

There is a green wind blowing

Richard L Wottrich, Managing Director, International, IMAP Chicago (Dresner Partners) looks at the future for the alternative energy industry in the US and concludes that we will have to look to our laurels if we are to stay ahead of the global competition ...



There is a powerful wind emanating out of Washington, foretelling that much of President Obama's success will depend on the creation of new green jobs in alternative energy and conservation. President Obama recently appointed Van Jones as a special adviser on green jobs to the White House Council on Environmental Quality, a man with a background in activism, promoting green jobs to lift people out of poverty. Many of these green jobs are assumed to be coming in wind power but what are the prospects for wind power in America?

Relative size of wind power production
Wind power in the US reached 29.4 MW of installed capacity in the second quarter of 2009. In 2008, the US surpassed Germany in installed wind power capacity, followed by Spain. (The world leader in percentage of utilized wind power is Denmark at 19 per cent of stationary electricity production.) Including projects installed through the end of 2008, wind power accounted for just 1.26 per cent of US electricity last year. Worldwide average wind power production contributes 1.5 per cent, while wind power project installations are growing in excess of 25 per cent per year in the U.S.

Coal still accounts for 50 per cent of US electricity production and natural gas accounts for 23 per cent. All renewable energy sources combined account for just 2.5 per cent of US electricity production. The sheer scale of energy requirements in America ensures that these relative ratios will change very slowly for years to come.

Slow project funding

The American Recovery and Reinvestment Act (ARRA) of 2009, signed by the president on February 17, includes a budget of \$32.8bn for clean energy, \$26.9bn for energy efficiency initiatives, and \$18.9bn for green transportation. Of this \$78.6bn, little has been allocated to date. For example, in August, the US Department of Energy chose 25 cost-sharing alternative-fuel projects to receive a total of \$300m from ARRA, amounting to .0038 percent of proposed funding. Then, the first hurdle is the slow drip, drip of federal funding for wind power projects. The second hurdle is the politics behind the selection process.

Global stimulus spending

ICICI Bank recently projected that total infrastructure stimulus spending committed by governments worldwide during this recession would top \$35 trillion over the next 10 years. This astounding amount puts in perspective funds that the US government plans on spending on wind power projects, as many other nations, including China and India, will be

approaching, matching or exceeding our spending. Hence, our relative advantage in direct federal subsidies is perhaps less than one might infer from the headlines.

Wind power in China

With 20 per cent of the world's population, China now consumes 10 per cent of the world's energy. This would suggest that just to come up to the international average, China would need to double its energy consumption. Indeed, China is opening one coal fired power plant a week as you read my words. China is the fourth largest producer of wind power in the world. The Chinese government is planning to have 150 gW of installed wind power capacity by 2020, of which 30 gW will come from offshore wind farms. Installed wind power capacity should reach 35 gW by the end of 2011, of which 5 gW will come from offshore wind farms, says China Daily (government-owned Xinhua News Agency). China had more than 12 gW in installed capacity as of the end of 2008. China plans to build seven of the world's largest wind farms with a minimum capacity of 10 gW, each by 2020 in Inner Mongolia, Xinjiang, Gansu and Jiangsu provinces. China is on the move and it is moving faster than the US.

Global wind power equipment manufacturing

Many wind power components are manufactured in other countries. This capacity is increasing rapidly in China, which has natural pricing, financing and governmental advantages in comparison to US companies. China has its own \$675bn stimulus-spending program, which it is allocating at a faster pace than in the US. Furthermore, the government-controlled banking system has been loaning huge amounts to Chinese companies, with total loans nearly equaling its GDP through the second quarter of 2009.

However, recent US political emphasis is leading a shift toward domestic wind power manufacturing. Many turbine manufacturing leaders have opened US facilities; of the top 10 global manufacturers in 2007, Vestas, GE Energy, Gamesa, Suzlon, Siemens, Acciona, and Nordex have an American manufacturing presence.

Even so, at least 15 Chinese companies are commercially-producing wind turbines and several dozen more are producing components. Leading Chinese wind power companies are Xinjiang Goldwind Co., Dalian Heavy Machinery, Zhejiang Yunda Co., Shenyang Industry University (Shenxin Co.), Dongfang Electric Group and Sinovel Wind Co. While wind power growth prospects in the US are promising,

it would be unwise to underestimate the impact of Chinese wind power component manufacturers on domestic US manufacturers once Chinese domestic demand is satisfied.

Smart grid technologies

A smart electricity grid is simply an upgrade of existing power grids, which generally 'broadcast' power from a few central power generators to a large number of users, utilizing digital technology to specifically route power when and where it is required within a wide range of conditions. American electrical grids are overloaded, antiquated and fragmented. Any attempt to integrate large volumes of solar and wind-generated electricity into the national grid must address this issue.

Prospects for expansion in renewable energy depend heavily upon the development of smarter grids, because most renewable energy sources are intermittent in nature. Any power infrastructure using a significant portion of intermittent renewable energy resources must be able to reduce electrical demand by 'load shedding' when alternative energy sources suddenly or gradually diminish. This also infers that traditional energy producers require 'negative' pricing incentives (variable taxation rates) to decrease electrical production when alternative energy sources are flowing.

To integrate disparate energy sources into a smart grid, dependable coal and natural gas sources must be co-ordinated with intermittent solar and wind sources. In a perfectly elastic smart grid, electricity prices should be allowed to spike exactly when the desired alternative energy sources are not present. Consumers will then, in theory, decrease consumption. However, this means that prices are unpredictable and literally vary with the weather, from the smart grid's perspective. This is a smart grid vision fraught with political danger, as politicians most likely will not sit idly by as their constituents see wildly-vacillating electric rates.

Energy storage

The solution for wildly spiking electricity prices in a smart grid is energy storage. However, it is very expensive to store electricity. Any parent who has run through dozens of batteries for his children's toys understands this.

Grid energy storage allows energy producers to route excess electricity production over the transmission grid to temporary electricity storage sites. These sites become energy producers when electricity demand increases.

Advances in energy storage are essential if alternative energy sources are to increase dramatically, as intermittent energy sources cannot store energy. Solar thermal, molten salt storage, compressed air storage, hydroelectric energy storage, ice storage, and liquid nitrogen are among scores of technologies in development in this field. It is a fact that Japanese companies lead the way in energy storage technology, including Japan Wind Development Energy Co., Ltd. Japanese car battery leaders (which can be adapted to wind power storage solutions) include Motor Corp. (TM), Honda Motor Co. (HMC), Nissan Motor Co. (NSANY) and GS Yuasa Corp. (GYUAF).

US manufacturers will have to form joint ventures, license technologies and accelerate research and development to achieve in-country green jobs in energy storage.

The future of wind power

Globally, alternative energy sources account for a small percentage of our energy needs. However, government tax incentives and direct subsidies are influencing a shift of resources into these industries, creating the potential for accelerating year-on-year increases in alternative energy capacity, and the resultant falling electricity prices associated with greater scale.

In the US massive federal spending will likely achieve the same results, but it would be unwise to assume that the same manufacturing advantages that have facilitated explosive growth in China, India and elsewhere will not apply to the wind power industry. As direct competition in wind power components gains traction and scale, US manufacturers will have to be very nimble and adroit to survive.

Oil, coal and natural gas will continue to be the dominate energy sources globally for the balance of this century. An increase of alternative energy sources for electricity in the US to 10 per cent of usage would represent a huge shift in resources and create many jobs along the way. However, at this point, such a shift is years away, as are the myriad green jobs that we assume will be created in the process. ▴



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