

Farm-Sized Portable Biodiesel Plant

Robert Byrnes uses biodiesel to produce electricity for his farm. He even uses it to power the plant that produces his biodiesel!

Using components imported from India and others produced locally, he has developed a turnkey biodiesel system that he expects to retail for about \$12,000 (delivered). He has even mounted one on a trailer for portable demonstrations.

"I use a biomass-fired boiler to produce steam to heat the oilseeds," explains Byrnes. "The steam is injected over the top of the oilseeds and through a tube that runs around the bottom of the seed hopper."

Once heated, the oil seeds pass through a Goyim expeller powered by a biodiesel-fueled 12 hp, single cylinder Listeroid engine. It also powers the water pump on the steam boiler and the hammer mill to crush the beans before they are sent to the heated hopper.

As the extruder screw turns, oil drips into a belly tank and meal cake comes out the other end. Unwashed biodiesel oil (without glycerin removed) fires a 2-cylinder Onan 10 kW generator, while the meal is fed to his livestock. He is also burning 50 percent unwashed oil in his diesel truck.

So far the unwashed biodiesel has not been a problem for the generator, which Byrnes checks regularly, pulling injectors and watching for buildup. The byproduct from the process has been anything but a problem for his livestock.

"The meal cake is great," says Byrnes. "I just brought in 400 50-lb. pigs, and they love the expelled meal. It has the gums they don't



Turnkey biodiesel system is expected to retail for about \$12,000. Here it's on a trailer rigged up for portable demonstrations.

get with commercial soy meal and no residual hexane or calcium additives."

Byrnes suggests farmers consider a system designed to meet farm needs, both in terms of power produced and livestock to be fed. "Figure how many gallons of biodiesel are needed for the farm," he says. "Then look at how many head of livestock will be needed to consume the meal. If you have to sell meal on the open market, you are too big. Then you are competing with ADM and Cargill."

Byrnes has recently assembled his

biodiesel system on a trailer to demonstrate the system at farms, farm shows and other events. He notes that his demo unit can process up to three tons of soybeans and pull out 100 gallons of unwashed oil in a 24-hour day. He suggests that larger units need to have washing/refining systems added to bring the oil to commercial grade. He advocates farmers going together to build such plants to produce washed biodiesel for their own use. Of course, a unit like his mounted on a trailer could be shared and pulled to owner farms

for periodic refilling of the diesel tank.

Byrnes reports that one group of Nebraska farmers is building a 20 ton/day plant for sunflowers. Instead of hauling sunflowers to buyers in Kansas, they plan to make their own biodiesel for use on the farm.

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"I can take it out fishing any time I want," says Thomas Mueller.

"World's First" Floating Gazebo

When Thomas Mueller and his wife decide to leave their gazebo and head back to the house, they first have to start up an electric trolling motor and drive back to the dock. That's because their gazebo floats on a two-acre spring fed pond.

"The pond is 20 ft. deep and stocked with fish," says Mueller. "I can take the gazebo out fishing any time I want."

The gazebo deck consists of eight 4-ft. by 4-ft. by 18-in. encapsulated Styrofoam floats around the outside of the 14 by 14-ft. base. The floats are held in place with 2 by 6-in. treated planks laid flat over the floats and anchored to them, and spaced about 16-in. apart around the perimeter. Mueller used ironwood (also called Brazilian walnut) for decking.

"I used discarded waste where I could," he says. "The uprights for the screened portion were sections of aluminum light poles that were being removed from a nearby parking lot. The uprights for the railing around the outside of the deck were recycled from weed whacker shafts."

Mueller cut the top 8 ft. from the 19-ft.

poles to make his 6 uprights. The tapered posts were welded to base plates attached to decking, with plates at the top to anchor the roof. He built the roof out of 2 by 4s sheathed in plywood and covered with shingles. At the center, the screened enclosure is 10 ft. high with each of the 6 sides measuring about 54 in.

The railing around the outside of the deck consists of pressure treated 2 by 6-in. horizontals with the weed whacker shafts in place. The top pieces are dressed up with ironwood decking.

Mueller built the gazebo on skids prior to filling his pond for the first time. Using a backhoe, he dragged it into position, removed the skids and let the rising water set it afloat.

"I put a solar charger on the roof with a 12-volt battery under a bench inside the gazebo," says Mueller. "It powers 12-volt lights and a trolling motor. When I am close to our dock, I can plug it in for more lights, radio and a ceiling fan."

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Simple "Hurricane Pump" Provides Emergency Water

Reed Franz has been working on his easy-to-make hand pumps for the past 15 years. He now has several different designs that draw up well water manually, when electricity is unavailable.

The Seminole, Fla. man says his home made pumps are inexpensive and quick to make. One version, which he calls his "Hurricane Pump", is made from pvc pipe, two commercial valves, and various adapters, couplings, elbows and O-rings. It's ideal to have on hand for when the power goes out during a disaster, he points out.

"This simple emergency pump costs no more than \$25 to make, and uses materials that are easily obtained from any plumbing supply or hardware store," Franz explains.

He says the pumps are environmentally friendly and can be used on shallow or deep wells. They're also easily operated by anyone, including children. They discharge water under pressure, so it can be pushed to a higher elevation than the pump.

According to Franz, the length of pipe needed depends on the water level in the well. The Hurricane Pump incorporates two Brady check valves, which prevent back flow and loss of prime, while providing efficient flow.

To use the Hurricane Pump, you disconnect the existing pipe that goes to your electric pump, and put the handmade pump's intake pipe down into the well until it's submerged in the water, according to Franz. Then you pump it by hand, using the handle to slide the smaller top section of pipe up and down, inside the larger bottom section of pipe. The height that you can raise the water to, depends on the muscle power of the operator.

Franz is looking for someone who's willing to put together detailed plans and make them available to the public.

"I don't hold any patent and am not concerned about making any money from this. I



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just want the pumps to help humanity in any way they can," he says. "I would like to see plans for this pump available to the public, but, being retired and elderly, I'm not anxious to do it myself. I'm hoping that someone will try it, think it's worthy, and make the drawings for sharing with others. Also, anyone who wants to finance mission groups to make the pumps for use in the Third World would be very welcome to do so."

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