



NZWEA Conference:

“THE FUTURE IS SMART”

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16th April 2014

Smart....things

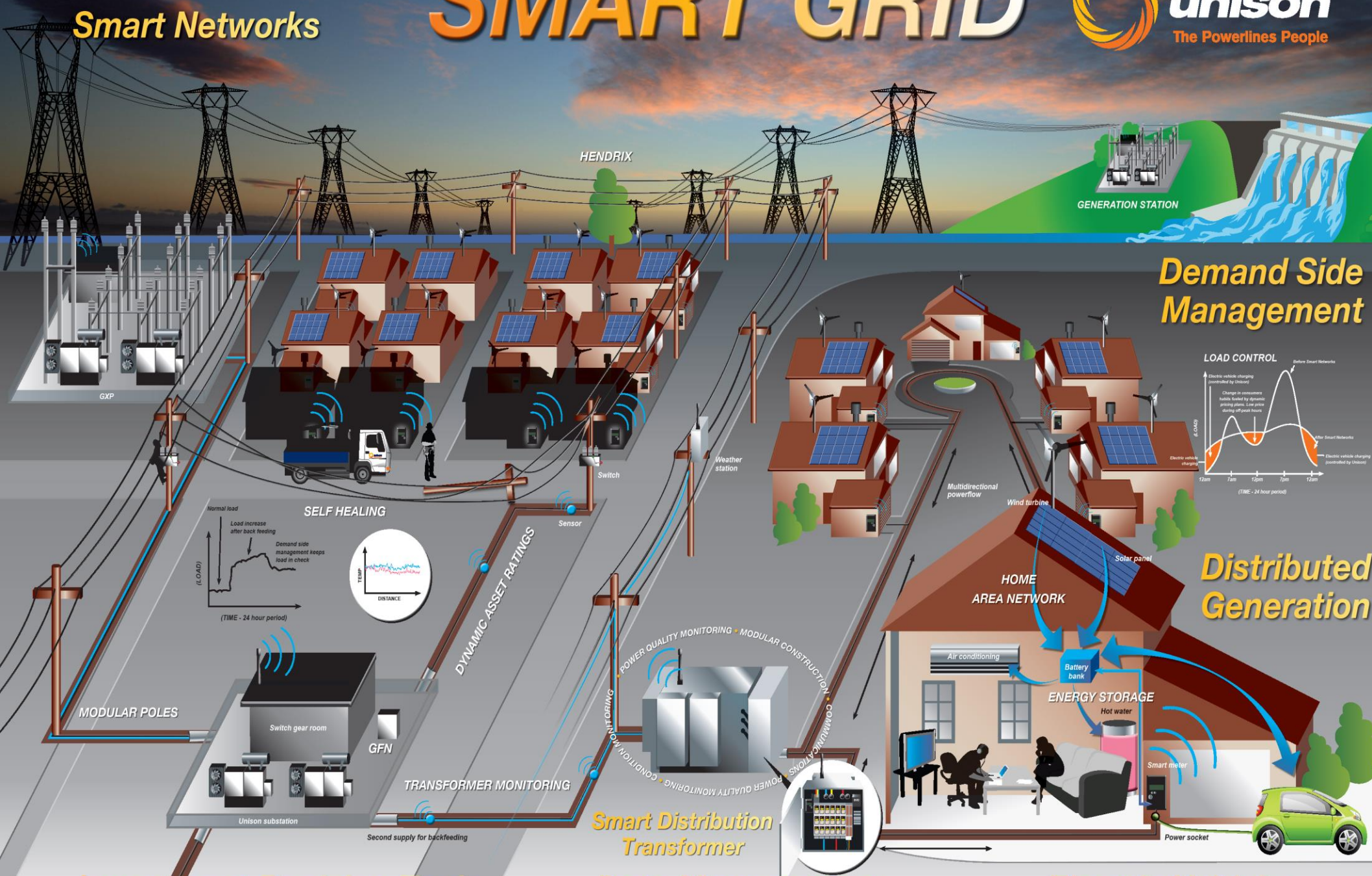


So what's Smart?

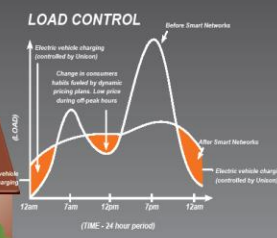
Providing the same, and much, much more...

Smart Networks

SMART GRID



Demand Side Management



Distributed Generation

Investment Decision Tools

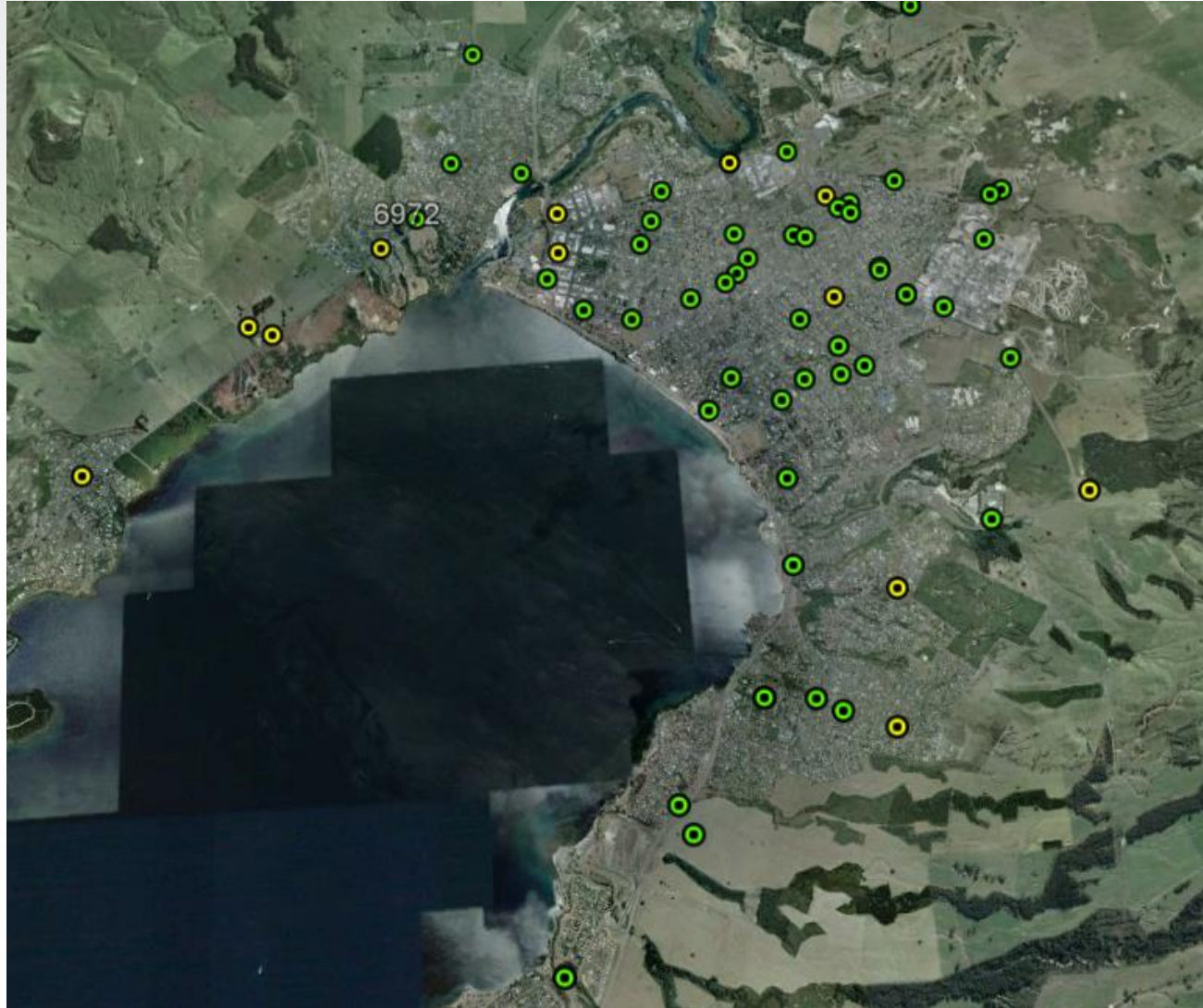
Data Management

Electric Vehicles

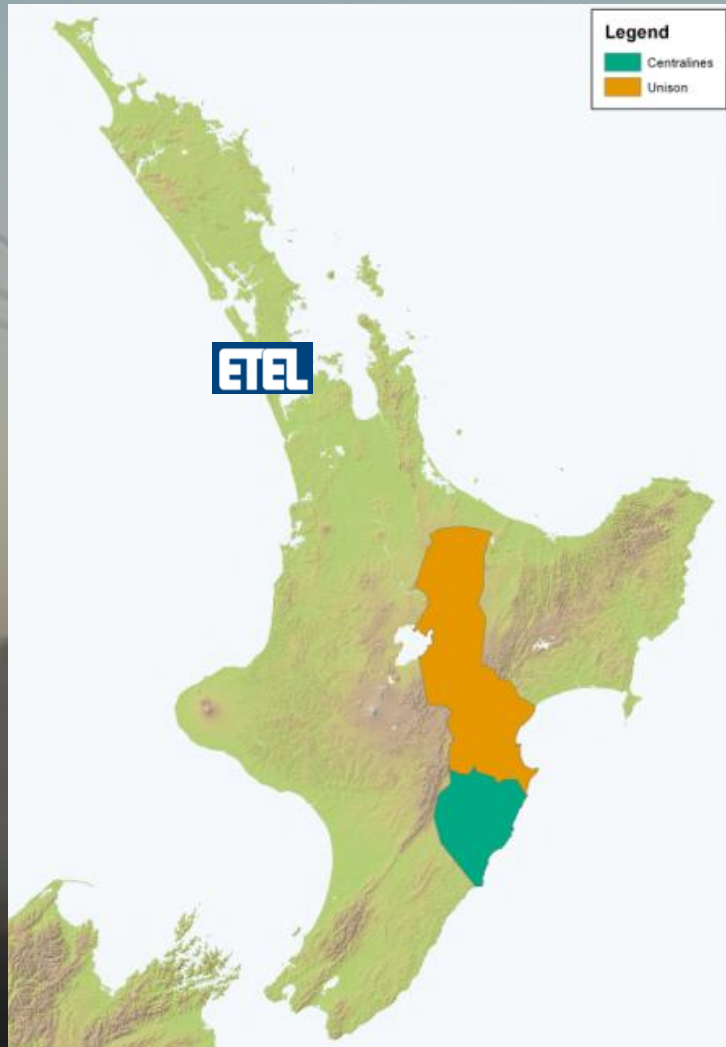
Taupo – Self Healing Network

Installed 40 automated switches in Taupo area and commissioning new advanced control system

“Self-healing” enabled April 2014

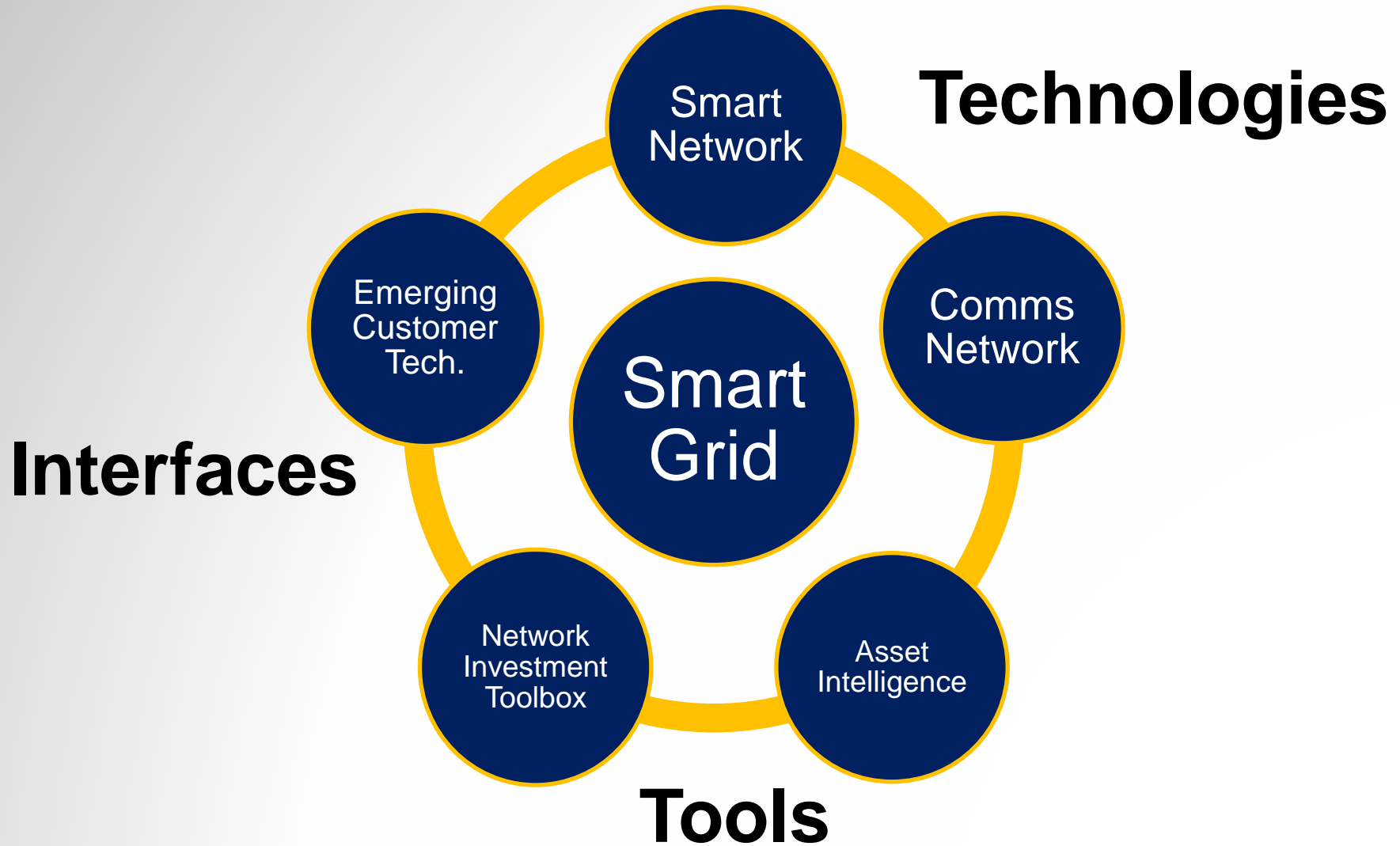


Electricity Distribution – by Unison



- We serve 109,000 customers,
- in urban/rural locations covering 12,000 sq km,
- by managing:
 - 9,600 km of lines & cable,
 - 57,385 poles, and
 - 9,197 transformers

Smart Grid Components



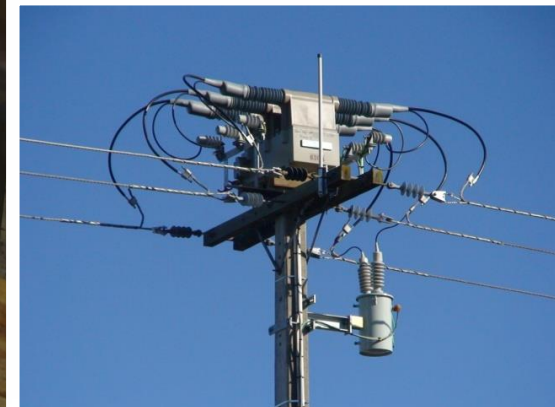
Smart Network Technologies

- Network Automation
 - Advanced Operational Systems
- Fast Protection/Load Transfer
- Network Sensors
- Fault Management
 - Ground Fault Neutraliser
- Alternative Line Construction Options e.g. “Hendrix”



In-field Automation Hardware

- Automated 11kV switches
- Pole mounted load break switches and reclosers
- Extensive remote monitoring and control



Ground Fault Neutraliser



Fault Without Ground Fault Neutraliser



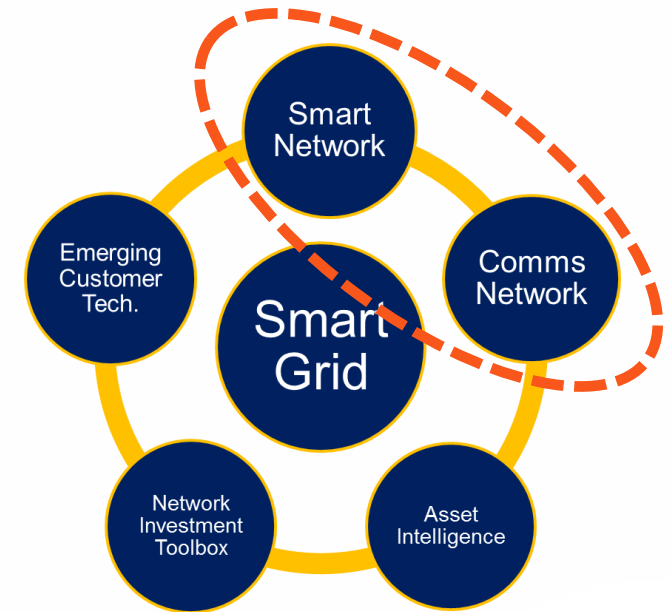
Fault With Ground Fault Neutraliser Operating



Advanced Distribution Management System

“ADMS” - What is it?

- A collection of applications:
 - SCADA
 - Outage Management
 - Network Management
 - Customer Relationship Management



For efficiently and proactively monitoring & controlling the distribution network

Fault Location, Isolation & Supply Restoration “FLISR”

Fault Location, Isolation & Supply Restoration “FLISR”



FLISR: Network Fault Resulting in Substation Feeder Trip



FLISR: Fault Located



FLISR: Downstream Network Restored / Fault Isolated



FLISR: Fault Repaired



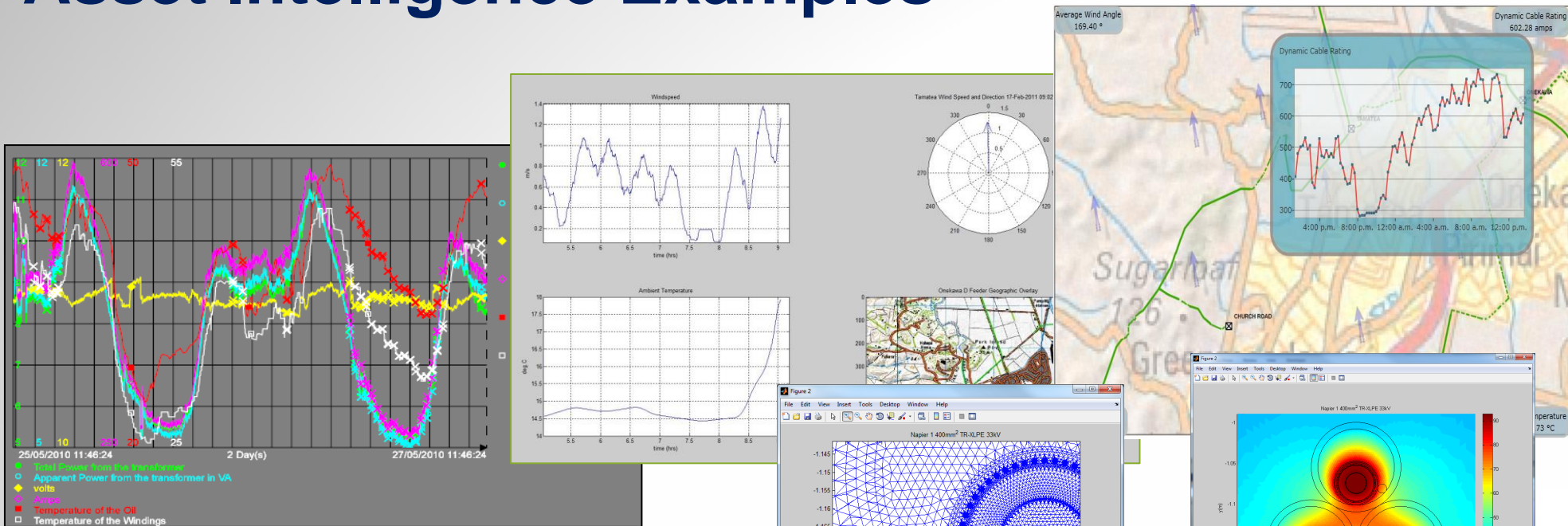
FLISR: Normal Condition Restored



Asset Intelligence

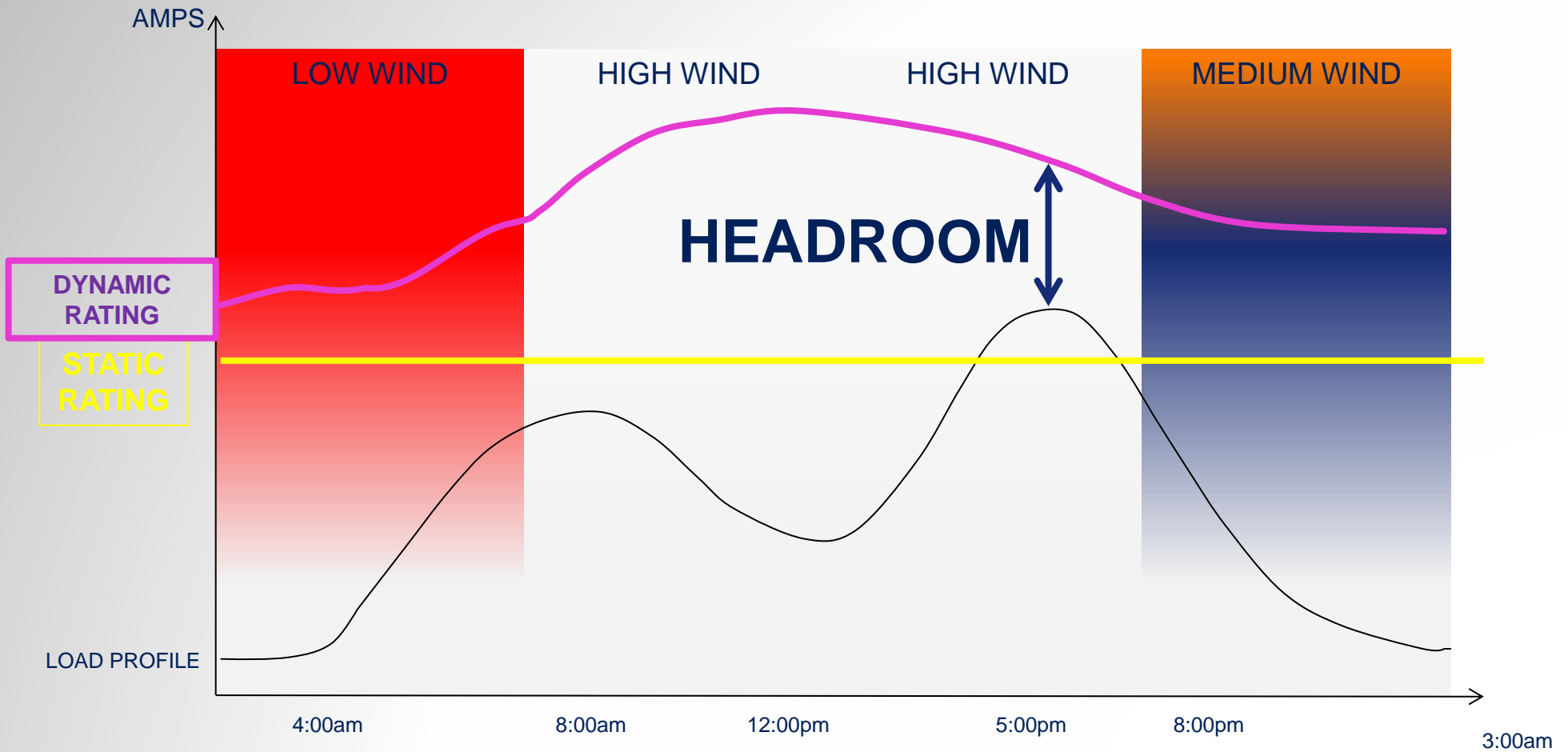
Data → **Information** → **Knowledge**

Asset Intelligence Examples



- Dynamic Line & Cable ratings
- On-line Power Transformers management
- Data Processing

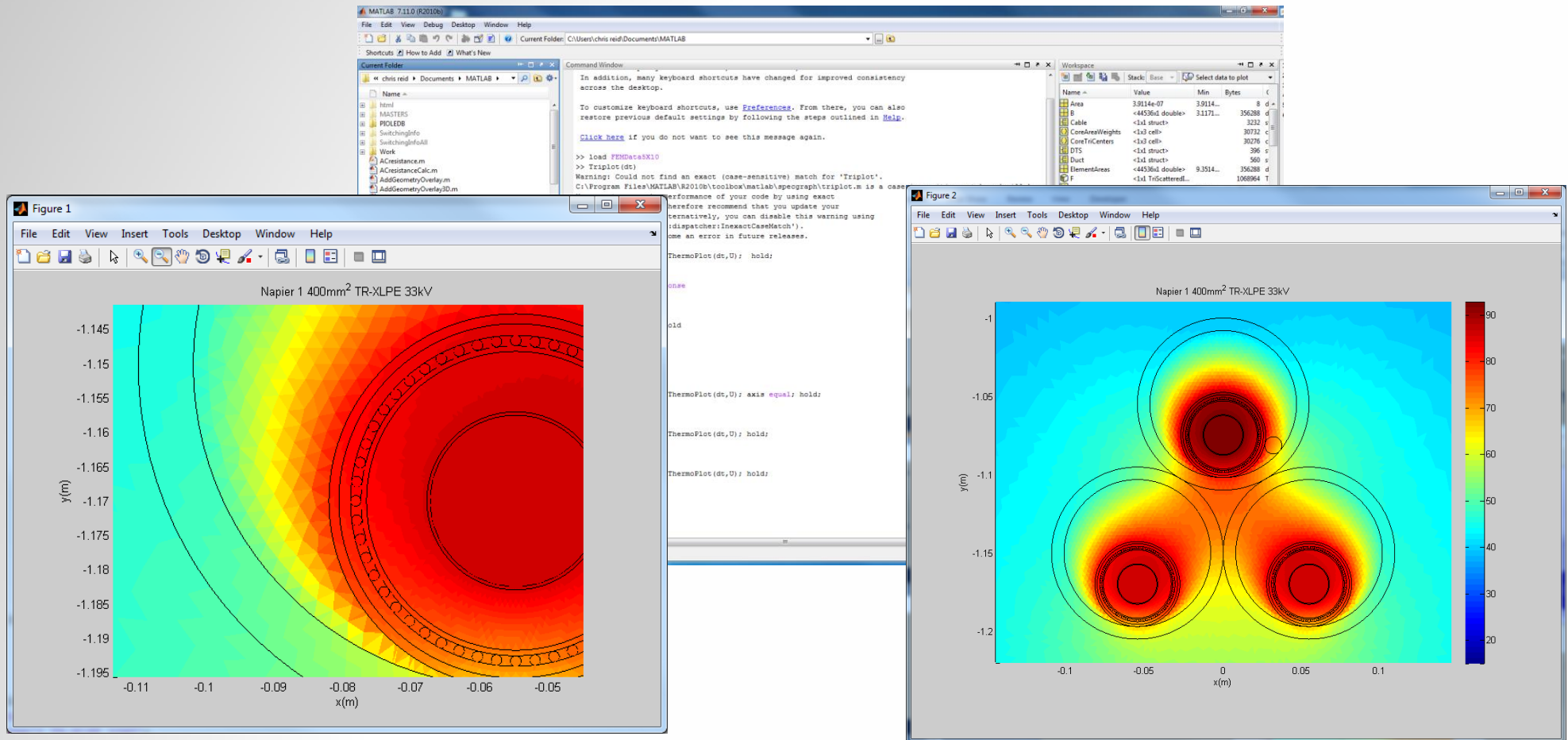
Smart Overhead Lines – *Dynamic Ratings*



DLR is expected to provide +20% capacity on OH lines and cables

Buried Cables – Maximising Capacity

- Finite Element Modelling of Heat distribution in cables



Transformer of the Future

I can carry X load
for T hours

My fans are not working.
Please repair them

Please
refurbish my
oil next week

The ambient
temperature
around me is Y
degrees C



I am due to
retire in T
years

Emerging Customer Technologies



Electric Vehicles, Distributed Generation – Wind, Solar, ...

Smart Transformer – by ETEL



- Localised power quality and voltage management
- Modular design
- Assist with network faults response



Thank You Questions?