

Electricity Invercargill Ltd (EIL)

EIL are smart meter asset owners, with the Meter Equipment Provider (MEP) function contracted to SmartCo. The SmartCo relationship has enabled the development of electronic tools for low voltage (LV) monitoring across EIL, providing valuable information including Quality of Supply (QoS) events and sub-hourly consumption information. It also includes dashboards that highlight voltage performance over time aggregated from meter information to different levels of the network (including customer, transformer, and network).

EIL, through PowerNet, have also helped develop a dashboard highlighting congested LV networks. This takes customer voltage information aggregated by LV network, performs analytics, and groups LV networks by these statistics. The analytics performed on demand coincidence (from smart meter data as well) with minimum voltage by LV network are used to derive maximum capacity of each LV network. This means EIL can identify congested networks and those that can deliver additional demand. Additionally, a Suspect Neutral dashboard has been developed to highlight potential neutral issues in LV networks using a developed algorithm that inputs aggregated customer voltage QoS data.

Finally, a dashboard that highlights customers that have Distributed Generation (DG) installed but are experiencing voltage issues has also been developed which hints to customers/installers that have likely incorrectly set up the correct inverter Volt-VAr protection settings. EIL is developing a process to target these customers for education and rectification of the inverter setting.

The Engineering team will review the suspect neutral dashboard weekly to try and highlight any potential neutral issues that could be causing non-compliance with the applicable voltage requirements of the Electricity (Safety) Regulations 2010 (ESR). Using the aforementioned dashboards, the team can dive into the voltage

history for customers and organise a faults team to address issues if they exist.

Additionally, customer connections will consider different options (including upgrading transformers/conductors) if a customer wishes to upgrade their contract capacity, but there are already voltage issues present on the LV network.

More work is required to productionalize the newly formed congestion dashboard, but the intention is to review the list of congested LV networks allowing a menu of typical upgrade costs to be applied across them and coupled with growth scenarios, provide a forecast to accommodate expected demand growth.

When voltage quality issues are raised by stakeholders (typically through the customer complaints process), a review of QoS data for that customer will occur with a high-resolution (i.e., 2 min resolution) logger will be initiated on the smart meter. This has traditionally resulted in an approach of 'adding more copper' by increasing transformer or conductor size. EIL is eager to evolve from this traditional approach as it can be expensive and is investigating options for DER control. EIL has identified that this bottom-up approach will be important, especially as the number of prosumers on its network increase, DG is added, and bi-directional power flow and voltage issues become a concern.

When voltage quality issues are raised by stakeholders (typically through the customer complaints process), the customer is kept in the loop through the process, which will include information on what is required to improve voltage quality for them as an affected consumer.