ARARAT
WIND FARM

Ararat Wind Farm

Construction Update April 2016

Downer
Relationships creating success

Jonathan Rowlands
Tanya Jackson

Ararat Wind Farm Construction Update April 2016

DOWNER-GE

Welcome to the first issue of the Ararat Wind Farm monthly construction update.

The Ararat Wind Farm is a 240MW, 75 turbine Wind Farm in south-west Victoria which, once completed, will be the third largest wind farm in Australia. It was the first major wind farm contract to be signed following restored bipartisan support for the Renewable Energy Target (RET) in June 2015. The project has attracted almost half a billion dollars of direct international investment into Victoria and has continued to invest in the local community throughout the initial stages of the construction process.

Ararat Wind Farm Pty Ltd is co-owned by a consortium of Renewable Energy Systems ("RES"), GE (NYSE: GE), Partners Group on behalf of its clients, and OPTrust.

The project also benefits from a power purchase agreement with the Australian Capital Territory Government (ACT), guaranteeing the purchase of approximately 40 per cent of the energy produced at the site, which was awarded under the ACT's Wind Auction announcement in February 2015.

The Ararat Wind Farm will produce enough electricity to power around 123,000 homes per annum or approximately six per cent of Victoria's households.

Construction of the Ararat Wind Farm is a joint venture between Downer and GE along with their various specialist build partners.

WHAT'S HAPPENING?

BALANCE OF CIVIL WORKS AWARDED

Lucas TCS has recently been awarded an Ararat Wind Farm civil works subcontract to construct 37 km of access track, wind turbine hardstands and the excavation of wind turbine foundations.

The work includes 440,000m^3 of cut and fill and around 150,000 tonnes of crushed rock for the access tracks, hardstands and drainage structures.

Lucas' portion of civil works on this project is due for completion in September 2016.

TRANSFORMER INSTALLATION COMPLETE

The arrival of two purpose built transformers for the Ararat Wind Farm substation in March marks a significant project milestone for the construction joint venture between GE and Downer.

The transformers, procured via a $4 million contract with Victorian-based Wilson Transformer Company, are over 8 m in length, 4.5 m wide and 7 m high when fully assembled. The Transformers were installed in the wind farm electrical substation to convert the 33 kV farm electrical collector network to 132 kV for transmission to the electricity grid at Elmhurst.

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Turbine Foundations aren't all made the same

by Rod Hetherington

This April the Ararat Wind Farm has reached a new milestone, the first wind turbine generator foundation concrete pour. The Wind Farm towers will be approximately 85 m tall and will be supported by one of two separate foundation designs – A Mass Gravity Foundation or a Rock Anchored Foundation. The Gravity Foundations consist of approximately 340 cubic metres in volume of concrete, measure 17 m face to face, consisting of 36 tonnes of conventional steel reinforcement, and are embedded approximately 3 m in the ground. The gravity footings design is based on an engineered design for securing the turbines through the shear mass of the concrete and the overburden buried under the surface. The Rock Anchored Foundations are locked onto the ground by Post-Tensioned Anchors drilled and grouted into the rock 20 m below the tower base. These foundations are smaller on the surface with only 8m face-to-face and a concrete mass of only 120 cubic metres in volume. The key to these foundations is the post tensioned anchor which can be founded in only the most competent of rock.

Figure 1 - Blinding concrete for foundation poured, due to the nature of the rock material blinding can sometimes require over 100m³ of concrete.

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Figure 2 - Steel reinforcement installation in a gravity foundation.

Figure 3 – Bolt installation in a gravity foundation.

Figure 4 - Installation of the conduit and reinforcement, these conduits will allow the turbine transformer to connect to the Wind Farms electrical network.

Figure 5 - The final step, all the steel has been installed in this foundation and it is now ready for the concrete to be poured.

Substation

The two purpose built transformers are installed in the Ararat Wind farm substation and have had the fire wall between the two installed. Once commissioned the two 96-tonne transformers will step up the voltage generated in the wind farm from 33 kV to 132 kV for the transmission to the station at Elmhurst.

FAST FACTS

199,627m^3

Of material excavated on the project to date.

22,803m^2

Of access track material laid on site to date.

62km

Of trenches required for the electrical cables.

230km

Of single core electrical cable required to connect the turbine generators to the substation.

150

Total of People employed on the project during the month of March

Upcoming in May

Over the next month Downer are expecting a significant increase in the pace of works across the project with several new construction partners expected to commence their work activities and existing build partners increasing their current work force to match construction requirements.

Some of the anticipated activities coming up over the next month are;

- The assembly of the main large crane, (600-Tonne) utilized to erect the turbines, to site,
- The ongoing delivery of heavy plant and equipment along the Pyrenees Highway for the construction of access tracks and other major civil works.

Heavy component movements in May

In the month of May there is a single set of heavy vehicle deliveries planned for the week of the 16th-22nd. During this week it is anticipated that a series of Tower Bases will be delivered for installation in the first of the turbine foundations completed to date.

Road works planned in May

During the month of May there will be a series of ongoing minor road works on Big Hill Road at the top of the rise where the access track network crosses this road. These works are planned to be completed by mid-May, however, caution should be used when approaching this crossing from either direction as heavy plant and equipment will continue to use this road throughout the construction process.

There are further works planned for May on a section of Hopkins River Road where the projects access tracks are intended to pass from one side of the road to the other. Downer advises that everyone observe all safety signage and speed limit reductions during these works as the area will be exposed to significant heavy plant movement during the construction period.

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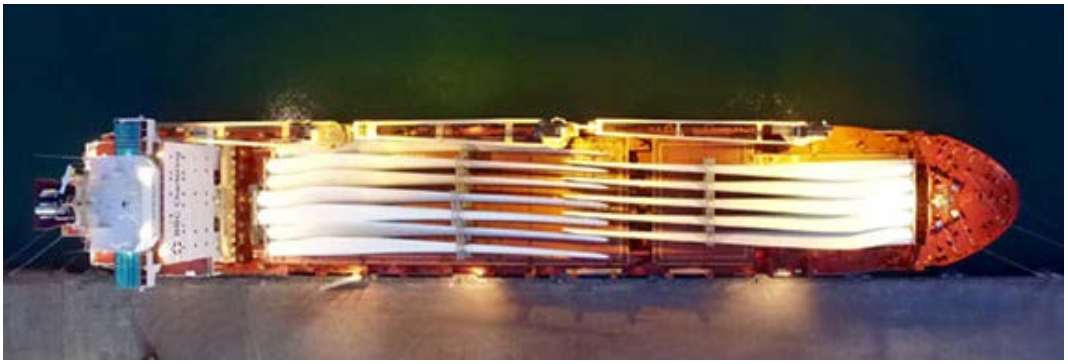
Ararat Wind Farm: bring on the blades!

June 22, 2016

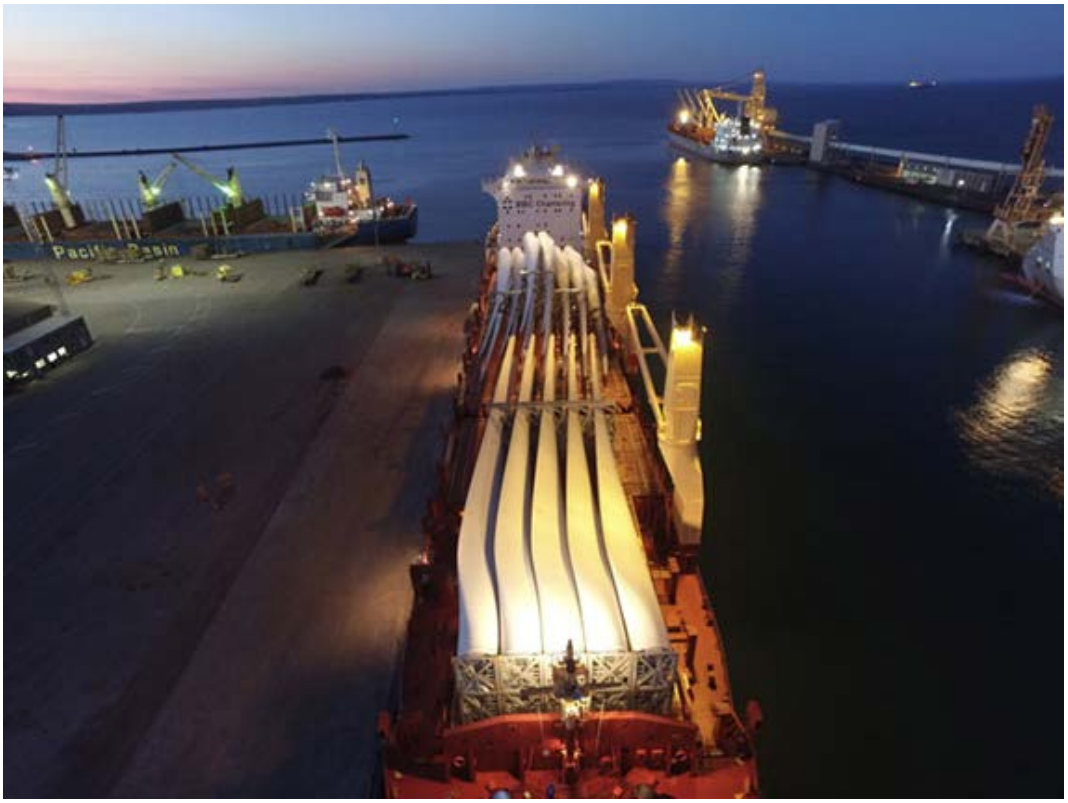
The official ground-breaking for Ararat Wind Farm was only in November 2015, but construction is in full swing at the site, which stretches across prime wind positions atop Victoria's Great Dividing Range and is set to be Australia's third-largest wind farm, 180km north-west of Melbourne .

Turbine towers will soon begin rising from the hills, and the blades that will spin from the nacelles have arrived on board the BBC Danube from Brazil. Ahead of a celebration in Ararat to welcome the blades (and the extra construction jobs on the site that arrive with them), let's take a moment to marvel at the precision and

supervision it takes to ship and transport these 50-metre-long, high-tech wind wands.



It could be a scene from *Vikings*, oars shipped. It's certainly an advertisement for pulling together—collaboration—and world trade. This aerial shot of the BBC Danube, docked at Portland in Victoria, shows the first cargo of wind-turbine blades destined for Ararat Wind Farm. The 50-metre-long blades landed after their long journey from Brazil, a manufacturing centre for turbine components. The Ararat project is destined to be the third-largest wind farm in Australia, and its long journey to realisation was achieved by a partnership between Renewable Energy Systems (RES), GE and services-and-infrastructure company Downer.

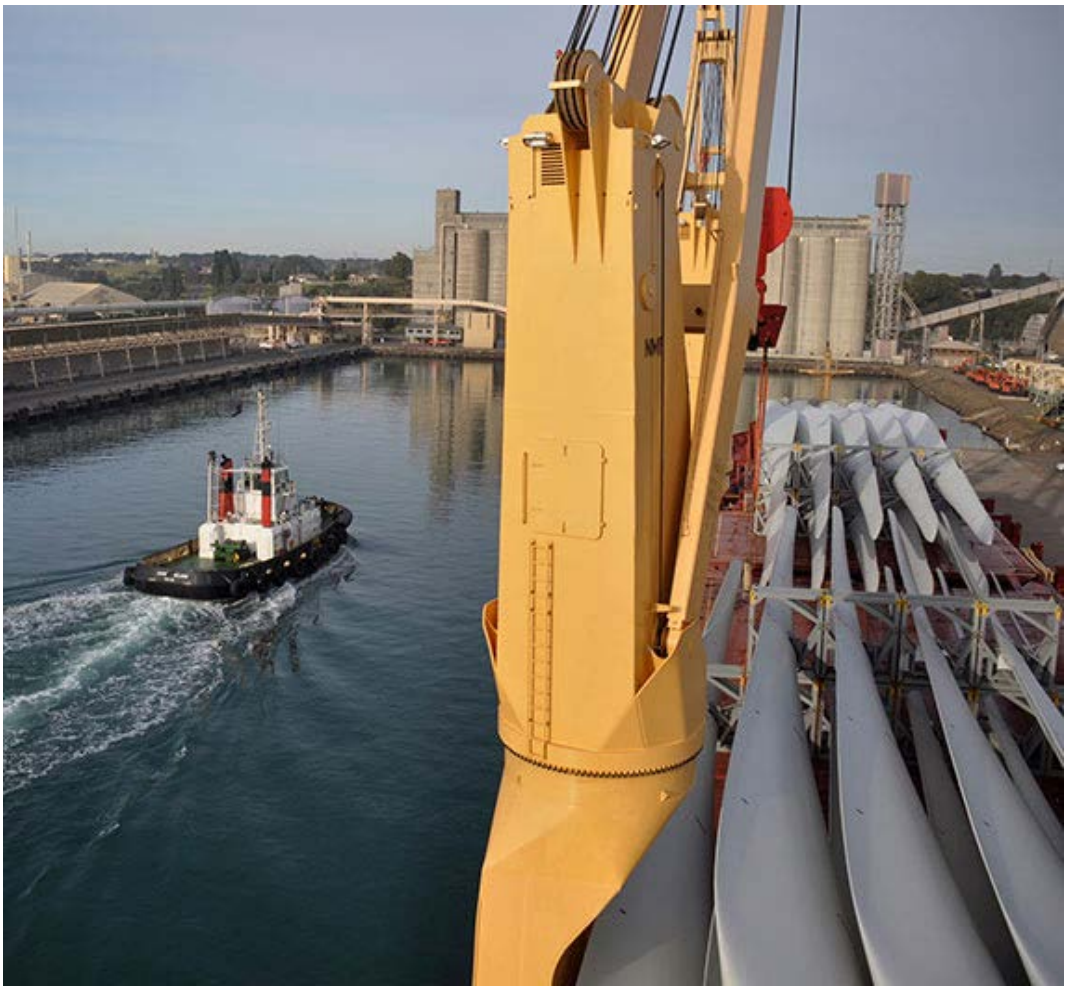


The charter vessel, Danube from above, looking out along the sinuous forms of wind-turbine blades, from stern to bridge and out to a glorious Portland dawn.

The blades are set to turn atop GE 3.2-103 brilliant wind turbines, on towers manufactured in Vietnam and here in Portland at nearby Keppel Prince Engineering.

Welded clips helped secure the deck-stored load of turbine blades destined for Ararat Wind Farm.

Another view of the secured cargo shows 10 blades in the forward stack. This end of the blades will connect to the bus-sized nacelles at the top of Ararat's 75 turbine towers. The nacelle houses the gearbox that transforms the slow turning of the blades to a faster rotor speed, the generator, the drive train and the brakes!



A job well done! A Portland tug chugs back to the dock. Situated strategically between the ports of Melbourne and Adelaide, Portland was the logical landing place for turbine components destined for Ararat, which is only 200 km inland by road. Tugs put a little grunt into moving the $2.5 billion annual income that the region derives from trade through this harbour facility.

At last the cranes swing gently into action, shifting each 9.5-tonne blade carefully from ship to shore. The backdrop shows the deepwater port of Portland, which specialises in the import and export of bulk commodities such as agricultural and mining products, aluminium and fertiliser, and in this case the means to clean, green energy—these blades have a of total installed capacity of 240MW.

Smooth moves: the brackets that held the blades in comfortable recline on the decks of the BBC Danube, also secure the blades to wheeled transport for their inland journey.

Ready to roll, the blades stretch out behind the truck cabs like bridal veils in the breeze. They're the perfect match for the windy ridges of Ararat's section of the Great Dividing Range. As the procession of the first three blades, each with its attendant 12 pilot vehicles, begins the 200-kilometre journey along the Pyrenees

Highway, a celebration is gathering in the township of Ararat.

Images: Troy Lowther of 3FB Aerworx, and RES

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Wise words on wind energy

Turbine blade puts fresh spin on renewable

ARARAT WIND FARM

COMMUNITY NEWSLETTER

NOVEMBER 2016

CONSTRUCTION UPDATE

TURBINES ARE TURNING

Less than a year since construction started in earnest at Ararat Wind Farm, power is flowing to the grid. 25 of the wind farm's 75 turbines are now fully commissioned and generating an average of 23MWh of electricity daily. This represents enough electricity to power nearly 42,000 homes per annum. The power is transmitted across 21.5km of transmission line and connection works, including 106 poles, to the grid via the 132/220kV transformer installed at Elmhurst by Powercor Network Services.

Powercor on behalf of Ararat Wind Farm designed and constructed the new terminal station where the transformer resides. The terminal station was fully energised by the end of June 2016.

October saw the final shipment of blades berth in Portland and safely unloaded. By the end of the year Ararat Wind Farm hopes to have all components on site marking the end of heavy transport convoys from Portland to Ararat.

Eight units awaiting unloading

Discharge of blades from the hatch covers

WHAT WE'VE ACHIEVED TO DATE

Turbines erected - 49 of 75

Transmission lines - 100% completed and permanently energised

Tracks completed – 84% of the required 52km of internal roads

70% of all wind turbine components have been delivered to site

Number of turbines commissioned and generating electricity - 25 of 75

COMMUNITY ENGAGEMENT ACTIVITIES

Ararat Wind Farm continues to support local community events as a part of its engagement activities. The past few months has seen us lend support to the events profiled below.

Ararat Pony Club

Ararat Wind Farm recently sponsored the Ararat Pony Club's endurance ride. The event proved to be the biggest and most successful endurance ride held in the region and one of the biggest in the state. Many riders participated, attempting to qualify for the 160km Tom Quilty race, a prestigious international event held in Lexton soon after the endurance ride.

The idea for this event started as a fundraiser for Ararat Pony Club. It has also provided another endurance ride in this part of the state and serves as an introduction to the elite sport for both the pony club members and the community.

The winner of the "Ararat Wind Farm" rug for Best Condition Medium Weight - Wendy Riha.

Perennial Pastures Conference

Perennial Pasture Systems (PPS) is an independent farmer group that was formed in the Upper Wimmera in 2007. The group's aim is to push the boundaries of perennial pasture research in the region and provide information on productive pasture management to members. Since its formation PPS has had 135 farm businesses join the group; collectively they farm 142,407 hectares and carry approximately 920,383 Dry Sheep Equivalents. Cropping and export hay operations are also conducted on many of the farms.

Ararat Wind Farm was pleased to provide financial support to this important event. A total of 130 people attended throughout the day and evening including PPS farmer members.

LOCAL BUSINESSES BENEFIT

LOCAL CONTRACTS EXCEEDING ESTIMATES

At the commencement of the project and following some preliminary economic studies, Ararat Wind Farm estimated its construction would provide $10 million worth of contracts to local and Victorian businesses. With another six months until project completion, the wind farm has more than $20 million under purchase orders across the region from Ballarat to Horsham.

In a recent interview by the Australian Wind Alliance, Ararat Rural City Council's Mayor Paul Hooper said the wind farm was "putting hundreds of thousands of dollars into our local economy on a weekly basis."

He went on to say the construction of the wind farm puts Ararat on the map through the provision of significant marketing and environmental benefits.

To see the interview in full, please visit our website at ***http://www.ararat-windfarm.com/news/***

Interested in seeing the Wind Farm?

Ararat Wind Farm is inviting the first 150 people to register the opportunity to tour some of the completed sections of the wind farm including operational turbines.

When

Friday 9th December – 2pm, 4pm and 6pm.

Where

Meet at Kokoda Park, McLellan St, Ararat

How

Please visit the online registration page at:
http://www.ararat-windfarm.com/visit/
to register your interest.

Only pre registrations will be able to participate. Names will be marked off as visitors board the bus. The bus will transport visitors from Kokoda Park to the wind farm, drive along some completed sections of the site and enable visitors to appreciate the size and scale of the turbines from close up. The bus will then return you back to Kokoda Park in Ararat (total duration max. two hours).

What if I miss out?

Unfortunately as the wind farm is still an active construction site we need to limit numbers to one bus load at a time. Ararat Wind Farm will host a community day once all construction is complete in May 2017.

WANT MORE INFO?

Freephone: **1800 738 807** or **02 8440 7400** to speak to a member of the team.

Or contact a site representative on **03 5359 4000**.

Or visit our website: **www.ararat-windfarm.com**

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