



Sacramento Refuse Trucks Become the First in the U.S. to Fuel Up on Food Waste

California has long been a pioneer in implementing innovative transportation strategies, and yet again, the State can claim another first-of-a kind project in the United States as its own.

It is the first closed-loop organic waste project in the country, undertaken by two Sacramento-area companies, CleanWorld and Atlas Disposal Industries, in which a portion of Atlas Disposal's refuse fleet is powered by the waste that it hauls.



One of Atlas Disposal's 17 refuse trucks to be powered by renewable natural gas.

Atlas Disposal collects food and organic wastes from local restaurants, supermarkets, food processing companies and households, diverting these wastes from a local landfill. It hauls them to Sacramento's South Area Transfer Station, where CleanWorld has built a commercial scale facility to capture and convert the biogas produced by the decomposing wastes into electricity and vehicle fuel. Biogas is produced through a process known as Anaerobic Digestion, in which bacteria convert the energy stored in the organic waste into biogas, a mixture of primarily methane and carbon dioxide.

This biogas is "refined" using a biogas upgrading system – designed and built by BioCNG, LLC – at which point it is referred to as renewable natural gas (RNG) or biomethane, the near chemical equivalent of pipeline natural gas.

Continues on Page 4

Tomorrow's Trucks: Leaving the Era of Oil Behind

In searching for a cleaner, more secure fuel than the diesel that has long powered their refuse trucks and other medium and heavy-duty vehicles, many cities, municipalities and towns across the New York City, Long Island and New Jersey region have found a better option -- natural gas.



One of Metropolitan Paper Recycling's 9 CNG trucks

Energy Vision's new report, **Tomorrow's Trucks:**

Leaving the Era of Oil Behind, highlights the rapid rise in the use of natural gas garbage trucks in the New York City, New Jersey and Long Island region – a ten-fold increase over the last five years. "Heavy duty trucks have been among the most polluting and fuel-consuming fleets in the region," according to Energy Vision's president, Joanna Underwood, and this shift from diesel to natural gas has cut soot emissions, a major risk

factor for respiratory and cardio-vascular diseases – by 58,133 pounds per year and emissions of NOx, a lung irritant, by 837,445 pounds a year, protecting the 20 million people in this region, especially

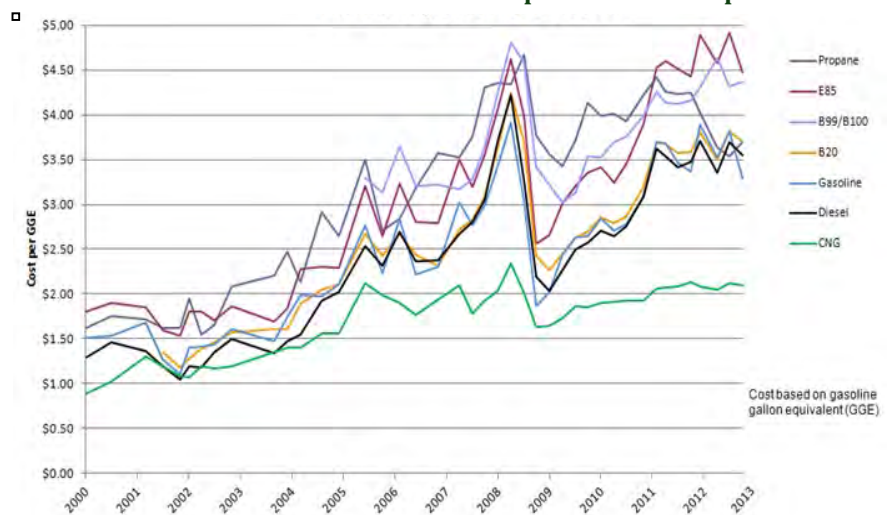
those who are most vulnerable: children and the elderly. Moreover, fleets shifting to natural gas cut greenhouse gases, the biggest contributor to climate change, by about 25.1 million pounds (12.5 thousand tons) a year.

This transition has eliminated the need for 4.52 million gallons of diesel, producing significant fuel cost savings for the fleets involved, totaling \$4.5 to \$6 million a year.

Late to the Party, But Big Strides Taken

The shift away from diesel trucks in the U.S. got underway first on the West Coast, where, by 2003, 23 California cities had 648 natural gas trucks in operation. However, East Coast communities did not begin to use this new fuel until later.

Natural Gas: The Low Cost Transportation Fuel Option



LETTER FROM THE PRESIDENT

Joanna D. Underwood

New York City has long relied on polluting, high-carbon diesel fuel to power its essential bus and truck fleets. But it doesn't have to do that anymore!

New York City can produce fuel for its fleets from its own organic wastes.

Energy Vision analyzed this potential back in 2009 (see [EV News Vol. II Issue I](#)) and we found that the 3 million tons of organics sent for disposal to out-of-state landfills were costing taxpayers more than \$325 million a year. Yet, these organics could be turned into a renewable form of natural gas, called RNG, that could power all of the 2,200 heavy-duty refuse trucks in DSNY's fleet and more. Now, four years later, as concerns about climate change are growing, the potential for RNG, the lowest carbon fuel available today, is even more important.

The NYC Department of Sanitation (DSNY) is now taking action on the organic waste front.

In an exciting new development, DSNY announced a plan to collect 100,000 of the total 1.2 million tons of the City's residential food waste for composting and to process the biogases produced by these wastes. Using these biogases for power generation – the option DSNY is currently considering – is one beneficial use. However, we strongly encourage DSNY to consider using it as a vehicle fuel since RNG, along with compressed and liquefied natural gas, are the only fuels that can displace significant amounts of diesel and gasoline in medium- and heavy-duty transportation.

In this [EV News](#), we profile a groundbreaking waste-to-fuel initiative in

Sacramento, CA (see p.1). It is a first in the U.S. and provides a good model for U.S. cities to follow. In a "closed-loop" system, more than 40,000 tons of Sacramento's waste organics will be used to produce 700,000 gallons of RNG fuel, which will power a portion of the public and private refuse fleets that haul these wastes. By using RNG these fleets obviate nagging concerns about the fluctuating price of diesel fuel, ensure cleaner air for their residents to breathe and eliminate 5,800 tons of greenhouse gases a year.



Refueling a new DSNY refuse truck in Newark

How can other cities start turning their organic wastes into a clean, secure, homegrown vehicle fuel?

First, they can get ahold of Energy Vision's new easy-to-read report: *Turning Organic Wastes into Vehicle Fuel: A Step-by-Step Guide for Communities*. It will be available next month via download on our website or for purchase in hard copy. They can seek advice from their local "Clean Cities" affiliate (part of the Department of Energy's alternative fuels network) or from EV on hosting regional RNG workshops modeled after the successful session that EV co-sponsored last fall in New York State (Agenda: <http://bit.ly/12RVWW5>). The first Clean Cities-EV 2013 workshop, mentioned in this [EV News'](#) "Upcoming Events" column (see p. 2), will be in Seattle on July 16th. If you would be interested in putting on a similar event, don't hesitate to contact us!

The vehicle fuel revolution is now moving into full swing in this country. For the health of its residents and for a brighter environmental and economic future, every city and community, coast to coast, should begin exploring this new direction. **Future generations will thank us.**

Joanna D. Underwood

EV ON THE ROAD

Apr 7-9 EV President Joanna Underwood and Research & Outreach Associate Matt Tomich traveled to Washington, D.C. to attend the Energy Independence Summit, the nation's premier alternative fuels & vehicles policy event. Public and private sector leaders discussed policy and industry trends and then spent a day on Capitol Hill with legislators explaining the importance of continued support for alternative fuels.



Apr 17 Joanna Underwood spoke to community leaders in northern New Jersey's Bergen County about the possibility of pursuing a renewable natural gas project. This initial discussion has prompted further exploration in which EV will continue to play a role.

June 5 EV's Underwood spoke at the opening of the Covanta/Clean Energy natural gas refueling station, the first in Newark -- NJ's largest city, alongside Clean Energy CEO Andrew J. Littlefair, Covanta CEO Anthony Orlando, Newark's Director of Energy/Environment Joel Sonkin, New Jersey Clean Cities Coordinator Chuck Feinberg and Rocky di Rico of DSNY.



Upcoming Events

July 16 EV is participating in a national biomethane (RNG) transportation workshop in Seattle, being put on by the Western Washington Clean Cities Coalition. The event will include many of the nation's leading public and private sector experts on the topic, including EV's Joanna Underwood and Matt Tomich.

Aug 8 EV Research & Outreach Associate Matt Tomich will present on renewable natural gas at an alternative fuels workshop at UC Davis. While in California, he will also visit nearby Sacramento and tour this first-of-a-kind food waste to vehicle fuel project.

Before 2007, only a handful of trucks powered by compressed natural gas (CNG) were used in the Northeast. But, in 2007, 38 CNG refuse trucks were ordered, and over the next five years, as *Tomorrow's Trucks* documents, they were being used in 13 communities and the number of trucks rose ten-fold – from 38 to 381.

What Caused this Rapid Shift?

“Our research shows that a number of factors have led to the increased use of natural gas garbage trucks,” explained Matt Tomich, co-author with Joanna Underwood, of *Tomorrow's Trucks*. “As natural gas engines became more sophisticated, and had more power and torque, interest in using them expanded. And when stricter EPA air standards for diesel fuel use required complex expensive new pollution controls for



Joanna Underwood and Matt Tomich posing with friends of EV after completing the white cloth test on one of Metropolitan Paper Recycling's CNG refuse trucks. For more on this test and to watch the video comparing diesel and CNG emissions, see the box below and to the right!

diesel trucks, the price advantage of \$50,000 to \$70,000 that diesel trucks had over natural gas models was cut in half... It's clear that, at present, the key driver for fleet conversions is the rock bottom price of natural gas fuel. But”, added Tomich, “another very critical driver may be the World Health Organization’s 2012 conclusion that diesel emissions are a ‘known’ carcinogen.”

The Future: Is it Bright for Natural Gas?

Joanna Underwood and EV Board Member and Former NYC Commissioner of Sanitation Brendan Sexton conclude that, “Natural gas is ripe today for use in the close to 10,000 trucks and buses in the New York City, Long Island and New Jersey region and the 10 million of these workhorse vehicles nationwide.

Shifting these fleets (just 4% of all vehicles in the U.S.) away from diesel would have a dramatic impact – eliminating almost a quarter of all petroleum-based highway fuel consumed a year. What this new Energy Vision report makes clear is that this shift is without a doubt underway in the New York/New Jersey region.”

- Can people really see the difference between diesel and natural gas truck emissions? EV invited a few New Yorkers to take the “white cloth” test. A clean, white cloth was held up to the exhaust of each kind of truck. Watch the video below to see the results! <http://www.youtube.com/watch?v=jfCt3fxSXmo>

New York Times OpEd: “Natural Gas, Not Diesel”

On April 29th, in response to an earlier story, “Fueling Up for the Long Haul,” The New York Times published EV President Joanna Underwood’s letter to the editor, “Natural Gas, Not Diesel.” The original story discussed the pace of adoption of fossil natural gas in the long-haul trucking sector, but made no mention of expanding use of renewable natural gas (RNG). The letter highlighted the long-term potential for RNG to displace significant amounts of diesel and the associated environmental benefits.

Read the letter here: <http://www.nytimes.com/2013/04/30/opinion/natural-gas-not-diesel.html>

EV’s Summer Interns are Tackling a Wide Range of Important Issues

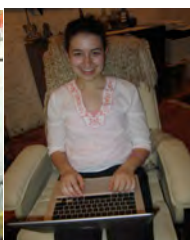
Once again, Energy Vision has been blessed with a group of fabulous summer interns who are taking the lead on a variety of exciting and important research projects.

Danielle Bissett, a graduate student at Bard College’s Center for Environmental Policy is focused on New York City’s organic waste and looking into opportunities for a renewable natural gas project right here in our own backyard. Based on preliminary research, there are exciting things happening in and around New York City! Similarly, Eve Gutman, a junior Anthropology major at Haverford College is working on an organics management policy overview, comparing different state and national level approaches to the sustainable management of organic waste. Not surprisingly, many European countries are way out front on this issue, but the U.S. is moving in the right direction.

Carolyn Nuyen, a junior Geology major at Colorado College is compiling data on the comparative economic costs and benefits of using biogas for power generation versus vehicle fuel. Moreover, given the current glut and low cost of fossil natural gas, she is also comparing production costs for fossil natural gas as opposed to renewable natural gas. This economic piece of the puzzle will be crucial in addressing what policy measures can be taken to “level the playing field” for RNG. Eric Weiss, a senior Engineering major at Lehigh University is looking at the oil and gas industry and the controversial extraction technique known as hydraulic fracturing or “fracking” to outline industry best-practices and suggested policy guidelines to ensure the proper level of regulation.



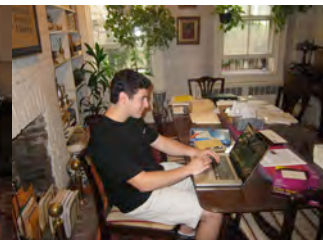
Danielle Bissett



Eve Gutman



Carolyn Nuyen



Eric Weiss



Summer 2013 Interns

At present, the Sacramento Biodigester is open and operating, processing 25 tons of food waste a day into RNG. However, by December 2013, the biodigester will have been scaled up to a capacity of 100 tons per day. The facility will then generate more than 700,000 diesel gallon equivalents (DGEs) of RNG annually, which will be distributed via the public access refueling station to CNG vehicles owned by Atlas as well as to other public and private fleets, including some of Sacramento’s municipal vehicles.

The environmental attributes of RNG are second to none – it is the lowest emitter of climate-changing greenhouse gases of any commercially available fuel. In fact, recent lifecycle analyses conducted by the California Air Resources Board

(CARB) concluded that renewable natural gas produced and used as vehicle fuel via “high solids anaerobic digestion” of food waste represents net-negative greenhouse gas emissions. In addition, once the biogases are extracted from the decomposing food waste, what’s left is a high-grade compost/soil amendment. The project illuminates the best practice for sustainable management of organic wastes.



CleanWorld's Sacramento Bio-Digester is designed to process 100 tons of food waste per day

CleanWorld CEO Michelle Wong said, “Anaerobic Digestion is a commercial technology -- and every city in the United States has the opportunity to capitalize on this opportunity to close the loop on organic waste.”

The project’s specific environmental and economic benefits include:

- Diversion of 40,000 tons of food waste from landfills annually
- Greenhouse gas reductions of 5,800 tons per year
- Yearly displacement of 700,00 gallons of diesel fuel
- The creation of 16 long-term green jobs
- Annual combined municipal tax revenue of more than \$1.1 million
- The sale of high value organic soil amendment co-products

BOARD OF DIRECTORS

Joanna D. Underwood
Chair and President

Michael S. Gruen
Attorney at Law

Brendan Sexton
Environmental Consultant
Former DSNY Commissioner

J. Dinsmore Adams, Jr.
Curtis, Mallet-Prevost, Colt & Mosle LLP

Cynthia Adler
Actor and Writer

C. Howard Hardesty, Jr.
Attorney at Law

Bailus Walker Jr., PhD, MPH
Howard University College of Medicine

Joan C. Pearlman
Publications Director
Professional Women Photographers

Energy Vision News, Quarterly © 2013 Energy Vision Inc.

For annual memberships, publications, speakers, and reprint requests, please email: tomich@energy-vision.org
Write EV at 138 East 13th Street, New York, NY 10003, call (212) 228-0225 or visit: <http://www.energy-vision.org>

EV is a national non-profit organization that analyzes and promotes ways to make a swift transition to pollution-free renewable energy sources and to the clean, petroleum-free transportation fuels of the future.

138 East 13th Street
New York, New York 10003

