

Small footprint, big ambitions



Collgar CEO Thomas Scott-Morey says the company is investigating the potential to add more turbines to its network.



WA wind pioneer to expand its horizons

In the heart of Western Australia's central wheatbelt, 111 wind turbines standing 80 metres above the fields produce sufficient renewable energy to power about 160,000 homes through the state's largest wind farm.

Collgar wind farm recently made aerodynamic improvements to the turbines and completed a major technical upgrade to the software driving them, lifting the wind farm's generation capacity by more than 7 per cent, to 222MW.

"At full power, the energy created by this wind farm displaces around 0.6 gigatonnes of carbon dioxide per year, equal to planting 9 million trees," says Collgar CEO Thomas Scott-Morey.

The wind farm has a small footprint, leasing space within about 18,000 hectares of prime farmland as landholders keep producing.

Collgar reserves an exclusion radius of just 30 metres around each turbine, Scott-Morey says, with minimal impact on crop yield, and the leasing fees provide a welcome steady income to host farmers.

Atmospheric modelling and wind energy assessments by Windlab – an Australian company using CSIRO-developed technology – identified the best sites to locate the turbines, Scott-Morey says.

The wind farm was developed as a joint venture between Windlab Systems and South Africa's Investec Bank, with planning approval granted in 2008, and was bought out by UBS Asset Management and REST Super (Retail Employees Superannuation Trust) at the \$750 million financial close in June 2010.

Following the construction phase, Collgar

began energy production in late 2011, and in mid-2019, Collgar became wholly-owned by REST.

"REST is one of Australia's largest industry superannuation funds, and it's proactive on ESG targets, so Collgar is an ideal investment for them because it's a long-term commitment in tried-and-tested technology that has a predictable return," says Scott-Morey.

"When you compare global electricity costs on a 'levelised cost of energy' basis, onshore wind is the cheapest source," he explains, adding that maintenance and ongoing costs are very low.

While solar panels generate energy about 25 per cent of the year on average, wind turbines generate energy for about 50 per cent, Scott-Morey says, often at peak demand periods when solar inputs are low or absent, such as dawn and dusk.

Collgar's wind turbines were assembled from diverse international sources: the steel towers were built in Victoria, carbon fibre blades manufactured in China, and the gearboxes and generators are from Germany – but the main tech is Danish.

"The most important technology comes from the software control systems developed by the world's preeminent wind turbine company, Vestas," he says.

"Each of the 111 wind turbines has a range of sensors, which detect which direction the wind is coming from, temperature, wind speed and humidity – and they relay this data back to a central controller, every second."

The controller automatically sends instructions to adjust the turbine to maximise productivity. "That happens with all 111 turbines, every second of the year."

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Every month, data from every turbine is reconciled against a central control system to find out where and why the turbines may not have met optimal power output.

"Wind turbine operation is mostly automated," Scott-Morey says. "We reconcile all the little details to find out where we've missed out on any possible energy, and shave off each fraction of a per cent to improve."

Collgar exports its power into the South-West Interconnected Network (SWIN), one of WA's two electricity grids, both independent of the National Energy Market connecting Australia's eastern and south-eastern states.

These grids (comprising poles and wires) are owned by the WA government, with wholesale prices set by the West Australian Economic Regulation Authority (ERA).

Scott-Morey points out that the WA grid is unlike any other worldwide in physical size and load variability; as an isolated grid, it cannot buy in power from other states, and the rapid adoption of rooftop solar PV by about 36 per cent of WA households can unbalance the electricity grid at times when solar supply is high and power demand low.

While Collgar was initially established for a 30-year term, Scott-Morey is optimistic about its future. Collgar is 10 years into a 15-year contract supplying all energy generated to WA's state-owned gen-tailer Synergy.

"We have a great relationship with our sole customer, and we are looking to extend that relationship or find alternative customers," says Scott-Morey.

"The market has changed significantly over the past decade, and now includes large industrial energy consumers making ambitious plans to run their business with net-zero emissions, who are willing to talk directly to energy suppliers."

Following the recent upgrade of Collgar's operational software and aerodynamic capabilities, the company is now investigating the potential to add more turbines into its network, and also looking for other sites suitable for a greenfield project.

Late last year, the international environmental, social and governance (ESG) assessment organisation, GRESB, named Collgar the 2021 global renewable power sector leader for its ESG performance.

"Collgar outperformed all other participating renewable assets not only in Australia, but globally," says Scott-Morey. "It's something we are very proud of."

Collgar Wind Farm is proud to be named by GRESB as Sector Leader in Renewable Power globally in 2021.



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