

His Tractor Is Solar Powered

Already an Allis-Chalmers G owner, Tom Galazyn bought a second one for parts but decided to electrify it instead. He swapped a 52 Dodge truck with a hydraulic lift with a friend who handled the conversion. Mike Bandow, who did solar and wind installations, had the expertise needed.

"He followed the directions he found on the internet," says Galazyn. "Ron Khosla had received a SARE (Sustainable Agriculture Research & Education) grant to electrify a G. He created a website that provided detailed instructions."

Unfortunately, the Khosla website is no longer accessible. However, the SARE grant project report and a FARM SHOW story (Vol. 32, No. 4) on a similar conversion by Tom Ruggieri are still available.

"The converted G worked well," says Galazyn, who produces fruits and vegetables in far northern Wisconsin, close to the edge of Lake Superior. "The only problem came after the coldest winter with temperatures as low as -27 F. The tractor had been stored outside, and it wouldn't start the next spring. I called Bob Batson at Electric Vehicles of America, and he suggested the problem was likely the motor controller. A new one cost \$400."

Galazyn says he learned his lesson. Since then, the eG has been stored under cover. He made the electric tractor even more efficient by adding solar panels mounted over the battery box behind the operator's seat. He also made a rack to hold four 2-sq. ft. panels that he can raise to match the sun's angle.

"The panels start charging the battery as soon as I shut down the G," says Galazyn. "If I'm working in a remote field and the battery charge goes down, I just shut it down and walk home. I can come back later, and it's charged back up."

Galazyn uses the G to cultivate his strawberry beds and vegetables. He also pulls a four-wheel trailer with it when picking apples or gathering firewood. The G also comes in handy when moving his broiler chicken tractor.

"The chicken tractor is a little too heavy to move by hand," he says. "I still have my old gas-powered G, but years can go by without starting it up."

Galazyn estimates his total cost over the 14 years he's had the eG at around \$2,000, none of which was energy. Living off-grid, his electricity is entirely supplied by solar panels and a wind generator.

"The only drawback is we used four 12-



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volt batteries when converting the G," says Galazyn. "They take up too much room for me to use rear cultivators. If we had used eight 6-volt batteries instead, they would've had a smaller footprint."

Contact: FARM SHOW Followup, North Wind Organic Farm, 86760 Valley Rd., Bayfield, Wis. 54814 (ph 715-779-3254; tomgalazyn@hotmail.com; www.northwindorganicfarm.org) or SARE (<https://projects.sare.org/wp-content/uploads/910807/converting-an-allis-chalmers-g-converting-tractor-into-an-electric-vehicle.pdf>).



Blade and headstock's slim profile keeps the weight near the tractor for better maneuverability in tight feed pads and dairy sheds.

Manure Scraper Works For Snow, Too

The Hustler LM260 SwiftBlade Manure Spreader is a durable tool designed to clean concrete pads in livestock barns.

"Hustler was founded in 1961 by RH Currie, a farmer and engineer in New Zealand," says Brent Currie, Hustler spokesperson. "He sought to simplify everyday tasks on his farm to save time and make life easier. The company remains family-owned today, with the DNA of innovation carried through the generations."

The SwiftBlade is a loader-mounted scraper built with a 40 mm abrasion-resistant SBR rubber blade. "We made the SwiftBlade as a simple attachment to make dealing with muck much easier," says Currie. "It's normally a messy, dirty job; Switchblade makes it clean and easy."

The high-tensile SBR rubber offers excellent abrasion and impact resistance for a clean sweep across concrete. "The special rubber reduces damage to troughs and floors and is available for skid steers and loaders. Some operators even use them to push light, fluffy snow," says Currie. "These are mostly

for dairy farmers, but SwiftBlades are useful for anyone with a feed pad or shed where cattle are housed over the winter that wants to maximize the fertilizer value of their manure."

The blade and headstock's slim profile keeps the weight near the tractor for better maneuverability in tight feed pads and dairy sheds. It's designed without unnecessary bells and whistles, and the parking feet allow for fast and easy hooking and unhooking to prevent blade damage when not in use. Blade height adjustment will suit any size tractor for a wide variety of operations. And because it's double-sided, you can quickly flip the rubber over to increase its working lifespan.

Each SwiftBlade weighs 452 lbs. and measures 102 1/3 in. by 33 1/4 in. by 19 1/8 in. Pricing starts at \$3,190 plus freight.

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beneficial. One reason was the need to be tied to the grid.

"We produce at least as much energy as we use 97 to 98 percent of the time, but the other two to three percent, you need to be on the grid," says Harbach.

Producing their own electricity and selling the excess to the power company has been challenging. "For the first four years, the utility was allowed to charge us a transition fee," says Harbach. "We had to pay them for the power we had purchased in 2005, but no longer needed after installing our system. They classified us as a generator, causing them competition. That continued until 2010."

In addition, for the first year and a half, they weren't paid for the excess electricity produced over the farm's needs because net metering laws weren't yet in effect. After that, they were paid the wholesale rate for excess but charged the retail rate when buying energy.

Payment was further complicated after 2010, with fees and extra charges if the farm's generator shut down and the farm drew power from the grid. When the farm went to three-phase power on a new facility, it became subject to high demand charges.

"If we took 220 power from the grid for 15 min. in any one-month billing period, we were charged for a month's demand," says Harbach. "We could get a \$2,000 bill for only 15 min. of power."

Another problem was that if the grid went down, the farm was required to shut down the generator and stop producing power.

Many of those complications will be in the past once the farm completes a planned upgrade. With over 150,000 hrs. on the old generator, it'll be replaced by a larger one.

Updated systems and a backup diesel-powered generator are also being added.

Over the past 24 years, the milking herd has increased from 600 to 1,300. While the digester was sized for the larger herd, the generator wasn't. Excess gas produced from the increased manure had to be flared off.

"We're installing a 425-kW generator on the digester and will be able to monitor gas production in the digester better," says Harbach. "We hope to minimize, if not do away with, flared gas."

The farm will also be able to eliminate buying power from the utility. They continue to be connected to the grid to sell excess power. However, if the grid goes down, the farm will be disconnected. The backup generator will kick in, and the digester system will continue to run, producing heat, electricity and liquid fertilizer for the farm.

Even with the power company complications, the initial decision to install a digester has been a good one. However, Harbach suggests anyone considering installing a system should research utility requirements in their area. Sizing the system for farm needs and utilizing both excess heat and electricity on farm is key.

While selling excess energy can help with the return on investment, rates and conditions can change over time. Harbach looks forward to a new level of independence from his power company.

"The new upgrade will allow us to stand alone," says Harbach. "It'll give us more options going forward to get away from high demand charges while still satisfying our heat and energy needs, not to mention crop nutrient needs."

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Manure Digester Meets Dairy's Needs

The manure digester on Schrack Farms has paid for itself as a heat source for the multi-generation family dairy. For the past 18 years, the 200-kW generator has also been pumping out electricity as local rates have doubled to 14¢/kW. The big surprise has been the residual liquids' benefits to the no-till/cover crop farming system (Vol. 48, No. 6).

"The ability to fertilize crops with the liquids has been a game changer for us," says James Harbach, Schrack Farms. "The manure goes into the digester at a pH of 7, and the liquid nutrients come out with a pH of 8. We drizzle it on our cover crops before harvesting as a feed source in the spring and then another application on the corn fields sometime after emergence and again at harvest after we have planted cover crops."

The heat produced by the system was immediately beneficial. Waste heat from the motor and generator provides hot water for the dairy and the farmhouse. It also dries



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digested solids for bedding and provides in-floor heat for the parlor and the milk truck bay. Even the exhaust heat from the motor that burns the digester-produced gas is run through a heat exchanger producing 160-degree air to dry washcloths used to clean udders on the farm's 1,300-cow milking herd.

"The entire digester system was designed to meet 100 percent of our heating needs," says Harbach.

Electricity generation wasn't immediately