

## **6 Wind Farm – China**

### **Executive Summary**

Energy is important in building an equitable and sustainable world for a comfortable, secure and healthy livelihood. However, the contradiction between the limitations of fossil energy and energy demands is growing in intensity. In the meantime, the climate problem becomes much critical nowadays. Wind power is considered as green energy for its zero greenhouse gas emission, sustainability, abundant and cost-effective properties. Wind power is one of the most mature, fast developing technologies which have great potential for growth in commercialization.

Despite wind power's great potential, people are concerned about it due to the knowledge gap. Different types of concerns, including political and economic concerns, operations and maintenance concerns have been discussed in this report. Some public misunderstanding of the concerns had been clarified.

Like all other renewable energy resources, wind power requires inputs of energy in order to generate energy output. For wind energy generation, the energy inputs include the turbine manufacturing and generator, building support infrastructure, such as access roads, and transmission lines. These inputs affect the energy generating efficiency and cost in terms of operation, maintenance, and decommissioning. The operation and maintenance management can greatly affect the successfulness of wind farm operations. In this report, maintenance challenges are discussed in terms of operating life and reliability, constrained resources of qualified technicians, and long response and operating time. Maintenance solutions include the condition monitoring system and life extended program. In terms of operations, unreliable supply, supply and demand inconsistency, system requiring excess energy backup, and the lack of communications within all types of electricity generation methods are major concerns. The smart grid integration and energy conversion are proposed as the solutions.