

# SIXTH ANNUAL SOUTHERN BIOPRODUCTS AND RENEWABLE ENERGY CONFERENCE

## "SUCCESS STORIES IN A GROWING INDUSTRY"



MISSISSIPPI BIOMASS COUNCIL

BIO BRIEF

The Sixth Annual Southern Bioproducts and Renewable Energy Conference will take place April 16-18, 2007, at the Pearl River Resort's Golden Moon Casino and Hotel in Choctaw, Mississippi. Come and indulge yourself in the natural beauty of this resort, two world class golf courses designed by legendary designers Tom Fazio and Jerry Pate, and the full service spa and salon.

The importance of biomass and renewable energy is of growing importance, both internationally and at home. Here in the South, we have the natural resources, research capability, and community support to capitalize on the growing demand for alternative and renewable energy and fuels, and environmentally-friendly products. Additionally, parts of this region were devastated by Hurricane Katrina in August, 2005, resulting in the destruction of approximately five million acres of forest land and raising the awareness for biomass uti-

lization. This year's conference will highlight recent successes in the rapidly growing renewable energy sector, and will examine from a regional approach ways in which the strengths and resources of the Southern United States can contribute to the development and implementation of various renewable energy technologies.

The Conference agenda includes a unique and practical workshop on technology commercialization and entrepreneurship in the energy arena. General Sessions relate to success stories in the industry and policy and finance. Breakout sessions focus on (1) Solar, wind, and distributed energy; (2) Energy efficiency, buildings, & emergency power; (3) Biofuels; and (4) Biomass opportunities and risks.

The Conference sessions feature many nationally acclaimed speakers from public and private sectors and there will be numerous opportunities for networking at the

breakfasts, evening receptions and session breaks. The luncheon keynote speaker is Dr. David Bransby of Auburn University who has been researching energy crops for several years and was recently featured on television programs such as ABC's Nightline.<sup>®</sup> In keeping with tradition, the conference will again feature a student research poster competition, with cash prizes for the top three posters. Additionally, the Mississippi Biomass Council will award the Second Undergraduate Biomass Studies Scholarship, in the amount of \$1,000 towards a student's tuition.

Be sure to watch the Mississippi Biomass Council's website for the updated conference information! <http://ms-biomass.org>

Written by: Lauren Michaud  
Business Analyst  
Mississippi Technology Alliance  
Phone: 601-960-3655  
Fax: 601-960-3605  
email:LMichaud@mta.ms

### Inside this issue:

PRESIDENT'S MESSAGE	2
GUEST ARTICLE: SENATOR LOTT'S COLUMN "ENERGY DEPENDENCE"	3
CONVERTING WOODY BIOMASS TO ENERGY AND CHEMICALS	4-5
TURNING WASTE INTO ENERGY: "MISSISSIPPI'S FIRST LANDFILL GAS PROJECT"	6-7
MISSISSIPPI BIOMASS COUNCIL COMPANY SPOTLIGHT	8
UPCOMING EVENTS	9

# PRESIDENT'S MESSAGE



As we send out the first letter of 2007, I hope that everyone's year has been off to a great start. It is shaping up to be another exciting and busy year for the Mississippi

Biomass Council. From now until mid-April, we will be focusing our efforts on the upcoming Sixth Annual Southern BioProducts and Renewable Energy Conference. Yes, that is correct, the name of conference is a little different this year, and has renewable energy mentioned in it. The Council Board and the Officers felt that this title reflects the theme of the conference much better, as energy has been a significant topic of discussion even in past years' events. Even though the Mississippi Biomass Council is inclusive of bio-products such as biodegradable packaging materials, bio-based polymers, and wood-based materials, more recently the energy issue has overshadowed the other target areas for the Council. And it is not just the Mississippi Biomass Council talking about biomass-derived energy. Last year we heard from the President of United States of America that we were "addicted to oil;" this year President Bush went a giant step further and acknowledged global warming in his State of Union Address, stating that, *"technologies will help us be better stewards of the environment, and they will help us to confront the serious challenge of global climate change."*

Bush also mentioned that extending hope and opportunity depends on a stable supply of energy that keeps America's economy

running and America's environment clean. He made it clear that our country needs to diversify the energy supply and expand the use of clean diesel vehicles and biodiesel fuel, and must continue investing in new methods of producing ethanol, using everything from wood chips to grasses, to agricultural wastes. He laid out a goal to reduce gasoline usage in the United States by 20 percent in the next 10 years by increasing the supply of alternative fuels, by setting a mandatory fuels standard to require 35 billion gallons of renewable and alternative fuels in 2017, and by modernizing the fuel economy standards for passenger cars. In light of his remarks during the State of the Union Address on January 23, 2007, the President's 2008 budget includes nearly \$2.7 billion for the Advanced Energy Initiative, an increase of 26 percent above the 2007 request and 53 percent above 2006. The 2008 budget provides \$179 million for the President's Biofuels Initiative, an increase of \$29 million (19 percent) compared to the 2007 budget. The President's Biofuels Initiative aims to accelerate cost reduction and commercial development of cellulosic ethanol, which can be made from abundant biomass materials, including agricultural waste and forest residues, and from dedicated energy crops such as switchgrass. Additionally the President's Farm Bill proposal will include more than \$1.6 billion of additional new funding over ten years for energy innovation, including bio-energy research, energy efficiency grants, and \$2 billion in loans for cellulosic ethanol plants.

Although these numbers are proposals at this time and actual funding remains to be seen, the bottom line is that these numbers point to

the urgency at the highest level of our government to develop the nation's energy resources and to shift away from the petroleum based products for the future. This shift will not happen in a year or two, or even ten, but gradually over the long run. We have to think of this as an investment in our retirement or 401K plans and follow the same advice that any sane financial advisor will give you: diversify your portfolio! When it comes to the energy sector, the petroleum base is similar to your fixed asset safe bets, with the emerging technologies such as cellulosic ethanol or lipids-based fuels as the riskier bets. But that is where innovation and entrepreneurship will step up and will reap the potential rewards in proportion to the risk associated with the bio-based opportunities that lie before us. This task is not for one individual or one company, but will require multiple stakeholders coming together. My hope is that the Mississippi Biomass Council is the organization that brings these stakeholders together to give a stronger voice for this rapidly emerging commercial sector. Once again, I will make the plea to everyone who reads this newsletter to become a member of the Biomass Council, and I hope to see all of you at the April conference. Please contact me at 601-960-3659 or [sarora@mta.ms](mailto:sarora@mta.ms) if you have any questions or suggestions.



## *-GUEST ARTICLE- SENATOR LOTT'S COLUMN "ENERGY DEPENDENCE"*

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Americans have come to expect an explanation for energy prices that yo-yo up and down in a volatile, seemingly never-ending cycle. But there's hope. In fact, Mississippians are largely responsible for creating it and for ensuring America achieves our goal of energy independence.

We recently announced construction of a facility in East Mississippi that will basically turn dirt into energy. A substance here called lignite, often referred to as "brown coal," can be turned into a gas and burned to fuel power plants. Lignite won't propel your car, but this project is part of what I've been asking our nation to do for years - adopt a broad, "whole package" approach to energy independence. That package has two main components: traditional energy sources like oil and natural gas, and alternative energy sources largely derived from plant and animal byproducts.

Back in October, I told you about an exciting new facility at Vicksburg, the first plant in the southeast solely dedicated to making ethanol, a fuel derived from corn that can be used in conventional gasoline engines. Mississippi also

will be the site of a major biodiesel facility in the Delta which will use plant products to make fuel for typical diesel engines.

It was also recently reported that yet another alternative energy generating facility will come to South Mississippi. It's a project using refuse from a Wiggins paper mill - like bark, wood scraps and damaged wood products to supplant the use of traditional fuels like gas, oil or coal when the prices of those traditional energies become unstable. As one of the company's officials correctly noted, when you take the volatility out of a local market with highly fluctuating energy prices, that means lower costs for manufacturers and electric power producers. It translates into cheaper prices for customers.

The best news about lignite, ethanol, biodiesel or bark is not that they're found in large quantities here in Mississippi but that they lower prices. These sources are renewable and don't come from Saudi Arabia, Nigeria, Venezuela or any countries with dubious attitudes about America and with no interest in our national security. I've warned Washington repeatedly that America's energy situation is also a national security issue. I needn't remind Mississippians how dangerous it is to entrust America's energy supply and economic well-being to nations that either openly acclaim terrorists or secretly subsidize them. That means, in addition to har-

vesting America's alternative energy resources, we've got to use domestic traditional energy resources, too. The Senate has passed a measure that will significantly expand oil and gas production in the Gulf of Mexico and provide more lease revenues to Gulf States like Mississippi, Louisiana, Alabama and Texas which allow and support this production.

Alternative fuel from natural products and more domestic energy production of traditional fuels are energy sources that bolster Mississippi's economy and enhance America's security. You're probably thinking both ideas make pretty good sense, and they do. But keep in mind there are special interests on both the energy producers' and environmentalists' sides that seem to benefit from the status quo, the vicious cycle of fluctuating energy prices and growing American dependency on foreign nations. America can't afford ever-increasing energy prices.

Through a dual approach mandating more domestic production of traditional and alternative energy, America will end the vicious, volatile cycle of energy dependence, charting a new independent direction. I'm proud to say that Mississippians, from Wiggins to Washington are leading the way.

# *CONVERTING WOODY BIOMASS TO ENERGY AND CHEMICALS*

## *“AN EMERGING INDUSTRY IN THE FOREST BASED MARKETPLACE”*

The production of energy and chemicals from woody biomass is rapidly emerging as an industry of the future as the demand for renewable energy increases. The renewed emphasis on wood as a renewable feedstock is a “Back to Future” situation, and ironical really, since for centuries wood was used as a source of energy and chemicals before it was replaced by fossil fuels.

The potential for a wood based industry producing chemicals and energy is continuing to increase as changes in the global economy are causing a reduction in the demand for wood in the US forest-based marketplace. In the southeastern states of the US, the forest-based marketplace makes a significant contribution to the employment and revenue of those states. The utilization of woody biomass will directly contribute to and enable the success of emerging segments within the traditional forest based marketplace. An energy and chemicals industry based upon forest-based biomass could utilize woody biomass considered to be unmerchantable or underutilized and would contribute to alleviating the nation’s economic, energy and environmental concerns. The removal of such material from forests would also create healthier forests that were less susceptible to attack by destructive insects, disease, and fire. In addition to the woody biomass obtained from forests, a significant volume of solid wood residue is produced by the wood products industry each year. This wood residue is often referred to as wood waste, but is now far from a waste, since it is eagerly being sought as a feedstock for the production of energy and chemicals. Given that wood residue in Mississippi is estimated at some 10 million tons there is a very real volume of feedstock to support an industry converting wood to energy and chemicals.

There is substantial opportunity for a

revitalization of the forestry and wood products sector based upon woody biomass utilization. As the demand for wood as a renewable feedstock continues to increase, it is interesting to consider the options for woody biomass utilization and the available technologies based upon a consideration of today and tomorrow. Perhaps we can consider the opportunities for woody biomass utilization as we move across time and go from low hanging fruit to the complexities of converting wood cellulose into liquid fuels such as ethanol.

TODAY                      → TOMMORROW

LOW HANGING FRUIT	THE MEDIUM TERM	LIQUID FUELS AND BIOREFINERIES
<ul style="list-style-type: none"> <li>• Wood as boiler fuel</li> <li>• Wood pellet manufacture</li> <li>• Co-firing wood with coal</li> <li>• Co-generation in combined heat and power units</li> </ul>	<ul style="list-style-type: none"> <li>• Production of chemicals from products such biooil</li> <li>• Production of liquid fuels from biooil</li> </ul>	<ul style="list-style-type: none"> <li>• Production of ethanol from wood cellulose feedstock</li> <li>• Biorefineries</li> </ul>

A brief review of woody biomass utilization based upon the today and tomorrow scenario provides a glimpse into the emerging industry which is contributing to the creation of alternative markets for the forest-based marketplace.

Today, the forest products industry, especially pulp and paper mills, uses significant amounts of their wood based by-products and wood residues from sawmills as sources of energy for their operations. Recently, sawmills and other primary processors are increasing their use of wood residues in boilers to create energy, especially for wood drying operations. The conversion of wood into wood pellets represents a huge opportunity. Already there are plans to install several wood pellet mills in the south, including Mississippi. Why wood pel-

lets? In the US midwest and north east domestic consumption of wood pellets for use in wood burning stoves is at an all time high. In fact there is a shortage of wood pellets. In comparison to the US, in Europe and especially Scandinavia, wood pellets are used for domestic heating and also as feedstock in power plants. The power plants either use wood alone or co-fire with coal. By co-firing the coal, power plants can reduce overall emissions and satisfy the demands of the Kyoto protocol. The customer base for the proposed pellet plants in the southern states of the US are destined for Europe and soon will satisfy the Asian demand. In fact it appears that some of the wood pellet manufacturers have already signed supply contracts, even though they have not completed construction of their mills. And you thought that buying a condo off plan was a good investment!

Wood pellets and wood chips can be used as feed stocks in combined heat and power (CHP) units. These units enable power and heating to be co-generated as distributed systems and not totally dependent on the electricity supply grid. The CHP units would lend themselves particularly well to small rural communities, especially in supplying the energy requirements for key installations such as schools, clinics and fire stations. Local economies could derive direct benefit from locally derived and developed energy, whilst retaining the revenue from the production of wood based fuels.

Wood can be converted into biooils when treated in processes using high temperature and in the absence of oxygen. Considerable research has been and still is being pursued on the production of biooil.

- CONTINUE ON NEXT PAGE -

**CONTINUED FROM PAGE 4**  
**CONVERTING WOODY BIOMASS TO ENERGY AND CHEMICALS**  
**“AN EMERGING INDUSTRY IN THE FOREST BASED MARKETPLACE”**

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Reports show that biooil can be used as a crude oil which can be further refined into liquid fuel type fractions. Even more important is the potential of biooil to be refined into high value-added chemicals such as flavorings, building blocks for adhesives or wood protection chemicals. Commercial biooil production plants are in operation in Canada, producing biooil for use as feedstock in a local power plant and export to a US specialty company.

The conversion of corn into ethanol is enjoying a business boom. However, the sustainability of using corn as a feedstock is being questioned. The search is on for the development of ethanol from cellulose containing feed stocks such as wood. Significant research and investment is being directed toward the production of ethanol from wood. The challenge here is the need to expose the cellulose in wood and obtain the sugars which are the building blocks for cellulose and which are fermented into ethanol.

The integration of such processes as gasification and fermentation can provide energy generating systems using wood as the feedstock. These systems can be further integrated into biorefineries which can convert wood into liquid fuels, power and value add chemicals. It is anticipated that the highly integrated biorefineries will be based

upon upgraded pulp and paper mills. Given the continual advances in technology and demands for specific products in the marketplace, the emergence of micro-Biorefineries seems a very logical development.

The emerging woody biomass industry continues to overcome the challenges of the marketplace, but still needs to have state and federal support if it is to become a sustainable industry. Woody biomass is bulky and presents unattractive transportation costs per dry ton-mile, especially if based upon bioenergy and biobased product values. There is a lack of specialized equipment which is required to effectively remove forest residue and small diameter stems. Federal and state policies such as production tax credits or subsidies are needed which support the use of renewable energy sources in the generation of electricity. However, such support may not be sustainable over the long term. Market driven solutions are more appropriate, such as providing information to exploit the existing market, or developing requirements or incentives such as renewable portfolio standards (RPS) that create a market on their own. RPS in some states place a requirement that a minimum of power must be generated from renewable energy sources. Another opportunity for Mississippi could be the use of CHP units in rural communities associated with a state government man-

date stating that within the next 10 years, local government buildings will consume energy which has been produced from at least 10 % renewable feed stocks.

At the federal, state and county levels there is commitment and keen interest to expand the role of woody biomass as a source of energy, chemicals and bioproducts. This commitment can be seen as a way to support the emergence of new industries manufacturing energy, chemicals and fuels. Additional work is required to develop appropriate conversion technologies and to determine the impact of woody biomass utilization on the traditional forest Based Marketplace. The technologies need sustained incentives to expand the role of woody biomass as a source of energy and chemicals, whilst regulatory mandates need to be continued and increased. Finally, there needs to be a continual effort to educate the community on the economic and environmental value that can be provided by developing woody biomass as a renewable energy source.

Written by: Dr. Liam Leightley,

Research Professor

Assistant to Dean and Director

Office of Dean and Director

Forest and Wildlife Research Center

Mississippi State University

Phone: 662-325-4444

email:lleightley@cfr.msstate.edu

# *TURNING WASTE INTO ENERGY: MISSISSIPPI'S FIRST LANDFILL GAS PROJECT*

In an attempt to become more energy independent and environmentally friendly, Mississippi has begun to look for energy from alternate sources. However, one such source of energy that often gets overlooked is the local landfills. This energy comes from the landfill gas that is generated as waste disposed within a municipal solid waste landfill decomposes. Landfill gas is typically comprised of about 50% methane and 50% carbon dioxide. A landfill generates methane 24 hours a day, 7 days a week and therefore, the gas can be used as one of the most consistent and cost-effective sources of non-fossil fuels. Also, methane is a potent greenhouse gas that may cause smog and global warming. About one-third of the total methane emissions in the United States come from landfills, making landfills the largest man-made source of methane emissions. We can protect the environment and public health by reducing landfill emission through the development of landfill gas utilization projects.



**Municipal Solid Waste Landfill**

For these reasons, many landfill owners are now capturing landfill gas to use as a renewable energy source. High profile manufacturers across the country including BMW, Ford, Frito-Lay, General Electric, General Motors, Honeywell, International Paper and others are currently using landfill gas to meet their energy needs. Considering the current high price of energy, more and more industries are exploring the possibilities of using landfill

gas to meet their energy needs also. This increased interest among industrial users bodes well for Mississippi, since our state has several candidate landfills with great potential to support an economically viable landfill gas project. In order to facilitate landfill gas project development in the state, MDEQ has joined EPA in a partnership program called the Landfill Methane Outreach Program (LMOP). LMOP is a voluntary assistance program to promote the beneficial use of landfill gas. MDEQ plans to grow the agency's current program activities to ensure the development of new landfill gas projects and to increase landfill gas energy awareness in the state.

Mississippi's first operational project that was developed through LMOP was the Pecan Grove landfill gas energy project. In this project, gas from Pecan Grove Landfill located near Pass Christian, MS is captured and treated at the landfill property and then piped to a DuPont facility located near DeLisle, MS. The landfill gas project involved laying over 5 miles of pipeline and has been designed to process 3,200 scfm of landfill gas. Dallas-based Toro Energy, Inc. developed this project in partnership with:

- Waste Management of Mississippi, Inc. (WMMI) – Landfill Owner and Operator
- DuPont – User of Landfill Gas Energy
- CPL-LEI Systems, Inc. – A Contractor to the Developer
- U.S. Environmental Protection Agency (EPA)
- Mississippi Department of Environmental Quality (MDEQ)
- Mississippi Department of Transportation
- Mississippi Public Utilities Staff

WMMI currently owns and operates the Pecan Grove Landfill that receives about 400,000 tons of waste annually. The landfill began operation in 1987 and has already received over 12.0 million tons of waste. The landfill was permitted to utilize 176 acres for waste disposal and still has 28 years of estimated life remaining. WMMI operates and maintains the well field and the flare system located at the landfill property. Landfill gas is captured through an existing gas collection and control system already operating on the landfill. In addition, a blower pulls the gas out of the landfill to the existing flare where, until this project came on line, the gas has been burned. This landfill is currently generating 2700 scfm of landfill gas and has the potential for generating more gas in the near future.

Previously, methane from the landfill was simply flared off and now this gas is used to fire boilers at the DuPont DeLisle plant. DuPont opened the DeLisle plant in 1978 and currently employs approximately 530 people. The principal product of this plant is titanium dioxide. DuPont entered into a 10-year deal with Toro Energy, Inc. and WMMI to use landfill gas at its DeLisle plant. DuPont is using landfill gas at its DeLisle plant to help improve air quality in the state and also to enhance its environmental image.

DuPont currently uses 2,700 scfm of treated landfill gas to fire boilers at its DeLisle plant. One of the special features of this project involves 99.99% removal of sulfur from the landfill gas. Toro Energy, Inc. initiated this landfill gas project by building partnerships with WMMI and DuPont. MDEQ assisted Toro Energy, Inc. in identifying the federal, state and government agencies

-CONTINUE ON NEXT PAGE-

**CONTINUED FROM PAGE 6**  
**TURNING WASTE INTO ENERGY:**  
**MISSISSIPPI'S FIRST LANDFILL GAS PROJECT**

that issue various permits necessary for this project development. MDEQ also communicated and coordinated directly with DuPont to help them understand the potential benefits and opportunities associated with using landfill gas at its DeLisle plant as an alternate energy source. Also, MDEQ issued the necessary air permits to DuPont that were required for the development of this project. In addition, MDEQ communicated and coordinated the solid waste permitting issues directly with WMMI.

Development of this landfill gas pro-



*LFG Flare System and Treatment Unit Located at the Pecan Grove Landfill Property*



*LFG Flare System and Treatment Unit Located at the Pecan Grove Landfill Property*

ject required permits from several

federal, state and local govt. agencies as listed below:

- MDEQ
- MS Department of History & Archives
- US Army Corps of Engineers
- US Department of Transportation
- US Fish & Wildlife Services
- Harrison County

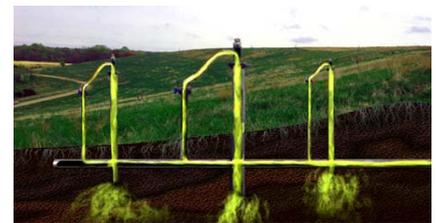
A direct benefit from this landfill gas project is the removal of a significant amount of methane, a greenhouse gas (GHG) from the environment, thus improving the local air quality. The estimated reduction of GHG through this project would be equivalent to:

- Removing emissions from 6,500 cars on the road for a year
- Reducing oil consumption by 79,000 barrels per year
- Heating 20,000 homes per year
- Reducing coal consumption by 160 rails per year
- Planting 10,000 acres of forest per year

The project, through the successful use of landfill gas, also helps:

- DuPont offset the use of fossil fuel with landfill gas;
- Toro Energy, Inc. and WMMI generate revenue from gas sales;
- The local community receive easement payments; and
- DuPont save more than one million dollars annually in energy costs.

The project came on line in July 2005. However, its operation was temporarily halted by Hurricane Katrina which struck the Mississippi Gulf Coast on August 29, 2005. The project partners took only 3 months to restore the project bringing it back to operation in December 2005.



*Landfill Gas Wells*

This landfill gas project is the result of building successful alliances among the project partners. Considering all the benefits, this project truly has resulted in a successful venture for the community, the developer, the landfill owner, the end user, and ultimately, the environment.



*Schematic of Landfill*

**Written by: Pradip Bhowal,**  
**Environmental Administrator**  
**Mississippi Department of**  
**Environmental Quality**  
**Phone: 601-961-5082**  
**Fax: 601-961-5785**

email:Pradip\_Bhowal@deq.state.ms.us

# MBC COMPANY SPOTLIGHT

## COMMUNITY RECYCLING INCORPORATED

Walter Ward, President of Community Recycling Incorporated (CRI) founded the company in 1991. Mr. Ward began to collect waste paper from commercial and industrial establishments in Sharkey County. Community Recycling Inc. is a privately owned recycling firm with sole proprietorship.

The mission of Community Recycling is to collect, process and market recyclable materials, otherwise discarded in the solid waste stream by commercial, agricultural, industrial, and residential establishments in the Delta region. Community Recycling Incorporated's objective is to recycle all grades of paper such as: office paper, newspaper, third class mail, magazines, telephone directories, corrugated boxes and stretch film plastic.

CRI has taken a leadership role in developing and implementing a regional waste minimization program by helping businesses in the Delta region reduce the amount of solid waste they dispose of. The goal has been to achieve a seventy-five (75) percent participation rate from various businesses in the county. In addition, creating jobs in the Delta through expansion of the company's services by supporting recycling efforts will bring more economic opportunities in the surrounding counties. Community Recycling Incorporated operates strictly off of the sale of recyclable items collected.

Ward is a active member of the Mississippi Biomass and currently serves on the Board of Directors. For additional information on CRI, please call 662-828-3779 or email at ward\_recycling@yahoo.com.

**“Specializing in collecting recyclable materials”**

# UPCOMING EVENTS



March 6-8, 2007 \* Mandalay Bay \* Las Vegas, NV

The Power-Gen Renewable Energy and Fuels Conference will be held on March 6-8, 2007 in Las Vegas, NV. With the passing of the Energy Bill coupled with critical initiatives to reduce our dependence on oil imports, one thing is clear - the future of renewable energy is NOW.

In its 4th year of partnership, PennWell Corp. and the American Council on Renewable Energy (ACORE) present the industry's premier event covering the most important trends and issues impacting the industry's progress. Bringing the wind, solar, biomass and fuels, hydro and geothermal sectors together for three days of information exchange and fast-track networking, POWER-GEN Renewable Energy & Fuels attracts the biggest names in renewables to discuss technical, strategic, regulatory, structural and economic issues. For more details visit their website at [www.powergreen.com](http://www.powergreen.com).



ALCORN STATE UNIVERSITY

The Alcorn State University Extension Program and the Mississippi Association of Cooperatives will host the Small Farmers Conference on March 26-28, 2007 at the Vicksburg Convention Center in Vicksburg, Mississippi. The conference will continue in its objective to be a part of the educational outreach efforts to the citizens of Mississippi. The exciting theme: *New Way-New Day, "Change"* fully exemplifies the direction the conference takes this year. There are several exciting learning sites that will be both educational and fun for the participants. At these sites there will be professionals on hand that can assist in getting conference attendees from one level of awareness to another. This is a continued effort to provide technical assistance while making it enjoyable. This statewide con-

ference will focus on assisting participants in creatively starting new enterprises on their farms and gaining a wealth of knowledge through new marketing strategies and business opportunities. We encourage farmers, cooperatives, and women in business to attend the conference. Educational professionals, non-private development specialists, federal and state agriculture business development staff and others that provide rural business development assistance are also asked to attend. The objectives are:

- To motivate and stimulate participants to embrace new ideas.
- To redirect the cooperative's message as a means to achieve financial success.
- To provide networking and marketing opportunities.

For more details visit their website at [www.smallfarmersconference.com](http://www.smallfarmersconference.com).

## **Mississippi Biomass Council**

Box 9642

Mississippi State, Mississippi 39762

Phone: 662-325-0513

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*Individuals who wish to submit articles, opinions, commentaries, etc. please send to [emyles40@hotmail.com](mailto:emyles40@hotmail.com)*

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