

CASE STUDY

REAL PROJECT

02

WIND ENERGY PROJECT

WINDFARM REPOWERING / ALBERTA, CANADA

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RESULTS

In 1993 and 1994, the Cowley Ridge Windplant was developed as part of a contract under the Alberta Small Power Research & Development Act (SPRD). The act provided for 20-year contracts for selected renewable energy projects, and set legislated prices for them. Cowley Ridge received a “flat” \$0.06/kWh.

The project was developed by Kenetech Wind Power and used their wind turbine, the KVS-33. This variable speed, 33-m rotor diameter wind turbine was nominally rated at 360 kW, and the project consists of 52 of these machines. The project was sold to a Canadian utility, who took advantage of certain capital cost allowance tax opportunities in order to make the project economic. Unfortunately, within several years Kenetech went bankrupt, and manufacturer support for the wind turbines disappeared. Keeping the machines operational and efficient is consequently a great challenge, but has been successfully done. Recently, the project changed hands again, and talk of repowering the facility has surfaced.

SYSTEM DESCRIPTION

The wind turbine that has been proposed for repowering is a Nordex Balcke N43 600, rated at 600 kW peak output, and using stall regulated rotor blades. It generates electricity at 690 VAC, 3-phase. Energy is transformed to 34,500 volts at transformers adjacent to each turbine, and delivered to the grid via an existing substation, connected to a 69,000-volt transmission line. The installed cost of a project of this scale would typically be about \$1,600/kW when all project costs are included.

LESSONS LEARNED

- Every possible measure to reduce costs, and expense capital costs rapidly, is necessary to reduce the cost of generation below the low existing contract price.
- At this scale of development, it is still not realistic to expect a marginal spot market to provide sufficient revenue, nor sufficient long term market certainty, to allow a successful project to proceed without some sort of additional revenue, such as a green premium, tax credit or emissions reduction market.
- A short-term contract, with 10 years remaining in this case, does not permit the amortisation of the high capital costs over the 20 to 25-year lifetime of the equipment.
- The capital costs, as well as the wind energy resources at a site, are critical to the economics of a project.



THE BIG PICTURE

Repowering an existing project may not always be as attractive as one would think. Although capital costs have declined, the tax regime and original advantages for projects may change and affect the financial viability of the facility in adverse ways. With electricity sales becoming deregulated and more competitive, the likelihood of large projects with long term contracts is reduced, and developers and operators must be creative in order to have successful projects, technically as well as financially.

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COWLEY RIDGE WINDPLANT, COWLEY, ALBERTA, CANADA
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