

Project Title

Green Power Procurement Pilot Project for Environment Canada and Natural Resources Canada Facilities in Alberta

Project Purpose and Description

Environment Canada (EC) and Natural Resources Canada (NRCan) plan a pilot procurement for their Alberta facilities of 2,200,000 and 1,400,000 kWh respectively of electricity generated from wind energy conversion. This pilot procurement, through ENMAX, will assist development of viable methods and standards for green power sale and purchase; test use of a full environmental-cost accounting model in demonstrating value-for-money for a green premium price; stimulate market opportunities; and partially fulfill EC's and NRCan's commitment to meet 15 - 20% of their national electricity needs from new green power sources by 2010.

ENMAX plans to supply the green power through contract with Vision Quest Windelectric Inc. (VQ), for electricity generated by one 600-kW nameplate-capacity wind turbine at each of VQ's Belly River and Castle River East sites and delivered onto the interconnected electric system in Alberta through connection points near its sites.

Scope of Assessment

Project aspects needing consideration relate to installation and operation of the two VQ wind turbines.

(Note: The following general and specific information was provided through personal communication with Vision Quest Windelectric Inc. Attachments were also provided by Vision Quest.)

General Information

- Each site is 46 ft by 15 ft (690 ft² or 64 m²). In addition, power poles utilize approximately 20 ft² (2 m²).
- Access road construction was not needed. Existing access from municipal road across ditch to the lands was improved at Castle River, in order to accommodate turning radius of the delivery trucks.
- Caisson-type turbine foundations were constructed by pouring concrete into the annular space formed by two nested culvert sections (about 12 and 15 feet in diameter) placed in a 24 ft deep hole. Long foundation bolts were installed prior to the pour. The inner ring and outside the caisson were packed and backfilled, and a concrete floor poured for the tower interior. The result is a 15 ft diameter foundation circle. Concrete shows for about 1 foot in a ring around the tower base. Excavated earth was stored adjacent to the hole, and was all used for backfilling and site landscaping.

- The transformer and metering equipment are on a separate, simple 'floating' concrete pad 82 " wide by 114 " long by 10" deep.
- Turbines were erected using only trucks and cranes primarily right on the disturbed site.
- The Belly River site was cultivated in 1996. The landowner will seed the site back to hay right up to the foundations.
- The Castle River site was pasture land. Vision Quest will reseed native grasses right up to the foundations.
- The turbines are VESTAS V44-600 Wind Turbines.
 - The 144 ft (44 m) diameter rotor is on a 131 ft (40 m) high tubular tower
 - Studies indicate typical sound levels of 45 dBA at 200 m, 40 dBA at 325 m and 35 dBA at 525 m.
 - The turbine itself monitors for some 2-300 parameters that could cause the unit to go from RUN to PAUSE to STOP to EMERG(ency stop). These include electrical faults, temperature, vibration, pressure etc. parameters. Operators can easily reach and activate four 'panic' buttons on the machine, from downtower to on the ladder to in the nacelle at the top where the generator is. The units are monitored remotely by telephone/computer link; all control actions can be executed via these links. The utility is able to shut off power to the unit in several ways; if that happens the machine goes into an automatic shutdown, and the computer supervises it (it is battery backed up).
 - Turbine will typically be serviced using a single pickup truck, at most once per month. After the three-month gearbox breakin period, lubricants will only be replaced every couple of years. An electric hoist on the turbine is used to carefully lift/lower enclosed containers up to the nacelle (i.e.no hand carrying on the ladder!).
 - Power was brought to both sites (about one km to the Castle River East site and 200 m to the Belly River site) using poles to within about 40 m or less of the turbine. The buried portions of the power cables were placed at required code depths and fell within the areas to be reseeded.
 - Transport Canada clearance was obtained at the Castle River East site; a steady red light is installed on the nacelle. The Belly River site does not require marking.
- Neither site was professionally examined for archeological/cultural values. Potential for disturbance of historical/cultural sites is likely low because of their locations on high plains.
 - Castle River East site landowners indicated that they had no evidence of any archeological/cultural sites there or nearby. Examination by Vision Quest personnel prior to and during construction revealed no evidence.
 - The Belly River site was disturbed by cultivation by the landowner in 1996; no archeological/cultural evidence was turned up. Examination by Vision Quest personnel prior to and during construction revealed no evidence.

- Migrating birds and raptors were observed by a professional biologist in the “regions” of both sites during a brief survey in early October, 1994. Work to date suggests that in the “region” of the Belly River site 'neo-tropical migrants (primarily passerines)' may use the vegetation along the river during migration. The river is located in a deep ravine or valley below the levels of the land where the site is. As well, a reservoir located within 20-30 km of the site is apparently used by waterfowl during migrations. No endangered species are reported.
- There are no site abandonment plans as the facility is unlikely to run out of “fuel” and the site is expected to operate “sustainably”. Dismantling and removal of the turbines, accessory equipment and foundations would be relatively straightforward.
- Copies of Alberta Energy and Utilities Board approvals are attached:
 - Board Approval No. HE 9707 and Board Order No. Misc. HE 9707 for Belly River site.
 - Board Approval No. HE 9708 and Board Order No. Misc. HE 9708 for Castle River East site.

Specific Information - Belly River Site

- Located within LSD 2, SE1/4 Sec. 12, Twp. 3, Rge. 28, W4M. See attached topographic map.
- There is a residence about 200 m away and another about 800 - 1200 m away. The nearest resident has explicitly expressed support for the facility.
- The site was disturbed by cultivation; the landowner is expected to seed hay back to the site right up to the foundations.

Specific Information - Castle River East Site

- Located within LSD 3, SW1/4 Sec. 35, Twp. 6, Rge. 1, W5M. See attached topographic map.
- The nearest residence is about 1600 m to the south.
- Reseeding mixture recommended and purchased from Prairie Seeds Inc. of Nisku, AB, is: 5% plains rough fescue, 30% sheeps fescue, 5% green needlegrass, 20% northern wheatgrass, 25% adanac slender wheatgrass, 15% walsh western wheatgrass.
- Seeding to be done in fall of 1997, right up to the foundations.
- Site will be fenced to protect seeded native grass from cows.

Conclusions

- Any impacts associated with installation of the turbines are not significant.
- Operation of the turbines might result in the possibility of bird collisions, and increase in noise.
- As only there is only a single, quiet turbine at each site it is expected that possible bird collision and noise level impacts will not be significant.
- A very modest commitment to document bird interactions (e.g. nest building, collisions should be established for a one(1) year period. Should evidence of potential interactions be confirmed then consideration should be given to design of an appropriate monitoring program in consultation with the Canadian Wildlife Service.

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