

Clean Cities Now



Workshops Bring Fleets and Fuels Together

Repowering Heavy-Duty Natural Gas Engines
Calculate Your GHG Emissions



Dennis Smith



Linda Bluestein

Dear Readers,

The more things change, the more they stay the same. This certainly rings true with changes you'll see in this issue of our bi-annual newsletter, Clean Cities Now (CCN). After five years of publishing online, we're returning CCN to its roots and presenting it in the magazine-style format we started with years ago. The change was inspired by unwavering requests from coordinators to have printed copies of the program newsletter to distribute at industry and stakeholder events.

Like before, this format crosses two lines of communications: electronic and print. It's still distributed to subscribers via e-mail, but that e-mail no longer links to a Web-generated newsletter. Rather, it links to a high-resolution PDF on the Clean Cities Web site. But, unlike before, printed copies are also available.

With this new format we've added some new features we thought would increase awareness about vehicle and fuel technologies, coalition accomplishments, and the coordinators who lead our 87 coalitions across the country. Accordingly, we've asked the Technical Response Service team at ICF International to write a special column answering frequently asked questions. This issue, the column explains the differences between electric, hybrid electric, and plug-in hybrid electric vehicles. Each issue will also include a Technology Spotlight, a department that explains the basics of a vehicle, fuel, system, or type of equipment. On page three, read this issue's Technology Spotlight about repowering compressed natural gas engines.

Two other new features of CCN are regionally based coalition news stories that detail coalition success stories at the local level and a Coordinator Profile, which offers personal and professional insight on the hard-working coalition leaders.

We hope you enjoy our new format and this issue. Let us know what you think at cleancities@nrel.gov.



Dennis A. Smith
National Clean Cities Director

Linda Bluestein
National Clean Cities Co-Director

In This Issue

Program News	3
Tool Tips: GREET Fleet Footprint Calculator.	3
Technology Spotlight: Repowering Fleets with CNG.	4
Coordinator Profile: Mark Bentley, Alabama.	5
Feature: Workshops Connect Clean Cities with Fleets and Fuel Providers	6
Coalition News	8
Ask the Technical Response Service	11
Clean Cities Resources	12
On the Road with Clean Cities	12



Mark Bentley: p5



Hybrid Electric Delivery Trucks: p9



Electric Vehicle Charging Station: p10



Vikings Planet Purple Initiative: p11

Clean Cities Now is published bi-annually. View electronic copies at www.afdc.energy.gov/cleancities/ccn. To order print copies, go to: www.eere.energy.gov/library.

Editor: Trish Cozart, National Renewable Energy Laboratory
Layout: Dean Armstrong, National Renewable Energy Laboratory

Dennis Smith: Department of Energy/PIX 17030; *Linda Bluestein:* Trish Cozart, NREL/PIX 17004; *Mark Bentley:* Alabama Clean Fuels Coalition/PIX 17024; *Charging Station:* Roger Borkenhagen/PIX 17031; *Hybrid Delivery Truck:* JD Tyre; *Vikings Planet Purple:* Twin Cities Clean Cities Coalition/PIX 17005

Program News



Melissa Howell/PIX 17025

Coordinators of the Year, Mindy Mize (left) and Chelsea Jenkins (right), were honored in Gatlinburg, Tenn.

Coordinators Earn Top Honors

For the first time in history, the U.S. Department of Energy's top honor of Coordinator of the Year went to two recipients: Chelsea Jenkins of Virginia Clean Cities and Mindy Mize of Dallas-Fort Worth Clean Cities. In addition, Kellie Walsh (Greater Indiana) received the distinction of Mentor of the Year, and Vandana Bali (San Francisco) received the award for Clean Cities Most Enterprising New Coordinator. All four women were honored in November at the Clean Cities Leadership Retreat in Gatlinburg, Tenn.

In January, Melissa Howell, of the Kentucky Clean Fuels Coalition, was selected to participate in the Bingham Fellows Class of 2010, a community action program in Louisville, Ky. This year's mission is to integrate ecological principles and stewardship with community and business practices to build a greener more sustainable community. Congratulations to all.

MotorWeek Airs Success Stories

Clean Cities continues to spotlight coalitions and their work with fleets during Maryland Public Television's MotorWeek television segments. You can catch the Clean Cities success story segments every other weekend on MotorWeek or watch and download any of the clips online on the Alternative Fuels and Advanced Vehicles Data Center (AFDC) Videos page at www.afdc.energy.gov/afdc/videos.html. If you have collaborated with a coalition and have an idea for a Clean Cities success story to be featured on MotorWeek, contact Sandra Loi at sandra.loi@nrel.gov.



Upcoming Events

Join Clean Cities on the road at conferences and events. Check out our booth at the National Truck Equipment Association Work Truck Show in St. Louis on March 9-12. See the complete event map and dates on page 12.



Tool Tips

Clean Cities develops a wide variety of tools to help fleets, fuel providers, and consumers find ways to employ alternative fuels, advanced vehicles, and fuel economy measures. To see all the tools go to www.afdc.energy.gov/tools.

GREET Fleet Footprint Calculator

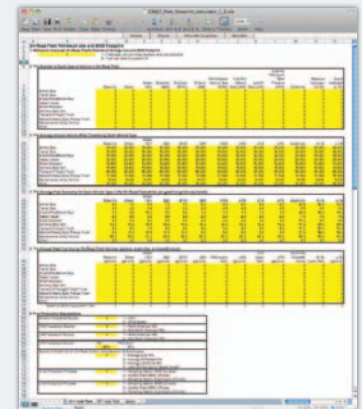
Developed by Argonne National Laboratory, the GREET Fleet Footprint Calculator helps Clean Cities stakeholders evaluate a fleet's petroleum use and greenhouse gas (GHG) emissions. This information can help fleets work with state and regional air-quality officials to develop emission-reduction strategies.

The calculator is based on Argonne's **G**reenhouse gases, **R**egulated **E**missions, and **E**nergy use in **T**ransportation (GREET) model, which generates life-cycle energy data about petroleum use and GHG emissions of key fuel production pathways and combustion fuels. The GREET Fleet Footprint Calculator lets fleet managers input data to project and evaluate well-to-wheel petroleum use and GHG emissions of medium- and heavy-duty vehicles.

The GREET Fleet Footprint Calculator uses an Excel spreadsheet to determine a fleet's petroleum use and greenhouse gas emissions based on hypothetical or actual fleet data.

The easy-to-use, Excel-based calculator uses hypothetical or actual data to analyze on- and off-road vehicles, including conventional (gasoline and diesel) and diesel hybrid electric vehicles, as well as vehicles using biodiesel (B20 and B100), ethanol, compressed natural gas, liquefied natural gas, landfill gas, propane, electricity, and gaseous and liquid hydrogen.

To get started, access the GREET Fleet Footprint Calculator at www.transportation.anl.gov/modeling_simulation/GREET/footprint_calculator.html.





Technology Spotlight

Under the Hood with Jim Moore

Repowering Fleets with Natural Gas

Not all natural gas engines are created equal. This is especially true in the world of medium- and heavy-duty vehicles. And long-time Clean Cities stakeholder and President of Emission Solutions, Inc. (ESI), Jim Moore, and his team, have spent many years perfecting their unique manufacturing process.

Moore helped launch ESI in 2002 to leverage the engine technology developed during his time at Enserch Corp. in Dallas. Today, ESI focuses exclusively on International/Navistar diesel engines in the intra-city fleet marketplace.

According to Moore, the semantics of natural gas engine conversions can be confusing. The idea of “converting” an engine to natural gas often carries the connotation of applying a “kit” to an existing gasoline or diesel-powered engine—with no major changes made to the internal workings of the engine. In ESI’s world, the entire engine is

modified and the end result is a new original equipment manufacturer (OEM) engine.

“Using our patented technology, we can repower existing International engines, from vehicle model year 1995 and newer, as well as install our engines in a brand new International chassis,” explains Moore. “We don’t really like to call it a conversion, or even a repower, because ultimately we are providing the customer a brand new engine.”

If the vehicle is new or only a few years old with low mileage, says Moore, an International dealer can actually rebuild the engine with new natural gas components from ESI “in-frame” under the hood. For older vehicles, the entire diesel engine is removed and shipped to Springfield ReManufacturing Corp. (SRC), stripped down to the block and rebuilt from the block



Trish Cozart, NREL/PIX17023

Emission Solutions President Jim Moore stands by his natural gas engine, which touts low tailpipe emissions.

The New York Botanical Gardens uses this clean burning natural gas lift truck powered by a new engine from ESI.



Emission Solutions, Inc./PIX17027

up with new components. During this manufacturing process, SRC may be able to reuse some or all of the lower-end components of the diesel engine (block, crank, cam, connecting rods) after cleaning, verification of specifications, and completely checking for defects. SRC replaces everything else with new engine components provided by ESI, thus providing a new OEM dedicated natural gas engine.

When the transformation is complete, the engine is certified to model year 2010 emission standards by both the the Environmental Protection Agency (EPA) and the California Air Resources Board (CARB). The new engine qualifies for the maximum Internal Revenue Service tax credit and comes with a new, two-year OEM warranty.

When looking to move to natural gas, a fleet first needs to assess its vehicle needs, and then look at the available makes and models of dedicated natural gas engines that are certified by EPA and CARB. Currently, ESI works with the 7.6L DT-466E and MaxxForce DT diesel engines in International/Navistar vehicles, which encompass a significant portion of the intra-city fleet market. Soon, ESI plans to offer a 9.3L dedicated natural gas engine using the MaxxForce 10 Navistar diesel engine at its core.

Other 2010 EPA and CARB-certified engines are available from Cummins Westport Inc., including the 8.9L ISL G used for heavy-duty vehicles made by Peterbilt, Freightliner, and Champion, among others. Baytech Corp. offers a 2010-certified 6.0L natural gas engine for use in specific models of medium- and heavy-duty vehicles. And BAF offers a certified, dedicated CNG conversion option as well.

When the switch is made to natural gas, fleets can start reaping the rewards. Because the cost of natural gas is significantly less than petroleum fuel (gasoline or diesel), the initial cost of converting a fleet to natural gas will eventually offer a healthy return on

see "Spotlight" on page 11 >



National Clean Cities Director Dennis Smith (left) awards Mark Bentley (right) an official coalition designation at Alabama's Renewable Energy Conference.

Coordinator Profile

Mark Bentley Leads Clean Cities' Newest Coalition

When Mark Bentley joined the Central Alabama Clean Cities coalition in 2006, he had big plans. He envisioned the coalition growing beyond 10 counties to reach the entire state. And grow it did. Under his leadership as executive director, the coalition's reach expanded to all 67 counties and now serves 4.5 million people across Alabama. The coalition's growth and Bentley's continuing dedication to the Clean Cities mission led him to national recognition.

On Nov. 17, 2009, the U.S. Department of Energy's Clean Cities program officially designated the Alabama coalition at the Sixth Annual Alabama Renewable Energy Conference in Auburn. The newly designated coalition, now known as the Alabama Clean Fuels Coalition (ACFC), is the state's principal organization for alternative fuels.

"The Alabama Clean Fuels Coalition has demonstrated an extraordinary ability to get things done by forming effective partnerships, finding innovative ways to leverage resources, and motivating communities to rally together for a common cause," says National Clean Cities Director Dennis Smith.

ACFC works tirelessly to support clean fuel initiatives and has leveraged grant funding for maximum alternative fuel infrastructure benefits. The nonprofit, membership-based organization is funded by private and public sources, including member dues and grants. ACFC's designation provides more project opportunities and gives the coalition access to Clean Cities resources.

Bentley and the ACFC have made significant contributions to the establishment of alternative fuel refueling infrastructure in Alabama, including a public access compressed natural gas station, E85 and B20 stations for state and municipal fleets, and retail E85 and B20 stations in the state. Most notably, ACFC partnered with Indiana, Kentucky, and Tennessee coalitions to develop the United States' first biofuels clean corridor along Interstate 65, which provides public access to biofuel (E85 and B20) stations from the Gulf of Mexico to the Great Lakes.

"Our members and stakeholders really work together toward the Clean Cities mission of reducing America's dependence on foreign oil," says Bentley. The ACFC has 27 members, including representatives from each major alternative fuel, and 74 stakeholders, including local and state government entities, public and private fleets, mass transit organizations, utilities, trade associations, alternative fuel producers, distributors, vehicle manufacturers, equipment suppliers, engine converters, colleges, universities, and individuals.

Feature

Fueling Your Alternative Fuel Vehicle Fleet

Bringing Together EAct-Mandated Fleets and Clean Cities Stakeholders to Deploy More Alternative Fuel Infrastructure

A series of U.S. Department of Energy (DOE)-sponsored workshops in 2009 brought Clean Cities stakeholders together with regulated fleet representatives and fuel producers to improve the availability of alternative fueling infrastructure. Participants formed regional partnerships and initiated projects that will displace petroleum and help fleets comply with alternative fuel requirements.

“The workshops were very worthwhile,” says Steve Walk, director of project development for Protec Fuel Management, which presented at and participated in three workshops. “Clean Cities, fleets, and fuel providers all benefited.”

Certain fleets regulated by the Energy Policy Act (EAct) of 1992 or other mandates are required to use alternative fuels, while other fleets and individuals want to use alternative fuels for the benefits they provide. However, many alternative fuel vehicle (AFV) fleets lack access to alternative fueling infrastructure or are unaware of available infrastructure. To address this need, DOE’s EAct State and Alternative Fuel Provider program initiated and funded the workshops in collaboration with the EAct Federal Fleets and Clean Cities programs.

“The goal of the workshops is to help regulated fleets, Clean Cities stakeholders, and fuel producers understand each other’s needs and fully use each other’s resources,” says Kellie Walsh, a transportation consultant who led the workshops (separately from her role as coordinator of the Greater Indiana Clean Cities Coalition). “They discover that, if fueling infrastructure is shared, the pooled demand enables fuel providers to install stations at little or no cost to the fleets because the producers profit from the higher fuel volumes sold.”

The initial workshop locations (see box) were chosen for their proximity to target fleets with substantial alternative fuel demand, and interest in the workshops was high. Seventy to 75 people attended three of the events, while the other was limited to 50 because of space constraints. “We had to turn people away at the doors,” says Walsh. Attendees represented a wide range of interests, including federal, state, county, and city agencies; fuel producers; nonprofit organizations; universities; airports; branches of the U.S. military; school districts; and various private companies.

The workshops had several sessions. First, DOE presented information about EAct and other statutory and

regulatory requirements and Clean Cities resources. Then, fuel producers presented about their fuels and the criteria they use to site alternative fueling infrastructure. After a working lunch, attendees broke into small groups based on geographic location to discuss specific vehicle and fuel opportunities in their areas.

Key to the breakout sessions were tools from the Alternative Fuels and Advanced Vehicles Data Center (AFDC) used to map attributes such as the location of existing alternative fuel stations, AFV density, and the location of federal vehicles with alternative fuel waivers.* The breakout groups were able to see how fueling infrastructure in their areas could best be used by

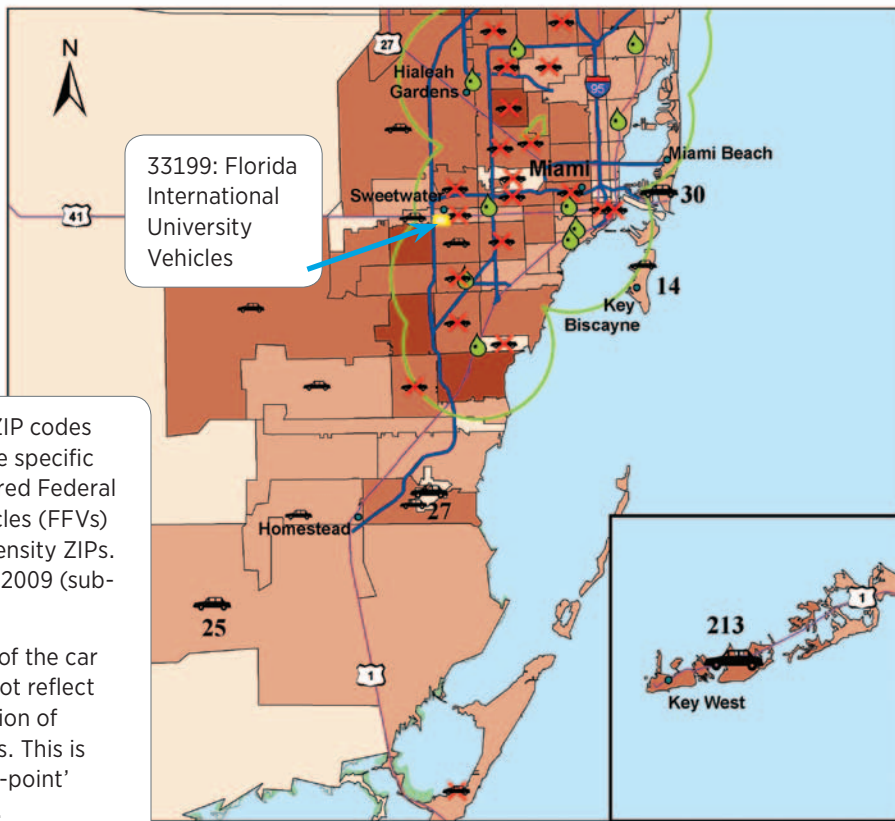
2009 Workshops

Location	Date	Related Clean Cities Web Sites
Williamsburg, Virginia	June 16	Virginia, www.hrccc.org
Denver, Colorado	Aug. 5	Denver Metro, www.lungcolorado.org/CleanCities.htm
Dallas/Fort Worth, Texas	Aug. 18	Dallas-Fort Worth, www.nctcog.org/TRANS/clean/cities
Miami, Florida	Sep. 17	Florida Gold Coast, www.sfrpc.com/fgccc.htm

2010 Workshops

Location	Date	Related Clean Cities Web Sites
San Diego, California	Feb. 19	San Diego, www.sdcleanfuels.org
Puget Sound, Washington	June	Puget Sound, http://pugetsoundcleancities.org
Chicago, Illinois	July	Chicago Area, www.chicagocleancities.org
Massachusetts	August	Massachusetts, www.mass.gov/doer
San Francisco, California	September	San Francisco, www.sfenvironment.org/sfccc

Customized maps helped workshop participants pinpoint alternative fuel supply and demand.



The numbers in ZIP codes correspond to the specific number of waived Federal flexible fuel vehicles (FFVs) for select high-density ZIPs. This data is from 2009 (submitted in 2008).

* The placement of the car symbols does not reflect the actual location of Federal Vehicles. This is simply a 'center-point' of the ZIP code.

** FFV Density is based on 2007 public vehicle registration data obtained from R.L. Polk & Co.

Waivered Federal Fleet FFVs, Public FFV Density (by ZIP) and Existing E85 Stations Miami-Dade and Monroe Counties, Florida



individual fleets or fleet partnerships, where alternative fuel demand justified installing new infrastructure, and where AFVs could be relocated or partnerships formed to create enough alternative fuel demand to justify new infrastructure.

“Our area is very large, so it’s hard to visualize all the fleets and stations together,” says Pamela Burns, co-coordinator of the Dallas-Fort Worth Clean Cities coalition. “The new AFDC tools helped with this, which was very exciting.”

The breakout sessions led to the initiation of partnerships and projects. For example, in Virginia, the City of Chesapeake had been negotiating to sell some of its fueling sites to a private fuel retailer. During the breakout session, representatives of other fleets near Chesapeake said they would use the fueling sites if E85 and B20 were avail-

able, and the prospect of guaranteed fuel sales interested the retailer greatly. The sale of the fueling sites is now being finalized.

In Colorado, a state fleet entered into discussions with other government fleets to build demand for installing B20 pumps at state-owned diesel stations. In Texas, fleet representatives from the City of San Marcos, the Texas Commission on Environmental Quality, and the Texas Parks and Wildlife Department met to discuss sharing fuel resources. In Florida, the Florida Gold Coast Clean Cities coalition reached out to EPA-act-regulated federal fleets that had waiver requests rejected and helped them identify E85 fueling locations for their flexible fuel vehicles.

“With these efforts, we’re going to see the number of federal fleet waiver requests reduced and more petroleum displaced,” says Walsh.

Five similar workshops are planned for 2010 plus two more focused on fuel retailers. Information will be posted on the EPA-act Transportation Regulatory Activities Web site (www.eere.energy.gov/vehiclesandfuels/epact) and host Clean Cities coalition Web sites (see box) as it becomes available. For areas not covered by the workshops, a toolkit is being produced to help Clean Cities coordinators run their own workshops. The toolkit will be available in 2011 in the Clean Cities Coordinator Toolbox at, www.eere.energy.gov/cleancities/toolbox.

* Pursuant to EPA-act 2005 Section 701, federal fleets must use alternative fuels in dual-fuel AFVs if the fuels are available within five miles or 15 minutes of the fleet’s AFVs. If alternative fuels are not available within this distance, a fleet may request a waiver from DOE that, if approved, releases them from the requirement to use alternative fuels in the relevant AFVs. For a list of waived vehicles, visit www.afdc.energy.gov/afdc/data/fleets.html.

Coalition News

NORTHEAST REGION

CNG Fleets Take New Jersey by Storm

Compressed natural gas (CNG) vehicle fleets are making a dramatic debut in New Jersey with help from the American Recovery and Reinvestment Act of 2009 (ARRA). The New Jersey Clean Cities Coalition will leverage almost \$15 million in ARRA funds to deploy 82 CNG refuse trucks and 190 CNG shuttle buses as well as four CNG fueling stations.

The New Jersey coalition spent years building the partnerships needed to bring CNG to the state and were ready when the ARRA opportunity arose. It garnered almost \$40 million in additional funding plus project support from the City of Newark, Central Jersey Waste, Atlantic County Utilities Authority, Waste Management, Atlantic City Jitney Association, and CNG provider Clean Energy.

“We pulled together a geographically diverse group of public and private stakeholders into a large, successful project,” says coalition coordinator Chuck Feinberg. “It’s a perfect example of the Clean Cities program in action.”

Feinberg credits the diverse partnership with helping the project qualify for ARRA funds. Surpassing the government’s cost-share requirement was also important, as was the project’s environmental benefits and the projected creation of more than 750 jobs.

The CNG fueling stations are slated to open this summer. The first phase of the trucks and shuttle buses will be on the road by fall. The fueling stations will be open to other fleets as well, and several have expressed interest in acquiring CNG vehicles to use the new stations.

“It’s exciting that this stimulus project is actually stimulating so much interest,” says Feinberg. “The federal investment is really paying dividends.”

SOUTHEAST REGION

USC Announces Plan for Petroleum-Free Fleet Starting with Propane

The University of South Carolina (USC) recently unveiled an ambitious plan to slash carbon-dioxide emissions from its vehicle fleet by 90% within five years. The “Genesis 2015 Initiative” puts the university first in the state for committing to operate all of its vehicles on alternative fuels.

USC has about 400 vehicles that are used for business, maintenance, and student transportation, says Derrick Huggins, associate vice president for transportation. By 2015, all vehicles on the campus will be powered by ethanol, biodiesel, propane, electricity, or hydrogen fuel cells.

More than 150 of the university’s vehicles could be converted to run on alternative fuels now. Funding from a Clean Cities grant will help USC

MIDWEST REGION

Minnesota Vikings Promote Clean Energy Choices

In partnership with the American Lung Association of Minnesota (ALAM) and the Twin Cities Clean Cities Coalition (TC4), the Minnesota Vikings recently launched a promotion to raise awareness of E85. At every Vikings home game, the Gold Lot at the Hubert Humphrey Metrodome becomes the “E85 Lot” where the first 25 flexible fuel vehicles (FFVs) can park for free. The lucky 25 also receive discount coupons for a nearby E85 station.

“It is wonderful to see greater interest in promoting cleaner choices in transportation at these games,” said Kelly Marczak, director of ALAM’s Clean Air Choice Program. “Our new E85 lot, along with the many fans who share a ride to the Dome or use mass transit, show that there are a lot of Minnesotans helping to reduce air pollution and related respiratory problems.”

The promotion is part of the Vikings’ Planet Purple initiative, an organization-wide effort to develop sustainable business practices, utilize renewable energy resources, and implement environmentally conscious programs. Last year the team announced it would offset 100% of the electricity used to power the Metrodome for all eight home games during the 2009 season through the purchase of wind energy credits.

“The Vikings are committed to developing sustainable business practices and utilizing renewable energy sources whenever possible,” says Vikings owner Mark Wilf. “Our hope is to build awareness and encourage other businesses and households to participate along with us.”



Kelly Marczak was among the TC4 stakeholders and volunteers who manned the E85 parking lot, providing free parking and E85 coupons to the first 25 flex-fuel vehicle drivers at each home game.

SOUTH CENTRAL REGION

Louisiana Coca-Cola Bottling Co. Brings Hybrid Fleet to New Orleans

The Louisiana Coca-Cola Bottling Co. recently introduced eight new hybrid electric delivery trucks to the streets of New Orleans. The Southeast Louisiana Clean Fuel Partnership hosted a public forum to highlight the new fleet and the sustainability initiatives of Coca-Cola Enterprises Inc. (CCE).

“The Southeast Louisiana Clean Fuel Partnership is delighted with Coca-Cola Enterprises’ inclusion of fuel-efficient and emissions reducing hybrid vehicles in its New Orleans delivery fleet,” said Rebecca Otte, coordinator of the partnership. “The move demonstrates Coca-Cola Enterprises’ ongoing commitment to a more sustainable community and serves as a great example of a viable clean transportation option for similar fleets.”



The trucks were specifically designed for effectiveness in the stop-and-go traffic common in urban areas. Regenerative braking and lithium-ion battery technologies make these vehicles 30% more fuel efficient than their diesel counterparts. They also create less noise and pollution than standard delivery vehicles, and CCE drivers report that the new vehicles handle better than the older, nonhybrid fleet.

The hybrid fleet is part of CCE’s nationwide initiative to employ hybrid vehicles to reduce emissions and fuel consumption. To date, the company has deployed 327 hybrid electric delivery trucks throughout the United States and Canada, making CCE’s the largest commercial hybrid fleet in North America. CCE plans to continue to incorporate hybrid vehicles into its fleets, eventually transitioning all its vehicles to cleaner, more fuel-efficient models.

Coca-Cola Enterprises uses hybrid electric delivery trucks nationwide.

convert 13 of these vehicles to propane and install propane fueling infrastructure. The Palmetto State Clean Fuels Coalition and Triangle Clean Cities Coalition helped secure this grant via a successful bi-state effort—the Carolina Blue Skies and Green Jobs Initiative—to gain millions of dollars in federal stimulus funding to support clean vehicles, fuels, and infrastructure across North Carolina and South Carolina.

“Today, we are making a commitment that will drive Carolina into a new era of environmental responsibility,” University President Harris Pastides says. “This is another important initiative supported by our faculty, staff, and students to create a campus that will be climate neutral.”

Michael Koman, the university’s director of sustainability, estimates that this initiative will reduce the university’s carbon footprint by more than 2,000 tons.

USC is a Clean Cities stakeholder with the Palmetto State Clean Fuels Coalition. The university earned top green ratings from the Princeton Review and the College Sustainability Report Card this fall, placing USC among the greenest universities and colleges in the Southeast.

MID-ATLANTIC REGION

Propane School Bus Fleet Launched in Gloucester County, Virginia

Some lucky students in Virginia are now enjoying a cleaner ride to school. Gloucester County Public Schools recently launched the state’s first propane school bus fleet.

“Using propane-powered school buses is a step in the right direction to significantly decrease vehicle emissions and improve the air quality for our students,” says Roger Kelly,

director of transportation for Gloucester County Public Schools. “We are excited to be involved in this clean school bus initiative.”

And cleaner air isn’t the only benefit the five propane buses offer. Gloucester County Public Schools estimates they will save about \$1.50 per gallon in fuel costs and more in maintenance costs due to the cleaner engine and prolonged oil change intervals.

“We are pleased and impressed with the forward thinking and actions of the Gloucester County School Board and administration,” says Chelsea Jenkins, director of Virginia Clean Cities. “The propane school buses are providing opportunities for students and the community to observe and learn first-hand about alternative transportation technologies.”

Virginia Clean Cities worked with Gloucester County Public Schools to

Electric vehicle recharging system at a public gas station in Sacramento, Calif.

develop the project, and was contracted by the Mid-Atlantic Regional Air Management Association to assist with project management.

A \$221,355 American Recovery and Reinvestment Act grant from the Environmental Protection Agency's National Clean Diesel Program funded half of the project and Gloucester County Public Schools funded the remaining amount.

NORTHWEST REGION

Utah Inaugurates AFV Awareness Month

November 2009 was Utah's first Alternative Fuel Vehicle Awareness Month. Lt. Governor Greg Bell and the mayors of Salt Lake City, Ogden, Provo, and Salt Lake County, joined Utah Clean Cities and AAA to kick off the month at the Utah Women's Expo in Sandy.

November marks the start of Utah's winter inversion, a climatic event that traps air pollution near the ground. This made November an opportune month for government leaders to urge Utahans to choose alternative fuel vehicles (AFVs) for improving the nation's energy security and the state's air quality.

Expo displays, hosted by the Utah coalition and AAA, educated attendees about AFVs, hybrid electric vehicles, and transportation grant and loan programs. At a press conference, the mayor of Salt Lake City accepted a \$10,000 grant for three electric-powered police vehicles as part of the AAA Greenlight Initiative.

Beyond the Expo, coalition stakeholders provided information during November to fleets that had no previous experience with AFVs. The month culminated in the Annual Utah Clean Cities stakeholder meeting, which

WEST REGION

Electric Vehicle Recharging System Opens at Public Gas Station in Sacramento

Sacramento, Calif., recently celebrated the opening of the first electric vehicle (EV) recharging system at a public gas station. DMC Green, Inc., installed the charger at a Phillips 76 station that also offers E85 and biodiesel.

The EV recharging system, which was designed and manufactured by Coulomb Technologies, offers a number of innovative features. Clients are issued a unique radio frequency key fob that unlocks and activates the recharging system. The system automatically sends a text message to the driver's cell phone when the car is fully charged or if anyone attempts to disconnect the electrical connection.

DMC plans to install at least 40 more EV recharging systems throughout the state by March.

"Once completed, these networked charging stations will connect major traffic arteries, cities, and counties throughout California, creating a significant step in reducing California's greenhouse footprint," said Richard Lowenthal, chief executive officer of Coulomb Technologies. "Electric vehicle infrastructure is beginning to take root in California and with DMC's plans for a retrofitted filling station network, EV drivers will be able to travel freely throughout California with peace of mind knowing they can locate a place to charge their plug-in vehicles."

DMC also recently installed E85 and biodiesel infrastructure at seven retail service stations in the Sacramento region. Funding for the E85 infrastructure was provided by a grant from the California Air Resources Board and administered by the Sacramento Air District, both members of Sacramento Clean Cities.



Roger Borkehagen/PIX 17032

drew more than 80 attendees. Dr. Dianne Nielson, Energy Advisor for Governor Gary Herbert, delivered the keynote speech.

The Utah coalition learned valuable lessons from this campaign. "We need to start a year in advance to plan a month of activities," says coalition co-coordinator Robin Erickson, adding that an AFV month should take place every year. "Fleets, government, and consumers continue to ask questions about AFVs. It takes time to educate them all."



AAA Greenlight Initiative/PIX 17036

Salt Lake City Mayor Becker hands Former Provo Mayor Billings the official documents declaring November Alternative Fuel Vehicle Awareness month.



> Spotlight from page 5

investment (ROI). How soon fleets will realize the benefit depends on the number of vehicles in the fleet, the number of miles driven, and the amount of fuel consumed. Tax credits and incentives can help fleets see the ROI even sooner. For example, assuming the cost of converting an existing diesel-powered bus or truck with an International DT-466 diesel engine to dedicated natural gas service is approximately \$50,000, the ROI timing can be significantly enhanced by the federal vehicle tax credit of \$32,000. State and federal incentive funding is often available as well.

Natural gas is certainly clean burning, domestic, and plentiful, but the movement to this alternative fuel strategy didn't really gain traction until there was an economic benefit to the customer. "In the summer of 2008, when crude hit \$148 a barrel—that is when the paradigm changed," says Moore. "And even though crude prices have been vacillating ever since, most fleet owners believe it is just a matter of time until crude prices hit triple digits again. So now it's clean, it's domestic, and we really have an economic case, particularly with the tax credits and incentives."



Trish Cozart, NREL/PIX 17026

ESI's cryogenic freezer supercools components, making them even better at withstanding high engine temperatures.

Ask the Technical Response Service



Do you have questions about alternative fuels, fuel economy measures, or advanced vehicles? The Clean Cities Technical Response Service (TRS) will help you find answers. For more information about the topics in this column or anything in the Clean Cities portfolio, e-mail technicalresponse@icfi.com or call 800-254-6735.

Q: What is the difference between a battery or "pure" electric vehicle (EV), hybrid electric vehicle (HEV), and a plug-in hybrid electric vehicle (PHEV)?

A: To put it simply:

- EV = batteries + electric motor + plug
- HEV = batteries + electric motor + internal combustion engine
- PHEV = batteries + electric motor + internal combustion engine + plug

EVs use batteries to store the electricity that powers the motor. The batteries must be replenished through onboard or offboard charging infrastructure, thus the vehicle uses a plug to "charge."

The primary source of power in HEVs is the internal combustion engine, though batteries are used to store the electricity that provides power via an electric motor. Electricity is generated by the engine and during braking, therefore HEVs aren't plugged in.

The primary source of power in PHEVs is the electric motor, which is powered by batteries. The internal combustion engine is used to extend the range of the vehicle and may not be used at all depending on the number of miles traveled between charges. PHEV batteries must be plugged in to be charged.

Specific examples of vehicles that are available today or coming soon are the Nissan Leaf (EV), Toyota Prius (HEV), and the Chevrolet Volt (PHEV).

There are benefits and challenges related to each technology. See the



The Nissan Leaf is an example of a pure electric vehicle (EV).

Alternative Fuels and Advanced Data Center Web site (www.afdc.energy.gov) for more information, including alternative energy conversion units such as fuel cells.

Q: Is there a rule of thumb for fuel consumption and emissions rates when a passenger vehicle or light truck is idling?

A: On average, a typical light-duty vehicle consumes 0.5 gallons/hour while idling. This rate is based on various data sources, including reports from Argonne National Laboratory. The actual rate may be more or less depending on the vehicle.

Using the U.S. Environmental Protection Agency's assumption that conventional gasoline emits 19.4 lb of carbon dioxide (CO₂) per gallon, the average gasoline powered light-duty vehicle emits approximately 9.7 lb of CO₂ per hour while idling.

For more information about alternative energy or energy efficiencies, you can also contact the EERE Info Center at 1-877-337-3463 or www.eere.energy.gov/informationcenter.

Resources



Clean Cities provides online tools and print resources for coordinators and stakeholders. Find all of these new documents and updated resources at www.afdc.energy.gov.

Online Resources

- **Incentives and Laws Database:** Search the redesigned and more user-friendly incentives and laws database to find state and federal incentives and laws related to alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics at www.afdc.energy.gov/afdc/incentives_laws.html.
- **Publications Search:** The redesigned publications search uses industry-standard search options to help you find technical reports, fact sheets, and other documents in an extensive alternative transportation publication database at www.afdc.energy.gov/afdc/progs/pubs.php.

2010 Alternative Vehicle Buyer's Guide:

The guide includes vehicle-specific information about fuel economy, emissions, vehicle specifications, estimated cost, and warranty, and helps consumers make informed decisions when buying an alternative fuel vehicle.



New Documents

- **Clean Cities Tools Brochure:** This document highlights all the online tools in the Alternative Fuels and Advanced Vehicles Data Center, FuelEconomy.gov, and more.
- **What is the Alternative Fuels and Advanced Vehicles Data Center? Fact Sheet:** Learn more about the resources available on the premier Web site for alternative transportation technologies.
- **Natural Gas Basics:** This document answers frequently asked questions about natural gas as a transportation fuel.

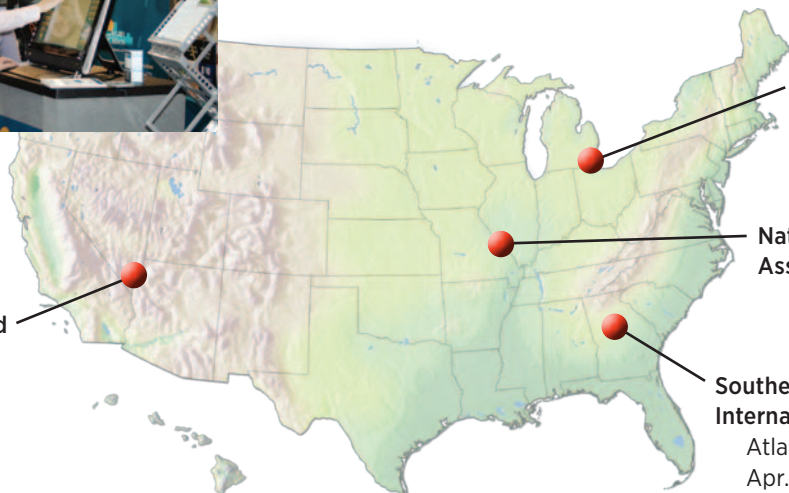
On the Road with Clean Cities

Look for the Clean Cities booth at the following shows and conferences.



Trish Cozart, NREL/PIX17006

Stacy Noblet and Sandra Loi peruse the program Web sites at the Clean Cities booth during the 2010 National Biodiesel Conference in Grapevine, Texas.



Alternative Fuels and Vehicles (AFVi)
Las Vegas
May 9-12, 2010

NAFA Fleet Management Association
Detroit
Apr. 24-27, 2010

National Truck Equipment Association Worktruck Show
St. Louis
Mar. 9-12, 2010

Southeastern Convention & International Propane Expo
Atlanta
Apr. 10-12, 2010

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

EERE Information Center
1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov/informationcenter

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste.

Prepared by the National Renewable Energy Laboratory (NREL), a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy; NREL is operated by the Alliance for Sustainable Energy, LLC.

DOE/GO-102010-2914 • March 2010