Energy Storage in Remote Australia: conceptions and kerfuffles

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Abstract

A review of energy storage in hybrid systems in Remote Australia including the messy bits (well a wee bit at least).
Where: Australia

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- Feel free to interrupt or redirect me.
Northern Territory/Powerwater

- Early SMA systems for delaying gen switch up (20y lifetime).
- Small ($\approx 50kW$) PV/Wind systems.
- Concentrated PV with limited smoothing.
- Ti Tree, Kalkarindji and Lake Nash ($\approx 1MW$ total PV, 80% peak penetration).
- Medium Pen Rollout.
- High Pen Diesel off systems.
Western Australia/Horizon Power, Verve Energy

In the past:

▶ Wind Diesel systems using Enercon, Vestas and Vergnet.
▶ Low Load Diesels: 12L/hr at 7% load for 320kW generator which gives us 280kW of spinning reserve and 190kW of step load.
▶ Flywheel Energy Storage: 18MWs at 500kW so 36s at rated which is enough to start and synchronise a diesel.

Currently:

▶ PV with hosting capacity limits and mandatory battery smoothing.
▶ It's very hard to get some of them away from Low Load diesels :-(.
▶ But I'm sure something will happen.
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- It's about energy and load shifting. A bit, it turns out that most of our NT work will be power limited using East/West arrays (or tracking).
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▶ And difficulties in sizing sets for loads.
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- Roll out medium penetration first and prove to our operations people that high penetration can work.
- Continue working on a variety of projects in order to improve system performance.
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