

# Water Power

## A new spin on an old concept expanding hydro-electricity in Ontario

BY NEIL HARRIS AND AARON ATCHESON

**GREENBUG ENERGY INC.** is taking a “reverse spin” on the concept of an Archimedean screw and has demonstrated that renewable energy investments in Ontario are no longer limited to wind and solar. Archimedes’ screw was invented by Archimedes of Syracuse (287 to 212 BC), an ancient Greek astronomer, engineer, physicist, and mathematician. It consists of a helicoid screw inside of a hollowed pipe and was historically used to pump low-lying water upward, often for irrigation purposes.

GreenBug uses the screw as a power generation mechanism for micro-hydro projects under the Independent Electricity System Operator’s (IESO) Feed-In Tariff (FIT) Program. The micro-hydro projects are strategically located alongside existing water control structure sites, such as dams and locks, to take advantage of existing water level differentials and flow speeds. Where possible, GreenBug has partnered with municipalities through project site acquisition and ownership, giving rise to the possibility of obtaining a per-kilowatt-hour (kW/h) community participation price adder under the FIT Program. The projects range from 60 to 300 kW of estimated capacity and are estimated to generate, at minimum, an internal rate of return of eight per cent. Under the FIT Program agreement, the length of the power purchase for these hydro-power developments is 40 years, as opposed to wind or solar that have a length of 20. This improves the financial viability of the projects in the long term, which is attractive to investors.

Hydro is not without its challenges. An assessment of the riparian rights of neighboring property owners is required, and in most cases, the proponent must work with the Ministry of Natural Resources and Forestry to secure access rights to the project site. This can be a slow and daunting process. Further, a FIT application itself is not an easy beast to manage. Thus, the involvement of legal counsel experienced in the area of water power is vital to ensure FIT application approval. GreenBug has one FIT waterpower project under development and numerous other applications under review by the IESO.

GreenBug was recently awarded the 2015 3M Environmental Innovation Award, an annual award established by the Royal Canadian Geographic Society in 2009, for their innovation contribution to environmental change. **wc**



Neil Harris and Aaron Atcheson practice within Miller Thomson LLP’s national projects group, with a focus on renewable energy projects. Miller Thomson represents GreenBug on its Ontario projects.

Photo: GreenBug Energy Inc.



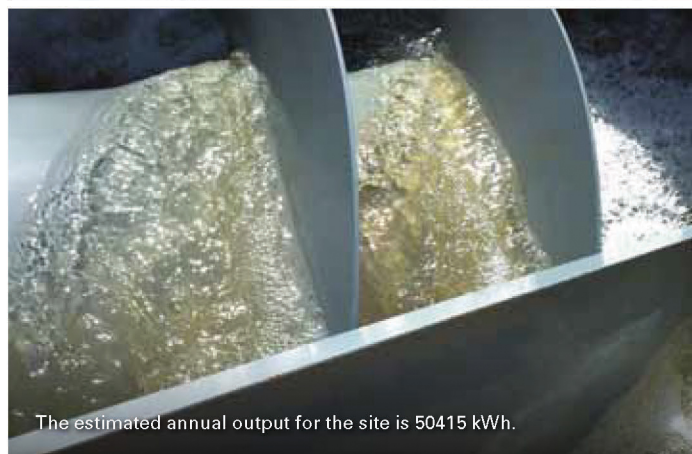
Brian Weber, VP Operations standing at water exit end of screw generator at Fletchers Horse Farm



The Fletchers Horse World had an old mill building and dam on the property that was last used to produce DC electric power a long time ago.



GreenBug’s Archimedes screw systems encompass site-specific designs for the flow regimes of the and grid connection.



The estimated annual output for the site is 50415 kWh.