Innovation and Non-Traditional Solutions Allowance Application: NZ Lens – Cable Health Monitoring Trial

Commerce Commission

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POWERCO

INTSA application
NZ Lens – Cable health monitoring trial

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INTSA application
NZ Lens – Cable health monitoring trial

1. Summary of Powerco allowance and INTSA applications

A summary of the proposed recovery in this application is provided in Table 1, along with a cumulative allowance recovery through the DPP4 period. Powerco's Innovation and Non-Traditional Solutions Allowance (INTSA) allowance limit is $20.1 million with 25% of that for collaborative projects only.

Table 1 Recovery proposal capex and opex

	Description	Purpose	FY26 recovery proposal		FY27 recovery proposal	
			Capex	Opex	Capex	Opex
NZ Lens – Cable Health Monitoring Trial	This trial involves deploying low-voltage (LV) monitoring equipment to identify early signs of underground cable failure. The initiative aims to evaluate the technology's effectiveness in detecting potential issues before they escalate, enabling proactive asset management.	The purpose of this trial is to determine whether LV monitoring can improve maintenance planning by forecasting failures and prioritizing funds for the most affected assets, foster collaboration among electricity distribution businesses (EDBs), and assess opportunities to enhance efficiency in maintenance and renewal programmes.	$160,000	$10,000		$95,000
Recovery in this application						$265,000
Allowance recovery previously approved – Powerco						$105,000
Allowance recovery previously approved – collaborative						$280,000
Remaining allowance – Powerco						$14,970,000
Remaining allowance – collaborative						$4,745,000
Total allowance						$20,100,000

2. Introduction

2.1 Purpose of this report

This is Powerco Limited's ("Powerco", "we") application for the innovation and non-traditional solutions allowance (INTSA), for a project planned across FY26 and FY27. This report collates the information required for the Commerce Commission (the Commission) to be satisfied that the project meets the requirements for recovery of the allowance for FY26 and FY27.

This application covers the following project we propose to commence in FY26:

- **NZ Lens cable health monitoring trial**

NZ Lens (Low-voltage Enhanced Network Solutions) is the name of the collaborative project joining multiple electricity distribution businesses (EDBs). It Is being facilitated by EA Technology[1] and will implement the VisNet suite of products and services.

The nature of data acquisition and analysis means that the phases of the project span multiple financial years. This application seeks approval for the costs forecast in FY26 and FY27.

We are happy to discuss any aspects of this application with the Commission. The first point of contact for this application is Irene Clarke - Policy Manager, [redacted]. No parts of this application are confidential, and we will publish this report in full.

2.2 INTSA requirements

Under the Default Price-Quality Path Determination, EDBs may make an application to the Commission for approval of recovery of the allowance under Schedule 5.3 of the Determination[2]. This report is guided by the requirements in Schedule 5.3. We have provided an assessment against Schedule 5.3 in Appendix 1.

The project in this application is innovative/non-traditional because the project is trialling innovative "Grid-edge" monitoring technology. This technology offers the ability for Powerco and collaborating EDBs to understand and manage Low Voltage cable health to a level that has not previously been accessible. It will also be a collaborative project with Orion and Unison to build a wider sample of NZ cable types covering a mixture of cables manufacturers, asset ages, soil morphology & urban/rural use cases. Powerco will be the first EDB to install the technology in this form. It is proposed that the results of this project will be shared with all NZ EDBs via a presentation in a future Electricity Engineers Association (EEA) conference.

We note Unison having already installed a small quantity of VisNet Hub LV monitors and will join as collaborative data pooling participant. Unison is investigating these monitors and a variation of this technology to identify low voltage (LV) pillar issues including proactive identification of electrical arching which can lead to fires.[3] This project is complementary as it is targeting cable health and condition.

The full Powerco allowance available under Schedule 5.3 is $20.1 million (with 25% for collaborative projects only). This application is for drawdown of $265,000. A breakdown of our allowance is provided in section 1.

[1] For more information on EA Technology see: About EA Technology | EA Technology
[2] Determination: 5BFINAL5D-Electricity-Distribution-Services-Default-Price-Quality-Path-Determination-2025-5B20245D-20-November-2024.pdf
[3] Paper presented at EEA conference 2025

2.3 Powerco's commitment to innovation and customer outcomes in our vision to grow to zero

Where and when energy is consumed and produced is changing. Emerging and improving energy technologies are creating new opportunities and challenges in network management. With increasing electrification of the NZ economy, the LV network will be required to be more flexible and resilient, managed in new ways.

To support this transition, we are investing in:

- Modernised network architecture to integrate and optimise new energy technologies.
- Smart grid solutions that enhance visibility, forecasting, and real-time network management.
- Targeted capacity upgrades to support increasing electrification where needed.
- Enabling flexible energy use, including demand response and local energy trading.

2.4 LV networks are the interface to consumer options

Over the coming decades we expect many of our customers will continue to make ever expanding choices on how they use energy. New Zealand has significant stock of LV assets - where the majority of these customers will interface with the network (97% of Powerco's customers are connected at LV). It is forecast that the cable installed to service urban growth throughout the twentieth century will reach end of life at a rate equivalent to urban expansion, putting pressure on these assets to perform. This includes low voltage cable assets.

Our upcoming AMP 26[4] will contain detailed information on our asset strategies, with Chapter 7 outlining our evolving cable asset management strategies. Outlined in section 10.5.2 of the AMP we identify that *"Our LV underground network consists of 7,750km of cable. This includes 2,089km of dedicated street lighting circuits and 469km of hot water pilot circuits."* The AMP identifies the following strategies:

- **Low voltage cable summary:** We expect to invest $84m in low voltage cable renewals during the planning period. This portfolio accounts for 1% of renewals Capex during the period.
- **Low voltage cable renewals Capex is driven by the need to:** Replace older assets that are forecast to be in poor health by the end of the planning period. The above plan sees an expected 4.37% (224km) of LV service and distribution cable replaced over the period. Current best practice is to apply age and type as conditional proxies.

Powerco's current models utilise age, type and known condition in a CNAIM model. Developing a robust asset health profile of our LV underground cable fleet supports more targeted asset management for a resilient underground cable fleet. The output of this project is aimed to give EDBs an understanding of what they cannot see and to enable a more targeted use of available funds, optimised use of assets, and to deliver more reliable service to consumers.

The upcoming "wave" of LV cable nearing its end of life is illustrated in a theorised form in Figure 1 (from (André CUPPEN. Kewen KUEH, 2023). The data displayed is from Powerco's cable fleet data. This Lens project will allow participating EDBs to develop better understanding of cost-benefit related to LV cable condition-based replacement, as well as better understanding the accuracy of age-based models being used as a good proxy for cable health.

This project supports our strategy to manage our LV cable assets via cost-effective, data-driven condition assessment process. With more 'at need' cables being replaced based on additional data inputs.

[4] AMP 26 to be published by 31 March 2026. Electricity disclosures

Figure 1 Image from LV cable renewal forecasting – how near is the wall of wire? - (André CUPPEN. Kewen KUEH, 2023)

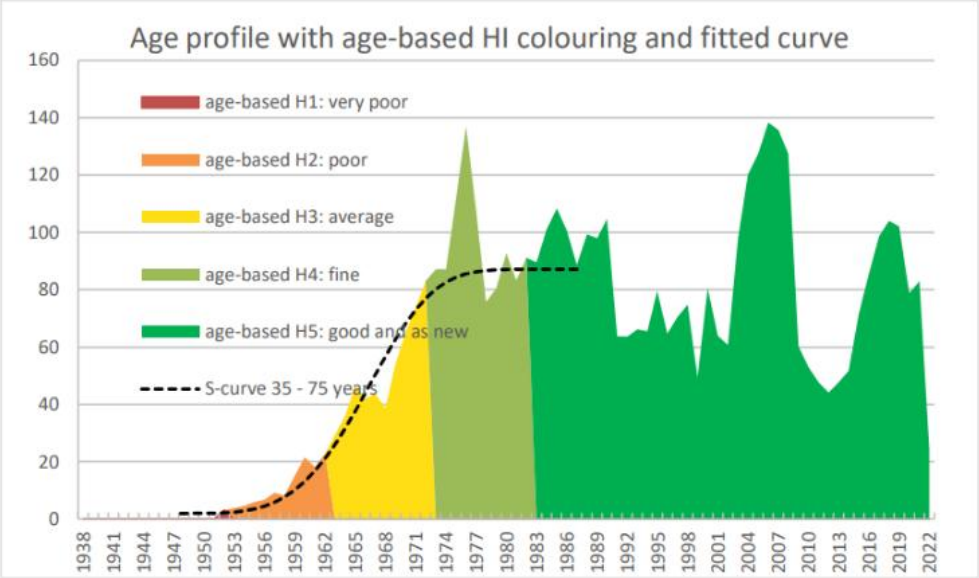

Figure 4 - LV cable age profile in January 2023, with AHI index colours by age (see below for more details on AHI), including an S-curve fit to the oldest cables, those installed between 75 and 35 years' ago.

By embracing decarbonisation, digitalisation, and customer-centricity, Powerco is dedicated to not only meeting today's energy needs but also laying the foundations for a more sustainable, resilient, and innovative electricity future.

3. Project information: NZ Lens cable health

3.1 Project purpose and steps to achieve the purpose

This trial intends to use the EA Technology VisNet LV monitoring equipment paired with an analytical platform to detect early underground cable failure by means of high-speed data logging at the grid-edge and logging of "pre fault indicators" to predict likelihood of failure.

A significant proportion of the distribution network is buried underground in the form of cables. True condition assessment requires excavation, a process that would not be financially or operationally prudent. Age and type are used as conditional proxies, an approach that is broad in application with assets that require remediation not being captured until they fail, and assets that have many years of useful life being replaced. Neither of these options provides the best outcome for consumers. If an asset fails prior to its scheduled replacement, it will potentially cause an extended outage for customers. If an asset is replaced due to its age, but could have continued to perform for several years, this is not optimising the asset's use, and is more costly for customers. This project aims to investigate a developing technology that can assist in the assessment of cable condition and health.

If successful, this technology will allow maintenance and renewal funds to be more efficiently targeted to worst affected assets. We also expect this will help provide measurement input data into our CNAIM Asset Health Scores (AHIs), providing a greater degree of confidence in our proactive asset replacement strategy.

Powerco does not expect a financial benefit from this trial – cable replacement is already factored into our long-term forecasts and forward pricing plans. We expect the value in this project will be through testing the

viability of the technology and identifying options for use of technology to bring efficiencies to future maintenance and renewal programmes. Ultimately, should the technology be successfully adopted, it could optimise asset use, target our forward planning, reduce failures (outages)and therefore have a financial benefit.

Selection of EA Technology as a partner comes from their track record of successful innovative technologies in improving management of network assets, improving the ability to diagnose and treat issues before asset failure – multiple EDBs within NZ including Powerco utilise the PD Detection systems to manage risk of HV switchgear failure. VisNet has had some success in overseas markets (UK and Australia), but as the technology has had limited testing in New Zealand, the success is uncertain. EA Technology is quite open about the need for localised cable condition environmental and type data to validate their predictive modelling.

The key steps to achieve the project purpose are:
1. Plan: Confirm install site locations for trial
2. Build: Install & Commission equipment
3. Operate: Track system analytics & carry out site investigations where appropriate
4. Share: Build case studies and present in an open forum to inform other EDBs on findings
5. Decommission
6. Report/present results

3.2 The outputs and consumer benefits

3.2.1 Outputs and timing

This project is planned over 2 financial years. All outputs are expected to be delivered by April 2027.

Table 2 Activities and timing

Activity	Timing	Output
Procurement	March 2026	Confirmed Bill of Material (BOM): for each proposed sites specific requirements
Site selection & installation	April 2026	Completed installation: Confirmed site selection and equipment and jobs issued to various regions
Updates & insights from EA Technology	Quarterly[5] from commencement	Round table discussion with participants: updates to any case studies in development, or requiring further input from interested parties
Present early findings in EEA conference paper	Sept 2026[6]	Potential EEA paper/presentation: Initial findings subject to timing/volume of results
EA Technology final report	April 2027[7]	Finalised reports: Reporting on both the Powerco specific data, trends and specific findings in the Powerco network; and an analysis of overall trends across New Zealand networks using pooled data. These will likely be produced as two separate reports.
Assess continued value and success criteria	March 2027	Final EEA paper from EA Technology

[5] Exact reporting structure dependant on insights and participants availability
[6] Proposed early findings release by EA Technology. This will be dependent on volume of data and insights uncovered.
[7] Final reporting date to be confirmed closer to the trial end.

3.2.2 Consumer benefits

Efficient investment in a resource constrained environment is of utmost importance to limiting the exposure of customers to increasing electricity prices. A more complete asset health indication of low voltage cable assets will benefit the customer in the following ways:

- Allow proactive replacement of at-risk assets giving customers and Powerco time to plan alternate arrangements for supply during the repair and replacement process – less disruptions and outages from asset failure
- More efficient bundling of work within the road corridor with other utility providers (geographically similar projects) to decrease costs and limit impact of repair and replacement
- Provide real time LV information to Network Operations Centre (NOC) to allow for more proactive and targeted fault response.

3.2.3 Anticipated learnings

It is expected the learnings that Powerco and EA Technology identify will improve the regional modelling for the cable health application. This will give New Zealand EDBs the option to access a reliable tool that is fit for purpose offering improved asset management capabilities.

Powerco and any other participating EDB will have a greater understanding of how their respective underground networks are performing in certain conditions, be that cable type, soil conditions, age or installation methodologies. It is expected this information will inform our assumptions of aging underground cable asset performance.

We also aim as a smaller sub project to identify integration opportunities to incorporate real-time LV information into our LV Visibility Platform alongside our other forms of LV monitoring and smart meter data to better inform interested stakeholders. In this case, we aim to validate the real time outage information demonstrated in EA Technology's case studies[8].

3.3 Eligibility criteria

3.3.1 Relates to the supply of electricity distribution services

LV distribution cables are the final link in the electricity distribution chain, where the majority (97%) of customers interface with the network. Traditionally these networks have seen reduced investment due to limited impact on consumers compared to HV networks.

3.3.2 Promotes the Part 4 Purpose of the Act

The project has a core purpose of enabling efficiency gains related to better asset management practices (through delaying the need for, or more targeted prioritising of, expenditure on network renewals).

This project is all about working smarter together. Improving cross-EDB collaboration and efficiency of replacement of assets to decrease impacts on consumers and better prioritise investment to ensure targeted spend that benefits customers.

Leveraging multiple EDBs' local scenarios, facilitates the project to select a variety of location types and conditions, increasing the data set and aiming for technology with potential benefit for all EDBs. At the time of

[8] Case Studies | VisNet® | Scalable Low Voltage Solutions

writing this application, Orion has committed to the project and is also submitting an INTSA application. Unison also intends to install some loggers. Informal conversation with other EDBs indicate potential for others to join this trial before commencement.

3.3.3 Unlikely financial benefit / sufficiently uncertain benefits

While this solution has had some promising results in overseas jurisdictions, the technology offered as part of this trial has had limited testing in New Zealand to date, and it is unclear if the models in their current (or future) state can provide tangible benefit in a New Zealand setting. EA Technology require localised data to confirm the suitability of their failure prediction algorithms. The primary purpose of testing the technology has uncertain benefits.

Should the technology be proven to suit the localised scenarios and adopted, it may enable us to optimise asset use and better assign asset replacement and renewal funds in the future. The technology does not increase revenue.

3.4 Project phases and forecast costs

The forecast costs of the project for each disclosure year are outlined in Table 3. All costs are GST exclusive

Table 3 Forecast costs

	Cost for output year 1 (FY26)	Cost for output year 2 (FY27)
Purchase of equipment	$160,000	
Installation		$40,000
FY engineering cost	$10,000	$15,000
Decommissioning close out cost		$40,000
FY total	$170,000	$95,000
Total cost of project		$265,000

Purchase of equipment: this the cost quoted by EA Technology for 40 LV loggers and access to the VISNET hub platform and all available applications.

Installation: This is the predicted cost to install 40 LV monitors at various kiosks across Powerco' network. This value is based off a quote from a similar project undertaken by a service provider in FY25.

FY engineering costs: This line item is the project business support cost required from internal and at times specialist external resources to support this trial. This includes:

- $5,000 for training and support material development, including a quick reference guide for basic use, functions, navigation and specialist installation requirements. A small allowance has been made for pre installation site visits and scoping
- $10,000 for specialist engineering support from underground cable specialists each quarter to assist with interpretation of results and insights. This will allow digestible results to be communicated to the wider business and stakeholders for adoption and analysis

- $10,000 for business support on an ad hoc basis from legal, property, consents, finance and information support (IS). IS may be required to develop bespoke data integration pathways to further draw down more granular data into internal systems.

Decommissioning and close out: this is the cost quoted by our service providers to return the network to a pre-trial state. Reducing the likelihood of orphaned unsupported equipment in the event of non-adoption.

The proportion of the forecast project costs proposed to be recovered is 100%.

3.5 Parties to this project and collaboration

This project is a collaborative project. For this project, Powerco is working with the following partners:
- Orion
- Unison
- Other EDBs (yet to be confirmed)
- EA Technology

In our initial scoping of this project, Powerco and other potential EDB participants have formed a working group to ensure we cover a wider range of cable types and locations. Each EDB has an information sharing agreement to enable all participants insights into learnings on our selected sites. EA Technology will facilitate monthly or quarterly meetings, dependant on volume of insights, with all participants. This will be an opportunity for participants to share key or interesting findings from their respective trial locations with each other.

Powerco will enter into an agreement with EA Technology, and other EDBs will enter separate, but equivalent, agreements.

Any other EDB INTSA applications are expected to be submitted to the Commission in the first part of 2026.

3.6 SAIDI and SAIFI

In delivering this project, we are not anticipating any SAIDI and SAIFI values to be excluded under Schedule 3.1 or Schedule 3.2.

4. Preparing this application and meeting schedule 5.3 requirements

4.1 Addressing the Schedule 5.3 criteria

In Appendix 1, we have outlined the criteria for the innovation allowance in Schedule 5.3. The table summarises how each criterion is met, and/or where in this application the relevant information can be found. We are satisfied that all the criteria have been addressed.

4.2 Reporting on completed projects and sharing learnings

The Commission has emphasised the focus of the innovation allowance to encourage projects that will benefit NZ Inc, and reporting on the projects and sharing learnings with other EDBs is an important part of the process. Should this application be successful, Powerco anticipates the following activities to share learnings:

- Prepare report as required by Schedule 5.3 (14). The report will be made available on our website
- Share updates on our application, key findings and related reports on our website and social media channels
- Attend monthly or quarterly insights updates hosted by EA Technology for the trial participants sharing findings and updates
- EA Technology and EDB participants expect to work towards a paper at EEA 2027 conference, with the potential for initial findings presented at EEA 2026 - a collaborative approach with trial participants (if they wish to be a part of that process). Powerco would participate in this paper/presentation.

5. Conclusion

Powerco has an active strategy to ready us for the changes in the energy sector ahead. An underlying direction for our Strategy is to drive innovation, with Powerco taking an active role in identifying and testing non-traditional solutions and new technology. This will not only be an integral part of operating our future network, but it will also provide longer-term outcomes for our customers.

In our focus on connecting communities and best outcomes for customers, the technology solution being tested through this application, demonstrates our Customer Commitments[9]. The technology solution presented in this application shows real world promise in creating better informed asset management strategies that utilise real time data and historical performance. Allowing a better-informed targeted approach to minimise disruption and maximise value add.

[9] Information on Powerco's Customer Commitments: Customer Commitments

Appendix 1 – Check of application against Schedule 5.3 requirements

Table 4 Innovation project allowance criteria and how the requirement is met

Schedule 5.3 requirement	How the requirement is met
(2) A non-exempt EDB may at any point prior to six months before the end of the DPP regulatory period submit an INTSA proposal to the Commission.	This application is made before the stated deadline
(3) If a non-exempt EDB proposes to work together with 1 or more other EDBs to carry out the project or programme in an INTSA proposal, each non-exempt EDB carrying out the project or programme that proposes to recover any of the forecast costs from the non-exempt EDB's innovation and non-traditional solutions allowance must submit an INTSA proposal.	Refer section 3.5. This project will be a collaborative project and each EDB will submit separately.
(4) An INTSA proposal must set out the following:	
(a) the purpose of the project or programme in the INTSA proposal, and the steps that the non-exempt EDB intends to take to achieve that purpose if the Commission approves the INTSA proposal	Refer section 2.4 and 3.1
(b) the INTSA outputs and expected benefits of the project or programme for consumers	Refer section 3.2
(c) the date by which the non-exempt EDB expects all of the INTSA outputs for the project or programme to have been delivered	Refer section 3.2
(d) the forecast costs of the project or programme for each disclosure year up to the date by which the non-exempt EDB expects all of the INTSA outputs to have been delivered	Refer section 3.4
(e) the proportion of the forecast costs of the project or programme that the non-exempt EDB seeks to recover from the non-exempt EDB's innovation and non-traditional solutions allowance (e.g., 75% of the forecast costs of the project or programme)	Refer section 3.4
(f) an estimate of any anticipated SAIDI INTSA values or SAIFI INTSA values that the non-exempt EDB expects to exclude under Schedule 3.1 or 3.2	Refer section 3.6
(g) the cause or causes of the interruptions for the SAIDI INTSA values and SAIFI INTSA values referred to in subparagraph (f)	Refer section 3.6
(h) any steps that the non-exempt EDB has taken, or proposes to take, to reduce the likelihood or impact on consumers of any interruptions referred to in subparagraph (f)	Refer section 3.6
(i) whether the non-exempt EDB intends to work together with 1 or more other EDBs to carry out the project or programme in the INTSA proposal and, if so, how it intends to work together with the other EDBs	Refer section 3.5
(j) sufficient information to enable the Commission to decide under paragraph (7) whether the project or programme meets the eligibility criteria under paragraph (6)	Refer section 3.3

(14) Within 50 working days of the delivery of all of the INTSA outputs for the project or programme in a non-exempt EDB's INTSA proposal that the Commission has approved under paragraph (7), the non-exempt EDB must submit a closeout report to the Commission	We will deliver a report within 50 days of completion of outputs. We do not request an extension to the time for submitting a close-out report, but reserve the option of making this request at a later time. Refer section 4.2.
(19) Subject to paragraph (20), the limit on the innovation and non-traditional solutions allowance for each non-exempt EDB for the DPP regulatory period is specified in Table 5.1	Refer section 1
(21) Where a non-exempt EDB considers that it has a right to confidentiality in any information that it provides to the Commission under this Schedule and the non-exempt EDB does not waive the right, the non-exempt EDB must— (a) include that information in an appendix; and (b) clearly mark the information as confidential.	This application does not contain any confidential information


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