A fuel tank at the Daphne (Ala.) Utilities biodiesel plant. By using biodiesel to power its trucks and equipment, the utility saves nearly $10,000 a year.

Saving the Planet With Bars of Soap And Trucks That Smell Like French Fries

An Alabama utility enlists its customers' help to remove FOG from sewers

Rob McElroy

Imagine the following scenario: You and your family are walking through a fun-filled street festival. Children are playing. Local artists are displaying their wares. Sips of ice-cold lemonade fend off the summer heat. Suddenly, you turn and exclaim, "Hey, there's the guy who runs the sewer system! Let's ask him what they're doing to protect the environment and how we can help."

Sound far-fetched? Well, it doesn't have to be. A sweet-smelling truck and a tiny bar of soap have transformed the way Daphne (Ala.) Utilities interacts with customers to combat sewer problems. As Daphne's story illustrates, you can get your customers' enthusiastic help, improve your sewer system's overall function, build powerful public relations, and save money, all at the same time.

The (Not So) Lovin' Spoonful

For many wastewater utilities, sewer spills caused by fats, oil, and grease (FOG) — along with the resulting liability exposure, cleanup costs, and bad public relations — are just part of day-to-day reality. Utilities are supposed to keep their sewer systems in good working order, but most simply wait until something breaks and then fix it. Doing this is "repairing," not "maintaining." To maintain sewer systems, utilities must address FOG effectively and proactively.

First, utility staff must understand that they do not directly control FOG deposits. It's a simple matter of scale. Consider this: Daphne Utilities has about 10,000 sewer customers. If each customer poured only 1 teaspoon of cooking oil down the drain each day, the sewer system would contain just as much FOG as if someone opened a manhole once a month and poured in seven 208-L (55-gal) drums of oil (about 1500 L [400 gal]). If you witnessed the drum dumping, you would surely call the U.S. Environmental Protection Agency to report this environmental crime. However, its effect on the sewers is no greater than the multitude of tiny deposits.

When Daphne tells its customers this story, they are startled by how quickly nonevents (1 teaspoon per day per house) can become huge problems (catastrophic sewer spills). They are equally startled to learn that the daily cooking and cleaning they do in their own homes is a prime cause of such problems — especially when they consider how much more than a teaspoon they often pour down their drains.

A Big First Step: Recycling Used Oil

In early 2004, Daphne Utilities launched a used-cooking-oil recycling program called "Cease the Grease." This program was designed to change residents' cooking and cleanup methods so less FOG would enter the sewers.

Utility staff established recycling stations throughout the city, carefully choosing locales that would be easy for residents to find and use. The locations that really seemed to work included gas stations, convenience stores, grocery stores, apartment-complex laundry and mail rooms, superstores, and utility offices.

Each station costs less than $200 to construct (including labor). Made of exterior-grade plywood and treated two-by-fours, the recycling stations resemble chicken coops or rabbit cages with shelves. They are attractive enough not to be objectionable to store owners and are completely serviceable.

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Biodiesel plants do not need to be complicated. Daphne Utilities' first plant was made from reused 208-L (55-gal) drums and water heaters.

Utility staff stock the stations with clean, empty, 3.8-L (1-gal) jugs on the top shelf. Customers are encouraged to take them, fill them with used oil, and then put them on the lower shelf. Staff periodically collect the filled jugs and bring more empty ones.

The jugs are provided as a convenience, but utility personnel are happy to receive used oil in any container rather than have it poured into a sink or toilet drain. Customers routinely donate oil in milk jugs, coffee cans, or its original packaging, which indicates that they clearly think about the program and want to participate.

To promote participation, Daphne personnel took every opportunity to explain the Cease the Grease program and its benefits to the environment. They spoke to every public and private organization they could, including schools, professional associations, and civic groups. Their efforts worked: The community has embraced this program, increasing their used-oil donations from virtually zero to between 1140 and 1890 L/mo (300 and 500 gal/mo) in about 4 years. Donations are especially high after Thanksgiving and Christmas, when many residents deep-fry turkeys. (This is the Deep South, after all — we love to fry *everything*.)

Meanwhile, sewer spills and grease blockages have dropped nearly 40%. The program also has led to better treatment plant operations, more efficient use of line-cleaning crews, great public relations, and happier customers. Clearly, the benefits far outweigh the costs of this program.

The Next Step: Biodiesel

At first, Daphne sent the collected oil to a rendering plant, but by late 2005, personnel began asking, "What else can we do with all of this used oil?" The answer was biodiesel, a clean-burning fuel made from used cooking oil. With the help of Earth Clean Technologies (Daphne; www.earthcleantechnologies.com), Daphne built its first biodiesel plant from scavenged treatment plant parts for almost no cost. The project team literally made it from empty drums, some old water heaters, and a few stick blenders.

Old propane tanks were repurposed for biodiesel production.

Daphne produced its first few gallons of biodiesel in early 2006. To make sure it was high quality, the project team established benchmarks to help operators evaluate the fuel. Utility staff quickly realized that they could produce quality biodiesel for about $0.26/L ($1/gal) because their feedstock (used cooking oil) was free. In other words, it cost about $2 less per gallon than commercial diesel fuel at the time. Staff knew they were onto something big.

They did a lot of experimenting with biodiesel, making fuel from a wide variety of oil sources, including commercial kitchen fryers and grease traps. Based on what they learned, Daphne built a second biodiesel plant (again from recycled materials, such as old propane tanks) and continued the study. Personnel recently assembled what will likely be Daphne's final configuration using a commercially available plant from Utah Biodiesel Supply (Syracuse, Utah;

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Daphne Utilities' current biodiesel plant.

www.utahbiodieselsupply.com). Its production rate exactly matches Daphne's monthly used-oil supply. The utility makes a B20 blend — 20% biodiesel and 80% petrodiesel — to produce all the fuel it needs.

This program's benefits were immediate and numerous. Daphne expects to save nearly $10,000 annually in fuel costs by using biodiesel to power its diesel trucks and equipment. This savings should increase as the utility gradually replaces its gasoline-powered vehicles with diesel-powered ones. Also, the truck exhaust smells better — like the odor of cooking French fries (not surprising when you consider the biodiesel's feedstock). Even better, this fuel is made from a material that used to plague Daphne's sewers, cause costly environmental damage, and threaten drinking water quality.

One of biodiesel's greatest benefits, however, is its ability to get customers excited about recycling used cooking oil to help improve sewers and treatment plant processes. Remember, customers have the power to improve sewer systems, and getting them to want to do so is every utility's responsibility. So, utilities must tell their stories often, everywhere they can — such as at city council meetings, at retirement communities, in talk-radio interviews, and during community festivals. It is up to you to spread the word, so your customers can discover this winning team they can join.

Behold the Power of Soap

Creativity is an absolute must in this industry. Daphne personnel were reminded of this while examining biodiesel-manufacturing wastestreams. Glycerin is a biodiesel byproduct that has industrial uses, but a current glut has driven market prices into the gutter. However, rather than considering it a wastestream to dispose of, staff saw it as another feedstock — this time for soap. They take the cleanest, clearest part of the glycerin, heat it to remove any excess methanol, and then add lye, water, dyes, and perfumes to make soap. The soap is molded into cute shapes suitable for handing out to children.

Surprisingly, these soaps have become a cornerstone of Daphne's customer-education efforts. Handed out by the hundreds at schools and public events, the soaps remind people to "cease the grease." It also has opened doors to a wide variety of groups and individuals. Daphne

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Used oil recycling stations are conveniently located to encourage customer participation. The Cease the Grease program has reduced sewer spills and grease blockages by nearly 40%.

prepares "Welcome Aboard!" bags for new residents that include a few soaps and information about oil recycling. Staff keep bowls full of soaps in the lobby to give to children who stop by with their parents to pay their utility bills. They also take them along to every on-air interview and public speaking engagement. Mothers have even asked for them to use as stocking stuffers at Christmas.

A folding table piled with colorful soaps is an instant attention grabber at a street festival. And while a child is trying to decide between a frog- or turtle-shaped piece of soap, you have a great opportunity to talk to the parents about oil recycling. ("You do recycle your cooking oil, don't you?")

And the Winner Is ...

Daphne Utilities has received many awards for its efforts to clean the environment and keep operating costs low via its oil-recycling and biodiesel programs. To date, this recognition has come from several local civic groups, the Chamber of Commerce, the county commission, and the Alabama League of Municipalities. Daphne also has been asked to speak to groups across the state and region to kick-start this approach in other cities. This helps keep Daphne's story in the public eye so people do not forget to participate in the programs.

Lessons Learned

Daphne learned many lessons along the way:

- ***A small investment is all it takes.*** A well functioning used-oil recycling operation can be started for less than $3000, including the cost of recycling bins, jugs, signage, and promotional advertising. A functional biodiesel plant can be had for less than $10,000. Savings in fuel and operations can recoup this amount in only a year or two.
- ***Make it easy to be ungreasy.*** Put your recycling stations in convenient places for your customers. Customers may not go to a regional recycling center, but they regularly visit gas stations, grocery stores, apartment-complex mailboxes, and utility offices.
- ***Be creative.*** Look for creative ways to tell your story or illustrate your issue. A simple, memorable analogy sticks in people's heads long after they've forgotten your speech. A tiny bar of soap has become a virtual calling card for Daphne's Cease the Grease program.
- ***You're my hero.*** Every chance you get, tell your story in public and thank your customers for helping make the program successful. They are the heroes of your tale; let them know that you appreciate their efforts. People who are not participating in your recycling program should be jealous of those who are.
- ***Stick to your mission.*** Stay focused on your core mission (being a great water and wastewater utility) in all your efforts. Daphne Utilities is not a biodiesel company or a soap company, but both efforts help to build and operate a world-class utility. Oil recycling improves sewer operations. Biodiesel made from used oil saves money. Together, they build a story that can incite people to act. That is the big payback for your efforts.

Do You Recycle?

Are you doing all you can to address the FOG in your sewer system? Do you have a cooking-oil recycling program? If not, then you are missing a great opportunity to improve your bottom line while endearing yourself to your customers. Access www.daphneutilities.com to learn more about how you can make a difference with these great programs. Maybe you, too, can help save the planet with a bar of soap and a truck that smells like French fries.

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