

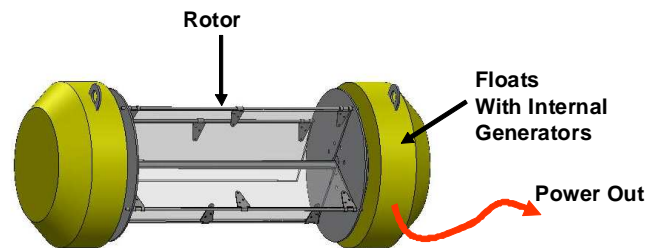
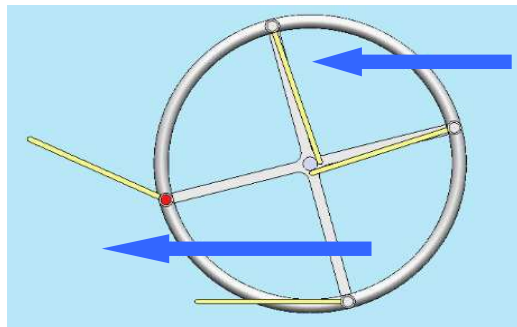
PRESS RELEASE

## New Hydropower Technology Validated by University of Washington Researcher

Seattle, March 12, 2009

A new hydropower turbine invented by a Seattle company has been validated by a researcher at the University of Washington. Dr. Jim Thomson of the Applied Physics Laboratory, an oceanographer funded by the US Navy, tested the Hydrovolts “Flipwing” hydrokinetic turbine on Lake Washington in Seattle in January and completed his analysis this week. “This turbine design is unique and has great potential to create renewable hydropower where it was not possible before,” he said. “We are applying for Navy funding to develop it further.”

Unlike dam turbines that are driven by water pressure, the Hydrovolts “Flipwing” turbine is driven by the hydrokinetic energy in water flows or currents. Therefore it generates power in rivers, streams, canals, tidal channels, industrial water discharges, and other waterways with fast currents. The Flipwing turbine can capture their energy and convert it to electricity for local use or sale to the grid.



*The Hydrovolts “Flipwing” Turbine uses blades hinged on their outer edges so they naturally swing open to greatly reduce their resistance to the current on the upstream stroke*

Hydrovolts President Burton Hamner is targeting fresh, not salt water. “Irrigation canals, constructed waterways and existing hydropower plants around the world are the first places we will install our turbines. The sites have controlled flows, they are already managed by engineers and environmental professionals and they can buy multiple turbines to drop into the canals wherever there is a good flow.” Hamner estimates that his company will sell over 8,000 turbines a year by 2013. “There are millions of sites for this renewable energy technology,” he says. “But we are very focused on constructed waterways managed by engineering organizations – they are the ideal customers, and there are lots of them here in Washington’s agricultural areas.”

Hydrokinetic energy increases with the cube of the current velocity. An increase in velocity from 2 to 6 meters per second produces about 30 times as much energy. The USA average price of electricity now is about 11 cents per kilowatt. At that price, the Hydrovolts prototype turbine in a 2 m/sec current, about a fast walking speed, can produce about \$1400 worth of electricity per year. In a 6 m/sec current, such as found in spillways, the same turbine with a larger

generator can produce about \$37,000 worth of electricity per year. According to Hydrovolts the turbine will have a manufacturing cost of about \$5,000-\$20,000 depending on the size of the generator.

The turbine uses a unique patent-pending mechanism that enables it to operate like an underwater paddlewheel. The mechanism enables the paddlewheel blades to change their position on the upstream stroke to be “edge-on” to the current thus eliminating most of their resistance to the current. The blades are pushed by the water so even slow currents can push large blades to operate small generators. Slower currents are more common so the new turbine enables many new sites to be developed for small-scale hydropower. The turbine is also rectangular in proportion and can be made to fit closely into water channels, thus greatly increasing its efficiency by forcing more of the water through the turbine.

Unlike traditional paddlewheel turbines which have 95% of their parts out of the water, the Hydrovolts turbine is completely submerged and self-supporting, making the same power as a paddlewheel in 5% of the space. The turbine has “drop-in” installation – it floats and is held in place by mooring lines or it can be attached to a fixed brace. No construction is needed except connecting the power output to local grid or energy use.



The prototype Hydrovolts turbine, only 2 feet long, generated enough power when towed slowly to operate Dr. Thomson’s remote ocean sensors used in his research. “The demonstration showed that the Hydrovolts turbine has great potential for increasing the mission life and reducing the cost of ocean observation,” said Dr. Thomson. “Extending battery life is a major priority for the Department of Defense and the Navy and for many oceanographers. It’s great that a technology invented for canal hydropower can also be used for high-value ocean research.”

*University of Washington researchers field-test the new Flipwing turbine*

Hydrovolts, Inc. is a start-up hydropower company based at the Washington Research Foundation in Seattle. It has secured a Cooperative Research and Development Agreement with the University of Washington and two technical assistance grants from the Pacific Northwest National Laboratory of the US Department of Energy. The company is pursuing private investment and grant funds to commercialize its new hydropower technology. For more information including animation and video of the new turbine see [www.hydrovolts.com](http://www.hydrovolts.com)

Contact: Burton Hamner, President. Hydrovolts, Inc.  
[burt@hydrovolts.com](mailto:burt@hydrovolts.com), 206-491-0945  
 @ Washington Research Foundation  
 2815 Eastlake Ave East, #300, Seattle, WA 98102