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A Market based status Analysis for Wind Power Plants: A study

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ABSTRACT

Recognition of the value of wind energy as a low cost, clean source for electricity is creating major new business opportunities for manufacturing and materials innovation. Worldwide growth in wind generation since 1994 has been 30% or higher annually. The cost of energy from large wind power plants has declined to less than $0.05/kWh at good wind sites. By the end of 2000, the global capacity has passed 17,600 megawatts (MW). The combined sale of large wind power plants and small turbines for distributed generation is now $4-5 billion annually worldwide and growing.

KEYWORDS : Renewable energy certificate, market establishment, distributed generation.

I Introduction

During 2013 India added 1.7 GW to rise to the fourth spot for new annual capacity installation globally, with total capacity of just over 20 GW. At present, wind power accounts for about 67% of total renewable energy installed capacity in the country. Grid connected renewable power (29.9 GW) accounts for almost12.8% of India's overall installed power generation capacity (~234 GW) and accounts for about 5% of electricity generation. A target of an additional 30 GW of grid connected renewable power is set in the 12th five year plan (2012-2017), of which15 GW is projected to come from wind power alone.

II Market establishment's scenario

In 2013 it was amended and extended up to the end of 12th plan period i.e. 31March 2017. The revised scheme has a cap of INR 10 million per MW between the 4th and 10th year of the project's operations. The Renewable Energy Certificate (REC) scheme (1 REC =1 M Wh) began in February 2013. However, due to poor enforcement and monitoring while the total volume of RECs being issued is increasing, the prices have been low, with a majority of RECs being sold at the floor price. About 10.12 million RECs had been issued by the REC Registry as of 6th March 2014. This consisted of 9.9 million non-solar RECs. Wind power accounted for almost 52% of the total accredited capacity of 4470 MW under the REC Registry. The Central Electricity Regulatory Commission (CERC) recently reduced the issuance fee of an REC from INR 10 per certificate in a move to strengthen demand for RECs. The new fee was effective from 1 April 2014.To narrow the country's power deficit and reduces its dependence on coal; the Indian government announced plans for a 'Green Energy Corridor' project to address grid integration and availability issues for renewable based electricity generation. It announced an initial allocation of INR430 billion. In the first phase this project aims to add 30 GW of renewables to the national grid by 2020. Germany has committed technical and financial assistance for the green energy corridor under the Indo-German bilateral development cooperation programme and will be investing almost 1.4 billion. The government of India has planned and launched a National Wind Energy Mission in 2014. This is expected to give a boost to wind power. It is widely expected that a NWEM will help streamline the support mechanisms and enhance development in the wind sector. Through this mission, the government aims to have a generating capacity of 100 GW of wind power installed by 2022, from the present 20 GW. The proposed mission draft would include large-scale promotion of onshore and offshore wind power as well as small (<100 kW) wind turbine systems.

III Capacity of manufacturing in India

At the end of 2013, 19 existing manufacturers offered approximately 50 models of wind turbines and have a combined annual production capacity of over 10 GW. By the end of 2014, more than 20 wind turbine manufacturing and turbine supply companies will be operating from India. Installation across the Indian States is overall 20226 MW upto 2014. Leading manufacturers like Suzlon, Wind World, and RRB Energy and players like Regen Powertech, Gamesa, Inox ,Kenerys, GE, Siemens, Nupower, Sinovel and Garuda have set up wind turbine production or assembly facilities in India. Among the new entrants Inox, Kenersys, Sinovel, Nupower and Global Wind Power (Reliance Group company) are supplying1.5 MW, 2 MW, 2.05 MW and 2.5 MW wind turbines. China's Ming Yang Wind Power Company has recently entered the Indian market with its 1.5 MW machine in collaboration with Global Wind Power. They aim to install 2.5 GW of wind power capacity over three years with financing Support from the China Development Bank.

IV Hurdles in development of wind energy

2013 has been one of the toughest years for the Indian wind industry since the economic recession of 2008. Annual wind installations fell from over 3 GW in 2011 to 2.3 GW in 2012 to 1.7 GW in 2013. The industry has faced various challenges including the withdrawal of accelerated depreciation benefits, challenges in transmission, scheduling and forecasting, lack of an integrated energy plan among others which precipitated a significant drop in capacity additions. Though wind power accounted for over half of the registered generation capacity under the REC registry, making RECs a widely accepted instrument and a revenue stream for the project financing community remains a challenge in India, especially with the limited validity of five years of the REC certificates.

V Expectations in 2015 and beyond:

According to the 12th five-year plan renewable energy must play an increasing role in achieving energy security and energy access. The approved outlay for 12th plan for new and Renewable Energy programmes was INR 33 billion, which is almost 3times that for the 11th five-year plan period (2007-12).In addition to streamlining various existing policy initiatives, new actions such as the NWEM are considered essential to accelerating the pace of deployment of clean energy technologies. After the recent announcement of the NWEM, the industry is hopeful of a recovery over 2014-2015. The strength of the recovery will be closely linked to how effectively the NWEM and its contents can be made operational and how well it is designed .If everything goes according to expectation then during the Indian financial year 2014-15 wind capacity addition is likely to cross 2,500 MW.

VI Market forecast for Asia (2015-2018)

Last year we were somewhat skeptical about the Chinese government's ambitious target of 18 GW in new installations in 2013; in fact they installed just over 16 GW, rebounding from 2012's slump to 'only' 12.9 GW. In the meantime, the government has set a new target of 200 GW of wind by 2020,which implies a market of at least 15.5 GW a year for the rest of the decade; and if the past is any indication, they are likely to exceed it. Furthermore, the Chinese offshore segment is expected to get underway in earnest in 2014.In India, much will depend on the outcome of the national elections to be held in May of 2014. The paralysis that currently plagues New Delhi, resulting in the stop/start policy situation which has hampered market growth over the past two years, will hopefully come to an end. A new 'National Wind Mission's a welcome step, but what is really needed is clear, stable national policy and government investment in infrastructure ,including strengthening transmission, to continue to fuel India's economic growth. The post-Fukushima energy revolution continues to stallin Japan, at least as far as wind power is concerned, and we expect moderate markets of 2-300 MW per year over the coming period, until and unless the electricity market reform, which was almost passed last year, becomes a reality. While heavily emphasizing offshore, this market will probably no track up large numbers until at

least the end of this decade .South Korea will move steadily forward with its offshore programme while the onshore industry struggles; and we are likely to see a steady stream of new projects in Mongolia, the Philippines, Pakistan and Thailand. All in all, nearly 120 GW of new wind power will be installed in Asia over the five year period, and Asia will very likely pass Europe in terms of cumulative installed capacity when we do the totals at the end of 2014.

REFERENCES

1. Kaldellis, J.K. (2007) 'An integrated model for performance simulation of hybrid wind-diesel systems', Renewable Energy 32(9), pp. 1544-64. | 2. Deshmukh, M. K., and Deshmukh, S. S., (2008), "Modeling of hybrid renewable energy systems", Renewable and Sustainable Energy Reviews, Science Direct, 12 (2008), pp 235-249. | 3. Rao, Singiresu S., (2006) "Optimization – Theory and Practice," New Age International (P) Ltd., Publishers (formerly Willey Eastern Limited Ltd.), Third Edition, Reprint. | 4. Wang C., Yang G., Li X., Zhang X., (2009) Optimal micro-siting of wind turbines by genetic algorithms based on improved wind and turbine models, 48th IEEE Conference on Decision and Control (2009, Shanghai, China), IEEE press,2009, pp 5092-5096. | 5. Martínez-Ramos J.L., Castro J., Riquelme-Santos J., Burgos-Payán M., A hybrid evaluative algorithm for wind farm optimum network design, International Conference on Artificial Intelligence in Energy Systems and Power (2006,Madeira, Portugal), ICSC publications, 2006, pp 1-5 |