THE PROJECT

WEL Networks aimed to modernise monitoring across its distribution transformers, particularly in rural areas where traditional approaches proved infeasible.

Traditional distribution network MDI monitoring records the highest peak measured by the device which does not provide sufficient data to make meaningful decisions for a future data enabled network. The MDI design was not widely used across the existing transformer fleet which resulted in low availability of current transformers (CTs) in the low voltage distribution frame. This hampered efforts to retrofit smart meters for load distribution analysis for new customer connections and asset planning. The meters are also used for near real time fault detection.

In urban networks, ground-mounted transformers are often pre-fitted with CTs during installation, but WEL's older infrastructure lacked this provision. Installing new CTs using whole-current designs required HV outages — disruptive and costly, especially in sensitive areas like schools, industrial and commercial sites.

PROJECT SNAPSHOT

Network Operator
WEL Networks

Challenge
Modernise transformer monitoring without costly outages

Solution
IP67-rated split-core CT live retrofit with smart meter integration

Environment
Rural, remote — valleys and farms across the WEL network

Hiko Equipment
IP67-rated Split-Core Current Transformers

The solution eliminated service disruptions during installation, enabled load and performance data collection in areas previously inaccessible, and standardised install procedures into a four-hour workflow suitable for field teams or contractors.

THE CHALLENGE

Load Monitoring Without Outages

WEL Networks needed to modernise transformer monitoring at scale. The meters are also used for near real-time fault detection. Without CTs fitted, retrofitting smart meters for load distribution analysis was hampered across the network.

Technical Barriers

The logistical and electrical environment presented 3 specific challenges:

- **Live installation required:** Transformers couldn't be taken offline without significant planning and cost.
- **Smart meter integration:** CTs needed to interface reliably with WEL's 5A-input smart meters.
- **Rural placement:** Transformers in valleys or remote farms meant traditional comms layouts were unworkable — requiring pole-mounted smart meters and waterproof, IP-rated CTs.

Interim Efforts and the Shift to Split-Core CTs

Initial attempts included whole-current CT installations at select locations. These required complete shutdowns, often at night or with alternative generation, incurring high labour and material costs. The team trialled several solutions including overseas-sourced CTs, but lead times and form factor issues delayed progress.

The search shifted toward a split-core design that could be safely installed around energised conductors. Hiko's IP67-rated split-core CTs emerged as a practical alternative offering sufficient resolution for operational monitoring without needing network outages.

THE SOLUTION

Live Retrofit with IP-Rated Split-Core CTs

Hiko's split-core CTs were retrofitted across transformers without needing power interruptions. The clamshell design enabled live, safe installation around busbars or cables. With a form factor compatible with smart meters and environmental robustness (IP67-rated), they met WEL's unique deployment needs.

What This Delivered

- Eliminated service disruptions during installation
- Enabled load and performance data collection in previously inaccessible areas
- Standardised install procedures into a templated 4 hour workflow for field teams or contractors
- Reduced installation costs and allowed better resource planning

THE IMPACT

By enabling live retrofits, WEL could finally integrate transformer smart metering at scale — even in remote, topographically difficult areas. The smart meters, now fed by reliable current inputs, provide near real-time insights into transformer performance.

Engineers can better rationalise asset upgrades, balance loads across feeders, and anticipate emerging faults before they impact service.

Field and Technical Feedback

WEL's engineers and field teams report improved safety, efficiency, and ease of use. With no need for outages or complex scheduling, the retrofit programme progressed swiftly. The waterproof, rugged design also avoided failures in exposed locations.

Looking Ahead

Although the solution was tailored to specific WEL constraints, the principles apply broadly to other networks facing rural deployment or retrofit challenges. Future regulatory shifts may increase demand for such solutions, and WEL is now better positioned to adapt.