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Company turns waste to cash Clean Green makes used antifreeze into new

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All but worthless in itself, used motor oil became valuable enough 20 years ago that a network developed to link auto repair shops with re-refiners who turned waste oil into fuel or an ingredient in asphalt.

The shops' next most plentiful waste fluid -- antifreeze -- was still only that. What's more, the millions of gallons of antifreeze drained from car radiators and industrial cooling systems are considered hazardous waste and can't legally be poured into sewers or the environment.

Tim Wilkinson has taken on that dilemma as a personal challenge. A longtime Durham car repair shop owner and auto mechanics teacher at Northern High School, he also is a lifelong tinkerer.

The result is Wilkinson's growing business of collecting used antifreeze and purifying it with a maze of tanks and tubing he invented and built in a warehouse in eastern Durham.

In one end goes greenish, scummy gunk. Out the other comes a crystal-clear liquid.

Wilkinson's Clean Green Inc. processes between 5,000 and 7,000 gallons of antifreeze a week at its plant at 211 S. Hoover Road in eastern Durham.

"It's really equal to new," he said of the product, which the company mixes with dye and additives to make any of the several types of automotive antifreeze on the market. Clean Green completes the recycling loop, selling back to garages the purified antifreeze.

Wilkinson taught himself the chemical processes necessary to purify antifreeze, then designed, patented and built his recycling system. His business employs 10 people, including his wife, two sons and two daughters.

Although Wilkinson has a business degree, "the only thing I wanted to do was invent stuff," he said. As a mechanic, he opened a small garage off Carver Street, then a larger one on North Roxboro Road, while also teaching high school auto shop.

Until recently, oil recyclers frequently accepted shops' used antifreeze just to get it off the mechanics' hands. It usually was mixed with the oil and later drained off and dumped or boiled off during the oil's reprocessing.

"There's been very few options," Wilkinson said.

About 10 years ago, a company sold truck-mounted machines to recycle antifreeze at garages on-site as a mobile service. But these machines only filtered the antifreeze, and they weren't able to handle the different types that were emerging. Wilkinson said. Besides traditional green fluid, manufacturers now produce red, purple, yellow and clear antifreeze, all with slightly different formulations.

Wilkinson learned that more complete recycling could be done by reverse osmosis, using a membrane that under a given pressure would allow molecules the size of ethylene glycol, the main ingredient of most automotive antifreeze, and water to pass through.

He researched osmosis membranes until he found one that would work.

"There was no benchmark for this," he said. "Even the membrane guys were guessing."

He incorporated Clean Green in 1997. Four years ago, the company moved into the former Public Service Gas Co. offices and warehouse on South Hoover Road.

Wilkinson's wife, Kathie, helps run the business, as does their son Andrew, who manages sales and scheduling. Their daughters, Melissa Long and Jennifer Rogers, split a position, handling billing and other accounting. And their younger son, Aaron, who attends Northern High, helps out after school.

The company now has 1,500 accounts. Clean Green's collection clients include municipal landfills and collection centers in North Carolina. And besides automotive antifreeze, Clean Green processes industrial coolant from such sources as Progress Energy's natural gas and coal-fired electric generators.

The company has grown about 20 percent each year, and this year, it will gross close to $800,000. Wilkinson hopes to gross more than $1 million next year, expanding into waste oil collection. He also plans to expand into the still-newer industry of recycling used oil filters and hopes to begin selling recycled antifreeze by the gallon to the public.

Because the antifreeze recycling industry is still young and fragmented into family-owned businesses like Wilkinson's, it's hard to know its extent nationally, said Jim Scott, regional branch manager for US Filter Recovery Services, which operates a fractional distillation plant for recycled antifreeze near Richmond, Va. Clean Green sells its residual waste antifreeze to US Filter and buys some supplies from it.

Scott said he knows of only three other facilities using Clean Green's technique between South Carolina and New Jersey and only a handful of distillers nationally.

"We are only limited by our capacity," Wilkinson said.

The company operates five trucks, each with separate tanks for collecting waste and delivering recycled antifreeze, which is available in all the major colors and formulations.

The company's clients can save money over the cost of virgin antifreeze. Mixed half and half with water -- the recommended concentration for cars and trucks -- virgin antifreeze sells for about $7 a gallon. Clean Green recycled antifreeze sells for less than half that price, Wilkinson said.

Since virgin ethylene glycol is made from natural gas, its price tracks closely with crude oil, Scott said "I've watched it, especially in the last six months, really skyrocket," he said.

Wilkinson agreed, saying he's noticed the price of off-the-shelf antifreeze double in the past year.

But recycled antifreeze still faces hurdles to consumer acceptance, Scott said, even though it is subject to the same standards as virgin product. Even virgin antifreeze, moreover, can contain as much as 15 percent recycled ethylene glycol.

Higher oil prices also are raising the profitability of oil filter recycling, he said.

So far, most governments haven't banned used oil filters from landfills, even though each filter typically contains three or four ounces of oil, Wilkinson said. A 55-gallon drum full of filters yields between five and eight gallons of waste oil, which is worth about $1 a gallon. The filter's canister then can be sold as scrap metal.

Clean Green collects oil filters, draining most of the oil and selling it, then selling the filters to a company in Pennsylvania that extracts the remaining oil and shreds the metal for scrap.

But within six months, Clean Green hopes to be operating its own shredder, Wilkinson said.

"This has been a lot of fun for me," he said. "I've been blessed to have this opportunity to use some of my God-given talent to try to make the world a little better."