

A BUMP IN THE ROAD TO SUSTAINABILITY

This new energy technology turns vehicles' braking motion into electricity.

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By **Noelle Stapinsky, Features Editor** | April 21, 2010



For many, driving over speed bumps, potholes and cracks in highways causes irritation, but for a Welland, Ont., based inventor a bump in the road gave him an idea.

After spending 11 years as a robotic welder at the now closed Welland John Deere manufacturing facility, Stefanos Horianopoulos started experimenting with capturing tidal energy with his brother in Greece.

He tried to bring those machines to Canada, but found that implementing the technology—which uses hydraulic pistons to harvest the energy created by waves—was unpredictable in our climate.

“While we were testing alternative energy methods, I thought that if we used the same principles as the wave technology and put a hydraulic piston under the wheel of a car, we can take the energy of the vehicle and make electricity,” says Horianopoulos.

Forming KinergyPower in 2004, Horianopoulos started developing this design with his brother Dimitri.

The idea was to develop the technology into a mat to be placed on roads where there is heavy braking motion from vehicles—such as a bus terminal—and in the form of a speed bump.

“In trials, the technology worked really well,” says Horianopoulos. “We put three prototypes through the trials and finally after four years we got the patent for the technology in the US.”

Essentially this technology uses the kinetic energy vehicles create while travelling and braking.

Branding its flat pavement application as a KinergyPower Carpet and speed bump application as KinerBump, the technology consists of a series of hydraulic pistons.

The "carpet" can be installed on any paved surface—when a vehicle passes over the device, the weight and momentum of the vehicle pushes the pistons, forcing fluid through a line to drive a hydraulic motor. The energy from the motor powers a generator that creates electricity, which can be supplied directly to the grid.

“When you travel on a highway at 120 km and suddenly decide to pull into a travel centre or truck stop, the vehicle has about 200 metres to slow to about 20 km,” says Horianopoulos. “Those are the areas you can harvest the maximum power from the vehicle, power that is otherwise wasted in the pavement or the braking of the vehicle.”

The power created is substantial. Horianopoulos says, for example, if 3,000 transport trucks passed over a KinergyPower device with 1,000 hydraulic piston activation points daily, it would create more than 25,000-kilowatt hours. That’s enough power to supply 1,000 homes.

The "carpet" can be installed at bus terminals, intersections, highway sections that require de-

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acceleration, truck stops, hospitals, etc. And if you think of all the streets and parking lots with speed bumps—which inevitably need to be replaced—the installation opportunities are endless.

KinergyPower's first commercial pilot project is currently underway in partnership with the City of Welland at its city bus terminal. The test installation has been purchased by the city and is estimated to produce enough electricity to power the equivalent of two houses.

KinergyPower has also partnered with Brock University in St. Catharines and Niagara College of Applied Arts and Technology to collect the scientific data and monitor results from the pilot project.

Once KinergyPower has the scientific proof to back up the data it has collected on its technology, the company is setting its sights on traffic hot-spots such as Toronto.

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