

Drawing on old technology to power Ontario's future

A Delhi company's micro-hydro energy system incorporates features of the past

BY FRANCES ANDERSON
Ontario Farmer

Once upon a time, almost every small town with a river running through it, had a dam and a mill race to power a grist mill.

Green Bug Energy of Delhi is not proposing a return to the past, but using old technology to power the future, and resurrecting those old mill sites for small hydro projects.

Tony Bouk, who formed Green Bug in partnership with Brian Weber, explains that he's using "old technology in the form of an Archimedes screw."

It's been used for a long-time in the Netherlands to drain the low lands, and in the sewage industry "because it's so robust."

"We wanted some of those features for micro-energy," Bouk told *Ontario Farmer* in a phone interview.

The first commercial-size demonstration project for Green Bug is set to be installed at an existing dam on Nanticoke Creek on the Fletcher Horse Farm to the east of Waterford.

The screw, or auger, will be 17 feet long and 52 inches in diameter, and will take advantage of a 1.95 metre drop, and water flows ranging from 186 to 1690 litres a second to generate 7.4 kw power.

It's expected to cut the horse

farm's hydro bill by \$10,000 a year – and to operate 24/7 – for the next 40 years.

Another advantage of the Archimedes Screw Micro Hydro System is that it doesn't disturb fish habitat, water taking, or turbidity of the water, so the Environmental Assessment, which can take up to five years, was completed "in about three months."

BOUK SAYS micro water power sites "requires a minimum of a metre of drop between the upper and lower water, and the more flow the better" but he said, one of the advantages of this technology is that it "will generate down to around 30 per cent of the maximum design flow" – whereas other turbines are not so forgiving.

This small-scale power is not going to pay for itself if you have to build your own dam, said Bouk. "We're talking about a run of river system, or existing infrastructure."

And, since people don't want to spend \$100,000 on something that they don't know anything about, Green Bug's business model is making site leases with sites owners, developing the project and maintaining the site. It will own the system and share the revenue, Bouk said.

The microFIT rate for water power is 13.1 cents/kw hr. There is also a FIT contract, for projects over 10 kw, "but in the water power class, if you've got the ability to use the power,

"Water sources change hourly, so you need head and flow data for a year..."

— Tony Bouk

you're better off net-metering because you're probably paying 15.9 cents/kw hr before tax," said Bouk.

However, "if you're net metering, we have no way of getting paid, so in those cases, you pretty much have to buy the system - and it can quickly get very expensive."

This is a not an "off the shelf," design, Bouk explained. It has to be customized to the site.

"Water sources change hourly so you need head and flow data for a year to optimize the size of the screw."

What Green Bug has done is develop a number of models to

simplify this process. It starts with developing the parameters for the screw, and the manufacturing requirements like the thickness of the metal, and the final models calculate costs and return on investment.

"This, we can do in about an hour now," instead of weeks, said Bouk.

"We're looking for other sites. We want to do several commercial size pilot sites, so later this year we'll be open for business."

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