

Maturing Asian Wind Power Market Finding Its Legs

China, Spain, India, Germany, and the US accounting for 73.5 percent of the world’s cumulative installed capacity as of 2011. Yet given that China is said to now be the world’s fastest growing market for wind energy, many predict that it will take on considerable market share on the whole in the coming years, with other nations following closely behind.ⁱ In order to address their need for technology fitted specifically for their unique conditions, Asia Pacific countries are using a variety of tactics to get the knowledge and tools they need to meet their wind power goals.

Acquiring Wind Technology in Asia: Mixed Bag of Solutions

By and large, if you’re going to invest in something as expensive as wind technology, you need to have a pretty good understanding of how to make it successful. Given that most Asian countries are relatively new to the wind power industry, this means acquiring expertise in the area, and quickly. In many cases, rather than develop their own technology, some Asian nations have sought technology transfers from firms in Europe and the US through licensing agreements. This not only ensures them a lower cost for the research and development phase, it also makes it possible for more experienced countries to lend their expertise in wind energy development.ⁱⁱ It’s a model that is particularly popular where budgets are tight.



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Yet this model poses some problems. Of course, there are challenges such as restrictions on the full implementation of a design due to IP rights issues or the fact that a model may be outdated. But perhaps more difficult is the fact that the technology may not necessarily work equally well in the environmental conditions of the country of installation. With stronger winds, deeper waters, mountainous terrain, dusty weather, and very dry deserts, there are new and unique challenges that need to be addressed when considering the application of technology in an Asian context.

Consider, for instance, what the impact Typhoon Haiyan (the strongest storm to hit land in recorded history) would have had on neighboring wind turbines. Similar challenges exist in most Asian nations.

As such, some Asian firms are looking to a development model whereby they create their own wind systems designs. This provides more implementation freedom, ensures designs are up to date, and allows for flexibility during the manufacturing process.

For instance, in Japan, where they would need to build 140 offshore wind turbines to replace their 50 nuclear reactors, the coastal waters are extremely deep.ⁱⁱⁱ This requires a highly specialized design since the depth prevents most locations from being developed if attachment to the sea floor is required.

This is why the country has been working on floating offshore wind turbines for the past several years.^{iv} In fact, the hotly anticipated floating turbine test rig was recently launched off the shores of Fukushima. The experiment, funded by the government and headed by Marubeni Corp, is designed with a 2 MW turbine from Hitachi Ltd. Dubbed the Fukushima Mirai (“future”), the turbine will be erected on a floating platform and connected to a floating substation (the substation is called Fukushima Kizuna, which means “future”).^v

Future plans include the installation of two more turbines, both developed by Mitsubishi Heavy Industries Ltd, which will each have a 7 MW capacity. If the country can successfully mature this technology, estimates peg the potential for energy generation at 1,000 MW from floating offshore wind turbines.^{vi} Needless to say, the country is making significant investments into further development of this groundbreaking technology in order to move away from their disastrous nuclear history.



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China firms are also contributing to the development of new technologies for the wind industry, but in the design of actual turbines as well as support systems. For instance, A2SEA’s Seal Installer vessel launched from China in January of this year.

Their mission was to install two Siemens 6 MW turbines at the Gunfleet Sands 3 site. The vessel was constructed in China over a period of two years, and was launched from Qidong. It was built especially to be able to handle some of the larger turbines that are now being erected around the world.^{vii} You'll also see Asian firms investing in heavy machinery plants outside of their country. For example, the Chinese firm Sinoval recently started discussions with a Romanian firm to build a wind turbine production facility in Romania.

A lot of Chinese energy is also focused on the creation of turbines and platforms specifically suited to Asian conditions. Sinoval, for instance, has been testing 5 MW, 6MW, and even a 10 MW turbine for offshore applications. They're just one of three firms vying to be the first to develop the mammoth turbine in light of the fact that the Chinese government has deemed these larger machines critical to their energy mix. The Sinoval 10 MW demonstration machine is set to be installed in Jiangsu coastal area, with the US \$6.6 million support of China's National Development and Reform Commission. Another major player in the Asian turbine manufacturing arena is Goldwind, a Chinese company that has been developing a permanent magnet direct drive platform with between 1.5 MW and 3 MW machines.

As wind becomes increasingly popular as a renewable energy source for Asian nations, many advancements are being explored in the region's wind technology sector, with most focusing on upgrading existing turbine technology to suit a wider variety of wind conditions as well as the developments of mega turbine machines. Of course, in every country research is also focused on keeping installation and maintenance costs down with designs that are easier to put in place and less work to operate.

Despite the fact that Asian countries are largely still youthful in the global wind competition, by developing their own systems, many countries have found success on the world stage. In particular China, India, and South Korea were all able to create their own wind turbine models and have them competing with other global leaders within a 10 year span of time. That's outstanding growth in an extremely short period of time.

Growing Pains and Looking Toward Joint Ventures to Move Asian Wind Development Along

Yet the development of Asian wind turbine technology has not been without its challenges. A fatal accident in 2012 during the lift of a 5 MW wind turbine nacelle in a Gansu Province production facility caused some concern and slowed down further research and development.^{viii} So though the proprietary development of technology in Asia can provide many benefits, in some cases there is a lack of experience or the financial resources to take a new design to completion.

In order to settle out the growing pains in the Asian wind market some firms are turning to a joint development model whereby the technology transfer happens in such a way as to avoid disasters due to inexperience, market competition and IP concerns. This method has become popular in countries like India and South Korea, and may well be the way of the future as Asia continues to surge ahead in the world of global wind development leadership.

But in order for this method to take hold, some political hurdles may yet have to be overcome. In particular, some local content requirements and WTO agreements will need to be altered or waived in order to ensure the smooth transfer of technology into these rapidly growing markets.

Certainly the best way forward as far as the globe as a whole is concerned is cooperation. In fact, an increase in government collaboration is just what many in the industry are calling for in order to speed the development of wind in Asia.

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