Innovation and Non-Traditional Solutions Allowance Programme: Demand forecasting model using AI/ML

Application to Commerce Commission

October 2025

POWERCO

Contents

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 Allowance recovery summary

This application				
	Description	Purpose	FY26	
			Capex	Opex
Demand forecasting using AI/ML - Phase 1	Develop a partial prototype of a short term demand forecasting model using AI/ML, focused on selected network assets and representative daily profiles.	Establishes technical foundations for future distribution system operator (**DSO**) capabilities, including automation, disaggregation, and long-term forecasting.		$105,000

Powerco allowance recovery		
	Collaborative allowance	**Powerco allowance**
Recovery in this application		$105,000
Allowance recovery approved in previous applications	$280,000	
Remaining allowance	$4,795,000	$14,970,000
Total allowance	$5,025,000	$15,075,000

2. Introduction

2.1 Purpose of this report

This report presents Powerco Limited's ("Powerco", "we") application for an INTSA project planned to commence in FY26.

This application seeks funding approval for Phase 1 of a multi-phase programme to develop automated, disaggregated demand forecasting capabilities that are seamlessly integrated with new business capabilities required to operate in a DSO and modern EDB environment. The programme will leverage Artificial Intelligence (AI)/Machine Learning (ML) techniques to deliver scalable forecasting aligned with emerging operational and planning needs. Phase 1 is planned to commence in FY26 in partnership with Sovereign Systems, who bring ML/AI deployment capabilities together with local electricity industry experience.

The latter phases of the programme will build on the outcomes and learnings from the first phase, so the final scope for these phases can only be finalised once the initial phase is fully delivered. This application therefore seeks approval for forecast costs associated with Phase 1 only. Assuming a robust outcome from Phase 1, we plan to submit a further INTSA application for the later phases of the programme.

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, Irene.Clarke@powerco.co.nz. 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, Electricity Distribution Businesses (EDBs) may make an application to the Commerce Commission (the Commission) for approval of recovery of the allowance under Schedule 5.3 of the Determination[1]. This report is guided by the requirements in Schedule 5.3. We have provided an assessment against Schedule 5.3 in Appendix 1.

This Phase 1 project is considered innovative/non-traditional, as it seeks to leverage modern, scalable digital platforms, AI/ ML techniques, and rich, diverse datasets. The programme aims to deliver what may be an "industry first" approach to disaggregated demand forecasting, both temporally and spatially, while incorporating an extended range of forecasting predictors.

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 $105,000. A breakdown of our allowance is provided in section 1.

2.3 Powerco's commitment to innovation & improved customer outcomes in our vision to Grow to zero

Where, when and how energy is consumed is changing. We anticipate changing demand profiles driven by factors such as the uptake of electric vehicles (**EVs**), industrial electrification, uptake of distributed energy resources, and use of more energy efficient devices. Electricity demand is becoming increasingly variable and unpredictable. To support the energy transition, we are investing in:

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

To adapt to the evolving role of electricity distribution businesses, Powerco is transitioning towards becoming a DSO, with a target of fully achieving this by 2030. The anticipated benefits from this transition include:

- Optimally limiting or deferring medium to longer term network investment, thereby serving to minimise total cost to customers without compromising service levels
- Supporting New Zealand's decarbonisation through facilitating lowest cost electrification, by offering customers opportunity to use flexibility to reduce supply costs, and removing any remaining barriers to connecting distributed energy resources, particularly renewable generation, to the network
- Improving energy security, through accelerating network modernisation and cost-effectively improving supply resilience.
- Providing opportunities for customers to monetise flexibility in their energy use, or from the use of their appliances to provide network benefits.

A data-driven approach is essential to achieve this, where real-time intelligence, automation, and digital innovation, alongside commercial and customer driven solutions, will underpin how we operate and manage the network. Our data, digital, and innovation strategy is central to this transformation.

---

[1] Determination: 5BFINAL5D-Electricity-Distribution-Services-Default-Price-Quality-Path-Determination-2025-5B20245D-20-November-2024.pdf

An improved demand forecasting approach (short and longer term) is an essential enabler for achieving these future aspirations, enhancing risk-analysis and providing for better-informed decisions on both network and non-network solutions.

In particular, we want to achieve the following:

- Customer electricity demand underpinning network management decisions, especially investment for operations and for capacity or security needs. Improved data and granular forecasting offers potential for enhanced visibility of demand profiles, at highly disaggregated levels, including on LV systems.
- Provide an open access and transparent network, with commercial and pricing arrangements that optimises network capability against customer need (demand and any flex response). This necessitates automated, scalable, statistically based, integrated and robust demand forecasting. Rich forecast information for customers on capacity, congestion and flex opportunity is also important to support their business and investment decisions.
- New and automated approaches to forecasting. As the need arises for greater volumes and more diverse data, digital developments offer opportunity to access new platforms and approaches to forecasting, which not only scalable but with appropriate data quality management and validation, can automate many existing manual processes. Applications based on such forecast data, including customer facing apps, are also rapidly evolving, requiring agility and clear integration architecture.

Chapter 7 of our Asset Management Plan 2023 outlines our evolving asset management strategies[2]. In our 2025 Asset Management Plan update[3] we have further outlined our DSO strategy (section 2.3), data and digital strategy (section 2.4), and DSO initiatives planned for the current year (section 3.2).

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.

Identifying and testing non-traditional solutions and new technology will provide longer-term outcomes for our customers. In our focus on connecting communities and best outcomes for customers, the non-traditional solution being tested through this application, demonstrates our Customer Commitments[4].

3. Programme information: Foundational short-term demand forecasting prototype Using AI/ML

3.1 Programme purpose and steps to achieve the purpose

Drivers for this programme

The phased development programme for a modern digital approach to demand forecasting, is one of several associated with our DSO transformation. It seeks to ultimately develop an automated and integrated suite of forecasting models, with electricity demand forecasting as the foundational and highest priority component. Future modelling capabilities will include forecasting network capacity and congestion, network investment needs and price signals which reflect the value of demand flexibility or DER.

---

[2] 2023-electricity-asset-management-plan.pdf (powerco.co.nz)

[3] 2025 Asset management plan update available from 1 April 2025 here: Electricity disclosures

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

Demand forecasting - Phase 1

Given that demand forecasts in future are expected to have direct commercial consequences for flexibility services, such forecasts will need to be transparent, consistent and defensible. Management of the network to very low levels (e.g. LV systems) require demand forecasts that are spatially granular, whilst the potential for highly dynamic load profiles in future also needs high temporal specificity.

Added to this is the intrinsic uncertainty of future demand, not only regarding electrification and DER uptake, and its use (potentially in response to externalities like the wholesale market price), but also in demographic trends, economic activity and the like. To support both network planning and DSO operation, the demand model must support probabilistic planning by appropriately representing demand through statistical parameters and/or multiple scenarios. DSO operational and commercial capabilities will depend upon timely and accurate time series profiles, again with potentially high spatial disaggregation.

Digital capabilities, both in data management and processing is expanding exponentially. This programme will attempt to leverage modern machine learning/artificial intelligence (ML/AI) techniques that can utilise disparate and unstructured datasets in new ways so as to improve predictive capability.

Programme purpose

This programme attempts to forge a new and innovative approach to demand forecasting, both short term (serving immediate operational needs) and long term (serving commercial and investment planning needs). This is to facilitate a step change in forecasting capability necessary for a future DSO, but also to create efficiencies through automation of existing manual processes and for better demand data informing planning.

Considering the volume of processing and number of parameters being forecast (across multiple scenarios) classical deterministic approaches are unlikely to scale sufficiently. There is also a wealth of new data (e.g. weather or socioeconomic) that can now be harvested to give insight into future customer choices and demand needs. New algorithms need to be leveraged to fully take advantage of these insights.

Investigating a ML/AI approach to demand forecasting is experimental and innovative by nature, so the long-term requirements of automation, repeatability, integration and consistency may not be immediately realisable. We will in parallel continue to both internally develop and scan the market for software that can be leveraged as our production forecasting "engines". As actual network out-turn data becomes available, we would further tune the ML model.

These uncertainties of outcome, and the innovative approach itself, are why we seek INTSA funding. Initially there is high risk the expenditure will not deliver immediate value as an operational platform. Immediate value is more about learnings/insight in preparation for the future digital world. We also see value in stimulating the software market by giving software vendors visibility of the capabilities future DSO operators will require.

Programme phases

The programme is structured into three phases, with this application covering Phase 1 only. The full programme is broadly structured into three phases:

- Phase 1 - Foundational Prototype in partnership with development partner Sovereign Systems (FY26)
  Deliver a partial proof of concept short-term demand forecasting model using AI/ML. This phase focuses on data ingestion, anomaly detection, and selected model examples. It establishes the technical foundations for future development.
- Phase 2 - Completion of Short-Term Forecasting Capability (potentially FY27)
  Extend and operationalise short-term forecasting across Powerco's network. This includes broader data coverage, improved model robustness and outputs structured for integration into operational tools.

- Phase 3 - Long-Term Forecasting and Production Integration (potentially FY27-28)
  Develop long-term forecasting capability and build a production-readiness model. This includes automation, UI/API development, multiple scenario support, two-way forecasting (injection and load) and market price elasticity modelling.

In phase 1 the intent is to use a staged and agile approach to achieve the ultimate goal of a future production-ready (automated and robust) demand forecast model integrated to business capabilities and applications. It will produce a set of representative demand profiles that reflect daily and seasonal variations, sufficient to support operational use cases and inform future model development. These outputs are expected to improve the demand profiles currently used in the operational advanced distribution management system (ADMS) distribution power flow platform. The underlying data quality, processing logic and model structure will be significantly improved. The work will provide the technical foundations and learnings to shape subsequent phases. If Phase 1 achieves a robust foundation platform, does not identify any unexpected anomalies, and indicates it can automate data normalisation, then we would seek to progress to phase 2.

A graphic showing the short term demand forecast model (phase 1) is attached in Appendix 2.

Phases 2 and 3 (not part of this application) will complete the short-term forecasting capability, incorporating additional predictors of demand (including two-way import/export), and prepare the model for future long-term forecasting (up to 30 years); again, seeking to produce spatially granular time series profiles. Further phases will then look to “productionise” these models (through hardening by improving data filters, error capture and validation checks) and integrate/automate both data ingestion and outputs to end users or downstream applications. The model will be expanded to cater for multiple demand scenarios and the systematic representation of future demand at any statistical level of certainty. Additional features like “customer elasticity” models will also likely be needed, to estimate likely demand changes as a function of customer response to price signals and/or wholesale market prices.

Powerco to lead Phase 1 and stimulate solution providers

The approaches to be explored in Phase 1 are experimental and extend beyond the strategic goals or ambitions of many potential industry partners. We propose to initially forge new ground independently while we explore ways to meet Powerco’s needs – necessitating rapid response and development, which could be constrained in a cross-industry project. Accordingly, we have not sought additional EDB involvement for this phase 1. However, the learnings and outcomes will have wide industry interest and will be shared, to potentially help develop consistent industry standards and assumptions. If phase 2 and 3 proceed, this presents opportunities to collaborate with other EDBs.

We also hope to stimulate the “solution providers” market, so that more “off the shelf” products are available in future for forecasting demand, both temporally and spatially disaggregated, to support DSO or network planning capabilities. Our research to date shows a shortage of providers, even those using more classical approaches. Options that do exist have a grid or wholesale market emphasis, which is an environment of rich, complete and accurate data of small volume. By contrast, the distribution industry faces vastly increased data and processing needs, challenges such as poor visibility and data quality (especially at highly granular), and limited digital capabilities and skills. Until considering DSO capabilities there was previously no imperative to dramatically lift forecasting capability in the manner proposed by this programme.

Our development partner, Sovereign Systems, will be looking to architect the solution in such a way that it can readily be configured for other distributors. This is anticipated to signal other software or analytic providers of the potential new market opportunity to provide commercial software that supports distributors on the DSO journey. The current lack of “off the shelf” products we have been able to identify is likely to be a reflection that the market for such products is still too immature, or unknown to potential suppliers of solutions. While

Phase 1 will not deliver a full production-ready solution, it will help define the technical requirements and stimulate vendor interest in scalable forecasting tools.

3.2 The outputs and consumer benefits

3.2.1 Outputs and timing

Phase 1 will deliver a partial prototype of a short-term demand forecasting capability, generating representative demand profiles that reflect daily and seasonal variations. The project will be delivered over approximately 4-6 months from commencement (during FY26), in partnership with Sovereign Systems, and structured into agile sprints. The outputs will be delivered in two key stages:

- Stage 1 - Data Cleaning and Anomaly Detection:
  Historical network data will be assessed and cleaned using time series modelling techniques to remove anomalies caused by instrumentation errors and network reconfiguration.
- Stage 2 - Forecasting on Cleaned Data:
  A predictive model will be developed using AI/ML techniques to generate demand profiles at a selected level of aggregation (e.g., feeder level), structured to reflect seasonal and day-type variations.

Outputs will be delivered in a format suitable for future integration into operational platforms. ADMS integration and installation control point (ICP)-level forecasting is excluded from Phase 1 due to data engineering and privacy constraints. Technical documentation and learnings will be captured to inform Phase 2 and future development.

Phase 1 will establish the technical foundations for a scalable, automated demand forecasting capability. Once the core model is proven to produce acceptable results, Phase 2 (FY27) would extend the model to support longer-term forecasting horizons and broader business use cases. Subsequent phases will also focus on business systems integration, user interfaces, increased granularity, reporting and other forecasting enhancements.

Assuming commencement by November 2025, phase 1 outputs, and decision whether to proceed to phase 2, will be completed by April 2026.

3.2.2 Consumer benefits

This demand model programme, as part of our broader DSO programme, is ultimately about minimising the total cost of electricity to customers while maintaining service levels, helping meet electrification needs and providing customer opportunities to monetise the value from providing network benefit. There will also be material network planning benefits from improved forecasting accuracy.

Early industry efforts, such as capacity maps and contracted DER/flexibility, have made some improvement to the information available to customers and their trading agents. However, investment decisions by such stakeholders will be further enhanced by improved forecast information, on network capability, capacity (free headroom), congestion (potential shortfall), and granularity (temporally and spatially) as well as widely available predictions of the future value of DER/flexibility in addressing any local network congestion. All such information is predicated on electricity demand forecasts.

In the operational space, the more accurate forecasting of short-term demand (hours to weeks ahead) will improve outage planning and optimise responses to unplanned events (faults). Together with the advanced capabilities of an ADMS system, accurate disaggregated demand profiles will allow us to make optimal use of secure capacity, thereby minimising outages to customers. Broader consumer-facing outputs will be looked at in subsequent phases.

Anticipating a future with dynamic interactions among traders, in both import and export directions, real time commercial decisions will be fully dependent on forecast of demand (both gross or unconstrained demand, and net of any price signal response). This could mimic the existing nodal spot price, itself essentially a product of the demand forecasting estimate, especially at the many "conforming nodes". As capacity becomes a more commercially tradable entity, the transparency and accuracy of the underlying demand prediction engine will be critical. Inaccuracies of demand could otherwise translate into unnecessary consumer outages or excessive costs as industry participants have to manage additional risk and uncertainty.

One of the biggest and most immediate benefits to consumers is the improved efficiencies of leveraging automated and integrated digital platforms and approaches. Our emphasis on automation, data filtering and validation and integration to end use applications (including external web services) aims to drastically reduce current manual interventions, hand-offs, data cleansing and processing. Delivery of these efficiency uplifts are predicated on innovative and unproven new technologies, with heightened risk of under-delivered outcomes.

3.2.3 Anticipated learnings

This programme will follow an agile project approach (test, evaluate, refine) recognising the exploratory and innovative nature of the modelling approach. Each phase is designed to generate learnings that inform the scope and outcomes of subsequent phases. In the unlikely event that Phase 1 reveals fundamental limitations, future phases may be reconsidered. More likely, Phase 1 will refine and sharpen the direction of future work.

The first phase is intended to prove (rather than trial) the use of machine learning approaches in the production of highly granular normalised network demand profiles. This is in consideration of known gaps in data quality, both metering (approx. 80% complete) and network monitoring (challenges in detecting discontinuities brought about by network reconfiguration). Additional learnings from this Phase 1 project are to understand the system, data and process architecture needs for future automation and integration.

The effectiveness of using rule-based methods to automatically manage data quality and monitor/validate model output will also be a key output from Phase 1 work. The project will inform requirements around the training of the ML/AI models and the achievable degree of predictive accuracy of these models (including understanding of "what does good look like").

Phase 1 of the demand model also provides the necessary data (in sufficient variety, volume and granularity) to test the veracity of the proposed suite of network capability forecasting models (congestion, capacity, investment and commercial) that underpin future DSO level capabilities. Many of these capabilities are the subject of industry consultations and developments, and our intent is to inform these industry developments, especially in terms of being ambitious for what is possible. Our work on the demand and network models will be made fully available to industry forums. While any commercial IP will remain the property of our development partner, we intend to give visibility to other software developers to stimulate the market for competitive options for "off the shelf" demand forecasting models.

3.3 Eligibility criteria

3.3.1 Relates to the supply of electricity distribution services

Electricity demand is a direct measure of the "electricity distribution services" our customers require. As such, it is a critical input into most of our planning, investment, operational and pricing decisions. Without a clear view of forecast demand, the very basis of good asset management and network operation is undermined.

All EDBs have demand forecasting models in place which have traditionally informed their asset management. However, uncertainty in demand forecasts is greatly increasing with more intermittent renewable generation, DER and flex uptake and in the manner in which customers respond to energy pricing. Beyond the intrinsic weather variability, volatile two-way power flows are expected to cause fluctuating market price signals, and these in turn will cause further uncertainty or variance in net (i.e. network) demand. Investment planning must therefore take a risk based or probabilistic approach in future, requiring systematic, consistent and statistically expressed forecasts of future demand, and its variance. Traditional, static forecasting models are therefore no longer sufficient.

3.3.2 Promotes the Part 4 Purpose of the Act

Section 3.2.2 comments on consumer benefits. In summary, the potential customer benefits through improved demand forecasting, include:

- Improved planning and investment decisions, supporting optimal investment and avoiding capacity shortfalls or unnecessary investment.
- Improved network utilisation, supported by increased use of flexibility services. Flexibility markets are underpinned by understanding and communicating network constraints which is directly dependent on accurate demand forecasts. Improved network utilisation, in turn, reduces the need for network investments and supports lower costs.
- Improved short term demand forecasts allows better operational response to real or pending outages, reducing the impact of, or avoiding outages.
- Improving the customer connection process through improved understanding of capacity and constraints allowing more accurate and rapid assessment and a faster approval process.
- Understanding and working with customers on the potential for flexibility in their consumption pattern to better match expected network demand, can greatly reduce the cost of connecting to the network.

The following case study of the Brunswick GXP illustrates the potential impact of automated normalisation vs current approach to reconfiguration. difference between maximum forecast demand using traditional methodology, compared to an algorithm-based approach to normalisation. Avoiding the overstatement of peak demand with traditional normalisation provides potential for significant capex deferral, and a more accurate picture for network utilisation and flexibility services.

Demand forecasting - Phase 1

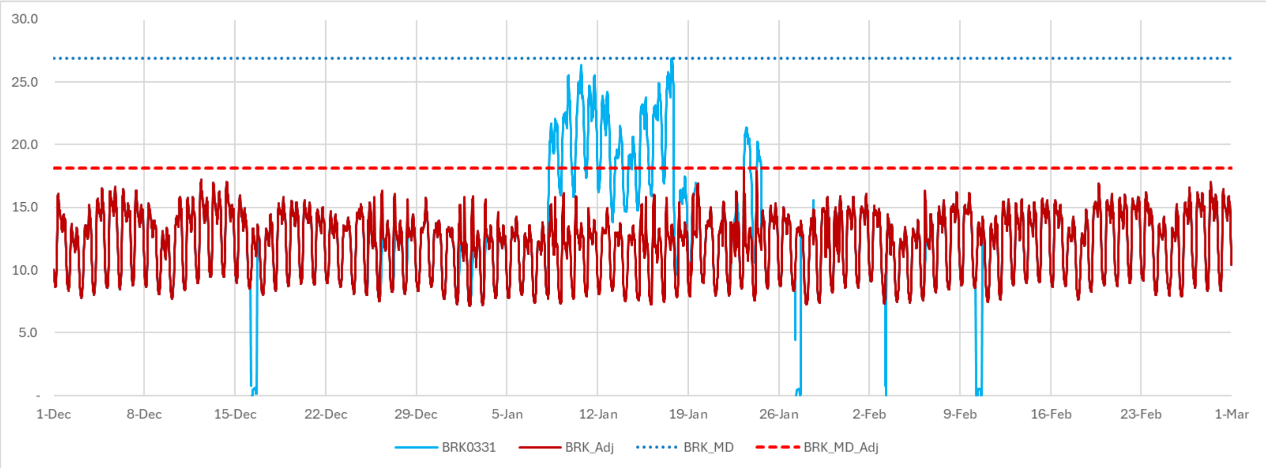
Case study – potential impact of automated normalisation at Brunswick GXP

Phase 1 of the demand forecast model project will attempt to automate the normalisation of network loading data. This case study uses an example data from GXP metering which evidences where "network reconfiguration" has created a discontinuity in the normal daily profiles (i.e. patterns) of demand. The raw demand data (half hourly) at Brunswick GXP (BRK0331) is shown for 3 months from Dec 2023 to Feb 2024.

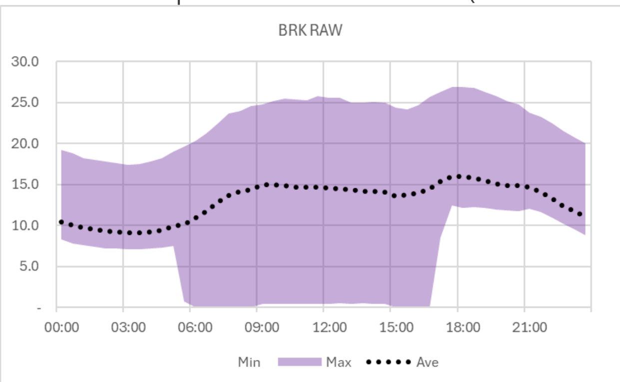
Normalisation has traditionally been very manually intensive, often involving graphic review of raw data and manual adjustment (or deletion) for any observable load transfer effects. This is inefficient, lacks accuracy, does not scale, and cannot support the future needs for forecast profiles (not just maximum demand).

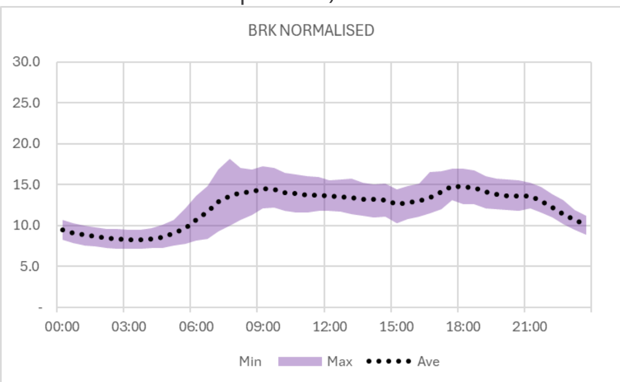
A very simplistic algorithm is shown below to demonstrate how an analytic approach could allow a more automated, and hence efficient, approach. In this case an algorithm detects if the current demand (in a given half hour) deviates by more than a specified tolerance (in this case 20%) from the average of the demand at the same half hour and day of week, both one week ago and a fortnight ago. If it does deviate outside tolerance, the average of the week ago and fortnight ago demands is substituted.

The adjusted approach using the algorithm (red line) removes the worst network reconfiguration effects and maximum demand is far more accurate. This improved certainty in peak demand provides for more accurate investment planning.



The following daily profile mock ups on the Brunswick case study show the benefit of normalisation with a view of the output of the normalisation (and the whole short term model process).





Note: the algorithm in this case study is very simplistic and not scalable or robust. It is used for illustrative purposes to show the potential value of this INTSA programme building on an automated approach.

3.3.3 Unlikely financial benefit / sufficiently uncertain benefits

This project attempts to take an innovative approach to forecasting, especially in leveraging modern ML or AI capabilities. This about leveraging advanced machine learning algorithms in place of classical or deterministic approaches.

The approach is unique and untested at scale, as it attempts to incorporate diverse and unstructured datasets never previously used in demand forecasting (e.g. potentially harvesting social media interest in EV uptake). Many of these are necessary as we consider the volatility and unpredictability (variance) the energy transition will introduce. However, with the experimental and exploratory nature of the project, especially in the rapid timeframe considered, there remains material risk this approach will not deliver adequately.

Prior attempts to deploy machine learning with in-house (industry) analytic capabilities have had minimal success. This is due to many factors, including limited internal skillsets, inadequate support capabilities (platform management, data engineering etc), and even a lack of "imperative". This programme therefore attempts to look outside the industry to skillsets and development partners that are more associated with the software and IT industry than the electricity distribution industry. That will introduce risks as we need to keep enough application specific (domain) knowledge shaping the outcome to ensure it is both effective (delivers appropriate outputs) and usable (can be integrated to business processes, users and systems).

Most capital projects to deliver a new IT system or software are known entities and follow a structured delivery path. Market scans of the available products normally precede implementation. From our research, there is little or no "off the shelf" products we can leverage currently for "distribution demand forecasting". Part of the intent of the project is to kick start or stimulate software providers interest in the distribution market, by giving visibility of the sort of products needed for a DSO future.

The project carries significant risk that the final deliverable may not be fully suited to the long-term future needs (production-ready and automated model). We intend to mitigate such risk by staging the development in phases, but in keeping with the nature of innovation, the takeaway 'asset' for this first phase may be mostly in the learnings we derive, and there will certainly not be any financial benefit from the prototype. This level of risk dictates that the project could not proceed without the INTSA allowance being available to offset that risk.

There are also no obvious financial benefits to Powerco from Phase 1 of the project. It is designed to explore the viability of a ML informed demand forecasting model and the outputs will be focused on informing future phases of the project. These future phases are where the real benefits from the project will be derived. It is also noted that these future benefits are all customer directed and would result in lower energy costs or improved customer service, not directly contributing to any additional revenue for Powerco.

3.4 Programme phases and forecast costs

The forecast costs of the programme for each disclosure year are outlined in Table 2. All costs are GST exclusive. Only the costs for Phase 1 are confirmed and included in this INTSA application. Costs for future phases are indicative and will be refined based on learnings for Phase 1.

Phase 1 - Confirmed Costs ($105,000)

- Development Partner costs - $85,000

  Scope is limited to developing a partial prototype of a short-term demand forecasting model. Key activities include:

  - Build development platform (offline analytics environment)
  - Ingest one-off datasets
  - Develop test and training datasets

- Develop a partial prototype of a short-term demand forecasting model using AI/ML
- Generate a limited set of representative forecast scenarios for selected network assets
- Conduct initial model training and manual data verification to support concept validation

- Internal costs - $20,000
  - Scoping
  - Project management & admin
  - SME input and direction
  - Provide data inputs & validation rules
  - Gather feedback from end users (Network Operation)
  - Reporting and lessons learned

Table 2 Forecast costs – all phases

	Cost for output year 1 (FY26)	Cost for output year 2 (FY27)	Cost for output year 3 (FY28)	Cost for output year 4 and 5
Phase 1 – Short Term demand model prototype (this application)	$105,000	$0	$0	$0
Phase 2 – Long term demand model prototype	$60,000	$90,000	$0	$0
Phase 3 – Production integrated & fully automated model, with advanced (scenario & DG) capabilities	$0	$130,000	$100,000	$0
Financial year total	$165,000	$220,000 (TBC)	$100,000 (TBC)	$
Total cost of programme				$485,000 (TBC)

Given the rapid development approach and lack of "off the shelf" vendors for a new area of software, we have selected a local development partner who has access to international resources, particularly in the new areas of machine learning and assisted intelligence, and recent experience in electricity distribution. Given the scale, speed and nature of the Phase 1 project, and our initial enquiries yielding few parties interested (yet) or competent, a formal market scan (e.g. RFI) was deemed to not add any value.

The developer partner has provided a fixed cost for Phase 1, based on the scope outlined in this document. This includes establishing a data and analytics environment, ingesting and preparing datasets, and developing a partial prototype of a short-term demand forecasting model using machine learning tools. The work will also include initial model training and manual data verification to support concept validation.

The development partner has accepted a degree of cost risk, recognising the opportunity to be at the forefront of innovation in this space. As with many exploratory projects involving high-volume datasets and machine learning, cost estimation variance is expected.

The proportion of the forecast project costs proposed to be recovered is 100% due to the risk involved and there being no financial benefit to Powerco (refer section 3.3.3).

3.5 SAIDI and SAIFI

There are no direct or material SAIDI / SAIFI impacts on customers arising from Phase 1 of this project.

3.6 Parties to this project and collaboration

Due to the experimental nature and required speed of development, Phase 1 would be progressed by Powerco and the development party, not jointly with other EDBs. Depending on the success of Phase 1, we would canvas industry partners, possibly through the Electricity Network Aotearoa (**ENA**) Future Networks Forum (**FNF**) forum for any future phases. For example, collaboration in future phases could be with:

- Other DSO focused EDBs
- The ENA FNF forum and associated workstreams
- Customer representatives, in terms of the ultimate outcomes we are seeking to achieve, of which the demand model is a foundational requirement
- Regulators in terms of transparency, and the future capabilities needed for future system operation.

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:

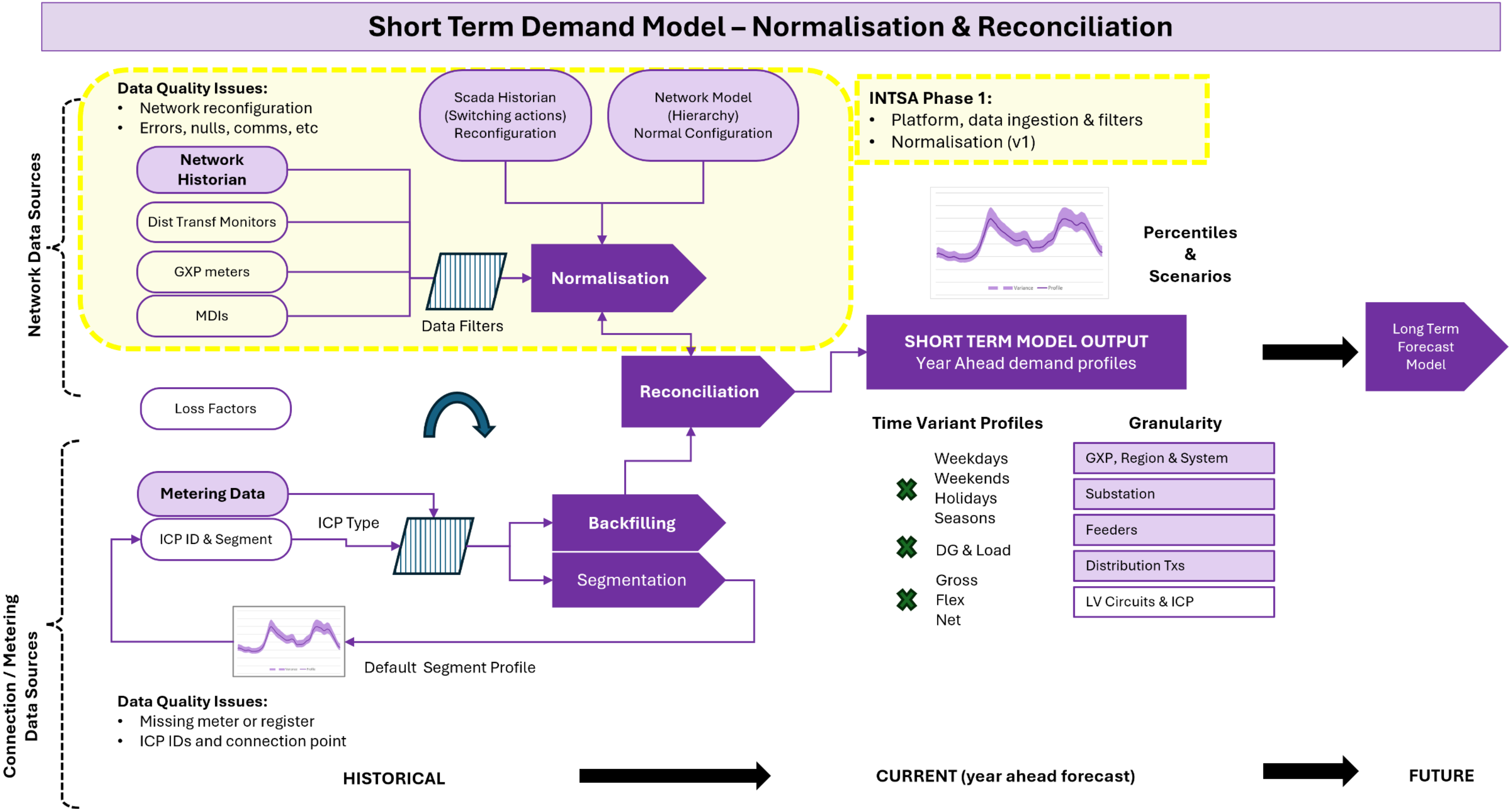
- Prepare report for Phase 1 as required by Schedule 5.3 (14). The report will be made available on our website
- Share updates on our application, key findings (including decision on progressing to Phase 2) on our website and social media channels
- Present an overview of the programme and key learnings to a suitable ENA or EEA or other industry forum to raise awareness amongst all EDBs. For example an ENA Future Networks Forum meeting.

Appendix 1 – Check against Schedule 5.3 requirements

Table 3 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.	This application is made before this deadline
(3) If a non-exempt EDB proposes to work together with 1 or more other EDBs, each EDB must submit an INTSA proposal.	Refer section 3.6. This is not a collaborative project.
(4) An INTSA proposal must set out the following:	
(a) the purpose of the project or programme, and the steps achieve that purpose if the Commission approves the INTSA proposal	Refer section 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 when all of the INTSA outputs are expected to be 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 INTSA allowance	Refer section 3.4
(f) an estimate of any anticipated SAIDI or SAIFI INTSA values that the non-exempt EDB expects to exclude under Schedule 3.1 or 3.2	Refer section 3.5
(g) the cause or causes of the interruptions for the SAIDI INTSA values and SAIFI INTSA values referred to in subparagraph (f)	Refer section 3.5
(h) any steps to reduce the likelihood or impact on consumers of any interruptions in subparagraph (f)	Refer section 3.5
(i) whether the non-exempt EDB intends to work together with 1 or more other EDBs to carry out the project or programme	Refer section 3.6
(j) sufficient information to enable the Commission to decide whether the project or programme meets the eligibility criteria under para (6)	Refer section 3.3
(14) Within 50 working days of the delivery of all of the INTSA outputs, the non-exempt EDB must submit a closeout report	Refer section 4.2. We will deliver a report within 50 days Phase 1 outputs being completed. We reserve the option of a request for an extension at a later time.
(19) Subject to paragraph (20), the limit on the innovation and non-traditional solutions allowance as 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 and does not waive the right, (a) include it in an appendix; and (b) mark it as confidential.	This application does not contain any confidential information

Appendix 2 – Short term demand model (phase 1)



POWERco