

Final decision on Transpower's Central Park Wilton B Line listed project

[2017] NZCC 16

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Purpose of this paper

1. This paper explains our final decision to approve an additional \$10.6 million base capex for Transpower's Central Park Wilton B reconductoring listed project.

Our final decision

2. On 2 March 2017 Transpower New Zealand Limited (Transpower) submitted an application seeking an increase in its base capex allowance to reductor the Central Park Wilton B line (application).^{1,2} Transpower plans to complete this project by the summer of 2019.
3. This project was included in Transpower's Individual Price Quality Path for RCP2 (IPP)³ as a listed project because it was not sufficiently certain at the time of setting the IPP. At the time the IPP was set Transpower estimated the cost of the project at \$26m.
4. Following detailed investigation and scoping, in March 2017 Transpower submitted a listed project application, estimating the cost of project at \$11.3 million. However, given uncertainties it considered that it could cost up to \$12.4 million and requested that we approve that amount.
5. Our draft decision was to increase Transpower's base capex allowance by \$9.8 million. In reaching the draft decision we reduced Transpower's estimate by netting-off project costs that we considered were already included in the base capex allowance set in 2014, adjusting the allowance for uncertainties (allowing costs at the 50th percentile (P50), rather than the 90th), and revising inflation and financing costs.
6. In its submission on our draft decision, Transpower revised its estimate to \$10.6 million. Transpower agreed with most of our draft decision, but not with our adjustments for overheads, inflation and financing costs. We also received submissions from Meridian and MEUG, which agreed with our draft decision.
7. After considering submissions, our final decision is to increase the base capex allowance by \$10.6 million. This is in line with Transpower's revised estimate that it provided as part of its submission on our draft decision with upward adjustments for overheads, inflation and financing costs compared to our draft decision. We explain our reasons for these uplifts from our draft decision below.

¹ A summary of the proposed project is provided in Attachment A.

² Transpower, "Central Park – Wilton B reductoring: Listed project application", February 2017. Transpower's application and supporting documents are available on our website: <http://www.comcom.govt.nz/regulated-industries/electricity/electricity-transmission/transpower-individual-price-quality-regulation/transpowers-price-quality-path-from-2015-to-2020/>.

³ Transpower Individual Price Quality Path determination 2015 [2014] NZCC 35, clause 12, Schedule I, see: <http://www.comcom.govt.nz/regulated-industries/electricity/electricity-transmission/transpower-individual-price-quality-regulation/transpowers-price-quality-path-from-2015-to-2020/>.

8. This decision increases Transpower’s base capex allowance for the regulatory period 1 April 2015 to March 2020 (RCP2) under the provisions for allowing additional funding for listed projects set out in the IPP and the Transpower Capital Expenditure Input Methodology Determination (Capex IM).⁴

Table 1.1 | Final decision on adjustment to base capex allowance

Base capex allowances*	Years ending:	30 June 2017	30 June 2018	30 June 2019
Current RCP2 allowance		249.5	242.0	231.6
Additional allowance		-	1.0	9.6
Amended allowance		249.5	243.0	241.2

*\$m in nominal prices

9. Table 1.1 shows forecast capex for this project being commissioned in the 30 June 2018 disclosure year of \$1 million, and forecast capex being commissioned in the 30 June 2019 disclosure year of \$9.6 million.

The regulation that applies to Transpower

10. We regulate the services that Transpower supplies to consumers under Part 4 of the Commerce Act 1986 (Act).⁵ We determined the price and quality requirements that apply to these services in the Transpower Individual Price Quality Path for RCP2 (IPP).
11. When setting the IPP we approved amounts of base capex for all of the disclosure years of RCP2, but excluded certain ‘listed projects’ from the base capex allowance.
12. We included five transmission line reconductoring base capex projects as ‘listed projects’ in the IPP.⁶ These projects were classified as listed projects because at the time of the RCP2 reset:
- 12.1 their costs were expected to exceed \$20 million;
 - 12.2 the projects involved asset replacement and/or asset refurbishment; and
 - 12.3 the commissioning dates were anticipated to be within the regulatory period but could not be forecast with specificity.⁷

⁴ Transpower Capital Expenditure Input Methodology Determination [2012] NZCC 2, clause 3.2.4, available at <http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/transpower-input-methodologies/>.

⁵ The service that Transpower provides is the transport of electricity through the transmission network also known as the national grid. The national grid connects large generators of electricity to large electricity consumers and electricity distribution businesses, who then connect to smaller electricity consumers.

⁶ These projects are listed in Schedule I of the IPP.

13. The rules relating to listed projects are set out in the Capex IM. Under the Capex IM Transpower may seek approval for additional base capex for listed projects in RCP2.⁸
14. The Capex IM requires Transpower to seek approval for additional base capex for listed projects before the end of June 2018.⁹
15. When seeking approval Transpower must, among other things, outline its proposed investment, the justification for the investment, the options it has considered, and the costs and benefits of the investment options.¹⁰
16. We may then, at our discretion, approve an additional amount of base capex for the listed project over the remaining years of RCP2, following an evaluation in accordance with the relevant evaluation requirements in the Capex IM.¹¹
17. When we listed this project in the IPP, Transpower had estimated the project to cost \$26m. We are satisfied that the project does not cease to be a listed project even though the revised cost estimate and additional base capex applied for is less than the \$20m threshold for listed projects. Our reasons for this view are set out in paragraphs A8 to A10 of Attachment A.

Our Evaluation framework

18. The Capex IM sets out the evaluation framework for assessing listed projects. This framework is outlined in Attachment B and requires us to focus on three key areas of assessment. We must:
 - 18.1 assess whether Transpower has complied with the consultation requirements in the Capex IM;¹²
 - 18.2 evaluate the application using the criteria in clause 6.1.1 of the Capex IM applicable to a base capex project that qualifies as an identified programme under the Capex IM;¹³ and
 - 18.3 apply the same CPI and FX values as used for the RCP2 proposal.¹⁴

⁷ Capex IM, clause 2.2.3.

⁸ Capex IM, clause 3.2.4(1) and "Setting Transpower's individual price-quality path for 2015-2020 Final decision and reasons, 29 August 2014, par 2.21.

⁹ Capex IM, clause 3.2.4(1).

¹⁰ The information we require is set out in clause 3.2.4(2) and Schedule G of the Capex IM.

¹¹ At least 22 months before the end of RCP2 – Capex IM, clause 3.2.4(4).

¹² Capex IM, clause 3.2.4(4) (a).

¹³ Capex IM, clause 3.2.4(4)(b). These include, inter alia, whether Transpower has met the Input Methodology requirements, the extent what is proposed will promote the Part 4 purpose of the Act, and the relevant criteria in Schedule A of the Capex IM.

19. We have analysed Transpower’s proposal against this framework to reach our final decision. Attachment C provides a summary of our analysis using this framework.

Summary of reasons for our decision

20. Transpower’s application sought an additional allowance of \$12.4 million for the project, including investigation costs and overheads.¹⁵ This amount estimated the costs of the project at the 90th percentile (P90) to allow for uncertainties.

21. Our draft decision was to allow \$9.8 million additional base capex. In reaching our draft decision we revised Transpower’s proposed estimate to net-off the costs of the project that we considered were already included in the base capex allowance set in 2014 (project overheads and investigation costs), adjusted the allowance for uncertainties (allowing costs at the P50 rather than P90), and revised inflation and financing costs.

22. In response to our draft decision, Transpower revised its estimate down to \$10.6 million. This amount estimated the costs of the project at P50, excluded investigation costs already included in the base capex allowance set in 2014 (but maintained that we should include an allowance for project overheads in our final decision), and re-calculated inflation and financing costs as a result of the changes in real costs.

23. Our final decision to increase the base capex allowance by \$10.6 million is due to inclusion of project overheads in real costs and slight increases of the inflation and financing costs, compared with our draft decision. The components of our final allowance are broken down in Table 1.2 below.

Table 1.2 | Summary of determination of allowance (\$ millions)

	Our draft decision	Our final decision
Real costs	9.22	9.91
Inflation	0.36	0.46
Financing costs	0.25	0.26
Nominal costs	9.83	10.63

¹⁴ Capex IM, clause 3.2.4(5).

¹⁵ We note that this project was estimated to cost \$26m at the time that we set the IPP for RCP2.

24. The reasons for the difference between our draft decision and our final decision on the additional base capex amount are:
- 24.1 We have allowed \$692,506 for Transpower's overheads as we have accepted that they were not provided for in the RCP2 allowance, as we initially thought. This change has some flow on effects for the inflation adjustment and financing costs.
 - 24.2 We have also changed the inflation calculation from being based on 2017 costs to December 2016 costs. This resulted in a slight increase in the base capex allowance from our draft decision to our final decision. The reasons for this change are explained in Attachment C.
 - 24.3 We have also changed our calculations for inflation costs and financing costs from using an annual rate to smoothing the annual rate on a quarterly basis. We consider that such an approach more appropriately matches Transpower's cash flows. We expect that such an approach would be an appropriate basis to determine the base capex allowance for each disclosure year in RCP3. We discuss this further in C6 to C8.
25. In approving the additional base capex for this project, we are satisfied that:
- 25.1 Transpower has met its consultation obligations and taken these into account when developing options;
 - 25.2 Transpower has met the relevant Input Methodology requirements;
 - 25.3 Refurbishing this line is consistent with the purpose of Part 4 of the Act. In particular, keeping the line in good condition will provide the quality of service consumers expect;
 - 25.4 Transpower considered a number of alternatives and selected the one with an appropriate balance between whole of life costs and expected service performance. The selected investment is also the option with the highest net electricity market benefits;¹⁶ and
 - 25.5 Our final decision uses the same CPI and FX rates as used for the RCP2 proposal.

¹⁶ Transpower "Central Park – Wilton B Reconductoring – Listed project application, Table 4-1, page 14.

Key points raised in submissions

26. We received submissions from MEUG, Meridian and Transpower. We did not receive any cross-submissions.
27. MEUG and Meridian supported our draft decision.¹⁷ Transpower mostly supported our decision, but disagreed on some aspects.
28. While Transpower agreed with our draft decision to exclude investigation costs from the listed project allowance on the basis that they were included in the base capex allowance for RCP2, Transpower submitted that project overheads were not provided for in RCP2 base capex allowance.¹⁸ We have considered Transpower's explanation and we are satisfied that project overheads for listed projects were not included as part of the base capex allowance set in 2014. We have therefore decided to allow the costs for project overheads in our final decision.
29. Transpower submitted that the costs are in 2016 terms, and more specifically, at December 2016.¹⁹ We note Transpower's submission and for our final decision we used December 2016 as our basis to determine inflation costs. This change also has a flow-on effect on the level of financing costs for the project.
30. Transpower also submitted that both inflation and financing costs should be determined on a quarterly basis. Transpower argued that using year end cash flows was not appropriate. Construction occurs over the summer, but using an annual rate for adjustments indicates that all construction cash flows occur on 30 June each year. Using a quarterly cash flow model provides a more accurate matching of cash flows to the expected construction timetable.²⁰
31. We agree with Transpower that a quarterly approach is more appropriate and provides a more accurate matching of cash flows. We consider that this approach is consistent with the Capex IM which specifies we must apply the same forecast CPI rates that were used to set the RCP2 base capex allowance.²¹ Given this, we used a quarterly approach to determine inflation and financing costs based on our estimate of real costs. We also expect that this approach will be an appropriate basis to determine the base capex allowance for each disclosure year for RCP3.

¹⁷ References to MEUG and Meridian submission.

¹⁸ Transpower submission, page 2.

¹⁹ Transpower submission, page 3.

²⁰ Transpower submission, page 3.

²¹ Smoothing an annual inflation rate or interest rate on a quarterly basis should not provide a different rate than using an annual rate. If we take the product of the quarterly inflation rates in Transpower's cost model, it results in the same annual inflation rates for each disclosure year as provided in RCP2.

Issues raised that may be relevant to our current review of the Capex IM

32. Submissions raised a number of issues that may be relevant for us to consider as part of our current review of the Capex IM.²²
33. Transpower suggested that if listed projects are approved at P50, then a tailored incentive rate for each individual project should apply to reduce any risk for consumers or Transpower.²³
34. NZIER, on behalf of MEUG, submitted advice on how Transpower might provide better estimates of the cost effect on consumers.²⁴ MEUG also suggested that customers should be advised of expected increases against clearly indicated additional benefits as a result of the investment.²⁵
35. MEUG suggested that we should consider the impact of the value of the discount rate in ranking different options, because it may make a difference for future projects (although it does not make any difference for this listed project).²⁶ We note that the Capex IM sets out the discount rates, and requires Transpower to consult on the discount rate for a particular project.

²² For more information about the current review of the capex IM, see: Commerce Commission “Transpower capex input methodology review: Proposed focus areas for the capex IM review” (15 May 2017)

²³ Transpower page 2.

²⁴ NZIER, and MEUG para 5.

²⁵ MEUG submission para 6.

²⁶ MEUG submission para 7.

Attachment A: Overview of Central Park Wilton B project

- A1 The thick pale blue line in the figure shows the Central Park Wilton B line.
- A2 The Central Park/Wilton B line is one of the two transmission lines supplying electricity to the Wellington CBD and the Southern suburbs via Wellington Electricity's distribution network. The line also connects Meridian's West Wind generation to the transmission grid.

- A3 The line capacity is 235 MVA.
- A4 The line is a 12.5 km 110 kV double circuit line and consists of 31 steel circuit towers. The line was commissioned in 1978.



- A5 The scope of the project is to replace the conductors attached to 26 towers on this line which comprises 11.7 km of the line.
- A6 Transpower has determined that the conductors on the first five towers out from Central Park have at least 10 years of remaining life so do not need to be replaced as part of this project.²⁷
- A7 Following detailed investigation and scoping, the estimated cost of this project reduced from approximately \$26m to \$10.6m.
- A8 We are satisfied that the project does not cease to be a listed project because the revised cost estimate is less than the \$20m threshold for listed projects.
- A9 The Capex IM requires listed projects to be identified before the IPP is set for a RCP.²⁸ The relevant projects are listed in the Schedule 1 of the IPP and the circumstances in which they cease to be a listed project are set out in cl 12.2 of the IPP. A project ceases to be a listed project when that project no longer meets the definition of a base capex project or programme during the RCP. The only practical circumstance where that is likely to arise is when the project or programme becomes a major capex project or the project need is deferred until after the current RCP.
- A10 We therefore consider that Transpower can apply for additional funding for this project as we are satisfied it remains a listed project.

²⁷ Transpower expect the savings from deferring the project are expected to significantly exceed the extra project establishment and management costs that will be incurred.

²⁸ Clause 2.2.3.

Attachment B: Evaluation framework

- B1 In this Attachment, we outline the framework for evaluating listed projects as set out in the Capex IM. The Capex IM has set out these criteria in a number of sections and in this Attachment we bring them together and show the interrelation between the various clauses.
- B2 Under the evaluation requirements for a listed projects, set out in the Capex IM, we must:
- B2.1 confirm that Transpower has met its consultation requirements;
 - B2.2 confirm that Transpower has applied the specified escalation and foreign exchange rates; and
 - B2.3 evaluate the application using the criteria in clause 6.1.1 applicable to a base capex project that qualifies as an identified programme under the Capex IM.²⁹

Consultation requirements

- B3 The Capex IM sets out consultation requirements for Transpower and the Commission. We are required to seek the views of interested parties on our draft decision.³⁰
- B4 Our evaluation included assessing that Transpower has met the consultation requirements set out in the Capex IM.

Consultation requirements for Transpower

- B5 The Capex IM requires Transpower to consult with interested parties on listed projects. Consultation must be commensurate with the nature, complexity, impact and significance of the project. These rules are set out in clauses 3.2.1 and 8.1.2 of the Capex IM respectively.

3.2.1 Base capex projects or programmes with forecast cost of greater than \$20 million

In respect of a base capex project or base capex programme involving forecast capital expenditure of greater than \$20 million Transpower must, prior to undertaking the project or programme, undertake-

- (a) a cost-benefit analysis consistent with determining expected net electricity market benefit; and
- (b) consultation with interested persons in accordance with clause 8.1.2.

²⁹ Capex IM, clause 3.2.4(4).

³⁰ Capex IM, clause 8.1.1(3).

8.1.2 Base capex projects or programmes forecast to cost more than \$20 million

For the purpose of clause 3.2.1(b), consultation by Transpower with interested persons must be-

- (a) of a scope commensurate with the proposed project's or programme's nature, complexity, impact and significance; and
- (b) undertaken by Transpower acting in accordance with the policies and processes specified in its base capex proposal.

Specified escalation and foreign exchange rates

- B6 The Capex IM specifies that to approve additional base capex for a listed project, we must apply the same forecast CPI rate and forecast FX rates that were used to set the RCP2 base capex allowance.³¹
- B7 When reviewing Transpower's application we confirmed that Transpower used the forecast rates specified in the Capex IM.

The relevant criteria set out in clause 6.1.1

- B8 Clause 3.2.4(4)(b) of the Capex IM requires that we assess a listed project proposal against the criteria in cl 6.1.1 that would apply if the application was part of the base capex proposal and the listed project was an identified programme. Clause 6.1.1(2) and (3) require that we consider:
- B8.1 whether the proposal is consistent with the Capex IM and Transpower Input Methodologies;
 - B8.2 the extent that the proposal will promote the purpose of Part 4 of the Act;
 - B8.3 whether, the data, analysis, and assumptions underpinning what is proposed are fit for the purpose of the Commission exercising its powers under Part 4 of the Act, including consideration as to the accuracy and reliability of data and the reasonableness of assumptions and other matters of judgement;³² and
 - B8.4 that we evaluate a **base capex proposal** in accordance with Schedule A.³³

Evaluation against Schedule A

- B9 Schedule A1 of the Capex IM sets out the requirements for general evaluation of base capex proposals while Schedule A2 sets out the requirements for evaluating identified programmes.

³¹ Capex IM, clause 3.2.4(5).

³² Capex IM, clause 6.1.1(2).

³³ Capex IM, clause 6.1.1(3).

- B10 Not all of the criteria in Schedule A1 are directly relevant to Transpower's proposal as Schedule A1 is designed to be used when considering a full base capex proposal – not an individual project. For example, Schedule A1(h) requires us to have regard to the overall deliverability of the base capex during the regulatory period. This is unlikely to be relevant to a specific project, except in circumstance where the project is sufficiently large to impact on the overall deliverability of the base capex package. Most of these criteria have also been thoroughly traversed as part of our reset process and they also overlap with the criteria in Schedule A2 in certain instances.
- B11 We have therefore focussed our evaluation of the proposal against the criteria in Schedule A2 rather than Schedule A1.
- B12 The sub-clauses setting out the specific areas of evaluation in Schedule A2 are listed in paragraph C19 of this final decision.

Attachment C: Summary of our evaluation

Purpose of this Attachment

- C1 In this attachment we explain our evaluation of the application using the framework outlined in Attachment B.

Transpower has met the consultation requirements

- C2 Transpower is required to consult with interested parties on listed projects, to the extent commensurate with the nature, complexity, impact and significance of the project.³⁴
- C3 In June 2015, Transpower consulted on its long list of options and invited interested parties to propose other options not in that list.³⁵
- C4 In December 2016, Transpower consulted a second time on its investment proposal. Meridian and Wellington Electricity (WE) submitted on it and both supported the proposal. WE also reiterated that Transpower should minimise the risk to Central Park security during construction and to engage with them when planning to mitigate the risks of interruptions.³⁶ Meridian submitted that Transpower should coordinate all maintenance work on the line during the reconductoring.³⁷ Meridian also submitted on this in response to our draft decision.
- C5 We are satisfied that Transpower has met its obligations to consult with interested parties through these two rounds of consultations.

Escalation and foreign exchange rates

- C6 Transpower used the following cost escalators in this listed project application:
- C6.1 changes in the general rate of inflation as measured by CPI; and
- C6.2 changes in foreign exchange rates, such as USD to NZD for materials used in the current listed project.
- C7 Under the Capex IM, we must apply the forecasts for escalation factors used to determine the RCP base capex allowance.³⁸ Therefore, in assessing the allowance for

³⁴ Capex IM, clauses 3.2.1 and 8.1.2.

³⁵ Transpower “Central Park-Wilton B Transmission Capacity investigation – long list consultation and non-transmission solution request for information (April 2015)”. Web page address on 7 March 2017 <https://www.transpower.co.nz/central-park-wilton-investigation-consultation#downloads>.

³⁶ Transpower “Attachment E Central Park-Wilton B Reconductoring – WE Submission”, January 2017.

³⁷ Transpower “Attachment F Central Park-Wilton B Reconductoring – Meridian Submission”, January 2017.

³⁸ Capex IM, clauses 3.2.4(4) and 3.2.4(5).

this project, we must use the forecast CPI and forecast FX determined when we set the IPP in 2014. We are also satisfied that Transpower has met this requirement.³⁹ The applicable forecast CPI and forecast FX rates are shown in Table C1 below:

Table C1 | CPI and FX used in the CPK WIL application

	1 July 2015 to 30 June 2016	1 July 2016 to 30 June 2017	1 July 2017 to 30 June 2018	1 July 2018 to 30 June 2019	1 July 2019 to 30 June 2020
CPI	1.80%	2.09%	2.06%	2.03%	2.00%
USD to NZD exchange rate	0.79	0.77	0.76	0.74	0.72

- C8 We used 2017 prices to arrive at our draft decision. In response to our draft decision, Transpower confirmed that the costs are costs at December 2016. We reflected this change in our final determination of inflation costs. This led to a slight increase of \$0.10 million.
- C9 We previously indicated that Transpower determined CPI on a quarterly basis (using a geometric mean). This approach resulted in a slight overestimation of inflation. The driver for this overestimate was that we used 2017 costs and Transpower used 2016 costs.
- C10 In considering Transpower’s submission and supporting calculation of its revised estimate, we now agree that Transpower’s quarterly approach is more appropriate and provides a more accurate matching of cashflows. We consider that this approach is consistent with the Capex IM which specifies we must apply the same forecast CPI rates that were used to set the RCP2 base capex allowance.
- C11 If we take the product of the quarterly inflation rates in Transpower’s cost model, it results in the same annual inflation rates for each disclosure year as provided in RCP2. So, smoothing an annual inflation rate on a quarterly basis does not provide a different rate than using an annual rate.
- C12 Given this, we used a quarterly approach to determine inflation costs (and financing costs) based on the Commission’s estimate of real costs.
- C13 We also expect that this would be the appropriate basis to determine the base capex allowance for each disclosure year for RCP3.

³⁹ Transpower’s application, Attachment G “CPK_WIL annual cost summary”, see assumptions.

Results of evaluation against the criteria set out in clause 6.1.1

C14 In the following paragraphs, we provide a summary of our evaluation of the application against the criteria set out in clause 6.1.1 of the Capex IM. As mentioned in paragraph B8 above, these are:

- C14.1 whether the proposal is consistent with the Capex IM and Transpower input methodology;
- C14.2 the extent that the proposal will promote the purpose of Part 4 of the Act;
- C14.3 whether, the data, analysis, and assumptions underpinning what is proposed are fit for purpose; and
- C14.4 an evaluation in accordance with Schedule A of the Capex IM, as if the listed project was part of a base capex proposal.

The application is consistent with the Input Methodologies

- C15 In making our decision, we are required to consider the consistency of the application with the relevant input methodologies.⁴⁰ In analysing the application we have focused on assessing whether Transpower has provided the information specified in the Capex IM and the certification requirements.
- C16 We are satisfied that the application is consistent with the relevant input methodologies. Transpower has met the information and certification requirements of the Capex IM.
- C17 Transpower has provided a certified copy of the extract of the minutes of a meeting of the Board of Directors held on 23 February 2017 and the CEO's certification.⁴¹

The application promotes the purpose of Part 4 of the Act

- C18 We consider that Transpower's proposed investment is in the long term interest of consumers. Replacing conductors that are corroding will improve the condition of the line to the level suitable to provide the capacity and quality of service expected by the consumers serviced from this line.
- C19 The counterfactual of not investing is likely to increase the number of conductor failures and affect security of supply. A prudent operator would improve the condition of these assets to mitigate these risks. Conductor failures would result in reduced quality of supply. Broken conductors could also pose a risk to public safety.

⁴⁰ Capex IM, clause 6.1.1(2)(a).

⁴¹ Transpower "Attachment H Chief Executive Certification listed project",

Data, analysis and assumptions in the application are fit for purpose

- C20 We are satisfied that the data, analysis and assumptions provided by Transpower are fit for purpose. The main data relevant to our evaluation are:
- C20.1 data on condition assessment that determines the need for this project;
 - C20.2 assumptions and data on demand forecast that support Transpower's conclusion that the existing rating of this line is sufficient for the future; and
 - C20.3 analysis and data used for the investment test set out in the Capex IM.

Evaluation criteria set out in Schedule A

- C21 Base capex proposals are required to be evaluated in accordance with the evaluation criteria set out in Attachment A of the Capex IM.
- C22 Attachment A contains two key sets of criteria for the purposes of evaluating a base capex proposal:
- C22.1 Schedule A1 sets out factors that the Commission will have regard to in evaluating a base capex proposal as part of a reset; and
 - C22.2 Schedule A2 sets out factors that the Commission must evaluate when reviewing identified programmes.

Schedule A1

- C23 The factors in Schedule A1 of the Capex IM are primarily concerned with the evaluation of a full base capex proposal, as part of an IPP reset. We have had regard to these factors and do not consider that there are any new matters raised in this listed project proposal that necessitate further analysis than the analysis we undertook when we evaluated Transpower's base capex for RCP2 in 2014 (beyond those considered in our evaluation against the criteria in Schedule A2).

Schedule A2

- C24 Schedule A2 sets out the criteria for evaluating an identified project and states that in evaluating a base capex proposal, the Commission will undertake a review of each identified programme and such a review may include evaluation of at least the criteria set out in A2(a)-(j). We set out a summary of our evaluation against each criterion below.

(a) Whether policies regarding the need for the project and its priority demonstrate a risk-based approach consistent with good asset management practice

C25 Transpower's policy on managing transmission line conductors is in the document FS03 that Transpower supplied to us as part of its RCP2 proposal.⁴² This document sets out the policy on replacing ageing conductors. The relevant elements of the key policies on condition assessment of conductors and criteria for replacement are:

Conductor condition is assessed based on a combination of loss of section and loss of tensile strength. AAAC conductors are deemed to have reached replacement criteria at 15% loss of strength or section loss and at 10% for copper. For aluminium conductor with steel reinforcing (ACSR) conductors, the replacement criteria is set at 20% loss of tensile strength and 15% section loss. These values are generally in line with those used by other international utilities.⁴³

C26 The conductors in the Central Park Wilton B line are ACSRs, so the criteria for replacing ACSRs applies. Transpower used two tests to assess whether the conductors needed replacement. These are the Cormon test and close aerial survey.

C27 In the Cormon test, a device is attached to the conductor which self-propels along the conductor measuring the thickness of the steel reinforcing every 5 to 10 mm of the conductor length. The results of the Cormon test are used to estimate the remaining thickness of coating on the steel core of the ACSR conductors. These thicknesses enable engineers to determine the tensile strength of the conductor.

C28 The results of the Cormon test carried out in 2013 show 80-100% galvanising loss on approximately 44% of the spans tested.⁴⁴ The result indicates that the aluminium conductors in these spans will start to corrode within the next few years.

C29 The close aerial survey uses a helicopter to undertake an aerial survey of transmission lines.⁴⁵ This is the best method of identifying conductor bulges and markers.⁴⁶ Transpower undertook close aerial tests in 2011 and 2013. The results are in Table C2 below.

C30 The 2013 test results show an increased rate of conductor deterioration affirming that significant corrosion is starting.

C31 Transpower's policy of timing replacement to just before the conductor loses its tensile strength reflects a risk-based approach consistent with good electrical

⁴² The document is FS03 "TL conductors and insulators – Fleet Strategy", 16 October 2013.

⁴³ Transpower, "FS03 TL conductors and insulators – Fleet Strategy", 16 October 2013, page 23.

⁴⁴ Transpower 'CPK-WIL B Reconductor Attachment A – Condition Assessment; page 10.

⁴⁵ Transpower is also trialling drones as an alternative to helicopters

⁴⁶ A marker is an area of conductor that shows signs of decolourisation and is an indicator of imminent conductor bulging.

industry practice. We consider that the risk based approach is applied satisfactorily. The risk that Transpower is managing is to provide a balance between replacing the conductor too soon and letting the conductor deteriorate to the extent that it can break and drop onto the ground.

Table C2 | Results of close aerial survey

Year of test	Number of conductor bulges	Number of markers
2011	2	0
2013	20	110

(b) Whether other relevant policies and planning standards were applied appropriately

- C32 We are satisfied that Transpower applied the other relevant polices and planning standards appropriately.
- C33 Policies on transmission line towers and transmission line foundations are two other policies applicable to this project. In assessing the scope of this project, Transpower engaged AECOM, a consultant, to scope the project in line with all policies on transmission lines. The study concluded that four towers require minor strengthening⁴⁷ and that the existing tower foundations⁴⁸ do not require any strengthening.
- C34 The study also shows that parts of the tower structures are rusting. Transpower intends to fix these under its routine maintenance programme before reconductoring.⁴⁹
- C35 Other relevant policies or standards require considering Electro-magnetic field (EMF), noise, radio frequency interference levels and earth potential rise (EPR). AECOM studied these and concluded that EMF, noise, radio frequency interference levels for the reconducted line would be within the national and Wellington City Council limits.
- C36 AECOM identified potential issues with EPR and has identified mitigation measures for these to be implemented during construction.⁵⁰

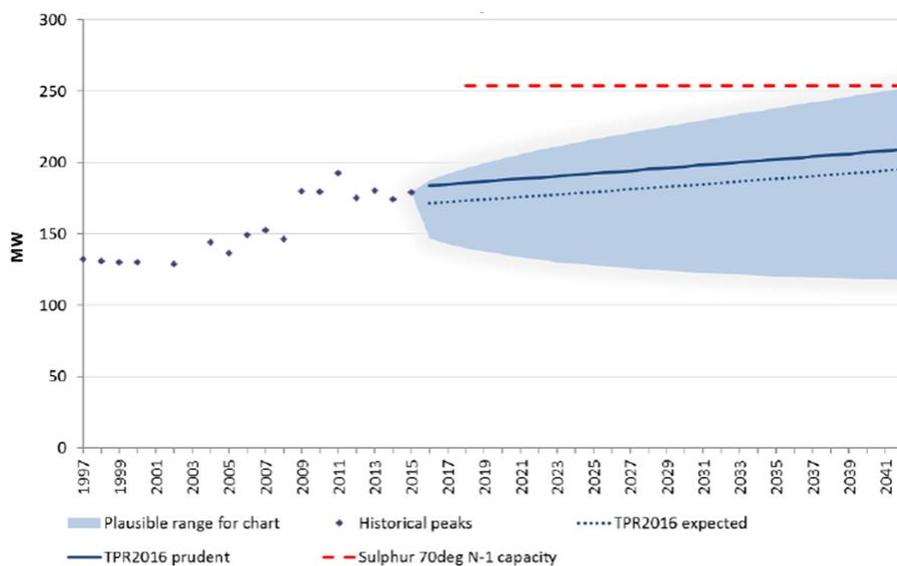
⁴⁷ AECOM, "CPK-WIL B Reconductoring Design Investigation and Constructability Report" 23 February 2017, page 10.

⁴⁸ AECOM "CPK-WIL B Reconductoring Design Investigation and Constructability Report" 23 February 2017, page 11.

⁴⁹ AECOM "CPK-WIL B Reconductoring Design Investigation and Constructability Report" 23 February 2017, pages i and ii.

- C37 The planning standard relevant to this project is that the capacity of the line should cater for expected growth in demand. Failure to do this may result in a solution that may not meet the future service requirements of this line.
- C38 The demand forecast used by Transpower, shown in Figure C1 below, confirms that the capacity of the line is sufficient to meet expected demand to beyond 2040. This confirms that the proposal to maintain the existing capacity is appropriate compared to the alternatives of upgrading or downgrading its capacity.

Figure C1 | Central Park – Wilton B winter peak demand forecasts



- C39 We are satisfied that the assumptions for the peak demand forecast are reasonable. The forecast confirms that Transpower does not need to increase the capacity of the line to cater for future growth in peak demand. The forecast also confirms that there is an on-going need for this line.
- C40 Demand forecasts are difficult in the present environment because new technologies and consumer behaviour have the potential to decrease future peak demand.
- C41 Significant generation in the vicinity of the line may also require an increase in capacity. While no generation is planned or forecast in the Electricity Demand and

⁵⁰ AECOM “CPK-WIL B Reconductoring Design Investigation and Constructability Report” 23 February 2017, page 11-18.

Generation Scenarios (EDGS), additional generation could be installed within the lifetime of the new conductors. Feasible generation includes upgrading the existing windfarm or even interspersing solar farms within the existing windfarm infrastructure. We do not consider that these scenarios need to be allowed for now because the section of the line from the generation site to Wilton can be upgraded at a later date if required.

(c) Transpower's processes to determine the project's reasonableness and cost effectiveness including the use of cost benefit studies

- C42 When determining a project's reasonableness and cost-effectiveness, we expect Transpower's processes to ensure that projects are delivering the right solution, at the right time, and at the right cost.
- C43 In paragraphs C41 to C47 we have discussed Transpower's approach to considering alternatives and that this process involved consultation with the wider industry. We consider that the process has helped ensure that the right solution is being delivered.
- C44 Transpower used site specific data on the extent and the rate of deterioration of conductors to determine the timing for this project, as discussed in paragraphs C20 to C26 above. We are satisfied this process determines that the replacement is scheduled at the right time.
- C45 Transpower used a consultant to scope the project and estimate its costs, as discussed in more detail in the section titled "The capital costing methodology and formulation and the quantum of contingencies" below. The consultant identified the scope and provided a cost in conjunction with one of Transpower's contractors. This process generally results in a reasonable estimate of costs. In requesting its proposed allowance, Transpower has included a greater amount of contingencies more suited to major capex projects than a listed project. We have accordingly reduced the allowance for contingencies for this project.

(d) Transpower's internal processes for challenging a need for an identified programme and the possible alternative solutions

- C46 Given that the driver for this identified programme is deteriorating conductors for a key line, we do not consider that the need for the project needed significant internal challenge. As discussed in paragraphs C25 to C31 the need for the project is clear and has been signalled since 2011. We therefore did not consider it necessary to review Transpower's internal process for challenging the need for the project.
- C47 We have reviewed the alternative solutions that Transpower considered and are satisfied that Transpower has chosen a solution that appropriately balances cost and performance of the conductors.

- C48 In its long list consultation, Transpower proposed non-transmission solutions and a number of transmission options.⁵¹ Given the driver for this project, non-transmission solutions are not appropriate and were discarded at an early stage.
- C49 Transpower refined the long list of options into the following short listed options for further studies and development:
- C49.1 piecemeal replacement of deteriorated sections of lines;
 - C49.2 replace with conductor type ACSR Chukar @75°C;
 - C49.3 replace with conductor type ACSR Zebra @90°C; and
 - C49.4 replace with conductor type AAAC Sulphur @70°C.
- C50 Chukar, Zebra and Sulphur are types of conductors used for overhead power lines. The names reflect their manufacturer's specifications and material. The temperature represents the maximum design temperature at which the conductors can be operated.
- C51 Transpower evaluated the above options and selected the investment option of reconductoring with Sulphur conductors based on cost-benefit analysis.
- C52 We also support this decision because the AAAC (All Aluminium Alloy conductors) conductors have better technical performance over ACSR (Aluminium conductor steel reinforced) conductors. The AAAC conductors are designed to get better strength-to-weight ratio, offer improved electrical properties, better sag-tension characteristics and are more corrosion resistance than ACSR conductors.

(e) How grid outputs, key drivers, assumptions, and cost modelling were used to determine forecast capital expenditure

- C53 Transpower engaged a consultant AECOM to prepare the scope and forecast capital expenditure (cost estimate) for this project. AECOM prepared the cost estimate in conjunction with Transpower's contractor Broadspectrum and the estimate includes all elements of cost required to complete the reconductoring.
- C54 The main assumptions used for costing include:
- C54.1 18 days of downtime due to weather;
 - C54.2 reconstruction of a shared driveway near T26;
 - C54.3 access upgrades at other sites;⁵²

⁵¹ Transpower "Central Park-Wilton B Transmission Capacity Investigation", April 2015. pages 8-9.

- C54.4 stringing will be completed in 2 runs per circuit;
- C54.5 existing conductor will be pulled out using a wire rope which will then be used to pull in the new conductor (this method reduces risks but requires more time);
- C54.6 the large number of mid-span joints may slow down the stringing process; and
- C54.7 ADSS (fibre optic cable) will be installed in two sections, increasing the complexity of the installation.⁵³

C55 The above assumptions are included in the cost estimate.

(f) The capital costing methodology and formulation and the quantum of contingencies

C56 Transpower used a consultant to investigate the project, prepare a scope of works to replace the conductors and insulators and refurbish the towers and fittings, and prepare an estimate of costs. The consultant worked with Broadspectrum - one of Transpower's contractors – to scope the works and prepare the estimate of costs. The estimated cost takes into account all areas of identified works and reflects the cost of potential challenges during installation.

C57 It also takes into account the cost of work that cannot be accurately scoped now but can arise during construction. These costs include downtime due to weather, access and property management, additional site security and treatment of the existing and new conductors. The quantum of contingencies is \$1.29 million. Transpower has included another \$160,000 as additional contingency. The total P50 contingency allowance is 21%. We are satisfied that this amount is reasonable.

(g) The effect of the forecast capital expenditure on other cost categories, including the relationship with operating expenditure

C58 The capital expenditure is not likely to affect other cost categories or opex in RCP2. Apart from the site investigations and Transpower overheads, other costs related to this project are not included in the base capex or opex allowances for RCP2.

C59 All costs incurred for this project will be capitalised as per Transpower's practice.

C60 After the transmission line is refurbished and reconductored, maintenance capex and opex for this line should reduce and this should be reflected in the RCP3 proposal.

⁵² AECOM "CPK-WIL B Reconductoring Design Investigation and Constructability Report" 23 February 2017, page ii.

⁵³ AECOM "CPK-WIL B Reconductoring Design Investigation and Constructability Report" 23 February 2017, page 21.

(h) Links with other projects or programmes, whether proposed or in progress

C61 This project does not link with any other project in RCP2.

(i) Mechanisms for controlling actual capital expenditure with respect to the proposed base capex allowances and ensuring performance of proposed grid output targets

C62 The three grid output measures that could be affected by this project are the number of unplanned interruptions, average duration of interruptions and duration of P90 unplanned interruptions.

C63 Transpower plans to do this work without an interruption to supply.⁵⁴ However, unplanned interruptions can occur because of the nature of the work. Transpower's execution plan includes installing temporary arrangements to minimise the risk of interruptions to supply and therefore any impact on grid output targets.

C64 While installing temporary structures incur additional costs, we are satisfied that Transpower's plan adequately meets the requirements of WE and Meridian, as mentioned in paragraph C4 above.

(j) The efficiency of the proposed approach to procurement of associated goods and services

C65 These matters were considered as part of the assessment of the RCP2 proposal and recommendations for any improvement were made at that stage. We are comfortable with the efficiency of these approaches for this project.

⁵⁴ Through the use of bypass structures.