

Critical Horizons: Powering the Future of WA

*Innovative solutions for a
new economy:*

*Off-grid, battery energy storage and
micro-grid technologies*

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DISCLAIMER

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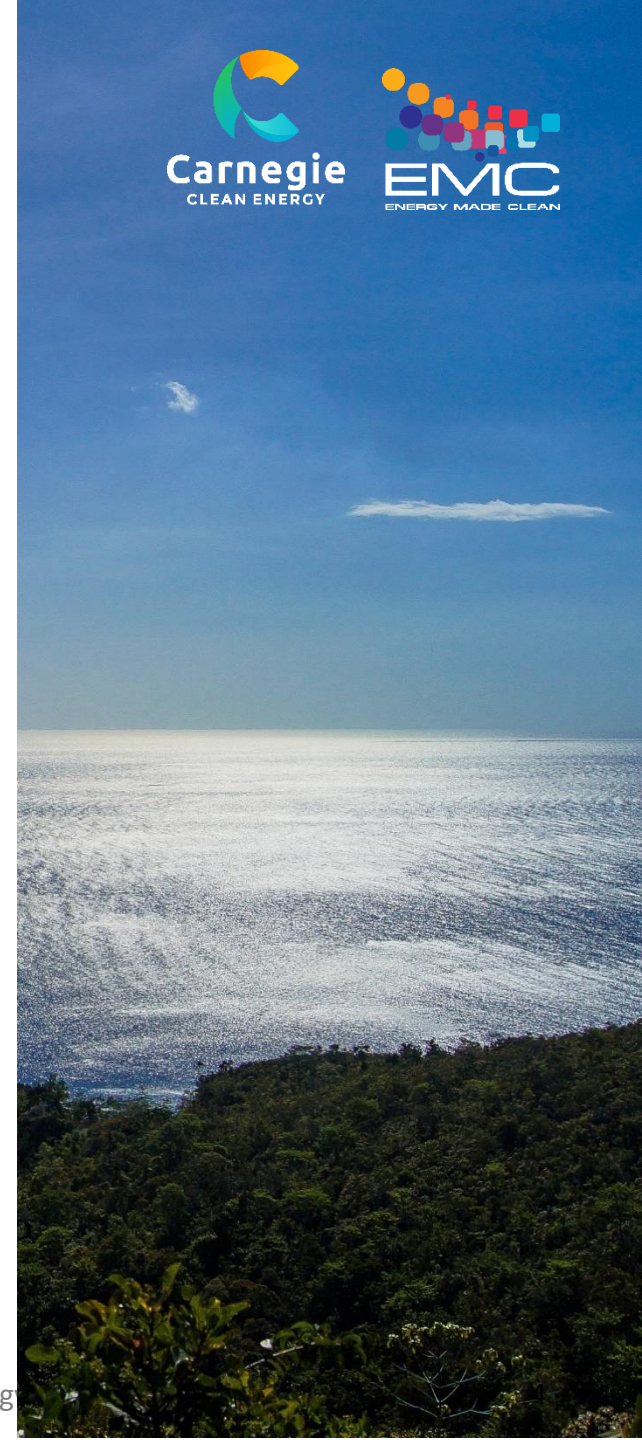
Carnegie Competitive Advantage

- Carnegie is an ASX-listed developer of utility scale renewable energy projects.
- A global leader in the delivery of solar, battery, wave and hybrid energy solutions.
- Business model across the full value chain of design, development, finance, construction, operation and maintenance.
- Established partnerships to deliver national and international delivery capability and enable larger scale projects with Lendlease Services (Australia) and Infratec (NZ and South Pacific).



Transition in the Energy Market

- The renewable energy sector is experiencing transformational growth as a result of more cost effective generation and storage options and the need to reduce greenhouse gas emissions.
- What are the benefits and opportunities for rural and regional communities?
 - Reduce electricity costs
 - Improve energy security/resilience
 - Job creation
 - Reduce greenhouse gas emissions
 - Create community co-investment opportunities



Case Studies



Mackerel Island Microgrid

Customer

Mackerel Islands Corporation

Location

Thevenard Island, 1300 km North of Perth,
Western Australia



FEATURES

- 324 kW Solar PV (ground mount screwpile)
- Corrosive location and high wind (CAT-D) region
- 614 kWh Sony Lithium Iron Phosphate (2 x 40ft containers)
- 440 kVA Diesel Generation (4 x 110kVA)
- EMC fully remote monitored and controls
- Fully Integrated Factory Acceptance Tested in Perth
- >4 Years of operation

CSIRO Australian Square Kilometre Pathfinder

Customer
CSIRO

Location

Off-grid, 645 km North-East of Perth,
Western Australia



FEATURES

- 1.2 MW / 2.6 MWh BESS
- ABB PCS100 / Samsung SDI
- 1.6 MW Solar PV Ground Mounted
- Containerised and RFI shielded
- Fire Suppression / Fire Rated, Centralised HVAC



Garden Island Microgrid

Customer

Power supply agreement with Department of Defence

Location

Garden Island, Western Australia



FEATURES

- Diesel generation and grid infrastructure
- 2 MW Solar PV
- 2 MW / 0.55 MWh battery storage
- Bumpless island operation and grid-parallel



Standalone Power Systems

Customer

Horizon Power and Western Power (WA Government)

Location

Esperance and Ravensthorpe regions
Western Australia



FEATURES

- Systems between 10-80 kWh Lithium Batteries
- Systems between 8-20 kW Solar PV ground mounted

- ✓ Remote
- ✓ Diesel-off operation
- ✓ High Renewable Fraction (>90%)
- ✓ Availability 99.97%

Kalbarri Microgrid – Battery Energy Storage System



Customer

Western Power

Location

Northam, 100 km East of Perth,
Western Australia



FEATURES

- EMC-LL JV to supply 4.5MWh battery, able to supply 5MW of peak capacity with at least 2MWh of energy storage.

- ✓ Technology
- ✓ Community Focused
- ✓ Containerised

Kalbarri microgrid project



Delamere Microgrid

Customer

Lendlease Building, Managing Contractor for
Department of Defence

Location

Delamere, 400 km South of Darwin,
Northern Territory



FEATURES

- 0.4 MW / 0.4 MWh BESS
- ABB PCS100 / Samsung SDI
- 0.36 MW Solar PV Ground Mounted
- 3 x 200kVA generators
- Containerised and fully offsite I-FAT tested
- Plant wide generation, load and operation control system

- ✓ Remote
- ✓ Diesel-off operation
- ✓ High Renewable Fraction (61%)
- ✓ Technology
- ✓ Containerised

Alkimos Utility Scale Energy Storage

Customer

Synergy (WA Government Generator and Retailer)

Location

Alkimos suburb of Perth,
Western Australia



FEATURES

- 0.3 MW / 1.1MWh energy storage system
- SMA SC500 /Samsung SDI
- Offers residents a virtual energy storage rebates for solar PV
- Supported by ARENA (Australian Government) \$3.3m grant
- Containerised and fully offsite I-FAT tested

- ✓ Technology
- ✓ Community Focused
- ✓ Containerised

Thank you

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