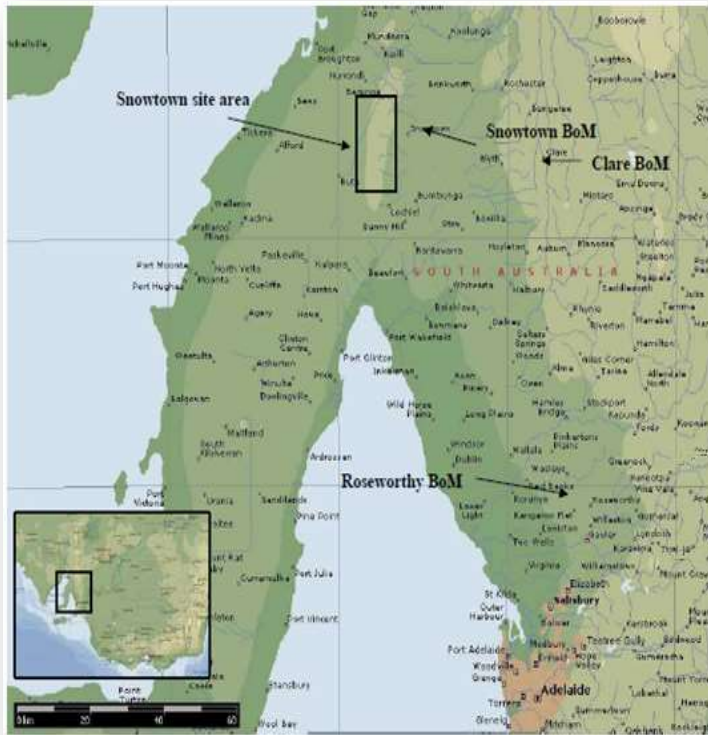




Snowtown Wind Farm – Stage 2 Project Update

NZWEA Conference
April 17th, 2014

A Fantastic Site



Snowtown Stage 1

An aerial photograph of a wind farm in a dry, hilly landscape. The terrain is brown and arid, with rolling hills and sparse vegetation. Numerous white wind turbines are visible, stretching across the horizon. In the foreground, a dirt road curves through the landscape, and a small white vehicle is parked near the base of a large wind turbine on the right side of the frame. The sky is clear and blue.

- 48 x Suzlon 2.1 - 88
- Completed Oct 2008
- 350 GWh p.a.
- 345,000 tonne CO2 offset p.a.

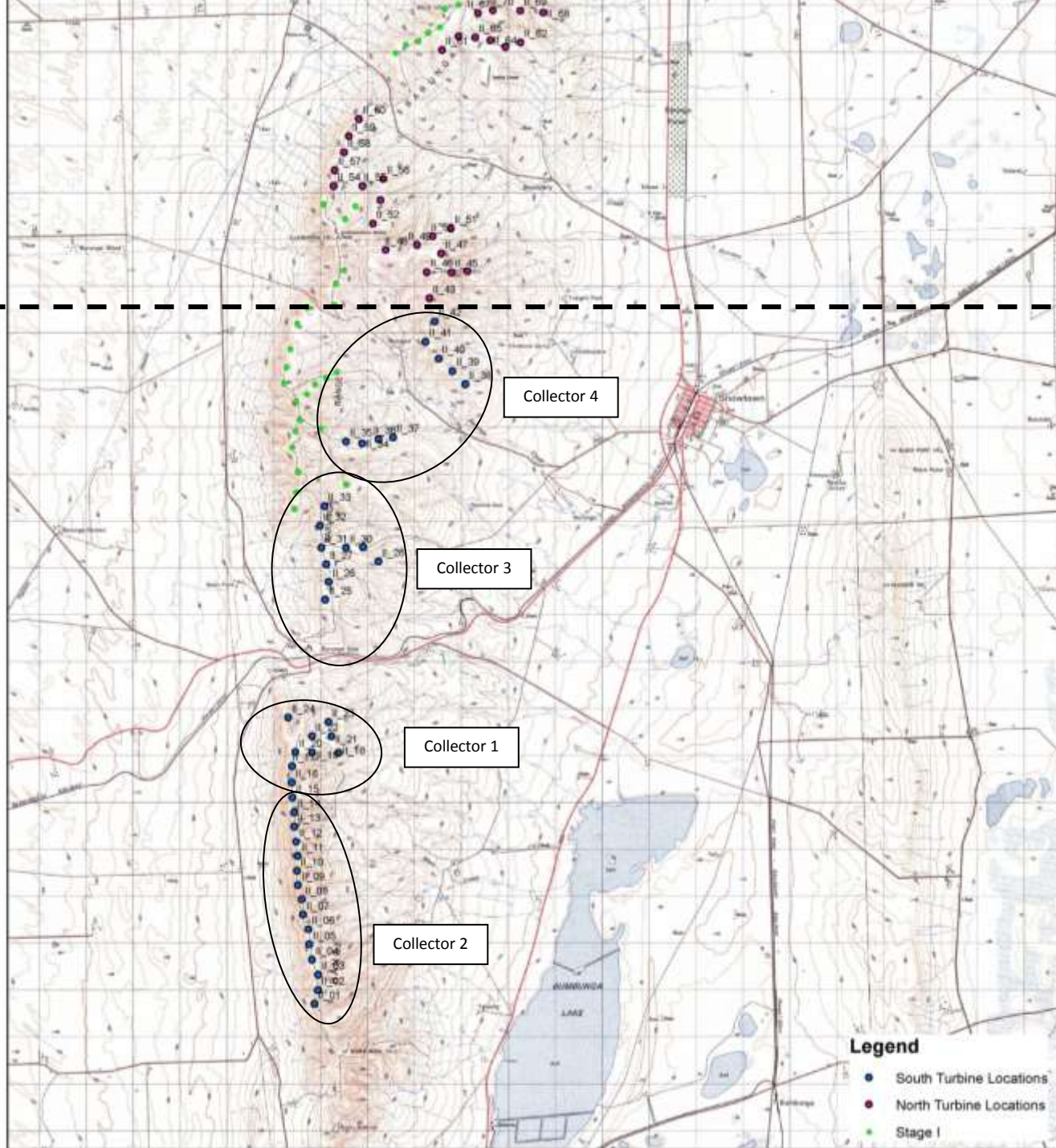
Snowtown Stage 2

An aerial photograph of a wind farm. In the foreground, a large white wind turbine stands prominently on a grassy hill. Behind it, a line of similar turbines stretches across the landscape, which consists of rolling hills with patches of green grass and brown earth. The sky is blue with scattered white clouds. The overall scene is bright and clear.

- 90 x Siemens Wind Turbines (SWT)
 - 10 x SWT-3.0-101
 - 80 x SWT-3.0-108
- 985 GWh p.a.
- 700,000 tonne CO₂ offset p.a.

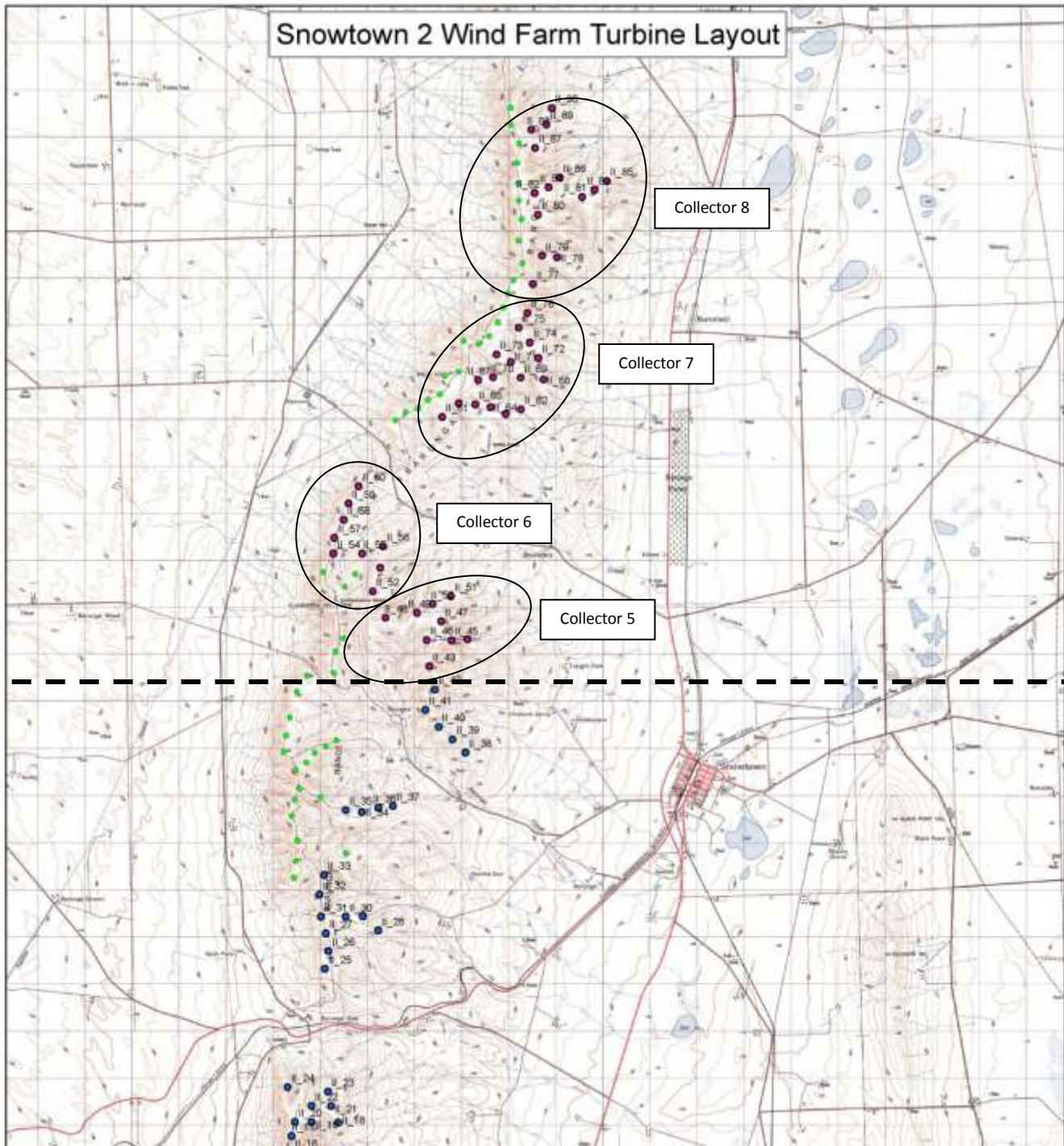
SWF2 South

42 WTG's



SWF2 North

48 WTG's



The Turbines



Parameter	SWT-3.0-101	SWT-3.0-108
IEC Class	IA	IIB
Type	3-bladed, horizontal axis	3-bladed, horizontal axis
Diameter	101 m	108 m
Swept Area	8,000 m ²	9,160 m ²
Generator	Synchronous, PMG, 3,000 kW	Synchronous, PMG, 3,000 kW
Speed Range	6-16 rpm	6-16 rpm
Hub-height	79.5 m	79.5 m
Operational Temperature Range	-10°C to +45 °C	-10°C to +45 °C

Key Facts

- 80m turbine hub height
- Maximum blade tip height of 134m
- 41km of site roading
- 96km underground cabling (33kV)
- 19km of onsite overhead line (33kV)
- New switching station 7km west of Blyth
- 28km of 275kV line to Blyth switching station



Schedule

Item	Planned Date
Roads / Hardstands Construction	Dec 12 – Dec 13
Foundation Construction	Dec 12 – Dec 13
Blade Shipments (6)	Jun 13 – Jan 14
Tower Shipments (6)	Jun 13 – Jan 14
Nacelle, Hub Shipments (3)	Jun 13 – Dec 13
WTG Erection Period	Jul 13 – Jun 14
Pre-commission First String of Turbines	31 Oct 2013
Date for First Synchronisation	31 Oct 2013 (contract)
Commissioning of all WTG's Completed	Jul 14
Reliability Tests Completed	Aug 14
SWF-II North complete	Apr 14
SWF-II South complete	Sep 14
Off Site / Final Handover Complete	Nov 14

Community



Benefits

- Employment
 - Around 150-225 local and State site staff during construction (500,000 man-hrs to date, 160 FTE equiv)
 - 25 – 30 local & state contractors
 - Estimated spend of \$85M on local and State contractors and consultants
 - Up to 15 site staff post construction

Benefits

- Community
 - No objections during public consultations, DA process
 - Advocates through experience
 - Partnerships & Sponsorships
 - Snowtown Lions Club - Lend a Hand Foundation Snowtown
 - Snowtown Community Centre
 - Local clubs / Clare Rotary
 - SA Hang Gliding Assn

Benefits

- Environmental
 - Native grassland Environmental Benefit offset programme (104Ha);
 - improved native grasslands biodiversity
 - improved land productivity
 - habitat protection for pygmy blue tongue lizard population
 - Native tree and shrub planting programme
 - CFS relationship, fire response, access and breaks
 - Wedge Tail Eagle breeding

Benefits

- Aboriginal Heritage
 - Surveys, monitoring, artefact preservation and agreed exclusions areas
 - Commitment to support heritage initiatives
 - Facilitating aboriginal training and employment opportunities
 - Ongoing aboriginal community fund contributions

Progress

- Work commenced in Sept 2012
- Erection and commissioning phase 65% complete
- 70 turbines erected, 58 operating
- Completion expected Sept 2014

Wind Farm Site (Siemens)

- 100% of the Roding, hardstand and foundations complete
- ~95% of the 33kV cable trenching and laying complete
- Substation commissioned Sept 30th

Progress

Procurement

- Blade deliveries to site since July
- Turbine components delivered since July
- Tower manufacture (20), Australia (E&A), from Feb
- Tower manufacture (70) since July
- All overseas components have landed in Australia



Progress

275kV Transmission Line Construction (Downer)

- Line completed and tested on July 28th

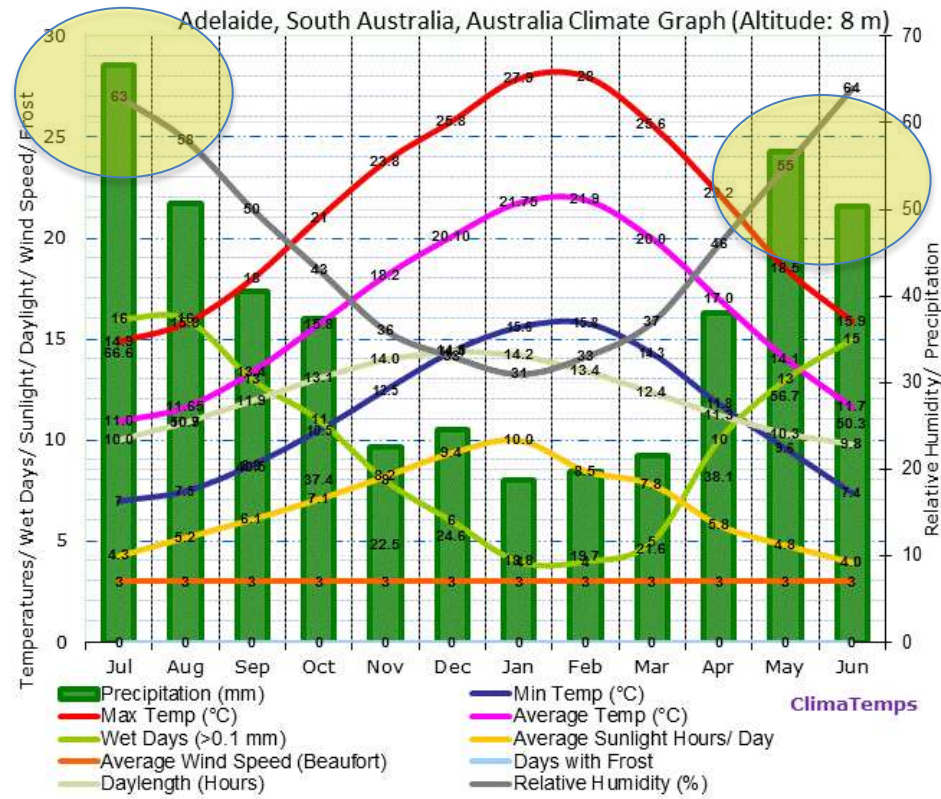
Blyth West Switching Station (ElectraNet)

- Commissioned on Sept 14th



Challenges

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Dec 29	30	31	Jan 1	2	3	4
Actual Temp 25° Lo 10° Hist. Avg. N/A Lo N/A	Actual Temp 31° Lo 12° Hist. Avg. N/A Lo N/A	Actual Temp 36° Lo 13° Hist. Avg. N/A Lo N/A	Actual Temp 36° Lo 23° Hist. Avg. N/A Lo N/A	Actual Temp 21° Lo 14° Hist. Avg. N/A Lo N/A	Actual Temp 20° Lo 14° Hist. Avg. N/A Lo N/A	Actual Temp 21° Lo 12° Hist. Avg. N/A Lo N/A
5	6	7	8	9	10	11
Actual Temp 21° Lo 7° Hist. Avg. N/A Lo N/A	Actual Temp 21° Lo 6° Hist. Avg. N/A Lo N/A	Actual Temp 21° Lo 9° Hist. Avg. N/A Lo N/A	Actual Temp 26° Lo 11° Hist. Avg. N/A Lo N/A	Actual Temp 32° Lo 9° Hist. Avg. N/A Lo N/A	Actual Temp 36° Lo 15° Hist. Avg. N/A Lo N/A	Actual Temp 33° Lo 17° Hist. Avg. N/A Lo N/A
12	13	14	15	16	17	18
Actual Temp 33° Lo 14° Hist. Avg. N/A Lo N/A	Actual Temp 39° Lo 21° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 21° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 22° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 21° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 22° Hist. Avg. N/A Lo N/A	Actual Temp 30° Lo 20° Hist. Avg. N/A Lo N/A
19	20	21	22	23	24	25
Actual Temp 28° Lo 13° Hist. Avg. N/A Lo N/A	Actual Temp 29° Lo 13° Hist. Avg. N/A Lo N/A	Actual Temp 25° Lo 12° Hist. Avg. N/A Lo N/A	Actual Temp 27° Lo 13° Hist. Avg. N/A Lo N/A	Actual Temp 31° Lo 17° Hist. Avg. N/A Lo N/A	Actual Temp 26° Lo 16° Hist. Avg. N/A Lo N/A	Actual Temp 25° Lo 12° Hist. Avg. N/A Lo N/A
26	27	28	29	30	31	Feb 1
Actual Temp 31° Lo 14° Hist. Avg. N/A Lo N/A	Actual Temp 38° Lo 12° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 16° Hist. Avg. N/A Lo N/A	Actual Temp 31° Lo 16° Hist. Avg. N/A Lo N/A	Actual Temp 39° Lo 21° Hist. Avg. N/A Lo N/A	Actual Temp 38° Lo 19° Hist. Avg. N/A Lo N/A	Actual Temp 41° Lo 24° Hist. Avg. N/A Lo N/A





Challenges



- 28km site
- Operating asset

Successes

- Health & safety
- Environment





Successes

- Relationships
- Programme
- Production

Acknowledgements

An aerial photograph of a wind farm. In the foreground, a large white wind turbine stands prominently on a grassy hill. A dirt road winds through the landscape, leading to several other turbines in the middle ground. The terrain consists of rolling hills with sparse vegetation. In the far distance, more turbines are visible against a horizon line under a bright blue sky filled with scattered white clouds.

Community

- Indigenous grps, landowners, neighbours, NGO's

Regulators / LA's

- AEMO, ElectraNet, Wakefield RC, Police

Contractors

- Siemens, Catcon, CPP, ENET, Downer
- Local contractors



Thank You



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Project Photos



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Site Roads and Hardstands



Site Roads



Rock Anchor Foundation Pour (66)



Rock Anchor Foundation Backfilled & Drill Unit



Gravity Foundation Pre-Pour (24)



Gravity Foundation Pour & Backfill



Final Foundation Pour (July 10th, 2013)



Cable Trenching and Laying



Wind Farm Northern Compound



275kV Transmission Line Stringing (28 Km)



Wind farm Substation



Wind farm Control Room



Wind farm Substation and 275kV Transmission Line



Main Transformers



Blyth Switching Station Site



1200 Tonne Main Crane



1200 Tonne Main Crane



Towers in Port



Blades at Factory



Blade Deliveries



Blade Deliveries



Blades On site



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



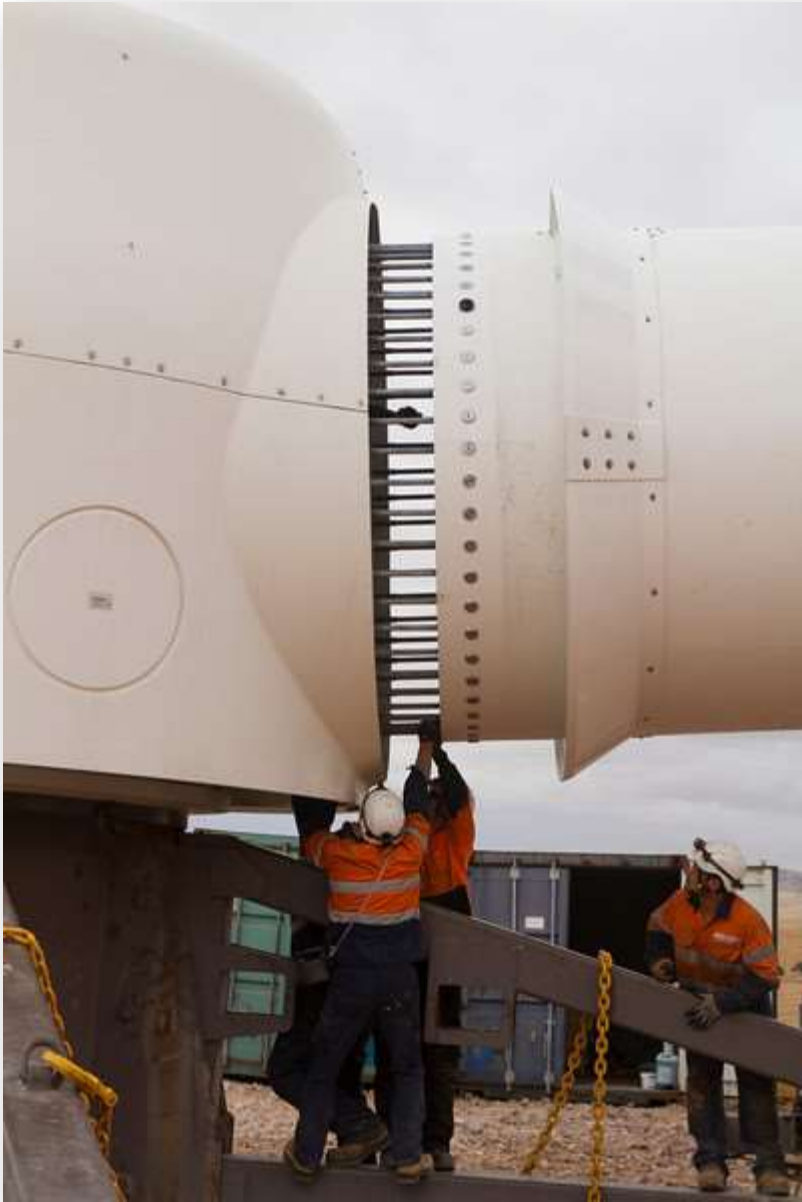
Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



Turbine Erection Sequence



