

## Strategies

### FirmGreen Energy

*Landfill Gas Reclamation Is Gaining Traction, New St. Louis Project to be Unveiled This Week*  
 “Our time has come,” says Steve Wilburn of Southern California’s FirmGreen Energy: technology for reclaiming landfill methane is being taken commercial, with partners brought into the fold.

FirmGreen is promoting production of a diverse mix of clean fuels, including compressed natural gas, methanol (both for its own sake and for making biodiesel), and even hydrogen, all from LFG – landfill gas feedstock.

The methane in LFG is a potent greenhouse gas, a more powerful contributor to global warming than carbon dioxide, which otherwise seeps from landfills into the atmosphere.

FirmGreen is taking advantage of the U.S. EPA’s Methane to Markets drive, which Wilburn says is yielding business opportunities not only in the United States but as far away as Poland and Brazil. The Methane to Markets program was just last month expanded to include Canada.

FirmGreen has inaugurated its first “Green Energy Center,” an \$18 million complex to be operational later this year, at a landfill in Ohio. The FirmGreen facility is being built at the Solid Waste Authority of Central Ohio (Swaco) landfill in Grove City, Franklin County, near Columbus.

By year-end FirmGreen will be running Ingersoll Rand microturbines to power Swaco’s administrative office building and maintenance facilities. Thermal energy from the microturbines will provide space heating and hot water. The turbines are expected to yield up to 820 kilowatts.

Power from FirmGreen will make the landfill 95 percent self-sufficient with an electricity cost reduction of 10 percent, Swaco says. “This is just the beginning of a very promising economic development story,” Swaco executive director Mike Long said in a release. “This process will take what we don’t want, our trash, and turn it into what we do want and need; energy and jobs.”



Steve Wilburn of FirmGreen with Mike Long of Swaco

#### FirmGreen Energy at a glance

**Headquarters:** Newport Beach, California

**Product:** Processing landfill gas into feedstock for clean fuels including biodiesel, methanol, and usable methane (CNG).

**Key Suppliers:** Acion Technologies for landfill gas feedstock (LFG) production.

**Key Customers:** Solid Waste Authority of Central Ohio (Swaco), Laclede, Mitsubishi Gas Chemical.

**Sales & Earnings:** Not disclosed.

FirmGreen uses “CO2 Wash” technology from Cleveland-based Acion Technologies to make the LFG and hence clean fuels (and, incidentally, produce pure carbon dioxide — as much as 75 tons per day — that will be available for merchant sale).

“We’re good at commercialization, they’re good at the concepts and pilot plants,” says FirmGreen chief Wilburn.

By March 2006 the Swaco complex will be producing CNG for landfill vehicles and for local school buses. Wilburn expects the vehicles to be fitted with CNG-diesel dual-fuel systems from BAF Technologies.



By the third quarter of 2006 the Swaco plant is to be able to make 6 million to 7 million gallons per year of methanol using a steam reformation process from Linde/Hydro-Chem.

The “green methanol” will be sold to Mitsubishi Gas Chemical America. It can be used as a feedstock for various chemicals, and at least 1 million gallons per year is expected to support production of up to 10 million gallons per year of B100 biodiesel. FirmGreen says its Swaco landfill plant will be the first in the world to make biodiesel from green methanol produced from LFG. MGC-A marketing VP Mark Vassar told *F&F* he’s already seeing significant demand for green methanol for biodiesel processing.

The process also yields hydrogen, which can be purified via PSA (pressure swing absorption) technology and made available for fuel cell research: at Ohio State, for example.

#### 70 Years Worth

The Swaco landfill, Wilburn says, should yield enough LFG to produce these various fuels for 70 years. He says too that there are from 200 to 300 other landfills of comparable size and (low nitrogen) suitability in the U.S. alone.

FirmGreen is next expected to unveil plans for a facility to yield pipeline-quality natural gas (and CNG for local vehicles) for Laclede Energy Resources landfill at a outside St. Louis. Details are to be made public this week at the Natural Gas Vehicle Technology Forum in Washington. (NGVTF 2005 is being held Tuesday-Thursday; see page 7.)

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