

WINDS OF CHANGE

MAIN CONSTRUCTION COMPANY : ACCIONA
CONSTRUCTION VALUE : \$280 million



Mortlake South Wind Farm includes 35 Nordex 4.5MW turbines with a capacity up to 157.5 MW, which will generate clean energy for the equivalent of up to 117,000 households and a 15km underground connection line to the 220kV Terang substation. The wind farm will assist the Victorian Government's target of 40% of electricity generation from renewable sources by 2025, while bringing significant economic activity to the region.

The energy division of ACCIONA is constructing its fifth wind farm in Australia at Mortlake South in south-western Victoria. On completion, the wind farm will have a generation capacity of 157.5 MW, sufficient to power 117,000 homes. The Mortlake South Wind Farm, situated on open farm land, forms part of the Victorian Government's legislated energy target, which is aiming for 25% of electricity generation from renewable sources by 2020 and 40% by 2025.

The \$280 million Mortlake South project will prevent the emission of some 532,000 tonnes of CO₂ from coal-fired power stations per year. It will be equipped with a battery storage facility of between 4MW and 5MW to increase the farm's performance and facilitate its integration into the power grid.

The Mortlake South Wind Farm will be powered by 35 Nordex 4.5MW turbines, with the 72.5m blades having a maximum tip height of 186m.

"The turbines will be positioned on towers manufactured by Hayward's Steel in Tasmania and Keppel Prince in Victoria, providing a significant level of Australian content," said Dan Belton, General Manager Engineering and Construction for ACCIONA's Australian energy business. "The turbines are heavy duty, high capacity units and have the highest output of any wind turbine in Australia. Due to the weight of the turbines, the 105m towers are being located on reinforced foundations measuring up to 23.6m in diameter and 3.4m

deep, requiring approximately 720m³ of concrete for each tower."

The first turbine was successfully installed in late November 2020, representing a major construction milestone for the project. Comprising four steel tower sections, a nacelle, hub and three blades, the turbine was erected over the course of four days by a team of skilled personnel.

The crane required to lift all the elements for the top of the turbine is capable of lifting the heaviest components together – the nacelle, hub and drive train – which collectively weigh 210 tonnes. "This lift is the heaviest ever completed by a construction crew at a wind farm in the southern hemisphere and it was an impressive effort by our team," Dan said. "A second crane is now at the site and each crane will complete the installation of one wind turbine per week between now and late May."

ACCIONA has been proactive in promoting local jobs. Up to 124 jobs have been created during construction and there will be 10 ongoing jobs once the farm is complete. Farmers have been able to continue their activities unimpeded during construction and when the wind farm is operational.

COVID-19 created a number of unique challenges. Delays were experienced through the supply chain as COVID impacted equipment manufacturers from China, Europe and South America. "Additionally, we had to operate under strict COVID-19

protocols in order to keep our workforce and the local community safe. Our team and delivery partners were very diligent and committed to maintaining a COVID safe workplace," Dan said.

A particularly wet winter in 2019 and 2020, though great for the local farming community, added some complications to civil works. Despite all these challenges the project has been able to maintain the construction schedule with completion expected in the June quarter 2021.

A key part of the Mortlake South Wind farm project has been community engagement and apart from employment opportunities, local businesses have benefitted from the supply of goods and services to the project.

ACCIONA will be the long-term owner and operator of the wind farm. The Mortlake South project will bring ACCIONA's total installed capacity in Australia to 592MW, which is enough clean energy to power 416,000 homes. The company is part of the Spanish ACCIONA Group, a global leader in sustainable infrastructure construction and management, encompassing wind and solar power, water treatment and road and rail transport.

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SUPPORTING LOCAL RENEWABLE INDUSTRY

In 2019 Wilson Transformer Company (WTC) was awarded a contract to deliver a 185MVA 220/33kV power transformer for ACCIONA's Mortlake South Wind Farm project, located in South West Victoria. The 35 turbine wind farm was one of six new renewable energy generation facilities that had been successful in the Victorian Renewable Energy Target (VRET) Reverse Auction, securing a 15 year support agreement with the State.

The unit took around two and a half months to build in the WTC manufacturing facility in Melbourne once materials were available.

WTC Bids and Solutions Manager, Muthu Subramaniam said that the procurement and coordination of the transformer parts and materials was an important aspect of the manufacturing process.

"Some of the parts and materials were ordered from overseas, including bushings from Europe, core steel from Japan and conductors from South Korea, and we needed to ensure that they all arrive on time so that the transformer could be built and delivered to site as planned," Muthu said.

A special feature of the design was using composite resin impregnated paper (RIP) bushings, which have some technical advantages such as fire resistance.

The project saw WTC graduate trainees and apprentices working alongside their experienced colleagues on the design and construction of the unit.

The manufacturing of the transformer was completed in early February 2020 with the official celebration event taking place on 7 February 2020 at WTC's factory in Glen Waverley. Minister for Energy, Environment and Climate Change Lily D'Ambrosio,

State Member for Mount Waverley District Matt Fregon, ACCIONA Energy Managing Director, Brett Wickham and WTC representatives attended the event to celebrate the delivery of the transformer.

"It gives us all great pleasure," said WTC Managing Director Ed Wilson, "to contribute to the local renewable energy sector and support the reliability of Victoria's electricity supply. We are grateful for the Victorian Government's VRET initiative, which encourages large developers to connect with local business to build and support local capability to benefit Australia and local communities."

In early February 2020 – just before the outbreak of COVID-19 in Victoria – the power transformer was transported to site, travelling overnight under VicRoads supervision. The transportation was carefully organised to combat the inherent risk that comes with transporting heavy equipment.

"Transportation ran seamlessly – we were lucky that it was scheduled before the outbreak of COVID," Muthu said.

Following its arrival, the unit was then installed in the substation at Mortlake, taking several weeks, and included site assembly, oil filling, and site acceptance testing. The WTC team worked closely with ACCIONA to complete the installation and ensure it was ready for use. Muthu said that the transformer would be a critical asset for the Mortlake South Wind Farm.

"It's essential that the product is of high quality and is reliable so that it can consistently export power to the grid for the next several decades," Muthu said.

Once operational, the Mortlake South wind farm will generate enough clean energy to power more than 115,000 houses each year. The Mortlake South wind farm is the second project WTC delivered to ACCIONA in recent years. In 2017, the company supplied two 80MVA 66/33kV power transformers and forty-four, 3.5MVA 33/12kV distribution transformers for the Mt. Gellibrand wind farm project, located in South West Victoria.

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