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## Pure profit

East Tennessee cleantech companies cultivate environmentally conscious market sector

By ANDREW EDER, edera@knews.com  
April 22, 2007

One technology collects sunlight and channels it into interior lighting.\_\_\_\_\_Another turns used restaurant oils and animal fats into diesel fuel.

Yet another moves traffic through stoplights more efficiently, reducing tailpipe emissions.



The connection: The technologies all work to cut down on waste and use resources more efficiently. And they're all local.

The market space is known as "cleantech," an umbrella term that covers a wide range of applications. Thanks to a number of factors - growing concern about climate change, high gas prices, environmental regulations - cleantech companies are attracting attention and investments.

The Knoxville area is certainly a powerhouse in cleantech-related research at Oak Ridge National Laboratory and the University of Tennessee. Thanks in part to that expertise, a lively and diverse collection of cleantech businesses is developing here, some led by the region's most prominent entrepreneurs.

It's a sector that businesses can feel good about, especially on Earth Day. But more importantly, it's a booming market in which East Tennessee companies are carving out a niche.

"If we can push the snowball down the hill and get people talking about it, thinking about it, believing in it, then these companies have a chance," said Chris Van Beke of Tennetic Ventures, which works to raise capital for several local cleantech companies.

### Fueling demand

East Tennessee is a burgeoning center for biofuels, which are made from organic materials other than coal and petroleum and generally burn cleaner than fossil fuels.

At its plant in Loudon, Tate & Lyle manufactures ethanol, which can be blended with gasoline to reduce petroleum consumption. Most ethanol today is made from corn, although researchers and companies are experimenting with other feedstocks.

Heartland Ethanol was recently formed by some of the area's best-known businessmen. DeRoyal Industries owner and Chairman Pete DeBusk is Heartland's chairman, and Knoxville investor Fred Langley is vice chairman. The company intends to build seven ethanol plants in Illinois, eventually producing as many as 1 billion gallons a year.



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Sunlight traveling across plastic optical fibers illuminates John Morris, president and CEO of Sunlight Direct, in a lab at ORNL. The startup company is a player in East Tennessee's budding cleantech business sector, which consists of products and services designed to reduce waste and use resources more efficiently.



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Clouds are reflected in the polished surface of the rooftop-mounted Sunlight Direct hybrid solar lighting system, which collects sunlight and distributes it indoors through plastic optical fibers. The Oak Ridge startup is in the final stages of testing its product at 18 sites in an effort to commercialize the ORNL technology.



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The Buffalo Mountain wind farm can be seen from Rosedale Elementary School on New River Highway in Anderson County. The Tennessee Valley Authority is generating more renewable energy than it can sell in its Green Power Switch program.

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### LOCAL CLEANTECH COMPANIES

Much of the new activity in the region is from companies ramping up to meet the growing demand for biodiesel, which can fuel diesel-engine vehicles with little or no modification.

BioPower USA recently moved into Fairview Technology Center in Solway. The company has licensed its proprietary production process to a plant in Nashville that should be operational in a matter of weeks, said Mark Troupe, the company's president.

Once the Nashville plant is up and running, BioPower USA will seek investors for a plant in the Knoxville area that can produce 30 million to 40 million gallons of biodiesel a year, Troupe said.

Troupe said demand is high right now for biodiesel because of its environmental benefits, its adoption among government fleets and its improved lubricity over ultra-low sulfur diesel fuel.

Northington Energy, a Wyoming-based renewable energy company, chose East Tennessee for its first foray into biodiesel in part because of that demand.

"There's more growth than possibly can be supplied in the area right now," said John Brichetto, Northington's director of operations.

Brichetto said the company's Morgan County plant should be up and running by the first week of June. The plant initially will produce 3 million gallons of biodiesel a year, with the possibility of expanding to 6 million gallons.

Soybeans will be the feedstock for the plant, and Brichetto said East Tennessee farmers will be able to meet the plant's initial needs.

An Athens, Tenn.-based company, SunsOil (formerly PetroGreen), intends to use virgin oils, used oils and animal fats to produce its biodiesel. The company is considering two production sites - one in Polk County, Tenn., and one near Atlanta, said Mark Mauss, one of the company's founders.

"Almost any supplier we talk to is eager to buy every drop of biodiesel we can make," Mauss said.

#### Complementary technologies

Cleantech companies often provide support services to existing industries. One of the area's most visible cleantech companies, IdleAire Technologies Corp., services the trucking industry by providing an environmentally friendly alternative for truckers at rest.

Many truck drivers idle their engines while resting to keep their cabs at a comfortable temperature. IdleAire installs units at travel centers that attach to a truck's window, providing climate control and other amenities.

The company reported that its installations, which were in 26 states as of December, saved its customers 5 million gallons of diesel fuel and eliminated more than 53,000 metric tons of diesel pollution last year.

IdleAire, whose CEO, Mike Crabtree, was a co-founder of CTI Molecular Imaging, has raised hundreds of millions of dollars and has more than 1,000 full-time employees.

Now hundreds of local residents who bought shares of IdleAire through private offerings are watching closely to see if the company, which reported a net loss of \$60.3 million last year, can become profitable as it continues to expand its network.

Another local player looking to capture a niche in the transportation market is The Aldis Group, an early-stage startup founded by a group of local entrepreneurs.

Aldis is looking at two complementary clean technologies - first, more efficient LED lights for traffic signals. Second, the company's "Guardian Eye," an above-ground traffic management system, would help move traffic more efficiently through intersections, resulting in reduced tailpipe emissions.

The Guardian Eye was the brainchild of Aldis President and CEO Vig Sherrill, a serial entrepreneur who has led several local technology companies to acquisitions.

On the industrial side, Circle Environmental supports auto parts manufacturers and other heavy industry with its recyclable oil-absorbent textiles. After the material soaks up oil from machines, the company collects it and brings it back to a plant to recycle both the oil and the absorbent material.

"What we're doing is taking two waste streams - the absorbent and the oil - and we're completely eliminating those," said owner Grant Barton.

A majority of Barton's business comes from local auto parts suppliers. Barton, who licenses Circle Environmental's technology, has been in business eight years, but he said demand has picked up in the last two to three years.

"I believe they all see the writing on the wall," Barton said of his clients. "It's never a good thing to be putting oil in landfills."

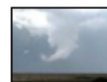
#### Finding the green

Many local cleantech companies are at early stages of development and face a difficulty common to most technology startups - finding capital.

Sunlight Direct, an Oak Ridge startup, is working to commercialize an ORNL technology known as hybrid solar lighting, which collects sunlight and distributes it indoors through plastic optical fibers.

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Sunlight Direct CEO John Morris said the company, which has 23 test units at 18 sites, hopes to start marketing its product widely by the end of the year.

The company has received support from Technology 2020, and the Tennessee Valley Authority funded two of Sunlight Direct's test sites.

Still, Morris said most of the company's funding so far has come from employees and management.

"There's just not a lot of angel money or venture money available for technology businesses," Morris said.

Investors from outside the area often view Tennessee "with a little bit of a jaundiced eye," Morris said, and some have wanted Sunlight Direct to move to a different state, although he said the management team is committed to the area.

Mycogenomix, a research-stage company spun out of a UT technology, has had success attracting angel investment from the Tennessee Center for Research and Development, a local economic development nonprofit.

CEO Harry Richards said the company, which is developing solutions to crop damage caused by insects, has benefited from its association with UT and the Center for Entrepreneurial Growth, a support program of economic development organization Technology 2020.

The university has an equity position in MycoGenomix, and the company recently won an award from the National Science Foundation, Richards said.

"We've been in very good shape as far as funding goes," he said.

Glenn Kline, the general partner for local venture fund Innovation Valley Partners, sees the cleantech sector as an opportunity to show East Tennessee's technological capabilities and draw capital from outside the community.

"The market is going to be very receptive to cleantech companies for the foreseeable future," said Kline, whose fund has invested in several cleantech companies.

But an important part of attracting outside investments will be a success story or two - an "exit," in industry parlance, either through the sale of a company or an initial public offering of stock.

"That's the next step," Kline said. "The technology is here. The market interest is here. And what we need to see now is the realization of an exit."

Business writer Andrew Eder may be reached at 865-342-6318.



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