

# 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.

## More Tennesseans Have a Choice at the Pump

Contributed by Linda Tidwell of the Tennessee Department of Transportation.

Tennessee consumers are gaining more opportunities to refuel their vehicles with a cleaner, renewable alternative to conventional petroleum fuels. There are now 15 E85 pumps and 27 B20 pumps across the state. With the cost of biodiesel remaining high, other stations have opted to sell lower biodiesel blends, (e.g., B10).

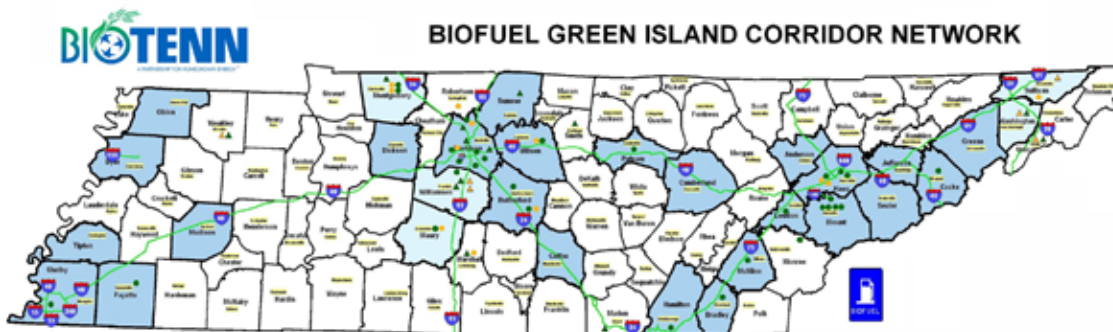
Many of these retail pumps were funded through grants provided by Governor Bredesen's BioTENN program and TDOT's Green Island Corridor grant program. Through the Green Island program, citizens can expect several more E85 and B20 pumps to open across the state in coming months.

The goal of the Green Island program is to help

locate biofuel stations no more than 100 miles apart along Tennessee's interstates and major highways. The grants provided through the Green Island program help encourage independent business owners who want to do their part to offer a cleaner, renewable alternative to petroleum fuels.

The BioTENN initiative works to make cleaner, home-grown, renewable biofuels a real choice for citizens, businesses and travelers. Increasing our use of biofuels helps reduce vehicle emissions, protect public health, reduce our dependence on petroleum, and support the biofuels industry in Tennessee.

For more information on Tennessee's biofuels program or to find a E85 or B20 pump near you, visit <http://www.biottenn.org>.



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## UT Biofuels Initiative Update

Contributed by Patterson Wilson of the University of Tennessee at Knoxville Office of Bioenergy Programs.

The UT Biofuels Initiative continues to make progress this spring as a new company was formed to manage the biorefinery, and UT Extension personnel began working with area farmers to plant 725 acres of switchgrass.

Genera Energy, a limited liability company established by the University of Tennessee Research Foundation, is

responsible for coordinating the construction and operation of the cellulosic ethanol biorefinery. Genera Energy and strategic technology partner Mascoma Corporation recently received a \$26 million joint award from the U.S. Department of Energy to be used in the construction of the 10 percent scale biorefinery.

Also this spring, 16 East Tennessee farmers enrolled in UT's switchgrass production program and began growing the crop that will be converted to ethanol in the biorefinery. Planting of the new bioenergy crop began on April 30 and continued through the end of May.

Switchgrass is a perennial, warm-season native grass that was selected as a bio-energy crop because of its biomass yield potential and its fit for East Tennessee farmland and resources. Once established, base yields of switchgrass are around six tons per acre, with the potential to reach eight tons per acre or more. Additionally, switchgrass has proven to be a drought resistant crop that can grow well with little or no need for fertilizer.

McMinn County farmer Dillon Vanzant plants switchgrass on 15 acres of land in Athens, Tennessee on May 14.



THE WEST TENNESSEE CLEAN CITIES COALITION HOLDS MONTHLY MEETINGS IN MEMPHIS. THE EAST TENNESSEE CLEAN FUELS COALITION HOLDS MONTHLY MEETINGS IN KNOXVILLE AND BI-MONTHLY MEETINGS IN JOHNSON CITY AND CHATTANOOGA. COME JOIN US AT ONE OF OUR MEETINGS AND GET PLUGGED-IN TO LOCAL ACTION!



U.S. Department of Energy



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## Shelby Buses Scheduled for Emissions Tune-up

"This project has taken almost two years, but is finally a reality, not just a good idea." Ronne' Atkins clean air coordinator for the Memphis and Shelby County Health Department's (MSCHD) Air Quality Division, said of the Health Departments plan to retrofit the nearly 300-vehicle Shelby County schools bus fleet with increased emissions controls. "We have been working with the county schools and the federal Congestion Mitigation and Air Quality (CMAQ) Improvement Program on this and are very pleased to now be so close to actually turning wrenches and cleaning up these buses' tailpipes and on-board emissions", says Adkins.

The school district's Diesel Retrofit program will place Diesel Oxidation Catalysts (DOCs) and Closed Crankcase Ventilators (CCVs) on all 294 of the buses. Using DOCs and CCVs will drastically reduce the emissions profile of each bus without limiting the performance, or flexibility of the vehicle. Each of these buses can still use ultra low sulfur diesel and various biodiesel blends.

DOCs reduce the emissions of various toxins by up to 70 percent. Hydrocarbons and carbon monoxide emissions from the tailpipe will be reduced by 20 percent, while the emissions of volatile organic compounds from the tailpipe will be reduced by 70 percent. Air Quality Improvement Supervisor Larry Smith of the MSCHD says, "toxic emissions reductions like these are substantial...implementing this technology is well worth the effort."

"Tailpipe emissions from buses are not the only

concern for us," says Director of Transportation for Shelby County Schools Mike Simpson. "On-board emissions that directly off the engine and get inside the school bus pose a risk to children and employees as well. With the installation of the CCVs, students, drivers, and parents can breathe a little easier." CCVs reduce in-cabin emissions considerably. Toxins like NOx and hydrocarbons are captured and redirected to the combustion chamber to prevent them from infiltrating the riding compartment. Particulate matter is filtered out as well. In all, engine vapors and other odors are removed from the breathable air on the bus thereby creating a healthier environment for those riding it. Traveling on the bus is still the safest and most efficient means of getting students to and from school; improvements such as the instillation of CCVs only serve to make an already preferred situation that much better.

The contract for the installation of these devices will soon be out for bid, with work expected to begin before the end of the summer. Total project costs for the retrofitting of all 294 busses are expected to be around \$400,000. Eighty percent of the funding is being provided by CMAQ funds, with the remaining amount coming from the MSCHD, via industrial air quality violation fine money. We are proud of our partners at the health department and Shelby County Schools for their commitment to the health and safety of all residents in the area, and look forward to the day when all buses are as clean as these will be.



Top - The students had built their own solar ovens using pizza boxes and aluminum foil. Bottom - Couch operates his bicycle-powered generator.



## Energy Education a Priority for WTCCC

Our mission is to help reduce our nation's dependence on high carbon energy and improve air quality by advancing the use of clean, domestic, and renewable fuels, energy efficient technologies, and environmentally responsible community development. Of all the different tools we use, the most successful and effective method of approaching this mission has been through education. By education I mean using interactive, multi-media presentations and discussions to help people connect the dots between their personal decisions and the effect those decisions have on our health, security, environment, and culture.

In our efforts to educate people about the value of energy, the effectiveness of energy efficiency, and the impact of our decision-making, we take audience members through the history of energy consumption from the time of whale hunting for lamp oil to the present day methods of hunting for new oil fields for whale oil... I mean fuel for our whales... I mean cars. Sorry about that. Taking people through this experience helps illustrate how all energy capture and release is dependant on sun, soil, and plants; whether its ancient sun energy (coal & petroleum), or recent sun energy (biofuels and your breakfast lunch and dinner).

We recently presented our educational efforts to a group of Memphis school students participating in the summer CLUE camp. CLUE is a program for gifted students that are by-far some of the most encourag-

ing of young people I have seen in a long time. The focus of the CLUE camp was heavily biased on clean, renewable energy, and their time was spent on field trips and in-class exercises. The class even visited Memphis Biofuels, one of our founding partners.

On the day I was asked to visit the class, the students had been working out word problems that centered on words like fleets, soybeans, fossil fuels, biofuels, and emissions. It was amazing to see how excited and interested these students were about creating energy from the sun. They had even constructed their own solar ovens (see picture at left).

I brought our bicycle-powered generator, some energy efficient products that I could power with the generator, and talked to about 60 students for a little over an hour. No one fell asleep, no one left the room, and almost every one of the students had questions. It was clear at the end of the presentation, when I ran out of time for questions, and was handed several little sheets of paper with additional questions to answer, that renewable energy and energy efficiency are something that kids feel they can actually relate to, and make a difference with.

The WTCCC is available to present to your community, group, or classroom at anytime. It doesn't matter how young or old, the information presented is timely, appropriate, and necessary. For more information send an email to andrew@wtccc.com.





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## Personal Energy Policy

When will congress pass a comprehensive energy policy? When will the state adopt a more aggressive energy policy? When will "they" do this and when will "they" do that? Even if it happened tomorrow, it could take years before such policies create meaningful impact and affect our individual lives.

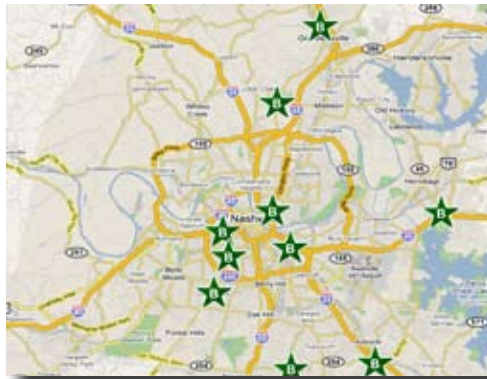
A new buzz phrase is addressing this issue. It is called a "Personal Energy Policy." The term might be new but the concept is older than the word policy itself. A Personal Energy Policy is about making individual changes to suit the needs of individual lifestyles and resources. When others won't do it for you, do it yourself.

Some suggestions include: drive 55 mpg and keep

tire pressure correct to save fuel; turn the heating in your home down to 68°F and the cooling up to 75°F to reduce your HVAC bill; and my personal favorite, use domestic, alternative fuels.

A personal energy policy can be anything you want it to be. It can include home, work, hobbies and vacations. Best of all, it can be implemented immediately. No congress to wait on, no corporate mogul to vilify, just the individual, the lifestyle and the policy. Once enough people begin living by their own more energy efficient policy (did I mention it can save you money?), the entrepreneurs and corporate decision-makers will follow. Individually we will influence those around us. Collectively, we might just shift a national paradigm.

## Davidson County Up to Ten B20 Pumps



Four years ago, biodiesel was often talked about but rarely used by the general public in Nashville. That's because only one public station was up and running. Today biodiesel enthusiasts in Davidson County have ten times as many choices to purchase this one renewable fuel. The combina-

tion of state and federal grants awarded for biofuel infrastructure and public support for alternatives to petroleum has helped business owners add biodiesel to their portfolio.

The ten stations include: the first public B20 station located at the Citgo on Main Street, the Shell station in Hillsboro Village, and then the eight (yes, 8!) Daily's has added that are all over the county.

Another important piece of the biodiesel availability puzzle is the addition of biodiesel production facilities in the state. The closer the fuel is produced, the easier and cheaper it is for stations to attain and sell. The economic loop also gets a boost as fuel produced in Tennessee is used in Tennessee.

*The biodiesel stations in Davidson County are all over the map. To see more information about all the locations including hours, maps to each station, go online to [www.biotenn.org](http://www.biotenn.org).*

## Maintaining Fuels' Diversity

Fleet managers find themselves in the midst of fuel issues where once the topic was relatively passive and mundane. Need fuel, order fuel, use fuel - a routine job when fuel is cheap. But a host of issues are forcing fleet managers into tough decisions. While cost has always played a role in the past, today fleet managers see it as a game changer and sometimes a deal breaker. The addition of choices in the form of biofuels has changed the rules as well. Cost is weighed against patriotism and environmental stewardship.

Two years ago, the decision to use biofuels was given a boost by federal tax breaks to the blenders. For a while the reduced price helped many fleet managers decide to give biofuels a try. Now, after hundreds of thousands of miles of successful use, fleet managers are torn between their desire to support a clean, domestic product and their bottom line.

The rising cost of petroleum is forcing company and government accountants everywhere to squeeze every penny out of operational resources. For the fleet managers wanting to continue using biofuels, the squeeze can feel like choking. Arguments for using a more expensive biofuel blend must broaden in order to survive at all. Using a domestic fuel that keeps money in the U.S. and out of the Middle East may be

worth a couple of pennies per gallon. Helping the environment is worth a cent or two. And diversifying energy supplies has real and practical merit.

Still, the tipping point for using alternative fuels exists whether that is 2 or 30 cents/gallon. For the Nashville Metro Transit Authority that threshold was 5 cents per gallon above the petroleum counterpart. For the city of Springfield, the tolerance level peaked at \$5/gallon for biodiesel. Patriotism and environmental stewardship are great flags to wave but on their own they rarely override sound business decisions from the board room. No matter how much a fleet manager or CEO understands the benefits of using domestic, clean, renewable fuels, there is no escaping economics.

Ironically, one argument for having diversity is to balance costs. In theory, fuels made from various feedstocks would rise and fall independent of each other. Customers could then choose the more economical solution and let the free market do the rest. In reality however, the existing production and distribution systems for liquid fuel cause a bottleneck in which prices can be homogenized. Stranded is the fleet manager who may now be convinced of the many benefits of biofuels, but must wait for markets to stabilize.



*This truly multi-fuel station is in San Diego where all kinds of alternative fuels are sold.*



## Sustainable Shelby: A Future of Choice not Chance

Contributed by Tim Schnippert of the WTCCC.

Over the last few months, Andrew Couch and I have had the opportunity to work on a new initiative for redefining the growth policies for Shelby County. Seven committees were formed to address everything from transportation to the county's purchasing policies. Shelby County Mayor A. C. Wharton tasked the committees with the responsibility of setting priorities for moving the county away from its current "unsustainable journey." "Today, our community regularly ends up at the bottom of the lists of sustainable, walkable, bike-able, fuel-efficient communities," said Wharton. "It doesn't have to stay that way."

Sustainable Shelby was a gathering of many leaders from diverse fields including a mix of private citizens and government employees. The members of Sustainable Shelby began meeting in March to craft ideas for the county to join the national "Smart Growth" or "new urbanism" movements for land use. Each committee drafted seven priorities, then presented their findings at a digital congress located at the University of Memphis. The priorities were then voted upon by all members of Sustainable Shelby. The top ten are as follows:

- Create or reinvest in a great public realm that includes parks, schools, streets, plazas that are appropriately scaled - one size does not fit all.

- Create or reinvest in great neighborhoods—not merely subdivisions—that are complete, walkable and provide a sense of neighborhood.

- Amend existing building, plumbing, electrical, mechanical and fuel gas codes by June 30, 2009, to eliminate obstacles to sustainable growth.

- Produce a comprehensive plan for Memphis and Shelby County that includes guiding principles that provide a clear, predictable, positive vision.

- Design new public buildings to be flexible and adaptable to potential changes in future use.

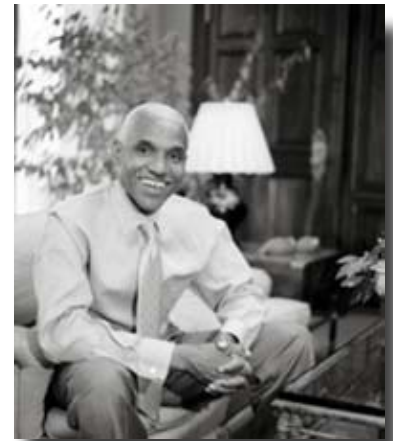
- The public sector should emphasize adaptive reuse of existing buildings.

- Amend local regulations for demolition to identify and enact incentives that encourage building reuse when feasible and material recycling when demolition is needed.

- Provide incentives for reclaiming declining property in established neighborhoods.

- Adopt comprehensive, community-based watershed management strategies as the driver of water quality, quantity and habitat decisions.

- Create and enhance bike routes and pedestrian facilities to identify routes that can easily be striped for bicycle lanes; ensure dedicated funding through capital improvement program for the routes and install "share the road signs."



Shelby County Mayor A. C. Wharton.

## Cheaper Fuel for Schools and Healthy Kids?

Contributed by Mark Mauss of SunsOil, LLC.

Ever want to help out the school band's fundraiser, but don't need another car wash or Krispy Kreme doughnut? How about a fundraiser that earns the kids that cross-country trip, saves the school system fuel money, and cleans up the air inside the buses where our kids ride? That sound better?!? We could have it all.

It's a bit complicated, but here's how it works. Student club members talk to restaurants and convince the owners to donate their fryer grease to the student group. Either the students themselves or an independent hauler picks up the grease and delivers it to the nearest biodiesel company. The biodiesel company, whose lifeblood is affordable feedstock, pays the student group for each gallon they "raise" and pays the hauler for pickup. The restaurant can get a tax deduction for their donation, and students can hand out flyers or coupons to promote the restaurant. "Eat at Local Joe's and support your high school band!"

As part of the arrangement, the biodiesel company agrees to sell the grease-based biodiesel to the school bus fleet at some kind of discount. The school gets cheaper fuel; the student club gets its donations; we bring the air inside the school buses back to EPA's safe levels; the restaurant, the hauler and the biodiesel company help maintain a thriving local economy.

As an example, say the school club gets 25 cents per gallon of oil, the hauler (or club) gets 60 cents (in part to cover their equipment and fuel costs) for delivery, and the bus fleet gets 25 cents off their biodiesel fuel purchase.

The biodiesel company effectively gets crude grease for \$1.10 per gallon, and our kids have an asthma-free ride to school. Everybody wins.

The trick is that it has to be a community effort. Students need to do the leg work. Restaurants may need to handle their grease differently. Some enterprising people need to get into the pickup and delivery business. And the biodiesel company needs to be able to handle crude grease. If you'd like to see this take off in Tennessee, contact any of the Clean Cities coalitions (see Couch, Pelton and Overly's contact info on their regional pages), or me, Athens, Tennessee-based biodiesel producer (mark.mauss@suns-oil.com), with your ideas.

*Biodiesel is a great option for school buses because it reduces pollution at the source—the engine—where some emissions leave directly and enter the cabin where the students are riding the bus. The aftertreatment devices that have been installed on new buses (2007 and later) typically don't include crankcase devices and therefore don't reduce the pollution that goes directly into the cabin.*







## Biodiesel Goes Backward in ET

With the onset of very high prices and reduced availability of biodiesel, East Tennessee has lost much of the gains that were created over the past three-plus years in fleets using the fuel and the opening of public biodiesel stations.

At least six public biodiesel pumps (two in Knoxville, two in Maryville, one in Jonesborough and one just north of Kingsport) have been closed and there are no signs of them reopening. Another five pumps were temporarily covered because of high prices, but have been reopened. We are definitely seeing impacts from the turn in the market of biodiesel, however,

some new pumps are to come online in the coming months and these are scattered across the area, so there is some good news.

Looking at the fleet side, recent conversations have shed new light on fleet activity. Several fleets continue to use B20, some have moved back to B5 and others have stopped using biodiesel altogether. Our best estimate is that we have fallen from a high water mark of approaching 100 fleets two years ago to on the order of 30-40 today. With Nu-Energie now online and SunOil getting close to opening, I'm hoping that we collectively reverse this trend before the end of '08.

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## Roadrunner Pumps Up on E85

Mountain Empire Oil Company (MEOC) operates 55 "Roadrunner Market" convenience stores in four states and is centered out of Johnson City, Tennessee. As of end of July, they will have four E85 stations in the northeast Tennessee area. Their first E85 station opened in March in Kingsport (station #113), and they just opened their second E85 station in Jonesborough (#124) in May... and two more are on the way.

Vice President of Operations John Kelly says, "We think that customer demand for E85 is building and it's clear that there are a lot of FFVs (flex-fuel vehicles) on the road today. But these folks have don't have enough places to fill-up yet. This is supply and demand situation, and we're putting in the supply to see if the demand will follow."

MEOC's third and fourth stations will open in Bristol (#101) and in Kingsport (#145), the second station that will open in that city.

As of Friday, June 27, regular gasoline at the Jonesborough station was \$3.99/ gallon while the E85 was priced at \$3.09/gallon. Customers in the area should

be so lucky!

To find the exact locations of the stations, just visit the MEOC Website at [www.meoc.com](http://www.meoc.com) and look-up the stations numbers (provided above) in the directory.

*MEOC held the Jonesborough E85 pump grand opening on May 6. At right, the team cuts the green ribbon! The smaller picture up top shows the sign they placed above the pump to keep vehicles from blocking it as it on the side of the convenience store. MEOC was able to reduce their costs but still make it available locally by replacing the kerosene pump they had there and reusing the tank.*



## Zero-turn Battle: Propane vs. Gas

John Sorochan, associate professor of the Turfgrass Science & Management Program within the UTK Department of Plant Sciences, is putting a propane mower to the test. Working with John Watson who operates Knoxville's Common Grounds landscaping company, they are testing two identical mowers made by EnviroGard: one gasoline and one propane. The purpose is to look at propane as a viable alternative fuel for mowers. The project will run for two years and is being supported by the Propane Education and Research Council.

They are measuring tailpipe emissions using portable testing equipment, tracking the fuel economy, and doing oil analysis to determine any impacts to oil life and engine wear. Graduate student Will Hasselbauer is helping Sorochan and collecting all the data.

Sorochan says, "When you look at the specs for propane as a motor fuel, the purveyors often note better fuel economy, reduced emissions and that it can be a cheaper fuel. We are just trying to put some real-world testing into it to see if all this is true. We

hope it is to support transportation fuel diversity."

Their other partners include EnviroGard (based in Cornelius, NC) and Manchester Tank (based in Franklin, TN) who is supplying the propane-filled tanks.

The research and actual mowing just started in June and they expect to wrap-up the project in summer 2010. The particular mowers they are using are 54" deck, zero-turn utility mowers. To see EnviroGard's propane mower line-up, just visit EnviroGard's Website at <http://www.onyx-solutions.com/p.php?PID=envP>.



*A snapshot taken during one of the emissions testing sessions for both mowers. The propane mower is on the left; the twin propane cylinders sit on either side of the driver.*

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## Tennessee! You now have a low- and medium-speed electric vehicle company to help you!

Josh Womack has been a passionate supporter of alternative fuels and weaning ourselves off of oil for quite a few years, and parlayed that passion into leading the passage of a “medium speed vehicle” bill that focuses on electric vehicles. The bill became law on July 1! Now he wants to help us all try out new LS and MS electric vehicles and has started *VerdeGoh!* as a business to match his advocacy. You can contact him at 615-467-2700 or [vehicles@verdegoh.com](mailto:vehicles@verdegoh.com) if you have questions. He represents multiple vehicle manufacturers (like Zenn, Tomberlin, and HiLine - an improved version of a GEM) and can service them in their current Nashville-area facility.

## Get involved!

The state of Tennessee’s three Clean Cities coalitions need your help to really make a difference. The more partners, the more change. Consider contacting one of us with questions or suggestions, coming to a regional meeting or workshop, or talking to your local station owners about finding how they can get involved offering one of the biofuels.



[www.WTCCC.com](http://www.WTCCC.com)



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