Wind towers aplenty sprout steel growth industry

That well-loved Australian bush icon, the windmill is making a big comeback with forests of advanced elevated wind turbines propagating at an astounding rate across the nation and erected predominantly on steel towers. Steel Australia editor, ***Alan Marshall*** *gets wind of why proponents of this alternative energy source are steel fans.*

There's a quiet boom currently going on in Australia, actually an emerging industry that's literally taking the world by storm in terms of exponential growth.

Figures from the Clean Energy Council show that from just 30 turbines, the equivalent of 10MW capacity installed by 2000, there were 545 turbines generating 825MW in 2007, representing more than an 18-fold growth in the number of working wind turbines and about an 82.5 times greater energy output achieved in just seven years. And that growth rate shows no sign of slowing soon.

The plant register maintained by the Clean Energy Council as the peak member-based industry body representing the renewable energy industry in Australia, reports plant capacity increasing to 867MW currently under construction, conservatively equating to around an extra 300 wind turbines about to become operational.

And what's more, there's 5647MW of plant capacity planned, or at least 1800 new turbines as most projected wind farms will use turbines in the range of 1.5 to 3MW each.

According to Acting Regional Sales Manager – VIC/TAS with BlueScope Steel's Australian Coated and Industrial Markets, **Simon Fieldsend**, the business has supplied over 75,000 tonnes of plate to the wind farms segment over the past six years, the majority of that for construction of wind towers to support the turbines.

"Almost one-third of that was supplied during 2007/08 as tower production has accelerated at existing manufacturing facilities," Mr Fieldsend said. "The past six years, especially the past 12 months have seen significant activity."

"The governments' commitment (in Australia) to the 20 percent Mandatory Renewable Energy Target (MRET) will also underpin strong activity in coming years."

Mr Fieldsend said that the wind towers are cost-effectively manufactured by a number of highly capable companies using purpose-built facilities. The preeminent tower makers currently servicing the market are Haywards Steel Fabrication and Construction based in Tasmania, Keppel Prince Engineering in Victoria, and Brisbane-based Rollpress Proplate Group (RPG Australia), two of which are ASI members.

RPG Australia Managing Director, **Barry Cox** said that steel has become established as the pre-requisite chosen material for the wind towers, a point echoed by Haywards Managing Director, **Steve Edmunds** who said steel is actually specified by the turbine suppliers for the towers.

That's a sentiment wholeheartedly supported by BlueScope Steel.

Steel holds a very high share of the wind tower market in Australia," Mr Fieldsend said. "The plates for the towers are often designed to European Standards so we have generally supplied variations of grades 250 and 350."

He said that the tower designs may involve 20 to 30 different plate sizes all rolled into cylindrical or conical sections and welded together usually to produce three or four section towers.

"Steel has become established as the pre-requisite chosen material for the wind towers."

"The plate sizes change from longer and thicker at the base to shorter and thinner at the top with some exceptions," he said. "They are coated and/or painted with special systems to ensure long design lives."

"The towers were made from angles like a transmission pylon many years ago but this gave a poor aesthetic compared to the current sleek cylindrical designs from plate."

Keppel Prince General Manager, **Steve Garner** said that the biggest challenge for makers of wind towers is staying on top of new advanced welding techniques.

"The quality of welds is critical for structural integrity as the steel towers usually have to support over 100 tonnes constantly swinging around and vibrating in the air," he said.

Keppel Prince currently averages two new wind towers a week which equates to about 300 tonnes of steel and has recently upgraded its plant to handle three a week to meet demand. It supplies wind farms in South Australia, NSW and Victoria.

"You need huge facilities to build these structures offsite and a lot of land. Our Portland plant is sited on 100 acres," Mr Garner said.

So huge is the nature of the business and its phenomenal growth that a number of joint ventures have been entered into, such as that between Keppel Prince and RPG Australia to make and deliver 64 wind towers for the Capital Wind Farm near the ACT, all due by the end of 2008.

Garner predicts more sizeable opportunities from this niche market for at least the next 10 to 15 years.

"It's the easiest, quickest form of clean energy available at the moment and the technology available is now very advanced," he said.

Cox from RPG Australia said that there is approximately 150 tonnes of steel per wind tower and much of that is Australian.

"We have imported steel in the past, but currently all of our steel plate requirements are being met locally," he said. "Steel used ranges from 250 to 350 grade depending on the specifications."

"Steel is the primary input so it is absolutely critical our supply is consistently of the highest quality."

"The steel towers usually have to support over 100 tonnes constantly swinging around and vibrating in the air."

Whilst RPG predominantly manufactures wind towers at its Adelaide plant for many of Australia's existing wind farms, including Starfish Hill, Lake Bonny, Wattle Point, Hallett, Snowtown and Cathedral Rocks, market demand has convinced the Group to expand these operations, more than doubling production capability by acquiring a new manufacturing facility at Dalby in Queensland.

RPG Australia is currently manufacturing 47 wind towers for the Capital Wind Farm in New South Wales at the Dalby plant.

Images courtesy of BlueScope Steel photographer ***Jean-Marc LaRoque.***