

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, higher fuel economy vehicles and advanced transportation technologies to the forefront in Tennessee.

Growing Pains for the Bioeconomy

By Peter Nelson of the Memphis Bioworks Foundation.

Over the last year, producers, blenders and retailers of 1st generation biofuels have suffered due to widely fluctuating raw material costs, unclear government direction, unpredictable petro markets, focus on competition with food, and growing debates concerning the sustainability of the fuels. 1st generation biofuels include corn ethanol and soy-based biodiesel, in which the raw materials are used for many other purposes that are not industrial. The bad news is that these issues will not go away. The good news is that a new President and a more comprehensive energy strategy will help grow a strong biobased industry in Tennessee as we move forward.

First, the projects that are beginning to develop across Tennessee are focusing on the whole range

of biobased products that will need to be produced, not just liquid fuels. Focusing on developing plant-based replacements for the petro/chemical products such as paints and solvents used in the growing regional auto industry will be a major contributor moving forward.

Second, a focus on a whole new range of feedstocks and conversion technologies exists, and these materials and technologies are benefitting from advances in biotechnology that are dramatically increasing yields, decreasing water and other inputs, and increasing biodiversity. At a conference late last year sponsored by Tennessee Department of Agriculture and Memphis Bioworks Foundation called "Planting Seeds for the Future," companies such as Performance Plants, Chromatin, and many others demonstrated amazing breakthroughs



that will allow the full use of photosynthesis to create biobased products and biofuels.

These advances in technology and a better understanding of the overall strategy is key. To put it simply, we must build a new system that replaces a barrel of oil with a combination of efficiencies that reduce 25 percent of that demand and three-quarters ton of renewable plant material harvested from our farms and forests. The old petro-system took 140 years to build and—even with modern technology—the new biobased system will take at least a few decades to be fully realized.

So is this all about big technology and large projects?

No. In reality some of the most basic changes require us to rethink our current assets. In West Tennessee this means agricultural capabilities, superior logistics, and

transitional manufacturing capacity. With the right entrepreneurs, such as the ones who are investing in producing and distributing biofuels, these assets can serve as the backbone for a bioeconomy that will deliver locally produced food, renewable components for the automotive sector, and energy.

All of this will take a lot of capital and innovation which is a characteristic of the new Obama Administration. What we need now is a sustained philosophical and political investment in the transformation away from fossil fuels and toward plant-based resources. If you are already in the business of producing, distributing, purchasing and/or selling biofuels, be encouraged that your investment and experience will be an important part of the emerging bioeconomy.

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THIS NEWSLETTER WAS MADE POSSIBLE BY THE TENNESSEE DEPARTMENT OF AGRICULTURE. THANK YOU!

ARRA Funding for Transportation Sky High

On February 17, 2009, President Barack Obama signed the American Recovery and Reinvestment Act of 2009, also called "ARRA" or the "Recovery Act." Those paying attention knew there were to be lots of dollars out there for "shovel ready" transportation projects. And now it's clear how much. See the below table for some of the particulars for some of the funding. Not shown is direct to states and cities energy-based funding that is noted on Tennessee's Recovery site (www.tnrecovery.gov) and will total to be roughly \$4.5 billion but is to cover all aspects of energy change, not just transportation area opportunities.

Suffice to say, if you've been interested in working on alternative fuels or advanced transportation vehicle projects, now's your chance! See the ETCFC homepage (for links to official RFPs and more information about each of these funding opportunities (ETCleanFuels.org) "Funding Opp.s" tab in center of the page).

Agency - Name	Total	Deadline	Cost Share	Min. Award	Max. Award
DOE, NETL - Clean Cities (Pet. Reduction)	\$300 million	5/29/09	50%	\$5 million	\$15 million
DOE, NETL - Transportation Electrification	\$378 million	5/13/09	50% most	\$500,000	none
EPA - Nat'l Clean Diesel Funding Assistance	\$156 million	4/28/09	0%	R4-\$250,000	\$2 million
EPA - Nat'l Clean Diesel Emerging Tech.	\$20 million	5/5/09	down to 0%	\$500,000	\$3 million
EPA - SmartWay	\$30 million	4/28/09	down to 0%	\$3 million	\$30 million
EPA - State Clean Diesel Grants	\$88 million			~ \$1.73 million/state	





West Tennessee - Tim Schnippert

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This is the image that the B.E.S.T. team is using with their efforts. You can read more about their efforts on their Website - <http://best.memphis.edu>.

University of Memphis Announces B.E.S.T.

Last fall in October, the University of Memphis held its first annual Sustainable Technologies Awareness Day. The campus-wide event encouraged environmental awareness, inquiry, and activism among students, faculty, and staff. This event was sponsored by the Center for Biofuel Energy & Sustainable Technologies (BEST), a group of faculty from various University of Memphis colleges who want to promote causes that will improve the quality of life for future generations through sustainable energy systems and practices. Key partners include the Herff College of Engineering, the Master of Public Health Program, Marketing and Supply Chain Management, and the Environmental

Unit, funded by the Tennessee Department of Environment and Conservation, that will convert recycled cooking oil from the Tiger Den dining facilities into biodiesel fuel for use in university generators, vehicles, and the Physical Plant. Residence Life showcased plans for the new West Hall, the first and most sustainable "green" public building to be constructed in the state of Tennessee. Student groups from Public Health, the Environmental Action Club, and the Ecologic Research Center focused on recycling and other actions that reduce health risks, improve our environment, and improve our economy.

The Center for BEST engages interdisciplinary teams in the discovery and dissemination of related knowledge from the wide range of disciplines required to formulate a holistic understanding of energy systems



Research Center. Sustainable Technologies Awareness Day featured current and planned sustainability initiatives at the University of Memphis and by our partners. These include BEST's Biodiesel Production

and to promote implementation of environmentally responsible energy systems on campus, in our community, and across the nation.

Planting Seeds for the Future

AgBioworks, an initiative recently started by the Memphis Bioworks Foundation, hosted a two-day conference in October in Memphis entitled, "Planting Seeds for the Future: West Tennessee Alternative Crops Conference." The focus of the conference was the production of new agricultural crops and the many emerging opportunities that exist for agriculture. From sequestering carbon to using carbon as

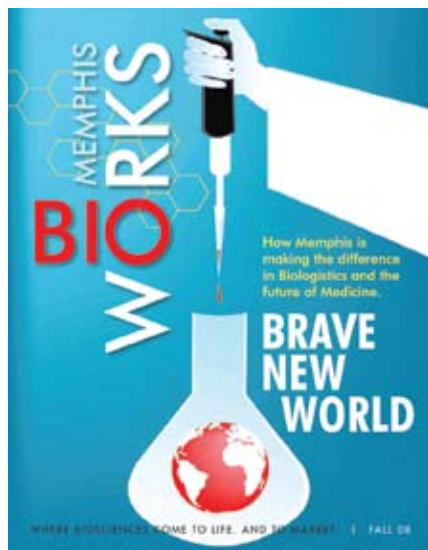
a raw material for petroleum-free plastics, new crops will play a vital role in solving environmental problems both locally and globally. The event featured speakers and panel members representing private corporations, universities, nonprofit organizations, and government research laboratories.

"The long-term trend says

that a bio-based economy is going to develop," said Bioworks leader Steve Bares. "That opportunity for job growth is something we want to be positioned for." The genesis of the effort is a government-backed project at Oak Ridge National Laboratory in East Tennessee that is looking for efficient ways to make fuel from cellulose, a common fiber found in plants. Dr. Kelly Tiller, Director of External Operations for the University of Tennessee's Office of Bioenergy Programs, was on hand to explain the current switchgrass program and the challenges faced by moving from a laboratory to field experiments. While much discussion was spent on fuel and biorefineries, Bares and associates emphasized that the effort goes beyond bio-based fuels. The foundation envisions farmers growing special crops for industrial purposes and using non-edible "biomass," including leftovers like corn stalks, to make products such as lubricants, fibers, and coatings.

"It may be some time before bio-based fuels take hold in the United States," said Bruce Scherr, head of Informa Economics, a Memphis-based agriculture consulting firm that focuses on agriculture, food, and energy. "The science for creating fuel out of cellulose remains crude, but there's lots of potential to create lubricants, fibers and other products from biological sources," Scherr continued. "Bio-based products are a dramatically growing part of our domestic and the global economy."

You can find out more about the AgBioworks effort and find connections to items like the Memphis Bioworks newsletter, on their site: www.agbioworks.org.





Middle Tennessee - David Pelton

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E85 on I-65

A new biofuel corridor along I-65 enjoyed a three day celebration October 7, 8 and 9 last year. The corridor, which stretches from the Great Lakes to the Gulf of Mexico, now makes it possible for drivers to travel the entire 800 mile length of I-65 on ethanol (E85) or biodiesel (B20). The I-65 project was developed by four Clean Cities coalitions in Indiana, Kentucky, Tennessee and Alabama. The Indiana state Energy Office helped secure a \$1.3 million DOE grant which enabled the Clean Cities partners to complete the project.

Tennessee's portion included a partnership with Tri-Star Energy and the BioTenn Green Island initiative to add fuel along I-65 in Goodlettsville. Clean Cities of Middle Tennessee and Tri-Star worked on the E85 pumps while BioTenn helped with the addition of B20.

Tri-Star offered a promotional price for the fuel during the celebration day: E85 for \$1.85 and B20 for \$3.20. Both represented about a \$1.00 savings over

regular prices. Speakers at the event in Goodlettsville included Michael Scarpino from DOE, TDOT Commissioner Gerald Nicely, TDOT Deputy Commissioner Ed Cole and Tri-Star's Rob Jewell.

Special thanks to TDOT and the Governor's Alternative Fuels Working Group for supporting this and other biofuel initiatives.

Rob Jewell of Tri-Star Energy speaks to the media during the grand opening in Goodlettsville.



Welcome Stephan!

Welcome Stephan Peter-Contesse

Clean Cities of Middle Tennessee is pleased to introduce Stefan Peter-Contesse to the Clean Cities family. Stefan is coming on board as the Associate Coordinator for Clean Cities of Middle Tennessee. He will be pursuing grants, finding alternative fuel projects, and building relationships with partners and stakeholders.

Stefan is an experienced team leader in the environmental field, most recently streamlining, improving,

and managing the recycling program at Western State College of Colorado. He moved to Nashville in February 2008 and is eager to apply his passion for leading positive environmental change through business. He is transitioning into the coordinator position with Clean Cities of Middle Tennessee and is looking forward to the opportunity to educate, promote, and ultimately reduce Middle Tennessee's dependence on fossil fuels. Please welcome Stephan when you hear or see him!

Odyssey Day 2008

The Nashville Auto Diesel College was transformed into an alternative fuel vehicle showcase for the national kick-off of Odyssey 2008. Odyssey Day is organized and sponsored by the National Alternative Fuel Training Consortium (NAFTC), based in West Virginia. Every two years NAFTC partners with Clean Cities coalitions and alternative fuel industry professionals to host dozens of workshops, seminars and showcases across the country. This year Nashville was honored to be chosen as the kick-off site. NAFTC Director Al Ebron led a great line-up of speakers including Auto Diesel College President Lisa Bacon, Lincoln Education President Shaun McAlmont, Country Music star Michael Peterson, NADC Direc-

tor of Education Doug Fox, Office of the Nashville Mayor representative Jenna Smith, VerdeGoh President Josh Womack, Tennessee Soybean Promotion Council Director Parks Wells, and Clean Cities of Middle Tennessee Director Dave Pelton.

The Nashville City Council also signed a proclamation authored by four area council members: Pam Murray, Karen Bennett, Erik Cole and Mike Jameson. The document proclaimed October 3, 2008 as National AFV Odyssey Day. Hundreds of Nashville locals toured the vehicle showcase along with over 1,000 students from the college. The array of vehicles ranged from electric cars to hybrid buses to hydrogen SUVs.

L-R: VerdiGoh Owner, Josh Womack; Soybean Council Executive Director, Parks Wells; City Councilman Megan Barry; NAFTC Director, Al Ebron; Trust for the Future President, Dave Pelton; City Councilman Pam Murray; Country Music Singer, Michael Peterson; Lincoln Education President, Shaun McAlmont; NADC Education Director, Doug Fox; City Councilman Karen Bennett

Photo on right: Car Expo at Nashville Odyssey Day. Over 30 vehicles, including light, medium and heavy duty, were on display





25x'25 Alliance Promotes National Renewable Energy Vision

The 25x'25 Initiative is a diverse alliance of agricultural, forestry, environmental, conservation, and other organizations and businesses that are working collaboratively to advance the goal of securing 25 percent of the nation's energy needs from renewable sources by the year 2025. 25x'25 is led by a national steering committee composed of volunteer leaders. The 25x'25 goal has been endorsed by nearly 800 organizations and companies, 30 governors, 14 state legislatures, and the U.S. Congress through the Energy Independence and Security Act, which was signed into law by President Bush on December 19, 2007.

The 25x'25 vision proposes that by the year 2025, America's farms, forests and ranches, and other working lands will provide 25 percent of the total energy consumed by the U.S., while continuing to produce safe, abundant, and affordable food, feed, and fiber.

The 25x'25 is proud to have the support and endorsements of Governor Phil Bredesen, the Tennessee Legislature, the University of Tennessee, and many other agencies, businesses and organizations in the state. Recently, state-level alliance of leaders as been formed to not only help increase awareness of the opportunities that renewable energy could provide, but to also actively address the chal-



lenges and barriers that may be preventing us from achieving the 25x'25 goal.

While the 25x'25 embraces all forms of renewable energy technology, from biomass-based energy production to wind and solar and geothermal, the 25x'25 has exerted considerable effort in promoting biofuels as a major part of a new energy future for the country. We have engaged numerous entities on the issues of "food vs. fuel," the energy balance of biofuels, and biofuels' greenhouse gas profiles.

As we move into 2009, the 25x'25 is advancing the idea that renewable energy, including biofuels, can serve as the engine of transformation into a new economy. To help jump-start that effort, the 25x'25 recently issued a 10-point plan for a comprehensive national energy policy that will accelerate the production of all forms of renewable energy and create new renewable energy markets. The 25x'25 is also developing a new set of recommendations that should be included as part of any new economic stimulus

plan.

To learn more about the 25x'25 Initiative and to access 25x'25 position papers and background materials, please visit us at www.25x25.org or contact Brent Bailey at bbailey@25x25.org.

UT MTAS Helps Create Renewable Energy Organization

On August 21, 2008, the Tennessee Renewable Energy and Economic Development Council was chartered by the State of Tennessee. The nonprofit organization was created as a result of follow-up from Governor Phil Bredesen's Conference on Biofuels held in June 2007. The Council was started by four mayors in Tennessee and the UT's Municipal Technical Advisory Service (MTAS) consultant Warren Nevad (who serves their area) as they all recognized that connecting opportunities for renewable energy and rural economic development would be the mission of the council.

Nevad stated that "a unique aspect of our organization is that it is made up of mostly mayors instead of industry professionals. We believe that often private companies have a difficult time gaining public acceptance for renewable energy development. Mayors are constantly amongst the people and are closest to the citizens. They are the frontline to better communicate the benefits of renewable energy into their communities. Also, many small, rural communities in Tennessee do not have the resources to recruit and market new developments in renewable energy. Our council can help by being an advocate for renewable energy in Tennessee and bring private investment here."

Pikeville Mayor Greg Johnson has been appointed by the Council's Executive Committee to a 4-year

term as president. The other mayoral appointments to the council include Gainesboro Mayor John Fox (vice president), Graysville Mayor Andy Beene (2nd vice president) and Crossville Mayor J.H. Graham (secretary). Emanuel Bailey, the president of McBee/Bailey & Associates, assisted the Council with the development of the bylaws. The statewide advisory board is chaired by UT President Emeritus Dr. Joe Johnson.

Mayor Johnson stated that "the State of Tennessee, the University of Tennessee, Oak Ridge National Laboratory and the Tennessee Valley Authority all have been very progressive and proactive in trying to develop and use more renewable energy inputs to create alternative fuels and electricity. With support from the Council, these great institutions in Tennessee can meet our country's goal of producing cellulosic ethanol, more biodiesel and more wind and solar energy to keep up with future growth."

The Council will help coordinate renewable energy issues and logistics among local governments in Tennessee. The Council has already commenced its outreach efforts and will shortly develop a logo that depicts renewable energy, develop a Website, adopt a budget and begin outreach activities to promote renewable energy. For more information contact Warren Nevad at 865-974-9839 or warren.nevad@tennessee.edu.



In 2008, Nevad introduced Overly of the ETCFC to Mayor Graham and Crossville's Public Works Director Tim Begley to discuss using biodiesel. The ETCFC is just one example of renewable energy groups that Nevad is working to bring further into the Cumberland Plateau region. (l-r) Overly, Mayor Graham, Warren Nevad and Begley.



Workshop Focused on Fleets

In partnership with Tom Johnson of *The 100 Best Fleets*, the ETCFC held an "Implementing Best Practices" workshop on December 5 at Knoxville Utilities Board that brought together 25 fleet managers and personnel from around East Tennessee. The workshop's focus was on providing real world solutions to common fleet problems that deal with overall resource efficiency, fuel management, and preventive maintenance. All feedback has been very positive!

One presenter, the fleet manager for the city of Atlanta, Steve Riley, had a valuable presentation cover-

ing preventative maintenance that definitely had their attention. Additionally, a resource CD featuring over 200 fleet case studies was provided to the attendees.



East Tennessee - Jonathan Overly



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Alt Fuels Education in ET in Jeopardy!

Contributed by Patricia Weaver of the ETCFC.

ETCFC's educational outreach is growing! As the Education & Outreach Coordinator, I am reaching more students every week, over 1,300 students so far this scholastic year. With about 80 hours of classroom time under my belt, I am able to engage the students, making learning about alternative fuels fun. This year I implemented several new activities to provide a more interactive experience for students, utilizing games as teaching tools. For instance, students really enjoy the new Jeopardy! game I developed. It is a wonderful way for me to quiz them, and kids love the competition.

The game has with four main categories of questions, two Double Jeopardy opportunities, and a final Jeopardy wager question. Teachers have also responded wonderfully to the new initiatives, and almost all of them want me to come back. In fact, a few teachers even told me that I should become a teacher—quite a

complement!

Furthermore, the Jeopardy game allowed me to implement a new pre-test/post-test measure of the presentation's effectiveness. I begin by asking students four simple but important and relevant questions about alternative fuels. The students then answer these same questions again during the Jeopardy rounds. For example, I ask, "When do you think the U.S. production of oil peaked or will peak?" The correct answer is the early 1970s, but I have heard everything from 1930s to 3035. By recording how many questions the students answered correctly, I am able to calculate their percent improvement. So far this year, after the presentations, students' scores improved a whopping 176%! Hopefully they are thinking about these issues and will start finding ways to take their own action. We are definitely making a difference here in East Tennessee.



While playing the game Clean Fuels Jeopardy! is been filled with questions related to fuels, Weaver splits the classes up into teams to compete. Here, one of the teams talks it over to give Weaver their answer to Final Jeopardy.

The ET Ethanol Blitz



Weigel's Farm Stores, et al.
Public E85 Pumps

Weigel's opened East Tennessee's 13th public E85 pump last October in Clinton, Tennessee right on the I-75 corridor. Pilot and Roadrunner Markets operate the remaining E85 pumps. About 7-8 more are on tap due to state funding through TDOT or federal funding through the ETCFC.



City of Chattanooga
Private E85 Pumps

Chattanooga is the first of the four major cities in Tennessee to begin using E85 in their fleet (not to mention have a GHG plan). Through state funding, they have opened 2 pumps that will service their 100+ FFVs as well as state or regional government fleet FFVs. Kudos to Chattanooga!



East Tennessee State University
Private E85 Pump

With Pete Gregg's leadership and funding from the state, ETSU now has a working E85 pump and is refueling their fleet of just over 10 FFVs there regularly. Gregg says that they are not only using E10 too, but have moved to B10 in their diesel vehicles and equipment.



Genera Energy
Cellulosic Ethanol Production

Genera Energy broke ground on October 14 on the 12-acre site in Vonore where the 250K gal/yr production and research facility will be located. Thanks to a partnership with Dupont Danisco, switchgrass and corn cobs will be the primary raw materials used at first to feed the plant.

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Just email jgoverly@utk.edu and say “*sign me up for the Advisor!*” and provide your mailing address.

Have you heard of the...



Yes, it's the Flexible Fuel Vehicle Club of America! This proactive group headed by Club President Burl Haigwood is out to help E85 drivers announce their action for America on their vehicles. Haigwood says, "I wanted to help give consumers the choice – do nothing or respond to the challenge of diversifying our transportation fuels system. That is why the Flexible Fuel Vehicle Club of America was formed. After 30 years of advocating alternative fuels and talking to thousands of people from all walks of life, I still believe the majority of Americans are tired of just complaining and want to be empowered to act."

Well put Burl!

Learn more here: <http://www.flexiblefuelvehicleclub.org/>

FuelEconomy.gov



A great resource for comparing not only fuel efficiency numbers but also many other environmental impact numbers, like "energy impact score" and "carbon footprint." Compare multiple vehicles side-by-side to see how they stack up against one another. Even enter your own fuel economy data, and compare your real world results against others that are tracking their's for your exact vehicle!

See all of this info, too:

- The 2009 Fuel Economy Guide
- Videos, including some from Motorweek and Extreme MPG
- Learn how fuel cells work
- Learn about flex-fuel vehicles (FFVs) and compare them side-by-side and to their non-FFV versions
- Tax incentives for diesels and hybrids
- Get tips on driving more efficiently
- Find links to gasoline and alternative fuel prices and locations
- Learn where the energy goes that is put in your car as fuel (hint: 17 percent is standby and idling losses)

HYBRID!