

Garage Invention Turns Restaurants Into Power Plants

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Would you like power with those fries?

A new garage-engineered generator burns the waste oil from restaurants' deep fryers to generate electricity and hot water. Put 80 gallons of grease into the Vegawatt each week, and its creators promise it will generate about 5 kilowatts of power.

That's about 10 percent of the total energy needs of Finz, a seafood restaurant in Dedham, Massachusetts, where the first Vegawatt is being tested. At New England electricity rates, the system offsets about \$2.50 worth of electricity with each gallon of waste oil poured into it.

Vegawatt's founder and inventor, James Peret, estimates that restaurants purchasing the \$22,000 machine will save about \$1,000 per month in electricity costs, for a payback time of two years.

"You take this waste resource and make it a profit center," said Peret, who spent four long years cooking up the project in his garage. "When I started telling people, they said, 'Someone's gotta have done this.' I'd run into more people. They'd say, 'Why hasn't anyone done this?' My only response was, 'I don't know; it seems like a good idea.'"

While Vegawatt is a small solution, Peret's invention is a very clever embodiment of several long-cherished alternative-energy ideas: capturing both the heat and power from fuel combustion, making energy where it's used, and recycling used resources. Big industrial plants that make paper, for example, have long taken advantage of these concepts to save on their utility bills, but the Vegawatt will be the first product that could turn thousands of fast food restaurants into mini power plants.

"Now the restaurant owners are going to be motivated to put every single drop of waste oil into this thing, because it will pay for itself," Peret said.

And importantly, it provides convenience for restaurateurs or Burger King managers, instead of subtracting it, like so many green solutions seem to.

Restaurants that fry delicious things like chicken and french fries generate dozens of gallons of waste oil that have to be stored in barrels out back. Because used cooking oil is considered a low-grade hazardous material, they haven't been allowed to just throw it away; they generally had to pay rendering-plant operators to come. But it is now a sellers' market for grease.

Higher crude prices have made other types of oil more expensive. Biodiesel makers and renderers have become increasingly willing to pay up to 40 cents a gallon for the stuff. There have even been reports of "[biodiesel pirates](#)" stealing fryer grease.

In fact, Vegawatt is derived from the [home-brew fuel movement](#) that many trace back to Dr. Thomas Reed, who popularized a recipe to convert waste cooking oil into biodiesel more than 20 years ago. Peret converted his truck to run on straight vegetable oil, or SVO to home brewers. But he was troubled by the inefficiency of the process.

"If you want to run waste vegetable oil in your car, it's not as simple as going behind a restaurant and filling up," Peret said. "People that do this spend the majority of their free time collecting fuel from restaurants."

Peret realized he could use the same engine technology to power an on-site generator and defray a restaurant's electricity costs.

"It's not difficult to go from spinning tires to spinning magnets," he said

So he created a test unit — which you can see at the back of his garage in the top photo — that's basically a diesel generator hacked to run waste cooking oil. It feeds power directly into the restaurant's electrical system through a 30 amp hook-in.

Vegawatt is more efficient than a typical coal or natural gas plant. Peret said it can capture 70 percent of the fuel's caloric value. That's because the generator captures and uses the waste heat it generates.



"All the water [the restaurant] would send to its boiler, instead of sending it straight there from the city, we run it through our heat exchanger first," Peret said. "Depending on the flow, [the water] can go into the hot water heater at 120 degrees." (This non-electrical energy savings is included in the 5-kilowatt rating cited above.)

The big power plants, though technically very efficient, waste most of the fuel they burn. After accounting for all the sources of energy waste "what you are left with ... is just 27.6 units of usable energy out of every 100 units you started with," energy researcher Benjamin Sovacool explained in his recent book, *The Dirty Energy Dilemma*. "In terms of making toast, it would have been nearly four times more efficient just to burn a lump of coal and place your bread over the flame."

Biomass energy sources — like waste wood, [switchgrass](#) or cooking oil — are best when used right near the source of their creation. Dragging the stuff creates more emissions and raises the cost of the fuel. Vegawatt doesn't have that problem. By company estimates, the Vegawatt generates 50 percent less carbon dioxide than a comparable amount of electricity from a coal power plant.

"In terms of the amount of energy that it takes to transport this waste, it's a french fry," Peret said. "You just feed the guy who is picking up the bucket and pouring it into the system."

Forest Gregg, an alternative-fuels expert and author of last year's [SVO: Powering Your Vehicle with Straight Vegetable Oil](#), called it a "nifty application and a great business idea."

Gregg also drew attention to a strong part of Vegawatt's pitch: that it won't require "intervention or maintenance by restaurant staff." That's because when users buy a system — or lease it for \$450 a month — they get a service contract with the company for cleaning and maintenance.

The owner of the very first Vegawatt, George Carey (pictured above), seems pleased with the unit, too. He heartily endorses the company on its website, saying, "The Vegawatt system enables me to significantly reduce my energy costs, generate clean energy on-site, and very importantly, reduce the heavy energy footprint of my restaurant."