

TENNESSEE

Clean Fuels Advisor



A quarterly publication from the partnership between the Clean Cities coalitions in Tennessee and the state of Tennessee.

Bringing alternative fuels and hybrids to the forefront. Alt fuels = biodiesel, electricity, ethanol, hydrogen, natural gas and propane.

Cades Cove Heritage Tours Nearing Launch

Starting this fall, Cades Cove Heritage Tours will present visitors to the Great Smoky Mountains National Park with the opportunity to lessen their impact on the traffic and air quality in Cades Cove, while enjoying a guided tour. Visitors will board a 19-passenger ARBOC Spirit of Mobility gasoline-powered bus at the Great Smoky Mountain Heritage Center in Townsend, then travel through and around Cades Cove before returning to the Heritage Center.

Alissa McMahon with the National Parks Conservation Association, one of the partners on the project, said, "We wanted to find a way to lessen the harmful

effects of high traffic levels in Cades Cove, especially the impact traffic has on air quality. Through Cades Cove Heritage Tours, visitors will now be able to choose if they'd like to have a more interactive experience and learn about the natural and cultural resources of Cades Cove, all while helping to improve air quality by essentially using mass transit during a guided tour."



With the support of local citizen Randy Boyd, CEO of Petsafe, along with the Great Smoky Mountain Heritage Center, Smoky Mountains Convention & Visitors Bureau, and National Parks Conservation Association, this pilot will begin service with two vehicles. Over the next several months, information will be gathered on emissions, visitor satisfaction, and ridership levels and analyzed to determine future levels of service, as well the appropriateness of the vehicle technology. Alex Roche, the manager of Cades Cove Heritage Tours added, "We will also examine the applicability and opportunity to add vehicles that are

fuelled by alternative fuels, such as biodiesel or ethanol. Cades Cove Heritage Tours want to be a leader, not only in visitor experience, but also in environmental stewardship."

To learn more about Cades Cove Heritage Tours, please contact Alex Roche, alex.gsmhc@cadescoveheritagetours.org.

Blue TDOT Signs Help Motorists Go Green

Contributed by Linda Tidwell of TDOT.

We are all familiar with those blue logo signs along interstate highways. The Tennessee Department of Transportation (TDOT) is now using those blue logo signs to inform motorists about the availability of E85 ethanol and/or B20 biodiesel along interstate highways.

Ed Cole, TDOT's Chief of Environment and Planning, says, "The BIOFUEL logo program complements and supports Governor Bredesen's Biofuel Green Island Corridor project, which provides competitive grants to help retail station owners convert or install storage tanks and dispensers to sell E85 and/or B20 to the public. The goal of the Green Island Corridor project is to establish a network of biofuel stations along Tennessee interstate and major highway corridors, so that E85 and B20 pumps are located no more than 100 miles apart."

Joseph Sweat of TDOT's Traffic Engineering Office says that interstate logo signs are intended to help travelers locate essential services. "Logo signs are installed before most interchange ramps on rural interstate highways. The individual business logos then alert travelers to available services located at each exit," Sweat says. "This allows motorists to locate important services, such as gas stations, restaurants, lodging and campgrounds, both quickly and easily."

"We encourage more eligible stations to advertise their E85 and B20 pumps on interstate signs," says Alan Jones, Manager of TDOT's Environmental Policy Office. "It's important to let commuters, travelers and truckers know where they can find these cleaner, renewable fuels."

For participating stations, TDOT will install a highly visible BIOFUEL marker above mainline Gas logo boards and off-ramp signs at the interchange. In return, the biofuel station owner must advertise the availability of E85 or B20 on the company business logo placed on the Gas logo boards and off-ramp signs.

TDOT includes a list of interstate biofuel stations and exit numbers on the Tennessee State Highway Map. Check the BioTENN website at <http://www.biotenn.org> for information about the E85 and B20 stations that are growing in number all across the state.

To qualify for interstate advertising, a retail biofuel station must sell E85, B20 or both; must meet location requirements of the logo sign program (for example, be located within three miles of the interchange); and must be willing to include E85 and/or B20 on their logo. The average cost to redesign existing logo signs or create new ones for the station owner is about \$1,500 (that covers 4 logo signs, 2 each direction). To apply for interstate signage, contact TDOT's logo contractor at 877-907-0036. For logo sign information, contact Joseph Sweat at 615-532-3431 or Joseph.Sweat@state.tn.us.

Tom Robertson, Chief Manager of Southern Convenience Stores, has the distinction of having Tennessee's first interstate BIOFUEL sign for Fuel and Mart USA #4. The large BIOFUEL marker installed by TDOT along with Fuel and Mart's colorful B20 logo directs travelers to this I-75 Cleveland fuel station.



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Memphis Light Gas and Water to Use E85

The state's largest utility company is now looking to expand its vehicle fuel options by one more fuel. Memphis Light Gas and Water (MLGW), like any other fleet in the world, has been using gasoline and diesel to fuel their vehicles since the beginning. In the mid-eighties, the utility began using natural gas-powered vehicles to help mitigate emissions and diversify its vehicle fuel options. Just over a year ago the utility began using B20 in its Brunswick service station to fuel large trucks and heavy equipment, using over 10,000 gallons of B20 per month. Now, after purchasing 35 flex-fuel vehicles, the utility is planning on installing a 2,000-gallon E85 tank in its north service center. "This service



center will provide E85 for 24 light-duty trucks and 11 sedans," says John Daho, transportation engineer for MLGW. "We expect to have the tank and pump installed by the first half of '09, and are budgeting for many more flex-fuel vehicles for next year."

MLGW's commitment to biofuels is also helping to encourage local distributors and retailers to sell and distribute more of them. With a fleet like MLGW on the road looking for B20 or E85, retailers can be assured that there will be a market for these fuels. At the time of writing, the utility had not committed to a specific distributor, although several local fuel carriers have expressed interest in providing E85, a first in this part of the state.

Dave Matthews & Willie Nelson



A young lady learns about making your own electricity at the WTCCC's booth during the concert.

This summer, Willie Nelson and the Dave Matthews Band (DMB) toured the U.S. together bringing good music and a positive message to music fans across the country. The bands fuel their entire fleet of vehicles on B20, and host an Eco-Village at each of the tour's shows. This July, WTCCC was on hand for the Memphis stop interacting with the nearly 20,000 concertgoers on hand at Autozone Park.

Willie Nelson has long been known for his support and advocacy of biodiesel, and the Dave Matthews Band has recently been promoting this message with their fans, too. "We had two main goals with the greening of this tour," says DMB bassist Stefan Lessard. "Shrink our environmental footprint as much as possible, and bring a message to our fans that we all can do something good for the environment and have fun doing it." While in Memphis the bands stopped by Riverside BP, a Tennessee Green Island refueling

station, to fill their tour buses and equipment trucks with B20. Among the other initiatives the bands have undertaken is a carbon offset program for concertgoers. Fans were encouraged to purchase credits, which would offset their travel to and from the event. Over one third of the carbon reduction was a direct result of fan participation in the Reverb Fan Carbon Offset Program, where concertgoers neutralized the CO2 from over 1,200,000 miles of driving to and from shows. The bands have calculated that a total of over 3,300,000 pounds of CO2 were reduced or eliminated on tour through the use of biodiesel and carbon offsets. This is equivalent to removing over 190 homes from the power grid for a year, or not burning 171,000 gallons of gasoline. There was also ample recycling available for plastic, aluminum, paper, and cardboard. The artists have even moved to organic cotton and bamboo products for their merchandise.

Senator Alexander – "Find More, Use Less"

Senator Lamar Alexander at the U.T. Agricultural Experiment Station tells Tennesseans "we need to find more oil, and use less of it".



On a broiling hot Friday morning in June, over 100 people gathered in the University of Tennessee Agricultural Experiment Station to engage U.S. Senator Lamar Alexander about the dynamic, complicated, and timely topic of energy policy and renewable energy. Participants came from a variety of disciplines and included farmers, researchers, retailers, truck drivers, biofuel producers, educators, attorneys, investors,

students, and reporters. All were hoping to hear some new wisdom, looking for light at the end of the tunnel (or at least some sort of reassurance that the light at the end of the tunnel would have a power source behind it that wouldn't vanish).

Senator Alexander arrived with a great tag line, "find more, and use less," and offered a variety of strategies to tackling our energy problems. These strategies regrettably

include increased off-shore drilling and drilling in the Arctic Wildlife Refuge, but offered such positives as increased support for sustainable biofuel production and plug-in electric vehicle production. While the increased support of second generation biofuels and plug-in electric vehicle technology is a critical component to our energy security, the question remains: how will we address the overall issue of energy consumption in this nation?

Finding more energy is a must, but using less oil is a significant challenge that we are all obliged to face. Changing our habits and methods is equally, if not more important than finding more. Energy efficiency is not as 'sexy' as installing solar panels or using biofuels, but there is no question that it represents as much hope as any deep drilling or new fuel. The cheapest and cleanest energy out there is the energy we don't use. Properly tuned vehicles, proper tire inflation, taking a bus, sharing a ride, riding a bike, driving less aggressively... all of these options, if utilized in some fashion by everyone, could represent a "use less" that will make the "find more" a whole lot more effective.



Middle Tennessee - David Pelton

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Fixing Future Vehicles

Jump in the driver's seat, turn the key and—as long as it runs well—most of us think little more about our vehicles. But on the day the key turns and nothing happens, or worse a horrid clanging noise arises from the under the hood, your next call could well be to a graduate of Nashville Auto Diesel College (NADC).

NADC has been teaching future mechanics and auto industry professionals for over 90 years. They first opened their doors in 1919, added diesel training in 1935 and collision repair in 1946. Students come from all 50 states and 62 foreign countries.

The rise in popularity of alternative fuel and hybrid vehicles has added a new set of classes to the school curriculum. Not only is it important to understand the

mechanics of using alternative fuels, but in the case of hybrid vehicles, there are very real hazards associated with high voltage power lines under the hood.

According to Doug Fox, vice president of education at NADC, the college is also beginning to work with first responders. Since hybrid vehicles rely on electric power there are major electrical cables under the hood that anyone working near needs to be aware of, especially in an accident setting. NADC can help first responders understand and identify potential hazards.

Whatever the future holds for the auto industry, NADC is preparing its students with equipment and curriculum that will benefit the rest of us who just want our vehicles to run well.



Some of the rail cars that haul ethanol straight to Tri-Star's main fuel farm in the Nashville area.

Stakeholder Spotlight - Tri-Star Energy

Three years ago Rob Jewel, Sales Manager for Tri-Star Energy, took a chance on a small biodiesel project in Franklin, Tennessee. Tri-Star and Clean Cities of Middle Tennessee collaborated to help Franklin Transit Authority use biodiesel in their trolleys. The perfect refueling location, very close to the Franklin fleet, just happened to be a Pacific Pride refuel site owned by Tri-Star. With plenty of space and easy access to the street, TriStar installed an aboveground tank, ran electricity to it, and hooked up a pump. That successful project helped build confidence to tackle bigger plans.

A few months later, Tri-Star explored some additional biodiesel options. Jewel explains, "We had some kerosene tanks and pumps at stations that didn't get much use." Tri-Star began converting those kerosene pumps to B20 pumps and, three years later, became the leading retail supplier of biofuel in the region.

Thanks to a combination of infrastructure grants from the state, a federal tax incentive for biofuels, and a growing numbers of fleets and consumers wanting

fuel choices, Tri-Star continued efforts to build a network of fueling sites and bring biofuels to customers. Today they operate and supply four E85 and thirteen B20 public pumps.

Most are located at Daily's brand Shell stations, like the one pictured below.

However, building a biofuels business is not without its hurdles. One of the hurdles for biofuels is the way it is transported from the production facility to the local supplier. While petroleum fuels travel the country via pipelines, biofuels must be hauled by truck, barge, and/or rail. This adds to transportation costs and brings into play tricky logistics when a rail spur or river ends a few miles short of an ultimate destination.

Tri-Star has invested in a solution to that logistics problem. They built their own infrastructure to bring rail cars straight to the back door of their facility in Nashville. The additions include a rail spur that can hold up to 30 rail cars and blending equipment to manage any blend of ethanol a customer wants.

"The facility is essentially a rack for E85," says Jewel. The project is helped further through a partnership with EcoEnergy, a local ethanol broker. EcoEnergy helps Tri-Star fill rail cars with E85 from around the country and, in turn, Tri-Star uses the Nashville facility to hold inventory for either wholesale or retail supply. Whether it is sold to other fuel jobbers or trucked to Tri-Star's own Daily's brand stations, the infrastructure is making biofuels available to the masses in middle Tennessee.

Green Hills Gets Biofuels

Three blocks from an upscale mall, three minutes from Hillsboro High School, and across the street from one of the trendiest shopping areas in Nashville, E85 and B20 have arrived in style. The Green Hills region of Davidson County has long been a shopping and entertainment destination. Now, just a block away from the famous Bluebird Café, residents and tourists can feed their frenzy for consumer choice with biofuels. The new "green island" is front and center under the canopy for anyone driving a flex-fuel or diesel vehicle. It is easily accessible off Hillsboro Pike and just minutes from interstate 440. Hillsboro Pike is also a major thruway for commuters living southwest of the city. Whether on their way to work or play, Nashville's newest alternative fuel site is perfectly located to catch thousands of vehicles.

Map it -- Tri-Star's Daily's Shell in Green Hills:
4040 Hillsboro Pike, Nashville, TN 37215





KUB Gets Hybrid Bucket Truck

Contributed by Keri Brill of KUB.

Leading the way for utility companies in Tennessee, the Knoxville Utilities Board (KUB) has introduced a new hybrid bucket truck to its fleet. KUB expects to save \$6,000 annually on fuel, constituting a net savings of \$20,000 over the projected 12-year vehicle lifetime. The truck, which was first deployed into service on July 11, has an electric-powered boom and a parallel hybrid recharge system, in which both the heat generated from the brake pads (regenerative braking) and an alternative generator power the truck and keep the boom's battery charged. With a projected payoff time of nine years, 44% better gas mileage than standard bucket trucks, and significantly reduced operating noise, the new truck will save money, reduce emissions, and enhance worker safety.

The truck's electric system by Eaton, and boom system by Altec, combine to form an advanced operating technology. When the operators start the truck in the morning and drive to the job site, the boom battery charges. When the truck reaches the job site and the engine is shut off, the boom runs on the charged

battery, greatly reducing the amount of noise. Less noise means that workers can hear each other better and that residents are less disturbed by the work. The boom can run off the battery for about two hours with a full charge, and then the truck's engine cycles on as needed to recharge.

The primary operators of the new truck have noticed the truck's increased boom reach distance, faster boom speed, shorter set-up time, better gas mileage, quieter operation noise, and roomier boom space to work with. All these things add together to make jobs faster, more efficient, and safer. "It's a super, super truck," comments Ron Calfee, one of the truck's primary operators, "I hope we get more of them because it looks like this is the way of the future." Any future purchase decisions will be based on this truck's evaluation. "It's an awesome truck. I wouldn't know what to do without it now," says the truck's other main operator, Jerry Miller.

With less than 80 others like it in the United States, this new hybrid bucket truck is one more step for KUB towards reducing emissions and conserving fuel.



Hydrogen Tour Hits Chattanooga

On Monday, August 18, the "Hydrogen Road Tour '08" stopped in Chattanooga for a two-hour press event and ride-n-drive thanks to the University of Tennessee at Chattanooga's Center for Energy, Transportation, and the Environment.

The event kicked off with several speakers including Congressman Zach Wamp and Catherine Dunwoody, executive director of the California Fuel Cell Partnership (CaFCP). The CaFCP was a major sponsor of the entire tour along with nine auto manufacturers, the U.S. Department of Energy, National Hydrogen Association, and the U.S. DOT. The event's subtitle was "31 cities in 18 days in 13 states" and started in Maine on 8/11 and finished in California on 8/23.

The fuel cell vehicles (FCVs) all operate on hydrogen compressed to 5,000 psi (350 bar) while the BMW uses liquified hydrogen.

For over an hour that day, everyone in attendance had a chance to either drive or ride in any one of the vehicles. I (Overly) drove the F-Cell and got to ride in the Tucson. Surprisingly, both had enough headroom, even for me at 6' 3". I was not any more scrunched than I expected from a smaller-sized SUV. And although we traveled along a preset route, the drive,

handling, and pickup all were comparable to similar vehicles of today.

Though the rival auto companies worked together for this event, they maintained their competitive edge by keeping their fuel-cell designs secret. And that's perhaps what's best here... that multiple approaches to making this technology work and reduce its costs have progressed to the very drivable and usable models that were on display. It appears we really are getting closer to driving hydrogen-powered cars in the not-too-distant future!

From the official press release through the U.S. DOT, Administrator Paul Brubaker of DOT's Research and Innovative Technology Administration noted that six transit agencies across the country currently operate hydrogen-powered buses, Southern California auto dealers are leasing hydrogen vehicles, and hundreds of individuals are driving hydrogen-powered vehicles in demonstration programs across the United States.

Find out more about the stops, the individual events, and the vehicles by visiting the tour's Website, <http://hydrogenroadtour08.dot.gov/>.



Clockwise from top right: Daimler's F-Cell, Nissan's X-Trail FCV, and Hyundai's Tucson FCV are all fuel cell vehicles and emit only water vapor from the tailpipe. BMW's Hydrogen 7 is essentially a flex-fuel vehicle that uses an internal combustion engine to operate on either hydrogen or gasoline. The Volkswagen Touran HyMotion is also a fuel cell and is shown while refueling at the onsite, mobile refueling station. The fuel cell vehicles all run on compressed hydrogen while the BMW stored its hydrogen on-board liquified -- that is chilled to -423°F.



ETCFC Educational Initiatives - '08-'09

After ramping up our K-12 school presentations over the past two years from reaching around 700 to almost 1,700 students, the ETCFC is beginning two new education-based initiatives this year: 1) Clean Fuels School, and 2) School-to-School Clean Fuels. Both are focused on giving regional students the chance to go beyond learning about alternative fuels themselves by teaching others about them, too.

The Clean Fuels School Program will offer regional middle and high school classes or clubs the chance to take their alternative fuels' knowledge into their local community. The goal will be to tackle a number of different tasks that garner "emissions reductions" (or points), and gather enough points to become a "Clean Fuels School." The options will vary widely and include such projects as talking to local businesses about wiser use of fuel, reaching out to others at their school with the alt fuels message (perhaps

setting up a table at the basketball game), or talking to the school's bus drivers about anti-idling or using biofuels. The reward for achieving their goal will be a full-size, two-plate street sign to be placed in front of the school that says "Blank High School is / a Clean Fuels School".

The School-to-School Clean Fuels Program will take a different slant by getting students at regional higher learning institutions to take the alt fuels message to middle and high schools students in their county. Our hope is to develop long-term relationships with professors so that annually we can work together to get more kids learning about alternative fuels and advanced technology vehicles. If we succeed, we have a chance of building better caretakers of this planet while potentially getting some kids interested in making a career out of advanced mobility or designing more walkable communities!

East Tennessee - Jonathan Overly



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SmartTrips Helps Knox Commuters save Money & Planet

Contributed by Tina Rolan, the Smart Trips Coordinator.

The Smart Trips program encourages commuters to take alternatives to driving alone. By carpooling, taking the bus, biking, walking, or telecommuting, program participants can save money on their commute and help improve our regional air quality. Commuters looking for a carpool can search the Smart Trips carpool matching database to find potential partners, and Smart Trips will help cyclists and walkers find the best routes to get to work and assist transit riders with KAT bus routes and schedules. Plus, Smart Trips offers an Emergency Ride Home program for participating commuters. If you take an alternative commute and an unplanned schedule change arises, Smart Trips will pay for your cab ride home up to five times a year.

Smart Trips participants can earn great rewards, too,

such as \$10 gift cards to Regal Cinemas, Mast General Store, Panera Bread, or Tomato Head Restaurant for taking an alternative to driving alone 30 days out of each quarter. If thirty days are a little ambitious, the Smart Trips Commuter Challenge is for you. Just take an alternative commute 5 days a month now through June 2009 to qualify for monthly, quarterly, and grand prize drawings which include \$50 gift cards each month, \$100 gift cards each quarter, and grand prizes that include a \$1,500 AAA Vacation Package, Nintendo Wii Game Systems, iPod Touch, and iPod Shuffles.

To participate in the Smart Trips program, simply sign up at www.knoxsmarttrips.org and start logging your commutes each month. Have questions about taking a Smart Trip? Visit the Smart Trips website or email Smart Trips at smarttrips@knoxtrans.org.



City of Sevierville up to 12 Plug-in Hybrids

It started about five years ago when the City of Sevierville was first beginning their alt-fuels fleet, which is arguably one of the most diverse fleets in all of the state of Tennessee. They bought four plug-in, hybrid, electric-drive, propane-fired Ebus trolleys to kick-off their mass transit service.

As with most new technologies, there's a strong likelihood that you'll experience a problem or two along the way, hopefully of the variety that are readily fixable. Sevierville has experienced some of those, problems but was able to keep things moving and overall have had a good experience with these vehicles. In fact, they've added eight more! Four were purchased from Knoxville Area Transit in 2007, and the remainder were purchased from the city of Gulfport, MS (who received funding to replace their own fleet this year). Now with ten to go into service (and two used for parts), they have perhaps the largest plug-in hybrid fleet in the southeast.

Public Works Director Bryon Fortner says, "We

[Sevierville] signed a pledge in March 2003 to utilize alternative fuels whenever possible, and these vehicles area big part of that. We have had some problems but have been able to get them fixed and keep this fleet up and running. It takes a commitment and a great attitude from our fleet maintenance department on learning new technology, but the more you do it, the easier the learning becomes. We couldn't have done it without our Fleet Manager Jim Dennison and Trolley Technician David Cope. They have gone beyond the call of duty by embracing this technology and rising to the challenges!"

Oh yeah... and I mentioned that diversity. Sevierville's fleet includes vehicles that run on biodiesel, ethanol, natural gas, propane and electricity. That's leadership!

One of the City of Sevierville's Ebus trolleys. The new ones are getting painted and are expected to be operational and running routes by the end of the year.





Anyone can sign-up to receive the *Tennessee Clean Fuels Advisor* online!
Just email jgoverly@utk.edu and say “*sign me up for the Advisor!*” and provide your mailing address.

Two EERE resources for you...



1. The DOE “Fact of the Week”

There is *tons* of useful info here! This weekly fact is posted by the Energy Efficiency and Renewable Energy folks, and they’ve got them all the way back to 2003. You’ll just have to see the list to see what all information is there. I think you’ll find much of it interesting and useful! Access it here:

http://www1.eere.energy.gov/vehiclesandfuels/facts/2008_index.html

2. Clean Cities Webcast Presentations

Although there are a variety of resources at your fingertips on the Clean Cities and Alt Fuels Data Center Websites, one good one is the presentations from the Webcasts that we view from time to time. Recent topics include heavy duty hybrids, GHG legislation, a review of EISA ‘07 and the retail case for E85. Get ‘em here:

http://www1.eere.energy.gov/cleancities/toolbox/webcast_presentations.html

Two TN Odysseys - Early October!

1. Nashville

The Nashville Auto Diesel College and Clean Cities of Middle Tennessee are co-hosting Middle Tennessee’s Odyssey 2008 celebration. The event will cover two days, beginning at noon, Thursday, October 2 and concluding on Friday, October 3. Contact Dave Pelton (davepelton@att.net) or Doug Fox (DFox@nadcedu.com) for more details.



2. Chattanooga

The East TN Clean Fuels Coalition is partnering with the Chattanooga Green Committee to hold an event in downtown Chattanooga in Miller Plaza on Oct. 3 from 11am-7pm. 30 booths will have info about transportation and stationary energy options that are wise ones for the environment. Come ride-n-drive a number of hybrids and cleaner vehicles that use advanced technology to help us diversify away from petroleum along. Find more info on our Website: <http://www.ETCleanFuels.org>.

