

Sundridge's proposed RE powered WWTP faces financial challenges

By Richard Leverton

The Village of Sundridge, Ontario, currently uses settling ponds for its wastewater treatment. Because of seasonal overcapacity and the expected population increase, the Ontario Ministry of the Environment is mandating a full and modern wastewater treatment plant (WWTP).

One item that was going to make this an expensive project was that the new WWTP would be located seven kilometres away from the nearest 3-phase electrical line. The cost to bring power to the new plant would be approximately one million dollars. As an alternative to this, the design and building consultant for the Village proposed powering the facility with a renewable energy (RE) system. It would save both the cost and environmental impact of installing a power line to the plant and the long-term cost of consumed electricity.

Hybridyne Power Systems Canada was commissioned to carry out a feasibility study, which showed that a hybrid RE power system could pay for itself in about 15 years. As a bonus, the RE system would prevent some 326 tonnes of greenhouse gases (GHG) from being produced annually.

Hybridyne proposed to produce electricity through an RE system consisting of twelve direct drive, high efficiency 10-kW wind turbines. These would produce about 567,648 kiloWatt hours of electricity per year. Also, 48 kW of photovoltaic solar panels, coupled with Hybridyne's high efficiency DC/AC conversion system, would produce an additional 83,885 kiloWatt hours of electricity per year. A single phase power line nearby could be used as a backup and supplemental energy source.

The RE system is designed to supply the plant's total power needs for twenty four hours per day, with a reserve power supply of seven to ten additional hours using lead/calcium batteries. This proprietary system, designed and supplied by Hybridyne, would be the first one used anywhere to power a municipal WWTP.

When the MOE decided that the local



Hybridyne's proposed system consisted of twelve 10-kW wind turbines and 48 kW of photovoltaic solar panels.

single phase power grid was not reliable enough for a backup to the RE system, it required the addition of a backup diesel generator. Accordingly, the design was altered to add one. As well, in keeping with the overall system philosophy, a hydrolyzer was proposed, so that any unused electricity would be used to generate hydrogen from water. The hydrogen would then be stored and used to augment the diesel generator's fuel supply.

Injection of hydrogen into the generator's air/fuel mix would decrease fuel costs and cut exhaust pollution by up to 50%. Additionally, since the generator would rarely be used, surplus hydrogen could be used to help power some of the village's diesel trucks.

The net result of this design was a WWTP with a highly reliable system, totally powered by renewable energy, and backed up by a small residential power grid and dual-fuel genset. It would be ca-

pable of paying for itself through the savings compared to the consumption of ever-more-expensive grid supplied electricity. No greenhouse gases would be generated except the small amount from the diesel genset on the rare occasion when it would be needed, and that small amount was further mitigated by the use of hydrogen as a blended fuel.

The Village of Sundridge was pleased about being a world first for industry-leading Canadian know-how. It was excited about sharing this concept with other communities in Northern Ontario and worldwide in developing nations, who all had similar challenges, i.e., modern infrastructure which needed lots of reliable, and otherwise expensive and/or hard-to-reach electricity.

Hybridyne were equally pleased because this would be a pilot project further applying their proprietary and patented Hybrid Renewable Energy system in a

new application, an Ontario-designed wastewater treatment system/concept which could be used throughout Canada and exported worldwide.

Funding for the project was to be from the federal and provincial governments and the Village of Sundridge in equal thirds. In November 2008, the Village applied to the Building Canada Fund (BCF) – Communities Component Program and was successful in getting some funding approved.

So what went wrong?

An application for the BCF program was submitted when the project was in the second public consultation stage of its Environmental Assessment. This meant that final costs and detailed design, including the addition of an RE system, had not been completed. When the final design was done, the cost for the project was much more than the funding approval received.

A Renewable and Clean Energy Application was submitted in September 2009. The Village was notified in January 2010 that it was not approved. It was told that, while the application met all of the requirements for funding, there was not enough funding available for all of the submissions received.

The Village then ran into multiple bureaucratic and government policy roadblocks:

- The BCF has a set timeline, during which the project has to be complete in order to receive funding; the timeline could not be met.



Located on Bernard Lake, between Huntsville and North Bay, Sundridge is a popular summertime destination and focal point for cottagers.

- Many of the funding applications stated that, if you had already received funding approval (even if it was inadequate), you could not apply for more.

- The Village resubmitted its application to BCF for additional funding after completion of the detailed design and asked for additional funds to be added to the project. However BCF would not approve it.

- An application under the first intake of Ontario Small Waterworks Assistance Program was submitted in February 2011. The Village was notified in June 2011 that it was not approved.

- Another application was submitted under the Showcasing Water Innovation Fund in June 2011. The Village was notified in January 2012 that it was not approved.

Sundridge's council is extremely disappointed that they have been unable to power their WWTP with Renewable Energy and is concerned about the following consequences:

- Installation cost of a seven kilometre long power line will be a drain on the Village's finances.

- Electricity costs will be an ongoing burden and will increase every year as prices rise.

- The cost of diesel fuel for the backup generator will also increase every year.

- Delays are extending the environmental impact of the existing wastewater process, because grid-supplied electricity will generate hundreds of tonnes of GHGs per year.

- The Village had been eagerly looking forward to being a leader in Canada and northern Ontario and had been anticipating visits from civic leaders from all over the world to visit their one-of-a-kind RE-powered WWTP.

To date the project has not moved forward. Because of the main upgrades, some of which were required by the MOE, available funding is far short of what is needed. The timetable has been negatively affected by the lack of funding approval and by delays waiting for the various funding applications.

Richard Leverton is with Hybridyne Power Systems Canada Inc, E-mail: richard.leverton@hybridynepower.ca