



# Content

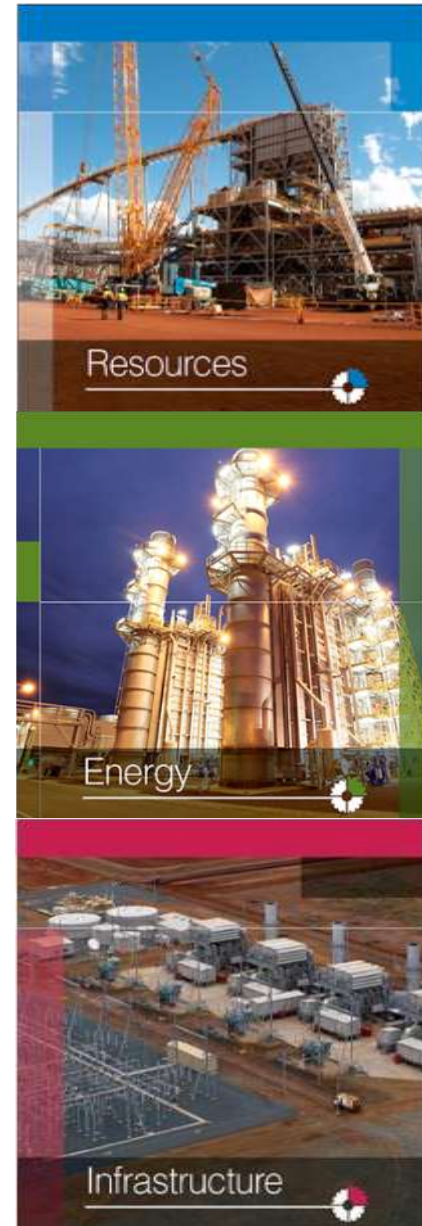


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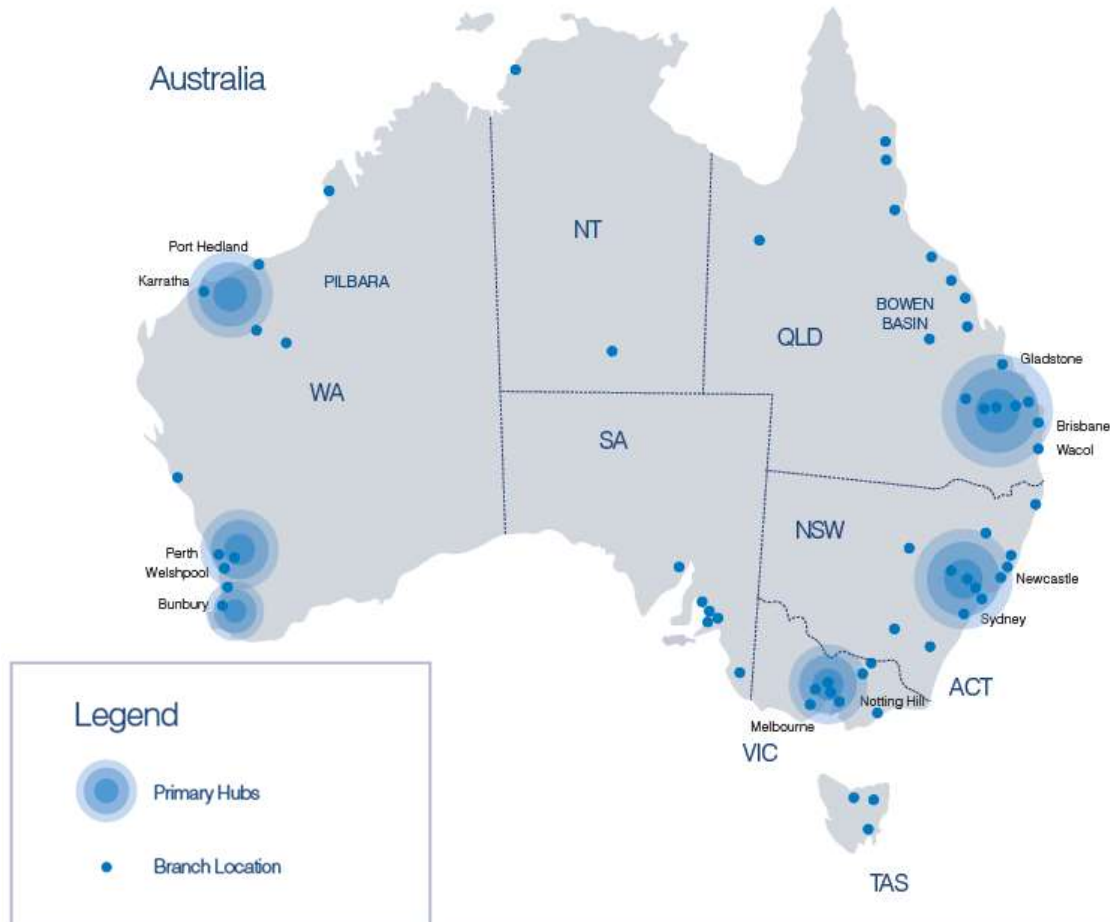
## About RCR Tomlinson (ASX200: RCR)

- RCR, an ASX200 company, provides integrated solutions: Infrastructure, Energy & Resources.
- One of Australia's oldest companies with a long and proud heritage reaching back 119 years.
- Strategically located in the Asia Pacific , including every state and territory in Australia backed by an employee base of approximately 3000 staff including apprentices.
- Boiler-making heritage lead to RCR making the towers for the Albany & Esperance Wind Farms in Western Australia

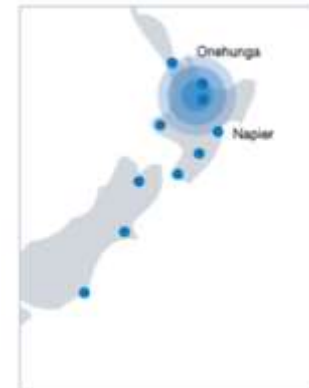


# Strategically Positioned

With 3,000 people and strategically positioned operations, RCR has the ability to undertake and resource large, complex projects.



## New Zealand



# Team Experience



Our team members have delivered Balance of Plant works for numerous renewable energy projects with civil and electrical challenges, including the \$1b Macarthur Wind Farm in Victoria (Australia's largest wind farm), the Broken Hill Solar Farm

Macarthur Wind Farm

# 2006-2010



## Emergence of EPC basis for contracting with AGL Hallett Series



Wind Farm, Developer & OEM



Dominant BoP Contractors

- Hallett, AGL - Suzlon
- Brown Hill, AGL - Suzlon
- Lake Bonney 2 & 3, Infigen - Vestas
- Snowtown 1, TrustPower - Suzlon
- North Brown Hill, AGL – Suzlon
- Waterloo, Energy Australia – Vestas
- Waubra - Acciona
- Woolnorths, Hydro Tasmania – Vestas
- Capital & Woodlawn, Infigen - Suzlon
- Clements Gap, Pacific Hydro – Suzlon **S&I**

- CPP Electrical
- Built Environs
- Downer Engineering
- UGL
- Ward Civil



# 2011 - 2014

Hiatus in wind farm development due to legislative uncertainty coupled with lingering GFC



## Capabilities

- Boco Rock, CWP – GE
- Oaklands Hill, AGL - Suzlon
- Mount Mercer, Meridian - Senvion
- Macarthur, Meridian/AGL - Vestas
- Bald Hills, Mitsui - Senvion
- Gunning – Acciona
- Musselroe, Hydro Tasmania - Vestas
- Collgar, Investec - Vestas
- Snowtown 2, TrustPower – Siemens
- Mortons Lane & Gullen Range – Goldwind

## Dominant BoP Contractors

- CPP
- Hazell Brothers
- Downer EDI
- CatCon Civil
- Leighton

# 2015 - 2018



## Consolidation of BoP teams



Capabilities

- Ararat, RES – GE
- White Rocks - Goldwind
- Hornsdale Series, Neoen - Siemens
- Silverton, AGL/PARF – GE
- Mt Gellibrand - Acciona
- Sapphire, WP/CWP – Vestas
- Yaloak South, Pac Hydro – Senvion **S&I**
- Mt Emerald, Ratchaburi - Vestas
- Coopers Gap, AGL



Emerging BoP Teams

- CPP/CatCon
- Zem Energy/Monadelphous
- Downer
- Fulton Hogan/RJE
- RCR/WBHO





# Four forms of BoP

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- Turbines procured on Supply & Install basis with separate BoP works also contracted by the developer either as individual or wrapped contracts. Widespread until 2006.
- Single EPC contract with OEM as driven by AGL ten years ago
- Where OEM is the developer, BoP scope tends to be let with separate contracts along with logistics etc – ie Acciona & Goldwind
- JV between OEM and BoP/logistics/install team.... ideally 50/50% scope split. Can allow the OEM to simply supply turbines ex works and leave the rest of the scope to the partner – GE's preferred model and illustrated by Mortensen's in the USA over last 20 years

# Benefits of shift to ECI and JVs



RCR's approach focuses on:

- Early Contractor Involvement in buoyant times when the industry as a whole is busy and the large scale RECs are trading above \$80
- Collaborative engagement with our clients: pain/gain share basis for risk pool such as road profiling, geotech & early generation
- Simplifying contracts and DOR documents to reduce gaps & overlaps
- Experienced PM, design, procurement, logistics & site teams
- Continuously applying learnings from past projects
- What is best for project to ultimately lower capital expenditure to improve LCOE?

# Recent Aus Wind Farm Activity



## Yaloak South Wind Farm, Vic

- Balance of Plant JV with WBHO (RCR's civil partner)
- Client – Pacific Hydro
- 14 Senvion MM92 WTGs
- Contract Q4 2016, on site 1 March 2017

## Recent Wind Farm Tender Pipeline

- Willogoleche WF, Engie Mitsui, SA
- Kennedy Energy Park, Windlab, QLD
- Moorabool WF, Goldwind, Vic
- Salt Creek WF, Tilt Renewables, Vic
- Crowlands WF, Pacific Hydro, Vic
- Yandin Hill WF, Alinta, WA (under preparation)
- DPEnergy hybrid wind, solar & BESS (under preparation)



# Emergence of Utility Scale Solar

RCR solar projects under contract include:

- Broken Hill - First Solar/AGL, NSW 53MW<sub>ac</sub> (complete)
- Darling Downs ECI – Origin Energy, QLD 110MW<sub>ac</sub>
- Sun Metals, Townsville, QLD 124MW<sub>ac</sub>
- Gannawarra – Edify, Kerang, Vic 50MW<sub>ac</sub>
- Manildra – First Solar, NSW 48.5MW<sub>ac</sub>



# Summary

- In parallel to the consolidation of the OEMs, BoP teams are working together more consistently.
- Improved efficiency as turbines grow in scale & innovation and professionalism of BoP teams
- There is a shift to Early Contractor Involvement to expedite projects and avoid expensive tendering costs
- Developers want to sell renewable energy and are less prescriptive about whether the electrons are sourced from wind, solar, geothermal, wave, hydro or batteries



# Broken Hill Solar Farm



<b>Client / End Client</b>	First Solar / AGL Ltd.
<b>Location</b>	Broken Hill, NSW
<b>Description</b>	The Broken Hill Solar Plant is a 53 MW solar PV power station located five kilometres southwest of Broken Hill. The solar plant occupies approximately 140 hectares and has over 650,000 solar PV modules installed at the site. The modules are fixed (non-tracking) tilt, at a 25 degree angle facing north. The modules were wired together in standard arrays which connected to inverters to transform the DC current produced by the modules into AC current, to be fed into the grid network. The solar plant was connected to the electrical grid via a 22 kV transmission line that connected into an existing substation, located 2.7 km to the east of the site.
<b>Scope of Work</b>	RCR was the electrical subcontractor responsible for the installation, testing and commissioning of the DC and AC plant, including the thin film PV modules. RCR undertook the detail civil and trenching works, AC/DC/Communication cable installation, terminations and earth grid works, in addition to installing 40 inverter stations, two 22kV Switchrooms, SCC (SCADA) and OEM buildings. RCR successfully completed 130,000 man hours within 6 months, one month ahead of schedule with 0 Lost Time Injuries.

# Broken Hill Solar Farm



- **Key Challenges**

- Design gaps and compliance
- Delivery schedule of free issued material
- Site conditions – heat, dust and geology
- Direct labour and productivity

- **Delivery Outcomes**

- Completed electrical detailed design and compliance
- Exceeded production rates achieved by previous First Solar contractors
- 130,000hrs LTI free delivery and completion one month ahead of schedule

- **Key Lessons Learned**

- Detail design to be carried out locally with strong constructability input.
- Sequencing of the works will give biggest gains on time and cost.
- Productivity, meeting minimum requirements and managing repetitive works
- Supervision and management – safety, quality, and site logistics
- Minimise reliance on free issued material (compliance & programme)
- Qualified labour norms and production rates