

## “Made It Myself” Hydro Provides His Electricity

Bill Kelsey doesn't believe in doing things the easy way. Commercial hydropower systems are widely available, but he put together his own system with a lot of help from friends. Over the past 20 years the system has been improved to the point where it now provides most of the electricity he needs.

“When I started, I had never even seen a hydroelectric system,” recalls Kelsey. “I started with a Harris Hydro turbine to be fed by waterlines laid by the side of a creek on my property.”

Kelsey installed a 275-gal. tank to catch water coming off a homemade dam. He filtered it before it entered the two 2-in. pipes.

“After months of working on it, I was disappointed to only get 30 watts at best,” admits Kelsey. “I called Don Harris, maker of the turbine, and he explained the requirements of a successful hydroelectric system.”

Harris explained to Kelsey that he had too much pipe friction and should change to 3-in. pipe. The creek had a total drop of about 30 ft. between its highest point on Kelsey's property and his house. Harris suggested taking full advantage of maximum drop. He also pointed out that the pipe needed to be buried to protect against winter freeze up.

Kelsey bought a friend's 20-ton excavator and went to work at the high point of his property. He excavated a small pond and built an earthen dam to hold the water. The old water tank was replaced with the bottom half of a

septic tank with a wood cover. Intake pipes inside the tank are surrounded by removable screens for easy cleaning. He also buried 4-in. pipe 15 ft. below the surface of the stream.

“That August we had 7 in. of rain in 24 hours, but my dam held,” says Kelsey. “After those improvements I was making 100 watts. Not much, but you learn what you can live with.”

Power was stored in 6-volt golf cart batteries. A panel designed with the help of Steve Schulze of New England Solar Electric and Larry Riley, Kelsey's electrician, managed the power supply and delivered electricity to the home's AC appliances. They also installed a DC panel to supply power to the DC compact fluorescent lights in each room of the house. It also powers a 24-volt DC circulating pump that brings hot water from Kelsey's outside Aqua-Therm wood furnace to his home's in-floor heating coils.

The control panel also has a remote start switch for a back-up generator located at a distance from the house. The Onan 5 kW propane fed generator kicks in mainly in the summer when stream flow is at its lowest.

“It also kicks in when I need power for my welder and an air compressor in my shop,” says Kelsey. “It averages about 75 hours of use each year.”

When Harris came out with a brushless, permanent magnet alternator, Kelsey upgraded. The old alternators ate up brushes, and Kelsey had kept a spare around so he



Kelsey Hydro System intake pipes and filter trap (left). Intake tank catches water coming off dam.



Photos courtesy Brian Wilcox



Unit's control panel (left) has a remote start switch for a backup generator. Kelsey started with a Harris Hydro turbine which is fed by waterlines laid by the side of a creek.



could change brushes without losing power.”

“The new hydro setup runs day in and day out, making a continual 150 watts or about 3.6 KWH per day,” says Kelsey.

Since completing the hydro system, Kelsey decided to increase the size of his home to 1,200 sq. ft. To supplement the hydropower, he installed four BP 75-watt solar panels and four 50-watt panels.

“The solar panels produce about 420 watts

in full sun,” says Kelsey. “When the batteries are full, excess power from the solar and hydro feeds a DC water heating element controlled by a Trace C35 controller. The extra power heats my domestic hot water. I have more than enough electricity to run lights and basic appliances.”

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Frank Pye's 12 by 20 by 7-ft. shed has a floor made from 18 pallets. The shed walls are two pallets high.

## How To Build A Pallet Shed

Shipping pallets have a couple things going for them as a building material, says Frank Pye, who farms in Labrador. They're usually free and most of them have consistent measurements.

“Most farmers have large numbers of shipping pallets around or they can easily find them. Most of them measure 48 by 40 in., so naturally, a do-it-yourselfer like myself, with a healthy ability for scrounging, found a way to turn them into a useful, low-cost shed.”

Pye's 12 by 20 by 7-ft. shed has a floor made from 18 pallets (three across by six down). Pye's shed walls are two pallets high – the full 80 in. – because he compensated for the 5-in. pallet depth by inserting 5 by 5-in. sills and corner posts.

“One mistake I made was that I should have laid down a scrap plywood floor nailed to both the sills and floor pallets to prevent any future movement of the sills and walls away from the floor,” he says.

Since every pallet has two grooves designed for the loading forks, these grooves are ideal to accommodate 2 by 4 wall studs, which are aligned flat to the wall instead of perpendicular, as in normal wall construction.

“I found that one wall stud for every two pallets makes a very solid building. I added a double 2 by 4 wall plate at the top of my wall, which resulted in a full and secure 7 ft. wall on which to place my homemade 12 ft., 10-in. roof trusses,” Pye explains. “If you were to build a 3-pallet wall (120 in. tall), you would no doubt require extra studs.”

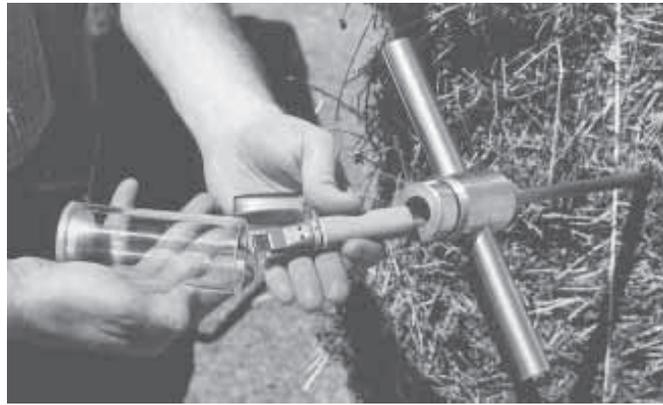
Scrap sheeting from a demolished building serves as Pye's siding for the walls and roof, further minimizing costs. In all, he spent \$350 to build his shed.

“It only took my 13-year-old grandson and me about a week to finish the project,” he points out. “It felt good to recycle so much material and I now have a very useful building.”

“A pallet shed built on a level, dry site should last 10 to 20 years, or more if tar or other wood preservative is applied to the floor and sills which lie on the ground,” he says.

Pye plans to build a 16 by 20-ft. shed this summer to house a flock of 100 large hens.

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Temperature probe works together with computer software. A removable, battery-powered data logger on back plugs into the USB port on your computer.

## State-Of-The-Art Bale Temperature Probe

“Our new temperature probe allows you to monitor the temperature in baled hay or silage, and use the information to determine the application rates for preservatives and inoculants,” says Sherwyn Unruh, TechTemPro, Copeland, Kansas.

The temperature probe works together with computer software. The probe consists of a two-handed, 3/8-in. dia. stainless steel rod with a removeable, battery-powered data logger on back that plugs into the USB port on your computer. The data logger is contained within a clear glass tube and is equipped with green and red LED lights that let you know if the temperature is within parameters that you set on the software. Whenever the temperature gets too hot the red LED light will come on.

The user can download the data logger on a laptop or personal computer and view a printable graph. The unit can be set to record temperatures all the way from once per second to once per day.

“It gives you a better idea on how your preservatives or inoculants are working and

whether you need to change the application rate,” says Unruh. “It can also be used to monitor grain, silage, ground temperature, compost, etc.”

“There's no need to unplug the data port and put it into your computer every time you use the probe. Instead, you can download the data logger's memory into your computer to keep an ongoing record. If you want you can keep a record of the times, temperatures, and dates for every stack of bales you've made. It helps when selling your hay, too, because the buyer knows exactly how that hay was treated with preservative, and that the hay never got too hot.”

The temperature probe sells for \$450 plus S&H and comes with a lifetime warranty from any manufacturing defects excluding electronic parts.

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