

Wind Power Cost and Value Analysis and in China

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ABSTRACT

With the development of society and industry, demand for energy is growing. Traditional fossil fuels such as coal and petroleum cannot support the growing demand any more. At the same time, the environmental issues caused by mining, transportation and consuming of these conventional fuels are getting more and more serious. As a result, developing renewable energy is the first choice to solve this problem. Wind energy, as a strong power on earth, has been developed for decades. With much attention drawn to it and the development of technology, the cost of wind power has been reduced to a relatively competitive price. Thus the utilization of wind power has been widely obtained globally.

Wind power has many advantages. The fuel is free to use; It does not produce any greenhouse gas and other poisonous pollution; The energy source is sustainable; It helps preserve ecological balance. However, the cost of wind power is still too high to compete with conventional thermal power if without incentives. As a result, it is important to find influential factors to this problem. This research paper presented the cost and profit of wind power in a more comprehensive way.

Firstly, this paper introduces a basic analysis of wind power cost. The cost of wind power mainly consists of three part: investment cost, operation and maintenance cost and financial cost. Site selection, wind energy source, turbine selection method along with tax policies are also discussed here. And then a mathematical model is derived. From this model, we can perceive the composition of wind power cost.

Secondly, the integration cost and environmental are discussed in this paper. The randomness of wind resource and the uneven distribution of electricity supply and demand lay heavy burden on electricity management, so that additional reserve capacity and energy storage technology are under development. Damages caused by coal production, transportation and use add environmental value to wind power generation. The social and environmental benefits are constantly ignored when calculating wind power cost, and the cost spent on grid integration caused by the uncertainty of wind energy should also be considered.

Finally, an integrated model is derived, analyzing factors influencing wind power cost. A case study is applied to this model.



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