

Voltage Rise

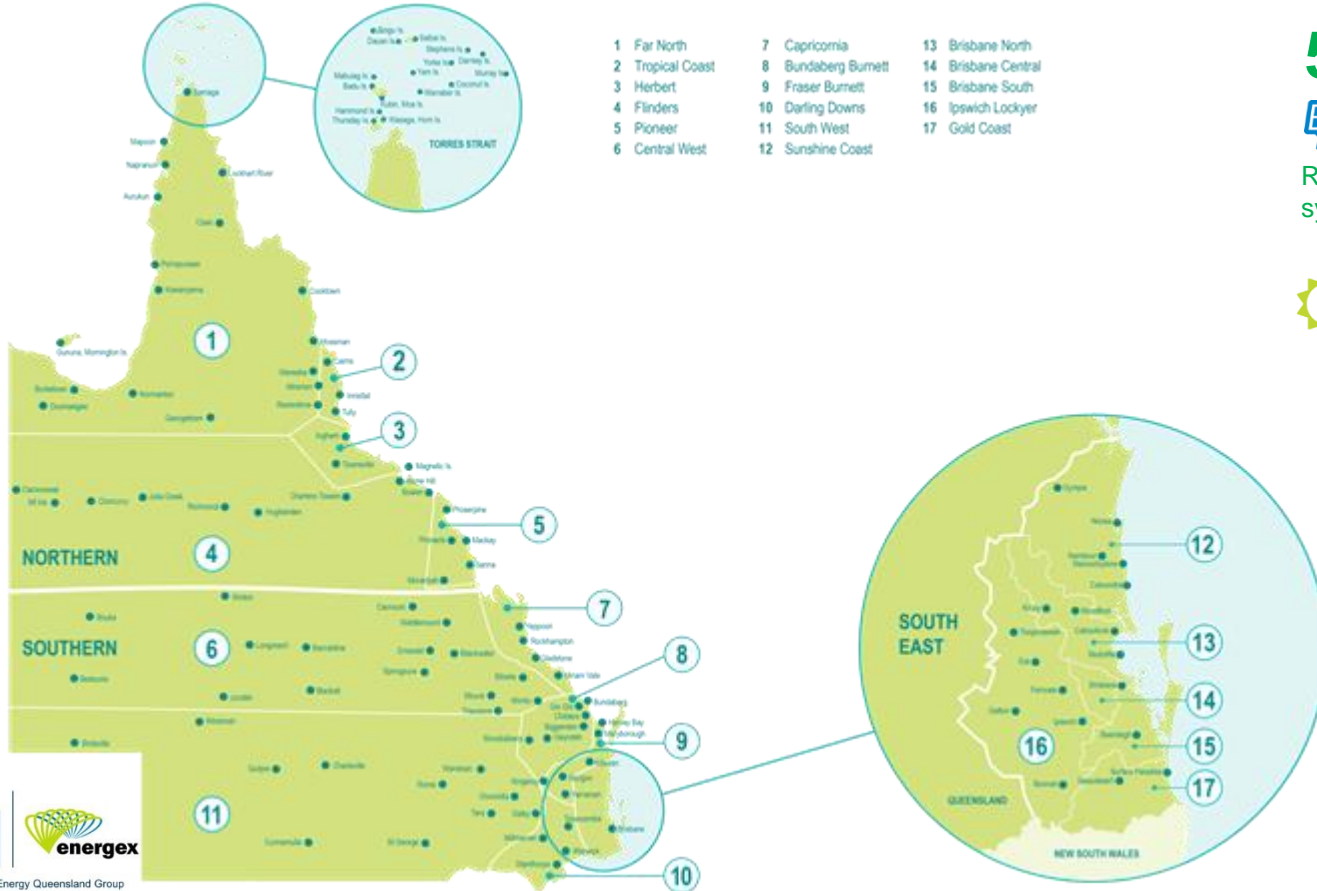
Ergon Energy Network and Energex



Part of the Energy Queensland Group

Candice Horig
24th October 2019

Queensland Distributors



- | | | |
|------------------|---------------------|---------------------|
| 1 Far North | 7 Capricornia | 13 Brisbane North |
| 2 Tropical Coast | 8 Bundaberg Burnett | 14 Brisbane Central |
| 3 Herbert | 9 Fraser Burnett | 15 Brisbane South |
| 4 Flinders | 10 Darling Downs | 16 Ipswich Lockyer |
| 5 Pioneer | 11 South West | 17 Gold Coast |
| 6 Central West | 12 Sunshine Coast | |

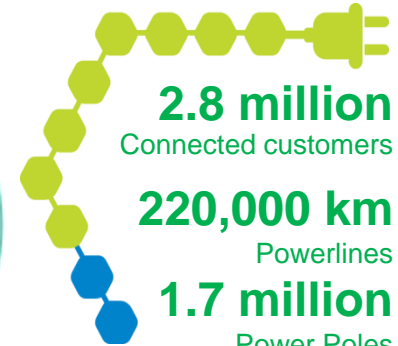
500,000



Roof solar energy systems



355MW Large scale renewables connected



Emerging Issues on the Network



Power Quality

Increase of DER exporting onto network presents new challenges in managing the voltage at the customer connection



Device Specification

With variety of technologies and the interaction between them, specifying the right mix of requirements for compliance (power quality including) and enabling the transition is a challenge for the electricity industry

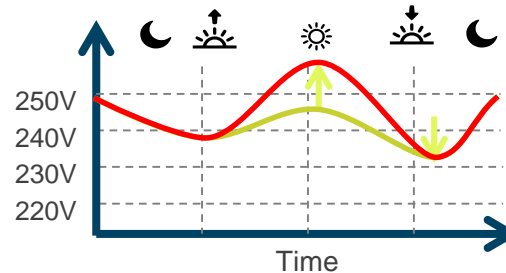
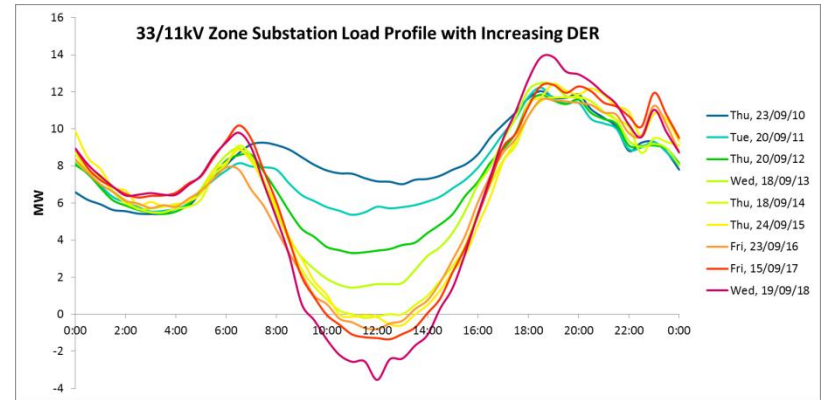


Operational Management

Weather and demand events with localised generation increase challenges in managing power quality locally and in certain cases globally



Voltage regulation with two-way power flows



Data and PQ Monitoring



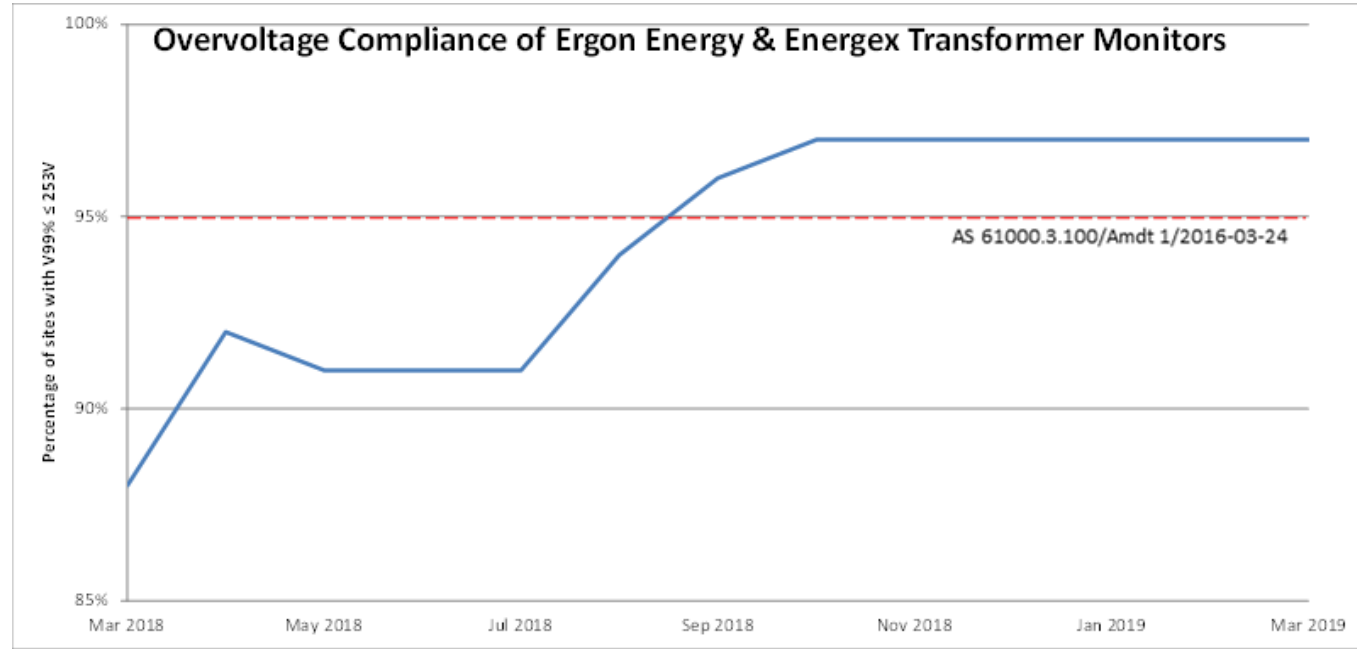
Ergon Energy Network

100,000 Distribution Transformers with power quality meters installed on 3.2%



Energex

48,000 Distribution Transformers with power quality meters installed on 44%



Network Repair Options Assessed

Customer Solutions



Service Line Upgrade

Upgrade the service line at a customer's premise

Distributor Solutions



Adopt 230V

Tap transformer to align with the 230V standard



LV Re-conductoring

Replace existing LV sections with lower impedance conductors



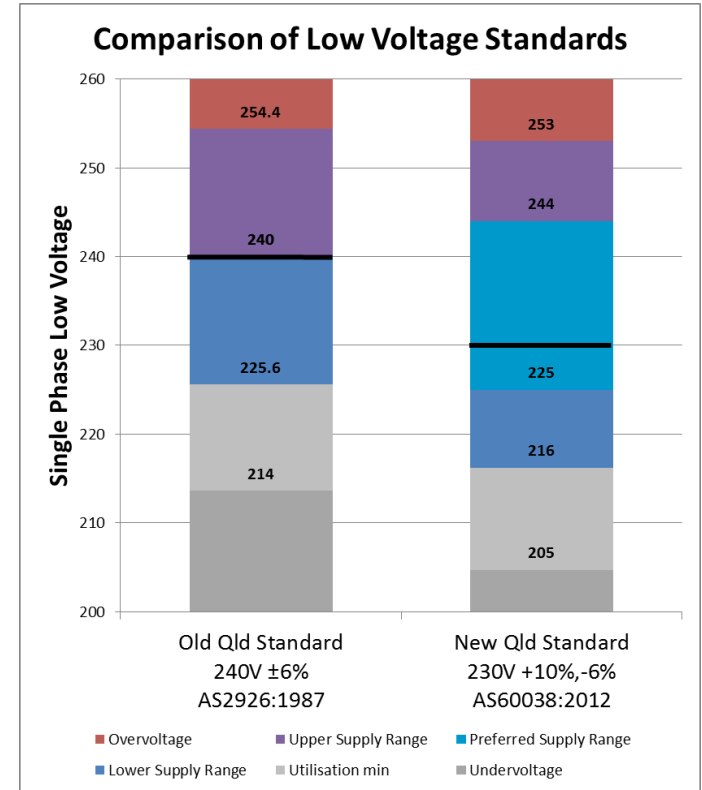
Transformer Upgrade

Either upgrade transformer or add a new transformer and split the LV network

230V Standard in QLD

In October 2017 an amendment was made to the Queensland Electricity Regulation to mandate a transition from the 240V to 230V standard by 26 October 2018.

Qld Supply Voltages		Existing (AS2926-1987)	Proposed (AS60038-2012)
Nominal	V_{In}/V_{II}	240/415V	230/400V
% Range		+6%/-6%	+10%/-6%
Max/V99%	V_{In}/V_{II}	254.4/440V	253/440V
Min/V1%	V_{In}/V_{II}	225.6/390V	216/376V
Range	V_{In}/V_{II}	29/50V	37/64V
V50% (AS61000.3.100)	V_{In}/V_{II}	-	225V-244V /392V-424V



Low Voltage Statcom



Customer expectations

Standard of Power Quality on Low Voltage network needs to meet customer needs



Changing interactions

Proposed to use Statcom to handle the change in interaction between the customer equipment and the

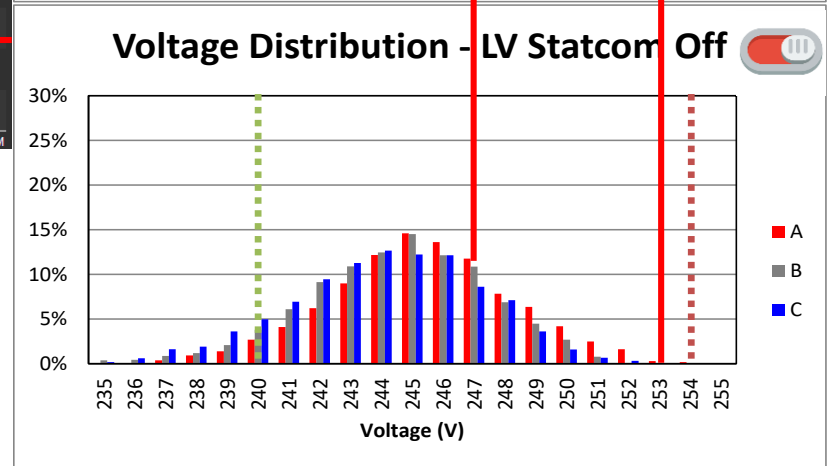
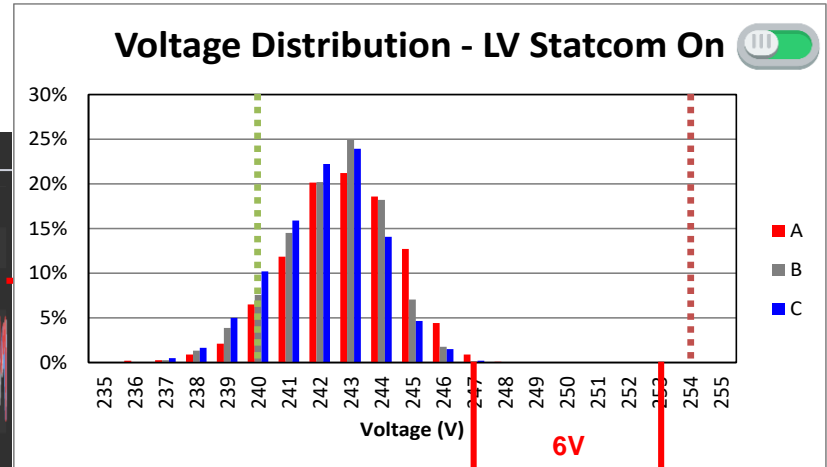
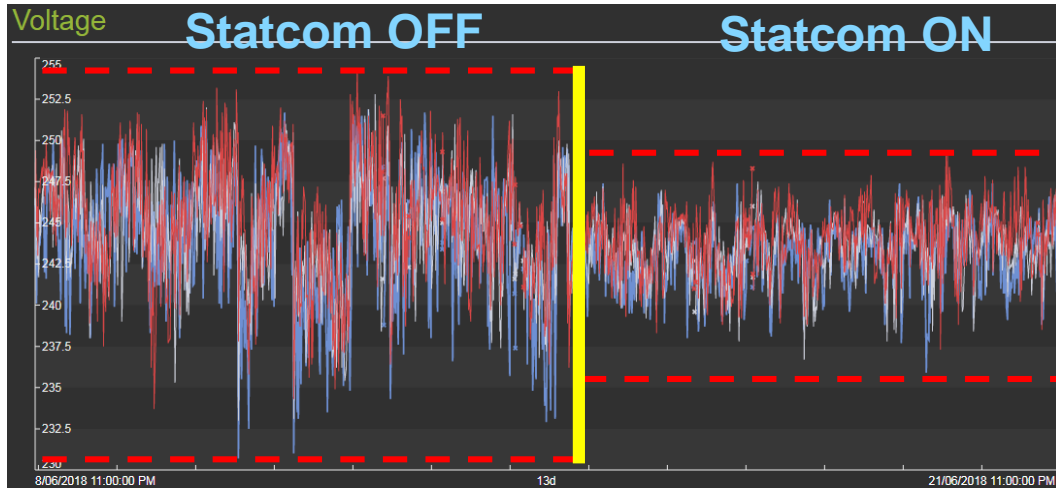


Network performance

Provides benefits to all customers on the LV distribution line
Enables peak demand voltage management and distributed generation voltage management
Greater visibility of LV network



Statcom Operation Impacts



Updated Connection Standards

Aligning Queensland with the new ENA Guidelines for Micro and LV Embedded Generation



EMBEDDED GENERATING SYSTEM CONNECTION STANDARDS

for Queensland



Streamlined

Document aligned with ENA guidelines.
Inverters settings aligned for Ergon Energy Network and Energex



Modern

Leverages other standards and is more applicable to modern EG installations



Enabling

Requirements not restrictive to new technology or innovations

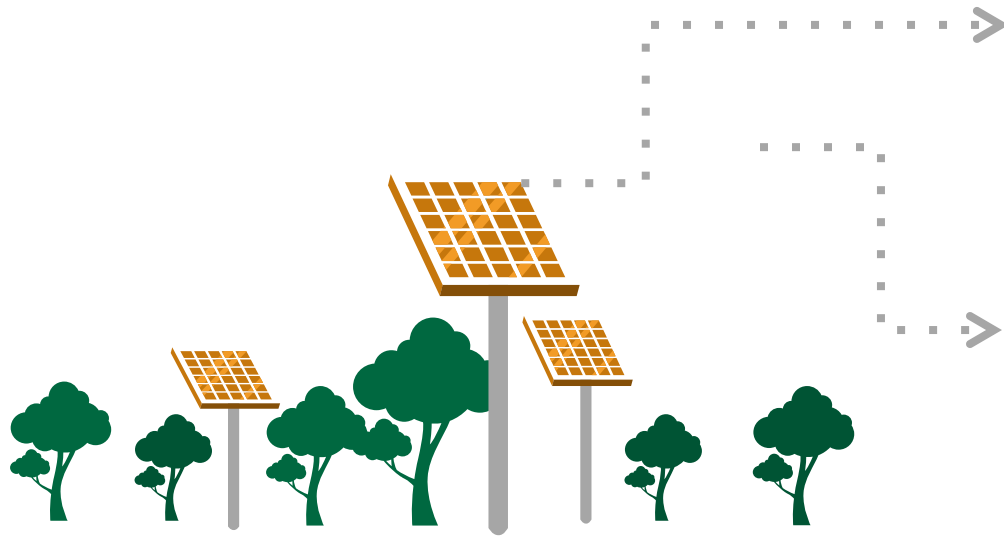


Consultation is open - <https://www.talkingenergy.com.au/EGCstandards>

Released 1st December 2019



Power Quality Response Modes – IES



National Settings

ENA has worked with DNSPs and through their guidelines to develop consistent National Settings



volt-var, volt-watt

From 1 December all IES < 1.5MW connected to LV in Ergon and Energen will have volt-var, volt watt power quality response mode as a mandatory requirement under the standard. – aligning with National guidelines,



Aligned $V_{nom-max}$

There will be an aligned sustained over-voltage setting for Ergon and Energen (10 minute average)

Future Opportunities

Active DER Management

Interaction with DER and controlling the impacts



Customer Data Availability

Opportunities to partner with aggregators and customers to monitor PQ



Modernising Standards

New AS 4777 revision, Harmonising and updating global/local PQ standards



PQ monitors

Increase of monitoring and data



Inverter Replacement

Replacement of inverter that unable to set Reactive Power Control



Watch this space

Industry Advancement and trials





Part of the Energy Queensland Group

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