Lakeland Network Ltd (LNL)

LNL are installing smart meters on new connections and have smart meters on some transformers. The SmartCo relationship has enabled the development of electronic tools for low voltage (LV) monitoring across LNL, providing valuable information including Quality of Supply (QoS) events and sub-hourly consumption information. This includes dashboards that highlight voltage performance over time aggregated from meter information to different levels of the network (including customer, transformer, and network).

LNL, through PowerNet, have also helped develop a dashboard which highlights LV networks that are congested. This takes customer voltage information aggregated by LV network, performs analytics and groups LV networks by these statistics. The analytics performed on demand coincident (from smart meter data as well) with minimum voltage by LV network is used to derive maximum capacity of each LV network. This means LNL can identify congested networks as well as those that can deliver additional demand.

Additionally, a Suspect Neutral dashboard has been developed that highlight potential neutral issues in LV networks by 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. LNL is developing a process to target these customers for education and rectification of the inverter setting.

LNL are evaluating a number of LV monitoring solutions alongside Smart Meters including PowerPilot, GridKey, and Eneida to find the most appropriate solution for the network. The engineering team review the SmartCo dashboard on a seasonal loading basis to identify

suspect neutrals, ICP voltage events, DER export, high impedance faults, transformer load monitoring and transformer voltage events. Although LNL (100% underground) have currently got 30% smart meter coverage, it provides insight into the network performance. SmartCo are progressively developing the above tools for greater accuracy and data interpretation. Customer voltage complaints are investigated with above tools and site investigation. Inspection program will commence to check LV pillar boxes for GIS data capture and additionally IR camera scan and service main cable connections. Most customer voltage complaints arise from loose conductors or overheating components.

When voltage quality issues are raised by stakeholders (typically through customer complaints process), a review into 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 and/or conductor size. ESL is eager to evolve from this traditional approach as it can be expensive and is investigating options of DER control. ESL 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 becomes a concern.

When voltage quality issues are raised by stakeholders (typically through 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 to them as an affected consumer.