply.

5.20 Transpower is proposing that we simplify and rationalise its grid output measures for RCP3 compared to RCP2. This reflects its consultation with customers and stakeholders. This engagement process is well-documented.[127]

Service performance measures

5.21 Transpower has proposed modified service performance measures after its RCP3 stakeholder and consumer consultation process, stating that:[128]

> we have refined our long-list of grid-reliability and grid-availability service performance measures for the current RCP to a set intended to be more meaningful and valuable to our customers and stakeholders—to provide some certainty on what they can expect the performance of the grid and assets to be over RCP3, and which incentivises us to deliver on (or outperform) intended outcomes for our customers.

5.22 Transpower's reasoning for changing the service performance measures from those in RCP2 includes that:

5.22.1 the RCP2 measures were more forward-looking but the proposed RCP3 measures better reflect historical performance;

5.22.2 the proposed RCP3 measures consider the current planned work programme;

5.22.3 the proposed grid reliability measures (denoted as GP1 and GP2) have been informed by the recently completed VoLL study, which resulted in a re-categorisation of the Points of Service (**PoS**);[129]

5.22.4 the list of assets that most materially affect the electricity market, when out of service, has been updated, leading to a change to the proposed high-voltage alternating current (**HVAC**) availability measure (AP2) target and the proposed new return-to-service measure (AP3); and

5.22.5 feedback from consumers and stakeholders has suggested that not all previous service performance measures provided value and could be improved.

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[127] Transpower's Service Measures consultation process documentation is available at: www.transpower.co.nz/transpower-service-level-refresh-rcp3.

[128] Transpower "Grid Outputs Report 2018" (2018), at 5, available at: www.transpower.co.nz/keeping-you-connected/industry/rcp3/rcp3-proposal-securing-our-energy-future-2020-–-2025.

[129] Above n 128, at 11.

5.23 Following its consultation process, Transpower has proposed to remove the service performance measure on P90 longest duration interruptions (previously measure GP3) and proposed two return-to-service measures (measures AP3 and AP4).[130, 131]

5.24 Transpower has proposed a new customer service/event communications measure (measure CS1) that is non-revenue linked. Measure CS1 relates to Transpower's ability to provide for the provision of timely information and communications following an event.

5.25 Transpower's proposed RCP3 service performance measures are summarised in Table 7 along with the proposed revenue at risk for the proposed revenue-linked measures.[132]

[130] Above n 128, at 18-19.

[131] For the terminology used in the naming of the various proposed measures, see Table 7 and Table 8. Where measures have been carried forward from RCP2, the original measures are set out in clause 14 of the RCP2 IPP determination, which can be found at: https://comcom.govt.nz/__data/assets/pdf_file/0023/108239/Consolidated-Transpower-individual-price-quality-path-determination-2015-28-November-2018.pdf.

[132] Figure 2 from the Transpower Grid Outputs Report 2018 illustrates the RCP2 to RCP3 service performance measure mapping, (above n 128, at 7).

Table 7 Proposed RCP3 service performance measures

Category	RCP3 code	Post-tax RCP3 revenue at risk ($m)	RCP3 measure description	Further work has been scoped based on targeted questions
Grid performance (reliability)	GP1	28.5	Number of unplanned interruptions across all PoS in a sub-category during a disclosure year	1. Is this the appropriate set of performance measures? 2. Should the performance targets be based on 'aspirational' or historical values? 3. Should the service measures include a normalisation method in the reliability measures? 4. Is the revenue at risk appropriate? 5. Should these continue to be symmetric incentives? 6. Are the incentive value settings appropriate (targets, caps, collars, incentive rates)? 7. How should these measures be aligned with quality standards? 8. Should measure CS1 also be a quality standard?
	GP2	28.5	Average duration of unplanned interruptions greater than one minute, across all PoS in a sub-category during a disclosure year	
Asset performance (availability)	AP1	2.5	HVDC energy availability (%) of the inter-island HVDC system	
	AP2	5	Average percentage of time HVAC assets are available during a disclosure year	
	AP3	-	Return-to-service time Extent that Transpower keeps to planned outage times in relation to selected HVAC assets	
	AP4	-	Return-to-service time communications Extent that Transpower communicates delays to planned outage return times in relation to selected HVAC assets	
Customer service	CS1	-	Customer Service/Event Communications Existing post-event survey. Focuses on timely information and communications	

Note: Revenue amounts are in nominal $s and not referenced to any particular year.

5.26 For the proposed RCP3 grid performance measures (measures GP1 and GP2), Transpower has refined the PoS categories (based on their level of security) and sub-categories (based on levels of demand and evaluation of economic consequence from an unplanned interruption) from RCP2.[133]

5.27 For the HVDC availability measure (measure AP1), Transpower noted that its RCP2 target was challenging to achieve in a normal year. For RCP3, Transpower has proposed to retain the percentage availability target from RCP2, with a downwards adjustment for three of the five years impacted by the one-off Haywards and Benmore Pole 2 extension programme.

5.28 For the HVAC availability measure (measure AP2), Transpower has proposed a lower target for availability compared with RCP2. Transpower noted that the proposed measures GP1, GP2, AP1 and AP2 service performance measures for RCP3 have been based on historical data.[134]

5.29 The new trial return-to-service time measure (measure AP3) is proposed to be non-revenue linked for RCP3. Transpower has proposed to report all daily outages of the 71 HVAC assets that are returned two or more hours after the original return-to-service time.[135]

5.30 The new return-to-service time communications measure (measure AP4) is also proposed to be non-revenue linked for RCP3. Transpower proposes to report on the percentage of time 1.5 or more hours' notice is given to the market in the event assets will be returned to service late (from the original planned return-to-service time).[136]

5.31 The new customer service/event communications measure (measure CS1) is proposed to be non-revenue linked for RCP3. Transpower is currently reviewing the effectiveness of the current post-event survey process that has been in place since 2016.[137]

[133] Above n 128, at 10.
[134] Above n 128, at 12.
[135] Above n 128, at 15.
[136] Above n 128, at 15.
[137] Above n 128, at 15-16.

Asset health measures

5.32 Transpower has proposed five asset health measures in RCP3. These measures are asset health target based rather than the volumetric refurbishment/replacement target-based measures set in RCP2, which do not appear to be achieving their intended effects.

5.33 Transpower has proposed revised asset health measures after consultation with stakeholders and consumers because:[138]

> asset health targets are superior to works delivery targets because they are better linked to what really matters, and they align with the way we manage network assets.

5.34 The existing RCP2 and proposed RCP3 asset health measures and the asset categories that they affect are summarised in Table 8 along with the proposed revenue at risk.

Table 8 Comparison of RCP2 and RCP3 asset health measures

	RCP2	RCP3	Further work has been scoped based on targeted questions
Asset classes covered	• Transmission towers (painting) • Tower foundations (grillages) • Outdoor circuit breakers • Power transformers • Outdoor to indoor substation conversions	• Tower protective coating (zinc coating or paint) • Tower foundations (grillages) • Insulators • Outdoor circuit breakers • Power transformers	1. Is this the appropriate set of asset classes for the Asset Health (**AH**) measures? 2. Should these AH measures be revenue linked? 3. Should the AH measures have symmetric incentives? 4. Are the value settings appropriate (targets, caps, collars, incentive rates)? 5. How should these measures be aligned with quality standards? 6. Should there be any recalibration of measures during RCP3?
Description of measure	Total number of asset replacements or refurbishments during the control period. There is a mixture of annual and 5-year targets.	The proportion of assets close to or overdue for intervention at the end of RCP3 (ie, Asset Health Index (**AHI**) > 8—see following Section 3.3.2 Asset health targets).	
Revenue amount	~$14m	$26.5m	

Note: Revenue amounts are in nominal $s and not referenced to any particular year.

[138] Above n 128, at 18.

5.35 Transpower stated that its proposed RCP3 asset health measures will:[139, 140]

> monitor the proportion of assets in each asset class assessed as having an AHI score of 8 or above (meaning poor to very poor health) at the end of the RCP3 period.
>
> Our targets are based on the following inputs:
>
> • current asset health scores across each population of assets
>
> • future health scores in the absence of investment
>
> • the impact of intended investment plans on future health.

5.36 Transpower's rationale for the asset class selection includes that they will:

5.36.1 cover a wide range of asset types including different portfolios;

5.36.2 include large and small asset classes by expenditure and population (both volumetric and non-volumetric asset classes included); and

5.36.3 include asset types that are generally not subject to large variations if project changes occur (such as overhead line conductors).[141]

5.37 Transpower considered that the asset classes covered in the proposed asset health measures appropriately cover a significant proportion of the R&R capex program, comprising $383 million (39%) of total R&R expenditure in RCP3.[142]

Revenue linkage to service performance and asset health measures

5.38 Each revenue-linked grid output measure has a target, cap, collar and incentive rate. The cap and collar set the range of performance for which Transpower will be rewarded or penalised, with the cap being the upper bound for rewards and the collar the lower bound for penalties. The incentive rate is the dollar amount of revenue loss or gain for each unit of deviation from the target within the cap and collar range.[143]

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[139] Above n 128, at 19.

[140] Transpower defined the AHI framework as follows *"An AHI score of 0 or 1 indicates a new asset. Over time, an asset deteriorates and moves through the asset health scores in the index until it is given a score of 8 or above, indicating that it is near the end of its useful life and that the probability of failure (which may cause an interruption to service) increases. This is generally when we decide to actively manage the asset"* (above n 128, at 19).

[141] Above n 128, at 20.

[142] Above n 69, at 45.

[143] In RCP2 we set the quality standards as the target values for the grid output measures.

5.39 Transpower's proposed caps, collars, targets, incentive rates and $ at risk for the incentives revenue linked to the service performance measures are summarised in Table 9.

Table 9 Proposed service performance measures incentive summary

Measure and category	Cap	Target	Collar	Incentive rate	Annual $ at risk
GP1: number of interruptions (per annum)				$ per event	
N-1 security high economic consequence	0	7	14	421,429	2,950,000
N-1 security material economic consequence	7	24	41	50,000	850,000
N security high economic consequence	4	6	8	325,000	650,000
N security material economic consequence	9	23	37	53,571	750,000
N-1 security generator	5	9	13	62,500	250,000
N security generator	6	12	18	41,667	250,000
GP2: average duration of interruption (min)				$ per min	
N-1 security high economic consequence	30	92	154	47,581	2,950,000
N-1 security material economic consequence	36	61	86	34,000	850,000
N security high economic consequence	0	103	206	6,311	650,000
N security material economic consequence	0	140	280	5,357	750,000
N-1 security generator	50	174	298	2,016	250,000
N security generator	11	93	175	3,049	250,000
AP1: HVDC availability (%)				$ per 1%	
HVDC availability (non-Pole 2 years)	99.5%	98.5%	97.5%	500,000	500,000
HVDC availability (Pole 2 years)	98.8%	97.8%	96.8%	500,000	500,000
AP2: HVAC availability (%)				$ per 1%	
HVAC availability (71 selected assets)	99.5%	98.9%	98.3%	1,666,667	1,000,000
Total					**$13.4m**

Note: Revenue amounts are in nominal $s and not referenced to any particular year.

5.40 Transpower's proposed caps, collars, targets, incentive rates and maximum $ at risk for the incentives revenue linked to the asset health measures are summarised in Table 10. These are based on the AHI and the percentage of assets in each class with AHI scores above 8 (indicating poor asset condition).

Table 10 Proposed asset health measures incentive summary

Asset class	Cap (%)	2024/2025 Target (%)	Collar (%)	Incentive rate ($m per %) at 20% strength	Maximum financial impact ($m)
Tower grillage foundation	1.02	3.43	5.85	1.23	2.98
Tower protective coating	1.87	4.18	6.49	7.10	16.40
Insulators	0.76	3.50	6.25	0.76	2.09
Power transformers	7.62	8.88	10.14	3.26	4.10
Outdoor circuit breakers	4.88	5.85	6.82	0.82	0.79
Total					**$26.5m**

Note: Revenue amounts are in nominal $s and not referenced to any particular year.

Transpower consultation on its proposed grid output measures

5.41 Prior to submitting its RCP3 proposal to us, Transpower consulted with stakeholders on its proposed service performance measures and asset health framework which have informed the proposed measures.

5.42 For the measures GP1 and GP2, Transpower consulted on which measures should be included in the proposal, whether the measures should be linked to revenue, and on refined PoS categorisations within the revenue-linked service performance measures. We understand that the consultation did not cover the proposed caps, collars or target values, the level of revenue at risk or the applicable incentive rates applied.[144, 145]

5.43 For the asset performance measures, Transpower consulted on the percentage availability targets. Transpower's consultation did not cover the proposed cap or collar values, the level of revenue at risk or the applicable incentive rates applied.[146]

5.44 Transpower's consultation on the asset health framework has informed how the AHI assessment process may operate, the methodology for setting targets, and which asset classes are covered in the RCP3 proposal.

[144] Above n 69, at 34-36.
[145] Transpower "Service and Asset Health Engagement Paper" (June 2018), at 10-13.
[146] Above n 69, at 37.

5.45 Transpower's consultation did not cover the proposed caps, collars or target values for the asset health measures, the level of revenue at risk or the applicable incentive rates applied.[147, 148]

5.46 We seek your views on aspects of the proposed grid output measures that Transpower has not consulted on to date, particularly the revenue at risk for both the service performance and asset health measures and the way these revenues are incentivised.

5.47 Additionally, as part of our own review of the RCP3 proposal, we have requested the analysis Transpower carried out to set the revenue limits and incentives for the proposed grid output measures.[149]

Verifier view of Transpower's proposed RCP3 grid output measures

Proposed asset health measures

5.48 The Verifier noted that its review of Transpower's proposed performance measures had been carried out prior to Transpower finalising them and that its conclusions in the verification report were based on information received prior to the Transpower June 2018 stakeholder engagement. The Verifier noted that the grid output measures were evolving during its engagement with Transpower.

5.49 The Verifier was able to comment on the overall approach to the proposed asset health measures. These will use AHIs based on a model of the actual condition of assets projected into the future based on a range of different factors.

5.50 Transpower proposed to set targets based on an acceptable level of risk associated with the percentage of assets with an AHI greater than 8. Transpower has chosen its asset classes for this asset health measure based on where its asset health and condition modelling is sufficiently advanced to support the proposed asset health measures and targets.

5.51 The Verifier made several key comments about this approach, namely that:

5.51.1 where work is found to be unnecessary, and better solutions arrived at for the same risk exposure, then these should not be penalised. However, if work is deferred or not performed because resources have been diverted, then this should be penalised if overall risk increases;

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[147] Above n 145, at 19-21.

[148] Above n 69, at 38-41.

[149] In the verification report, the Verifier did not cover Transpower's proposed caps, collars, targets, revenue at risk or incentive rate applied to grid output measures.

5.51.2 any activity that improves the knowledge of the actual asset condition should be incentivised; and

5.51.3 the asset health targets and measures should be based on the volume of assets with an AHI>8 rather than a percentage of them (significant numbers of new assets will improve the AHI percentage without improving the understanding of remaining assets and their condition).

5.52 In practice the AHI model will be updated with actual condition data and additional factors to improve the model's predictive ability of how the health of assets will change over time. The updated data may result in changing AHI scores for a portfolio of assets. As the Verifier noted:[150]

> In this case, no capital expenditure has occurred, but the index may improve and worsen based on the actual field condition of assets.

5.53 The Verifier concluded that Transpower's proposal of asset health measures, and incorporating them into the RCP3 performance measures incentive scheme, in principle reflects GEIP, because it will increase accountability for the integrity of its assets. However, the Verifier also noted that the process surrounding the proposed asset health measures will be challenging to implement and administer, and it was unable to satisfy itself that this aspect of the proposed asset health measures satisfied GEIP, stating that:[151]

> However, reporting on these measures will be significantly more challenging than reporting on typical grid reliability and availability measures, including due to the need for judgement to be applied in the administration of the incentive arrangements. In this context and given the work still required to design the operational details of the incentive arrangements, including the views we have expressed in this report, we are not able to determine at this point that the new asset health measures satisfy GEIP.

Proposed service performance measures

5.54 The Verifier considered that the proposed service performance measures reflected the effectiveness of Transpower's stakeholder consultation process, and based on the information that the Verifier had at the time, it concluded that the proposed service performance measures satisfied GEIP because:

5.54.1 the proposed measures address areas of service performance that are likely to be most concern to consumers, especially those that are directly connected;

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[150] Above n 48, at 104.
[151] Above n 48, at 106.

5.54.2 the introduction of economic consequence linked to VoLL estimates for the GP1 and GP2 grid output measures "enhances the robustness of the measures because it incorporates the value that customers place on supply reliability into the service performance incentive mechanism".[152]

5.55 However, the Verifier was doubtful about the four-hour buffer Transpower had built into the proposed return-to-service measure (measure AP3).[153] Following consultation, Transpower has moved from the initial four-hour buffer to a two-hour buffer for the AP3 measure. We seek your views on Transpower's renewed return-to-service buffer.

5.56 Transpower has stated that it is proposing that the RCP3 service performance targets be more aligned with historical performance, stating that "the RCP2 targets were aspirational and have proved too challenging", specifically the availability targets.[154]

5.57 The Verifier concluded that the proposed RCP3 grid output targets are largely consistent with RCP2 although PoS had moved category and some customers will have higher or lower reliability and restoration performance. In summary, due to the evolving situation with the grid output measures at the time of writing, the Verifier couldn't fully satisfy itself that the proposed targets for the grid output measures satisfied GEIP.

5.58 Finally, the Verifier was not able to verify Transpower's claim that the proposed RCP3 service performance measure targets were consistent with historical data. We have asked Transpower to provide us with this analysis as part of our own review of the RCP3 proposal.

[152] Above n 48, at 106.
[153] Above n 48, at 106.
[154] Above n 128, at 28.

Our view of Transpower's proposed RCP3 grid output measures

5.59 We set for Transpower the following types of quality standards, grid output measures and reporting requirements:

5.59.1 Grid output measures that are linked to a proportion of Transpower's revenue and which are also quality standards. We will determine which elements of the measures will be quality standards for the purposes of compliance with the Act.[155] We will also determine the compliance reporting requirements associated with each grid output measure.

5.59.2 Grid output measures that are not revenue linked, which may also have associated quality standards, and may include associated reporting requirements.

5.59.3 Quality standards that are not part of grid output measures, and which have simplified compliance reporting requirements.

5.59.4 Reporting requirements that are not quality standards or grid output measures.

5.60 We will be assessing each of Transpower's proposed service performance measures and asset health measures to ensure that we set what we expect to be the most effective combination of incentives to provide services at a quality that Transpower's customers demand—ie, statutory, financial and/or non-financial.

Proposed service performance measures

5.61 Transpower has refined and rationalised its service performance measures after considerable consultation with industry. It has not consulted on the incentive arrangements that accompany these, so we seek your views about the incentives and how Transpower has proposed to set the revenue at risk in each of its measures, as well as appropriate quality standards.

5.62 Transpower has stated in its RCP3 proposal that it believes the RCP2 service performance measure targets, which sought to provide a higher level of reliability, were "aspirational".[156]

[155] This means that if a quality standard is breached, financial penalties under the revenue-linked performance measure as well as statutory penalties could apply to Transpower.

[156] Above n 69, at 27.

5.63 We consider that higher levels of quality should only be set or incentivised if stakeholders demand this and are willing to pay for it. This raises the question about whether Transpower should be rewarded for performing better than its service performance targets which it states are based on historical performance (particularly for the GP1 and GP2 measures).[157]

Proposed asset health measures

5.64 The RCP2 asset health measures require Transpower to publicly report on the work delivery outputs for a range of asset classes. Three of these reporting requirements are to disclose how annual output targets are being met while the remainder are due to be reported on at the end of RCP2. These measures were set to focus on deliverability of selected RCP2 expenditure plans while improving overall fleet asset health outcomes.

5.65 As noted by the Verifier, Transpower has failed to meet these asset health targets in the first three years of RCP2.[158]

5.66 There appear to be several reasons for this, but primarily the predicted replacement volumes did not transpire, because either replacement strategies have been updated since the RCP2 decision and/or actual asset condition has resulted in refined asset health models, leading to a significant change in predicted asset replacement volumes.[159]

5.67 Transpower has proposed new asset health measures based on AHI model percentage targets above an AHI score of 8 (which is poor condition) and has effectively doubled the amount of incentive revenue when compared to the RCP2 asset health measures.

5.68 While Transpower has demonstrated significant maturity in its asset health modelling and a commitment to continuous improvement, the Verifier expressed concern that the processes to operate and report on the proposed asset health scheme may be difficult to set up and implement.

5.69 Our view is that setting percentage limits for asset condition using a predictive model before fully observing actual asset condition in the field may result in a similar outcome as the failure to meet the volumetric targets set in RCP2.

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[157] Above n 128, at 38.
[158] Above n 48, at 84.
[159] Above n 48, at 84-85.

5.70 We will continue to work with Transpower to further investigate how it can better understand its knowledge of asset condition, and how mechanisms could be used to incentivise this understanding of asset condition. We consider that Transpower should especially focus on understanding the condition of assets that are near the end of their useful life and at risk of failure.

5.71 The Verifier has suggested that Transpower's proposed asset health measures could be carried out as a paper trial in RCP3 to refine the process and test effectiveness before committing to an incentive framework. Our preliminary conclusion is that we agree with this view.

5.72 If we conclude that the asset health measures should be carried out as a paper trial, it appears that it would be easier to include in the IPP a mechanism to recalibrate the proposed asset health targets during RCP3 (either annually or periodically). This could take account of the ongoing work that Transpower is proposing to continually improve the asset data used in the measures. This would allow Transpower to separately identify the improvements to data and the improvements in asset health from the management of the assets.

5.73 We have sought further information from Transpower about how asset condition data has informed the asset health modelling and AHI forecasts in its asset health measures proposal.

Revenue at risk and quality standards

5.74 The level of revenue at risk acts as a limit to the amount of Transpower's revenue it can gain or lose under the service performance measures. For each year of RCP2, $10 million (nominal) of revenue is at risk for the performance-based measures, equivalent to approximately 1% of revenue (or 1.5% of revenue before adjustments for tax and time value of money).

5.75 Transpower has proposed to increase revenue at risk on the revenue-linked measures to 2% (before adjustments) in RCP3 for grid performance and asset performance measures, with an additional 0.8% revenue at risk proposed for asset health measures. Total revenue at risk proposed for RCP3 would be 2.8% of revenue (before adjustments), resulting in approximately $18 million (nominal) of revenue at risk per year, or $90 million over RCP3 (compared to $50 million during RCP2).

5.76 Increasing revenue at risk may provide an incentive to improve quality that consumers might not necessarily be willing to pay for. However, if revenue at risk is set too low, the incentive to reduce costs through the expenditure incentive mechanisms might outweigh the cost associated with maintaining quality.[160]

5.77 As noted above, for RCP2 we set Transpower's quality standards at the same values as the revenue-linked grid output targets. Transpower has been progressing its asset health and criticality modelling during RCP2. One potential outcome of this modelling, when the models are integrated, is that it can be used to understand network risk for a range of expenditure forecasts.

5.78 Network outage risk (which is calculated probabilistically) can be used to set performance measures rather than simply looking at historical performance as a predictor of future performance. We believe that using network risk modelling in this way is the future of setting some service performance measures and will be encouraging Transpower to continue to pursue this modelling approach during RCP3. However, we consider it is not yet in a state that it can be used to set the RCP3 measures.

We are considering a measure to normalise the effects of interruptions

5.79 For RCP3 we are considering whether an adjustment to the measurement of grid reliability should be made to normalise for the effect of factors that are beyond the reasonable control of Transpower (for example, 'force majeure' events). These would be high impact, low probability events that sit outside the reliability of the grid expected by customers during a given period.[161]

5.80 These events could include acts of God, natural disasters, and other events not reasonably able to be controlled by a prudent transmission operator. We are considering whether outcomes of such events should be excluded from the grid output measures. We seek your views on this normalisation measure.

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[160] A low revenue at risk may also not have any impact on the network owner's behaviour if it perceives the penalty or reward to be insignificant. This also depends on the strength of the expenditure incentive mechanisms and the level of targets, caps, collars and quality standards.

[161] In Australia, the Australian Energy Regulator (**AER**) has a similar approach to normalisation of interruptions for force majeure events. For more information see: Australian Energy Regulator "Electricity transmission network service provider – Service target performance incentive scheme" (October 2015), at 26-31 and 49, available at: https://www.aer.gov.au/system/files/AER%20-%20STPIS%20version%205%20%28corrected%29%20-%2030%20September%202015_0.DOCX.

We seek your views on Transpower's grid output measures and quality standards

5.81 We welcome your views on Transpower's proposed grid output measures. We invite you to consider any of the following general questions that are important to you:

5.81.1 Transpower has proposed seven service performance measures, plus asset health measures in five asset classes.

5.81.1.1 In your view, do the proposed measures cover the main dimensions you expect to see in measuring Transpower's performance in RCP3?

5.81.1.2 Is anything missing?

5.81.1.3 Do all of the proposed measures add value for consumers?

5.81.2 Transpower considers that the proposed service performance measures should be challenging but realistic, and it notes that the RCP2 targets have proved too challenging.[162]

5.81.2.1 Do you agree that it is appropriate to move away from aspirational targets to targets that are based on historical performance?

5.81.2.2 If so, is there any additional reporting that you would want disclosed each year in RCP3 to monitor how Transpower is tracking against its targets?

5.81.3 Transpower has proposed increasing total revenue at risk in its proposed RCP3 performance measures from the 1.5% of the forecast allowable revenue that applies in RCP2 to 2.8% of forecast revenues in RCP3.

5.81.3.1 Do you agree that increasing the proportion of revenue at risk for the service performance measures and asset health measures is appropriate?

5.81.3.2 If so, why?

[162] Above n 69, at 42.

5.81.4 We are considering whether we should determine additional reporting requirements that would apply if Transpower breaches a quality standard in RCP3 or if its performance on a performance measure goes outside of the expected range (ie, if Transpower underperformed a measure such that the reported value is below the collar value).[163] That reporting might include, for example, the type of information that we currently seek from industry experts when a breach currently occurs in a regulated sector, but in this case a publicly available report would be proposed by Transpower.

5.81.4.1 Do you consider that such a reporting requirement would add value for Transpower's customers?

5.81.4.2 Are there any specific features of such reporting that you would want us to consider?

5.82 We also welcome your views on the following specific design features of the measures that Transpower has proposed:

5.82.1 Each of the proposed RCP3 revenue-linked measures is a symmetric incentive mechanism, with target, cap and collar values. The result is that good performance against a measure rewards Transpower at the same rate that under performance is penalised, with limits on the extent of the financial impact being applied at the cap or collar respectively.

5.82.1.1 Do you agree that the service performance measures and the asset health measures should be symmetric incentive mechanisms in all cases?

5.82.1.2 If not, which measures could we consider for asymmetric treatment (ie, possibly only reward good performance, or only penalise underperformance)?

5.82.2 Do you have any comments on the target, cap, collar or other values proposed by Transpower for the RCP3 service performance measures or for the asset health measures (for example, the four-hour buffer in proposed measure AP3)?

[163] This is similar in concept to the major interruption reporting requirements in the current Gas Transmission DPP. See: *Gas Transmission Services Default Price-Quality Path Determination 2017* [2017] NZCC 14, at [9.5-9.8].

5.82.3 In RCP2 we set Transpower's quality standards at the same target values as the revenue-linked grid output measures.

5.82.3.1 In respect of the proposed revenue-linked service performance measures GP1, GP2, AP1 and AP2, should the applicable quality standards for these measures be the collar values, or something else? If so, why?

5.82.4 Transpower has proposed that the asset health indices for five asset classes should be revenue linked.

5.82.4.1 Do you agree that the asset health measures should be revenue linked?

5.82.4.2 Should the applicable quality standards for these measures be the collar values, or something else?

5.82.4.3 If so, why?

5.82.5 Transpower has proposed that measures AP3, AP4 and CS1 should have no revenue at risk. However, it appears that proposed measure CS1 is a sufficiently mature measure that it could be set as a non-revenue linked quality standard.

5.82.5.1 Do you consider that this proposed non-revenue linked measure should be set as a quality standard?

5.82.6 Transpower has proposed that measures AP3 and AP4 should be trial measures for RCP3 that are not treated as quality standards. These proposed measures are new and do not have a sufficient track record to justify making them quality standards this time around.

5.82.6.1 Do you agree that these proposed service performance measures should be output measures for reporting purposes only?

5.82.6.2 If so, what reporting features would you like to see each year to show the effectiveness of the trial measures?

5.82.7 We are considering whether to include a form of normalisation mechanism in the proposed grid performance (reliability) measures to deal with, for example, the impact of a force majeure event at our discretion.

5.82.7.1 Do you agree that we should consider such a normalisation approach?

5.82.7.2 If so, what features should that normalisation mechanism include?

5.82.7.3 What features should not be normalised for this purpose?

5.82.7.4 What limitations, if any, should there be to the Commission's annual discretion in this respect?

5.82.8 There are two main things that could influence the results of the proposed asset health measures: Transpower's management of the assets and Transpower's work on improving the state of knowledge about its assets.

5.82.8.1 Do you agree that there should be a mechanism to recalibrate the proposed asset health targets during RCP3 (either annually or periodically) to take account of the ongoing work that Transpower is proposing to continually improve the asset data used in the measures, so that the proposed measures reward Transpower principally for its management of the assets?

Chapter 6 **Asset management**

Purpose of this chapter

6.1 This chapter focusses on Transpower's asset management practices and explains why we think they are important part of ensuring that Transpower's asset-related expenditure forecasts are prudent and efficient, in RCP3 and beyond.

6.2 We discuss our reasoning for highlighting asset health modelling and asset criticality as key asset management focus areas for Transpower. We focus particularly on how asset health modelling and asset criticality will improve Transpower's own internal expenditure decision-making processes and ultimately benefit stakeholders.

6.3 We seek your views on Transpower's current asset management practices and how these will affect RCP3. We also discuss specific areas that we propose to explore further with Transpower in preparation for the RCP4 and RCP5 periods.

6.4 In this chapter we discuss:

6.4.1 why we focus on asset health and criticality models and why we think development these areas will improve Transpower's asset management practices;

6.4.2 the Verifier view of Transpower's current asset management practices;

6.4.3 our view of Transpower's asset health and criticality modelling maturity, in general and with respect to specific asset classes; and

6.4.4 Transpower's understanding of network risk and how and why taking particular steps to develop this understanding could benefit Transpower, its customers, and other external stakeholders.

6.5 Finally, we pose specific questions seeking your views to help inform our assessment of asset management practice in Transpower's RCP3 proposal material, and to assist us in our strategy during RCP3 and beyond.

Why asset health and criticality models are important for effective transmission asset management practice

6.6 In our process, framework and approach paper, published in October 2018, we signalled that one of our focus areas when reviewing Transpower's RCP3 proposal would be to assess how it was progressing its asset health and criticality modelling.[164]

6.7 Asset health reflects the likelihood of an asset failing due to its assessed condition, while asset criticality reflects the consequence of the asset failing, ie, how the asset affects network reliability and consumer supply.

6.8 Having a good understanding of asset health is a cornerstone of effective asset management because:

6.8.1 it informs asset replacement or refurbishment expenditure decisions; and

6.8.2 asset expenditure forecasts can be made with more certainty, particularly within the context of the regulatory approvals process.

6.9 While it may be impractical to derive detailed asset health models and perform asset condition assessments for all asset types, we expect that where asset health models are practical and useful, they should be developed and implemented.

6.10 The decision to derive asset health models and their level of complexity will be based on many considerations. However, for all primary assets, we would expect that in-depth asset health modelling is being carried out and that adequate condition assessment processes exist to inform these models.[165]

[164] Above n 21, at Chapter 4.

[165] Primary assets – Power system equipment operating at a high voltage that forms part of the grid. Examples of primary assets are circuit breakers and transformers (Transpower "2018 Integrated Transmission Plan Glossary" (2018), at 3, available at: https://www.transpower.co.nz/sites/default/files/uncontrolled_docs/2018%20ITP%20Glossary%20-%20FINAL.pdf.

6.11 Conversely, we recognise that in-depth asset health modelling may not be appropriate for some secondary asset classes, and that simpler models may be more practical, with some replacement strategies necessarily being based on volumetric, age-based or technical obsolescence factors.[166]

6.12 Despite these practicalities of deriving asset health models, how complex they are, and what processes exist for condition assessments to inform them, asset health modelling has many benefits and is one of our focus areas.

6.13 Specifically, asset health models inform expenditure decision making and not just decisions to replace an asset. These models also assist in determining if it is economic to refurbish an asset, how long refurbishment is likely to provide a benefit, and the likely timing of expenditure intervention.

6.14 Improving the accuracy of expenditure forecasting is one reason we are so focussed on asset health modelling. This is particularly relevant to a the IPP reset for RCP3 where expenditure approval is being sought in 2018/2019. Better asset health models lead to more confidence that Transpower's expenditure forecasts can be relied upon.

6.15 Within the context of the regulatory approvals process, we believe that implementing effective asset health models will:

6.15.1 reduce the risk to consumers that Transpower is over-forecasting expenditure; and

6.15.2 reduce the risk to Transpower that it is under-forecasting expenditure.

6.16 Asset criticality modelling is about understanding the supply security consequences and outage implications of an asset within the context of the wider network. We consider that this understanding is also a key input to effective asset management because:

6.16.1 it could provide timely, risk-based signals for refurbishment/replacement investment that reliability outcomes may not provide;

[166] Secondary assets – Secondary assets support the overall operation of the grid and provide essential services for the monitoring and control of equipment. They cover the protection, station DC systems, revenue metering and substation management systems (Transpower "Asset Management Plan", above n 103, at 67).

6.16.2 it allows asset refurbishment and replacement strategies to be compared across the asset fleet, and prioritisation decisions can be made if a common criticality measure is employed;

6.16.3 it can provide connected parties and stakeholders with an informed estimate of the likely outage risk that they face, linked to the price they are required to pay; and

6.16.4 it can provide Transpower with the ability to use network risk estimates to set performance measures and targets based on their investment strategy, rather than using historical performance as a predictor of future performance.

6.17 Over RCP2 Transpower has taken steps to improve its asset health and condition assessment practices in different asset classes, and its understanding of asset criticality across the asset fleet.[167]

6.18 However, for the reasons outlined below, we consider there are still a number of areas in which Transpower can improve its asset health and condition assessment practices, particularly given its forecast of a large uplift in asset replacement capex in RCP4 and RCP5.

Verifier view of Transpower's asset management practice maturity

6.19 The Verifier reviewed Transpower's asset management practices, and analysed Transpower's asset data processes, asset health and asset criticality modelling.

6.20 The Verifier concluded that while Transpower had made progress in developing asset health models to its target level of maturity in many key asset classes, and that its criticality framework appeared to be comprehensive:[168]

6.20.1 it lacked confidence in the level of data Transpower had in several asset classes (see Table 29 of the Verification Report);

[167] Transpower "Initiatives Plan Update" (March 2016), available at: https://www.transpower.co.nz/sites/default/files/plain-page/attachments/Regulatory%20Initiatives%20Plan%20-%20March%202016%20Update.pdf.

[168] Above n 48, at 124-125.

6.20.2 there are several opportunities for improving Transpower's asset health and criticality modelling. While maturity of asset health modelling of some asset classes was well understood, such as for substation outdoor primary assets, other asset types require further development in this area, such as transmission lines, HVDC, reactive support plant and some secondary systems (for example, protection relays and substation site Direct Current (**DC**) control and protection supply systems);

6.20.3 there are considerable benefits in improving the life expectancy of some secondary assets and hence there are benefits from improved data and asset health modelling for these assets; and

6.20.4 asset health models can and should be refined for HVDC, and the majority of individual reactive plant assets, using a facility approach rather than a fleet-based approach.

6.21 The Verifier also made some recommendations for asset health and criticality modelling improvements such as:[169]

6.21.1 increasing the coverage of asset classes for criticality modelling and the continued development of the criticality model through reviewing assumptions, such as restoration times;

6.21.2 develop asset health models for transmission lines (existing models in Excel to be transferred to CBRM models);[170] and

6.21.3 continue to develop 'Probability of Failure' curves for each asset class and improve probability of failure from well-researched historical failure models.

Our view of Transpower asset health and criticality modelling maturity generally

6.22 The Verifier report indicates that Transpower's use and understanding of asset health and criticality modelling across the asset fleet is progressing but that there are some inconsistencies.

[169] Above n 48, at 125.

[170] Condition Based Risk Management (**CBRM**) is a well-known electricity industry asset management process developed to assist asset owners to make risk-based asset management decisions.

6.23 In some asset classes, notably the AC Substations – Power Transformers asset class Transpower uses and benefits from an in-depth level of asset health and criticality modelling. We consider that this is the level of asset management understanding that Transpower should aim for in all its primary assets and certain of its secondary asset classes.

6.24 However, in some primary asset classes there are no asset health models (for example the HVDC and reactive support assets) and asset health modelling of key secondary assets is generally limited.[171]

6.25 We consider that improving asset health and criticality modelling should be one of the top priorities for Transpower over RCP3, especially given that Transpower is signalling a significant expenditure uplift in RCP4 and RCP5.

6.26 We also consider that rather than modelling individual asset classes in isolation, Transpower's asset health and criticality modelling should be integrated to ensure Transpower understands the level of risk that the grid as a whole carries under different modelling conditions and expenditure strategies.

6.27 In their submissions to our process, framework and approach paper, MEUG and Genesis Energy both supported greater use by Transpower of asset health and criticality frameworks to underpin investment decisions. MEUG further submitted that the timeframe for improving asset health and criticality modelling was not ambitious enough and that Transpower must achieve this by the end of RCP3.[172]

6.28 On this topic, and in our process, framework and approach paper, we stated that:

> We currently consider that by the end of RCP3, Transpower should be in a state where its investment decision making framework is underpinned, where appropriate, by a risk-based asset management approach that includes considering both asset health and criticality.

6.29 MEUG responded to this statement in its submission, stating that:[173]

> The above goal has been the objective ever since RCP1 commenced 8-years ago in July 2011. We think an innovative customer-centric business in a workably competitive market would have achieved this goal by now. Rather than expecting the goal should be achieved in another 6-years, we suggest it must be achieved.

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[171] Above n 32, at 221.
[172] Genesis, above n 42, at 1-2; MEUG, above n 39, at [4(a)].
[173] Above n 39, at [4(a)].

6.30 Like MEUG we agree that Transpower should have a continuous focus on improving its asset health models and criticality understanding to better inform its expenditure forecasts and investment decision-making processes, and that by the end of the RCP3 period this aspect of the asset management practice should be well developed.

6.31 We are encouraged that Transpower has begun developing and refining its asset condition assessment processes and procedures, and network asset criticality framework tools, and has begun using them to inform its expenditure forecasting and work program decision making.

6.32 We are testing ideas about how we might further encourage Transpower to progress this work as priority during RCP3. We are proposing several options to do this. One option is to require Transpower to report annually on its progress in developing its asset health and criticality modelling, and how this is integrated to form an understanding of asset and network risk. Another option is to require independent verification part-way through RCP3 to report on progress in this area.

Our view of Transpower asset health and criticality modelling maturity on transmission lines

6.33 Transpower is also signalling a significant expenditure uplift in RCP4 and RCP5 in the Transmission Lines asset category and has indicated that most of this uplift will be driven by the condition of the overhead line conductor.[174]

6.34 In the Transmission Lines - Conductors and Hardware asset category there is, by Transpower's own admission, uncertainty regarding detailed conductor asset health and condition knowledge for 70% of the conductor fleet.[175]

6.35 While Transpower appears to have a well-developed understanding of transmission line asset criticality, down to a span and structure level of granularity, transmission line conductor asset condition is less well understood.

6.36 We acknowledge the difficulty Transpower faces when carrying out asset condition assessments of overhead line conductor and estimating conductor asset health.

[174] Above n 48, at Figure 40.
[175] Above n 48, at 187.

6.37 Transpower has indicated to us that it is taking a very proactive approach in this area and to the predicted RCP4 and RCP5 conductor replacement volumes. It has been actively progressing internal investigations to improve its asset condition assessment techniques in anticipation of the signalled expenditure uplift and we will be testing Transpower's plans to prepare for this uplift during RCP3.

We are seeking your views on Transpower's asset management practices

6.38 In addition to the areas of interest that we will be focussing our review on, we are seeking your views on key aspects of Transpower's RCP3 proposal asset management practice, and have some specific questions we would like you to consider in preparing your submission:

6.38.1 Improving Transpower's use and understanding of asset health and criticality has been an ongoing focus for us for some time as we see it as a key expenditure decision-making input. We would like to understand your experience with asset health and criticality to test:

6.38.1.1 your relevant experience in using asset criticality in your business environment;

6.38.1.2 how you use asset health modelling to inform asset criticality;

6.38.1.3 how useful an asset criticality framework is to you in deciding priorities for your work programmes; and

6.38.1.4 whether Transpower should approach asset health and criticality in a different way and, if so, how you would suggest it does this?

6.38.2 We would like to see Transpower link its asset health models and asset criticality framework in order that it can understand network risk. A network risk model can be used to communicate network outage risk to stakeholders and connected parties for a variety of different investment strategies. Would this be useful to you?

6.38.3 We would like to hear from interested parties about how we might incentivise Transpower to prioritise development of a network risk model. There are a range of options to accomplish this, including:

6.38.3.1 financial (dis)incentives using a regulatory compliance mechanism during RCP3 (2020-2025);

6.38.3.2 independent review/verification and reporting, for example, at the mid-point of RCP3;[176] and

6.38.3.3 annual Transpower self-disclosure on progress using a regulatory compliance mechanism during RCP3.

6.39 We would also like to hear from you if you have any other issues with aspects of Transpower's asset management practices that are not discussed here.

[176] This is currently our preferred option.

Chapter 7 **Base capex forecast**

Purpose of this chapter

7.1 This chapter discusses aspects of Transpower's proposed base capital expenditure (base capex), highlights key observations made by the Verifier, and includes our initial observations from our review of the Verifier's report and Transpower's RCP3 proposal so far.

7.2 Setting appropriate expenditure allowances for Transpower in RCP3 is a key focus area for us because base capex allowances impact on the revenue Transpower can recover from its customers during RCP3 and beyond.

7.3 We seek your views on potential issues with Transpower's RCP3 base capex forecast. We discuss specific areas that we are exploring further with Transpower in setting the RCP3 base capex allowance and other RCP3 expenditure, in preparation for RCP4 and RCP5.

7.4 In this chapter we discuss:

7.4.1 how capex is approved using the Capex IM approvals mechanisms and how base capex proposals fit within the Capex IM framework;

7.4.2 the composition of the RCP3 base capex forecast and how this is different to the base capex forecast for RCP2;

7.4.3 the verification process and how it complements our review of Transpower's RCP3 base capex proposal;

7.4.4 the Verifier's view of Transpower's base capex forecast; and

7.4.5 our view of Transpower's base capex forecast after reviewing the Verifier's report and Transpower's base capex proposal material so far.

7.5 We also pose specific questions where we seek your views to help inform our assessment of Transpower's RCP3 proposal base capex forecast.

How capex is treated by the Capex IM

7.6 Transpower is required to apply the Capex IM when preparing and submitting capex proposals to us.[177] The Capex IM sets out:

7.6.1 the rules and processes for approving Transpower's capex;

7.6.2 the processes that we and Transpower must follow;

7.6.3 the information that Transpower must provide with its proposals; and

7.6.4 the evaluation criteria and approach that we will use in approving (or rejecting) capex proposals.

7.7 Our role under the Capex IM is to provide independent scrutiny, and where appropriate:

7.7.1 approve projects and programmes that are major capex proposals (**MCPs**) at any time before or during regulatory periods;[178, 179]

7.7.2 set base capex allowances before each regulatory period and specify possible base capex projects that are listed in the IPP as listed projects;[180, 181] and

7.7.3 approve base capex proposals that are listed projects during regulatory periods.[182, 183]

[177] Section 54S(2) of the Act.

[178] Clause 3.3.3, Part 6, Schedule C and Schedule G of the Capex IM.

[179] Major capex means capex incurred to either meet the existing Grid Reliability Standards or that provide a net market benefit. MCPs are major projects where the cost is estimated to exceed $20 million. They provide transmission capacity enhancement to existing transmission assets or add new transmission capacity to the network (clause 1.1.5 of the Capex IM).

[180] Part 2 Subpart 2, Part 6 and Schedule A of the Capex IM.

[181] Base capex projects are those that involve the replacement or renewal of existing transmission primary or secondary assets – it can also include projects involving business support, and information and technology assets (clause 1.1.5 of the Capex IM).

[182] Part 3 Subpart 2, Part 6 and Schedule A of the Capex IM.

[183] Listed projects are usually transmission line re-conductoring projects where the estimated cost is likely to exceed $20 million, but where there is uncertainty about the timing, scope and project cost at the time of the RCP submission process (clause 1.1.5 of the Capex IM).

7.8 The Capex IM sets out the process for Transpower to seek approval for MCPs and listed projects which exist outside this RCP price setting framework for regulatory periods. Transpower can lodge MCP and listed project proposals with us at any time during a regulatory period.[184, 185]

7.9 E&D projects are base capex projects that enhance transmission network capacity but individually are estimated to cost less than $20 million. E&D projects are part of the RCP approvals process.

7.10 Some E&D projects may be unforeseen or have sufficiently uncertain costs and timing when an RCP is submitted, that they cannot reasonably be included in the base capex allowance. The Capex IM includes an approvals mechanism (the base capex allowance adjustment mechanism) to allow Transpower to seek a base capex adjustment during the regulatory period for these unforeseeable or uncertain E&D projects once these uncertainties are removed. Uncertainties of cost and timing may be due to demand changes or new generation connection to the transmission network, for example.[186]

7.11 In this chapter we refer to some of these regulatory mechanisms and their use by Transpower and us, as we discuss projects and programmes of work in the RCP3 base capex proposal.

The verification process and our proposed review of Transpower's base capex proposal

7.12 In our process, framework and approach paper we outlined our expenditure assessment approach on Transpower's RCP3 proposal, and the use of the pilot verification process.[187]

7.13 We expressed confidence that the verification process would be able to inform the breadth and depth of our own review of the RCP3 proposal material.[188]

7.14 Having reviewed the verification report, we consider that it is of a high quality. The report should greatly assist external parties to have more confidence in Transpower's RCP3 proposal, and our review of Transpower's proposal.

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[184] Clause 3.3.3(3) of the Capex IM for MCPs and clause 3.2.3 of the Capex IM for listed projects.

[185] The MCP process requires Transpower to externally consult, seek transmission alternative options, consider long list and short list options, analyse the short list options using a net market benefit test, before selecting its preferred option for our approval. The Listed Project approvals process has less extensive external consultation and alternative option testing requirements.

[186] Clause 2.2.2.5 and Schedule A of the Capex IM.

[187] Above n 21, at Chapter 5 and Attachment B.

[188] Above n 21, at Attachment B.

7.15 We also consider that the verification process has provided considerable benefit to Transpower, external parties, and other stakeholders because it has:

7.15.1 provided useful contextual references about how Transpower compares with its Australian counterparts for a variety of metrics and measures;

7.15.2 assessed Transpower's asset management framework, including its processes around asset health modelling and criticality, with a commentary about Transpower's asset condition and data collection processes;

7.15.3 helped us to improve our review process by testing Transpower's policies, planning standards and the analysis assumptions that underpin the base capex expenditure forecast;

7.15.4 provided us with detailed insights into how Transpower has compiled its base capex forecast at an asset class level of detail, by testing business cases and justifications of expenditure need; and

7.15.5 identified key issues that we may want to focus our attention on when we review the RCP3 proposal material in preparation for setting the RCP3 base capex allowance.

7.16 We are using verification report findings to:

7.16.1 help narrow our focus of the base capex proposal for investigation; and

7.16.2 make judgements about what areas of the RCP3 base capex forecast we can agree with.

7.17 In our assessment we will also be guided by our principle of proportionate scrutiny.

Transpower proposes a 5% increase in base capex for RCP3

7.18 Transpower proposes a 5% increase in RCP3 base capex ($1,202 million) when compared to RCP2 ($1,144 million). Transpower has indicated that it seeks approval to include an estimated $135 million of possible projects in the IPP schedule for listed projects for RCP3 and an estimate of $177 million of MCPs that may be submitted to us during the RCP3 period.[189]

[189] All expenditure expressed in real $2017/2018.

7.19 The revenue impact of listed projects or MCPs that we approve during RCP3 will depend on when in the regulatory period we approve those projects, how much we approve for each project, and when Transpower commences to capitalise costs in respect of the projects.

7.20 The comparison of total RCP2 and RCP3 base capex (that includes the listed projects but not the MCPs) by expenditure category is shown in Table 11.

Table 11 Comparison of RCP2 and RCP3 base capex by category (real 2017/2018 dollars)

	RCP2 expenditure ($m)	RCP3 expenditure ($m)	Variance (%)
Asset Renewals	846.1	976.8	**15%**
E&D	97.5	76.4	**-22%**
ICT	169.5	146.1	**-14%**
Business Support	30.4	17.1	**-44%**
Price-Quality and Grid ICT benefits	-	(14.0)	**-**
Total base capex	1,143.6	1,202.4	**5%**

7.21 As outlined in Chapter 3 of this paper, Transpower has also signalled that there is likely to be a significant uplift in capex in RCP4 and RCP5, largely due to condition-based transmission line re-conductoring projects. This potential uplift is not directly relevant to our consideration of the RCP3 base capex forecast but affects the way we are discussing asset management with Transpower, proposed expenditure for preparing for this uplift, and the deliverability of proposed projects within RCP3.

Verifier review of Transpower's RCP3 base capex proposal

7.22 The Verifier reviewed 11 Identified Programmes and two non-Identified Programmes within the RCP3 base capex programme expenditure portfolio.[190]

[190] As noted in Chapter 3, identified programmes are base capex projects or programmes of work forecast to be undertaken by Transpower in RCP3, which were selected by reference to categories or criteria agreed between the Commission and Transpower, prior to Transpower submitting its proposal. Non-identified programmes are those expenditure categories that were outside the agreed criteria for Identified Programmes in the Verifier's TOR.

7.23 Selection of the Identified Programmes were guided by criteria, in line with the Capex IM, and agreed by Transpower and us, as:[191]

I. The top two portfolios by expenditure for the following asset categories across capex[192]
   - Grid Capex – Lines
   - Grid Capex – Substations
   - Grid Capex – HVDC
   - Grid Capex – Secondary assets
   - Non-network capex including ICT capex and corporate capex

II. All Enhancement and Development (E&D) expenditure

III. Where the criteria in paragraphs (i to ii) do not provide 70% coverage of forecast capex for **RCP3**, the number of capex **portfolios** that are required to provide 70% coverage ranked from largest to smallest by forecast base capex spend for **RCP3**

7.24 The Verifier carried out a review of two non-Identified Programmes that, for the following reasons, were outside the agreed criteria:

7.24.1 ACS Buildings and Grounds capex ($39.5 million over the RCP3 period) - because the quantum of capex in this category had increased by 13% when compared with the RCP2 expenditure; and

7.24.2 ICT Asset Management Systems capex ($18.6 million over the RCP3 period) - because this expenditure category was reviewed during the RCP2 reset process, and the Verifier wanted to test the identified benefits of the RCP2 initiatives in this category against what Transpower was proposing in RCP3.

7.25 Verifier scrutiny of the Identified Programmes and two non-Identified Programmes in the base capex portfolio increased the total expenditure that was reviewed from $977.6 million to $1,035.6 million.

7.26 Excluding the listed project expenditure estimate of $135 million from the RCP3 base capex expenditure total of $1,202.4m, the Verifier effectively reviewed 97% of Transpower's RCP3 base capex expenditure that was practicably able to be reviewed.

7.27 A summary comparison of each of the verified Identified and Non-identified Programmes is presented in Table 12, illustrating the expenditure differences between the RCP2 and RCP3 period forecasts and their variances.

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[191] The Identified Programmes and their selection are discussed in the Verification Report (above n 48, at 157-282).

[192] Note that the buildings and grounds asset category has not been included. This is the only exception.

Table 12 Base capex programmes reviewed by the Verifier

	RCP2 expenditure ($m)	RCP3 expenditure ($m)	Variance (%)
Identified programmes			
Transmission Lines - Structures and Insulators	$254.1	$308.7	+21%
Transmission Lines - Conductors and Hardware	$36.9	$90.2	+144%
HVDC and Reactive assets - HVDC assets	$27.4	$64.6	+136%
HVDC and Reactive assets - Reactive assets	$9.4	$39.5	+315%
AC Substations - Power Transformers	$93	$60.1	-35%
AC Substations – 33kV Indoor Outdoor conversions	$88.9	$42.1	-53%
Secondary assets - SA Protection, Battery Systems and Revenue Meters	$63.2	$141.6	+124%
Secondary assets - SA Substation Management Systems	$61.7	$58.6	-5%
E&D	$97.5	$76.4	-22%
ICT - IT Telecoms, Network and Security Services	$64.7	$48.8	-25%
ICT - Transmission Systems	$31.8	$47.0	+48%
Non-identified programmes			
AC Substations – Buildings and Grounds	$23.3	$18.6	-20%
ICT - Asset Management Systems	$32.1	$39.5	+23%

7.28 Following its review of the Identified and Non-identified Programmes, the Verifier concluded the following, amongst other things, in each expenditure category:

7.28.1 **Transmission Lines – Structures and Insulators** – the Verifier noted a high level of rigour in the management of structures evidenced by quality data, asset health modelling and a robust field condition monitoring program. Transpower has also demonstrated a willingness to consider new approaches and technologies, with increased corrosion zone modelling granularity and trialling of newer tower paint technologies to extend tower member life. The Verifier concluded that based on the asset class strategy, condition assessments and the modelling outcomes, that the proposed expenditure for this category is consistent with GEIP;[193]

7.28.2 **Transmission Lines – Conductors and Hardware** – the Verifier identified that many of the modelling and asset health practices were still in the development stage but conceded that modelling conductor life expectancy is difficult without carrying out focussed and detailed assessments of conductor condition. The Verifier raised concerns about Transpower's forecast peak expenditure estimates, disagreeing with Transpower about when they were likely to reduce. The Verifier also identified that Transpower needed to improve some of its processes around delivery efficiency. The Verifier concluded that based on the advanced level of maturity in managing this asset fleet, and the demonstration of efficiencies Transpower demonstrated in RCP2, that the proposed expenditure is consistent with GEIP;[194]

[193] Above n 48, at 158-174.
[194] Above n 48, at 174-189.

7.28.3 **HVDC and Reactive Assets – HVDC Assets** – the Verifier, while agreeing that the expenditure is likely prudent to minimise the risk of asset failure due to delayed intervention, commented about the lack of asset health modelling and criticality strategies in this asset fleet. The Verifier recommended that Transpower develop a bespoke asset health model based on asset criticality and condition modelling typically used in power stations, and that this should be a priority for Transpower during RCP3. However, despite this, the Verifier concluded that based on asset class strategy documentation and a good understanding of future costs based on historical costs down to item level of detail, that the proposed expenditure is consistent with GEIP;[195]

7.28.4 **HVDC and Reactive Assets – Reactive Assets** – the Verifier, while concluding that the expenditure was likely to be prudent, identified that apart from the capacitor banks, all other reactive plant did not use asset health modelling for expenditure planning. Additionally, the Verifier concluded that "collection and monitoring asset condition and data quality poses some risk to whether the forecast for capital expenditure on reactive assets is sufficiently accurate". The Verifier concluded that based on Transpower's strategy in this asset class to replace assets based on age-based end-of-life estimates, which was not unreasonable, that this expenditure was consistent with GEIP;[196]

7.28.5 **AC Substations - Power Transformers** – the Verifier concluded that the health and criticality modelling in this asset category was the most mature in Transpower's asset fleet. Transpower have developed a site-specific monetised risk-based options analysis tool, with asset health models and a criticality understanding informing refurbishment/replacement decisions. The Verifier concluded that based on the modelling maturity and the monetised risk-based options analysis tool that this expenditure is consistent with GEIP;[197]

[195] Above n 48, at 189-200.
[196] Above n 48, at 200-211.
[197] Above n 48, at 212-223.

7.28.6 **AC Substations – 33kV Indoor Outdoor conversions** – the Verifier identified that this programme (since 2008) of asset replacement has been driven by design-related safety and reliability issues rather than due to asset condition concerns. For these reasons the Verifier concluded that asset health models for the remaining outdoor 33kV switchyards forecast for replacement are unnecessary. The Verifier concluded that based on the maturity of this replacement programme, supported by the Asset Class Strategy, that this expenditure programme is consistent with GEIP;[198]

7.28.7 **Secondary assets - SA Protection, Battery Systems and Revenue Meters** – the Verifier identified that while many secondary asset types, such as protection assets, can be justifiably replaced due to obsolescence and spares unavailability, it was recommended that Transpower continue to support developments to extend reliable operation of some of the fleet. For example, revision of the duplicate line protection replacement interval had revised down the RCP3 forecast by $35 million. However, given the criticality of protection and DC systems to support this, a conservative replacement strategy was not an unreasonable one. The Verifier also identified that Transpower's cost estimation processes have matured in this asset class which has improved expenditure forecast accuracy. Informed by these considerations the Verifier concluded that this expenditure programme is consistent with GEIP;[199]

7.28.8 **Secondary assets - SA Substation Management Systems** – the Verifier observed that there are no asset specific health and criticality models for these assets. Presently asset replacement decisions rely on manufacturer information and real-world failure rate data, with criticality linked to the relevant substation criticality ranking. The Verifier recommended that asset life extension may be possible by developing asset-centric health and criticality models. However, the Verifier concluded that the forecasting approach in this asset category was not considered unreasonable and that this expenditure programme was consistent with GEIP;[200]

[198] Above n 48, at 222-229.
[199] Above n 48, at 229-237.
[200] Above n 48, at 238-247.

7.28.9 **E&D** – E&D projects are those that improve supply reliability, security of supply and/or increase network capacity to accommodate demand growth, new (or removed) generation or if the network configuration is changed for any reason. The Verifier was positive about the expenditure envelope approach taken by Transpower, and considered scenario modelling was an improvement on the RCP2 forecasting method because it provided a good basis for considering uncertainties. On these bases the Verifier concluded that this expenditure programme was consistent with GEIP;[201]

7.28.10 **ICT capex -** the Verifier identified that in the total ICT capex program there are 170 life-cycle projects ($94.7 million), 62 benefits-driven projects ($36.7 million), 29 risk mitigation projects ($13 million) and five compliance projects ($1.6 million). The Verifier generally accepted that Transpower's ICT asset replacement approach was prudent and that the life-cycle projects met the requirements of GEIP. The Verifier was also satisfied that Transpower had established suitable procedures to identify benefits of the benefits-driven projects and reviewed Transpower's high-level analysis of the benefits of these projects:[202]

7.28.10.1 **ICT capex - IT Telecoms, Network and Security Services** – the Verifier accepted that Transpower's approach to forecasting based on life-cycle management and benefits-driven investment was a sound approach for IT telecoms related projects. Transpower had also carried out condition assessments of substation infrastructure and network assets to support the program forecast. The Verifier concluded that this expenditure programme was consistent with GEIP;[203]

[201] Above n 48, at 247-259.
[202] Above n 48, at 259-269.
[203] Above n 48, at 269-274.

7.28.10.2 **ICT capex - Transmission Systems** – this ICT expenditure relates to tools to maximise grid utilisation, maintain and improve network and primary asset control, and to monitor of network and asset status. The Verifier identified that much of this program is to fund continuation of upgrades and enhancements that were part of RCP2. The largest activity is the replacement of the SCADA/EMS assets.[204] Asset replacement due to technical obsolescence and lack of vendor support was identified a key driver in this expenditure category. The Verifier was satisfied that there was sufficient rigour around the identification of investment need, the resulting benefits, and the processes surrounding selection of preferred solutions to consider that this expenditure programme was consistent with GEIP;[205]

7.28.10.3 **ICT capex - Asset Management Systems** – this ICT expenditure relates to software tools and associated processes to improve Transpower's asset management using tools such as PowerPlan, an asset management planning system, and Maximo, the operational asset register and maintenance management tool. Only 35% of this expenditure program is life-cycle based while the rest is benefits driven. The Verifier was satisfied there were sufficiently demonstrable benefits such as, saving in annual maintenance expenditure, improved operational decision making and a potential to reduce response times to outages, to consider that this expenditure programme was consistent with GEIP;[206] and

[204] SCADA – Supervisory Control and Data Acquisition. EMS – Energy Management System.
[205] Above n 48, at 274-282.
[206] Above n 48, at 290-296.

7.28.11 **AC Substations – Buildings and Grounds** – the Verifier noted the level of rigour and detail Transpower applies to its buildings and grounds assets including detailed modelling of each component for condition and expected asset life. Substation criticality and corrosion zone effects are used as inputs into the intervention decision-making estimates. The Verifier was satisfied that the expenditure in this category as well-targeted, prudent and efficient in maintaining safe and reliable operations in the substations. For these reasons the Verifier considered that this expenditure programme was consistent with GEIP.[207]

7.29 The Verifier also recommended particular areas in which we could focus our attentions in reviewing the RCP3 base capex proposal, namely:[208]

7.29.1 to review the business rules Transpower has used to derive the E&D capex forecast;[209] and

7.29.2 whether the HVDC Pole 2 life-extension works should be categorised as a listed project, which is used when renewals projects exceeding $20 million may be uncertain in cost and timing. In its AMP Transpower discusses the risks and uncertainties in this expenditure category, such as:[210]

7.29.2.1 there is restricted access to accurate cost information and a limited pool of HVDC suppliers who may not prioritise Transpower's RCP3 work program;

7.29.2.2 commissioning of planned HVDC refurbishment works relies on specialist resource availability; and

7.29.2.3 delays to refurbishment work will lead to a re-prioritisation and deferral of work into RCP4.

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[207] Above n 48, at 283-289.

[208] Above n 48, at 387-388.

[209] The Verifier recommended business rules (for the generation of the high and low scenario estimates, including justification for any unidentified project allowances and any deductions in the low scenario for emerging technologies or other factors). This was adopted in the draft 2018 Transmission Planning Report by Transpower (above n 48, at 257-258).

[210] Transpower "Asset Management Plan", above n 103, at 351-252.

7.30 While the Verifier largely agreed that the majority of Transpower's base capex forecast was prudent having regard to GEIP, it raised issues we will test with Transpower as we carry out our review of the RCP3 base capex proposal with our expert advisors Strata. We will consider these, as well as any other issues we identify, as we continue to analyse the proposal.

7.31 Finally, in discussions with us, the Verifier expressed its view that Transpower generally compared well with its peers in Australia in terms of asset health modelling and condition assessment processes. In some asset classes the Verifier considered Transpower was performing state-of-the-art asset health modelling, and we consider that Transpower's asset criticality framework is a good foundation for future decision making and understanding of risk.

Our view of Transpower's RCP3 base capex proposal

7.32 Alongside the Verifier suggestions that we should focus on the E&D portfolio business rule modelling, we also intend to investigate some other aspects of the capex program, namely:

7.32.1 Transmission assets – Conductors and Hardware: Transpower is predicting a significant uplift of expenditure in RCP4 and RCP5 largely due to the predicted need to replace transmission line conductors that have reached end-of-life status. At present Transpower has a well-developed understanding of the condition of only 30% of these assets. We will be testing Transpower's strategy during RCP3 to adequately prepare for these condition-based replacements in RCP4 and beyond;

7.32.2 HVDC and Reactive assets – Reactive assets: there is a substantial expenditure uplift in this asset category in RCP3 when compared to RCP2 and the Verifier identified that Transpower has no asset health models for these assets. By not understanding asset health yet predicting expenditure to replace and/or refurbish assets, there is likely to be expenditure forecasting error. To reduce the uncertainty that we are approving too much or too little in this expenditure category we are considering whether Transpower should be directed to use an alternative expenditure approvals path. There are two options for this that depend on the quantum of expenditure, namely the base capex adjustment mechanism or listed project approvals paths.[211] As asset replacement need and costs become clearer, and expenditure plans firm, Transpower can either seek to modify the base capex allowance or apply for expenditure approval using the listed project mechanism;

7.32.3 Secondary assets - SA Protection, Battery Systems and Revenue Meters: specifically seeking evidence of business cases and justifications to support expenditure programs such as duplicate bus zone protection. While the Verifier identified that in many cases replacement was necessary due to obsolescence and spares unavailability, there was likely to be value in life extension for some assets. We consider that the Verifier did not fully explain why there was such a significant expenditure uplift in this category, so we will be testing this with Transpower; and

7.32.4 ICT capex: the benefits-driven expenditure comprises 32% of the total proposed program total expenditure and is linked to 62 projects predicted to result in operational savings, capex deferral and stakeholder/customer relationship improvements. We will test the benefits-driven projects' expenditure justifications in this asset category.

7.33 We are less concerned about expenditure programs like the AC Substations – Power Transformers. In this expenditure category Transpower appears to have set the benchmark in its understanding of asset health and condition, and the systematic monetised risk-based approach to replacement or refurbishment decision making and investment timing. This gives us confidence that there is less expenditure forecasting uncertainty in this asset category.

[211] The base capex allowance adjustment mechanism allows Transpower to seek a base capex adjustment during the regulatory period as projects which are uncertain in need, cost and timing become more certain.

7.34 In our opinion this systematic evidence-based decision-making approach by Transpower should be informing investment decisions across the asset fleet in order that investment prudency and risk can be better understood.

We seek your views on aspects of Transpower's RCP3 base capex proposal

7.35 In addition to the areas of interest we will be focussing our review on, we are seeking your views on key aspects of Transpower's RCP3 base capex forecast, and have some specific questions we would like you to consider in preparing your submission:

7.35.1 In the E&D capex program ($76.4 million) Transpower has identified projects and assigned probabilities to these occurring over the RCP3 period, based on business rules recommended by the Verifier. Transpower is proposing that the Commission approve an envelope of E&D expenditure. A different option would be for Transpower to use the base capex adjustment mechanism in the Capex IM,[212] which would bring the projects into the base capex allowance as the projects become more certain in need, cost and timing, especially those projects predicted to occur later in the RCP3 period. Do you think we should direct Transpower to adopt the base capex adjustment mechanism approach for the larger less certain projects that are forecast to start later in the RCP3 period, or do you think that Transpower's proposed envelope approach is preferable, and why?[213]

7.35.2 Transpower has signalled that in the HVDC and Reactive Assets – HVDC assets capex program there are uncertainties in accessing accurate cost estimates and resource availability which may result in deferral of works into RCP4.[214] Should this capex program, which is largely focussed on Pole 2 life-extension works, be considered as a listed project and, if so, why?

[212] The base capex allowance adjustment mechanism allows a base capex adjustment during the regulatory period for capex projects with uncertainties, and those that are unforeseen prior to the regulatory period but are below the $20 million listed project threshold.

[213] Transpower's analysis of how it arrived at the E&D portfolio expenditure envelope is discussed in the TPR (Transpower "Transmission Planning Report", above n 56, at 21-36).

[214] Transpower "Asset Management Plan", above n 103, at 351-352.

7.36 We would also like to hear from you if you have other issues with aspects of Transpower's RCP3 base capex forecast that are not discussed here but that you consider merit comment.

Chapter 8 **Operating expenditure**

Purpose of this chapter

8.1 This chapter discusses Transpower's proposed RCP3 opex allowance.

8.2 We discuss why we have selected the efficiency of the base year and the AM&O portfolio as areas for additional scrutiny, and how decisions in these areas affect other aspects of Transpower's opex proposal.

8.3 As with capex, setting appropriate opex allowances for Transpower in RCP3 is a key focus area for us. However, on a dollar-for-dollar basis, approved opex amounts have a more significant impact than capex on the revenue Transpower can recover from its customers during the forthcoming RCP because capex is recovered in revenues over a number of years.

8.4 We seek your views on the overall efficiency of Transpower's opex. We will consider this expenditure in the context of Transpower's changes in activities over time, which includes expected future challenges and change in work profile in RCP4 and RCP5.

8.5 In this chapter we discuss:

8.5.1 Transpower's approach to opex forecasting;

8.5.2 The Verifier's view of Transpower's proposed opex; and

8.5.3 Our view of Transpower's proposed opex allowance and our views on the efficiency of the base year and the proposed level of expenditure within the AM&O portfolio.

8.6 We also pose specific questions where we seek your views to assist us in our evaluation of Transpower's proposed opex.

Our approach to assessing Transpower's opex

8.7 In our process, framework and approach paper we explained that "setting appropriate expenditure allowances for Transpower in RCP3 is a key focus area for us as the opex and capex allowances will impact on the revenue Transpower will be able to recover from its customers in RCP3 and beyond".[215] In Chapter 3 of that paper we outlined the legal framework we intend to apply in setting those allowances and explained that:[216]

> In contrast to base capex, there is no IM that sets out rules about how we should determine or evaluate forecast opex for RCP3. However, we consider the criteria to be applied should not be materially different to the criteria that apply to base capex, particularly given the need to direct capex expenditure towards achieving cost-effective and efficient solutions, and the potential cost trade-offs between capex and opex that this implies.
>
> Therefore, consistent with our approach to assessing base capex, in assessing opex we will be guided by:
>
> - the extent to which what Transpower proposes will promote the purpose of Part 4 of the Act; and
> - where they can be usefully applied to opex, the base capex evaluation criteria.
>
> In considering the extent to which Transpower's opex proposal will promote the Part 4 purpose, we will be guided by whether Transpower's proposal is consistent with an expenditure outcome which represents the efficient costs of a prudent supplier (ie, where a 'prudent supplier' is a hypothetical transmission business facing the same circumstances as Transpower whose planning and performance standards reflect GEIP).

Transpower used a base-step-trend methodology to forecast opex

8.8 In developing its proposed RCP3 opex forecasts, Transpower used a base-step-trend forecasting methodology,[217] which it explained as follows:[218]

> For most of our opex forecasts we have adopted a base-step-trend framework. Base-step-trend forecasting is generally appropriate for expenditure that is recurring and assumes that historical 'revealed' expenditure provides a suitable starting point for a forecast requirement. The base-step trend approach involves the following main components.

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[215] Above n 21, at [4.15].
[216] Above n 21, at [3.16-3.18].
[217] The base-step-trend methodology has been applied to the opex forecasts with the exception of insurance opex (discussed in Attachment A) and preventive maintenance opex, which is partly forecast using a bottom up approach, combining maintenance schedules from Maximo, Transpower's operational asset register and maintenance management tool (for more information, see the Verifier report (above n 48, at 308-318), and Transpower's RCP3 proposal (above n 69, at 104).
[218] Above n 69, at 59.

• Base year – identifying an efficient base year, typically the most recent year for which actual opex data is available. This includes assessing the extent to which the base year is relatively efficient.

• Base amount – following an assessment of the base year, the base amount is identified by adjusting the base year expenditure for any atypical cost items.

• Step changes – required to meet the needs of the network or to allow for external requirements, and which are not already captured within the scope of the base amount.

• Trends – these reflect expected changes in cost due to output growth. It can also include adjustments for ongoing productivity and/or cost efficiency.

8.9 In assessing the efficiency of its base level opex, Transpower undertook historical trend analysis. Transpower considered a proposed base level opex efficient if it was in line with the average expenditure of some of the preceding years.[219]

8.10 Implicit in this assumption is that historical expenditures (ie, 'revealed costs') should be reflective of efficient costs if there is an effective incentive mechanism in place that incentivises a supplier of regulated services to actively pursue efficiency gains. A range of such incentive mechanisms apply to Transpower, with the IRIS applying to Transpower's opex.[220, 221]

Transpower's proposed AM&O expenditure for RCP3 is broadly in line with RCP2

8.11 Transpower explained that "Asset Management and Operations primarily encompasses the staff and consultancy costs associated with work activities in our grid divisions, including strategic and tactical asset planning, and grid project management".[222]

8.12 In establishing its proposed opex forecast for AM&O, Transpower has assumed the FTEs delivering the works associated with that portfolio will remain unchanged from RCP2. This results in an expenditure forecast that is broadly in line with the spend in RCP2 (an increase of approximately $7 million).

[219] Above n 69, at 100-101, for example.
[220] For Transpower's approach to efficiency in RCP3 see Transpower's RCP3 proposal (above n 69, at [2.2.1]).
[221] For details on the opex IRIS applying to Transpower, including what it is trying to achieve, see: Commerce Commission "Input Methodologies review final decision – Transpower Incremental Rolling Incentive Scheme" (29 June 2017), available at: https://comcom.govt.nz/__data/assets/pdf_file/0021/62382/Input-methodologies-review-final-decision-Transpower-Incremental-Rolling-Incentive-Scheme-29-June-2017.pdf.
[222] Above n 69, at 108.

8.13 From 2011/12 to the 2017/18 year there has been a downward trend in the proportion of capitalised expenditure within this portfolio.[223] The activities in this portfolio are now more focussed on maintaining and replacing assets rather than on new capital projects.

8.14 Transpower expects the overall volume of work within this portfolio in RCP3 to be similar to RCP2. However, the mixture of work is expected to change. While development of asset management tools and processes is expected to decrease, both strategic investigations to manage longer-term challenges and pre-capex investigations are expected to increase.[224]

Verifier review of RCP3 forecast operating expenditure

8.15 The Verifier reviewed all of Transpower's proposed opex ($1,343 million). It considered $1,229 million of the proposed opex to be consistent with GEIP, and the remaining $114 million required further scrutiny in order to form a view.[225] Transpower's proposed opex by category is shown in Table 4, within Chapter 3.

8.16 The remaining $114 million comprised $88 million in proposed insurance opex which was outside of the Verifier's terms of reference, and $26 million from three step changes within predictive maintenance.[226]

8.17 The proposed insurance opex required an expert opinion from an actuary in order to confirm its efficiency, and additional information was needed to confirm the efficiency of the step changes.[227] Transpower has obtained, and provided us, with a broker report and actuarial opinion in support of its insurance proposal. We discuss the proposed insurance opex in Attachment A.

8.18 Although it concluded that much of the proposed opex was consistent with GEIP, the Verifier expressed reservations and suggested we apply further scrutiny to the areas of Transpower's proposed opex discussed below.

8.19 While the Verifier was satisfied with most of Transpower's proposed opex step changes and proposed trend assumptions over the course of RCP3, it was unable to confirm that Transpower's proposed base level opex is cost efficient.

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[223] Above n 48, at 332.
[224] Above n 69, at 109.
[225] Above n 48, at 325 and 358.
[226] Above n 48, at 325 and 358.
[227] We have requested this information from Transpower.

8.20 In that regard, the Verifier noted that:[228]

> From a regulatory perspective, it is also important that the base year is efficient. In this regard, we note that in RCP2 Transpower is subject to an opex incentive scheme (IRIS), such that it is being financially rewarded for out-performance compared to the Commerce Commission's RCP2 forecasts. For this reason, in principle, we are inclined to accept that Transpower's reported total opex for 2017/18 is an efficient base for the RCP3 forecasts.
>
> The economic benchmarking results we presented in Chapter 3 of our report indicated that Transpower's total opex was relatively high compared to Australian transmission networks. However, we concluded that this result could be the result of capex-opex trade-offs that Transpower has been implementing as part of its asset management decision-making framework. Further, given the constraint of a very small sample of benchmarked transmission networks, we are not confident in relying on the benchmarking evidence to form a firm view that Transpower's reported 2017/18 total opex is inefficient.
>
> However, we have not been able to verify whether the 2017/18 base expenditure for each of the individual grid and non-grid maintenance and opex programmes is efficient.

8.21 In addition to the Verifier's general finding that it was unable to confirm cost efficiency of the base level opex, the Verifier was particularly concerned about Transpower's base level overhead costs relating to the AM&O portfolio. In particular, the Verifier noted that:[229]

> Whilst there is evidence of the shift from a major capital works to an enhanced maintenance planning focus and the supporting Asset Management and Maintenance Overview outlines qualitatively the activities and benefits of the current resource levels, we have not been able to verify the effectiveness of the increased number of FTEs planning the maintenance expenditure, particularly as the overall maintenance expenditure for RCP3 is only 4% higher than RCP2.
>
> To provide greater confidence regarding the efficiency of the Asset Management and Operations, as well as effectiveness of the relatively new Grid Operating Model, we believe that Transpower should consider developing a business case detailing the number of FTEs in each division, their role and contribution to planning of the maintenance programme and a projected long-term benefit in monetary terms that is reasonably expected from their planning and investigative work.

[228] Above n 48, at 304.
[229] Above n 48, at 335.

Our view of Transpower's RCP3 forecast operating expenditure

8.22 While we consider that most of the proposed deviations from the recurring historical opex (the base level opex) reflect the efficient costs of a prudent supplier, we have not formed a view yet on whether Transpower's base level opex is cost efficient.

8.23 Apart from establishing consistency with the historical average, Transpower does not further elaborate on whether such typical costs are efficient, instead relying on the opex IRIS incentive scheme driving it to pursue any potential efficiency gains inherent in its opex.

8.24 We consider that relying only on the opex IRIS to drive efficient costs could be premature for RCP3 because:

8.24.1 the opex IRIS has only been in place since the start of RCP2 and it is unlikely that Transpower's financial outcomes have yet 'revealed' all potential efficiencies inherent in its base level opex;

8.24.2 Transpower's historical opex has been relatively constant and the proposed total for RCP3 is 2.9% higher than in RCP2, rather than showing the decreases that might be expected if Transpower was realising efficiencies;[230] and

8.24.3 as the Verifier concluded, Transpower's opex benchmarks proportionately high in comparison to some of its peers in Australia, although we appreciate the different regulatory environment these organisations operate in. The Australian working environment has tended to favour earlier asset replacement over maintenance, which results in a greater emphasis on capex projects.

8.25 In addition to the general issue of Transpower's base level opex, we see further difficulty in assessing the cost efficiency of the base level opex of Transpower's AM&O portfolio.

8.26 While the proposed FTE level in this portfolio remains constant and the base level opex for the portfolio reflects historical spend, we are still considering whether Transpower's shift in focus from an organisation that undertakes major capex works to one that maintains and renews its network requires constant FTE levels.

[230] Above n 69, at 40. We note that this does not suggest Transpower is necessarily inefficient, but that the trend does not provide immediately apparent evidence that efficiency gains are being realised.

8.27 A relevant question is about Transpower's ability to deliver the increased level of work expected in RCP4 and subsequent RCPs. Deliverability is already expected to be a constraint in RCP3 (as further discussed in Chapter 9), and is expected to continue to be an issue going forward. We understand from feedback from Transpower's customer consultation on the RCP3 proposal that Transpower's stakeholders have concerns about Transpower's ability to fully deliver necessary work in the future. If Transpower does not have the capability to deliver upon this work, deferral may produce an undesirable change in the risk profile of the asset base. In this context, maintaining an available workforce and specialist skills base might be prudent.

8.28 We have asked Transpower to provide additional information on how the proposed expenditure within the AM&O portfolio fits into its preparation for these future challenges, and to the extent it is not commercially sensitive, to share it with stakeholders so they may provide their views in cross-submissions.

8.29 We have also engaged Strata as an independent expert to provide analysis to support our evaluation of the efficiency of Transpower's proposed opex (see more detail on the Strata engagement in Chapter 2 and Chapter 3).

Potential impacts of changes in accounting standard

8.30 Early in 2018, the International Accounting Standards Board (**IASB**) issued a new standard, IFRS16, updating the principles relating to the treatment of leases. IFRS16 replaces IAS17 and comes into effect for annual reporting periods beginning on or after 1 January 2019.

8.31 Under the new accounting standard, lessees' operating leases are referred to as 'right of use' assets and are brought onto the balance sheet for financial reporting purposes (whereas under the previous standard these leases were not on the balance sheet and the lease rentals were treated as operating expenditure).

8.32 Any changes to the accounting rules will not affect the IMs unless we decide to amend the IMs. We will be discussing this issue further in a separate cross-sector consultation process. This will occur alongside our consideration of the IPP draft decision and final decision. We intend to publish an issues paper inviting comment on the regulatory treatment of operating leases in early March 2019.

We seek your views on Transpower's proposed opex forecast

8.33 We would welcome your views on how Transpower has developed its proposed opex forecasts.

8.34 Some questions we would like you to consider in preparing your submission are:

8.34.1 Given the opex IRIS scheme has only been in place since the start of RCP2, it is unlikely Transpower has yet 'revealed' all potential efficiency gains inherent in its opex. We have engaged Strata to help us identify the extent to which the base year opex used in the base-step-trend approach is likely to be efficient opex. Is there any further analysis you suggest could be carried out to assess whether the proposed base level opex is efficient?

8.34.2 How do you interpret Transpower's relatively constant historical opex trend, including its overall forecast for RCP3 increasing by 2.9% compared to RCP2:

8.34.2.1 Would you expect the historic trend in opex to be increasing at a greater rate, if Transpower had not increased its efficiency?

8.34.2.2 Would you expect to see a lower increase or even a downwards trend in opex if Transpower was actively pursuing efficiency gains?

8.34.3 Do you consider it prudent for Transpower to maintain capability and skills ahead of RCP4 (and bring forward some work to utilise the resources), even if there was some cost to customers in RCP3 to do so? What additional evidence do you consider Transpower should be asked to provide to further support its proposed opex level in this regard?

We seek your views on Transpower's proposed insurance opex expenditure

8.35 We also welcome your views on Transpower's insurance opex expenditure forecast. Transpower's proposed insurance opex is discussed in Attachment A.

8.36 We are particularly interested in your views on whether you think Transpower's insurance coverage reflects what you would expect of a prudent electricity transmission operator. Some questions we would like you to consider in preparing your submission are:

8.36.1 Given any relevant experience, do you consider that the policies taken on by Transpower are appropriate, and if so, to what extent should Transpower be insuring them?

8.36.2 Are there other risks (other than those which Transpower identifies) that you consider a prudent electricity transmission operator would insure?

8.36.3 Does the forecast increase in the Fire and Emergency New Zealand (**FENZ**) levy correspond to your own expectations on how legislative changes may affect the industry? Are there other approaches to account for the FENZ levy that we should consider?

Chapter 9 **Deliverability**

Purpose of this chapter

9.1 The purpose of this chapter is to seek your views on how Transpower has addressed deliverability risks for RCP3 expenditure and outputs.

9.2 In setting expenditure allowances for RCP3, we are required to apply the base capex evaluation criteria specified in the Capex IM, one of which relates to the overall deliverability of the proposed base capex during the regulatory period.[231, 232] We also consider it important that Transpower's customers, when consulted on potential deliverability adjustments to proposed capex and opex, understand the impact on network risk when identified works are deferred.

9.3 In this chapter we discuss:

9.3.1 the deliverability constraints Transpower has built into its RCP3 expenditure forecasts;

9.3.2 the Verifier's views on deliverability;

9.3.3 our expectations, following on from such an implementation, for Transpower to develop its approach to customer consultation in a way that its customers are able to make informed decisions on the amount of risk they are prepared to accept in exchange for the price they have to pay for transmission services (also discussed in Chapter 4).

9.4 We also pose specific questions where we seek your views on the deliverability issue.

Transpower has built deliverability constraints into its RCP3 expenditure forecasts

9.5 In developing its proposed RCP3 expenditure, Transpower's proposal outlines its consideration and consultation on deliverability risks, particularly those relating to resourcing, as resource constraints can impact on work volumes and the timing of works.

[231] Clause A1(h) in Schedule A of the Capex IM.

[232] In assessing opex, we are also guided by the base capex evaluation criteria where they can be usefully applied to opex.

9.6 More specifically, Transpower identified five broad deliverability risks:[233]

> • In several portfolios, forecast work volumes increase to a level that we consider will exceed service provider capacity to deliver.
>
> • Some portfolios have low forecast certainty in later years of RCP3 due to the nature of their risk or condition-based replacement strategies. While this supports efficient investment and provides flexibility to refine our plans closer to the need date, it makes it more difficult to forecast where and when resources will be required.
>
> • Our service provider workforce has been reducing over recent years, which has reduced capacity to respond to peaks or spikes in workload.
>
> • There is a risk that reducing workload in some portfolios could result in service provider workforce reductions overcompensating and creating new resource shortages in future.
>
> • Substantial regional shifts in work, coupled with demand for skills from industry peers, could create shortages where service providers are unable or unwilling to shift resources to where they are needed.

9.7 In aggregate, to account for deliverability risks, Transpower removed:

9.7.1 $58 million from its proposed base capex forecast (ie, 5% of total base capex); and

9.7.2 $29 million from its proposed maintenance opex forecast (ie, 2% of total opex).

9.8 Table 13 and Table 14 below briefly summarise how these deliverability adjustments apply to the proposed base capex and opex allowances.

[233] Above n 69, at 25.

Table 13 Transpower's proposed deliverability adjustments to base capex[234]

Asset Grouping	Description	Adjustment ($m)
Conductors and Hardware	Increased work volume over RCP3 means that more work must move to shoulder seasons, during which work conditions tend to be less optimal for re-conductoring work. This is expected to reduce the potential for work to be completed.	-41
Power Transformers	Availability of key resources could constrain our ability to accommodate unscheduled transformer replacements without adjustments elsewhere in our work programme. Reduced forecast allowance for expected but unscheduled transformer replacements.	-10
Protection, Battery Systems and Revenue Meters	Expected constraints on technician availability.	-7
Total		**-58**

Table 14 Transpower's proposed deliverability adjustments to maintenance opex[235]

Opex portfolio	Description	Adjustment ($m)
Maintenance opex	Our RCP3 deliverability review identified that, over a typical period, there are likely to be constraints or specific circumstances in delivery that mean we cannot complete all specified maintenance work. Accordingly, we have applied a deliverability adjustment to our RCP3 maintenance forecast.	- 29

9.9 The adjustment for maintenance opex is a lump-sum adjustment, ie, Transpower has not allocated it to the individual categories the maintenance portfolio comprises, but intends to do so when maintenance works become more certain.[236] We have asked Transpower to provide in its submission on this paper its views on how this might play out. For example, to what extent might this adjustment affect the preparatory works necessary to better understand the ageing conductor issue.

[234] Above n 69, at 70.
[235] Above n 69, at 98.
[236] This is a lesson learned from RCP2 where Transpower allocated a 7.5% productivity adjustment down to project level at the planning stage, which had a disruptive impact on delivery (above n 69, at 26).

9.10 In addition to adjusting its proposed RCP3 expenditure forecasts to account for deliverability constraints, Transpower also applied a phasing adjustment to its proposed base capex forecast. This adjustment spreads the renewal capex works programme more evenly across RCP3, as otherwise the works programme would be front-loaded towards the start of RCP3.

9.11 To minimise the amount of works to be deferred into subsequent regulatory periods, Transpower indicated it will be "looking at ways for the organisation to create efficiencies in the planning and delivery process that allow a greater throughput of works".[237] We have asked Transpower to provide in its submission on this paper more details on how it intends to achieve the efficiency gains that would enable it to undertake all the works it considers necessary in RCP3, notwithstanding the deliverability adjustments.

Verifier's views on deliverability

9.12 The Verifier noted that the responses to Transpower's consultation on the deliverability issue:

9.12.1 did not support the reduction of capex and/or opex programmes as a consequence of the identified resource constraints;

9.12.2 suggested Transpower should be considering ways of addressing the skills shortages; and

9.12.3 considered Transpower should identify the risk associated with any deferred work from the optimal programmes.[238]

9.13 However, the Verifier was satisfied that Transpower had considered deliverability of the RCP3 base capex and opex programmes appropriately and with rigour and had adjusted the forecast expenditure where necessary to account for any identified delivery constraints. Nevertheless, the Verifier considered that Transpower should be targeting efficiency improvements in RCP3 to help ensure delivery of all works considered necessary in RCP3.

[237] Above n 69, at 26.
[238] Above n 48, at 369.

9.14 Regarding any capex works programmes Transpower proposes to defer, the Verifier noted that:

> Whilst we accept that the practices used in assessing deliverability of capex programmes is sound, we are of the opinion that for RCP3 base capex, Transpower should be targeting efficiency gains to fund the $58 million (which represents 4.8% of the total base capex) to deliver the programme of works identified for RCP3. We believe this is most important given the delivery challenges Transpower may have to address in RCP4 and RCP5 due to the anticipated significantly higher work volumes in reconductoring and tower painting.
>
> The Deliverability Review is limited to RCP3 and does not address the longer-term view, other than suggesting that workforce retention and awareness of regional requirements needs to be addressed to avoid losing staff. In addition, there is no discussion about risks associated with deferring expenditure from RCP3 into RCP4, or net effect on the overall corporate risk profile of reduced maintenance spend in RCP3 because of current delivery constraints.

9.15 Regarding Transpower's proposed adjustment to the maintenance opex works, the Verifier noted that:

> Transpower has RCP3 maintenance works that are a pre-requisite for works that are projected in RCP4 and RCP5, particularly with regards to tower painting and re-conductoring, but also that support the implementation of a more risk-informed maintenance approach across the asset categories.
>
> We believe that as $29 million represents approximately 6% of the RCP2 total expenditure, Transpower should be targeting an efficiency improvement of approximately 5-6% to offset any deliverability constraints, as the increase in RCP3 maintenance is largely due to work that has been previously deferred and is now considered necessary to support RCP4 and RCP5 activities.

Our views on the key issues relating to deliverability

9.16 In general, we agree with the Verifier's views on deliverability. While we consider that Transpower has an appropriate governance framework and management processes in place to identify and mitigate any deliverability constraints, we are concerned that:

9.16.1 a deferral of works into RCP4 and beyond may put the delivery of these works further at risk, as deliverability of works in subsequent RCPs is likely to be significantly more challenging;

9.16.2 deferral of works considered necessary in RCP3 may have a detrimental impact on network risk in RCP3;

9.16.3 Transpower customers did not have enough opportunity to consider the impact of the proposed works on network risk as Transpower did not quantify such information in consultation on that matter;[239] and

9.16.4 some of the necessary preparatory works to better understand future ramp-ups in re-conductoring and tower-painting works may not be undertaken in time, potentially resulting in a sub-optimal delivery of these works (which may get reflected in inefficient costs that Transpower will share with its customers).

9.17 We also understand there are some outstanding delivery risks for RCP2.[240] This is of concern, as any works deferred into RCP3 as a result of decisions made by Transpower in RCP2 will further increase the risk of under-delivery in RCP3 with, at this stage, an unknown impact on network risk.

9.18 We have asked Transpower to include in its submission on this paper its view on whether deliverability in RCP3 will be further impacted by any works deferred into RCP3 from RCP2, and to explain the extent of that deferral and the resulting impact on network risk.

We are seeking your views on the deliverability issue for RCP3

9.19 We welcome your views on the deliverability issue for RCP3. Some questions we would like you to consider in preparing your submission are:

9.19.1 How effective was Transpower's consultation on the deliverability issue? If you consider there were gaps, how might our proposed process for the IPP reset allow you to adequately provide your views on this?

9.19.2 To what extent should Transpower be targeting efficiency improvements in RCP3 to help ensure delivery of all works considered necessary in RCP3?

9.19.3 How much detail should Transpower provide on how it intends to minimise the amount of RCP3 works being deferred into later regulatory periods?

---

[239] We have asked Transpower to explain in its submission on this paper how and when it intends to develop its asset health and criticality framework such that it can be used to quantify the risk associated with project delivery timing changes and associated deliverability adjustments (including for consultation on such proposed adjustments).

[240] Above n 48, at 367.

9.19.4 Given the potential significance of the deliverability issue for RCP3, including its potential impact on subsequent regulatory periods, what reporting requirements relating to deliverability should we set for Transpower? For example, this might include details on how Transpower is tracking against the RCP3 forecast, highlight any areas where delivery may be at risk, and note any mitigating actions Transpower proposes to take.

9.19.5 To what extent should Transpower undertake preparatory works in RCP3 to better understand ramp-ups in future periods in re-conductoring and tower painting?

9.19.6 To what extent would you value Transpower using its asset health and criticality modelling to prepare a quantitative assessment of how network risk is going to be affected by expenditure choices during RCP3?

Chapter 10 **Revenue path**

Purpose of this chapter

10.1 This chapter focusses on Transpower's proposed revenue path for RCP3. We set out what we see as the potential effects from smoothing Transpower's revenues between the years of RCP3, as well as between RCPs, and some of the ways this could be carried out.

10.2 We seek your views on whether Transpower's revenue path should be smoothed to reduce year-on-year variations in revenue, and on whether Transpower should accumulate wash-up and incentive amounts and spread their recovery or repayment over RCP4. These decisions will affect the year-on-year variation in the revenue Transpower earns, and therefore the prices paid by its customers.[241]

10.3 In this chapter we discuss:

10.3.1 Transpower's forecast HVAC and HVDC revenues across RCP3, the proposed revenue path, and the treatment of wash-up and incentive amounts;

10.3.2 Our views on the RCP3 revenue path, including smoothing of forecast revenues between the years of RCP3, to produce more constant year-on-year transmission prices, and also potentially smoother changes between RCPs to mitigate step changes.

10.4 We also pose some questions where we seek your views on the appropriate profile of the RCP3 revenue path.

[241] Although it should be noted that we set the total revenue Transpower can collect from its customers – the effect on what Transpower charges any individual customer will depend on the transmission pricing methodology.

Why revenue path design is important

10.5 The design of Transpower's revenue path will determine the level of volatility of Transpower's yearly transmission revenues, which will in turn affect prices paid by Transpower's customers, and ultimately, end users of electricity. In our process, framework and approach paper, we signalled that we considered pricing predictability could offer a benefit to Transpower's customers.[242]

> Smoothing the total forecast revenues could be beneficial, as it reduces volatility in Transpower's year-on-year total forecast revenues, and therefore would promote pricing predictability for Transpower's customers and, to a proportionately lesser extent, household consumers.
>
> We did not smooth the total forecast revenues when we initially set the IPP for RCP2. We concluded that smoothing was not justified because any wash-up values and pass-through costs and recoverable costs up to then had not been material to the yearly revenue totals, and pricing predictability had not been an issue for Transpower's customers or electricity consumers.
>
> However, such updates to revenues have to date become more substantial during RCP2, and we are of the view that the associated potential benefits of smoothing may now outweigh any additional costs and complexity (which we consider to be low). Also, smoothing the total forecast revenues would align the approach to setting revenues across the sector.

10.6 Revenue smoothing is not intended to change the economic value to Transpower of its total revenue. It is more about the timing of recovery of the allowable revenues from customers. To this extent revenue path design is a matter of timing, with the main consideration being minimising price shocks to Transpower's customers.

[242] Above n 21, at [6.20-6.22].

Transpower proposed revenue smoothing in RCP3

10.7 Transpower proposed nominal total forecast revenue of $4,419 million in RCP3, equivalent to a 6.6% reduction from its total revenue in RCP2. This reduction was largely driven by an expected lower WACC, which Transpower assumed to be 5.50% in RCP3.[243] This put downward pressure on Transpower's total forecast capital charge, which offset the impact of proposed higher capex and opex allowances on Transpower's total forecast revenue in RCP3.

10.8 With regard to its total forecast revenue, Transpower proposed:

> to adopt 'revenue smoothing' arrangements from April 2020, to remove volatility in our pricing and give our customers more stable and predictable transmission charges. We propose initial smoothing, to reshape our revenue path to have a consistent growth rate across each RCP. We also propose deferred updates, carrying revenue updates across RCPs rather than applying annually.
>
> We sought feedback from our customers and stakeholders on this approach when we consulted on our RCP3 proposal in June 2018, and received feedback that was generally supportive.
>
> To ensure transparency, in our consultation paper we also described potential annual disclosures relating to revenue smoothing:
>
> • The economic value (EV) adjustment (wash-up and incentive) calculation for the disclosure year.
>
> • The effect of this EV adjustment on the annual revenue in the following control period (which would be the same amount for each year of the following control period).
>
> • The net/aggregate annual EV adjustment in the following control period. This would be the aggregate of the EV adjustments accumulated since the start of the control period.
>
> • The current forecast of the smoothed revenue for each year of the following control period.
>
> These disclosures would give customers advance warning of the revenue impact of accumulated EV account entries and of the resulting revenue that is likely to be applied under the transmission pricing methodology.

[243] Transpower's revenue path proposal is only indicative as it is based on Transpower's non-binding current assumption of WACC. We will set the WACC applying to the IPP during RCP3 in October 2019. The latest WACC estimate we published for information disclosure purposes in July 2018 shows the 67th percentile as 5.16% (see: *Cost of capital determination for disclosure year 2019 – For Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end)* [2018] NZCC 11, available at: https://comcom.govt.nz/__data/assets/pdf_file/0028/91189/2018-NZCC-11-Cost-of-capital-determination-Transpower,-GPBs-and-Airports-ID-31-July-2018.PDF). The WACC we used to set Transpower's total forecast capital charge in RCP2 was 7.19%.

10.9 In a footnote to the above, Transpower noted:

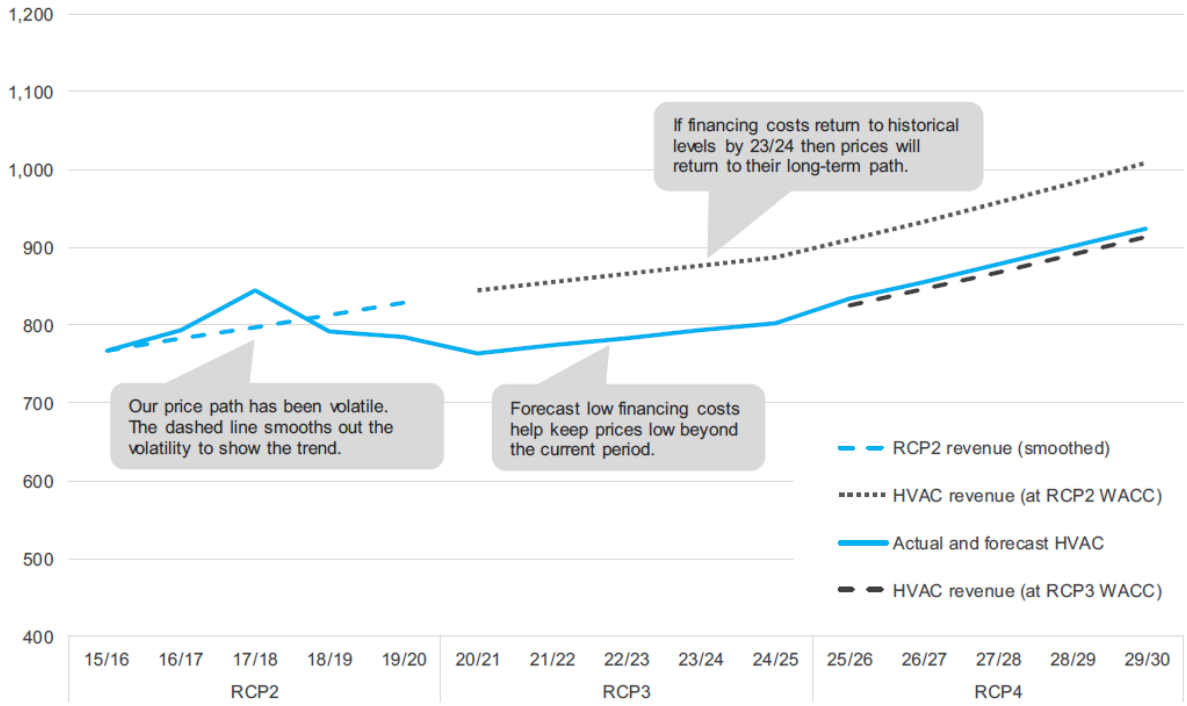
> We propose to apply smoothing to total forecast revenue, rather than forecast maximum allowable revenue (MAR). Most of our revenue is represented by our MAR, but the additional components (pass-through and recoverable costs) can contribute significant volatility.

Transpower's proposed HVAC network total forecast revenue

10.10 To account for the lower total forecast revenue, Transpower proposed its HVAC total forecast revenue drops by 2.6% in the first year of RCP3 compared to the last year of RCP2. Transpower then proposed that the annual total forecast revenues would increase by 1.3% per annum across RCP3. This annual increase is less than Transpower's expectation for inflation growth in RCP3.[244]

10.11 Figure 6 below shows Transpower's proposed HVAC network total revenue, including how it would look if the WACC remained constant from RCP2 to RCP4.

Figure 6 Transpower's proposed HVAC total revenue ($ million/nominal)[245]



[244] The impacts of any listed projects approved during RCP3 will then be on top of this. Even with the forecast listed project approvals, the total annual revenues in RCP3 are forecast to remain below the level approved for 2017/18 in RCP2.

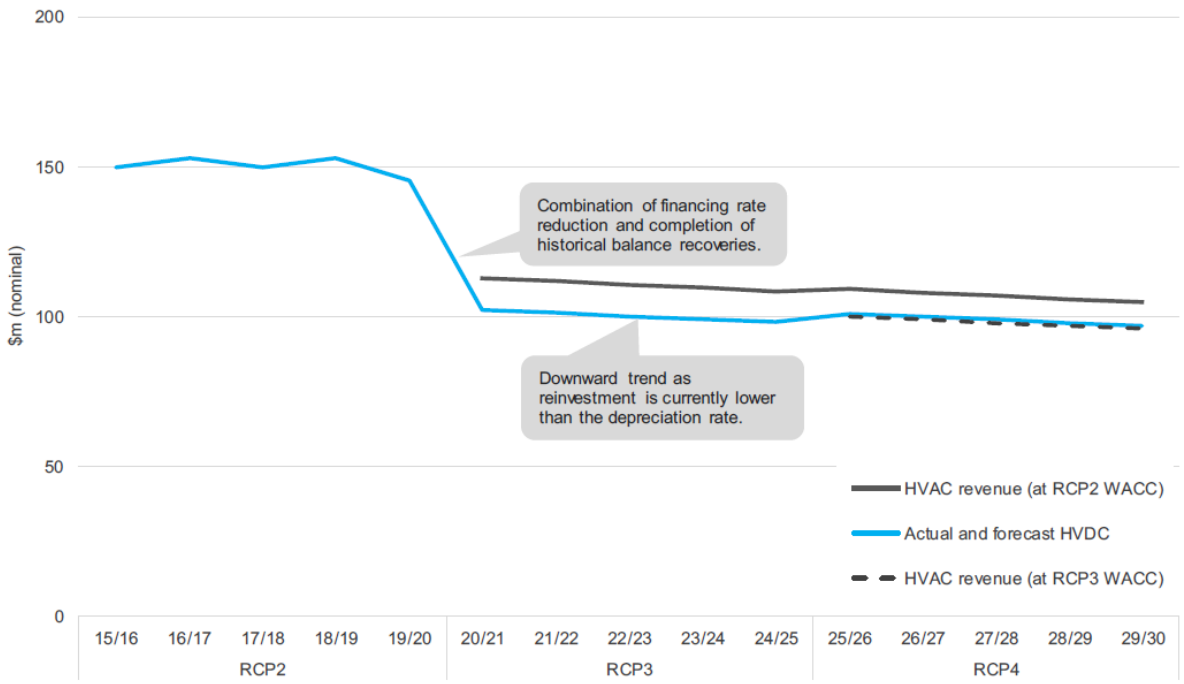
[245] Above n 69, at 50.

Transpower's proposed HVDC network total forecast revenue

10.12 For its HVDC total forecast revenue, Transpower also proposed an initial drop followed by a steady trend. The initial drop it proposed was proportionally significantly larger, as this is both driven by a lower WACC assumption applying to its RCP3 revenue as well as the completion of "a nine-year period of recovering earlier unpaid charges from large South Island generators. The overall trend during RCP3 is for decreasing prices, even with life-extension investment in Pole 2 forecast during the period."[246]

10.13 Figure 7 below shows Transpower's proposed HVDC network total revenue including how it would look if the WACC remained constant from RCP2 to RCP4.

Figure 7 Transpower's proposed HVDC total revenue ($ million/nominal)[247]



Our view on smoothing the RCP3 revenue path

10.14 In our process, framework and approach paper we explained:[248]

10.14.1 the roles the base capex allowances and opex allowances have in our setting of the forecast MAR. The forecast MAR is the key component of the revenue path that we will set for each year of RCP3; and

[246] Above n 69, at 51.
[247] Above n 69, at 51.
[248] Above n 21, at [3.8-3.18].

10.14.2 how the forecast MAR will be combined each year with Transpower's forecast pass-through costs, forecast recoverable costs and forecast adjustments to the EV account to derive total forecast revenues that will be applied by Transpower in setting its pricing for each year of RCP3.[249]

10.15 We also noted:[250]

> that we will consider smoothing the total forecast revenues and the forecast MAR in RCP3 to limit volatility of Transpower's pricing; and
>
> that we will consider accumulating revenue and expenditure wash-up amounts, arising from forecast values we will initially set being different from actual values, to be carried forward and spread across RCP4.

The use of total forecast revenue

10.16 Transpower's proposal to use total forecast revenue (as opposed to forecast MAR) in determining the revenue path design for RCP3 requires Transpower to forecast pass-through costs, recoverable costs and forecast adjustments to the EV account as part of its RCP3 proposal.

10.17 We consider such an approach sensible, as forecast pass-through costs and recoverable costs can contribute significantly to pricing volatility throughout an RCP. Forecasting these additional revenue components can however be an issue, as they are largely out of Transpower's control, difficult to predict and therefore may create another layer of complexity.

10.18 We note that any differences arising from the actual costs being different from the forecast pass-through costs and forecast recoverable costs will be washed-up in the EV account and applied to Transpower's total forecast revenues when they are updated at the end of RCP3.

---

[249] The EV account is used to account for under/over-recovered revenues until the next available pricing year, with balances carried forward being adjusted at the WACC rate. These balances include annual revenue path wash-up calculations and incentive calculations that have not yet been recovered from or returned to Transpower in revenue calculations.

[250] Above n 21, at [6.13-6.14].

Revenue smoothing

10.19 Transpower's total forecast revenue for RCP3 can be smoothed:[251]

10.19.1 across individual years in RCP3 (**intra-period smoothing**) – ie, any fluctuations in the total forecast revenues as a result of varying yearly forecast values of building blocks and pass-through and recoverable costs would initially be smoothed across RCP3 at the time that we first set the revenue path in 2019; and/or

10.19.2 potentially, between the last year of RCP2 and the first year of RCP3 and/or between the last year of RCP3 and the first year of the subsequent regulatory period (RCP4) (**inter-period smoothing**) – ie, to close any potential step changes between regulatory periods.

10.20 We consider Transpower's proposed approach to intra-period smoothing sensible, as it contributes to pricing predictability. We note, however, that Transpower has not proposed any form of inter-period smoothing, and this is a more complex issue. Total forecast revenues for both Transpower's HVAC and HVDC networks have step changes of varying magnitudes in between RCP2 and RCP3 as well as between RCP3 and an indicative revenue path for RCP4.

10.21 Any estimates of step changes in transitioning from RCP3 to RCP4 at this early stage can only be preliminary and come at a high level of uncertainty. This is driven by uncertainty in future expenditures, but potentially even more by uncertainty in future WACC rates, as these can move Transpower's total forecast revenues significantly in both directions. For example, as can be seen in Figure 6, if the WACC returns to historical levels in RCP4, this may add another $100 million (nominal) to Transpower's annual total forecast revenue.

10.22 Table 15 shows the step changes in total revenue between RCP2 and RCP3 as proposed by Transpower and those between RCP3 and RCP4 based on Transpower's early modelling of RCP4 total forecast revenues (indicative only). To illustrate the uncertainty in step changes when transitioning to RCP4, it also shows the indicative step changes if the WACC returned to historical levels in RCP4.

[251] For more background information on revenue smoothing, see our process, framework and approach paper (above n 21, at Chapter 6).

Table 15 Step changes in total forecast revenues between RCPs (nominal)

	RCP2 to RCP3	RCP3 to RCP4 (if we used the estimated RCP3 WACC in RCP4)	RCP3 to RCP4 (if we used the RCP2 WACC in RCP4)
HVAC network	(2.6%)	+3.9%	+13.3%
HVDC network	(29.7%)	+2.8%	+11.0%

10.23 If we applied inter-period revenue smoothing in transitioning from RCP2 to RCP3, this would result in higher initial total forecast revenue than Transpower has proposed – ie, Transpower's customers would not benefit immediately from the 2.6% reduction in 2020-21, but would instead benefit over the course of RCP3, through smaller annual increases than the 1.3% Transpower has proposed. This would produce a larger step change between RCP3 and RCP4 irrespective of how the WACC rate turns out.

10.24 Partially closing the step changes in transitioning from RCP3 to RCP4 would have the reverse effect – ie, lower initial total forecast revenue followed by a higher rate in annual revenue growth, and a larger-than-forecast step change transitioning between RCP2 and RCP3 (assuming that the rate of change between each year of RCP3 is constrained to be the same).

10.25 Figure 8 and Figure 9 below show the difference between the proposed HVAC revenue path and illustrates the issue of closing the step change between RCP2 and RCP3 by inter-period smoothing. Closing this step results in a lower RCP3 ending revenue and, as a consequence, a lower starting revenue in RCP4 produces greater year-on-year price changes throughout that RCP (although a larger step between RCP3 and RCP4 could potentially be used instead).

Figure 8 Proposed HVAC revenue path showing year-on-year change

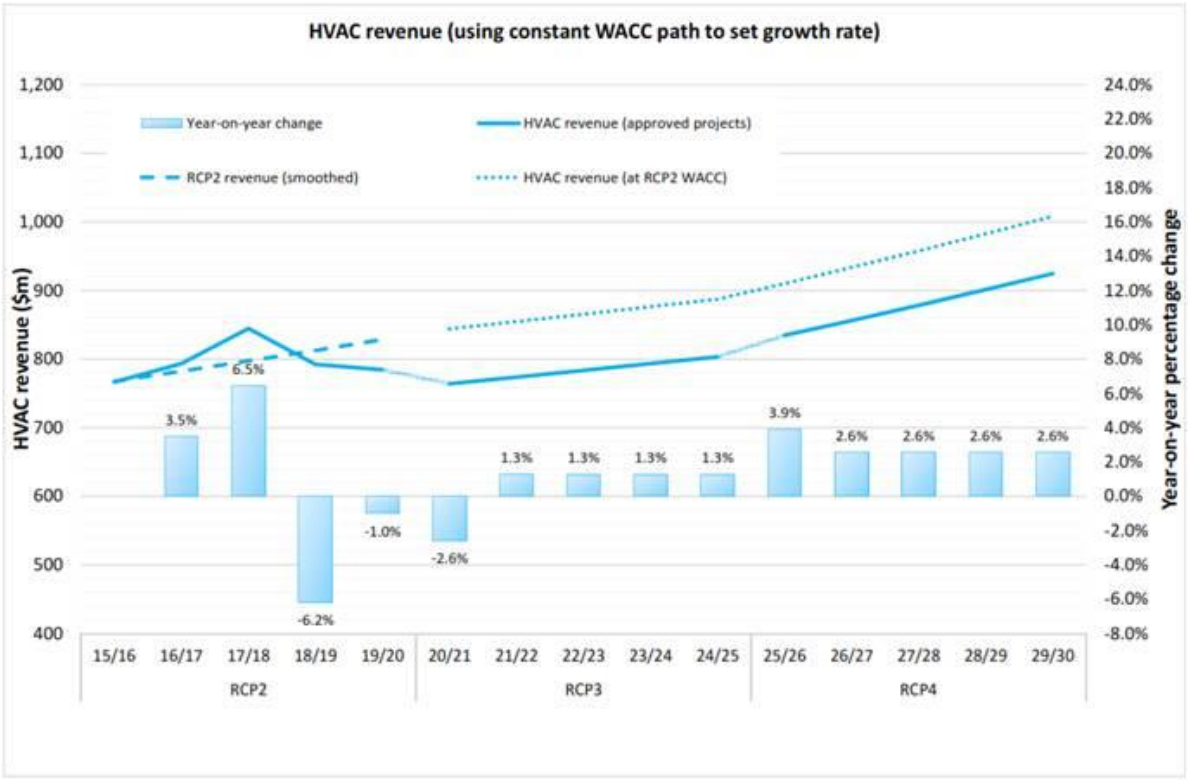
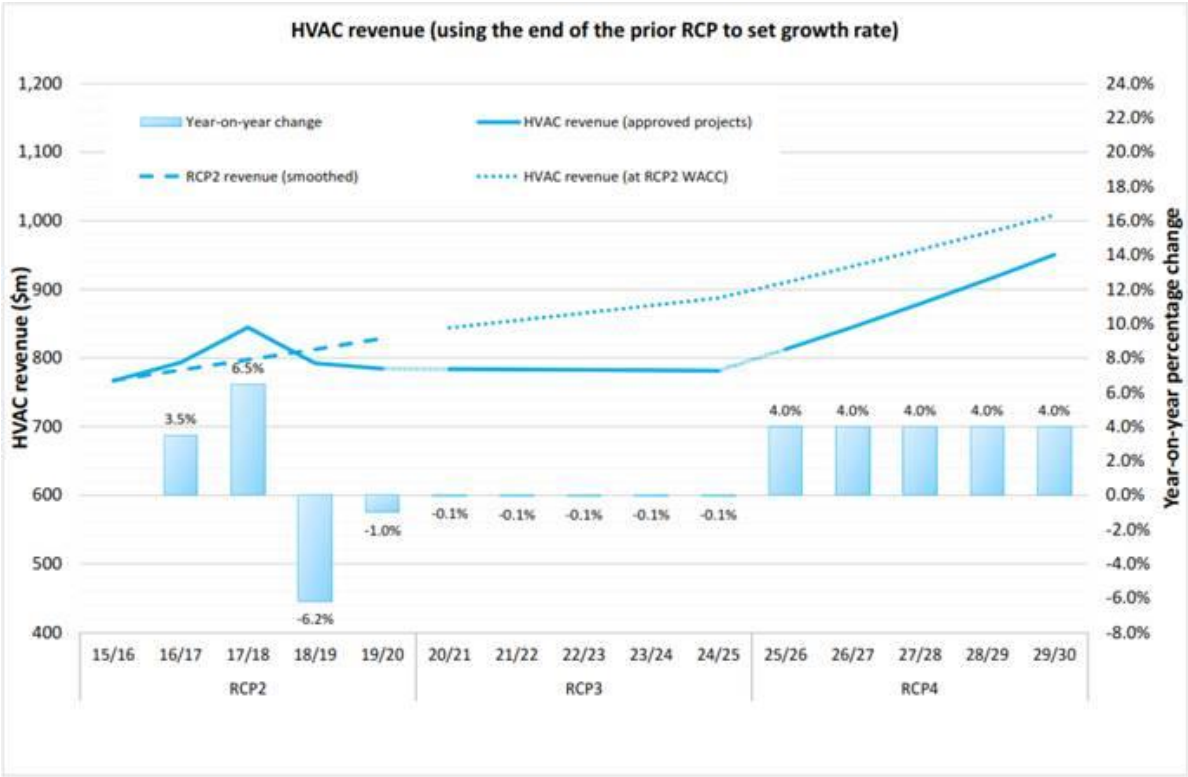


Figure 9 HVAC revenue path with RCP2-RCP3 step closed



Accumulating wash-up amounts until the subsequent RCP

10.26 We see merit in Transpower's proposal to move to an approach where wash-up amounts and annual incentive amounts are accumulated for RCP3 in the EV account, but with its balance only applied to Transpower's total forecast revenues when we reset the IPP for RCP4 in 2024 (as opposed to the current practice of annual updates).

10.27 Such an approach could reduce IPP compliance costs and further contribute to pricing predictability during RCP3.

10.28 As Transpower has identified, the practical implementation issue that may arise is a build-up of the EV account balance (in favour of either Transpower or its customers) to levels that could be more likely to result in price shocks when we set Transpower's total forecast revenues for RCP4.

10.29 We see value in Transpower annually disclosing information that would give its "customers advance warning of the revenue impact of accumulated EV account entries and of the resulting revenue that is likely to be applied under the transmission pricing methodology".[252]

We seek your views on Transpower's proposed revenue path design

10.30 We welcome your views on how Transpower's revenue path should be designed for RCP3.

10.31 We are particularly interested to hear whether you consider we should aim to design it in a way that reduces pricing volatility in the regulatory period, as well as between regulatory periods. Some questions we would like you to consider in preparing your submission are:

10.31.1 Should Transpower's revenue path be based on its forecast total revenues, which would build in estimates of (and smooth the impact of) future pass-through costs and recoverable costs?

10.31.2 Should we do anything in the design of the revenue path to address the step changes in Transpower's total forecast revenues in transitioning from RCP2 to RCP3 and/or RCP3 to RCP4?

[252] Above n 69, at 49.

10.31.3 Should Transpower carry forward wash-up amounts and annual incentive amounts that build up in the EV account during RCP3, with a view to then applying the balance on a smoothed basis across RCP4 (as opposed to doing annual total forecast revenue updates during RCP3)?

10.31.4 If those adjustment balances build up to become significant[253] (in favour of either Transpower or its customers) during the RCP, is it necessary to have any mechanism under the RCP3 IPP that would allow for an annual forecast MAR update to release some or all of the EV account balance into a reset of the total forecast revenues for the remaining years of RCP3?

[253] Such that the application of the EV balance to Transpower's total forecast revenue could potentially result in price shocks when we set the revenue path for RCP4.

Attachment A Insurance

Purpose of this attachment

A1 This attachment expands on Chapter 8: Operating expenditure and considers Transpower's forecast insurance opex expenditure in more detail. This issue is discussed separately from opex due to its specialised nature. In particular, it was outside the Verifier's area of expertise.

A2 Transpower's insurance coverage is an element of its risk management strategy. Expenditure within this category will influence risk and, as with all opex, it will directly affect Transpower's revenue.

A3 We seek your views on Transpower's insurance approach, and what you would expect of a prudent transmission operator.

Insurance coverage

A4 Transpower's insurance coverage is provided through a combination of externally insured policies and self-insured policies. Transpower's self-insured policies are insured through its subsidiary captive insurer, Risk Reinsurance Limited (**RRL**).

A5 Transpower has set out its approach to obtaining insurance:[254]

- we purchase insurance cover from external insurers for our key risks, to a prudent level and where insurance cover is available at reasonable cost, and
- we self-insure (through our captive insurer, Risk Reinsurance Limited – RRL) where risks are small, where market-based cover is unavailable or expensive, and where we think we have a better understanding of the risks than the market and can therefore price the risk more accurately and lower than an external insurer.

A6 We understand that a benefit of maintaining a captive subsidiary is that it enables Transpower to negotiate better terms on insurance coverage that it places on the external market.

A7 Transpower's proposed insurance opex includes amounts for brokerage fees and Fire Service Levy, as well as premiums for the following policies:[255]

Externally insured cover

A7.1 Material damage and business interruption (**MDBI**);

[254] Above n 69, at [8.3.1].
[255] Above n 69, at [8.3.6].

A7.2 HVDC submarine cables;

A7.3 General third-party liability;

A7.4 Directors and officers;

A7.5 Minor policies (such as vehicle, travel and marine cargo);

Self-insured cover

A7.6 Under-deductible HVDC submarine cables and internal electrical breakdown;

A7.7 MDBI under-deductible;

A7.8 Transmission lines and underground cables;

A7.9 Consumer Guarantees Act; and

A7.10 Cyber risk.

Transpower is proposing a 22% increase in insurance opex

A8 Transpower is proposing a 22% increase ($16 million) in insurance opex expenditure ($88.0 million) compared to RCP2 ($72.0 million).[256] This will provide coverage of approximately $1 billion, including for damage to assets and liability to third parties.[257]

A9 The forecast is based on actuarial and broker advice to Transpower, and can be described under a base-step-trend approach as:[258]

A9.1 Taking 2017/18 as a base year provides a base expenditure of $78.1 million;

A9.2 A step change of $2.7 million is estimated from expected legislative changes that will result in an increase to the FENZ Levy; and

A9.3 Trend changes amount to a forecast increase of $7.2 million across RCP3.

A10 Transpower considers that the change from RCP2:[259]

> is primarily driven by forecast movement of premiums from historical lows back to historical averages, the impact of Transpower's actual loss experience on actuarial forecasts and inclusion of new risks, such as cyber insurance and lower deductibles on several policies.

[256] Above n 69, at [8.3.6].
[257] Above n 69, at [8.3].
[258] Above n 69, at [8.3.6].
[259] Above n 69, at [8.3.6].

Verifier views on Transpower's insurance opex

A11 At a high level, the Verifier considers Transpower to be acting prudently in managing network risk exposures through insurance programmes, and that it would expect a prudent network services provider to take a similar approach using both externally provided insurance and self-insurance. However, as the Verifier did not possess actuarial expertise, it was not within its terms of reference to form a view whether Transpower's insurance opex is consistent with GEIP.

Our views on insurance opex

A12 Transpower has provided us with opinions from a broker (regarding externally insured or reinsured policies) and an actuary (regarding policies insured through RRL), which consider the premiums paid for the various policies. We are reviewing these opinions and will form a view on the efficiency of the insurance opex.

A13 We did not set out a specific approach to assessing insurance opex expenditure allowances, separate from that for other opex, in our process, framework and approach paper. We will therefore apply the same framework as for opex generally, as described in Chapter 8.

A14 While we are comfortable that a prudent transmission business would take steps to insure key assets (whether externally or by self-insurance) we have not yet formed a view on whether Transpower's insurance coverage meets that test and, in particular, whether the assets insured and level of coverage are efficient.

A15 There is also a question of whether the forecasts and estimates underlying Transpower's trend increase are reasonable. We do not yet have a view on the reasonableness of the estimated asset base growth, and repair and replacement cost inflation, or the forecast increase in market rates for insurance. The step change attributable to the forecast increase in the FENZ levy is particularly difficult to assess given the uncertainty surrounding it. We understand that other businesses are also affected by the expected changes to the FENZ levy and are likely to be making their own contingencies.

A16 Transpower has indicated that it may insure a risk through RRL where it understands that risk better than the external insurance market and can price more efficiently. Where this results in lower premiums, this efficiency gain would be shared with consumers through the opex savings.

A17 For policies retained within RRL, there is a question of whether Transpower's opex expenditure should be benchmarked against the premium it pays to RRL, or against the expected value of loss experienced by Transpower, to the extent there is any difference.

A18 We are open to engaging an appropriate expert if, after reviewing submissions, we consider a second opinion on the actuarial and/or broker forecasts is required, and consistent with proportionate scrutiny principle.