TRANSPOWER

Information Submission under s53ZD notice *Cost Estimation*

Date: 24 November 2025

Contents

1. The Section 53ZD notice for cost estimation

1. The information sought under the s53ZD notice[1] via this report is to assist the Commission to:
   - investigate and assess the efficiency of Transpower's cost estimation process and systems over RCP2 and RCP3
   - set allowances for major capex projects and listed projects; and
   - reset Transpower's individual price-quality path for RCP4.[2]

Table 1 Information provision dates

Information provision date	What (DY means Disclosure Year July-June)
24 November 2020	Completed capex programmes and listed projects completed in RCP2.
25 November 2022	Completed capex projects for DY 2021 and DY 2022 of RCP3.
28 November 2023	Completed capex projects for DY 2023 of RCP3.
24 November 2025	Completed capex projects for DY 2024 and DY 2025 of RCP3.
24 November 2025	Completed capex programmes completed in RCP3.

2. The information in this report presents how costs have tracked for

   a. **Capex projects** for DY 2024 and DY2025 of RCP3 under Major Capex, Base Capex > $20m (including Listed), and Enhancement and Development >$5m expenditure categories. The tracking is via variance reporting for the *proposal* estimate to *delivery business case* estimate and

   b. **Capex programmes** in the base capex *Renewal* category, completed in RCP3. The tracking is via variance reporting for the *proposal* estimate to commissioning *actuals*.

1.1 Capex projects

3. For any variance between the proposal cost estimate and the *delivery business case cost estimate* of 30% or more, we must provide an explanation of the reasons for the cost variance.

4. The definition for "completed capex projects" requires both commissioning and all costs being in, to be in the same Disclosure Year.[3] The "and" requirement for the information - for both

[1] Transpower-s53ZD-notice-Cost-estimation-24-February-2020.pdf (comcom.govt.nz)
[2] Clause 7 of the notice
[3] **completed capex programme** means the projects or activities within a capex programme for which the assets have been commissioned *and* for which all costs are finalised and attributed.

commissioning and all costs are in in for the disclosure year - has inadvertently restricted the projects in scope. [4]

5. A strict interpretation of the notice would deliver information on very few projects. Instead, we have also included projects that Transpower has commissioned (are in service), with *most* costs known. We included projects with outstanding amounts less than 15% of the forecast total.

6. We report:
   a. **two** *major capex project*s completed in DY 2024 or DY 2025

   b. **three** *enhancement and development* (E&D) projects >$5m (and less than $20m) that have been commissioned (in service) DY 2024 or DY 2025
   c. **one** *base capex R&R* > $20m

   d. no listed projects.

1.2 Capex programmes

7. A **capex programme** is a base capex programme that was proposed by Transpower to have an estimated cost (*forecast commissioning cost*) of greater than $20 million over RCP3 and is renewal expenditure.

8. The definition for "completed capex programmes" requires both commissioning **and** all costs being in, to be in the same Disclosure Year.[5]

9. Explanations are required for variances between programme proposal cost and actual cost greater than 20%; however, we voluntarily provide explanation where variance is less than 20%.

10. Of sixteen asset programmes under Renewal base capex, four had a forecast commissioned cost of less than $20m, so these will not be in this report.[6] Therefore, we report on twelve asset programmes.

11. The expenditure and variance information under this notice for capex programmes will continue to be delivered for RCP4 under the requirements of the Individual Price-Quality Path for 2025 – 2030[7], clause 31 *Annual Delivery Report.* Noting reporting differences that the categories are by *asset class* rather than programmes, information is delivered each year, and explanations sought for *all* variance amounts.

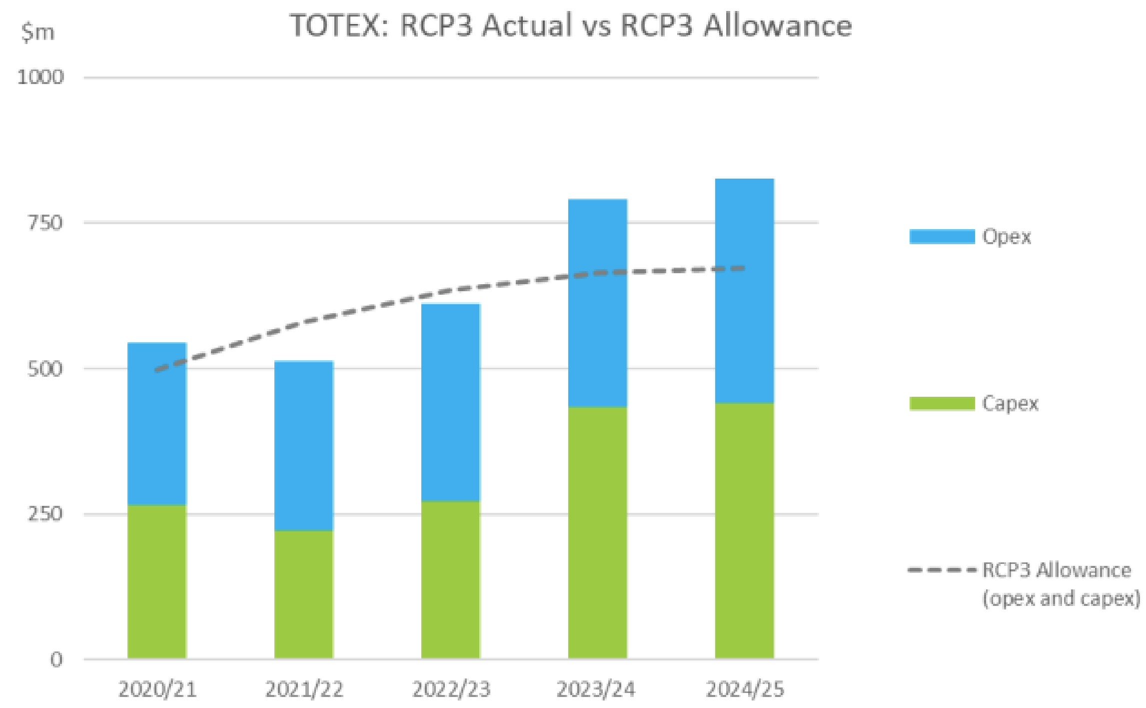
1.3 Overall RCP3 base capex

Our overall base expenditure (2024/25 $ constant) was $3.23bn. This was $128m (4%) above our allowance of $3.1bn. Our expenditure profile is shown in the figure below. The underspend during

[4] In our submission to the draft s53ZD Cost Estimation notice (via comment boxes) we noted "*commissioned is a date in our financial system, but those costs will not be actual costs until sometime after commissioning. Which means that completion may not be in the same disclosure year as commissioning*" Transpower_submission_Revised draft IPP and three section 53ZD notices_12Sept2019.pdf (refer TP9)
[5] **completed capex programme** means the projects or activities within a capex programme for which the assets have been commissioned and for which all costs are finalised and attributed.
[6] Not reported: Outdoor Instrument Transformers, Structures & Buswork, TL Foundation, and Access.
[7] Transpower Individual Price-Quality Path Determination 2025

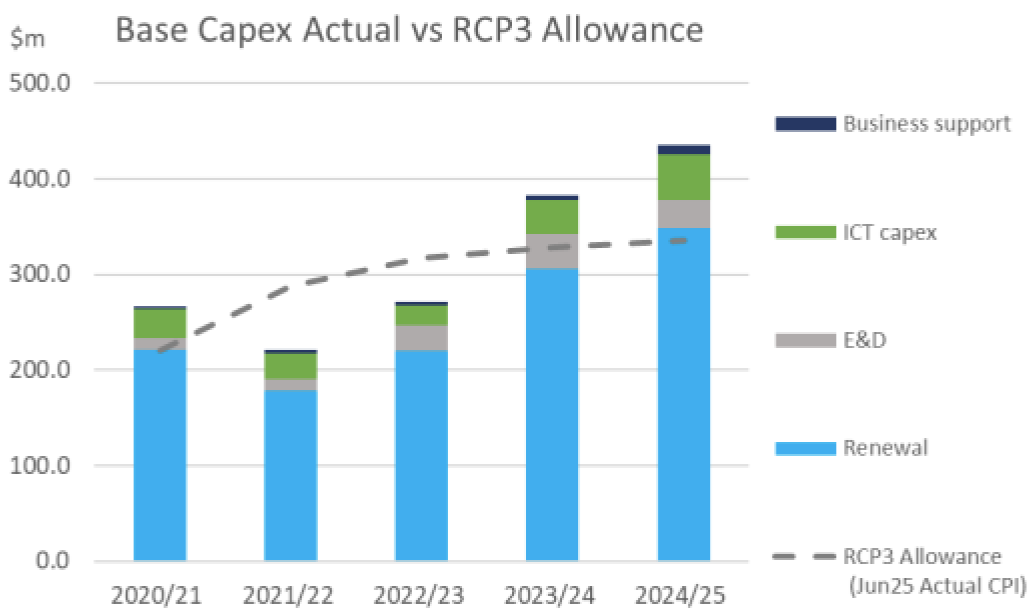
the early years reflected the impact of covid-19, including the resulting delays to our service provider contracting.

Figure 1 Totex: RCP3 actual vs allowance



Our overall RCP3 base capex was $1.58bn, which was $88m (6%) above the 1.49bn allowance. The annual expenditure against the overall allowance is shown in figure 2 below.

Figure 2 Base Capex actual vs allowance



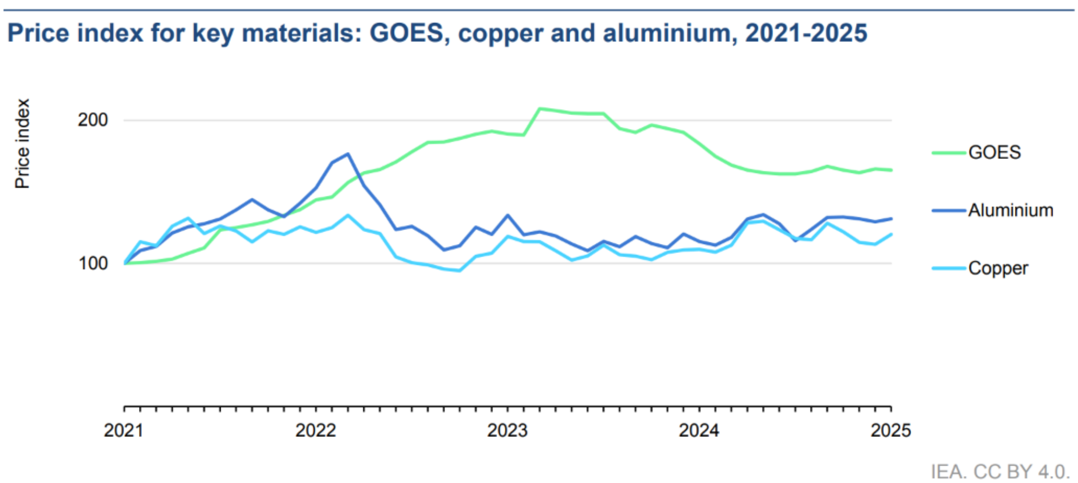
1.4 A comment on cost escalation

12. As we submitted to the Commission recently[8], cost escalation in the electricity sector is a growing risk as worldwide electrification has significantly increased demand for electricity network equipment. EDBs, Transpower, and their suppliers face real cost escalation that is unlikely to have been covered by real price effects based on raw material input prices.

13. The International Energy Agency has published "Building the Future Transmission Grid"[9], a report that examines investment in electricity transmission networks and trends related to the supply chain of key components. Based on a survey of industry stakeholders in 2024, it identifies how increasing infrastructure needs are affecting prices of components, lead times, and related market dynamics.

14. *For transmission component materials*, the costs of copper and aluminium peaked in early 2022, and grain oriented electrical steel (GOES) doubled between 2021 and 2023, to contribute to the cost surge. However, after prices rose sharply to 2022, supply grew at a faster pace than demand and prices reduced and stabilized.

Figure 3 Price index for copper, aluminium and grain oriented electrical steel (GOES)

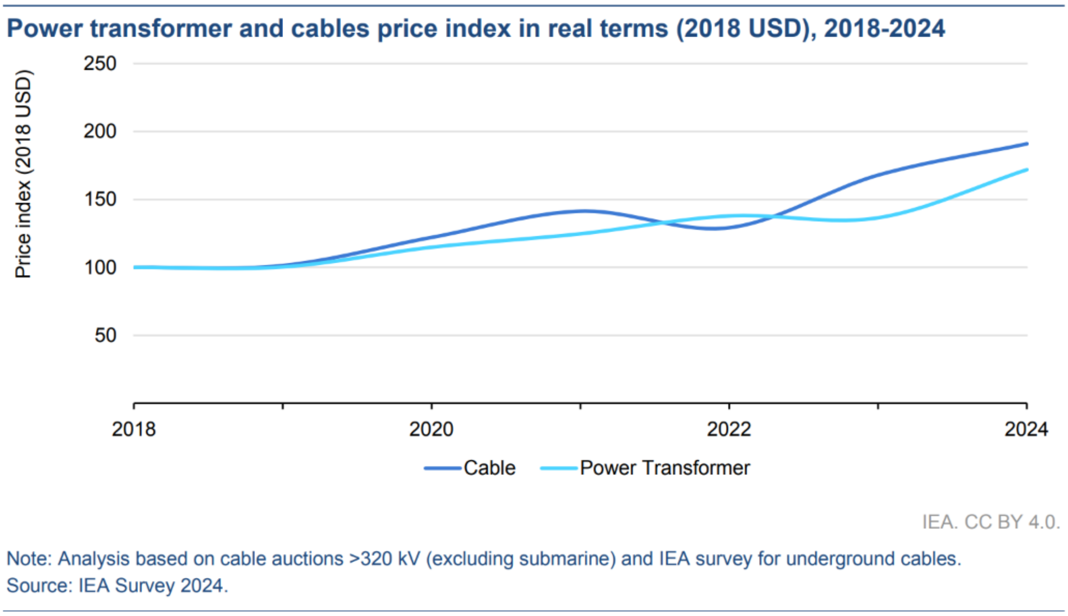


15. Source: IEA analysis based on data from Bloomberg, T&D Europe, Federal Reserve Economic Data.

16. For *cables and power transformers*, high demand has driven up their prices. The IEA survey revealed a sharp increase in the price of power transformers since 2022, although prices for individual transformer units depend on their complexity, capacity, and customized design. For cables, lead times have increased significantly, driven by high demand and more complex projects such as long-distance HVDC cables or submarine installations.

[8] Commission's open letter for Default Price Path 5 (DPP5), October 2025
[9] International Energy Agency Building the Future Transmission Grid

Figure 4 Price index for transformers and cables

17. 

18. Overall, equipment costs are rising far faster than input commodities due to increased demand but limited manufacturing capacity. The report concludes that "manufacturers are responding with plans and investments to increase production capacity, but this will take time, and uncertainties remain over the extent of future demand and the availability of a skilled workforce."[10]

19. Closer to home, AusNet's October 2025 transmission revenue proposal for 2027 – 32[11] includes detail on cost escalation taking an" average project" view plus transmission line and substation components. The cost information is sourced from AEMO's transmission cost database (TCD) as the national benchmark for cost reporting in the sector. It shows approximately 60-80% real cost escalation between the 2021 TCD and the 2025 TCD.

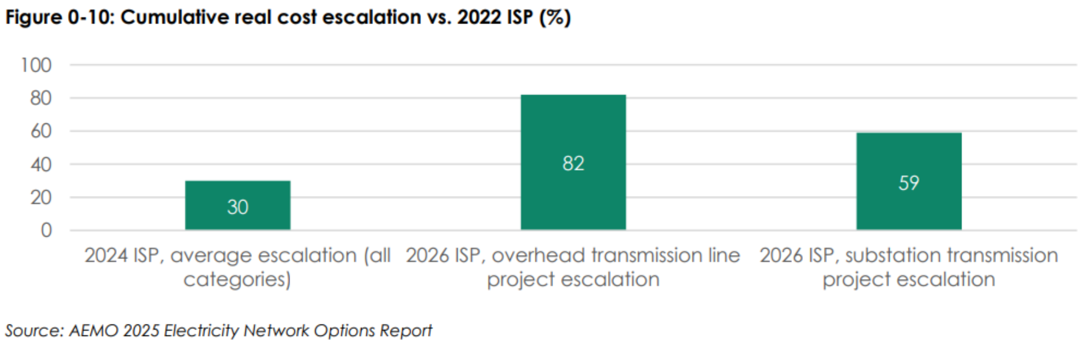
20. The graph below reproduced from its proposal[12] highlights cumulative real cost escalation comparing the 2022 integrated System Plan (ISP) against more recent ISPs:

    a. For the 2024 ISP, the average escalation for *all categories* is 30%

    b. By the 2026 ISP, project cost escalation is 82% for overhead transmission lines and 59% for substations.

[10] Ibid page 8
[11] AusNet Revenue proposal 2027 - 32
[12] AusNet Revenue proposal 2027 - 32, page 8

Figure 5 Cumulative cost escalation across integrated service plans (ISPs)



2. Capex Projects: variances between proposal, delivery business case cost and actual cost

1. For each project, the variances between *proposal* and *delivery business case* cost estimates are shown in the table below. Column 5 contains the information for compliance with the s53ZD notice.
2. The table also shows some commissioned projects with *actuals* and any *forecast outstanding costs.* Forecast outstanding costs for in-service (commissioned) projects are those at 15% or less to ensure some projects are reported (the alternative is to be literal with the notice and only report on projects that are commissioned, and ALL costs are in. This "and" situation cannot arise if a project is commissioned close to the end of one disclosure year, but costs are still being recovered in the following disclosure years.)

Table 2 Capex projects variances

Project	Project Classification	Proposal estimate $m	Delivery Business Case (DBC) estimate $m	Variance ($m, %) DBC against proposal	Actual / Forecast end cost (FEC) $m	Variance ($m, %) Actual/FEC against DBC
Waikato and Upper North Island Voltage Management (WUNIVM)[13]	Major capex project	$143.1m	Hamilton 110kV Statcom $62.3m Otahuhu 110kV Statcom $64.0m = $126.3m	-$16.8m 11.7%	$97.0m $5.4m forecast for FY26 FEC = $102.5m	-$23.8m 19%
Bombay Site Upgrade[14]	Major capex project	$50.5m	Transformers $30.5m Conductor $15.7m = $46.2m	-$4.3m 8.5%	$31.5m ($24.3m for transformers, $7.2m for conductors)	-$14.7m 31%

[13] Commerce Commission - Waikato and Upper North Island voltage management
[14] Commerce Commission - Bombay-Otahuhu Regional Major capital proposal

Project	Project Classification	Proposal estimate $m	Delivery Business Case (DBC) estimate $m	Variance ($m, %) DBC against proposal	Actual / Forecast end cost (FEC) $m	Variance ($m, %) Actual/FEC against DBC
UNI High Voltage Management - Build	Base capex E&D > $5m	TPR 2022[15] section 6.5.1.3 $15.2m	$15.9m	$0.7m 5%	$15.1m	-$0.8m 5%
Timaru voltage stability Interconnecting transformer	Base capex E&D > 5m	TPR 2022[16] section18.4.2 $7m	$15.3m	$8.3m 118%	$12.1m	-$3.2m 21%
Kawerau interconnection capacity	Base capex E&D > $5m	TPR 2022[17] section 10.4.7 $10m	$10.4m	$0.4m 4%	$5.0m $0.7m forecast for FY 26 FEC = $5.7m	-$4.7m 45%
Penrose control room	Base capex R&R > $20m[18]	Board approval 2019 $22.8m	Revised Board approval $27.2m	$4.4m 19%	$18.2m $2.2m forecast for FY26 FEC = $20.4m	-$6.8m 24%

[15] 2022 Transmission Planning Report.pdf page 64
[16] 2022 Transmission Planning Report.pdf page 320
[17] 2022 Transmission Planning Report.pdf page 175
[18] As a base capex project > $20m, consultation was with Vector and Kiwirail under Capex IM clause 3.2.1

2.5 Explanation of any variance > 30% between *proposal* and *delivery business case* for the project

3. One project is in scope for variance reporting, the **Timaru voltage stability interconnecting transformer.**
4. The proposal amount of $7M in the Transmission Planning Report was based only on forecast transformer costs including installation and design costs.
5. In contrast, at the delivery business case, the solution study detailed all the other work and fittings needed to commission the transformer. These works and fittings were:
   - Modification to the 220kV transformer bay, and new 220kV & 110kV surge arrestors, and associated conductors
   - New firewalls between transformer # 8 (T8) and the perimeter
   - Upgraded existing transformer # 5 (T5) transformer bay to replace existing circuit breaker and current transformer with a new disconnector circuit breaker
   - New neutral earth resistors for both T5 and T8
   - New secondary works
   - Protection modifications for both transformers T5 and T8. This includes line differential, transformer differential, and distance protection
   - Project risk allowance, escalation (CPI and Foreign Exchange) and interest during construction.

2.6 Voluntary explanation of any variance > 30% between *delivery business case* and *actual cost*

6. Two projects fall in scope for voluntary reporting of any variance between delivery business case and actual cost greater than 30%.

7. **Bombay Site Upgrade**[19] The reasons that the project forecasts lower costs than at delivery business case are:
   - the transformer procurement for Bombay occurred after a supplier had another order cancelled and was able to offer Transpower a better price
   - a change to the timing of Counties Power’s new zone substation at Bombay avoided a work planning clash and allowed for simpler implementation at the site
   - through smart design the project team was able to significantly reduce the required enabling works, for example the use of new technology (smaller/lighter Catenary Support System Blocks) reduced the amount of temporary strengthening works and infrastructure protection required, and no requirement for hurdles over motorways.

[19] This information is also disclosed under ID for 2024/25, refer Tab Schedule TP4

8. **Kawerau interconnection capacity** This enhancement project was fast-tracked to accommodate the loss of load from closure of Norske Skog heavy industry at Kawerau, and to enable increase in generation export from existing and potential new generation in the area. Under the tight timeframe it was not possible to obtain a solution study report that would better specify likely costs.
9. Economic analysis at the time showed that with the future generator connections from Lodestone Energy and Far North Solar with solar generation at Waiotahe to exceed 50MW, it was economic to replace the Kawerau T13 transformer with a larger one.
10. Without this investment, it was thought unlikely that new generators would connect due to the perceived high risk of generation curtailment with a Kawerau T12 outage. Upgrading the transformer T13 also has the benefit of freeing the existing transformer at Kawerau for use at Edgecumbe.

3. Capex Programmes: variances between *proposal cost* and *actual cost* (commissioned basis)

11. The forecast cost for each programme is based on what was presented to the Commission for the RCP3 proposal, then escalated for CPI as at June 2025.
12. Across RCP3:
    a. on a commissioned basis, base capex is $1.39bn, 90% of the RCP3 approved amount ($1.53 bn). The rest are works under construction to be commissioned in RCP4.
    b. on an expenditure basis, base capex was $1.58bn; $88m (6%) above the 1.49bn allowance (figure 2).
13. Our continued focus on applying our investment decision frameworks and asset strategies; creating asset condition information through improved modelling and enhanced data acquisition through technology means expenditure plans may be changed by better information. This focus ensures we create dynamic efficiencies through decisions on the right investments at the right time and place.
14. Reallocations of capex within and between programmes are governed by our Executive Leadership Team scrutinising performance of capex programmes, derived from monthly reviews of the programmes and overall RCP position. Our governance structure ensures rationales and trade-offs are discussed and understood and considered against our asset strategies and portfolio management plans, so that expenditure is appropriately authorised and allocated.

3.1 AC Substations

Table 3 AC substations

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
Power Transformers	72.9	101.2	39	Two existing strategic spares were deployed as transformer replacements for failed transformers, and two new units purchased to replace these, Delayed commissioning of three transformers into RCP3 resulted in five additional replacements against the plan. We replaced more bushings on some of the transformers than proposed (28 v. 23) as this approach extended transformer life and meant full transformer replacement could be deferred. so that more bushings were replaced than proposed (28 v. 23). The health quality measure was not impacted by this decision.

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
				More firewalls replaced than proposed (eight v. four). Six of these firewalls resulted from the replacement of Gore T2 and T3 transformers that were brought forward from RCP5 to RCP3 due to government GIDI funding. The funding resulted in a big milk plant in the region converting to an electric boiler and needed the capacity increase sooner. Two did not proceed as further investigation concluded they were complex and consequentially not economic (sites South Dunedin and Maungaturoto).
Indoor Switchgear	35.0	44.4	27	Most indoor switchgear replacements have cost more than were anticipated. Also, Gas Insulated Switchgear and SF6 gas monitoring work have been additionally completed in this portfolio, following an update to Transpower's SF6 strategy to extend the life of SF6 circuit breakers create time to allow newer less-emissive technologies to develop (instead of replacing with SF6 technology). This life extension approach requires additional monitoring of the circuit breakers.
Other station equipment	20.5	55.4	170	Costs were greater than anticipated for oil containment works and LVAC (low voltage AC) replacements. Unforeseen Brownhill-Pakuranga cable joint repairs $7m, Otahuhu-Penrose and Otahuhu-Mount Roskill (Highbrook) cable termination retrofits and joint replacements $7m. Replacement of Penrose control room cost $7m more than anticipated because of asbestos on site, and taking longer to complete. Additional (unplanned cost) headgear refurbishment to extend disconnector lives $3m.
Outdoor 33kV switchyards: Outdoor to Indoor Conversion (ODID)	63.2	62.6	0.9	Technically n/a as the variance is less than 20%. Each ODID completed was at significantly higher cost than forecast. Overall, fewer ODIDs were delivered than planned (planned 11, delivered 4) and 4 also completed by the connected customer.

3.2 ACS Buildings and Grounds

Table 4 ACS Buildings and Grounds

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
ACS Buildings and Grounds	48.4	71.9	23	A change in our warehouse strategy (green field site at Rolleston $12m and new warehouse at Bunnythorpe $12m) meant costs were higher than forecast. Original approach was to renovate but considering expensive seismic retrofit and recognizing need for space for larger volumes of transmission assets, the revised decision was to build both new.

3.3 Transmission Lines (TL)

Table 5 Transmission Lines

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
TL Structures and Insulators	387.8	341.1	12	Technically n/a as the variance is less than 20%. Noting lower delivery in several areas due to recalibration of health models and corrosion zone updates since the RCP3 approval amount was determined. All replacements being based on actual condition rather than forecast condition. Lower quantities of transmission line insulators (3613 instead of 6530). Three towers were replaced; allowance was made for seven, but actual replacements depend on better information about failure risk. Significantly fewer poles (894 instead of 1250) were replaced. As with Insulators, the actual numbers replaced are based on condition rather than forecast health. A revised tower corrosion strategy resulted in reprioritizing which towers to paint. Transpower revised the original 2845 towers (as submitted) to a new target of 2127 towers; in the end 2283 towers were painted making use of the specialized and scarce tower painting resource. Also, a further focus was to increase the quantity *of minimum approach distances* areas painted on the towers (these areas signal safe approach distances). Forecast quantity was 1707, with 2954 completed to make use of the scarce resource.

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
TL Conductor & Hardware	111.5	69.4	38	Largest projects completed in RCP3 were Bunnythorpe – Wilton A (Judgeford-Wilton section) reconductoring $26m; and Otahuhu - Whakamaru A & B (Otara section) reconductoring $12m. Implementing our Intelligent Conductor program (ICON) resulted in deferral of works (such as Carrington Street – New Plymouth.) Updated condition assessments meant cancellation of other works previously forecast needing intervention in RCP3. Additional work to rectify under clearance violations. Additional reconductoring work triggered by joint poor condition/joint quantity.
TL Grillage	55	36.2	34	Submission of RCP3 grillage interventions was based on completing 1250 Concrete Over Grillage (CoG). After implementation of the Cathodic Protection (CP) intervention the numbers were adjusted top-down to be an expected split of 900 CoGs and 750 CPs. Delivered 369 CPs vs planned 750. CP was deemed not viable at a number of locations due to soil resistivity, proximity to substations and buried services (e.g. cables). Delivered 620 CoGs vs planned 900. The actual delivery of CoG was based on actual scoping (in line with intervention strategy) rather than forecast conditions. In addition, the emerging Tower to Pole strategy has reduced the total number of lines we want to intervene with CoG and sites having more complex access and other constructability challenges is causing rollovers to future years

3.4 HVDC and Reactive Assets

Table 6 HVDC and Reactive Assets

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
HVDC	80.0	64.4	19	Technically n/a as the variance is less than 20%. Lower than forecast primarily due to deferral of Pole 2 filter work based on asset condition ($15m).

Reactive Assets	50.9	22.6	56	Transpower deferred Albany SVC7 refurbishment to RCP4 due to outage constraints and supplier lead times.

3.5 Secondary Assets

Table 7 Secondary Assets

Asset group (programme)	Forecast cost $m	Actual Cost $m	Variance %	Commentary if variance > 20%
SA Protection, Battery Systems and Revenue Meters	177.2	145.2	18	Technically n/a as the variance is less than 20%. Protection systems exist for bus zones, bus couplers, feeds, lines and transformers. Protection works were reprioritised to realise delivery synergies between other Transpower works and customer works; and improved information on needs across all substation assets. Transpower did several battery & charger replacements early in RCP3 to meet black start carryover requirements; with these needs established during scoping studies.
SA Substation Management Systems (SMS)	78.2	69.1	12	Technically n/a as the variance is less than 20%. Transpower undertook several SMS replacements earlier in RCP2; in contrast, some sites could not be completed prior to the end of RCP3. This resulted in an overall reduction.

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