

CASE STUDY

REAL PROJECT

03

WIND ENERGY PROJECT

GREEN POWER PRODUCTION / ALBERTA, CANADA

RETScreen®
Customer Support

www.retscreen.net

rets@nrcan.gc.ca



+1-450-652-5177

+1-450-652-4621

*Cette publication est aussi
disponible en français.*

CANMET Energy Technology
Centre - Varennes (CETC)

In collaboration with:



Disclaimer

This publication is distributed for informational purposes only and does not necessarily reflect the views of the Government of Canada nor constitute an endorsement of any commercial product or person. Neither Canada, nor its ministers, officers, employees, and agents make any warranty in respect to this publication nor assume any liability arising out of this publication.

RESULTS

In 1996, Vision Quest Windelectric was investigating the new electricity market in Alberta. In deciding how to proceed in the new market, Vision Quest conducted an internal study to compare operations as a merchant plant and operations as a green power supplier. The firm also examined how to incorporate the new rules on investment flow-through announced in the 1996 federal budget, under Canadian Renewable and Conservation Expenses (CRCE).

The study showed that in order to be financially viable, the project would have to receive a green power premium for its output, and take advantage of all possible cost reductions, CRCE opportunities and new market advantages (such as system loss credits).

A contract for green power supply was sought and obtained, the wind turbine was installed in 1997, and it became the first new power plant installed in Alberta after deregulation began in 1996.

SYSTEM DESCRIPTION

The wind turbine is a Vestas V44/600, rated at 600 kW peak output. It generates electricity at 480 VAC, 3-phase. Energy is transformed to 25,000 volts at a transformer adjacent to the turbine, and delivered to the grid via a 300-m purpose built power line.

Public information available on the Power Pool of Alberta website indicates that the wind turbine produces about 1,800 MWh/yr. Projects of this scale, involving only a single turbine, typically cost around \$2,000/kW. The nearest public wind data stations were too far away to provide enough confidence in data to proceed directly with the turbine installation. Therefore, the IPP firm first invested in the collection of wind data nearby at 10 m and found the average wind speed to be 6.2 m/s. The energy from the Belly River wind turbine is sold under the brand name Green Energy® to an electricity distribution company, ENMAX, which in turn sells it to commercial customers as an environmentally superior electricity product.

LESSONS LEARNED

- Every possible measure to reduce costs, and to expense capital costs rapidly, is necessary to reduce the price of the energy produced.
- At this scale of development, it is 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. A green power premium or other method to recognise the value of wind energy is required.
- The capital costs, as well as the wind energy resources at a site, are critical to the financial viability of a project.



THE BIG PICTURE

The electricity markets in some parts of Canada are in transition, moving from regulated monopolies toward deregulated competitive markets. This provides challenges as well as opportunities for renewable energy resources such as wind energy. Companies interested in this market need to be very business “savvy,” conduct very high quality preparatory investigations, look to the best equipment they can afford, and learn how to market and sell in competitive markets.

REFERENCES

Alberta Department of Natural Resources, website:
www.resdev.gov.ab.ca

Bourn, Mike, “Personal communication,” Vision
Quest Windelectric Inc., 2000.

Power Pool of Alberta, website:
www.powerpool.ab.ca

Vision Quest Windelectric Inc., website:
www.greenenergy.com



BELLY RIVER WIND TURBINE, SOUTH OF HILLSPRING, ALBERTA.
PHOTO CREDIT: VISION QUEST WINDELECTRIC INC.