Economic Benefit Study

Wombelano Wind Farm

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Prepared by Wind Projects Australia

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1. Introduction

The Wombelano Wind Farm (WWF), consisting of up to seven Wind Turbine Generators (WTGs), will be the first wind farm in the West Wimmera Local Government Area (LGA) in Western Victoria.

In this report, expected investment is estimated, as well as identifying the number of jobs likely to be generated through this project, and finally an assessment is presented of the long-term economic impacts.

2. Investment

The WWF, with up to seven WTGs, is likely to have a capacity of approximately 25 MW, based on the existing transmission capacity between Charam Zone Substation and Horsham Terminal Station.

Typical Capital Expenditure (CAPEX) for wind energy facilities is in the order of $1.8 million/MW, implying a CAPEX in the order of $45 million.

This is typically divided into the Supply and Install (S&I) cost, paid to the turbine supplier usually referred to as the Original Equipment Manufacturer (OEM). OEMs tend to have global supply chains, with the WTG componentry sometimes assembled in Australia. Final WTG transport and on-site assembly of the rotor is also completed with local staffing resources and Australian lifting/transport equipment.

S&I costs typically account for 60% – 70% of the total CAPEX. The remaining Balance of Plant (BoP) is likely to be in the order of $15 million – $20 million, of which nominally 60% – 80% would be spent locally – due to local jobs and sourcing local resources. This is broken into two broad trades – electrical and civil typically including:

Civil

- Road base for access tracks and crane hardstands built at each turbine location.
- Concrete for footings. This will ideally be mixed on site with a portable batch plant using local sand and aggregate. Although the footings have not been designed yet, the approximate volume of the footings will be 650 m^3 which will require 110 concrete truck loads. The pours will commence early in the morning and finish mid-afternoon. The footings will be approximately 18 m in diameter.
- In preparation for the footing there will be excavation, surveying, the placement of steel reinforcement, earthing cables and conduits for cabling.
- Surveying scope and road preparation which can include stormwater drainage and geo-mesh fabric to control erosion risk.

Electrical

- Underground cables are usually aluminium with PVC sheathing laid in trenches approximately 1000 mm deep. Having the cables at this depth allows cropping to continue as normal above the cables although the cable location will be marked with signage to remind people attending the property.
- Depending on the characteristics of the material excavated from the trench, it is often appropriate to partly back-fill the trenches with sand to improve the thermal efficiency of the cabling system.
- Optic fibre cabling is usually laid in the same trenches, as the WTGs are all connected and remotely monitored and controlled.

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- Switch-gear at the base of the WTGs plus switch-gear, metering, protection and communications equipment at the local substation.
- Switchgear, switchboards and transformers are manufactured across the world, with some components manufactured in Victoria, for example Wilsons Transformers in Glen Waverley, Victoria and Nexans Olex Australia whose factory is in Lilydale, also in Victoria
- While the specific supply chain has not been finalised, the final sourcing of electrical componentry will likely be a balance of local and imported components that achieves competitive pricing and timing.

The WWF may implement either concrete towers or steel towers. There are two steel tower manufacturers in Australia. These manufacturers have longer lead times as many projects are seeking local contribution. As a result, steel towers would likely be imported.

Alternatively, concrete towers would be a significant innovation, not having been implemented in Australia previously. This would both add to Australia's intellectual property as well as requiring batching and manufacturing in the West Wimmera region. The concrete tower solution would bring an additional $5 million – $7 million of local investment to circulate through the Australian economy that would otherwise have been spent on steel towers from off-shore – most commonly China, Indonesia or South Korea. Both steel and concrete towers have been illustrated in the two sets of photo-montages prepared for the planning submission for this project. The concrete towers are slightly wider at the base and are not painted as they will fade to off-white without requiring any further treatment.

There are various suppliers of precast concrete component installation systems emerging. The proponent that we have engaged with in most detail is Jacking Systems Limited, whose system is described on the website jackingsystems.com.

Jobs

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Construction

The total capital investment for the project is approximately $45 million using the metric of $1.8 million per mega-Watt installed.

During the construction phase, the project will generate between 50 and 75 construction jobs through local contractors. Local contractors will undertake the majority of the construction works. Some training will be required on an as-needed basis, while the OEM will supply a skeleton crew to oversee some of the more technical structural and electrical components of the construction phase. The roles completed by the wind turbine manufacturer are expected to comprise approximately 20% of the overall construction work force. The remainder will comprise largely civil and electrical positions and are expected to be able to be filled locally. It is appropriate to note that although WWF is the first wind farm proposed in West Wimmera Shire, the district has several wind farms – both established and recent.

In 2012/2013 Mortons Lane was developed by Goldwind Australia and then AGL developed the Oaklands Hill Wind Farm, both of these are close to Glenthompson. Recently Murra Warra Stage 1 was completed North-East of Horsham and Murra Warra Stage 2 is currently under contract. The presence of these projects approximately one hour away means that a pool of experienced personnel is more likely to be available to the project both during the construction phase as well as during the 25 to 30 year life of the wind farm.

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Table 14 Wind power: Australian employment per MW (results)

		Unit	This Survey	Comparison with other work		
				ABS 2019 [2]	ISF 2015 [3]	IRENA 2017 [4]
Construction & development	Survey outcome	Job-years/MW	2.34			
	Adjusted[1]	Job-years/MW	**2.84**	1.2	3.2	3.30
Manufacturing [5]		Job-years/MW	**0.38**	0.093	0.3	0.23
O&M [6]		Jobs	**0.22**		4.7	1.65

Note 1 Adjusted for missing elements (detailed design and grid connection, using the employment data from IRENA 2017)[2].
Note 2 Australian Bureau of Statistics, 2019 [5]
Note 3 Rutovitz, J., Dominish, E. and Downes, J. (2015)[13]
Note 4 International Renewable Energy Agency (2017)[2]
Note 5 This refers to manufacturing employment occurring in Australia
Note 6 The O&M employment factor includes a small element of manufacturing for gear box repair, which assumes that 10% of installed capacity has a gear box repair each year.

Through the nominally one-year construction period, this workforce would likely spend in the vicinity of $700,000 locally – at cafes, pubs, petrol stations, supermarkets, restaurants and local accommodation.[1]

Long-Term

Depending on the final layout, the wind farm may be an unmanned site, with most spare parts and workforce located at larger facilities relatively close by. Alternatively, the site may include maintenance facility and control room. In either case, the operations and maintenance costs are likely to be in the order of $500,000 per year, supporting the employment of approximately five full-time-equivalent workers.

A simple maintenance facility is proposed to be built adjacent to the existing shearing shed on the North Eastern edge of the property. This will be used for storage and will include basic amenities, change facilities and lunch shed for visiting contractors. The existing power infrastructure will need to be upgraded to allow welding and the charging of electric vehicles.

In addition, landowner payments, council rates and community contributions will come to approximately $200,000 per year for the 30-year life of the project, totalling over $6,000,000 in today's dollars, over the life of the project.

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[1] Clean Energy Council (2019), Submission on the future of jobs in regional communities, Submission to the Senate Select Committee on Jobs for the Future in Regional Areas, senate-select-committee-jobs-for-the-future.pdf (cleanenergycouncil.org.au) viewed January 2020.