TRANSPOWER

Huntly–Ōtāhuhu A reconductoring BOB–DRY and HLY–T43 sections Consultation document

Overview

June 2026

Executive summary

Transpower is consulting on the listed project[1] 'Huntly–Ōtāhuhu A reconductoring'[2] for Regulatory Control Period 4 (RCP4), 2025-2030. We are inviting feedback on our preferred option for reconductoring two sections of the 220 kV duplex double circuit Huntly–Ōtāhuhu A line (HLY–OTA–A), together with the cost-benefit analysis used to identify the preferred option.

The existing Zebra conductors on the southern sections of the HLY–OTA–A line between Huntly and Drury (HLY–DRY) are approaching end of life due to conductor corrosion. We propose to split the HLY–DRY section into the three sub-sections (HLY–T43, T43–BOB[3], and BOB–DRY) as shown in Figure 1, to manage delivery and risk.

- **Stage 1:** HLY–T43 and BOB–DRY, with replacement needed in 2030.
- **Subsequent stages:** T43–BOB and DRY–OTA, with replacement expected 2030-2040.[4]

Subject to feedback from this consultation, we intend to apply to the Commerce Commission (Commission) to increase our base capex allowance to account for Stage 1 of this work. Separate applications will be made for subsequent stages closer to the need date. As this is a listed project for replacement of existing conductors, we are carrying out one consultation prior to the application being submitted to the Commission.

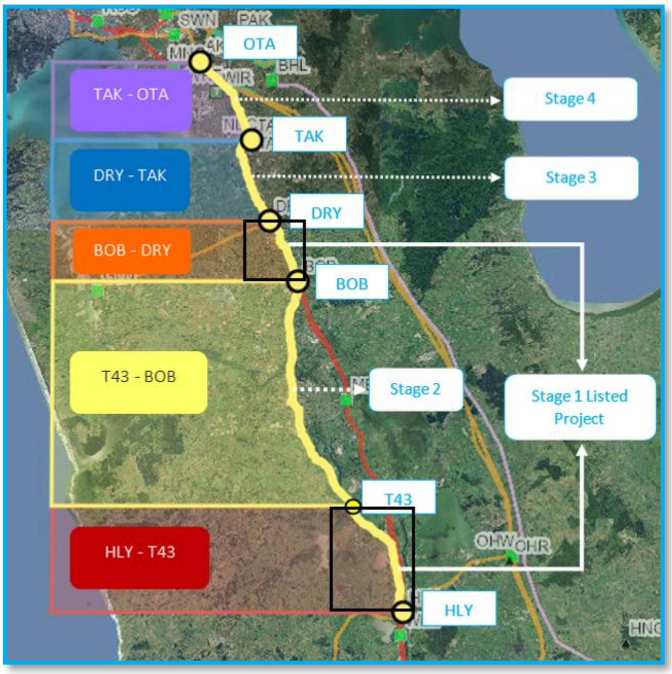

Figure 1: Line sections on the HLY–OTA–A line

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1 Listed projects are as defined in the Capex IM. This listed project is primarily driven by Transpower's policies for replacing conductors on transmission lines and has an expected cost above the base capex threshold of $30 million.

2 Transpower Individual Price-Quality Path Determination 2025, Schedule I (Listed Projects)

3 Bombay substation

4 Regulatory Control Period 5 (RCP5) covers 2030-2035, followed by Regulatory Control Period 6 (RCP6) from 2035-2040.

The need for investment

The HLY–OTA–A line is a critical part of the upper North Island transmission network, connecting the Auckland and Northland networks to generation from Huntly and the south. It also supplies Bombay, Drury and Takanini substations.

We have identified that the HLY–T43 and BOB–DRY sections will soon reach end of life due to corrosion-based defects. Close aerial surveys (CAS) carried out in 2021, 2023 and 2025 identified numerous corrosion defects across the HLY–OTA–A line associated with predominantly sub-conductor spacer damage. Given the extent and distribution of these defects, localised repair is not a practical solution. If no action is taken, the risk of conductor failure will increase further over time.

A conductor failure may cause it to fall, risking property damage and safety. This would lead to an unplanned outage of one or both circuits on the HLY–OTA–A line, affecting supply to the Bombay and Takanini substations, restricting power flow between the Auckland, Northland and the rest of the country, potentially threatening electricity supply security during periods of peak demand.

The two circuits (DRY–BOB–HLY–1 & DRY–BOB–HLY–2) carried by the HLY–OTA–A line are part of the core grid under the Electricity Industry Participation Code 2010 (Code) (Schedule 12.3). Decommissioning this circuit – the alternative to replacing the conductor – would breach the grid reliability standards (GRS) in Schedule 12.2 of the Code, as N-1 transmission security (and N security under some conditions) to the Auckland and Northland would be compromised. This would increase the risk of unplanned outages under contingency conditions, increase loading on the remaining core grid lines supplying Auckland and Northland, increase the likelihood of load shedding, and create potential voltage issues at Bombay and Glenbrook.

Option assessment

After assessing a range of options to address the condition-based need on the HLY–T43 and BOB–DRY sections, we have identified Option 2 (duplex Zebra operated at 90°C) as the preferred option to replace the existing duplex 75°C Zebra conductor.

Table 1 Short list of options

Options	Description	(winter/shoulder/summer)		
Option 1	Reconductor with duplex Zebra at 75 °C (like-for-like)	764.3/730.3/694.33 MVA	72 years	57.4
Option 2	Reconductor with duplex Zebra at 90 °C (thermal uprate)	848.0/818.9/788.5 MVA	72 years	57.4
Option 3	Reconductor with duplex Selenium AAAC at 80 °C (alternative conductor)[6]	855.9/821.2/784.7 MVA	112 years	77.0

5 Service life is indicative only and depends on the environment. The HLY–OTA–A line traverses multiple corrosion zones, so we use a simple average physical asset life by conductor type.

6 All Aluminium Alloy Conductor (AAAC).

Options assessment compares the net benefits of each short-listed reconductoring option against a base case. The Capex IM[7] defines the base case (counterfactual) as a future grid state where no major investment is made. For this listed project, the alternative to reconductoring is decommissioning the line. The base case therefore assumes the HLY–DRY section of the HLY–OTA–A line is decommissioned at the need date (June 2030), with no replacement. This would leave the Bombay substation unsupplied and the communities and businesses of Bombay would be unable to access their electricity supply from the national grid.

All three of the options have positive benefits when compared to the base case. Our investigation indicates the conductor can be thermally uprated from Option 1 (Zebra 75°C) to Option 2 (Zebra 90°C) for effectively the same cost.[8,9]

However, Option 2 provides a higher capacity rating than Option 1, increasing future optionality. This benefit can only be realised once the whole line has a similar rating. The section north of Drury (DRY–OTA) is strung with duplex Chukar conductor (which has a substantially higher capacity than the existing duplex Zebra conductor on the HLY–DRY section), so the key remaining constraint for realising the thermal uprate benefit will be the middle T43–BOB section. The planned replacement T43–BOB section in RCP5/6 provides an opportunity to align conductor ratings (potentially to Zebra 90°C), so we can realise the capacity benefit.

Option 3 provides a similar capacity rating to Option 2 and has a longer expected service life, resulting in approximately $8.3m of additional terminal benefits. However, Option 3 is approximately $19.6m more expensive than Options 1 and 2, and there is uncertainty around realising that longer service life of Option 3, as a system upgrade may be needed before the AAAC conductor reaches end of life.

For these reasons, Option 2 provides the best balance of addressing the need while keeping open the option of additional capacity for effectively the same cost, and we have identified it as the preferred option.

Our option assessment is summarised in Table 2. For more information regarding option assessment, please refer to Section 3.

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7 Transpower Capital Expenditure Input Methodology (Capex IM).

8 There is a small cost difference with under-clearance violations. Under-clearance violation is where conductor distance to another object falls below minimum safe-distance requirements. Under the current operating temp (75°C), we have one existing violation under the BOB–DRY section. This violation applies to all three options, and its rectification cost is included in the total cost of each option in Table 2. As conductor temperature rises, sag increases and under-clearance violations become more frequent and harder to rectify. On the HLY–DRY section, violations increase steadily above 90°C for Zebra conductors, so 90°C represents a practical upper limit for low-cost thermal uprating. Uprating to 90°C results in two additional violations in the T43–BOB section (Stage 2) and increases the relative cost of Option 2 by only approximately $9k. For more information on the project costs, refer to Section 3.2.

9 There may be some minor additional costs associated with construction methodologies for Zebra at 90°C, these would fall within the band of uncertainty of the costing performed for this investigation.

Table 2: Option assessment summary, 2026 present values at 5% discount rate

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Terminal value benefits ($m)	17.1	17.1	25.4
Avoided decommissioning cost ($m)	20.8	20.8	20.8
Deficit benefits ($m)	5724.9	5724.9	5724.9
Total benefits ($m)	5762.8	5762.8	5771.0
Total costs ($m)	57.4	57.4	77.0
Net benefits ($m)	5705.4	5705.4	5694.0

Approach to analysis (consultation vs application)

The HLY–OTA–A line provides several benefits, including supplying the Bombay substation and supporting reliability in the upper North Island transmission network. For this consultation, we capture part of these benefits using avoided deficit costs, which is sufficient to demonstrate the economic case for reconductoring the relevant sections.

In parallel with consultation, we will undertake electricity market modelling to support the listed project application. This will allow us to estimate broader electricity market benefits and support the calculations needed for indicative starting allocations. Information on indicative starting allocations will be included in our application to the Commission.

While pricing information is always important, because this investment is required to maintain N-1 on a Core Grid asset, this consultation focuses on whether there are other considerations that would inform the options considered. Therefore, we consider that providing indicative starting allocations at this consultation stage would not lead to additional insights beyond those sought. For more information regarding our approach to calculate the indicative pricing impacts, please refer to Section 6.

Application to the Commerce Commission

As a listed project, we are required to submit an application to the Commission supporting an increase to our base capex allowance to recover the costs of this project.

At this point we expect that the cost of reconductoring the BOB–DRY and HLY–T43 sections of HLY–OTA–A line with the Zebra conductor rated at 90°C will be $29.3 million in nominal terms.[10] We are currently undertaking further work to confirm this cost and refine our analysis and will apply to the Commission to recover the confirmed cost.

Following this consultation, we expect to submit our application to the Commission in late 2026.

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[10] Our draft application only seeks approval for the Stage 1 investment. Any subsequent stages would require separate approvals. The draft listed project capex allowance (LPCA) is $29.3 million in nominal terms, including inflation and interest during construction. For more information on the LPCA, refer to Section 5.

Consultation details

We invite written feedback on our preferred replacement option and our cost-benefit analysis.

We have asked specific questions throughout this document and its attachment. These questions are intended to aid your response, and are summarised in Appendix A. You are not obliged to answer all or any of these questions, all relevant feedback is welcome.

Please send your written feedback to grid.investments@transpower.co.nz by 5pm on 6 July 2026. We will acknowledge submissions by return email.

Once the consultation period ends, all submissions will be published on our website as transparency is important to us. Please note, this includes any contact details on your submission. In addition, we will share all consultation feedback with the Commission as part of our discussions on this project.

If any aspect of your submission is confidential, please let us know. Thank you for your assistance with this project.

Contents

1 Need for investment

The HLY–OTA–A line is a critical part of the transmission network, connecting the upper North Island network to generation from Huntly and further south.[11]

The sections scheduled for replacement in Stage 1 (during RCP4) are:

- HLY–T43: Total of 43 structures (HLY–OTA–A0001 - A0043), about 30.6 circuit-kilometres.
- BOB–DRY: Total of 22 structures (HLY–OTA–A0125 - A0146), about 15.5 circuit-kilometres.

The middle section (T43–BOB) and the northern section (DRY–OTA) are scheduled for reconductoring in later regulatory control periods.

The need to replace the existing conductor is driven by three factors:

- Asset condition.
- Public safety risk.
- Electricity criticality of the HLY–OTA–A line within the transmission network.

1.1 Asset condition

"Dog-bone" sub-conductor spacers were fitted on parts of the HLY–OTA–A line at the time of conductor installation in the 1980s. These spacers were found to accelerate conductor corrosion where they clamp to the conductor bundle. The spacers causing this damage are no longer installed on our conductors.

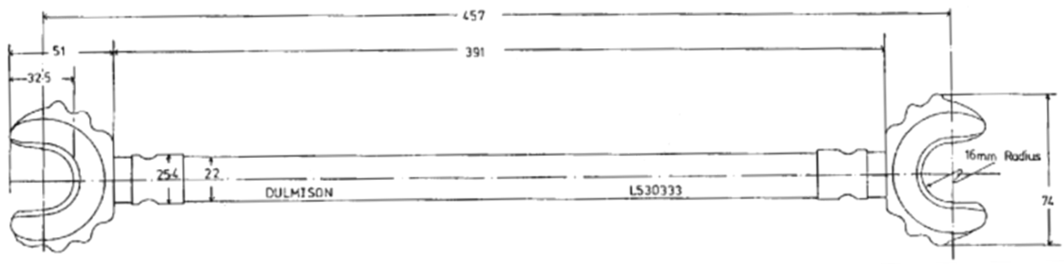

Figure 2 Drawing of "dog-bone" sub-conductor spacers

[11] Most of the existing HLY–OTA–A conductors have been in service since 1983. The line is installed across moderate and severe corrosion zones and runs through a mix of rural farmland and urban Auckland. The section north of Bombay (BOB–DRY–OTA) is in the severe corrosion zone, while the section south of Bombay (HLY–BOB) is in the moderate corrosion zone. The existing Zebra GZ conductors have achieved a service life of around 43 years, primarily due to corrosion caused by dog-bone spacers. The replacement Zebra AC conductors are expected to last around 72 years, reflecting their longer service life compared to Zebra GZ and the use of greasing to extend conductor life.

Close aerial surveys (CAS) in 2021, 2023 and 2025[12] identified widespread corrosion damage (aluminium oxide) on the conductors. The primary cause of the corrosion products is historical damage from dog-bone sub-conductor spacers. We know this because the aluminium oxide observations are frequently paired across the sub-conductors in a bundle, or nearby phase locations. We expect these aluminium oxide observations to shorten the conductor lifetime with respect to the expected service life.

The photographs in Figure 3 show corrosion of the HLY–OTA–A conductors.

Figure 3: Examples of conductor defects

Huntly–Tower 43 section

CAS undertaken in 2023 identified widespread corrosion damage on the conductor south of Bombay. HLY–T43 is an area of higher concern due to the greater severity and higher count of aluminium oxide observations compared with the rest of the southern section of the line.

Bombay–Drury section

CAS in 2021 identified aluminium oxide observations in the BOB–DRY section of the line. Our assessment indicates this section is in a similar or marginally better condition than the HLY–T43 section.

Overall condition

Overall, the HLY–OTA–A line has numerous aluminium oxide observations throughout all sections due to sub-conductor spacer damage. Each duplex span contains around 18 to 21 sub-conductor spacers per circuit.[13] In the worst case scenario, this could result in up to 42 instances of aluminium oxide per circuit span. Given the widespread nature of the defects, we consider it impractical to address the spacer damage with localised repair alone.

12 Different sections of the HLY–OTA–A line were inspected by CAS in different years. This is common for longer lines, where we may inspect one section first and then prioritise the remaining sections based on the findings. For this line, DRY–OTA was surveyed in 2025, HLY–T43 in 2023, and BOB–DRY in 2021.

13 Six to seven sub-conductor spacers per phase.

Southern sections versus northern sections of the line

The latest information we have obtained from CAS indicates that the southern HLY–DRY section of the line is in relatively poorer condition than the northern DRY–OTA section of the line. This may seem counterintuitive, as the northern section traverses a severe corrosion zone, while the southern section traverses a moderate corrosion zone. However, we have identified some reasons why this may be the case:

- Dog-bone spacer damage: Some spans of the HLY–DRY section had dog-bone spacers fitted for a longer time than the DRY–OTA section. It is possible that this has resulted in more severe damage for the southern sections.
- The HLY–DRY section is strung with duplex Zebra conductors, while the DRY–OTA section is strung with duplex Chukar conductors. There is a difference in construction and geometry between Zebra (HLY–DRY) and Chukar (DRY–OTA) conductors.[14] Chukar has an additional aluminium layer compared with Zebra. The strand diameter of Chukar is also slightly larger, which may have a role in the rate of degradation under the dog-bone spacer.

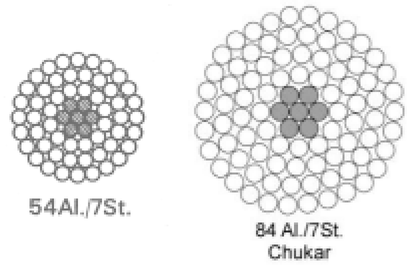

Figure 4 Strand diameter of Zebra and Chukar conductors

1.2 Public safety risk

As the conductor continues to deteriorate, our ability to effectively maintain it will reduce to a point where this approach is no longer safe or cost effective. If no action is taken, this ongoing deterioration will increase the risk of conductor failure.

If a conductor fails due to poor condition, it is likely to fall onto the ground below. Potential consequences associated with such an event include vegetation and property fire, electrocution or harm from physical impact. Some of the HLY–DRY sections cross major roadways, as well as a mix of private residential properties, both rural and urban.

1.3 Electrical criticality

The HLY–OTA–A line connects Auckland and Northland networks to the generation rich regions of Huntly and the south. This provides several critical benefits to New Zealand, including:

- Reduced electricity generation costs by allowing greater utilisation of lower cost generation that can be transferred into the upper North Island (including Auckland).

[14] Both the Zebra and Chukar conductors on the HLY–OTA–A line were installed in 1983.

- Improved security of electricity supply during peak periods, which allows more power to flow into Auckland with lower AC losses.
- Supplies the Bombay, Drury, and Takanini substations.
- Greater competition in the electricity market.

A conductor failure would cause an unplanned outage of the HLY–OTA–A line. This would restrict power flow between the upper North Island and the rest of the country which may threaten security of supply if it occurred during peak periods.

The HLY–OTA–A line is also part of the core grid under the Electricity Industry Participation Code Part 12 (Schedule 12.3). If the line were decommissioned, the grid would not meet the grid reliability standards (Schedule 12.2) as N-1 transmission security - and N security under some conditions - to Auckland and Northland cannot be maintained.

Q1.	**Are there any other considerations relating to the need that we should incorporate into this project?**

2 Identification of options

We have considered the future of the entire HLY–OTA–A line in our options analysis, as the future of the southern HLY–DRY section of the line needs to be considered in the context of what we are likely to do with the rest of the line in the future.

We carried out analysis to identify options to meet the need set out in Section 1. We identified the options set out in Table 3. We then assessed each of these options against the screening criteria below to arrive at a short-list of options:

A. Fit for purpose
B. Technical feasibility
C. Practicability of implementing the option
D. System security (additional benefit resulting from an economic investment)
E. Indicative cost
F. External considerations where a solution requires investment from other parties

Table 3: Option assessment against screening criteria

Description of options considered	Short-listed	Comments
Do nothing (no major investment)		

Description of options considered	Short-listed	Comments
Removal of the HLY–OTA–A line completely. The sub-options include: • Removal of the HLY–OTA–A line between Huntly and Drury, retain DRY–OTA section (reconductor in future RCP). • Removal of HLY–OTA–A line entirely from Huntly to Ōtāhuhu.	This is the base case for the analysis	Fails criterion A, D & F. Removal of the line between Huntly and Drury will result in no supply to Bombay substation. Removal of the full length of the line from Huntly to Ōtāhuhu will result in no supply to Bombay, Drury, Glenbrook and Takanini substations. N-1 security cannot be maintained with either of these sub-options.
Complete localised repairs to of the HLY–OTA–A line. The sub-options include: • Increase the frequency of the CAS on the HLY–OTA–A line between Huntly and Drury • Increase the frequency of the Close Aerial Surveys on the HLY–OTA–A line between Huntly and Ōtāhuhu	×	Fails criterion C, E & F The corrosion damage to the conductor is widespread across the entire length of the line. As a result, localised repairs are not a practicable solution. Any conductor damage that requires repairs in the spans would require significant outages and costs. Such repairs would be anticipated to increase in frequency as the conductor condition deteriorates.
Non-transmission solutions		
Special Protection Schemes (SPSs) Load-shedding Load shifting Demand response New generation New distributed generation	×	Fails criterion A. Does not address the condition-based need and does not exist on a scale large enough to eliminate the need for the HLY–OTA–A line.
Transmission options		
Reconductor the existing Duplex Zebra at 75°C on both HLY–T43 and BOB–DRY sections of the HLY–OTA–A line with new Duplex Zebra at 75°C (like for like).	✓	Short-listed components. This option retains N-1 transmission security to the upper North Island.
Reconductor the existing Duplex Zebra at 75°C on both HLY–T43 and BOB–DRY sections of the HLY–OTA–A line with new Duplex Zebra conductor but operating at a higher temperature of 90°C.	✓	Short-listed components. This option retains N-1 transmission security and increases capacity to the upper North Island.

Description of options considered	Short-listed	Comments
Reconductor the existing Duplex Zebra at 75°C on both HLY–T43 and BOB–DRY sections of the HLY–OTA–A line with alternative conductor with additional capacity.	✓	Short-listed components. We considered alternative conductor types that could provide a similar capacity to Zebra 90°C (around 847 MVA). We selected duplex Selenium AAAC (80°C) as a representative AAAC option for assessment. AAAC conductors can provide a longer expected service life than Zebra conductors by replacing the traditional galvanised core wires with aluminium clad wires. However, AAAC conductors can sag more than Zebra conductors, which can increase the extent of under clearance violations and the cost to rectify them.
Reconductor the full length of the HLY–OTA–A from Huntly through to Ōtāhuhu at the same time.	×	Fails criterion E. This would be prohibitively expensive and would unnecessarily bring forward replacement of much of the conductor that does not need to be replaced for condition related reasons.
Replacement of the existing HLY–OTA–A transmission line on both HLY–T43 and BOB–DRY sections with a new underground cable.	×	Fails criterion A, B, C, D & E. This would be prohibitively expensive and unnecessary. It is anticipated that a significant number of easements would be required, and extensive stakeholder engagement would be necessary to determine the best route for the cable installation. Installation works would cause major public disruption with major impact on communities, businesses and traffic.

The only credible options we identified for meeting the need are to reconductor the affected sections (HLY–T43 and BOB–DRY) using either:

- Option 1: Like-for-like duplex Zebra at 75°C.
- Option 2: Duplex Zebra uprated to 90°C.
- Option 3: Duplex Selenium AAAC at 80°C (alternative conductor with additional capacity).

For all shortlisted options, replacement of the two sections of conductor takes place in 2027-2030 (expected commissioning date in June 2030). These shortlisted options are assessed in Section 3.

HTLS conductors: assessment and exclusion from short list

We also considered conductors from the High Temperature Low Sag (HTLS) family (including ACCC Dublin, ACCR Drake and ACSS Drake) as potential alternatives because these conductors can provide higher capacity at lower sag. We did not shortlist HTLS conductors because their cost is significantly higher than Zebra conductors, and there is no material benefit in using HTLS conductors, as existing clearances are generally adequate to uprate the line to 90°C using Zebra conductors.[15]

Reconductoring the HLY–T43 and BOB–DRY sections of the HLY–OTA–A line with Zebra or AAAC conductor are the only credible options from the option components set out in Table 3.

Q2.	**Do you agree with our assessment of the option components?**

3 Assess options

This project is a listed project of the type contemplated in clause 2.2.2(8)(b)(ii) of the Capex IM, as it is work that:

- is primarily driven by Transpower's policies for replacing conductors on transmission lines;
- improves the original service potential of the transmission lines; and
- is required due to the condition of the conductors.

Base case

We assess the identified options against a base case which assumes no major capex investment. In the context of this project, this means no reconductoring of the HLY–OTA–A line or any of its sections.

We have determined the base case to be the decommissioning of the HLY–DRY section of the HLY–OTA–A line at the need date (June 2030), without replacement.

Under this base case, the decommissioning of the HLY–DRY line would maintain connections to Takanini and Drury substations, while leaving Bombay substation unsupplied.

This is because the two existing 110 kV circuits supplying Bombay substation (Bombay–Meremere–A and Meremere–Takanini–A) are scheduled to be dismantled in 2026. These are committed projects.[16] Once that work is completed, Bombay will be supplied only via the 220 kV HLY–OTA–A line. Decommissioning of that line under the base case would leave the Bombay substation unsupplied, so consumers at Bombay and those in the region supplied from this substation would need to self-supply, with the cost of self-supply captured as deficit benefits in Section 3.1.

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15 ACCC Dublin is approximately 3.7 times more expensive than Zebra conductor. Construction costs for HLTS conductors are also higher due to the additional handling requirements as well as expected additional structure strengthening costs to enable the higher tension.

16 FINAL 2025 Transmission Planning Report.pdf, Chapter 9.4 (110 kV connection to Auckland).

While this base case does not meet the N-1 standard of the GRS and we do not consider the option to be good electricity industry practice, we include it to demonstrate the economic benefits of the alternative investment options.

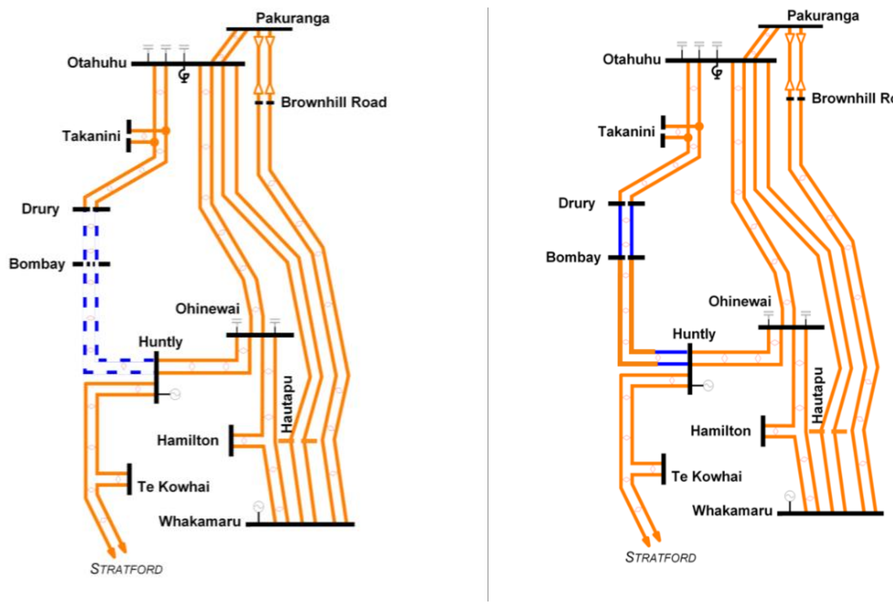

Figure 5: Base case & reconductoring grid configurations[17]

Figure 6 Existing circuits supplying Bombay substation

[17] The blue lines show the scope of work. The dashed line represents the section to be decommissioned under the base case, while the solid blue line shows the Stage 1 reconductoring scope.

Cost-benefit analysis parameters

We have included reconductoring of the middle T43–BOB section in 2035 as a 'modelled project' in the three reconductoring options. We include the future stage as a modelled project to reflect the need to consider the affected sections in the context of how the rest of the line is likely to be developed. This also ensures that our preferred option remains robust when these future stages are taken into account.

We also make the following assumptions in our analysis.

- 5% pre-tax real discount rate as outlined in the Capex IM;
- 20-year analysis period (2031-2050); and
- Using three out of five 2024 electricity demand and generation scenarios (EDGS)[18] i.e., Growth (weighted at 60%), Reference (20%) and Innovation (20%) – We consider three scenarios are sufficient to consider for this project. Consistent with prior investigations, we have not considered the constraint scenario due to its unreasonably low level of growth. We have also omitted the environmental scenario, as it is within the range of the three selected scenarios so does not provide additional insights.
- Value of unserved energy – the value of expected unserved energy is the assumed value to consumers of losing electricity supply because of an unplanned outage. As we are not planning to assess reliability benefits, we will not apply a value of expected unserved energy in our benefit analysis for this consultation stage. However, we will consider deficit costs, loss costs and costs of curtailed renewable generation based on the market modelling.

3.1 Benefits

This listed project investigation will consider three types of benefit:

- **Terminal benefits:** the economic lifespan of some of the investments considered extend beyond the calculation period, meaning that the assets will retain value at the end of 2050. We account for this as a terminal benefit, which effectively reduces the overall asset cost. It is assumed that the asset value decreases linearly over its lifetime.
- **Deficit benefits:** under the base case, no transmission investment is made to retain the line and supply to the Bombay substation. This would mean that we are unable to supply all forecast electricity demand at Bombay. In this situation, consumers would be required to curtail demand or find alternative ways of being supplied with electricity. This electricity shortfall is valued using deficit cost tranches, with most of the shortfall valued at $700 per MWh.[19] This deficit cost represents a benefit to undertaking a reconductoring investment.
- **Electricity market benefit:** quantified by comparing the electricity market costs associated with the reconductoring grid configuration to those in the base case dismantling grid configuration. We derive the electricity market benefits from our models covering power system analysis, generation expansion planning and generation dispatch simulations for

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18 Electricity Demand and Generation Scenarios (EDGS) | Ministry of Business, Innovation & Employment

19 See Transpower: Assumptions Book.

the two configurations. This type of benefit is not included in this consultation cost-benefit analysis, but it will be further discussed and included in our listed project application that will follow this consultation.

While recognising that the HLY–OTA–A line provides several benefits, for this consultation stage, we capture only the terminal benefits and avoided deficit costs (or deficit benefits). The deficit benefit alone is sufficient to demonstrate the economic case for reconductoring the relevant sections. This simplified approach is appropriate as we assume there is no material difference in electricity market benefits between the three reconductoring options. This is because the Stage 1 project only involves reconductoring two sections of the HLY–OTA–A line, and the additional capacity (and electricity market benefit) associated with Options 2 and 3 can only be realised once the remaining sections of the line are reconductored or uprated to the same rating.

Table 4 shows the present value of terminal and deficit benefits across our three selected EDGS scenarios. The deficit cost under the base case dismantling scenario is treated as the deficit benefit for each of the reconductoring options. The deficit benefits are the same across the three reconductoring options because they all avoid the same electricity shortfall that would otherwise occur under the base case.

Table 4: Quantified benefits, 2026 present values at 5% discount rate

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Terminal value benefits ($m)[20]	17.1	17.1	25.4
Deficit benefits ($m)	5724.9	5724.9	5724.9
Avoided decommissioning cost ($m)	20.8	20.8	20.8
Total benefits ($m)	**5762.8**	**5762.8**	**5771.0**

The difference in total benefits is therefore driven by terminal benefits. Options 1 and 2 have the same terminal benefits because they use the same conductor type and the same assumed service life.[21] Option 3 has a higher terminal benefit because the Selenium AAAC conductor has a longer expected service life, which increases the terminal benefits of the asset at the end of the calculation period. As a result, Option 3 has approximately $8.3m more total benefits than Options 1 and 2, but there's uncertainty around realising that longer service life, as a system upgrade may be needed before the AAAC conductor reaches end of life.

More detailed electricity market benefit modelling will be undertaken for the listed project application following this consultation. That modelling will use our power system analysis, generation expansion planning and generation dispatch models, and will support the calculations for indicative starting allocations for the application.

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[20] Terminal benefits include the modelled Stage 2 investments to ensure costs and benefits are compared on an equal basis.

[21] Assumed average service life: Zebra conductor 72 years; Selenium AAAC conductor 112 years.

3.2 Costs

In our analysis, we have included project costs for the three reconductoring options. The base case decommissioning cost is treated as a benefit of avoided decommissioning cost of the reconductoring options, as shown in Table 4.

Our costs were derived from a high-level desk top study, with an uncertainty range of -30%/+30%. These are shown in Table 5.

Table 5 Cost estimates of options, 2026 present values at 5% discount rate

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Stage 1 investments ($m)	22.2	22.2	32.6
Stage 2 modelled project ($m)[22]	35.2	35.2	44.4
Total costs ($m)[23]	**57.4**	**57.4**	**77.0**

These costs include:

- Investigation and design;
- Materials (conductors, insulators & hardware); and
- Construction (conductors, structures, foundations, access and property).

Options 1 and 2 have the lowest and effectively the same total costs across the reconductoring options. Our investigation indicates that the Zebra conductor can be thermally upgraded from 75°C to 90°C without materially increasing under-clearance rectification cost. At the current operating temperature (75°C), there is one existing under-clearance violation in the BOB–DRY section. This applies to all three options, and the cost of rectifying it is included in the total cost of each option shown in Table 5. Uprating to 90°C would result in two additional violations in the T43–BOB section, but that section is outside the scope of Stage 1 and would increase the relative cost of Option 2 (Zebra 90°C) by only around $9k. Allowing for rounding and the accuracy of cost estimates, the total costs for Option 1 and Option 2 remain effectively the same. As a result, Option 2 does not materially increase the scope of works or costs compared with Option 1.

Option 3 has a higher total cost because it uses Selenium AAAC conductor. This increases both the Stage 1 investment costs and the cost of the future modelled project reconductoring. Overall, Option 3 is approximately $19.6m more expensive than Options 1 and 2.

[22] Stage 2 modelled project refers to the planned reconductoring of the middle T43–BOB section in 2035.

[23] The cost-benefit analysis includes the costs of the Stage 1 investment and future modelled reconductoring works. This differs from the listed project capital allowance, which only seeks approval for Stage 1 investments.

3.3 Net benefits

The cost-benefit analysis identifies the option with the highest net electricity market benefit as the preferred option. Table 6 outlines the quantified net benefits (total benefits minus total costs) for each of the shortlisted options.

Table 6: Quantified net benefits, 2026 present values at 5% discount rate

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Total benefits ($m)	5762.8	5762.8	5771.0
Total costs ($m)	57.4	57.4	77.0
Net benefits ($m)	**5705.4**	**5705.4**	**5694.0**

This shows that Zebra 75°C and Zebra 90°C have the highest net expected electricity market benefits.

Capex IM clause D1(2)(a) states that options that have a difference in quantum of expected net electricity market benefit within 10% of the cost of the option with the highest net expected electricity market benefit are considered similar. For these options, unquantified benefits can be considered in determining the best option. In this case, the Zebra options are considered ‘similar’.

An unquantified benefit in this case, is upgradeability, as shown in Table 1; this benefit favours the Zebra 90°C option. Higher temperature conductors have higher capacity ratings which could be realised if the middle section T43–BOB of the line were uprated/reconductored to at least the same rating when it comes due for replacement.

3.4 Sensitivities

We have undertaken sensitivity analysis to determine the robustness of our quantified option assessment. Table 7 shows the net benefit of each option relative to our base case. It shows the difference in the present values of each option under low and high sensitivities:

- Costs -30% / +30%;
- Discount rate at 3% and 7%; and
- Various weightings of the three selected EDGS scenarios.

Table 7: Quantified net benefits, sensitivity analysis, 2026 present values ($m)

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Low discount rate 3%	7496.5	7496.5	7488.2
Base discount rate 5%	5705.4	5705.4	5694.0
High discount rate 7%	4415.8	4415.8	4403.1

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Capex increase (130% of base)	5694.4	5694.4	5677.2
Capex decrease (70% of base)	5716.4	5716.4	5710.9
Equal scenario weighting	5723.8	5723.8	5712.5
Innovation only	6384.7	6384.7	6373.4
Growth only	5677.7	5677.7	5666.4
Reference only	5109.0	5109.0	5097.6

The sensitivity analysis indicates that Zebra options consistently deliver the highest net benefit across a wide range of assumptions.

Q3. Do you have any comments on our analysis of costs and benefits for this project?

4 Identify solution

Table 8 summarises the quantitative and qualitative analysis. We consider Zebra 90°C currently has the best overall ranking and is our preferred solution.

Table 8: Quantitative and qualitative ranking of similar options

	Option 1 Zebra 75°C	Option 2 Zebra 90°C	Option 3 Selenium AAAC 80°C
Net quantified benefit ($m, PV)	5705.4	5705.4	5694.0
Ranking based on quantified benefits	1	1	3
Ranking based on unquantified benefits	2	1	3
Overall ranking	**2**	**1**	**3**

Q4. Do you agree with our assessment of the preferred solution and our application of the cost-benefit analysis?

5 Next steps

This project is a listed project within the Capex IM for RCP4 (2025-2030). Listed projects are large replacement projects expected to be undertaken during RCP4, but for which the scope and cost was uncertain at the time of our RCP4 application. The listed project status means that we need to apply to the Commission for its approval to increase our base capex allowance and consult on our application of the cost-benefit analysis set out in the Capex IM.

Based on our analysis and subject to feedback from this consultation, we intend to develop an application to the Commission for the following:

Application snapshot	
What:	• Procuring, installing and commissioning Zebra conductor on the HLY–T43 and BOB–DRY sections of the HLY–OTA–A line, rated to operate at a temperature of 90°C. • Works on the foundations and towers for the spans on which Transpower proposes to install the Zebra conductor. • Decommissioning the existing conductor.
When:	Commence work as soon as funding is approved and complete by 2030.
How much:	Transpower is seeking approval for $29.3m.

Our cost estimate for the project, while considered appropriate for options analysis, is currently being refined through further investigation. Assuming this work does not change the cost materially, we will update this figure when we make our application to the Commission.

If the Commission approves cost recovery for this project, the approved amount will be added to our RCP4 base capex allowance. We have called this the Listed Project Capex Allowance (LPCA).

Although the cost-benefit analysis includes future modelled projects, our draft application only seeks approval for the Stage 1 investment. Any subsequent stages would require separate approvals. As a result, the total cost values presented in Table 5 are higher than those presented in the draft application. Note that the expected cost and draft LPCA presented in Table 9 are not discounted.

Our capital cost estimates are expressed in real 2026 NZ dollars. To calculate the (nominal) listed project capital allowance, we apply:

- inflation (CPI) adjustments to reflect expected cost increases over time; and
- interest during construction (IDC) to account for financing costs.

Table 9 summarises our anticipated LPCA application of $29.3m. We intend to submit our application to the Commission in late 2026.

Table 9 Listed project capital allowance application

	Cost applied for
Capex ($m, real 2026)	25.4
Inflation ($m)	1.7
IDC ($m)	2.3
Total LPCA ($m, nominal)	**29.3**

6 Indicative pricing impact

Under the Transmission Pricing Methodology (TPM),[24] the costs of post-2019 investments in interconnection assets and interconnection transmission alternatives (BBIs) are recovered from customers identified as expected beneficiaries of the BBI. A customer is expected to be a beneficiary of a BBI if it has expected positive net private benefit (EPNPB) from the BBI. A customer's starting allocation for the BBI is the customer's share of total EPNPB.

The cost recovered through BBCs for a BBI is referred to in the TPM as the BBI's 'covered cost'.[25]

Under the TPM, a BBI's covered cost is calculated annually based on the values of certain capex and opex inputs for the relevant pricing year. A BBI's covered cost is made up of:

- costs that are directly attributable to the BBI or have a verifiable causal relationship with it. This captures capex costs (depreciation and a return on investment using our regulated WACC) and some types of opex; and
- a portion of our "overhead" opex, which does not have a direct or causal relationship with the BBI but is reasonably attributable to it. This type of opex is attributed to all BBIs in proportion to their depreciation (depreciation multiplied by an attributed opex ratio).

We have used the same cost estimates as in Section 3.2 to calculate the indicative covered costs for the HLY–OTA–A Reconductoring Stage 1 project.

The annual covered cost of a BBI is confirmed as part of calculating transmission charges for each pricing year after the BBI is commissioned. Our calculation of HLY–OTA–A Line reconductoring Stage 1 listed project's indicative covered cost relies on several estimates, including final asset composition and asset values, which we will not know until after the BBI is fully commissioned.

Table 10 summarises information about the covered cost due to the HLY–OTA–A Line reconductoring Stage 1 listed project.

Table 10 HLY–OTA–A Reconductoring Stage 1 indicative covered costs ($m)

Pricing year, PY (starting 1 April)	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43	43/44	44/45	45/46
Accounting Depreciation (Da)	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Capital charge (C)	0.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0
Revaluations	-	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)
Attributed opex component (AO)	-	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
Tax (Ta)	0.0	(0.5)	(0.4)	(0.3)	(0.2)	(0.1)	(0.1)	(0.0)	0.0	0.1	0.1	0.2	0.2	0.3	0.3
Total forecast covered cost	0.1	2.3	2.4	2.5	2.7	2.8	2.8	2.9	3.0	3.1	3.2	3.2	3.3	3.4	3.4

In parallel with this consultation, we will undertake electricity market modelling to support the listed project application. This will allow us to calculate broader electricity market benefits and

[24] The TPM is in Schedule 12.4 of Part 12 of the Electricity Industry participation Code (Part 12 - Transport).
[25] For more information see also Transpower's TPM Information Sheet - BBC Covered Cost v2.pdf.

support the calculations needed for indicative starting allocations for the BBI. If this is determined to be a low-value BBI, we would use the simple method to calculate the starting allocations.

If the Commission approves cost recovery for this project, Transpower will calculate expected net private benefits and proposed starting BBI customer allocations and consult on them.

7 Feedback requested

We invite your feedback on our assessment of options, application of the cost-benefit analysis and potential application to the Commission.

We have asked questions throughout this document and its attachment. These questions are intended to aid your response and are summarised in Appendix A. You are not obliged to answer all or any of these questions, all relevant feedback is welcome.

Following consultation, we will consider all feedback and prepare an application to the Commission for approval to increase our base capex funding baseline for RCP4 to account for this work. We intend to submit this application in late 2026.

Please send your written feedback to grid.investments@transpower.co.nz by 5pm on 6 July 2026. We will acknowledge submissions by return email.

We intend to publish all submissions and further information on Transpower's website. If there is any aspect of your submission that is confidential, please:

- Clearly mark the sections you consider confidential and indicate why.
- Indicate whether we can share the confidential information with the Commission.
- Please note that Transpower is subject to the Official Information Act.

Thank you in advance for your assistance with this project. If you have questions during the consultation period, please email grid.investments@transpower.co.nz.

Appendix A: Questions in this consultation

Q1. **Are there any other considerations relating to the need that we should incorporate into this project?**

Q2. **Do you agree with our assessment of the option components?**

Q3. **Do you have any comments on our analysis of costs and benefits for this project?**

Q4. **Do you agree with our assessment of the preferred solution and our application of the cost-benefit analysis?**

Q5. **Do you consider our demand assumptions appropriate for this investigation? Please provide us with any information about developments in the region that could help inform our forecasts**

Q6. **Do you have any additional information that could materially affect our electricity demand forecast or generation assumptions?**

Q7. **Do you agree with our proposal to use our BBC Assumptions Book v3.0 variations as the basis for our market scenarios for this investigation?**

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