



Large scale solar > 1MW

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What technology are we talking about? Flat Plate PV



What technology are we talking about? CPV Dish



What technology are we talking about? CST Linear Fresnel



What technology are we talking about? CST Power Tower



What technology are we talking about? CST Trough



What has been built so far?

- Remote Projects as Utility Test Cases
 - Diesel Grids, remote communities
 - Roughly 30-50% Penetration
 - Moderate scale to 1MW
 - Qld - Weipa, Windorah
 - WA - Marble Bar, Nullagine
 - Others 6x NT sites, Lord Howe, Flinders, King Island hybrids
- Large on-grid
 - NSW - Nyngan (102MW), Broken Hill (54MW), Moree (72MW), Twynam (6MW), Royalla (20MW)
 - Victoria - Mildura, Bridgewater (2MW), Kerang (1MW)
 - NT - Alice Springs (1MW growing to 4MW)
 - WA - Geraldton 10MW
 - QLD - Solar Boost at Chinchilla (44MW stalled mid-construction)

What has been committed?

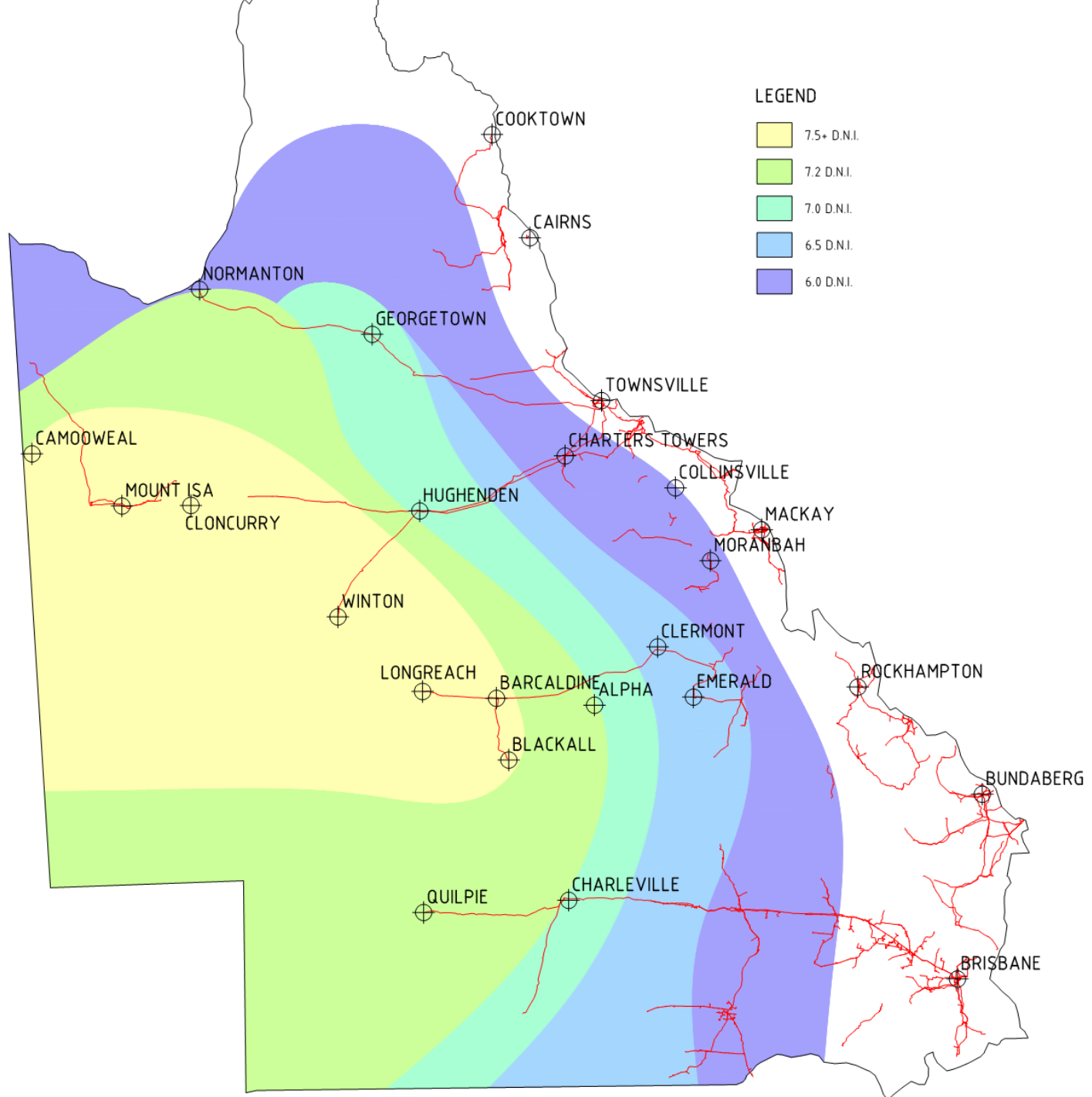
- Barcaldine QLD (25MW)
- Normanton QLD (5MW)
- MWSF QLD (20MW across 3 sites)
- Lakeland QLD (10MW)
- Doomadgee QLD (1MW 100% renewable)
- Coober Pedy SA (4MW Hybrid)
- NT SETuP Project (10MW 36 communities)

What is in development?

- Clare QLD 150MW + another 50MW
- Collinsville QLD 40MW
- Darling Downs QLD 2GW
- Kidston QLD 70MW
- Perenjori WA 20MW
- Port Augusta SA
 - 150MW flat plate
 - 100MW CST
- Roughly 30 early development projects I know of
- Roughly 2000MW worth
- 1/3rd of which is in Northern Queensland

What about Townsville?

- Council considered a site near Woodstock
 - Expensive land & labour
 - Moderate sunlight
 - Poor financial returns
- The Solar City Project
- Great place for Rooftop solar
 - 20-25% more bang for buck than Sydney
 - Residential or Commercial
 - Ergon not hard to deal with
- Best concentrating on biomass, algae, hydro



Funding?

I could get all political here about Govt subsidies for Coal but...

- Large Scale Solar cannot compete with Coal
 - Roughly 15-18 c/kWh vs 4c/kWh LCOE
- ARENA provide 30-50% funding support
 - Must be novel, must show gains, must share knowledge, must be credible counterparties
- RET provides 4c/kWh
- CEFC provide discounted loans
- Aus Banks now involved, Euro banks also
- Private funding for equity

Issues?

- Grid Connection locations not near premium resource
- Cost – still needs to fall further
 - PV Vs Build Cost
- Intermittency
 - Battery technology suited to small scale
 - New Ergon trial in Townsville
- Needs other integration tools
 - Synchronous Capacity a major problem
 - Highlighted by wind in SA
 - Underlined by rooftop solar in Qld
 - Must learn to play well with others
 - Molten salt, biomass, biogas, cleaning up coal, battery systems, wind, pumped hydro, flywheels, natural gas and of course, diesel.

My role in all this?

