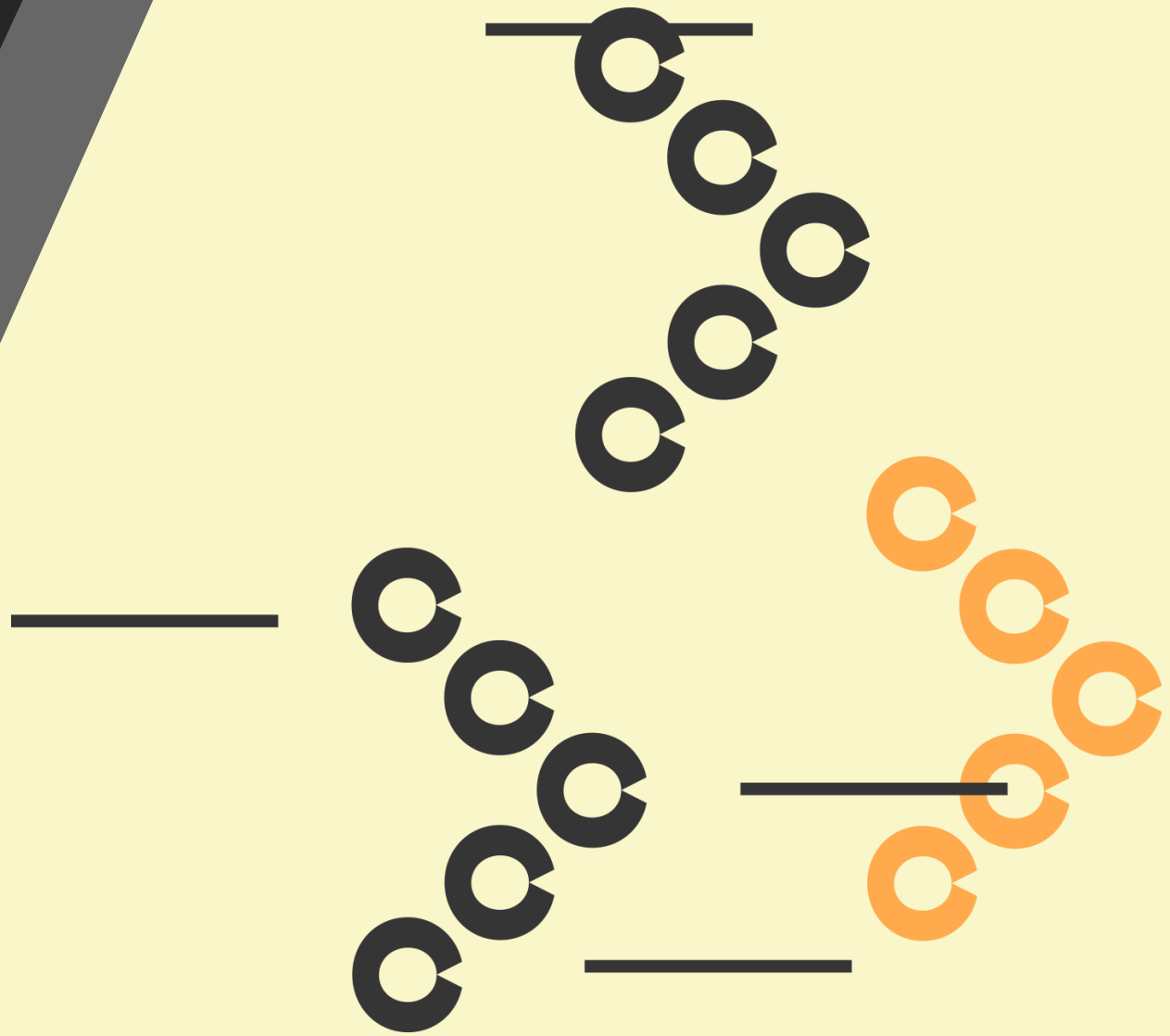
Integration of Distributed Generation

Elizabeth Maina
24th Sept 2020



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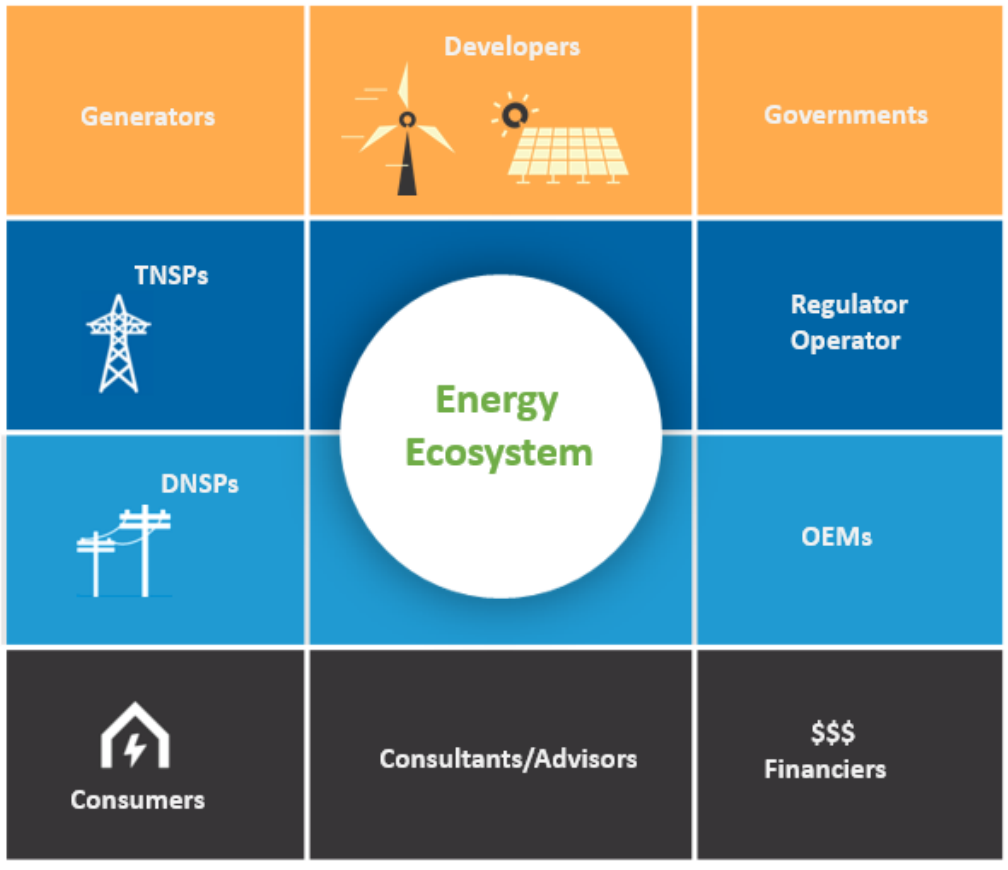
Technical Considerations in the Connection of Distributed Generation



- Connection studies for distribution connected generators, historically focused on quality of supply provisions.
- Shifts in the wider energy ecosystem mean the technical landscape in the connection of distributed generators is also evolving.
- Changes happening across all parts of the ecosystem as the energy system transforms towards decentralization and increased variable energy sources.

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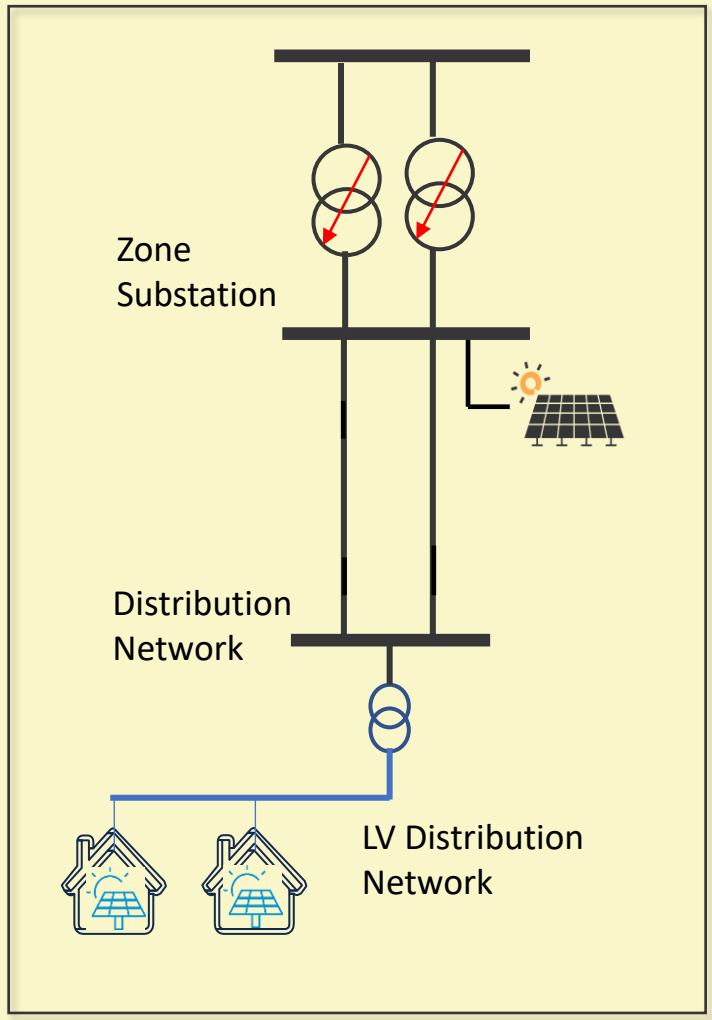
Voltage Management Considerations



DNSPs looking at management of voltage rise due to increased DER on their LV Networks are considering network solutions such as the replacement of zone substation transformers with OLTCs.

Generator voltage control strategy?

Historically focussed on voltage step considerations to ensure plant can meet the quality of supply requirements of the distribution code e.g.

3% - 66kV
5% - 22kV

Now needs to also ensure co-ordination in light of other changes in the distribution network to avoid counter interaction.

- OLTCs – slow response voltage control
- Power park controllers – closed loop control

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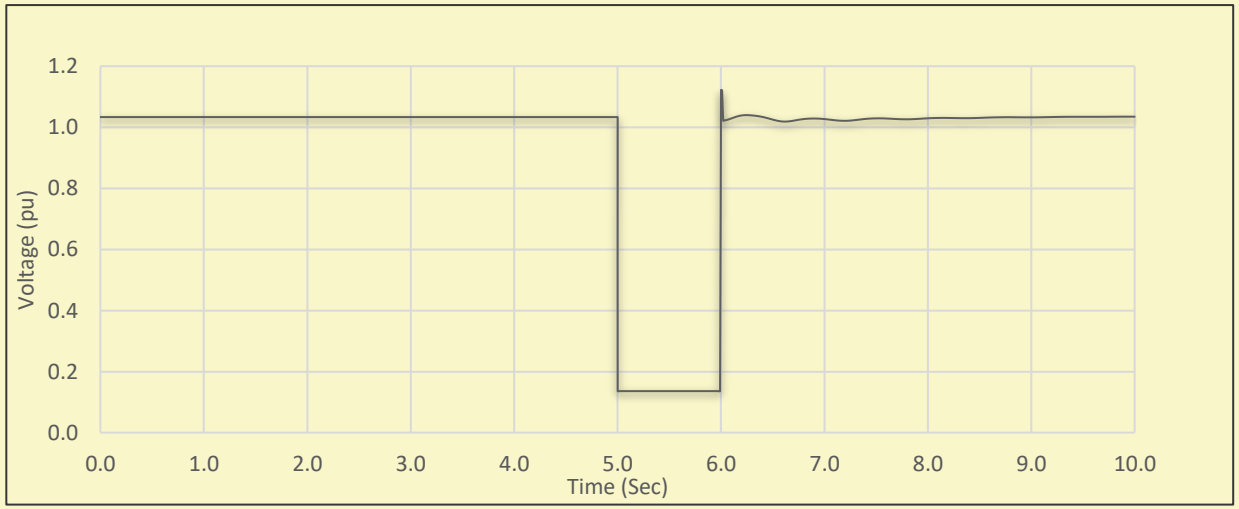
Disturbance Ride Through

- The 2019 Generator Technical Standards rule change introduced wider voltage disturbance ride through requirements.
- OEM's widened their voltage ride through thresholds to meet the new requirements.
- For distribution connected projects, this has been particularly useful given the long fault clearance times that can be found in distribution networks. A small community solar farm may have previously elected to trip for a certain contingency but a similar project can now ride through.

Voltage range	Tolerance Time
1.1-0.9pu	Continuous
0.15pu	0.625 sec

Voltage range	Tolerance Time
1.2-0.8pu	Continuous
0.15pu	1.75 sec



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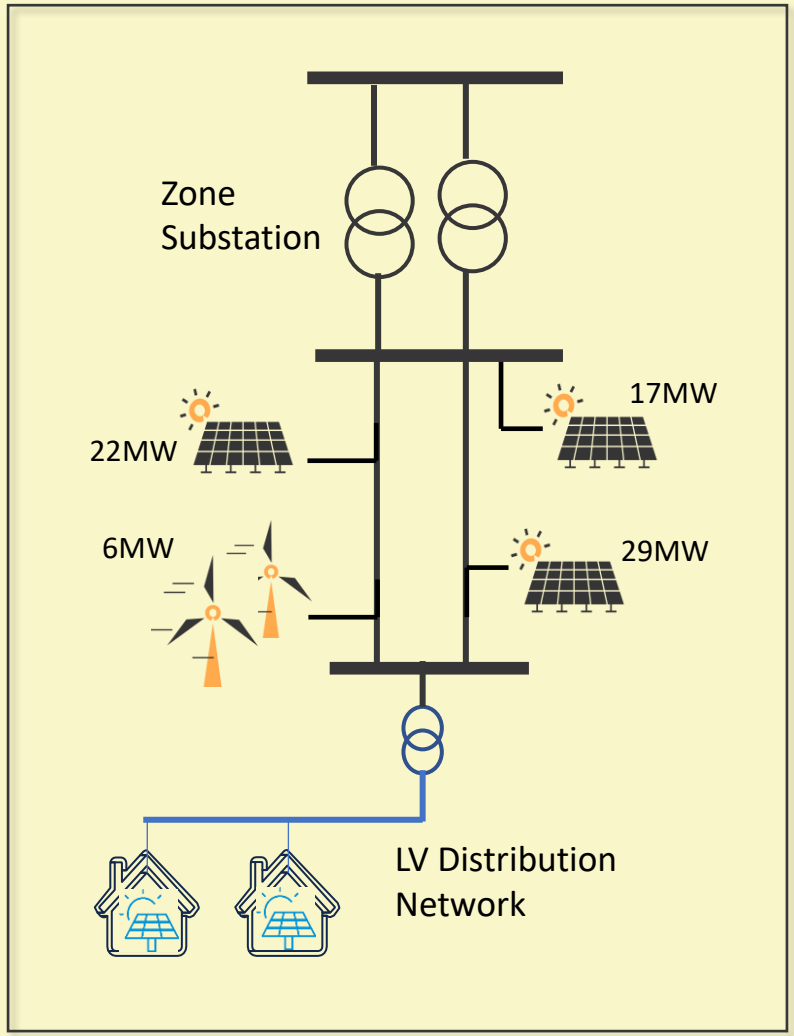
Visibility and Frequency Response Capability



- Ongoing work at the regulatory level to address visibility of DER
- Plant between 5MW and less than 30MW are classified as non-scheduled generators.
- However AEMO has discretion under NER s2.2.2(b1) to classify such generators as (semi) scheduled in areas of high congestion.
- Not uncommon to have multiple projects connecting within the same distribution network. This may require classification to semi-scheduled status.

- Helping with increased visibility and now generators that participate in central dispatch must provide primary frequency response.

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Summary

Distribution generators have historically been focussed on meeting quality of supply provisions (voltage steps, harmonics, fault level) and now evolving to support system security.

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