Clean Heating Using Wind-Power - Case study in Inner Mongolia

Loan 3218-PRC: Low-Carbon District Heating Project in Hohhot in Inner Mongolia

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Accelerating the Clean Energy Transition and Ensuring Energy Security and Affordability –
Time for Urgent Action Now

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Featured Speaker
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Hohhot is the capital city of Inner Mongolia Autonomous Region and with only 480 kilometers away from Beijing. The heating season lasts for 183 days each year, making district heating projects one of the most important livelihood projects in Hohhot.

Project adopts a district heating approach that integrating the CHP, gas boiler and wind-power electric boiler.
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Project Content

The total investment of the project is RMB 2.429 billion, with USD 150 million ADB loan. It includes the construction of five new 70MW gas boilers; two new 25MW electric boilers; two new pump stations; reconstruction of two 70MW gas boilers; 36.83km of new long-distance transmission pipelines; 79.37km of heating pipe network; and 94 heating stations. The project resulted heat capacity in an increase of 29.7113 million square meters.

Wind-Power Heating Area

The wind power peak-shaving project covers a heating area of one million square meters.
During the heat season in winter, wind farm curtailment becomes a prominent issue due to the need to ensure normal operation of combined heat and power units.

In addition, Hohhot has expanding its urban footprint and population, leading to a substantial increase in heating demand.
Hohhot features an average temperature difference of 6 degrees Celsius between nighttime and daytime during the heating season, resulting in higher heating loads at night.
## Advantages of Electric Boilers

1. **Compact size**

2. **Rapid start-up**

3. **High electrical-to-heat conversion efficiency**

4. **Low water quality requirements**

5. **Advanced automation capabilities**
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Three Parties Cooperation Mode

Wind power co. sells power to the grid and provides peak-shaving subsidy of power price to the heating co.

Heating co. purchases power from the power grid during the period when the load is the lowest for grid and the highest for heat supply.

Power grid increases power generating hours of wind power co.
Advantages of Wind-Power Heating

**Lower overall operating costs**

1. Savings on electricity cost
2. Savings on ash handling fees.
4. Reduced difficulty in coal procurement, transportation and storage.
5. Mitigation of capital tie-up due to coal purchases.
6. Improved automation and mechanization levels.

**Emission reduction**

1. Carbon dioxide
2. Sulfur dioxide, and other harmful emissions
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Overall Project Outcomes

- The Project has added 29,711,300 square meters heating capacity.

- Reduce coal consumption by 944,800 tons, dust and smoke by 28,900 tons, sulfur dioxide by 12,200 tons, nitrogen oxides by 10,000 tons and carbon dioxide by 1.66 million tons on an annual basis as compared with the former heating supply system.

- The average annual concentration of PM 2.5 has decreased by 59.4% from the 2013 level.

- The Project has achieved significant energy savings, improved air quality, reduced emissions, and exceeded its designed energy conservation and emission reduction goals.
Thank You

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