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**PUBLIC** version

## **Transpower's Western Bay of Plenty (WBOP) major capex project proposal**

**[DRAFT] decision and reasons paper - Attachment A to D**

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## Attachment A Our decision-making framework

A1 This chapter provides an overview of the decision-making framework we apply in reaching our decisions on Transpower’s major capex project (**MCP**) proposal.

### Our decision-making framework

#### Capex Input Methodology (IM)

A2 Regulation under Part 4 of the Act (**Part 4**) seeks to promote the long-term benefit of consumers of regulated services.<sup>1</sup> These regulated services include electricity transmission services provided by Transpower.

A3 The input methodologies (**IMs**) under Part 4 are the upfront rules, processes, and requirements of Part 4 regulation. Their purpose is to promote certainty for suppliers and consumers in relation to the rules, requirements and processes applying to regulated services under Part 4.<sup>2</sup> The IMs apply to electricity transmission services provided by Transpower.

A4 One of the IMs that applies to Transpower is the Capex IM.<sup>3</sup> The two major functions of the Capex IM are to provide for the scrutiny of Transpower’s proposed and actual investments, and to incentivise Transpower to deliver those investments efficiently.

#### Major capex projects

A5 Under clause 3.3.2 of the Capex IM, Transpower may only recover its costs relating to a major capex project if we have first approved it.

A6 Transpower submits a MCP to us.<sup>4</sup> If we do not reject the MCP,<sup>5</sup> we must either:<sup>6</sup>

A6.1 approve the project (and in the case of a major capex project (staged), the approval or declinature is of one or more staging projects);<sup>7</sup> or

A6.2 decline the project.

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<sup>1</sup> Commerce Act, s 52A.

<sup>2</sup> Commerce Act, s 52R.

<sup>3</sup> Along with the Capex IM, Transpower is subject to the Transpower Input Methodologies (**IMs**) which set out IMs for: cost allocation, asset valuation, treatment of taxation, cost of capital, specification of price, the incremental rolling incentive scheme, and reconsideration of the price-quality path.

<sup>4</sup> Capex IM, clause 3.3.3(1).

<sup>5</sup> Capex IM, clause 3.3.4 states that we may reject a MCP if it does not comply with the requirements in clause 7.4.1, or if Transpower has not complied with the requirements specified in clause 3.3.1 of the Capex IM.

<sup>6</sup> Capex IM, clauses 3.3.5(1)(a) and (b).

<sup>7</sup> We will refer to “projects” to cover both staging projects and non-staged major capex projects.

- A7 If we approve a MCP, we must also determine the major capex allowance (**MCA**),<sup>8</sup> major capex incentive rate,<sup>9</sup> and any exempt major capex.<sup>10</sup>
- A8 Before we can approve or decline a MCP, we must:
- A8.1 publish the MCP;<sup>11</sup>
  - A8.2 evaluate the MCP in accordance with the evaluation criteria in the Capex IM, including any further information we have received in the evaluation process;<sup>12</sup> and
  - A8.3 consult in the following ways:<sup>13</sup>
    - A8.3.1 make and publish a draft decision or decisions on the MCP;
    - A8.3.2 seek the written views of interested persons on anything published; and
    - A8.3.3 seek the written views of interested persons on others' submissions.
- A9 Figure 2 below shows, at a high level, how our evaluation and decision fits into the Capex IM's regulatory approval process for major capex projects.

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<sup>8</sup> Capex IM, clause 3.3.5(7)(a).

<sup>9</sup> Capex IM, clause 3.3.5(7)(b).

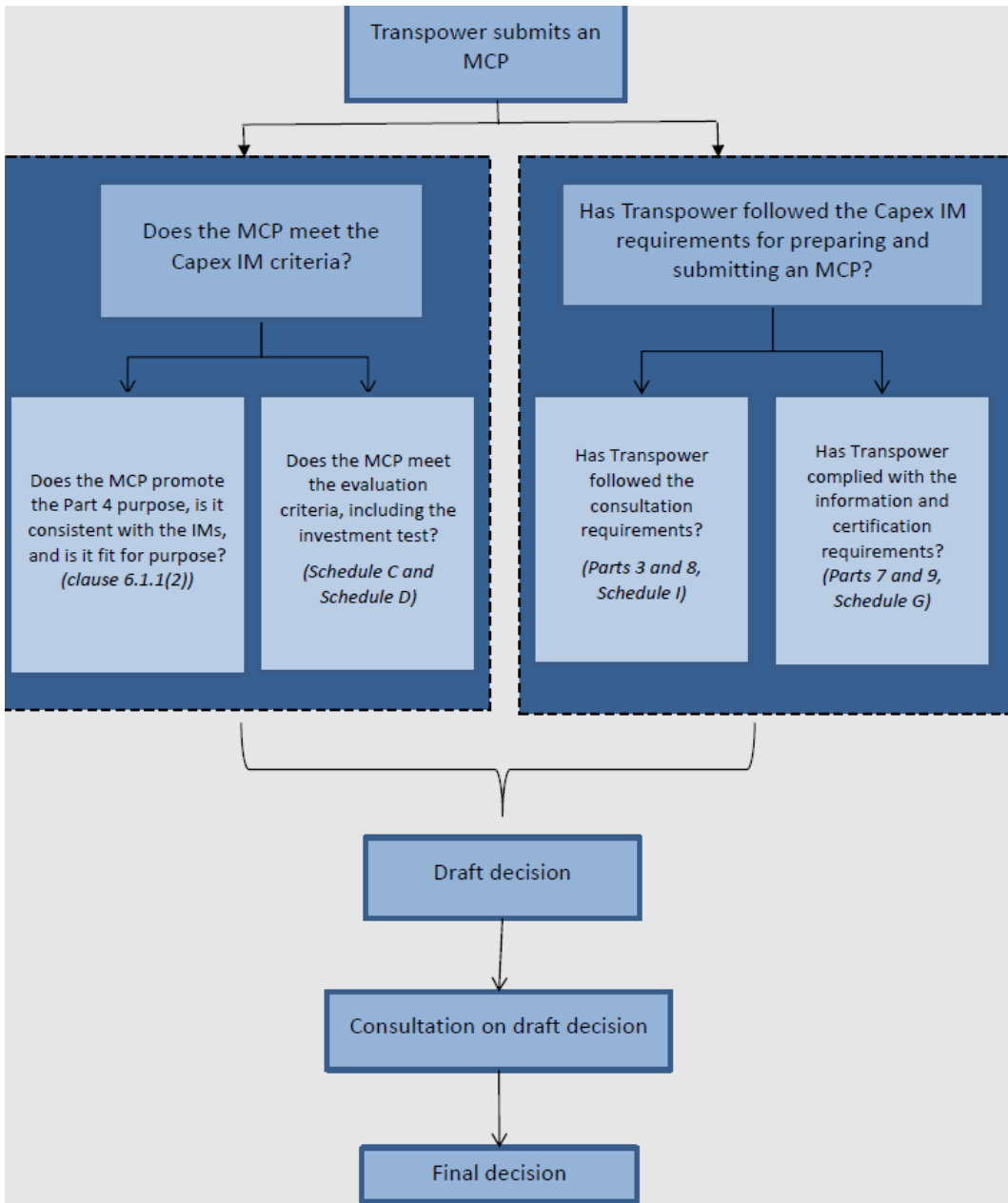
<sup>10</sup> Capex IM, clause 3.3.5(7)(c).

<sup>11</sup> Capex IM, clause 8.1.1(1)(a).

<sup>12</sup> Capex IM, clause 3.3.5(5)(b)(i)-(ii).

<sup>13</sup> Capex IM, clauses 3.3.5(5)(a) and 8.1.1(1)(a)(ii) to (iv).

Figure 1.1 Capex IM regulatory approval process for major capex projects



## Capex IM evaluation criteria

- A10 This attachment sets out the evaluation criteria against which we evaluate a MCP under the Capex IM.
- A11 The Capex IM requires us to evaluate a MCP against three sets of criteria:
- A11.1 the *general* criteria for evaluating all capex proposals in Part 6;
  - A11.2 the *specific* criteria for MCPs in Schedule C; and
  - A11.3 the *investment* test in Schedule D, Division 1.

## The purpose of Part 4 of the Act

- A12 The purpose of Part 4 of the Act is to promote the long-term benefit of consumers in markets where there is little or no competition, and little or no likelihood of a substantial increase in competition.<sup>14</sup> ‘Competition’ means ‘workable or effective competition’.<sup>15</sup>
- A13 To promote workable or effective competition that is in the long-term benefit of consumers, we must promote those outcomes produced in workably competitive markets which are specified in s52A(1). Section 52A(1) of the Act specifies the following four outcomes that we must promote so that regulated suppliers, including Transpower:
- A13.1 have incentives to innovate and invest;
  - A13.2 have incentives to improve efficiency and provide services at a quality that reflects consumer demands;
  - A13.3 share the benefits of efficiency gains with consumers, including through lower prices; and
  - A13.4 are limited in their ability to extract excessive profits.

## General criteria for evaluating MCPs

- A14 The general criteria for evaluating all capex proposals under the Capex IM are:
- A14.1 whether what is proposed is consistent with the Capex IM and, where relevant, the Transpower IMs;<sup>16</sup>
  - A14.2 the extent to which what is proposed will promote the purpose of Part 4 of the Act;<sup>17</sup> and

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<sup>14</sup> Commerce Act 1986, s 52A(1).

<sup>15</sup> Commerce Act 1986, s 3(1).

<sup>16</sup> Capex IM, clause 6.1.1(2)(a).

<sup>17</sup> Capex IM, clause 6.1.1(2)(b).

A14.3 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.<sup>18</sup>

### **Assessing whether what is proposed is consistent with the input methodologies**

A15 The first general criterion is that a MCP must be consistent with the Capex IM and, where relevant, the Transpower IMs. We will discuss the Transpower IMs first.

A16 The Transpower IMs provide for recoverable costs associated with major capex projects and the revenue impact of such projects we have approved.<sup>19,20</sup>

A17 The Capex IM sets out the requirements that Transpower must follow when developing and proposing a staged major capex project, and that we must follow when evaluating a MCP for such a project.<sup>21</sup>

A18 When assessing whether a MCP is consistent with the Capex IM, we evaluate the proposal's compliance with;

A18.1 the process requirements;<sup>22</sup>

A18.2 Transpower's consultation requirements;<sup>23</sup>

A18.3 the information requirements;<sup>24</sup> and

A18.4 the certification requirements.<sup>25</sup>

### **The process requirements**

A19 The Capex IM requires Transpower to notify us of its intention to plan a major capex project or a staged major capex project.<sup>26</sup>

A20 Transpower must agree the following with us:

A20.1 a consultation programme;

A20.2 an approach to considering non-transmission solutions (**NTSs**);

A20.3 an application date; and

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<sup>18</sup> Capex IM, clause 6.1.1(2)(c).

<sup>19</sup> Transpower IM, clause 3.1.3(1)(d).

<sup>20</sup> Transpower IM, clause 3.7.4(4).

<sup>21</sup> Capex IM, Part 3.

<sup>22</sup> Capex IM, clause 3.3.3.

<sup>23</sup> Capex IM, clause 8.1.3.

<sup>24</sup> Capex IM, Schedule G.

<sup>25</sup> Capex IM, clause 9.2.1

<sup>26</sup> Capex IM, clause 3.3.1(1) and (2).

A20.4 an approval timeframe.<sup>27</sup>

A21 Together with Transpower, we must publish the matters agreed on above and regularly review and update these matters.<sup>28</sup> We may (after considering Transpower's views) amend any of these matters to ensure they remain appropriate and reasonable.<sup>29</sup>

### **Transpower's consultation requirements**

A22 The requirements for Transpower's consultation programme and its approach considering NTSs are set out in clause 8.1.3 of the Capex IM.

A23 Transpower must consult with interested parties on the following matters:<sup>30</sup>

A23.1 the investment need;

A23.2 each demand and generation scenario variation;

A23.3 key assumptions;

A23.4 long-list of options, including any potential NTSs (ie, the long-list consultation); and

A23.5 short-list of options including the results of the investment test (ie, the short-list consultation).

### **The information requirements in a major capex proposal**

A24 In the MCP Transpower must provide to us the following:

A24.1 information on the investment need,<sup>31</sup>

A24.2 information on the relevant demand and generation scenarios;<sup>32</sup>

A24.3 information relating to each investment option;<sup>33</sup>

A24.4 information relating to proposed investment;<sup>34</sup>

A24.5 major capex project outputs;<sup>35</sup>

A24.6 information on consultation;<sup>36</sup>

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<sup>27</sup> Capex IM, clause 3.3.1(3).

<sup>28</sup> Capex IM, clause 3.3.1(6).

<sup>29</sup> Capex IM, clause 3.3.1(7).

<sup>30</sup> Capex IM, clause i1(1).

<sup>31</sup> Capex IM, clause G2.

<sup>32</sup> Capex IM, clause G3.

<sup>33</sup> Capex IM, clause G4.

<sup>34</sup> Capex IM, clause G5.

<sup>35</sup> Capex IM, clause G6.

<sup>36</sup> Capex IM, clause G7.

- A24.7 information on NTSs;<sup>37</sup> and
- A24.8 any additional supporting material Transpower reasonably considers is relevant to our decision on the major capex project.<sup>38</sup>
- A25 The Capex IM also requires that:<sup>39</sup>
- A25.1 the number of investment options in a MCP is appropriate, given the magnitude of the estimated expenditure and the complexity of the investment need associated with the proposed investment; and
- A25.2 the specificity of information, and the rigour and comprehensiveness of the analysis for each investment option described in a MCP, must be commensurate with the estimated expenditure and complexity of that option.

### **Certification requirements for MCPs**

- A26 Transpower's CEO must certify in respect of a MCP that:<sup>40</sup>
- A26.1 the information provided by Transpower under Schedule G of the Capex IM was derived from, and accurately represents in all material respects, Transpower's operations;
- A26.2 the proposed investment to which the information under Schedule G relates, was approved in accordance with the applicable requirements of Transpower's director and management approval policies; and
- A26.3 the MCP complies, in all material respects, with the information requirements set out in Schedule G.
- A27 Our assessment of Transpower's compliance with the general criteria is set out in Attachment B.

### **Specific criteria for evaluating MCPs**

- A28 The specific criteria for evaluating a MCP are set out in Schedule C of the Capex IM, and are as follows:
- A28.1 we must evaluate whether the proposed investment satisfies the investment test.<sup>41</sup>
- A28.2 we must have regard to at least one of the following factors:
- A28.2.1 whether the investment and investment options reflect good electricity industry practice (**GEIP**), are technically feasible, can

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<sup>37</sup> Capex IM, clause G8.

<sup>38</sup> Capex IM, clause G9.

<sup>39</sup> Capex IM, clause 7.4.1(2) and (3).

<sup>40</sup> Capex IM, clause 9.2.1.

<sup>41</sup> Capex IM, clause C1(1).

be implemented in terms of all the application statutory planning and regulatory requirements, and can be integrated in the network and market operations;<sup>42</sup>

A28.2.2 whether the estimated time for construction, commissioning date, and completion date are reasonable;<sup>43</sup>

A28.2.3 whether key assumptions around outage planning are reasonable;<sup>44</sup>

A28.2.4 the extent that Transpower has had regard to views of interested parties in consultations;<sup>45</sup> and

A28.2.5 the impact of sensitivity analysis on the electricity market benefit of the proposed investment and investment options.<sup>46</sup>

A28.3 we must also evaluate Transpower's proposed:

A28.3.1 MCA;<sup>47</sup>

A28.3.2 major capex project outputs;<sup>48</sup>

A28.3.3 approval expiry date;<sup>49</sup>

A28.3.4 major capex incentive rate;<sup>50</sup>

A28.3.5 exempt major capex;<sup>51</sup> and

A28.3.6 commissioning date assumptions.<sup>52</sup>

A29 The Capex IM lists evaluation techniques and approaches we may use in the specific evaluation, but enables us to use any other technique of approach we consider appropriate in the circumstances.<sup>53</sup> We can also consider any additional information that we judge is relevant.<sup>54</sup>

A30 We discuss our assessment of the MCP against specific criteria in Attachment C, and our evaluation of the MCP under the investment test in Attachment D.

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<sup>42</sup> Capex IM, clause C2(a).

<sup>43</sup> Capex IM, clause C2(b).

<sup>44</sup> Capex IM, clause C2(c).

<sup>45</sup> Capex IM, clause C2(d).

<sup>46</sup> Capex IM, clause C2(e).

<sup>47</sup> Capex IM, clause C1(3)(a).

<sup>48</sup> Capex IM, clause C1(3)(d).

<sup>49</sup> Capex IM, clause C1(3)(e).

<sup>50</sup> Capex IM, clause C1(3)(f).

<sup>51</sup> Capex IM, clause C1(3)(g).

<sup>52</sup> Capex IM, clause C1(3)(h).

<sup>53</sup> Capex IM, clause C7.

<sup>54</sup> Capex IM, clause C7(f).

**Our decision on a MCP**

A31 After evaluating a MCP, we can decide either to:

A31.1 approve the MCP proposal as proposed by Transpower;<sup>55</sup> or

A31.2 decline the MCP proposal.<sup>56</sup>

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<sup>55</sup> Capex IM, clause 3.3.5(1)(a).

<sup>56</sup> Capex IM, clause 3.3.5(1)(b).

## **Attachment B Our evaluation of the Western Bay of Plenty major capex project proposal against the general criteria**

- B1 This attachment sets out our evaluation of:
- B1.1 the Western Bay of Plenty (**WBOP**) major capex project (**MCP**) proposal against the general criteria for capex proposals set out in Part 6 of the Capex Input Methodology (**IM**); and
  - B1.2 Transpower’s consultation against the requirements of the Capex IM.
- B2 All dollar values in this paper are expressed in 2024 values, unless expressed in 2032 values, in which case this will be indicated with “(\$ 2032)”. Because the project will be commissioned by 2032, this takes into account forecast inflation and interest during construction added to the cost estimates in 2024 values.

### **The general criteria in Part 6 of the Capex IM**

- B3 The general evaluation criteria set out in Part 6 of the Capex IM are:<sup>57</sup>
- B3.1 whether what is proposed is consistent with the Capex IM and, where relevant, the Transpower IMs;
  - B3.2 the extent to which what is proposed will promote the purpose of Part 4 of the Act; and
  - B3.3 whether the data, analysis, and assumptions underpinning what is proposed are fit for the purpose of exercising our powers under Part 4 of the Act.

### **Whether what is proposed is consistent with the Capex IM and, where relevant, the Transpower IMs**

#### **Transpower’s proposal is consistent with the Capex IM<sup>58</sup>**

- B4 To be consistent with the Capex IM, the proposed expenditure must be ‘major capex’ as defined in the Capex IM,<sup>59</sup> and Transpower must meet the notification, consultation, information, and certification requirements that apply.<sup>60</sup>

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<sup>57</sup> Capex IM, clause 6.1.1(2).

<sup>58</sup> The WBOP MCP proposal compliance has been checked against the current Capex IM since Transpower’s letter of intention was issued on 29 March 2023. The 2023 amendments to the Capex IM will be enacted on 1 April 2025.

<sup>59</sup> Capex IM, clause 1.1.5(2).

<sup>60</sup> Capex IM, clause 3.3.1, clause 7.4.1, Schedule I, Schedule G, and clause 9.2.1, respectively.

B5 We are satisfied that the proposed expenditure is major capex, and that Transpower met the Capex IM requirements on notification, consultation, information, and certification. The details of our assessment of the individual requirements follow.

*The proposed expenditure is major capex*

B6 The Capex IM defines ‘major capex’ as expenditure that is:<sup>61</sup>

- B6.1 incurred to meet the grid reliability standards (**GRS**) or provide a net electricity market benefit;
- B6.2 forecast to have an aggregate capital cost exceeding \$20 million; and
- B6.3 not asset replacement, asset refurbishment, business support, or information system and technology assets.

B7 The proposed expenditure for Transpower’s WBOP MCP proposal is consistent with the Capex IM definition because:

- B7.1 the proposed investment provides a quantified net electricity market benefit of \$675.1 million (\$ 2032);<sup>62</sup>
- B7.2 the major capex allowance (**MCA**) (excluding potential non-transmission service (**NTS**) of the proposed investment is \$83.2 million (\$ 2032);<sup>63</sup>
- B7.3 the maximum recoverable cost of \$2.5 million for a development NTS for a one-year transmission investment deferral, provides a higher expected net market benefit than transmission investment only;<sup>64</sup> and
- B7.4 it is not incurred in relation to asset replacement, asset refurbishment, business support or information system and technology assets. Rather, it will enhance existing assets as well as increasing capacity in WBOP.

*The proposed expenditure in the WBOP MCP provides the highest expected net electricity market benefit*

B8 The proposed expenditure is driven by population driven demand growth in the Western Bay of Plenty region, exacerbated by a number of forecast step load increases in the region, leading to transmission capacity issues.<sup>65</sup>

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<sup>61</sup> Capex IM, clause 1.1.5(2).

<sup>62</sup> *Transpower NZ Ltd*, WBOP MCP Application, Table 3, p. 12, available [here](#).

<sup>63</sup> *Transpower NZ Ltd*, WBOP MCP Application, p. 5, available [here](#).

<sup>64</sup> *Transpower NZ Ltd*, WBOP MCP Application, p. 5, available [here](#).

<sup>65</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 2 – Overview of need, section 1.2, p. 4, available [here](#).

- B9 Since there is no significant new generation forecast in the WBOP region, power will continue to be imported into the Tauranga, Mt Maunganui and Te Matai grid exit points (**GXPs**).
- B10 The proposed investment in WBOP MCP meets the requirements of clause D1(1)(b) of Schedule D of the Capex IM, and provides the highest positive net electricity market benefit.<sup>66</sup>
- B11 In Attachment D we discuss which limb of the clause D1(1)(b) requirements are applicable in this case, and discuss the impact of the core grid definition and transmission network changes since then.

*Transpower has met the notification requirements under the Capex IM*

- B12 We are satisfied that Transpower's notification of 29 March 2023 complied with clause 3.3.1(1) of the Capex IM.<sup>67</sup> This is because the notification advised us of Transpower's intention to plan to submit the WBOP MCP.
- B13 Transpower's notification also proposed the matters required under clause 3.3.1(2) of the Capex IM. On 6 July 2023, Transpower agreed with us a consultation programme, including the long-list and short-list consultations, and an approach for Transpower to seek proposals on NTSs.<sup>68</sup>
- B14 Under clause 3.3.1(7) of the Capex IM, the Commission and Transpower must regularly review whether the consultation programme remains appropriate and reasonable. We may amend the consultation programme to achieve that outcome.

*Transpower has satisfied the consultation requirements*

- B15 The Capex IM requires Transpower to consult with interested parties on the following matters when preparing a MCP:<sup>69</sup>
- B15.1 investment need;
  - B15.2 each demand and generation scenario variation;
  - B15.3 key assumptions;
  - B15.4 a long-list of options to meet investment need; and
  - B15.5 a short-list of investment options to meet investment need.

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<sup>66</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 2 – Overview of need, section 3, p. 15, available [here](#).

<sup>67</sup> *Transpower New Zealand Ltd*, Letter of Notification under clause 3.3.1(1) available [here](#).

<sup>68</sup> *Commerce Commission*, letter to Transpower agreeing matters under clause 3.3.1(2) of the Capex IM, available [here](#).

<sup>69</sup> Capex IM, clause I1.

- B16 Transpower's long-list consultation must:<sup>70</sup>
- B16.1 describe the relevant investment need and its links to other relevant documents, such as the integrated transmission plan;
  - B16.2 set out the relevant demand and generation scenarios;
  - B16.3 specify any non-standard values or amounts of the calculation period, or value of expected unserved energy for the investment test;
  - B16.4 specify any non-standard discount rate that it may use for the purpose of the investment test; and
  - B16.5 for each option, specify whether the option is a transmission investment or a NTS, and describe its features.
- B17 Transpower's short-list consultation must:<sup>71</sup>
- B17.1 describe the relevant demand and generation scenarios to be used for the investment test;
  - B17.2 provide information on the relevant key assumptions;
  - B17.3 describe each investment option, including its features, submissions on the option from the long-list consultation, and likely electricity market benefit or cost elements and project costs; and
  - B17.4 describe Transpower's preliminary application of the investment test.
- B18 Transpower carried out its long-list consultation between 17 July 2023 and 13 September 2023, and its short-list consultation between 30 July 2024 and 10 September 2024.<sup>72</sup>
- B19 Transpower prepared its short-list of investment options using a number of criteria. The criteria included that the investment option:<sup>73</sup>
- B19.1 was fit for purpose;
  - B19.2 was technically feasible;
  - B19.3 was practical to implement;

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<sup>70</sup> Capex IM, clause I2.

<sup>71</sup> Capex IM, clause I3.

<sup>72</sup> *Transpower New Zealand Ltd*, WBOP Development Plan long-list consultation, available [here](#); WBOP Development Plan short-list consultation, available [here](#).

<sup>73</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 4 – Short list of development options, section 2, p. 5, available [here](#).

- B19.4 was consistent with good electricity industry practice (**GEIP**);<sup>74</sup>
- B19.5 ensured system security would be maintained;
- B19.6 did not degrade network resilience; and
- B19.7 the indicative capital cost was not prohibitive when compared to another investment option with the same or similar benefits.

*Our evaluation of Transpower's consultation*

- B20 Transpower received six submissions in response to its long-list consultation and twelve submissions in response to its short-list consultation.
- B21 As part of its consultation process, Transpower asked sixteen specific questions in its long-list consultation stage and thirteen in its short-list consultation stage.
- B22 Submitters were generally supportive of the process Transpower had used to refine its long-list to the short-list of investment options, and the criteria it used to do so.<sup>75</sup>
- B23 Many of the submissions Transpower received were focussed on NTS, apart from Meridian and Vector where the concern was indicative cost allocations.<sup>76</sup> Their view is that the indicative benefit-based customer allocations should be provided as part of the short-list consultation in order to provide more scrutiny of proposed transmission investments.
- B24 We agree with Meridian and Vector that indicative benefit-based customer allocations should be provided as part of a short-list consultation, particularly if diverse transmission solutions form part of the short-list.

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<sup>74</sup> Capex IM, under clause 1.1.5(18), the definition of 'good electricity industry practice' is that specified in clause 1.1(1) of the Code, which is: "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."

<sup>75</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 7 – Stakeholder consultation, section 3.2.2, p. 8, available [here](#).

<sup>76</sup> *Meridian*, Western Bay of Plenty: Major Capex Proposal short-list consultation, available [here](#); *Vector Electricity*, Western Bay of Plenty Development Plan: Major Capex Proposal short-list consultation, available [here](#).

- B25 Transpower also mention in its proposal that for other MCPs where the beneficiaries may be less clear, more detail on allocations might be appropriate.<sup>77</sup> We will be encouraging Transpower to provide more transmission cost allocation detail, consistent with the Transmission Pricing Methodology (**TPM**), at the short-list consultation stage. This will enable affected parties, and beneficiaries of the proposed investment, to fully consider the impact on their electricity bills.
- B26 Many of the long-list and short-list consultation submissions were from potential NTS providers. Our view is that while Transpower considered NTS as alternatives to the proposed transmission investments during its consultation, it needs to consider a more detailed commercial approach to NTS.
- B27 In Attachment C we discuss Transpower’s revised approach to NTS following NTS provider submissions, and our feedback that development NTS arrangements may be possible under the present Capex IM.
- B28 Following our review, we are satisfied with Transpower’s approach to consultation.

*Transpower has satisfied the information requirements under the Capex IM*

- B29 The Capex IM sets out the information that Transpower needs to provide in a MCP.<sup>78</sup> The MCP and the attachments that Transpower provided for this purpose are listed in Table B1 below.<sup>79</sup>
- B30 Transpower provided a table mapping the information required under the Capex IM with the information provided in its MCP and the attachments.

**Table B1: The WBOP MCP and attachments**

<b>Document provided by Transpower in its proposal</b>
Western Bay of Plenty (WBOP) Development Plan major capex proposal (the MCP) Overview
Attachment 1: Compliance with the Capex IM
Attachment 2: Overview of need
Attachment 3: Demand and Generation Scenarios
Attachment 4: Short-list of development plans
Attachment 5: Options Analysis
Attachment 6: Costing
Attachment 7: Stakeholder consultation
Attachment 8: Benefits modelling
Attachment 9: Approach to non-transmission solutions
Attachment 10: Indicative starting allocations and benefit-based charges

<sup>77</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 7 – Stakeholder consultation, p. 6, available [here](#).

<sup>78</sup> Capex IM, Schedule G.

<sup>79</sup> The WBOP MCP proposal documents are available [here](#).

B31 We have reviewed the MCP and the attachments against clause G1 to G8 of Schedule G of the Capex IM, and are satisfied that Transpower has met the information requirements.

*Transpower satisfied the certification requirements under the Capex IM*

B32 Clause 9.2.1 of the Capex IM requires that, before Transpower submits a MCP to us, Transpower's CEO must certify the MCP according to requirements in that provision.

B33 Transpower provided a certificate signed by its CEO.<sup>80</sup>

B34 We reviewed this certificate against clause 9.2.1 of the Capex IM and we are satisfied that it meets the relevant requirements.

### **The Transpower IMs are not relevant to our review of Transpower's WBOP MCP proposal**

B35 As noted in Attachment A, the Transpower IMs provide for recoverable costs associated with major capex projects, and the revenue impact of such projects we have approved.<sup>81</sup>

B36 The treatment of recoverable costs and the revenue impact of the major capex are not relevant to our review of Transpower's proposal. However, if we approve the proposal:

B36.1 recoverable costs associated with the NTS will be recoverable by Transpower as per clause 3.1.3(1)(d) of the Transpower IM; and

B36.2 the revenue impact of approved major capex will be subject to a price-quality path reconsideration as per clause 3.7.7(4).

### **Delivering WBOP as proposed will promote the purpose of Part 4 of the Act**

B37 Under the general evaluation criteria, we must consider "the extent to which what is proposed will promote the purpose of Part 4 of the Act".<sup>82</sup> Alongside the investment test under Schedule D, we consider this is an important test for expenditure proposed under the Capex IM.

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<sup>80</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 11 – CEO certification available [here](#).

<sup>81</sup> Transpower IM, clauses 3.1.3(1)(d) and 3.7.4(4).

<sup>82</sup> 2012 Capex IM Reasons paper, at para 1.3.7.

### **The purpose of Part 4 of the Act**

- B38 The purpose of Part 4 of the Act is to promote the long-term benefit of consumers in markets where there is little or no competition, and little or no likelihood of a substantial increase in competition.<sup>83</sup> ‘Competition’ means ‘workable or effective competition’.<sup>84</sup>
- B39 To promote workable or effective competition that is in the long-term benefit of consumers, we must promote outcomes in regulated markets that are consistent with outcomes produced in workably competitive markets.
- B40 Section 52A(1) of the Act specifies the following four outcomes produced in such markets that we must promote, so that regulated suppliers, including Transpower:
- B40.1 have incentives to innovate and invest;
  - B40.2 have incentives to improve efficiency and provide services at a quality that reflects consumer demands;
  - B40.3 share the benefits of efficiency gains with consumers, including through lower prices; and
  - B40.4 are limited in their ability to extract excessive profits.

### **The WBOP MCP will promote the purpose of Part 4 by providing for Transpower to deliver the right investment at the right time**

- B41 The purpose of Part 4 of the Act, particularly as set out in section 52A(1)(a) and (b), will be promoted by delivering the right investment at the right time to meet an identified need.
- B42 The Capex IM requires Transpower to apply the investment test to select the investment option with the lowest expected net market cost, or highest expected net electricity market benefit as the proposed investment.<sup>85</sup> This can include a qualitative assessment to take account of associated unquantified benefits, or cost elements, in certain circumstances.<sup>86</sup>
- B43 The investment test under Schedule D of the Capex IM, is a net electricity market benefit test that uses a range of future scenarios to identify the investment option, with the lowest expected net market cost in meeting the GRS, or highest expected net market benefit to meet forecast demand. The test is designed to identify the most efficient investment option as the proposed investment in a MCP.

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<sup>83</sup> Commerce Act 1986, s 52A(1).

<sup>84</sup> Commerce Act 1986, s 3(1).

<sup>85</sup> Capex IM, clause D1.

<sup>86</sup> Capex IM, clause D1(1)(c).

- B44 We consider the investment test enables the selection of the right investment based on the available information, and corresponding assumptions about the future composition of the power system.
- B45 Based on our evaluation in Attachments C and D, we are satisfied Transpower has proposed the right transmission investment options to meet the investment need.

**Delivering the WBOP MCP provides the highest expected net electricity market benefit**

- B46 Consistent with section 52A(1)(b) of the Act and the Capex IM, a proposed investment must be the investment option with the highest expected net electricity market benefit when compared with alternative options, unless it is designed to meet the deterministic limb of the GRS.<sup>87</sup>
- B47 Following our review of the proposal, we are satisfied Transpower's proposed investment provides the highest expected net electricity market benefit when compared with alternative investment options.

**The data, analysis, and assumptions underpinning what is proposed are fit for purpose**

- B48 Schedule G of the Capex IM sets out the information that Transpower needs to provide in a MCP.
- B49 Transpower's WBOP MCP contains the following documents:<sup>88</sup>
- B49.1 Main proposal: the main proposal document provides an overview of the MCP, including the investment need it proposes to meet the forecast electricity demand out to 2052, a consolidated summary of the analysis Transpower has performed to support its application, and the conclusions it has reached;
  - B49.2 Attachment 1 (Compliance with the Capex IM): summarises where in the proposal Transpower has addressed the Capex IM requirements;
  - B49.3 Attachment 2 (Overview of need): describes the power systems analysis performed to identify transmission investment constraints, and potential transmission upgrades at a single GXP or meshed network. The constraints are identified using updated generation and demand scenarios;
  - B49.4 Attachment 3 (Demand and generation scenarios): describes how Transpower has used the demand and generation scenarios in the investment test;

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<sup>87</sup> Capex IM, clauses D1(1)(b) and D1(1)(c)(i).

<sup>88</sup> The WBOP MCP proposal documents are available [here](#).

- B49.5 Attachment 4 (Short-list development plans): describes how Transpower developed its short-list development plans from the long-list options and the criteria it used to do this;
  - B49.6 Attachment 5 (Options analysis): explains how Transpower has analysed its short-list investment options using the investment test methodology;
  - B49.7 Attachment 6 (Costing): provides an overview of Transpower's assessment of investment option capital costs;
  - B49.8 Attachment 7 (Stakeholder consultation): provides a summary of Transpower's short-list and long-list consultations and outlines how stakeholder feedback has informed the proposal;
  - B49.9 Attachment 8 (Benefits modelling): describes how Transpower has calculated the benefits of the investment options considered using the benefit modelling approach;
  - B49.10 Attachment 9 (Approach to non-transmission solutions): describes how Transpower could potentially use NTS to defer transmission investment for at least one year;
  - B49.11 Attachment 10 (Indicative starting allocations and benefit-based charges): provide an estimated increase in transmission charges based on the recently enacted TPM; and
  - B49.12 Attachment 11 (Chief Executive Officer (**CEO**) Certification): provides certification from Transpower's CEO that the information complies with the relevant provisions of the Capex IMs.
- B50 When assessing a MCP proposal, we must be satisfied that data, analysis, and assumptions underpinning what is proposed allows us to make our decision. As we evaluated the WBOP MCP, we sought additional information from Transpower using a Request for Information (**RFI**) process.
- B51 In accordance with clause 3.3.5(4) of the Capex IM, we sought further information to assist our evaluation of:
- B51.1 the investment test analysis;
  - B51.2 project costs and calculations of the MCA;
  - B51.3 Government policy changes and how this may affect step load change assumptions;
  - B51.4 investment need at the Mount Maunganui GXP;
  - B51.5 the framework and cost allocation for the duration of potential NTS; and

B51.6 choice of overhead conductors for line uprating.

B52 Table B2 lists additional information that Transpower provided to assist our analysis.

**Table B2: Additional information provided by Transpower**

Document short name	Subject
<b>RFI01</b>	Need for investment
<b>RFI02</b>	Demand generation scenarios
<b>RFI03</b>	Non-transmission systems (NTS)
<b>RFI04</b>	Choice of overhead conductors

B53 Having reviewed the WBOP MCP proposal material and the additional information that Transpower has provided, we are satisfied that the data, analysis, and assumptions underpinning what is proposed, are fit for purpose, reliable and accurate.

B54 We consider that the information provided to us is sufficient for us to make our draft decision on the WBOP MCP.

## Attachment C Evaluation of the Western Bay of Plenty major capex project proposal against the specific criteria

C1 In this attachment we set out our evaluation of Transpower’s Western Bay of Plenty (**WBOP**) major capex project (**MCP**) proposal against the specific criteria set out in Schedule C of the Capex Input Methodology (**IM**), as required under clause 6.1.1(4) of the Capex IM.

### The specific criteria for evaluating a MCP

C2 There are two parts to our evaluation of the WBOP MCP under Schedule C of the Capex IM, and we may use one or more of the techniques listed under clause C7. The two parts are;

C2.1 evaluating the WBOP MCP against specific criteria broken down as follows<sup>89</sup>;

C2.1.1 *investment test*: clause C1(1) requires us to evaluate whether the proposed investment satisfies the investment test in Schedule D of the Capex IM; and

C2.1.2 *specific components*: clause C1(3) requires us to evaluate, to the extent applicable to the proposed investment, specific components of the proposed investment.

C2.2 evaluating the WBOP MCP, having regard to the general factors under clause C2, and the specific factors relating to individual components of the WBOP MCP.

C3 Clause C2 requires us to have regard to at least one of the factors listed in clause C2(a) to (e) when evaluating a MCP. The factors listed in clause C2 are:<sup>90</sup>

C3.1 whether the proposed investment and investment options;

C3.1.1 reflect good electricity industry practice (**GEIP**);

C3.1.2 are technically feasible;

C3.1.3 can be implemented in terms of statutory process and regulatory consents; and

C3.1.4 can be integrated into the system and market operations;

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<sup>89</sup> Capex IM, clauses C1(1) and C1(3)

<sup>90</sup> Capex IM, clause C2.

- C3.2 whether the estimated time to deliver the project is reasonable compared to the proposed commissioning date or completion date;
  - C3.3 whether key assumptions around outages are reasonable;
  - C3.4 the extent to which, in complying with the consultation programme or approach to consider non-transmission services (**NTSS**), Transpower regards the views of interested parties; and
  - C3.5 the impact of the sensitivity analysis on electricity market benefit, or cost element of the proposed investment and investment options.
- C4 The specific components described in clause C1(3) we must evaluate are:<sup>91</sup>
- C4.1 the major capex allowance (**MCA**) and maximum recoverable costs (clause C3);
  - C4.2 approval expiry date and commissioning date assumptions (clause C4);
  - C4.3 major capex project outputs (clause C5); and
  - C4.4 major capex incentive rate (clause C6).
- C5 When evaluating the specific components in clauses C3 to C6, we must have regard to at least one of the factors set out under each clause. We may also employ the evaluation techniques set out in clause C7.<sup>92</sup>
- C6 Our evaluation of these MCP components and how we tested the WBOP MCP against the requirements of Schedule C are outlined below.

### **Clause C1(1) – whether the MCP satisfies the investment test**

- C7 Our evaluation of Transpower’s application of the investment test is outlined in Attachment D.
- C8 In reviewing Transpower’s application of the investment test, we carried out our own analysis. We took a two-step approach.
- C8.1 Firstly, we looked at whether Transpower’s inputs and assumptions were reasonable and met the requirements of Capex IM, and whether the preferred investment passed the investment test.
  - C8.2 Secondly, we cross-checked Transpower's investment test application to satisfy ourselves that components of the proposal would deliver net electricity market benefits.

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<sup>91</sup> Capex IM, clause C1(3).

<sup>92</sup> Capex IM, clause C7.

- C9 In reviewing the economic analysis results in Transpower’s proposal, we consider Transpower has taken a robust approach in applying the investment test, and that the costs and benefits have been reasonably calculated.
- C10 Following our review, we are satisfied Transpower has calculated net electricity market benefits of the investment options that outweigh the costs of those investment options, and in aggregate, Transpower’s WBOP MCP proposal passes the investment test.
- C11 In summary, our draft decision is that the proposed investment meets the investment test under Schedule D of the Capex IM. Specifically, we are satisfied:
- C11.1 with the values Transpower has used for the parameters of the investment test;
  - C11.2 that the proposed investment has the highest positive expected net electricity market benefit of the investment options it considered; and
  - C11.3 that the proposed investment is robust to sensitivity analysis.

## Clause C2 – general evaluation of the MCP

- C12 Under clause C2 of Schedule C, we must have regard to at least one of the factors listed in clause C2(a) to (e) when evaluating a major capex proposal.<sup>93</sup>
- C13 Our analysis below sets out how we had regard to each of these factors in evaluating the MCP.

### Clause C2(a)(i) – do the investment options considered reflect GEIP?

- C14 In evaluating the MCP, we had regard to whether Transpower’s proposed investment, and investment options reflect GEIP. We consider GEIP reflects the appropriate planning and performance standards of a prudent supplier.<sup>94</sup>
- C15 We consider Transpower’s transmission planning and performance standards are appropriate, and have underpinned Transpower’s analysis to investigate options to enhance the transmission grid to cater with the forecast load growth through to 2052.

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<sup>93</sup> Capex IM, clause C2(a-e).

<sup>94</sup> ‘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.

- C16 Transpower, and local distribution network business Powerco, worked closely to develop the WBOP development plan, which has informed the proposed WBOP MCP.<sup>95</sup>
- C17 We consider Transpower has been prudent in selecting and consulting on investment options to address the investment need. Transpower has proposed an appropriate investment strategy given the need date it has identified.
- C18 In our view, the investment options Transpower selected and consulted on reflect GEIP. Our draft decision is that the requirements of clause C2(a)(i) have been met.

**Clause C2(a)(ii) – are the proposed investment and investment options technically feasible?**

- C19 The proposed investment, and the other two investment options that Transpower considered in its short-list consultation, use equipment and network upgrades that are similar to those it has previously implemented. The installation and commissioning methods for these assets are well proven over the years, both locally and internationally.
- C20 The proposed 120MVA, 220/110 kV interconnecting transformer at Kaitemako, and the phosphorus line conductor for the 110kV line upgrades, are well proven equipment and technologies for use on the grid.
- C21 We are satisfied Transpower has demonstrated the choice of well-proven equipment in its short-list investment options are all technically feasible. Our draft decision is that the requirements of clause C2(a)(ii) have been met.

**Clause C2(a)(iii) – are the proposed investment and investment options able to be implemented in terms of the statutory processes under the Resource Management Act 1991 (RMA), other regulatory consents, and obtaining property and access rights?**

- C22 Transpower intends to install some of the MCP outputs at its own sites, so it already has full property and access rights for those investments.
- C23 However, Transpower will need to engage with the RMA process as it intends to install different conductors on existing transmission lines.
- C24 Transpower should have ample time to engage in the RMA approvals' process following the proposed approval of this MCP. Many of the transmission upgrades are planned to be installed by 2031, and Transpower has significant experience in RMA processes related to existing transmission line reconductoring projects.
- C25 Based on Transpower's experience with similar projects, we consider the requirements of clause C2(a)(iii) are met.

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<sup>95</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 2 – Overview of need, p. 3, available [here](#).

**Clause C2(a)(iv) – can the proposed investment and investment options be integrated into system and market operations?**

- C26 We have tested whether the proposed investment, and investment options, can be integrated into the transmission system and the market operations. We consider this would be the case if these investments provide sufficient transmission capacity, do not incur uneconomic transmission constraints, and allow efficient dispatch of generation under normal operating conditions.
- C27 The proposed investment and investment options delivering sufficient transmission capacity, is directly linked with the investment need of the WBOP MCP, namely, to provide sufficient transmission capacity to meet WBOP demand growth.
- C28 Transpower’s power flow analysis (Attachment 2 – Overview of need) sets out the transmission capacity, the investment options, and the proposed investment it will deliver, to ensure there will be no transmission capacity constraints in the WBOP region out to 2052.<sup>96</sup>
- C29 Most of the proposed investments are to upgrade existing assets, therefore these assets are already components of system and market operations. The addition of another interconnecting transformer will necessitate some changes by the System Operator to the market dispatch framework, but the change process should be standard for Transpower.
- C30 We consider the transmission upgrades in the proposed investment will meet the requirements of clause C2(a)(iv), because they are transmission investments that ensure WBOP demand will be met without constraint, and can be integrated into system and market operations.

**Clause C2(c) – are the key assumptions around outage planning reasonable?**

- C31 Transpower notes in the proposal that it will implement its standard project delivery procedures, which also includes planning and scheduling.<sup>97</sup>
- C32 Transpower mentions in its proposal that factors may affect its ability to deliver the required MCP outputs, specifically:<sup>98</sup>
- Unforeseen changes to electricity markets operations limiting our ability to secure the required system outages. This is largely outside Transpower’s control, but we consider it highly unlikely to impact this project as we plan and forecast outage requirements to the market in advance.
- C33 However, we consider Transpower is experienced in carrying out outage planning to facilitate transmission line upgrades, and that its outage planning assumptions, as outlined above, are reasonable. Our draft decision is that the requirements of clause C2(c) have been met.

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<sup>96</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 2 – Overview of need, available [here](#).

<sup>97</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, p. 8, available [here](#).

<sup>98</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, p. 9, available [here](#).

**Clause C2(d) – in complying with clause 3.3.1(9) with respect to the consultation programme or the approach to considering NTSs, did Transpower have regard to the views of interested persons?**

- C34 Clause 3.3.1(9) of the Capex IM requires Transpower to consult interested persons in accordance with its consultation programme, and to follow its published approach for considering NTSs.<sup>99</sup>
- C35 Under clause 8.1.3(1)(a) of the Capex IM, Transpower’s consultation programme must provide for Transpower to consult prior to submitting a MCP on such matters specified in Schedule I of the Capex IM, as applicable.
- C36 In its proposal, Transpower provided:
- C36.1 a summary document with selected feedback and its response to that feedback of the stakeholder long-list, and short-list consultations;<sup>100</sup> and
- C36.2 a document setting out its new approach to engaging with possible development NTS providers.<sup>101</sup>
- C37 Over the course of Transpower’s long-list and short-list consultations, feedback from potential NTS providers was that the NTS approach taken by Transpower, would not facilitate NTS uptake in the WBOP region, and may lead to inefficient transmission capex investment.
- C38 Transpower noted in its short-list consultation documentation that, while a NTS would not eliminate the need for transmission investment in the WBOP region, it may play a role in deferring transmission investment and/or managing project delivery risk.<sup>102</sup>
- C39 However, Transpower concluded that it considered there was “too much uncertainty to proceed with a detailed request for proposals (**RFP**) for NTS at this point in time” and proposed “to consider an RFI/RFP at a later date” when it had “more certainty around requirements and potential providers have more certainty around their capacity to meet the need.”<sup>103</sup>
- C40 SolarZero, in its short-list consultation submission noted that, contrary to Transpower’s Whakamana i Te Mauri Hiko work,<sup>104</sup> where battery and solar photovoltaic (**PV**) installations were predicted to be key technologies used to help

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<sup>99</sup> Capex IM, clause 3.3.1(3)(a), requires Transpower and us to use reasonable endeavours to agree a consultation programme for a transmission investment or a NTS, in accordance with clause 8.1.3. If the parties cannot agree within the specified time period, the Commission will set the consultation programme after considering the views of Transpower.

<sup>100</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 7 – Stakeholder consultation, available [here](#).

<sup>101</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 9 – Approach to NTS, available [here](#).

<sup>102</sup> *Transpower NZ Ltd*, WBOP MCP Short-list consultation, section 3.1, p. 15 available [here](#).

<sup>103</sup> *Transpower NZ Ltd*, WBOP MCP Short-list consultation, section 3.1, p. 15 available [here](#).

<sup>104</sup> <https://www.transpower.co.nz/about-us/our-strategy/whakamana-i-te-mauri-hiko-empowering-our-energy-future>

meet future demand, that Transpower appeared to have “made the decision to not pursue non-transmission solutions as part of the proposal.”<sup>105</sup>

C41 Flex-Able noted “engagement of NTS providers in the Western Bay of Plenty should be undertaken immediately and not in the future” and that NTS solutions could provide transmission investment deferral, and a means to manage transmission project delivery risk.<sup>106</sup>

C42 In its short-list submission Flex-Able sought engagement from Transpower on a commercial level, stating:<sup>107</sup>

The only uncertainties seem to be around Transpower’s lack of engagement with NTS providers at a commercial level to agree remuneration around providing any potential NTS services. We find it hard to see how the major roll out of appropriate NTS network capacity will materialise in time without robust and finalised commercial discussions around pricing for using these networks.

C43 Prior to Transpower’s WBOP MCP submission, we encouraged Transpower to consider a more detailed commercial approach to NTS, and also indicated that funding for developing NTS was possible under the present Capex IM arrangements.

C44 As part of its proposal, Transpower has further developed its thinking on the use of NTS.<sup>108</sup> It has addressed some of the concerns expressed by submitters that its NTS approach to date had not been sufficiently commercial to enable NTS providers to meaningfully engage.

C45 We have reviewed the Transpower’s WBOP ‘Approach to NTS’ document. While its WBOP MCP NTS plan is not yet fully formed, and it has not yet set commercial terms for NTS development costs and NTS operational remuneration, it plans to initiate a NTS RFP process that will be more commercial in nature. Transpower has indicated this process will enable NTS providers to judge whether it is economic for them to enter into a NTS agreement with Transpower.

C46 In summary, consistent with the clause C2(d) requirements, we consider that Transpower has had regard to interested parties’ views on NTSs, following the long-list and short-list consultations.

C47 In addition, we will continue to encourage Transpower to provide information that is likely to attract NTS investment that could avoid transmission investment, other than just short-term deferral in future MCPs, for example, grid-scale battery installations.

C48 Our draft decision is that the requirements of clause C2(d) have been met.

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<sup>105</sup> *SolarZero*, Submission: Western Bay of Plenty Major Capex proposal, p. 2, available [here](#).

<sup>106</sup> *Flex-Able*, Response to Western Bay of Plenty Development Plan, p. 1, available [here](#).

<sup>107</sup> *Flex-Able*, Response to Western Bay of Plenty Development Plan, p. 1, available [here](#).

<sup>108</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 9 – Approach to NTS, available [here](#).

### Clause C2(e) – the impact of the sensitivity analysis on electricity market benefit or cost elements of the proposed investment and investment options

C49 This is discussed in our evaluation in Attachment D of Transpower’s application of the investment test to the proposed investment.

### Clause C3 – evaluation of the major capex allowance and maximum recoverable costs

#### Evaluation of the major capex allowance

C50 Transpower has requested a MCA of \$83.2 million, in 2032 prices. Table C1 summarises the components of the proposed MCA.

**Table C1 Summary of the components of the WBOP MCP MCA as proposed <sup>109</sup>**

MCA component	Amount (\$m 2024)
OKE-TMI 110kV line reconductoring	15.4
OKE-TRK 110kV line reconductoring	13.5
KMO-TMI 110kV line reconductoring	11.1
Substation upgrades (after reconductoring)	0.8
KMO-TGA 110kV line reconductoring	3.7
KMO 220/110kV interconnecting transformer	13.3
Investigation cost	1.5
Contingencies	7.7
P50 estimate of cost (real) (P50 estimate)	67.0
Inflation related cost	7.3 (\$m 2032)
Interest During Construction (IDC)	8.9 (\$m 2032)
<b>MCA (sum of P50 cost, inflation related cost and IDC)</b>	<b>83.2 (\$m 2032)</b>

#### We are satisfied with the components of the proposed major capex allowance

C51 While Transpower has sought maximum recoverable cost funding of \$2.5 million for the development NTS, this amount should be included in the MCA Transpower has sought approval for. This is consistent with the definition of major capex in the Transpower IM.<sup>110</sup>

<sup>109</sup> The summary components of the proposed MCA were provided to us by Transpower as separate confidential information.

<sup>110</sup> Capex IM, clause 1.1.5(2) and Transpower IM, clause 3.1.3.

- C52 In adding the proposed NTS recoverable cost to the proposed MCA, the MCA we have reviewed totals \$86.1 million (\$ 2032).<sup>111</sup>
- C53 Following our review, we are satisfied with the underlying calculations, cost estimates and reports provided by Transpower, that verify Transpower's calculation of its proposed MCA.
- C54 We consider the WBOP MCP project cost estimates are reasonable, subject to the commissioning date of 31 December 2032.
- C55 In coming to this conclusion, we are mindful that estimating the capital costs of projects in a MCP is a complex engineering process that requires:
- C55.1 producing conceptual designs;
  - C55.2 conducting site investigations;
  - C55.3 scoping the projects, and then preparing the scope of work packages; and
  - C55.4 estimating the quantity of work for each work package.<sup>112</sup>
- C56 In reviewing the estimated costs, we sought to form a view on whether Transpower had:
- C56.1 adequately scoped the works;
  - C56.2 estimated the quantities;
  - C56.3 applied the unit costs where applicable;
  - C56.4 allowed for preparation costs for turnkey portions of the projects; and
  - C56.5 derived contingencies in a reasonable manner.
- C57 We outline our approach to assessing the MCA and the analysis we carried out in the following paragraphs.

### **Our approach to evaluating the MCA**

- C58 Under clause C3 of Schedule C, we must consider at least one of the following factors when evaluating the MCA:

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<sup>111</sup> We inflated the NTS recoverable cost component amount of \$2.5 million to \$ 2032 values to enable us to approve an MCA amount in \$ 2032 and quantify the amount of exempt major capex. Our estimate is that the NTS recoverable cost is \$2.9 million in \$ 2032 based on Transpower inflator data.

<sup>112</sup> Examples of work packages include site excavation, fencing, installing security lights, constructing the foundation for the equipment, strengthening tower foundations, freighting equipment onto sites and installing the MCPO's primary assets.

- C58.1 how Transpower used the major capex project outputs, key drivers, key assumptions, and cost modelling to determine the P50 and MCA cost (clause C3(a));<sup>113</sup>
- C58.2 the capital costing methodology and formulation, including unit rate sources, the method used to test the efficiency of unit rates, and the level of contingencies included (clause C3(b));
- C58.3 the impact of forecast costs on other Transpower costs, including the relationship with operating expenditure (clause C3(c));
- C58.4 mechanisms for controlling actual capital expenditure with respect to the MCA (clause C3(d)); and
- C58.5 the efficiency of the proposed approach to procurement of goods and services (clause C3(e)).
- C59 In evaluating Transpower’s proposed MCA, we considered the factors under clauses C3(a) and C3(b) because they best enable us to form a view on whether Transpower’s estimated cost of the project, and the subsequent derivation of the MCA, are reasonable. This is because they enable us to form a view on whether Transpower’s estimate cost of the project, and the subsequent derivation of the MCA, are reasonable.
- C60 To assess the capital cost of the MCP’s proposed investment, Transpower provided us with:
- C60.1 a concept development report on the reconductoring of Hairini-Tauranga lines;<sup>114</sup>
- C60.2 a costing spreadsheet that included unit costs, estimated quantities, and associated uncertainties; and
- C60.3 a project costing that outlines Transpower’s approach to estimating capex, estimating the P50 cost as well as a breakdown cost estimates of the major components of the WBOP MCP.<sup>115</sup>
- C61 We assessed the estimated capital costs by:
- C61.1 reviewing the above documents; and
- C61.2 seeking further clarification and explanation from Transpower.

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<sup>113</sup> The MCA is the allowance for the MCP and is based on the base cost estimate plus the fiftieth percentile of uncertainties, or P50 cost estimate. Under clause 1.1.5(2) of the Capex IM, ‘P50’ means the estimated aggregate project costs where the probability of the actual aggregate project costs being lower than that estimated is 50%.

<sup>114</sup> BECA Hai-TGA-A Upgrading, Concept Development Report, 7 July 2023.

<sup>115</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, pp. 2-7, available [here](#).

C62 We met several times with Transpower when assessing the cost estimates. The objective of these meetings was to establish whether the scope, unit costs, and estimated quantities in the above documents were reasonable.

**Clause C3(a) - how Transpower used the major capex project outputs to determine the MCA**

C63 Transpower derived the MCA according to the components shown in Table C1, using the following general approach:

C63.1 determine the base estimate and uncertainties;

C63.2 use triangular distribution to derive the P50 costs;<sup>116</sup>

C63.3 forecast exchange rates, and forecast inflation from 2025 to 2032; and

C63.4 forecast financing costs.

C64 Transpower's base estimate is the summation of the cost to deliver the five major capex project outputs of this project, plus the support and preparedness projects (investigation costs).

C65 To reach its project cost estimates, Transpower has used its Transpower Enterprise Estimation System (**TEES**) pricing model, and indicative prices provided by potential suppliers, to estimate the cost of each works package. There is a clear link between the cost estimate and each major capex project output. With regard to TEES, Transpower states:<sup>117</sup>

We use TEES (Transpower's Enterprise Estimating System) to estimate the cost of all capital projects. TEES produces cost estimates for a project based on the historical rates from past projects or known current rates, as well as information from consultants and/or potential vendors (e.g. RFPs, concept design and solution study exercises). It also factors in changes to the cost of foreign exchange and key commodities such as external labour, copper, steel and aluminium.

C66 We are satisfied with the triangular probability distribution approach used by Transpower to derive the P50 cost estimate. We are also satisfied with the lower and upper cost estimates derived, based on the estimate of material and labour unit quantities that Transpower used. The variation between these and the base quantities are in the range expected of such estimates at this phase of a project's life cycle.

C67 We are satisfied that the above methodology provides an MCA based on a P50 estimate for project costs as required by the Capex IM.<sup>118</sup>

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<sup>116</sup> Triangular distribution is a representation of the probability distribution when using data for maximum, minimum and most likely values.

<sup>117</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, p. 2, available [here](#).

<sup>118</sup> Capex IM, clause G5(2)(c).

**Clause C3(b) - evaluation of the base estimate using the capital costing methodology, including unit rate sources, the method used to test the efficiency of unit rates, and the level of contingencies included in the estimate**

- C68 We evaluated the base estimate of the MCP project cost using the technique of the capital costing methodology, and formulation as outlined under clause C3(b) of Schedule C.<sup>119</sup>
- C69 We assessed how Transpower prepared the base estimate and whether the underlying assumptions appear reasonable.
- C70 TEES includes a database of assembly costs which is the source of the unit costs Transpower use in its costing methodology. We assessed how Transpower derives and updates its unit rates as follows:
- C70.1 we evaluated TEES and assessed how Transpower ensures unit costs in TEES are current. The same process is used to update the unit costs in assemblies.<sup>120</sup> We are satisfied that Transpower has a sound process to ensure the unit costs are current. For example, Transpower updates external labour and material rates based on actual costs from completed projects and through internal panel review; and
- C70.2 as part of evaluating Transpower's unit costs and assembly costs that have been factored into the TEES unit costs, we asked Transpower to verify the values of previous similar projects, as well as the multipliers used to update the TEES estimates to 2024 prices. Based on our random sampling of certain material items and evaluating its estimate, we are satisfied that:
- C70.2.1 the current unit costs in TEES are reflected in Transpower's cost estimation; and
- C70.2.2 the assemblies are sufficiently granular for the purpose of estimating the cost of the MCP.

**The level of contingencies included in the base estimate**

- C71 The two types of risks contributing to uncertainties are:
- C71.1 scope risk, which arises from uncertainties at this early stage, in estimating the quantities for the work packages; and
- C71.2 project risks, which arise from variations in prices, stakeholder liaison, environmental considerations, project commencement timing, and project duration due to external events such as weather.

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<sup>119</sup> The base estimate is the cost of each element (for example labour cost, and list of material) used to provide the overall MCP project estimate.

<sup>120</sup> An assembly is a package of work with one or more cost items underneath it. Transpower considers that assemblies can provide the level of more granular and site-specific costs required to estimate the cost of the Project.

- C72 Allowing for the above uncertainties recognises that not all works can be identified at this early phase, because contractor prices can vary, project delivery can be affected due to availability of equipment outages, and project delays due to external events such as weather.
- C73 We consider these risks have a reasonable possibility of materialising and have therefore accepted them in the MCA. This allows Transpower to recover these costs should they materialise.
- C74 We are satisfied that the uncertainties discussed and proposed by Transpower, are reasonable and consistent with clause G5(2)(c) of Schedule G of the Capex IM, which requires the proposed MCA be a P50 estimate of the capital cost, and the estimated probability distribution of the P50.
- C75 The level of contingency proposed by Transpower (\$7.7 million in 2024 prices) is included in the base cost estimate. This amount is 11.5% of the base estimate, and we consider this is appropriate for the type of projects in the WBOP MCP. This contingency assumption is at the lower end of the scale when compared to a recent MCP (Waikato Upper North Island voltage management), and similar to the Bombay Otahuhu reinforcement listed project, which we have reviewed and approved.<sup>121</sup>

#### Exchange rate and inflation assumptions

- C76 The exchange rate and inflation assumptions of the MCA are subject to the wash-up mechanism, which means these assumptions do not impact the incentive calculation or the final revenue amount Transpower can recover.<sup>122</sup>
- C77 Transpower's exchange rates and inflation assumptions are shown in Tables C2 and C3 below.

**Table C2 Exchange rates used to calculate the MCA**<sup>123</sup>

Currency	Exchange rate
AUD	0.9104
EUR	0.5281
SEK	6.1175
USD	0.5924

<sup>121</sup> In the case of the Waikato Upper North Island Voltage Management Stage 1 MCP, the contingency was 25.9% of the base estimate, while for Bombay Otahuhu reinforcement MCP the contingency was 11.4%.

<sup>122</sup> Capex IM, clause B3(1).

<sup>123</sup> Transpower email to the Commerce Commission (26 February 2025).

**Table C3 Forecast inflation rate used to calculate the MCA** <sup>124</sup>

Year	2025	2026	2026	2027	2028	2029	2030	2031	2032
Rate	2.3%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

### Financing cost assumptions

C78 Transpower has estimated its financing costs based on the assumption that:

C78.1 the financing rate is set at Transpower’s current weighted average cost of capital (**WACC**);<sup>125</sup>

C78.2 expenditure occurs at the end of each month: and

C78.3 the same principles used in its RCP4 base capex proposal still apply.<sup>126</sup>

C79 The capital expenditure profile of the WBOP MCP is the ‘S’ curve typical of such projects.<sup>127</sup> Most expenditure associated with line works will occur throughout the project’s duration, with an increase in expenditure at the start of the project, allowing for project mobilisation and start-up.

C80 Site preparation works, that are carried out in the early stages of the construction phase, are where variations in scope or delays may occur, and corresponding increased costs are most likely. Due to the comparatively lower costs of site preparation works for the WBOP MCP, the effect of variations to capital expenditure profile on the financing costs is not high.

### Our evaluation of the maximum recoverable cost

C81 The maximum recoverable cost of \$2.5 million that Transpower is proposing, is based on a potential development NTS that would defer selected WBOP MCP transmission investments for at least one year.<sup>128</sup>

C82 In calculating the value of transmission investment deferral, Transpower has broken down the transmission investment deferrals into 6 work streams.

C83 The transmission investment deferral values Transpower calculated are set out in Table C4.

<sup>124</sup> This Transpower information was provided to us in spreadsheet labelled ‘WBOP MCA ComCom copy’ December 2024. The annual values are those of the December quarter of each year.

<sup>125</sup> We set the WACC in our cost of capital determination: *Commerce Commission, Cost of capital determination for electricity distribution businesses’ 2020-2025 default price-quality paths and Transpower New Zealand Limited’s 2020-2025 individual price-quality path (2019) NZCC 12 (25 September 2019)*, available [here](#).

<sup>126</sup> Under clause 1.1.5(2) of the Capex IM, the ‘base capex proposal’ is the information Transpower submits to enable us to determine the components of the IPP under clause 2.2.2 of the Capex IM.

<sup>127</sup> Project S curve is a graphical representation of the cumulative expenditure of a project, and this normally takes the shape of “S”.

<sup>128</sup> *Transpower NZ Ltd, WBOP MCP Attachment 9 – Approach to non-transmission solutions, p. 2*, available [here](#).

**Table C4 Transmission investment deferral values (\$m 2024)** <sup>129</sup>

WBOP transmission investment works subject to NTS 1-year deferral	Transmission investment deferral values (\$m 2024)
Kaitemako 220/110kV Transformer	0.53
Reconductor Kaitemako – Tauranga 110kV line (interconnection portion)	0.15
Reconductor Okere – Te Matai 110kV line	0.68
Reconductor Okere – Tarukenga 110kV line	0.60
Reconductor Kaitemako – Te Matai 110kV line	0.47
Substation upgrade after reconductoring	0.03
<b>Total</b>	<b>2.46</b>

- C84 To calculate the transmission investment deferral values, Transpower has assumed a discount rate of 5%, and presented these values in real terms in 2024 dollars.
- C85 Transpower has then taken its forecast peak demand and calculated a \$/kW value for each transmission investment work stream, based on the capital cost of the work stream and the expected peak load reduction.
- C86 We have reviewed Transpower’s approach and the deferral value calculation methodology it applied. We consider these are reasonable and the use of a 5% discount rate is appropriate.
- C87 The maximum recoverable cost of \$2.5 million (\$ 2024) for a development NTS to enable a one-year transmission investment deferral, is reasonable. Our draft decision is to approve the maximum recoverable cost of \$2.9 million (\$ 2032) to enable a minimum one-year of transmission investment deferral.
- C88 While the development NTS framework Transpower proposed is to fund a single year of transmission investment deferral, this deferral is a minimum. The potential for NTS in the WBOP region appears significant, according to submitters during the development of Transpower’s proposal, so additional transmission investment deferral may be possible. We consider the development NTS arrangement as proposed, and approved in this draft decision, allows this.
- C89 If it transpires that additional transmission investment deferral beyond a single year is likely, then Transpower can seek to amend the WBOP MCP proposal outputs and the MCA.

<sup>129</sup> Transpower NZ Ltd, WBOP MCP Attachment 9 – Approach to non-transmission solutions, p. 4, available [here](#).

- C90 We encourage Transpower to work with Powerco to assist NTS providers. It is likely that NTS providers will seek close cooperation with Powerco to effect investment deferral in the distribution network. In this situation, any NTS investment that creates distribution network investment deferral, will need to be paid for by Powerco to the NTS provider, via Powerco's own regulated revenue.

#### **Clause C4 – evaluation of the proposed approval expiry date**

- C91 Transpower proposes an approval expiry date of 31 December 2037 for the WBOP MCP.
- C92 The effect of an approval expiry date is that Transpower cannot recover the costs of any assets commissioned after this date. This incentivises Transpower to deliver the MCP project within the approval expiry date, or apply for an amendment to that date under clause 3.3.6(1)(d) of the Capex IM.
- C93 In evaluating Transpower's proposed approval expiry date under clause C4 of Schedule C, we must have regard to at least one of the six factors listed in that provision.
- C94 We tested Transpower's proposed approval expiry date against the factors set out in clause C4(c): the effect of the proposed approval expiry date, and the commissioning date assumption in the WBOP MCP.
- C95 We agree that Transpower's approval expiry date is reasonable since it provides Transpower with sufficient time to deliver on the WBOP MCP, while managing the short-term uncertainties. Our draft decision is that the clause C4 requirements have been met.

#### **Clause C5 – evaluation of the major capex project outputs**

- C96 We evaluated Transpower's proposed major capex project outputs against the factors set out in clause C5(a): the extent to which the major capex project outputs reflect the nature, quantum, and functional capability of the transmission investment assets to be commissioned.
- C97 The nature and functional capability of the proposed transmission investments are to enhance transmission capacity in the Western Bay of Plenty region, to ensure electricity supply is maintained out to 2052.
- C98 We are satisfied the WBOP MCP outputs reflect the nature, quantum, and functional capability of the transmission investment assets to be commissioned. Our draft decision is that the requirements of clause C5(a) have been met.

#### **Clause C6 – evaluation of the major capex incentive rate and exempt major capex**

- C99 The major capex incentive rate we set under clause 3.3.5(7)(b) of the Capex IM determines the reward (or penalty) that Transpower receives (or bears), depending on how the actual cost of delivering a major capex project compares to the

project's MCA.<sup>130</sup> Exempt major capex is that portion of the MCA amount to which the major capex incentive rate does not apply to.<sup>131</sup>

C100 Transpower has proposed:<sup>132</sup>

C100.1 a major capex incentive rate of 15%; and

C100.2 that we do not set any exempt major capex.

C101 We discuss Transpower incentive rate and exempt major capex proposals below.

### **Major capex incentive rate**

C102 Under clause 1.1.5(2) of the Capex IM, the major capex incentive rate is 15%, the default rate, or an alternative rate we specify after considering a request from Transpower. In its WBOP MCP proposal, Transpower proposed the default MCP incentive rate of 15% apply.

C103 We are satisfied the incentive rate of 15%, which is the default rate under the Capex IM, will incentivise Transpower to seek efficiencies in delivering the WBOP MCP. We would only typically consider moving from the default incentive rate for projects where the forecast capital cost is high, the forecast capital cost is uncertain, or the potential for efficiency gains is high. We do not consider these circumstances apply to this MCP.

### **Exempt major capex**

C104 Exempt major capex is the part of the MCA to which the major capex incentive rate does not apply. It is typically set for portions of the MCA that reflect uncertainties that are outside the control of Transpower. Transpower has proposed there not be any exempt major capex.

C105 Transpower has characterised the project cost estimate contingency as a risk adjustment to “account for cost uncertainty not represented in our lower and upper bound estimates.”<sup>133</sup>

C106 The effect of applying exempt major capex to identified cost contingencies, is that Transpower would not suffer a loss from spending the contingency if the risks eventuate. Similarly, consumers would not have to pay for any reward if the contingency allowance is not spent.

C107 The proposal's project cost contingency is estimated by Transpower to be \$7.7 million (in 2024 prices), which is 11.5% of the total project cost estimate of \$67.0

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<sup>130</sup> Capex IM, clause B3(1), determines how the major capex incentive rate applies to an approved major capex project.

<sup>131</sup> Capex IM, clause 1.1.5(2).

<sup>132</sup> *Transpower NZ Ltd*, WBOP MCP Application, p. 5, available [here](#).

<sup>133</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, p. 2, available [here](#).

million. This translates to a contingency of \$9.6 million for the forecast MCA of \$83.2 million (in 2032 prices).<sup>134</sup>

- C108 In our review of Transpower’s detailed costing data, we ascertained that there was no risk adjustment associated with \$1.5 million of investigation costs. On this basis, we consider the contingency amount of \$9.6 million relates to the MCA of \$83.2 million (in 2032 prices).
- C109 We consider project cost risks have a reasonable possibility of materialising and have therefore included them in the MCA. This allows Transpower to recover these costs should the risks materialise.
- C110 However, we have decided that exempt major capex should apply to the risk adjustment (contingency) identified by Transpower. Our view is that Transpower should not be rewarded through incentives for saving cost contingency amounts.
- C111 We have also included a \$2.9 million (\$ 2032) recoverable cost component of the MCA as exempt major capex.<sup>135</sup> This is because there is uncertainty about whether Transpower is able to procure a viable NTS to defer the transmission investment. Given this uncertainty, we do not think the NTS recoverable cost should be subject to the incentive framework.
- C112 This approach is consistent with how we treat uncertainties relating to foreign exchange, and inflation forecast error as mentioned under ‘Exchange rate and inflation assumptions’ in paragraphs C75 and C76.
- C113 Our draft decision, under clause 3.3.5(7)(c) of the Capex IM, is to treat:
- C113.1 the risk adjustment component of the MCA as exempt major capex, equal to \$9.6 million in \$ 2032 prices; and
- C113.2 the recoverable cost component of the MCA as exempt major capex, equal to \$2.9 million in \$ 2032 prices.
- C114 This means the capital cost uncertainties up to \$9.6 million, and \$2.9 million recoverable costs for the development NTS, will not be subject to the incentive mechanism.
- C115 Accordingly, in setting the exempt major capex and the major capex incentive rate, the incentive scheme under clause B3(1) of Schedule B of the Capex IM will work as follows. If the actual cost of delivering the WBOP MCP is:

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<sup>134</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, p. 5, available [here](#).

<sup>135</sup> We inflated the NTS recoverable cost component amount of \$2.5 million to \$ 2032 values to enable us to approve an MCA amount in \$ 2032 and quantify the amount of exempt major capex. Our inflated estimate is based on Transpower inflator data.

- C115.1 less than the MCA minus exempt major capex, then applying the major capex incentive rate, Transpower will be entitled to a reward;
- C115.2 between the MCA and the MCA minus exempt major capex, then there is no reward or penalty; and
- C115.3 more than the MCA, then applying the major capex incentive rate, Transpower will be penalised.

## Attachment D Evaluation of the investment test

- D1 In this attachment we set out our review of Transpower's application of the investment test to the Western Bay of Plenty (**WBOP**) major capex project (**MCP**).
- D2 We discuss our evaluation of:
- D2.1 the parameters Transpower used for the investment test;
  - D2.2 the expected net electricity market benefits Transpower found;
  - D2.3 Transpower's selection of the proposed investment;
  - D2.4 our assessment of Transpower's investment test application; and
  - D2.5 the results of Transpower's sensitivity analysis.

### Criteria for satisfying the investment test

- D3 The investment test set out in Schedule D of the Capex Input Methodologies (**Capex IM**) requires Transpower to use a cost-benefit analysis, using discounting of relevant costs and benefits in the electricity market over a defined calculation period, to identify the most economic investment option as the proposed investment.<sup>136</sup>
- D4 Under clause D1(1) of Schedule D, a proposed investment satisfies the investment test if it has the highest expected net electricity market benefit and is robust to sensitivity analysis, compared with other investment options.
- D5 The net expected electricity market benefit:<sup>137</sup>
- D5.1 does not need to be positive for the proposed investment to meet the N-1 criterion of the Grid Reliability Standards (**GRS**); but
  - D5.2 needs to be positive for any other proposed investment.
- D6 When selecting the proposed investment, Transpower may consider unquantified electricity market benefits or cost elements, if the difference in expected net electricity market benefits between two or more investment options, is within 10% of the aggregate project costs.<sup>138</sup>

### We are satisfied with Transpower's application of the investment test

- D7 Under clause C1(1) of Schedule C of the Capex IM, we are satisfied:

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<sup>136</sup> 2012 Capex IM Reasons paper at para 7.2.1. We note that in our 2017/18 Capex IM review, we decided to retain the investment test criteria and approach in the 2012 Capex IM. See 2017/18 Capex IM review reasons paper at para 194.

<sup>137</sup> Capex IM, clause D1(1)(b).

<sup>138</sup> Capex IM, clauses D1(1)(c)(ii) and D1(2).

- D7.1 with the parameters Transpower used in applying the investment test;
- D7.2 that Transpower's proposed investment satisfies the investment test; and
- D7.3 that Transpower's proposed investment is robust to sensitivity analysis.

### **How the investment test is performed**

- D8 In carrying out the investment test, Transpower must:<sup>139</sup>
- D8.1 estimate the electricity market benefits, or cost elements and project costs, for each investment option under each relevant generation and demand scenario;<sup>140</sup>
  - D8.2 calculate the net electricity market benefits for each investment option under each relevant generation and demand scenario. The net electricity market benefit is the sum of the electricity market benefits, less the sum of the electricity market costs, including the project cost; and
  - D8.3 calculate the expected net electricity market benefit, which is the weighted average of the net electricity market benefit, under each relevant demand and generation scenario.
- D9 As part of carrying out the investment test, Transpower must also test whether its proposed investment is sufficiently robust under sensitivity analysis, which verifies whether the proposed investment is robust to changes in some of the key assumptions.<sup>141</sup>

### **How we evaluated Transpower's application of the investment test**

- D10 Under the Capex IM, we reviewed Transpower's application of the investment test by considering whether:
- D10.1 the proposed investment is to meet the economic criterion of the GRS and provides a positive net market benefit;
  - D10.2 the investment need date is reasonable;
  - D10.3 the parameters of the investment test are appropriate and whether Transpower consulted on the parameters it applied;
  - D10.4 Transpower reasonably estimated the expected net electricity market benefit of each investment option;
  - D10.5 the proposed investment is the investment option with the highest net electricity market benefit; and

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<sup>139</sup> Capex IM, clause D2.

<sup>140</sup> The terms 'electricity market benefit or cost element', 'project cost', and 'relevant generation and demand scenarios' are defined in clause D4(1), (2), and clause D3(4) of Schedule D.

<sup>141</sup> Capex IM, clause D1(1)(a).

D10.6 the proposed investment is robust to sensitivity analysis.

D11 We present a summary of our evaluation of Transpower's investment test application in the rest of this attachment.

### **The proposed investment needs to meet the economic criterion of the GRS**

D12 Transpower has submitted the MCP to meet clause D1(1)(b) of Schedule D of the Capex IM.

D13 Following our review of the proposal, we agree that Transpower's proposed investment and the alternative investment options it considered, are consistent with investments required to meet the economic criterion of the GRS.

D14 Transpower states in its proposal that the proposed investment provides the highest expected net electricity market benefit, and meets the economic criterion of the GRS.<sup>142</sup> Following our review, we are satisfied Transpower has demonstrated that its proposed investment provides the highest expected net electricity market benefit.

D15 While Transpower has applied for this MCP under the economic limb of the GRS, the transmission links into the Tauranga and Mt Maunganui grid exit points (**GXPs**) are still defined as core grid links, and subject the N-1 deterministic limb of the GRS.

D16 The core grid definition contains 110kV core grid links between Tarukenga and Tauranga (**TRK-TGA**), and Tarukenga and Mt Maunganui (**TRK-MTM**).<sup>143</sup> Since the core grid was defined, there has been investment in the Western Bay of Plenty region, with the Kaitemako substation installed in 2008.<sup>144</sup>

D17 The Kaitemako substation introduced new 220/110kV interconnecting transformers (**ICTs**), 110kV transmission links between Kaitemako and Tauranga (**KMO-TGA**), Kaitemako and Mt Maunganui (**KMO-MTM**), and a new 220kV transmission link between Tarukenga and Kaitemako (**TRK-KMO**). These new 110kV and 220kV circuits and KMO interconnecting transformers (**ICTs**) replaced the existing TRK-TGA and TRK-MTM 110kV core grid links.

D18 In our view, Transpower has economically demonstrated that N-1 transmission supply security into TGA and MTM may also be justified. This would align with Transpower's view that the investment need date of 2029/2030 is driven by N-1 outage considerations.<sup>145</sup>

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<sup>142</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 1 – Compliance with the Capex IM, section 3 p. 15, available [here](#).

<sup>143</sup> See Schedule 12.3 of the Electricity Industry Participation Code (EIPC) 2010 available [here](#).

<sup>144</sup> <https://www.nzherald.co.nz/bay-of-plenty-times/news/new-substation-fires-up/TMWJVZLQOAYF77S5HFWM66UB3E/>.

<sup>145</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 2 – Overview of need, section 1.2.1 p. 5, available [here](#).

### Our evaluation of the parameters of the investment test

D19 The Capex IM allows Transpower some discretion to select the analysis parameters of the inputs into the investment test. Transpower is required to consult on the values of the parameters it uses.<sup>146</sup> The key parameters in this proposal are the:

D19.1 calculation period;<sup>147</sup>

D19.2 demand and generation scenarios (comprising demand forecasts and generation scenarios);<sup>148</sup>

D19.3 discount rate;<sup>149</sup>

D19.4 value of expected unserved energy, including any involuntary demand curtailment costs;<sup>150</sup> and

D19.5 investment options Transpower considered and consulted on.<sup>151</sup>

D20 For the reasons we outline below, we are satisfied that Transpower has reasonably selected the investment test parameters.

#### *Calculation period*

D21 Transpower has used a calculation period of 20 years after commissioning of the final investment in the proposal in 2033. The default calculation period, under clause G5(11)(b) of Schedule G of the Capex IM, is 20 years.

D22 In its long list consultation, Transpower proposed using the extended calculation period starting from 2033, which is the point at which the cost of having insufficient transmission capacity to meet demand becomes significant on an annual basis. Transpower notes in its proposal that, based on long-list consultation feedback, it adopted this calculation period assumption.<sup>152</sup>

D23 We are satisfied the calculation period Transpower has selected, and the timeframe over which it has calculated the costs and benefits in the application of the investment test, are appropriate.

#### *Demand and generation scenarios*

D24 The Capex IM requires Transpower to use the relevant demand and generation scenarios when it calculates the expected net electricity market costs and benefits in the investment test.<sup>153</sup>

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<sup>146</sup> Capex IM, clause I4.

<sup>147</sup> Capex IM, clause G4(5)(b).

<sup>148</sup> Capex IM, clause G3(1).

<sup>149</sup> Capex IM, clause G4(5).

<sup>150</sup> Capex IM, clause G4(5)(c) and clause I4.

<sup>151</sup> Capex IM, clause 7.4.1(2).

<sup>152</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 3.1 p. 4, available [here](#).

<sup>153</sup> Capex IM, clause D2(1).

- D25 The relevant scenarios that Transpower use must be either the demand and generation forecasts published by the Ministry of Business, Innovation and Employment (**MBIE**), or Transpower’s development of a reasonable variation of those scenarios (**scenario variations**), having had regard to the views of interested persons on the variation.<sup>154</sup>
- D26 The most recent scenarios published by MBIE are the 2024 Electricity Demand and Generation Scenarios (**EDGS**), published in July 2024.<sup>155</sup>
- D27 However, in the proposal, Transpower states it has based its WBOP MCP analysis on the 2019 EDGS to reflect consultation it undertook “as part of the Net Zero Grid Pathways 1 (**NZGP1**) workstream in 2021”<sup>156</sup>, including focussed updates on WBOP regional demand that the 2019 EDGS and 2024 EDGS do not adequately model.
- D28 The 2024 MBIE EDGS were released during the WBOP MCP long-list consultation process. Transpower’s view is that its use of the 2019 EDGS variations with updates, is reasonable, and that the new EDGS contain “very limited regional information to inform this project.”<sup>157</sup>
- D29 In the following sections we assess whether the demand and generation scenario assumptions Transpower has made, are reasonable and consistent with the Capex IM.

*The demand and generation scenario variations must be feasible and reasonable*

- D30 Clause D3(3) of the Capex IM sets out a non-exhaustive list of the factors that Transpower must have regard to for a scenario variation to be a “feasible and reasonable” variation of EDGS. Those factors include existing and forecast demand, the grid reliability standards, the value of expected unserved energy, and transfer capacities and capabilities of the grid.
- D31 Some of these requirements are more relevant to the demand scenarios and some are more relevant to the generation scenarios.
- D32 The WBOP MCP is a proposal to enhance transmission capacity that is primarily driven by demand growth in the WBOP region. As such, modelling nationwide demand growth and generation developments is not as important as it might be for a generation scenario and an energy demand driven project, such as NZGP1.
- D33 In the next sections we evaluate the demand and generation scenario variations Transpower has used, and if these are feasible and reasonable variations of EDGS.

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<sup>154</sup> Capex IM, clauses D3(1) and D3(2). Under clause I1(1)(b), Transpower must consult on each demand and generation scenario variation.

<sup>155</sup> <https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-modelling/electricity-demand-and-generation-scenarios>

<sup>156</sup> Transpower NZ Ltd, NZGP Phase One, available [here](#).

<sup>157</sup> Transpower NZ Ltd, WBOP MCP Attachment 3 – Demand and generation scenarios, section 1 p. 2, available [here](#).

*Transpower has weighted the scenarios*

- D34 Transpower notes in its proposal that the default setting for scenario use in the investment test analysis, is that each scenario has equal weighting.<sup>158</sup>
- D35 However, as Transpower developed its proposal it considered different scenario weightings because:
- D35.1 demand growth rates in the Global and Reference scenarios are low, which is inconsistent with electrification and a net zero carbon target; and
  - D35.2 the Growth and Environmental scenarios produce very similar levels of demand growth.
- D36 Transpower consulted on its proposal scenario weightings and, based on feedback received, adopted the following scenario weightings in its analysis:<sup>159</sup>
- D36.1 weight the Global scenario as zero - because the Reference scenario “provides an adequate lower bound for demand growth in the region to test our investment decisions”; and
  - D36.2 weight the Environmental scenario as zero, but increase the weighting of the Growth scenario to 60%, because the Environmental Scenario has similar levels of growth as the Growth scenario, and “replacing two broadly similar scenarios with one reduces computational time”. Transpower also note that the Growth scenario closely aligns with Powerco’s own forecast demand.
- D37 In its sensitivity analysis, Transpower also considered the effect of equally weighting the scenarios, and found Option 2, as the preferred investment option, was robust to this assumption.
- D38 Following our review, and considering Transpower’s argument and consultation feedback, we consider Transpower has applied reasonable scenario weightings.
- D39 In choosing the scenario weightings, it has attempted to match the scenario demand variations to the known regional demand growth. Given the proposed investments are driven by demand growth and that the generation scenarios do not affect the proposed transmission investment need, we are satisfied with Transpower’s approach.

*Electricity demand scenarios*

- D40 Electricity demand forecasts are primarily used to predict the investment need date, and future investments of modelled projects. The need dates of modelled projects affect the electricity market costs and benefits of the investment options considered.

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<sup>158</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 2 p. 2, available [here](#).

<sup>159</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 2 p. 3, available [here](#).

- D41 EDGS does not forecast megawatt (**MW**) demand by region or GXP but instead provides national level forecasts of energy demand. When Transpower carries out power systems and economic analysis in support of a MCP proposal, it usually estimates peak demand forecasts by GXP, by matching the national energy forecasts with known GXP demand levels, and growth trends.
- D42 Transpower explains in the proposal that it consulted on, and updated the 2019 EDGS variations it used in the NZGP1 project, to derive peak and energy demand forecasts for the WBOP region. It did this after working closely with Powerco to include known factors that were specific to the regional demand growth.<sup>160</sup>
- D43 These factors include:
- D43.1 base demand growth driven by factors such as population increase;
  - D43.2 step load changes that might appear in the future from new commercial and major residential developments;
  - D43.3 electric vehicle (**EV**) uptake;
  - D43.4 uptake of residential and commercial solar photovoltaic (**PV**) panels;
  - D43.5 uptake of residential and commercial battery storage; and
  - D43.6 electrification of industrial processes, such as the conversion of coal and diesel boilers to electric boilers.
- D44 Transpower notes in its proposal that base level demand (eg organic growth related to population increases), and new step loads are driving the majority of WBOP regional growth over the next decade.
- D45 Transpower predicts that base load growth may result in upwards of 60MW of load growth out to 2040 under the Disruptive demand scenario, and 25MW under the Reference scenario.
- D46 However, the majority of demand growth is likely to be due to “new developments expected to occur in the region that will lead to a step increase in electricity demand” that will “contribute between 64 MW and 79 MW to peak growth by 2030.”<sup>161</sup>
- D47 EV charging effects during peak demand periods are predicted to be less impactful than the step load changes. Transpower predicts that upwards of 1.6MW of demand growth is attributed to new EVs under all scenarios.

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<sup>160</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 1 p. 3, available [here](#).

<sup>161</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 2.1.2, p. 6-7, available [here](#).

- D48 Solar and battery uptake effects have been modelled at an energy level of detail in the Transpower scenarios, with batteries more appropriately modelled as affecting peak demand (4% by 2040 and 1% by 2050).
- D49 Over the course of the WBOP MCP development, Transpower has been continuously refining demand growth assumptions as new information has arisen. In its Proposal, it sets out the changes to these assumptions following the short and long-list consultations, including load shifting between GXPs within the Powerco network.<sup>162</sup>
- D50 We also tested Transpower about how it had incorporated recent Government policy changes that may affect WBOP demand growth. In particular, we wanted to understand if Transpower had considered the effect of the Government’s decision to remove the Government Investment in Decarbonising Industry (**GIDI**) subsidy for large businesses to decarbonise.
- D51 Transpower responded to our Request for Information (**RFI**) about this Government policy change. Transpower responded:<sup>163</sup>
- D51.1 while the GIDI fund was announced during the early phase of the high-level consultation process (late 2020), the scenario assumptions are considered robust enough to encompass futures with and without the fund;
  - D51.2 some step loads associated with known process heat conversions were included in the load modelling, as informed by Powerco and during consultation;
  - D51.3 WBOP MCP process consultation submissions were generally supportive of the demand assumptions made, and several submitters noted a strong expectation for growth in the region from a variety of developments;
  - D51.4 electrification of process heat allocated to the region in 2030, contributes between 0.8% and 2.3% of the peak load which is not considered material; and
  - D51.5 it has worked closely with Powerco, which arguably holds the best information about load step changes in the WBOP region, to ensure local expectations of demand growth in preparing the proposal are represented.
- D52 In general, Transpower has taken the same demand forecasting approach it has used in previous demand driven MCPs. In this case, it is evident that Transpower has worked closely with the local lines company, Powerco, to model known demand step changes that are driving the majority of WBOP regional load growth.

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<sup>162</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 2.1.10, p. 14, available [here](#).

<sup>163</sup> Transpower response to RFI02 – WBOP MCP Demand and generation scenarios.

We are also satisfied that Transpower has reasonably accounted for the impact of Government policy changes on the demand growth assumptions.

- D53 In conclusion, we are satisfied that Transpower has met the Capex IM clause D3(2) requirements. We agree with the process it uses to match the energy demand forecasts in its energy demand scenario variations to GXP demand, modelled likely demand step changes, and that the demand scenario variations are reasonable variations of the EDGS forecasts.

#### *Generation scenarios*

- D54 A generation scenario is a hypothetical prediction of a set of generation developments within the electricity industry, and is used by Transpower to calculate the fuel cost differences between generation developments, and to calculate network losses.
- D55 In its proposal Transpower stated that, apart from existing embedded generation in the WBOP region, and following consultation, it was “not advised of any additional existing generation as part of our long-list consultation.”<sup>164</sup>
- D56 While Transpower has not identified any major generation plant locating in the region that could defer the need for the proposed investment, it has accounted for smaller scale solar generation schemes and batteries in each of the scenario variations it has used in its analysis.
- D57 In each scenario, Transpower has modelled WBOP regional solar uptake rates that are consistent with the national solar uptake rate, and modelled the effect of solar penetration on demand growth at a half-hour dispatch level of accuracy.<sup>165</sup>
- D58 Transpower has taken a similar approach to battery penetration and has assumed that batteries are installed at the same rate as solar installations. It has also modelled the effect of EV uptake on peak demand reduction.<sup>166</sup>
- D59 We consider Transpower has reasonably modelled the effects of organic solar and battery installation growth in its scenarios.
- D60 There is also existing generation embedded in the Powerco network behind the Tauranga GXP (**TGA GXP**), specifically the 42MW Kaimai hydro scheme. This generation scheme has a significant impact on the WBOP transmission network loading.
- D61 In its power systems and market dispatch modelling, Transpower has assumed that the Kaimai generation continues to operate throughout the investigation period.

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<sup>164</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 2.1.4, p. 10, available [here](#).

<sup>165</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 3.2, p. 18, available [here](#).

<sup>166</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 3 – Demand and generation scenarios, section 2.1.5, p. 11, available [here](#).

- D62 Transpower analysed the impact of the Kaimai generation based on historical dispatch behaviour. We consider this is a reasonable assumption when calculating the market benefits.
- D63 In summary, there is no new generation modelled in the scenario variations that discriminate between the investment options, or affect the investment need date. We are satisfied with Transpower’s generation scenario modelling approach and the assumptions it has made.

*Value of expected unserved energy*

- D64 Transpower selected and consulted on a non-standard value of expected unserved energy equal to \$31,500/MWh.<sup>167</sup> In its proposal, Transpower argued that it used this value after inflating the default value of \$20,000/MWh, which was set in 2004.<sup>168</sup>
- D65 Under the definition of ‘value of expected unserved energy’ in clause 1.1.5(2) of the Capex IM, this figure is non-standard because it is higher than the \$20,000/MWh specified in 2004 under clause 4(a) of Schedule 12.2 of the Code.
- D66 Transpower has also carried out its sensitivity analysis with values of expected unserved energy of \$20,000/MWh and \$60,000/MWh.
- D67 We accept Transpower’s approach and use of the non-standard value of expected unserved energy equal to \$31,500/MWh, and the amended sensitivity range, and agree that inflating the default value of unserved energy, set in 2004, is reasonable.<sup>169</sup>

*Discount rate*

- D68 In its application of the investment test, Transpower has used a discount rate of 5% and sensitivities of 3% and 7%. Transpower consulted on its proposed use of the amended discount rate, and is consistent with changes made to the Capex IM, which take effect from 1 April 2025.
- D69 The effect of a lower discount rate is that the long-term benefits of transmission investment will be higher on a net present value (**NPV**) basis, in a cost benefit analysis.
- D70 Until 1 April 2025, the discount rate is set at 7% with sensitivities of 10% and 4%, but Transpower can propose a different discount rate if it consults on this.<sup>170</sup>

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<sup>167</sup> Capex IM clauses I2(2)(c) and I3(3)(d)(iii) require Transpower to consult in its long-list and short-list consultations on a non-standard value of expected unserved energy Transpower proposes to use. In the short-list consultation, Transpower must also explain why the non-standard value is appropriate.

<sup>168</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 3.4, p. 5, available [here](#).

<sup>169</sup> In our recent Transpower RCP4 final decision, we used a Value of Lost Load (**VoLL**) of \$35, 374/MWh for the Transpower RCP4 quality settings incentive rate calculations. The RCP4 Quality Standards discussion is set out in paras 4.236 to 4.240, available [here](#).

<sup>170</sup> Capex IM, clause D6(3).

- D71 In the Proposal, Transpower used a 5% discount rate and changed sensitivity range, consistent with Capex IM changes we made in 2023, to be more appropriate.
- D72 We agree that using the Capex IM discount rate of 5% and sensitivities of 7% and 3% is reasonable, and was supported by long-list consultation feedback.

*Investment options Transpower considered and consulted on*

- D73 The Capex IM requires that:
- D73.1 the number of investment options must be appropriate given the magnitude of the estimated expenditure, and the complexity of the investment need associated with the proposed investment;<sup>171</sup> and
  - D73.2 with respect to each investment option, the specificity of information and rigour and comprehensiveness of the analysis, must be commensurate with the estimated expenditure and complexity of the option.<sup>172</sup>
- D74 Transpower considered and consulted on 47 long list options.<sup>173</sup> These options can be classified into the following broad categories:
- D74.1 new interconnecting transformers;
  - D74.2 establishment of new GXPs;
  - D74.3 new 220 kV or 110 kV transmission lines;
  - D74.4 investments in the distribution network; and
  - D74.5 non-transmission solutions, such as demand response.
- D75 We reviewed Transpower's long-list of options and the criteria it used to determine its investment options, in conjunction with the results of Transpower's power system studies, and demand and generation scenario modelling.
- D76 Transpower refined its long-list into a short-list of three investment options using the following screening criteria; namely that they are:<sup>174</sup>
- D76.1 fit for purpose;
  - D76.2 technically feasible;
  - D76.3 practical to implement;

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<sup>171</sup> Capex IM, clause 7.4.1(2).

<sup>172</sup> Capex IM, clause 7.4.1(3).

<sup>173</sup> <https://www.transpower.co.nz/projects/western-bay-plenty-development-plan/western-bay-plenty-development-plan-major-capex>

<sup>174</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 4 – Short-list of development plans, section 2, p. 5 available [here](#).

D76.4 are consistent with good electrical industry practice;

D76.5 provide system security; and

D76.6 indicative capital costs mean it is likely to be economically feasible.

D77 We consider the screening criteria for the short-list options are reasonable, because they are similar to those used by the Commission when evaluating a major capex proposal.<sup>175</sup>

*Whether the number of investment options is appropriate given the magnitude of the estimated expenditure and the complexity of the investment need*

D78 The Capex IM defines an investment option as a technically feasible solution designed to facilitate or meet a specific investment need.<sup>176</sup>

D79 Transpower state that the WBOP MCP investment need as the forecast transmission capacity constraints, related to demand growth in the Western Bay of Plenty region, that require transmission network upgrades to address.

D80 Following its long-list consultation, Transpower selected three investment options that it would apply the investment test to. The three short-list options are set out in Table D1.

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<sup>175</sup> Capex IM, clause C2.

<sup>176</sup> Capex IM, clause 1.1.5(2).

**Table D1 Short-list investment options** <sup>177</sup>

Option	Description of transmission developments
1	<ul style="list-style-type: none"> <li>• Upgrade 220/110 kV transformer capacity at Kaitemako</li> <li>• Upgrade both 110 kV lines into Te Matai (Kaitemako-Te Matai, Okere-Tarukenga and Okere-Te Matai)</li> <li>• Upgrade the 110 kV line between Kaitemako and Tauranga</li> <li>• Increase 110/33 kV supply capacity at Tauranga GXP</li> </ul>
2	<ul style="list-style-type: none"> <li>• Upgrade 220/110 kV transformer capacity at Kaitemako</li> <li>• Upgrade both 110 kV lines into Te Matai (Kaitemako-Te Matai, Okere-Tarukenga and Okere-Te Matai)</li> <li>• Upgrade the 110 kV line between Kaitemako and Tauranga</li> <li>• Build a new grid exit point (GXP) in the Tauriko/Pyes Pa area</li> <li>• Build a new 220 kV line connecting the new Tauriko GXP to the existing 220 kV Kaitemako–Tarukenga line</li> </ul>
3	<ul style="list-style-type: none"> <li>• Upgrade 220/110 kV transformer capacity at Kaitemako</li> <li>• Upgrade the 110 kV line between Kaitemako and Tauranga</li> <li>• Build a new substation near Okere, with two 220/110 kV transformers connected on the existing Edgecumbe–Tarukenga 220 kV line</li> <li>• Build a new double-circuit 110 kV line between Te Matai and the new substation near Okere</li> <li>• Dismantle the existing 110 kV lines into Te Matai (Okere-Te Matai, Okere Tarukenga and Kaitemako-Te Matai)</li> <li>• Build a new GXP in Tauriko/Pyes Pa area</li> <li>• Build a new 220 kV line connecting the new Tauriko GXP to the existing 220 kV Kaitemako–Tarukenga line</li> </ul>

D81 We are satisfied the shorted-listed investment options set out in Transpower’s proposal, provide a reasonable number of investment options for analysis and testing, using the investment test. This is because they:

D81.1 cover a range of potential solutions, including implementing options to increase transmission capacity of existing assets, such as reconductoring existing 110kV transmission lines; and

D81.2 will meet the investment need by enhancing transmission capacity to meet regional demand in the WBOP region out to at least 2050.

<sup>177</sup> Transpower NZ Ltd, WBOP MCP Attachment 4 – Short-list of development plans, Table 1, p. 3, available [here](#).

*Whether, for each investment option, the specificity of information and rigour and comprehensiveness of the analysis are adequate*

- D82 Following our review of the proposal and supporting material, we consider Transpower provided sufficient information and supporting analysis as part of the WBOP MCP, including in response to our RFIs.
- D83 Key to this proposal is the power systems analysis, which is used by Transpower to identify WBOP transmission capacity issues to test the proposed investment, and investment options, to resolve those issues.
- D84 Following our review, we consider the specificity of information, and rigour and comprehensiveness of the analysis in the WBOP MCP, is adequate and consistent with the Capex IM.

### **Our evaluation of the investment test application**

- D85 We outline the analysis that supports our findings and our assessment of Transpower's application of the investment test for the WBOP MCP. We have analysed how Transpower calculated the net market costs, and net electricity market benefits in its investment test application, and the sensitivity analysis it has carried out.

### *Expected electricity market cost and benefit elements in the Capex IM investment test*

- D86 In applying the investment test, Transpower must calculate the following for each investment option included in the MCP:
- D86.1 the electricity market benefits under the relevant demand and generation scenario;
  - D86.2 the electricity market costs under the relevant demand and generation scenario;
  - D86.3 the net electricity market benefit for the relevant demand and generation scenario; and
  - D86.4 the expected net electricity market benefit.
- D87 Under Schedule D of the Capex IM:
- D87.1 'electricity market benefit or cost element' means any of the market benefits received, or market costs incurred by consumers, during the calculation period under the relevant demand and generation scenario, that will affect net electricity market benefits;<sup>178</sup>
  - D87.2 the 'net electricity market benefit' is, in respect of an investment option, applied to a demand and generation scenario, its aggregated quantum of

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<sup>178</sup> Capex IM, clause D4(1).

each electricity market benefit or cost element, less its aggregated quantum of each project cost; and

D87.3 the 'expected net electricity market benefit', in respect of an investment option, is the weighted average of the net electricity market benefit under each relevant demand and generation scenario.<sup>179</sup>

D88 In evaluating Transpower's application of the investment test, we assessed whether Transpower reasonably estimated, for each investment option in the proposal:

D88.1 the electricity market benefits;

D88.2 the electricity market costs; and

D88.3 the net electricity market benefit, and the expected net electricity market benefit.

*Expected electricity market cost and benefit elements in the WBOP MCP proposal*

D89 Clause D4 of the Capex IM sets out the electricity market cost or benefit elements that Transpower can consider in the investment test. Accordingly, Transpower calculated the following categories of electricity market costs and benefits for the investment options it considered:<sup>180</sup>

D89.1 fuel costs, eg, the cost of dispatching electricity;

D89.2 cost of involuntary demand curtailment;

D89.3 capital costs of transmission and distribution network investments required to meet the investment need, including connection asset capital costs, and capital costs of modelled projects;<sup>181</sup>

D89.4 operation and maintenance costs;

D89.5 losses costs; and

D89.6 reliability costs.

D90 Clause D4(l) allows Transpower to include in its application of the investment test, any other benefit or cost occurring in the electricity market proposed by Transpower, prior to its consultation on the short-list of investment options, and agreed to by the Commission.

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<sup>179</sup> Capex IM, clause D2(1).

<sup>180</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 4, p. 5, available [here](#).

<sup>181</sup> Modelled projects are projects modelled by Transpower in its analysis to ensure the transmission network capacity is able to meet the investment need over the analysis timeframe. Modelled projects do not form part of the MCP application.

- D91 In the WBOP MCP, Transpower has included the following additional benefits in its investment test application:
- D91.1 deficit benefits to model the effect of the transmission network having insufficient capacity to meet demand;
  - D91.2 thermal operating benefits that model the effect of less thermal generation being dispatched, to meet unserved demand when deficit benefits start to accrue;
  - D91.3 terminal value benefits associated with the transmission and distribution investments; and
  - D91.4 resilience benefits.
- D92 We evaluate Transpower’s calculation of each of these electricity market costs and electricity market benefits.

### Fuel costs

- D93 While generation dispatch modelling and fuel cost differences between investment options are not one of the determining factors in the WBOP MCP investment test application, they have been modelled by Transpower to capture the generation scenario effects for the sensitivity analysis, and to calculate network losses costs.
- D94 Transpower used the following approach to assess the relative electricity market fuel costs of the investment options and the proposed investment:<sup>182</sup>
- D94.1 generation expansion plans were developed using Optgen for each generation scenario for two cases– a factual and a counterfactual.<sup>183</sup> The factual case models generation unaffected by WBOP regional constraints, noting that there are no known major future generation projects within the Western Bay of Plenty region. The counterfactual case models an unconstrained network;
  - D94.2 the new generation connections and investment option transmission upgrades are modelled in the factual cases (the three short-list investment options). The counterfactual case assumes the transmission network is not upgraded to connect new generation, with demand growth met by some other means; and
  - D94.3 for both the factual and counterfactual cases, generation fuel costs are assessed by optimising market dispatch solutions for each year in the modelling horizon. For this analysis, Transpower used market dispatch

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<sup>182</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, section 3.4, p. 5, available [here](#).

<sup>183</sup> Optgen is modelling software Transpower uses to develop its generation expansion plans. Transpower notes that Optgen finds the “lowest cost combination of capital costs (due to investments in new generation) and operating costs (due to operating existing and new generation plant) over the modelling horizon.” Transpower discuss its use of Optgen in section 1.3 [here](#).

software that modelled a range of historical hydro inflow sequences, demand levels and wind generation output variability etc.

- D95 We reviewed the approach Transpower had taken to create the factual and counterfactual cases, and its analysis approach to calculating fuel costs. We agree with the analysis approach Transpower has taken and consider it is consistent with analysis to support previous MCP applications.<sup>184</sup>

### Cost of involuntary demand curtailment

- D96 In its analysis of the counterfactual study cases, Transpower modelled the cost impact of the transmission network being unable to meet demand in the WBOP region if additional transmission investment did not occur.<sup>185</sup>
- D97 Transpower has termed this cost the deficit cost and has assumed that different demand tranches have different deficit costs. These cost tranches are set out in Table D2.
- D98 The assumption being made is that, if the transmission network was unable to supply all the demand due to transmission capacity issues, then consumers would find a way to self-supply.

**Table D2 Deficit cost assumptions<sup>186</sup>**

Proportion of hourly demand	Cost
<b>First 30% of demand</b>	\$600/MWh
<b>Between 30% and 35% of demand</b>	\$800/MWh
<b>Between 35% and 40% of demand</b>	\$2,000/MWh
<b>Greater than 40% of demand</b>	\$10,000/MWh

- D99 The costs Transpower has assigned to each tranche of deficit costs are important in this MCP. This is because the avoidance of these costs is the key benefit used by Transpower to justify the proposed transmission investment.
- D100 In its proposal, Transpower describes how it has estimated the deficit costs of each tranche. The first three tranches represent “voluntary ‘demand response’ measures, such as retailers controlling hot water cylinder demand” with the last tranche representing forced load curtailment. These costs are linked to the cost of generation to meet demand, and the value of stored water in hydro schemes.

<sup>184</sup> *Commerce Commission*, Transpower Net Zero Grid Pathways Stage One – Final decision and reasons paper (28 Feb 2024) Attachment D para D39 to D57 available [here](#).

<sup>185</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, section 2.2.2, p. 8 available [here](#).

<sup>186</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, Table 1, p. 8 available [here](#).

- D101 Transpower did not specify the source for the deficit costs it has assumed, but they do reflect the likely cost of contracting demand side management (**DSM**) that have been used in other projects.
- D102 As a comparison, for the Waikato and Upper North Island Voltage Management (**WUNI**) major capex project, Transpower used pre-fault DSM costs of \$2,000/MWh.<sup>187</sup>
- D103 We note it is not easy to assess the reasonableness of future DSM costs since these can:
- D103.1 vary with the type of demand involved, eg, commercial, or industrial;
  - D103.2 the duration of DSM use;
  - D103.3 when it is used; and
  - D103.4 whether it is pre- or post-fault demand side management.
- D104 These costs are also likely to increase as DSM capacity penetration levels rise, an effect Transpower has also modelled.
- D105 We agree with Transpower that DSM costs may increase as its quantum or duration increases, and so Transpower's proportionate pricing approach is appropriate. Transpower could have modelled demand curtailment costs at the value of unserved energy but instead has attempted to model demand curtailment costs more realistically. We agree with this approach.

### **MCP staging project and modelled project capital costs**

- D106 Transpower has used its Transpower's Enterprise Estimating System (**TEES**) cost estimation framework to estimate the WBOP MCP, and modelled project capital costs. A description of the Transpower capital cost estimation process is set out in the WBOP MCP Costs attachment.<sup>188</sup>
- D107 We have discussed Transpower's approach to project capital cost estimation in Attachment C of this decision, and are satisfied that the process is robust and fit for purpose.
- D108 Powerco, in its 2023 Asset Management Plan (**AMP**), discuss the medium and long-term investments it may need to make in its network as Transpower progresses the WBOP MCP.<sup>189</sup>
- D109 The WBOP MCP is unusual in that for each Transpower investment option considered in the investment test application, Powerco capital costs are higher than the capital costs Transpower has modelled. As a consequence, the accuracy of

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<sup>187</sup> *Transpower NZ Ltd*, "Waikato and Upper North Island Voltage Management Attachment C: Options and Costing Report", December 2019 p. 28. available [here](#).

<sup>188</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 6 – Costing, available [here](#).

<sup>189</sup> *Powerco NZ Ltd*, Powerco 2023 Asset Management Plan, available [here](#).

the Powerco investment plan cost estimates, aligned with the Transpower investments, is important. While we are not approving the Powerco investments, the modelling of Powerco's capital costs influence the investment test application.

- D110 Powerco applied to us for a Customised Price Path (**CPP**) in 2017. Part of the Powerco CPP review process included analysis of Powerco's capital cost estimation approach to ensure that the efficiency component of the CPP expenditure objective (ie that proposed expenditure is both prudent and efficient) was met.<sup>190</sup>
- D111 In the Powerco CPP, Powerco had supported its application by carrying out unit rate and asset capital cost benchmarking. At the time, following the verifier review, we were satisfied that Powerco capital costs were efficient, and that its policies and procedures to estimate project capital costs were reasonable and, in some cases, improving.<sup>191</sup>
- D112 We reviewed the Powerco 2023 AMP to test whether Powerco's cost estimation processes are consistent with a prudent supplier with efficient costs. The Powerco electricity business maintains ISO 55001 certification, which is focussed on asset management systems. Key to ISO55001 certification, is that policies and procedures are in place to ensure asset management systems that drive project work are consistent and repeatable, and this includes cost estimation processes.<sup>192</sup>
- D113 Given that Powerco has been working closely with Transpower to develop its WBOP network development plans, and it has been subject to the CPP review process, which includes the verifier assessment of its capital cost estimation processes, and Powerco is ISO55001 accredited, we are reasonably satisfied that the Powerco capital costs used in the Transpower investment test application, are likely to be reasonable.
- D114 Table D3 sets out the major Transpower and Powerco capital costs, including connection asset and modelled project costs (future project costs that are not applied for in this MCP).

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<sup>190</sup> *Powerco NZ Ltd*, Powerco CPP application and decision, available [here](#).

<sup>191</sup> *Powerco NZ Ltd*, Powerco CPP application, Verifier report, Appendix F – Expenditure benchmarking, available [here](#).

<sup>192</sup> International Standards Organisation ISO 55001:2024 Asset management — Asset management system — Requirements, available [here](#).

**Table D3 Short-list investment option capital costs (\$ million)** <sup>193</sup>

Capital costs	Option 1	Option 2	Option 3
Transpower interconnection assets (\$2024)	70.0	67.0	42.4
Transpower modelled projects (\$2024)	36.8	28.5	-
Transpower connection assets (\$2024)	92.7	71.8	149.3
Powerco distribution assets (\$2024)	185.4	222.9	222.9
<b>Total capital cost (\$2024)</b>	<b>384.9</b>	<b>390.2</b>	<b>414.6</b>
<b>Total capital cost (\$2032)</b>	<b>371.0</b>	<b>379.0</b>	<b>412.4</b>

### Operation and maintenance (O&M) costs

- D115 Transpower note in its proposal that “Operational expenditure associated with each short-list option was considered. We found there to be no material differences across the options, so it was not included in the analysis.”<sup>194</sup>
- D116 Transpower’s view appears reasonable given that each of the investment options considered in the investment test all contain similar investments. While we haven’t sighted Transpower’s assessment of the O&M costs associated with each investment option, we accept Transpower’s conclusion, given the preferred investment decision will be driven by more significant costs and benefits.
- D117 For these reasons we are satisfied Transpower has reasonably argued that O&M costs do not need to be considered in the investment test analysis.

### Losses costs

- D118 When comparing investment options that contain different transmission upgrade options in an investment test application, transmission loss differences between options may be significant.
- D119 While Transpower’s power system analysis options report talks about transmission losses only in general terms, the quantification of losses for each investment option is carried out, following the analysis to ascertain the relative fuel costs in the market dispatch analysis.
- D120 Transpower notes that losses costs are estimated as a post processing step after the market dispatch analysis has been carried out, and quantified “using modelled circuit flows. Loss costs are then estimated using Island short run marginal costs”.<sup>195</sup>

<sup>193</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, Table 3, p. 8, available [here](#).

<sup>194</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, available [here](#).

<sup>195</sup> Transpower NZ Ltd, WBOP MCP Attachment 8 – Benefits modelling, section 4.1, p. 10, available [here](#).

- D121 We agree this approach is reasonable, and given losses appear to be estimated for each half-hour period over the analysis timeframe, is likely to be a highly accurate estimate for the market dispatch assumptions made.
- D122 We are satisfied with Transpower’s approach to modelling losses in the WBOP MCP proposal.

### Reliability costs

- D123 Transpower modelled reliability costs that “relate to being able to supply demand when one of our assets goes out of service unexpectedly.”<sup>196</sup> Any shortfall during a modelled outage has been valued at an unserved energy cost estimate of \$31,500/MWh.
- D124 The reliability costs are calculated for each investment option considered, and compared against the counterfactual transmission investment scenario, which assumes no transmission investment is made to meet WBOP demand.<sup>197</sup>
- D125 In the investment test application, each of the annual reliability costs associated with each investment option are significantly lower than in the counterfactual case, particularly post 2030. The avoidance of the counterfactual case reliability costs then accrues as a benefit to the investment option considered.
- D126 Table D4 sets out the NPV reliability benefit results relative to the counterfactual case for each investment option considered. In the investment test application, Transpower has used weighted scenario results.

**Table D4 Weighted scenario reliability benefits (\$ 2032) <sup>198</sup>**

Option	Reliability benefits relative to counterfactual (\$m)
Option 1	105
Option 2	110
Option 3	111

- D127 We have reviewed the Transpower reliability analysis and are satisfied that the modelling approach taken, and the benefit calculation results, are reasonable.

### Market dispatch costs and benefits

- D128 In its investment test application, Transpower has modelled a number of costs and benefits, using its generation dispatch modelling tool for each investment option by

<sup>196</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, section 5.1, p. 8, available [here](#).

<sup>197</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, section 5, pp. 16-18, available [here](#).

<sup>198</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, Table 4, p. 9, available [here](#).

“finding the difference between simulated electricity system costs for that investment and the counterfactual of no investment”.<sup>199</sup>

D129 These market dispatch costs and benefits include:

D129.1 deficit benefits; and

D129.2 thermal operating benefits.

D130 In the investment test application, these market dispatch costs and benefits are consolidated and scenario weighted. We describe our review of how Transpower has considered and calculated the deficit benefits and thermal operating benefits.

### **Deficit benefits**

D131 Transpower has calculated what it terms deficit benefits. These are based on the transmission network, without upgrades, having insufficient capacity to supply WBOP demand under normal transmission network operating conditions eg when the transmission network cannot supply demand at N security.

D132 Transpower notes in its application that:<sup>200</sup>

D132.1 the investment options are designed to ensure that WBOP continues to be served by the transmission network into the future; and

D132.2 the counterfactual (the case where there is no transmission investment) there are long periods of deficit, where WBOP consumers are not supplied by either the transmission network, or grid connected generation.

D133 The deficit benefits are the avoidance of the unserved energy costs (or deficit costs) that occur in the counterfactual case, when compared to each investment option considered, and in the investment test application these benefits have been weighted by scenario.

D134 The deficit benefit calculation methodology utilises the deficit cost demand curtailment tranche assumptions, and is based on the market dispatch analysis used to calculate fuel costs, losses costs, and thermal dispatch costs.

D135 In its investment test application, Transpower has used each scenario result to create a weighted deficit benefit in support of the investment proposal.

D136 We reviewed Transpower’s methodology to calculate deficit benefits and agree that the approach is reasonable. The deficit benefits constitute the majority of the benefit that justifies the proposed investment.

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<sup>199</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, section 4.1, p. 10, available [here](#).

<sup>200</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 8 – Benefits modelling, section 2.2.2, p. 8, available [here](#).

### Thermal dispatch benefits

- D137 In its dispatch analysis, Transpower has also included what it terms thermal dispatch benefits (or costs as is the case in this application).
- D138 These benefits (or costs) occur in the counterfactual study case where there is a deficit benefit eg when the transmission network has insufficient capacity to meet the WBOP demand, and the demand is met by other means such as self-supply, demand response, or unserved energy.<sup>201</sup>
- D139 Transpower argues that in this situation, less thermal generation is dispatched as a consequence in the counterfactual study case. This is the one benefit that accrues to the counterfactual study case against the investment options considered.
- D140 We reviewed Transpower’s methodology for, and application of, the calculation thermal dispatch benefits, and agree that the approach is reasonable.

### Summary of market dispatch benefits

- D141 Table D5 sets out the weighted scenario results of the total market dispatch benefits for each option, when compared against those calculated for the counterfactual study case.
- D142 These market dispatch benefits include the thermal dispatch benefits, the losses benefits, and the deficit benefits.

**Table D5 Weighted scenario market dispatch benefits (\$2032)<sup>202</sup>**

Option	Market dispatch benefits relative to counterfactual (\$m)
Option 1	825.5
Option 2	829.3
Option 3	840.0

### Terminal values

- D143 Transpower has also calculated the terminal values of the investment options considered, and compared this against the counterfactual ‘do nothing’ investment case. The terminal values for each investment option are set out in Table D6.

<sup>201</sup> Transpower NZ Ltd, WBOP MCP Attachment 8 – Benefits modelling, section 4.1, p. 10, available [here](#).

<sup>202</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, Table 4, p. 9, available [here](#).

**Table D6 Terminal values (\$2032)** <sup>203</sup>

Option	Terminal values relative to counterfactual (\$m)
Option 1	96.2
Option 2	96.4
Option 3	94.2

D144 Transpower argues that including transmission investment terminal valuation is reasonable because “the economic lifetime of some options considered is longer than the calculation period, and the assets will still have value in 2052.”<sup>204</sup>

D145 Additionally, Transpower considers that including terminal values is appropriate because it trades-off “between assessing benefits over the full economic life of an option and the uncertainty regarding far off benefits.”<sup>205</sup>

D146 We reviewed Transpower’s calculation of terminal values as a benefit of making the transmission investments to meet WBOP demand, and are satisfied these are reasonable and can be included in the investment test.

### Resilience benefits

D147 Resilience benefits will accrue when an investment option is more resilient to a High Impact Low Probability (**HILP**) event than another investment option.

D148 Transpower has estimated that Options 2 and 3, which involve construction of a new GXP, has resilience value as it provides “an alternative means of supplying demand following a high impact event, such as a flood.”<sup>206</sup>

D149 Specifically, the new Tauriko GXP in Options 2 and 3 will allow “significant backfeed capability between the Tauranga GXP, and the proposed Tauriko GXP through Powerco's 33 kV network.”

D150 Transpower notes that the Tauranga GXP is exposed to a 0.25m surface ponding flood event with a 1 in 100-year return period, based on Tauranga City Council estimates. Other assumptions in the analysis are:

D150.1 the HILP event results in an 8-day outage, with 8 hours a day valued at the full Value of Lost Load (**VoLL**), and the remainder at 20% of the value of unserved energy;

<sup>203</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, Table 4, p. 9, available [here](#).

<sup>204</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, section 5.1, p. 9, available [here](#).

<sup>205</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, section 3.1, p. 4, available [here](#).

<sup>206</sup> Transpower NZ Ltd, WBOP MCP Attachment 8 – Benefits modelling, section 6, p. 18, available [here](#).

D150.2 the HILP event results in a \$5m substation repair cost (assumes 0.5m inundation due to climate change effects); and

D150.3 the quantum of HILP event unserved energy is determined using the five 2019 EDGS variation forecasts, and information supplied by Powerco about network backfeed capability.

D151 Transpower has used its market dispatch analysis tool to estimate HILP event lost load costs over the 2025-2050 period, to calculate load at risk and the cost of that load at risk, divided by the HILP event probability, to calculate the investment option resilience benefits. These are set out in Table D7.

**Table D7 Resilience benefits (\$2032)** <sup>207</sup>

Option	Resilience benefits (\$m)
Option 1	0.0
Option 2	18.6
Option 3	18.6

D152 We have reviewed the Transpower methodology and HILP event resilience analysis. We are satisfied the analysis approach taken, and the resilience benefits calculated, are reasonable. In the application of the investment test Transpower has weighted the resilience benefits for each option by scenario.<sup>208</sup>

### **Our observations of Transpower's investment test results**

D153 In reviewing Transpower's investment test application, we carried out our own analysis, taking a two-step approach. Firstly, we looked at the proposal and whether this passed the investment test.

D154 Secondly, we cross-checked Transpower's investment test application to satisfy ourselves that individual components of the proposal would deliver net electricity market benefits.

D155 In reviewing the economic analysis results in Transpower's proposal, we consider Transpower has taken a robust approach in applying the investment test, and that the costs and benefits have been reasonably calculated.

D156 Table D8 sets out the quantified cost and benefit investment test NPV results for the three investment options Transpower considered in its proposal.

<sup>207</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, Table 4, p. 9, available [here](#).

<sup>208</sup> Transpower NZ Ltd, WBOP MCP Attachment 8 – Benefits modelling, Table 10, p. 23, available [here](#).

**Table D8 Quantified costs and benefits (\$ million in 2032 prices)<sup>209</sup>**

Benefits	Option 1	Option 2	Option 3
Total capital costs	371.0	379.0	412.4
Market benefits	825.5	829.3	840.0
Reliability benefits	105.3	109.8	110.5
Resilience benefits	0.0	18.6	18.6
Terminal value	96.2	96.4	94.2
<b>Total benefits</b>	<b>656.0</b>	<b>675.1</b>	<b>650.8</b>

D157 Table D8 illustrates that the quantified net electricity market benefits are positive for the three investment options considered, and all these options pass the investment test. Transpower's proposed investment is Option 2, which provides the most positive net market benefit.

#### *Unquantified benefits*

D158 The investment test results in Table D8 demonstrate that the proposal does not require unquantified benefits to pass the investment test, and the NPV results are all very similar for the three investment options considered. On this basis, we have not reviewed Transpower's approach to unquantified benefits.

#### *Summary of our assessment of the proposed investment benefits*

D159 We have carried out analysis to assess whether the WBOP MCP passes the investment test.

D160 We are satisfied Transpower correctly applied the investment test and related Capex IM requirements in selecting Option 2 as the proposed investment for the MCP.

#### **The proposed investment is robust to sensitivity analysis**

D161 The Capex IM requires Transpower to perform a sensitivity analysis to test whether the proposed investment is robust to some key assumptions.<sup>210</sup> The Capex IM also lists the parameters that must be varied to assess whether the results of the investment test are robust to variations.<sup>211</sup> These parameters reflect the key assumptions that can have a significant impact on the investment test results.

D162 There are two reasons sensitivity analysis is carried out. The first is to ensure that the proposed investment is robust to some of the key assumptions and passes the investment test. The second is whether the results of the investment test are

<sup>209</sup> *Transpower NZ Ltd*, WBOP MCP Attachment 5 – Options analysis, Table 4 and Table 5, p. 9, available [here](#).

<sup>210</sup> Capex IM, clause D7.

<sup>211</sup> Capex IM, clause D7(1).

robust to the selection of the proposed investment when compared to the investment options.

D163 Transpower considered several parameters in its core sensitivity analysis, including:<sup>212</sup>

D163.1 forecast demand variations by scenario and net benefit are reported for each of the five EDGS variations;

D163.2 capital cost sensitivities of +30% and -30% around central estimate;

D163.3 value of unserved energy sensitivities of \$20,000/MWh and \$60,000/MWh;

D163.4 scenarios using preferred weighting (20% Disruptive, 60% Growth, 20% reference) and equal weighting reported;

D163.5 discount rates of 3% and 7%; and

D163.6 a range of hydro inflow sequences in the market dispatch analysis.

D164 The sensitivity analysis results are presented in Table D9.

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<sup>212</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, section 4.2, p. 7, available [here](#).

**Table D9 Sensitivity analysis results (\$ million in 2032 prices) <sup>213</sup>**

Scenario	Option 1	Option 2	Option 3
Disruptive scenario	1,261.3	1,290.3	1,271.3
Environmental scenario	422.5	443.3	416.4
Global scenario	253.2	267.0	236.2
Growth scenario	556.6	573.9	549.4
Reference scenario	348.5	363.4	334.7
Equal scenario weighting	568.4	587.6	561.6
Discount rate 3%	913.8	940.3	919.6
Discount rate 7%	463.2	476.7	450.1
Capital cost +30%	544.7	561.4	527.1
Capital cost -30%	767.3	788.8	774.5
VoLL of \$60,000/MWh	751.2	791.2	767.6
VoLL of \$20,000/MWh	617.5	628.2	603.7

D165 We are satisfied the parameters Transpower used for its sensitivity analysis are reasonable. The results of Transpower's sensitivity analysis show that Option 2 retains the highest expected net electricity market benefits for all sensitivity analysis parameters.

D166 We are satisfied Transpower's sensitivity analysis confirms that the proposed investment (Option 2) is robust to sensitivity analysis.

<sup>213</sup> Transpower NZ Ltd, WBOP MCP Attachment 5 – Options analysis, Table 8, p. 11, available [here](#).