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Microgrid Framework

Perth Energy Submission

Definitions

Embedded Network

The definition of an Embedded Network according to the Australian Energy Market Commission rule determination of 2015 states:

Embedded networks are private networks which serve multiple premises and are located within, and connected to, a distribution or transmission system in the National Electricity Market through a parent connection point

The main differentiator between this and a microgrid is that an embedded network does not have sufficient generation to be able to disconnect from the grid.

Microgrid

We consider CIGRE's definition is the most applicable

*Electricity distribution systems containing loads and distributed energy resources, (such as **distributed generators**, **storage devices**, or **controllable loads**) that can be operated in a controlled, coordinated way either while connected to the main power network or while islanded.1*

Key features are:
Distribution connected
Controllable
Able to be islanded

We believe there are 2 main sub categories of microgrids, physical and virtual. Within Physical microgrids there are potentially a number variations. Virtual microgrids are commonly referred to as Virtual Power Plants

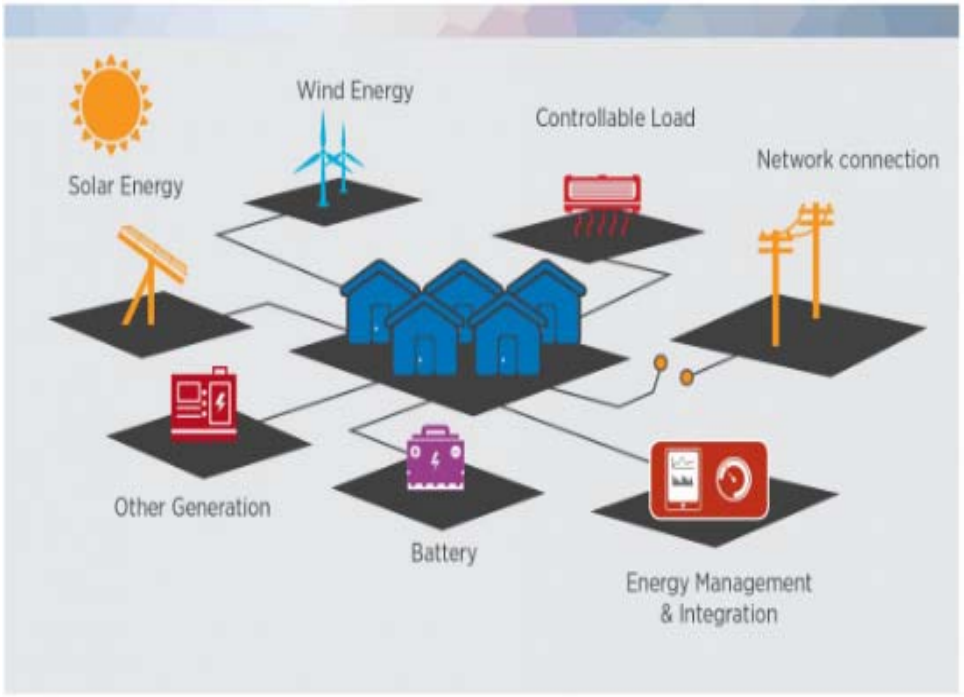
Virtual Power Plant (VPP)

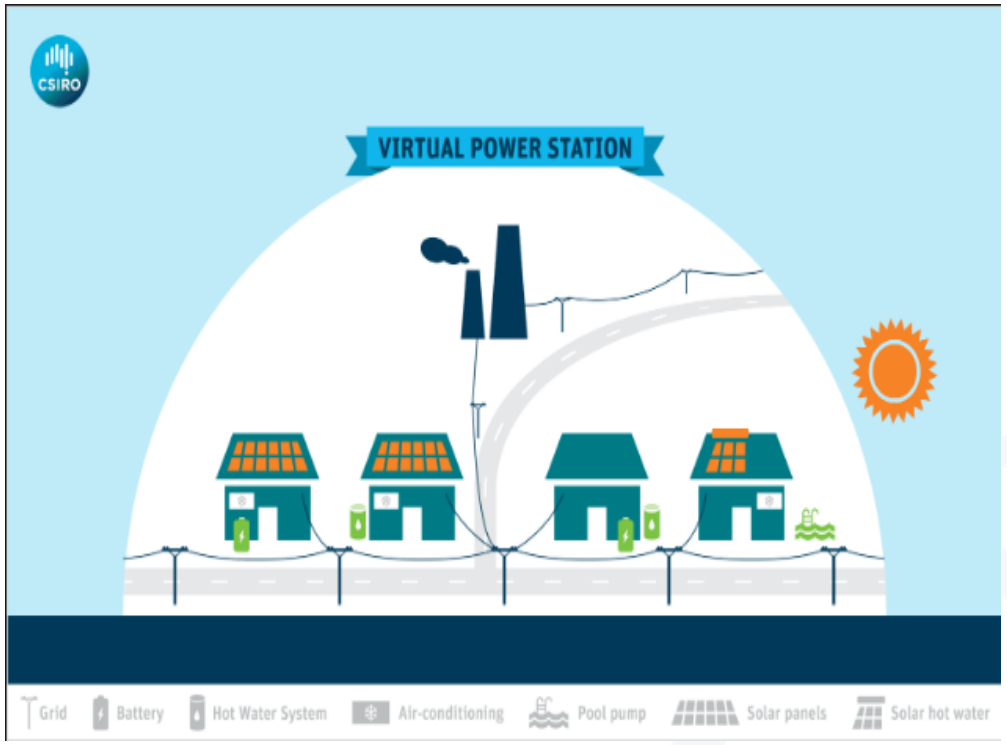
PE considers this term to refer to loads and distributed energy sources that are located at various physical locations but coordinated and virtually aggregated to form a single controlled entity (e.g. communities, commercial portfolios or industrial parks) to trade energy.

Illustrating definitions

Microgrid vs Virtual power plant

Main point being physical connection (can be islanded) vs. virtual connection (cannot be islanded)





1st illustration from www.energynetworks.com.au
2nd illustration from https://blog.csiro.au/virtual-power-people

Consumer Protection

Goal:

- All consumers are protected by an energy specific framework of regulation that is strongly policed and enforced by a fully funded regulator acting in the best interests of the consumer

Achievable Steps:

- Ensure that any VPP / microgrid / embedded network arrangements must include a holder of a Small Use Electricity Retail Licence

Competitive Neutrality

Goal:

Contestable Metering:

- providers currently can only sell behind the meter solutions and customers of scale.
- A smart metering network is a key enabler for all technologies developed in the last 20 years.

Customer choice

- Currently non-contestable customers can only select from the narrow range of solutions Synergy can offer

Achievable Steps:

Either:

1. allow multiple trading relationships at a connection point; or
2. require a third party to establish a new connection point as well as purchasing and installing a new meter and associated infrastructure

Customer choice

- an “opt-in” or “opt-out” model for contestability based on an “as-if test”.

Adequate Metering Services

Goal:

- Timely and transparent meter data is made available via the cloud to VPP operators and participants
- Peer to peer trading can be undertaken on a 5 minute basis if desired

Achievable Steps:

- Recommend that the ERA allow the investment in the communications infrastructure to support smart metering, as proposed by AA4 submission. If Western Power is unable to facilitate the timely roll-out of this infrastructure, the introduction of competition in metering services becomes a necessity.

Tariff Reform

Goal:

- Network charges are fully cost reflective, and sufficiently flexible to allow consumers to consume or generate energy without fear of penalty.

Achievable Steps:

- Cost allocation and pricing arrangements reviewed to account for:
  - changes in the wholesale cost of electricity to reflect the cost or value of network constraints
  - the application of the Tariff Equalisation Contribution and similar cross-subsidies with respect to the cost of servicing regional areas of the network
  - the allocation of transmission costs to distribution-connected, distributed energy customers who would no longer be connected to Western Power's transmission network, and the resulting impact on transmission network tariffs.

Recommendations for the Committee

1. prioritise arrangements to create a workable regulatory and competitive framework that promotes microgrids, distributed energy resources, and associated technologies in WA.
2. undertake a high-level cost benefit assessment of the two options that could address the one user per NMI restriction
3. allow customers to opt-in to alternative technology schemes such as microgrids, VPPs
4. consider the robustness of the consumer protection framework with respect to the third and fourth-party sale of energy to end-use customers
5. encourage the State Government and Western Power to progress with the roll-out of smart meters (not just smart capable meters), despite the ERA's scepticism
6. progress targeted tariff reform for those customers opting-in to alternative technology solutions, reflective of the various reductions achievable in the total energy cost-stack

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