



# Electricity Network Transformation & new business opportunities

GM Asset Management & Operations – SAM SOFI

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# Sharing is better



# Ausgrid Overview



**4m**  
Australians



**20%**  
of Australia's  
GDP



**1.5m**  
Homes



**200k**  
Businesses



**1,238**  
Schools

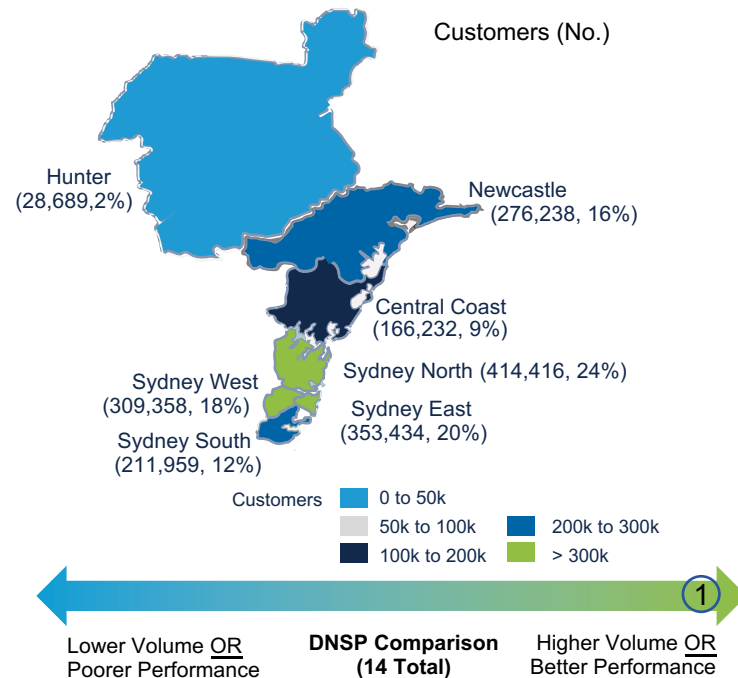


**105**  
Hospitals

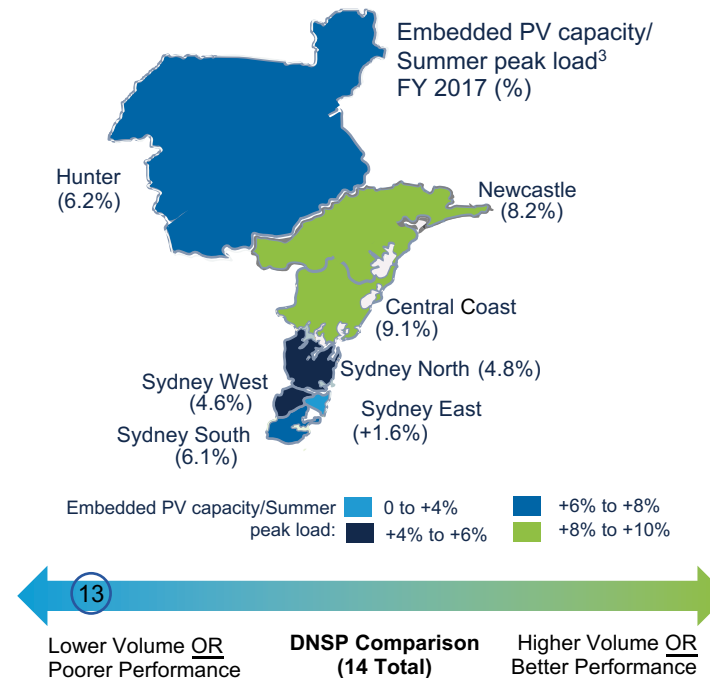
# Customer Characteristics

The Ausgrid network has diverse drivers from the Hunter Valley to the South of Sydney. There is a large variation in Ausgrid's network economics, and misalignment of DER penetration and load growth

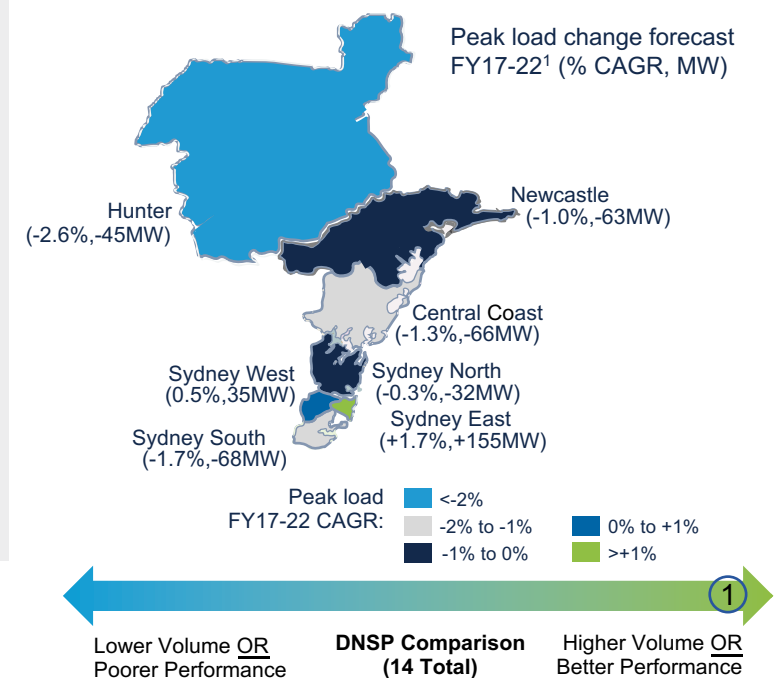
**Customers** (1.74 million) are concentrated in Sydney with approximately half located south of the harbour in Sydney



**PV penetration** ranges from 1.6% in Sydney East to 8-10% in Central Coast & Newcastle



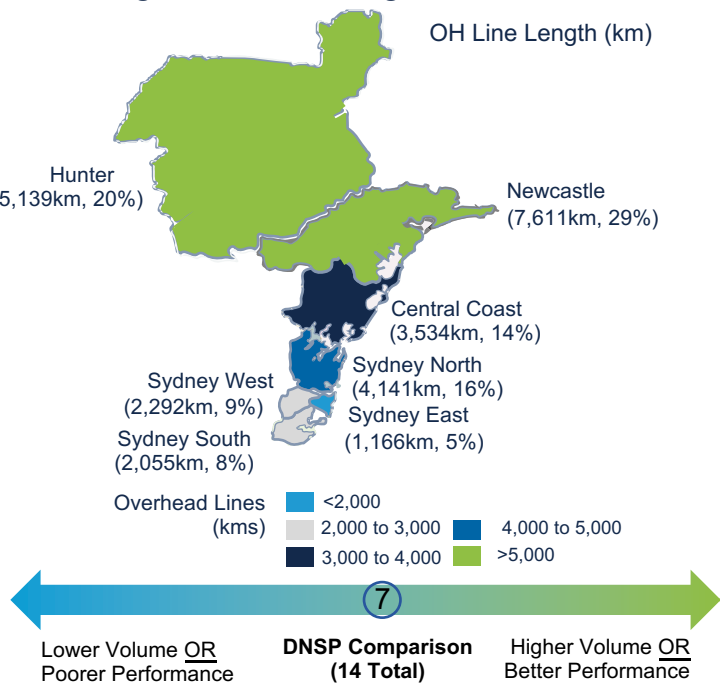
**Load** is forecast to decline in all regions except Sydney West and East



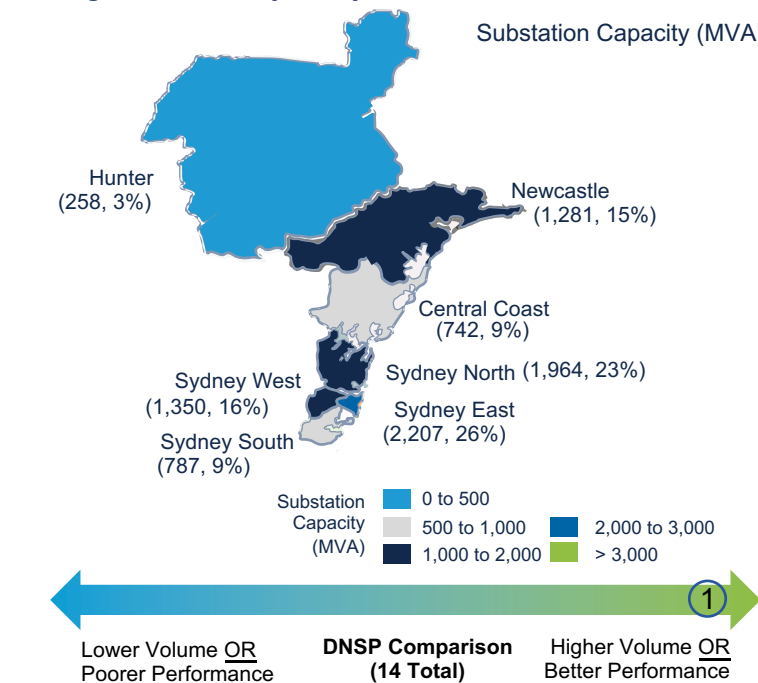
# Network Characteristics

The Ausgrid network is diverse with coverage from the Hunter Valley to the South of Sydney. There are over 40,000km of power lines (38% underground) connected with 231 major substations and over 31,000 distribution substations.

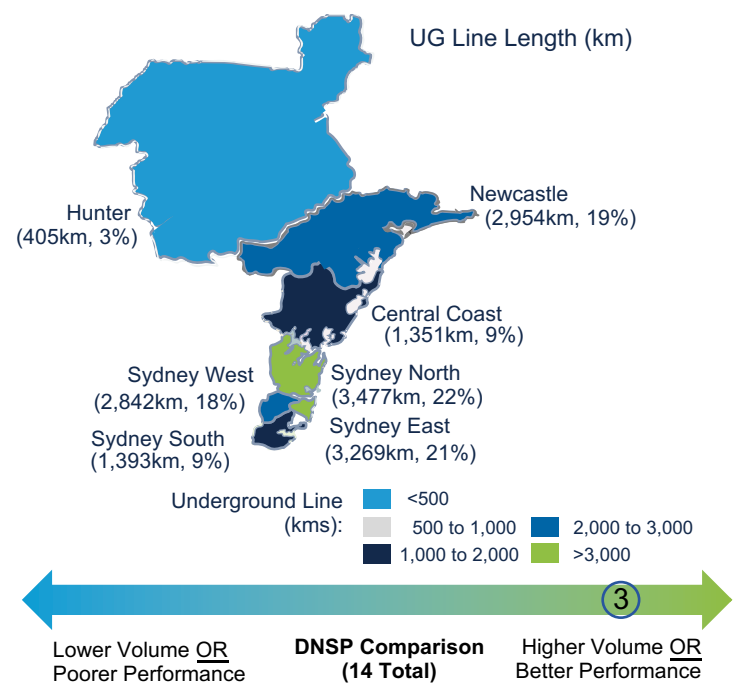
**Overhead Line length** is stable and dominates in less dense customer areas including the Hunter region



**Major Substation Capacity** is growing, predominantly in areas where there is customer load growth in Sydney



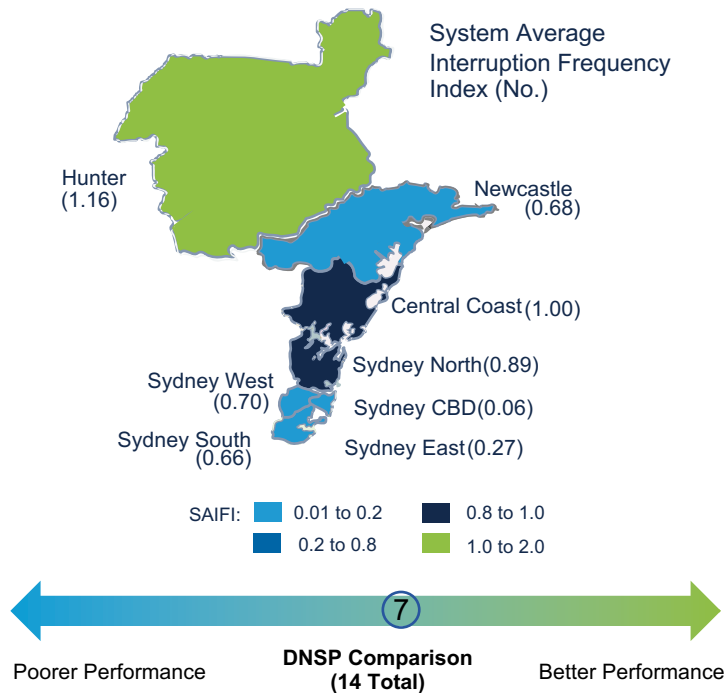
**Underground Cable length** is increasing in all regions and dominates in Sydney



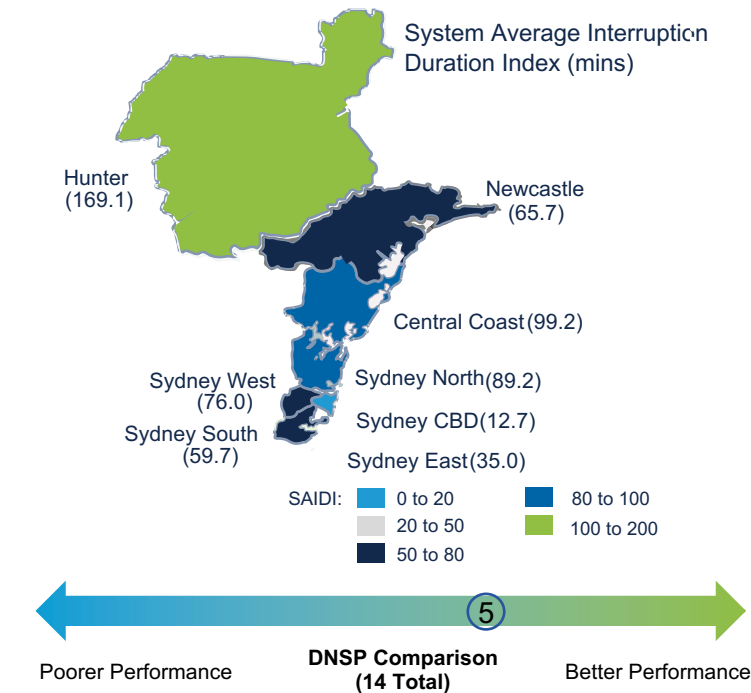
# Network Reliability

The Ausgrid network electricity supply performance ranges from that of a typical rural distributor to a high performing CBD. Performance (event and duration) improve in higher density areas.

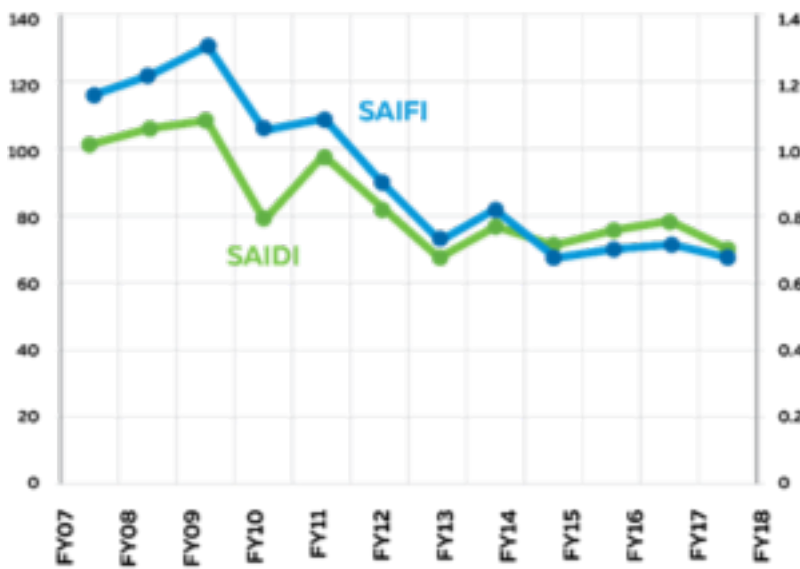
**SAIFI** ranges from 0.06 interruptions per customer per year in the CBD to 1.16 in remote areas



**SAIDI** ranges from 12.7 minutes per customer per year in the CBD to over 2 hours in remote areas



**Reliability** has improved over the past decade and only marginally improved in the last five years.





# What customers have told us



# Delivering affordability through energy sharing

- ✓ **Customer first**
- ✓ Incentives to innovate
- ✓ Balance short and long term
- ✓ Transparency





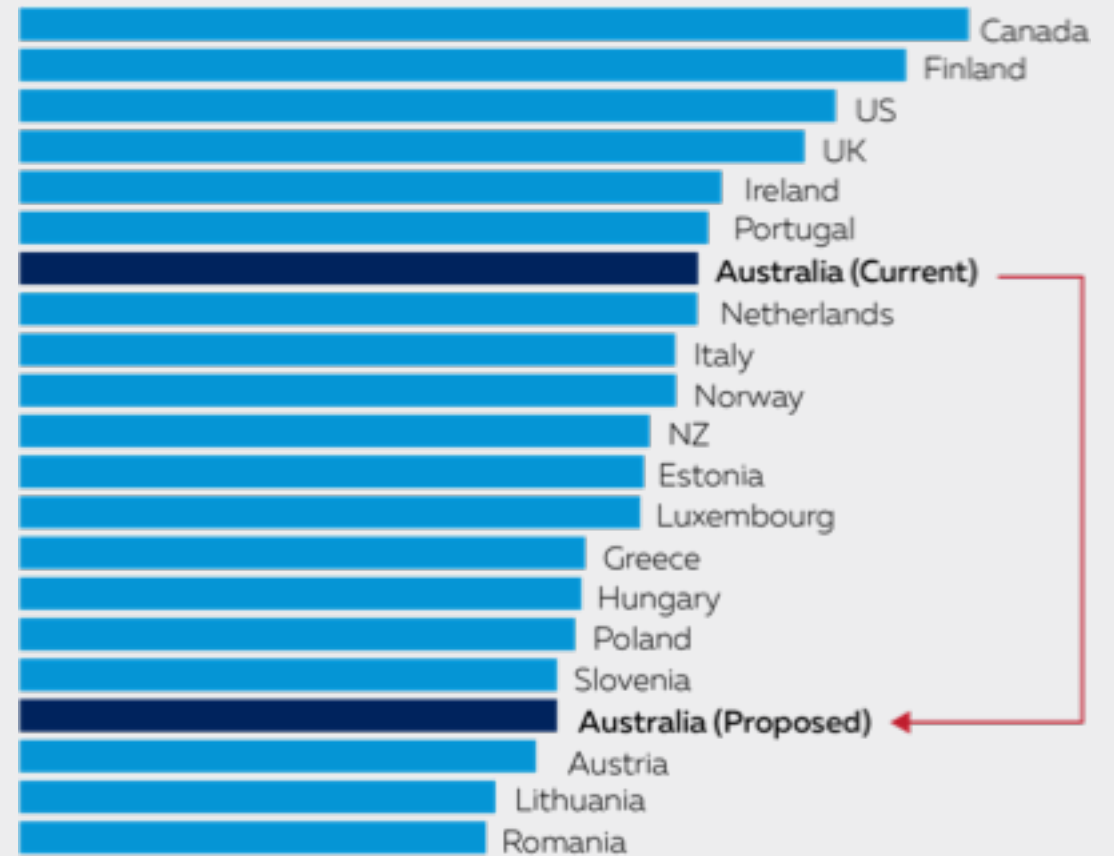
# The 'internet of energy': driving affordability



# Delivering affordability through energy sharing

- ✓ Customer first
- ✓ Incentives to innovate
- ✓ Balance short and long term
- ✓ Transparency

Relative equity returns across international energy network jurisdictions



# Delivering affordability through energy sharing

- ✓ Customer first
- ✓ Incentives to innovate
- ✓ Balance short and long term
- ✓ **Transparency**

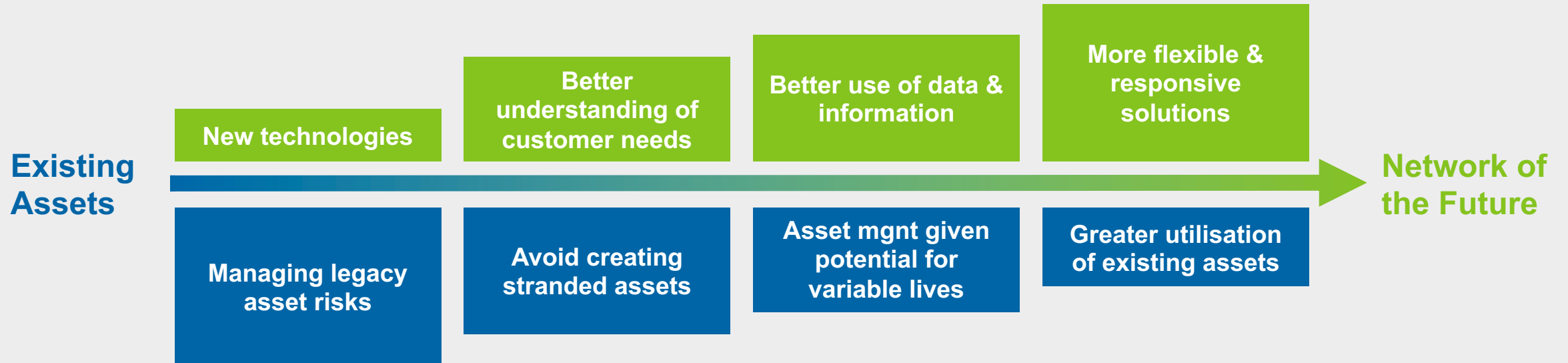




# Accelerated Transition Path

## Safe, Reliable and Sustainable & Affordable.

Strategies for both legacy and future networks



# Asset Transformation Initiatives

- **Enhancing Network Operations**











- ADMS (furthering the integration of asset management systems)
- Distribution System Operator (DSO) Trials
- Increased monitoring and control
- Deployment of distribution network automation
- Deployment of grid storage & voltage control
- Alternative grid models - EV Charging Platform, Microgrids, etc.

- **Information Insights for Improved Decision Making**

- Digitisation of the Network – LIDAR / HD Imagery / Satellite Imagery / Smart Metering Information / Load and DER Information / Increased network health monitoring
- Better integration of data – Big Insights Data Platform
- Predictive Analytics for Network Optimisation, Improved Load & DER Forecasting
- Use of Asset Health, Risk and Smart Grid Indices









# Innovative Technologies

TECHNOLOGY CLUSTER						
	CONDITION MONITORING	FAULT INDICATION	NETWORK AUTOMATION	DEMAND MANAGEMENT	DER MANAGEMENT	MICRO-GRIDS/ SAPS
Benefits	Sensor-based, real-time information about asset condition—improves reliability and cost via failure prediction and prevention	Fault detection and recognition – improves SAIDI and cost via targeted field response	Network switching and fault restoration via remote control and automation devices – improves SAIDI, SAIFI and reduces cost	Targeted demand response to reduce peak load using two-way smart meters, appliances and battery storage – prevents overloading and defers augmentation	Solutions to integrate DER to the network and manage their impact on power flows and power quality – enables customer choice of PV, EV and battery	Alternative solutions for customers in low dense network areas – reduces cost and provides reliable alternative to customers
Long-term relevance 						
Safety 						
Reliability 						
Efficient spend 						



# Innovative Project Trials & Pilots

								
		TECHNOLOGY CLUSTER	CONDITION MONITORING	FAULT INDICATION	NETWORK AUTOMATION	DEMAND MANAGEMENT	DER MANAGEMENT	MICRO-GRIDS/ SAPS
Network Area	High Density (Underground)	Network Insights Program				Demand Mgmt for Replacement Needs	Dynamic Load Control	
	Medium Density (Mixed)	Smart Metering Data Acquisition			Self Healing Network / FLISR Trials	Distributed Storage Demand Response	Grid Battery Trials	Portable All-In-One Portable Off Grid Supply Units
		Network Digitisation& Machine Learning		Advanced Voltage Regulation	CoolSaver IoT	EV Charging Areas		
	Low Density (Overhead)	Advanced Condition Monitoring Trials	Line Fault Indicator (LFI) Trials / Development			Advanced EV Charging Platform	HV Microgrid Trial	
Customer Evaluation					Continuous Value of Customer Reliability	Residential Peak Time Rebate	Customer DER Investment Evaluation Tool	
						Research		
Enabling Platforms		Distribution System Operator (DSO) Trials						
		Advanced Distribution Management System (ADMS) Implementation						



