



MISSISSIPPI BIOMASS COUNCIL

BIO BRIEF

BIODIESEL AVAILABLE TO THE PUBLIC

Diesel fuel made from vegetable oils, such as soybean oil, has made its way to the Jackson area with the opening of the first retail biodiesel pumps in the state of Mississippi. Earth Biofuels, a local company with offices in Byram and a refinery in Meridian, recently opened a retail location in Byram, at the corner of Terry Road and Siwell Road that sells the alternative fuel to the general public. Tommy Johnson of Earth Biofuels, said: *"We are excited to be the first in the state to bring this important fuel to the public. The support for this project by the Department of Agriculture, the Mississippi Farm Bureau, and many others have finally made this a reality. This is the first, but it will not be the last. We have been providing the Lauderdale county schools with biodiesel for over a year now to use in their school buses. We have an educational package that we will be taking to several other school districts throughout the state. It's time to make it available to everyone."*



Tommy Johnson, Earth Biofuels

Biodiesel can be used as B100, or 100%, in any diesel engine, but is

mostly blended with petroleum diesel to create a fuel that is much cleaner than the traditional diesel. With virtually no difference in power, the fuel has a remarkable difference in emissions. Depending on the amount of the blend, emissions can be cut by as much as 70%. The odor is not offensive, and is compared to french fries cooking by some who use the fuel regularly. Biodiesel has widespread use in Europe, which has led the German/American automaker Daimler Chrysler to ship the new Jeep Liberty diesel to dealers with biodiesel in the fuel tank from the factory.

Earth Biofuels produces its fuels from oils in Mississippi. Bill Webster of Earth Biofuels states that, *"we want to stay as local as we can and we support the local farmers by offering a local market for their soybeans. We can use the oil for fuel, and the meal can be used for a variety of food and feed uses. We can all win with this formula. This fuel is renewable, which means that we are not fighting a timetable. It will never run out, because we can always make more, right here in our state."* In addition to the local diesel drivers, Earth Biofuels markets its fuel to school districts and other large fleet diesel users throughout the south. The pricing is competitive with traditional diesel, making the demand far exceed the supply. "We are

upgrading our plant in Meridian to produce 8000 gallons a day, which is not nearly enough. We plan to build several plants in the state over the next few years, but there is no way we can build fast enough to meet the demand," says Tommy Johnson. "It's a nice place to be in, and the people who breathe air are the winners. I guess that's all of us."

To further promote the use of biodiesel, the company has a retail preowned truck center that specializes in diesel cars and trucks. "We are stocking reasonably priced diesel vehicles for those that want to use biodiesel," according to Tommy Johnson.

The retail station officially opened on January 18th, with a press conference held by Mississippi Agriculture Commissioner Lester Spell. "The turnout was excellent, with much more interest in our product than ever imagined," says Johnson. "Sales of biodiesel have outstripped even our wildest estimates. It's been a great start."

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MISSISSIPPI POSITIONED TO EXPLOIT BIOBASED FUELS AND BIOBASED CHEMICALS INDUSTRIES

Once it seemed that profit was the sole consideration in industrial development, but now the environment has not only become a major concern or component in development, it is the driving force behind the new wave of biobased development. History shows that the petrochemical industry was fueled by the vertical integration of the automotive industry. Mass corporate mergers under General Motors and partnerships between major industrialists such as Ford and Firestone created a demand for inexpensive fuel and other chemicals.¹ Products made from natural rubber could not compete with inexpensive products produced from petroleum. Nearly 100 years later, the petrochemical industry might have reached its apex because of environmental concerns.

The United States has embraced the concept of sustainability. Profit is no longer the only driving force for economic development. Industry must pass the environmental scrutiny of the community at large. Citizens are educated to reject industry that may create chemical contamination, oil spills, or nuclear waste. The health affects and monetary costs associated with restoration, shipping and storage of products such as spent reactor fluid are prevented through NMBY (Not in My Back Yard) programs and backed by policy.

The institution of the General Agreement on Tariffs and Trade in 1947 and the North American Free Trade Agreement in 1994 helped to provide a common mechanism for resolving trade disputes and opened new markets for U.S. exports. Revisions and amendments to these documents encompassed emerging concerns of environmental policy in trade. These concerns do not only relate to food production and management but also to the larger challenge of increasing production while reducing greenhouse gas emissions- the primary cause of global climate change. Ratification of the Kyoto Protocol by the U.S. or Russia would impose a binding agreement on industrialized nations to reduce emissions of six greenhouse gases by five percent below 1990 emission levels by 2012. At this point in time it matters little whether one agrees with the theory that there is a hole in the ozone layer or that auto emissions, burning coal and oil and methane from landfills increase global temperatures. Global environmental policy is a driving force for the evolution of natural based fuels and chemicals. Approximately 122 countries have ratified the Kyoto Protocol. Although the U.S. withdrew from the Protocol in

2001 and has not officially accepted the climate change theory, U.S. policy and programs steer us toward the production of natural based systems and products.² The Energy Policy Act of 1992 contained mandatory and voluntary energy and environmental programs. The Climate Change Action Plan of 1993 required the Department of Energy to coordinate with the Environmental Protection Agency to fulfill its responsibilities under the Climate Protection Act of 1987 and the Clean Air Act. The 2002 revision of the Farm Security and Rural Investment Act pushed for collaboration between the United States Department of Agriculture and the United States Department of Energy to establish programs related to energy efficiency and renewable energy.

In order to comply with CAFÉ (Corporate Average Fuel Economy) standards and mandates for low emission vehicles, auto makers created flexible fuel vehicles that can operate on a blend of 85 percent ethanol and 15 percent gasoline. Some heavy equipment manufacturers warranty engines to operate on a blend of 5 percent biodiesel to 95 percent petroleum based diesel.

The biobased chemicals industry should not take another 100 years. The price gap between natural and petrochemicals is quickly closing due in part to advances in biotechnology which makes production cheaper and in part to the costs associated with meeting environmental regulations associated with fossil and nuclear fuels. Integrated production facilities will help to revitalize the biobased chemicals industry. In the 70's and 80's the State of Illinois promoted the sale of gasohol, a gasoline and alcohol blended fuel. Today, two companies located in Illinois, Archer Daniels Midland and Williams Energy are the largest ethanol producers in the world. Although the states of Illinois, Iowa and Minnesota are leading the way for biodiesel production, many states including Mississippi, are quickly organizing resources and infrastructure to compete. Mississippi currently has one biodiesel refiner and one pumping station; however, there are plans for at least seven other production facilities in the state.

The evolution of Mississippi's biobased liquid fuels and biobased chemicals industries may be accelerated through integrated facilities. Large petrochemical firms, such as Chevron, could refine biodiesel and blend the fuels in one location--i.e., one case for biofuel development. The more likely scenario will be integrated bio-

refineries. Unlike ethanol, the technology to produce biodiesel from indigenous feedstocks requires no additional study. Feedstock coordination, infrastructure investment, and market development are more immediate challenges. Centralizing the collected feedstocks for use by several companies may make the industries more sustainable. Consider the cost benefits when in one location soybean can be milled and pressed for oil, oil can be used to make soy diesel, the by-product of glycerin can be used to produce gloves, glues and other adhesives, and a variety of beauty products. Other states have looked at collocating or integrating production facilities that can stand alone but logically have a higher rate of success from reduced collection, processing, transportation and marketing costs.

Mississippi can compete! The state has substantial natural resources that can create a biobased fuels industry and a biobased chemicals industry. There is a need for greater coordination and planning for the logical simultaneous development of these industries. Embracing the opportunity could be an economic boom, while ignoring the opportunity could mean less job creation and greater importation of fuels and chemicals. There is no denying that the earth is warmer and polluted, so why shouldn't Mississippi profit in finding solutions to its restoration as other states have?



References:

Wes Miller, President of MBC
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¹Rae, John B. 1959 American Automobile Manufacturers. Chilton Company: Philadelphia, p. 103

²Caring for Climate A Guide for the Climate Change Convention and the Kyoto Protocol <http://environment.about.com/od/kyotoprotocol>

MDEQ PRORAM EXPLORES ALTERNATE ENERGY SOURCES

As our nation attempts to become more energy efficient and environmentally friendly, we have begun to look for alternate energy sources to replace many of our traditional non-renewable energy sources. Generally, when we think of alternate energy sources, we envision using solar, wind, and water sources. However, there is one source of alternate energy that is often overlooked, the local landfill. This alternate energy source is actually the methane gas that is generated as solid waste disposed within the landfill decomposes. This methane gas is generated continuously which creates great potential for use as alternate energy. Today, businesses and communities in Mississippi can explore potential opportunities for using this alternate energy source through a



Landfill

program at the Mississippi Department of Environmental Quality (MDEQ) called the Landfill Methane Outreach Program (LMOP).

The LMOP is a voluntary assistance and partnership program that promotes the use of landfill gas as a renewable energy source. MDEQ entered into a partnership with the U.S. Environmental Protection Agency (EPA) in October 2001 to promote the use of landfill gas energy in our state. Through this program, MDEQ's goal is to protect the environment and public health by reducing methane emissions from landfills throughout the state through the development of landfill gas-to-energy projects. An additional benefit that the LMOP program offers the state is the economic development opportunities in those areas near the state's landfills.

In partnering with EPA, MDEQ formed a state LMOP task force, developed a state primer document on the state's landfill gas energy potential and hosted several workshops on statewide landfill gas energy potential. While the EPA requires that these tasks be completed within two years, MDEQ accomplished the partnership tasks within a record time of 6 months. The agency was able to accomplish

these efforts by building successful partnerships with EPA, with other state and local government agencies and with the regulated community. The state LMOP task force is comprised of representatives from MDEQ, the Mississippi Development Authority (MDA), the Mississippi Public Service Commission, the Mississippi Department of Transportation and the Governor's Office.

Because of MDEQ's success at completing its partnership tasks, the agency's LMOP program has been recommended by EPA as a model for other states.

Since joining LMOP, MDEQ has worked towards the development of beneficial use projects for landfill gas in the state. The agency has provided assistance to landfill owners, private developers and potential end users to encourage the development of these landfill gas projects. MDEQ has also worked to encourage other state and local organizations and businesses to become official LMOP partners. Currently, there are 7 LMOP partners in the state. There are 2 state partners in MDEQ and Mississippi Development Authority; 3 community partners in the City of Jackson, the City of Canton, and the Golden Triangle Regional Solid Waste Management Authority; and 2 industry partners in Waste Management, Inc. and Neel-Schaffer, Inc.



Pradip Bhowal receives the Landfill Methane Outreach Program (LMOP) State Partner of the Year in Baltimore, Maryland

Through LMOP, MDEQ and EPA have identified several landfills throughout the state that have potential to support an economically viable landfill gas energy project. MDEQ has coordinated and communicated directly with the

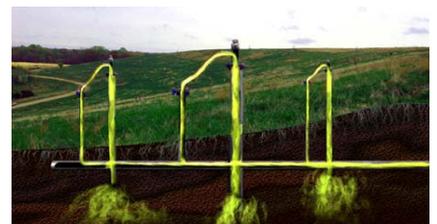
landfill owners and operators to help them understand the potential benefits and opportunities associated with using landfill gas as an alternate energy source. In addition, the agency has networked



Schematic of Landfill

with various project developers to gain their interest in projects at Mississippi landfills. MDEQ has taken the initiative to connect developers with the prospective landfills in the state that are candidates for landfill gas energy projects. As a result of these efforts, landfill gas project developers from around the country are now actively taking interest in developing projects at Mississippi landfills.

Because of its commitment and efforts to promote landfill gas energy in Mississippi, MDEQ was recently honored by EPA as the **LMOP State Partner of the Year 2004** at the 8th Annual LMOP Conference held on January 10, 2005 in Baltimore, Maryland. MDEQ plans to build on the agency's current program activities to ensure the development of new landfill gas projects in the state and to increase landfill gas energy awareness.



Landfill Gas Wells

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REGIONAL BIOMASS-BASED ALLIANCE WILL STIMULATE THE SOUTH'S RURAL ECONOMY BY CREATING NEW ENERGY AND CHEMICAL MARKETS FOR FARM AND FOREST PRODUCTS

The Southern Alliance for the Utilization of Biomass Resources (SAUBR) has been formed to capitalize on the resources and strengths of the South. The new industry envisioned by SAUBR will provide a stimulus to the rural economy, reduce our dependence on fossil fuels and commercialize the science of extracting chemicals from forest and farm crops. The feedstocks for the new energy and chemicals industry will be low-value timber, forest and farm residues and farm crops.

The University of Alabama's Alabama Institute for Manufacturing Excellence (AIME) is the home of this new regional Alliance of industry, university, federal and state government agencies, private businesses, forest and farm landowners, and landowner associations across the South. As this goes to print in January 2005, SAUBR's membership includes 98 organizations and companies from 12 states.

While there are differences in economic circumstances among states, the rural economies across the South have suffered from the closure and slowed production rates of pulp mills and the decrease in value of farm crops. Concurrently, the nation's need for energy and the dependence on foreign oil continue to increase, driving up the use and cost of energy from fossil fuels. The South, with its 214 million acres of forestland and 128 million of the nation's 338 million acres of total farmland, has renewable, expandable, and sustainable sources of energy and chemical feedstocks.

We have an under-utilized labor force, the business infrastructure, and the scientific resources needed to bring the concept of a bio-based industry into reality. With the wise use of this enormous land resource, combined with our technical and business capabilities, it is possible to significantly reduce our dependence on fossil fuels without degrading air and water quality or compromising our timber and food supplies, all while creating jobs in our rural economy.

The biomass based energy and chemicals industry will create a high-volume, non-cyclical market for forest and farm crops. When well established, it will revive the depressed timber market and create new demand for agricultural crops. One SAUBR spokesman summarizes the need for this new industry: "For over 70 years we planted trees for what we thought

was a growing and never-ending demand from sawmills and pulp mills. Timber prices were strong and in a reliable, upward trend, with only an occasional pause. For many years we exported chips to meet the demands of foreign markets. In the last few years things have changed dramatically. Some pulp mills have closed and others have reduced production. In some markets we can import pulp cheaper than we can produce it domestically. It appears unlikely that another pulp mill will be built in this country. Large volumes of wood chips are now being imported through the port of Mobile, Alabama, further reducing demand for and prices of our own small diameter timber.

International Paper Company recently announced the start of a preliminary study of their third pulp mill in Brazil. Weyerhaeuser recently sold extensive landholdings in Georgia. A recent press release stated that the Company had purchased of 320,000 acres of land in Uruguay, where trees can be grown faster. Without new uses and markets for our own trees, there is little incentive to continue to invest in growing timber. Farming in the South has been on the decline even longer. The creation of a biomass-based energy and chemicals industry creates new opportunities for all those involved in all phases of the growing and harvesting of farm and forest products."

The conversion of biomass (woody plants, grasses, and their residues) to energy and chemicals is not a new idea. This has been done for centuries. The U.S. Departments of Energy (DOE) and Agriculture (USDA) have long supported and encouraged research into the commercialization of biomass-based products. The lack of progress in these programs has been due to an insufficient and incomplete method of enabling cooperation among and between the participants and end-users.

SAUBR brings everyone together for collaboration, communication, and co-ordination. The result is a more efficient, cost-effective program, and a shorter time to market for biomass-based energy and chemical products. The areas that will be targeted for the first conversion facilities will be those which are economically depressed, have abundant feedstocks, and have the necessary infrastructures in place.

Several leaders have spoken in support of SAUBR:

Dr. Bob Wells, Executive Director of the

AIME, described SAUBR as being "the perfect fit with our mission to provide research, technology development, assistance, technology transfer to industries to enhance economic development and competitiveness."

Ms. Nisa Miranda, Director of The University of Alabama's Center for Economic Development, said: "SAUBR can be an important part of the rural development program in the Southeast. We want to be a part of it."

Auburn University's Dr. Dave Bransby, Professor, Energy and Fiber Crops, and Forage-Livestock Management, sees SAUBR as "a good way to bring farm and forest interests together for the mutual benefit of both."

The Southern Alliance for the Utilization of Biomass Resources (SAUBR) brings together the resources, researchers, government agencies, and business interests necessary to make rural development in the South a reality. The creation of this new industry will reduce our dependence fossil fuels, much of which is imported, by using forest and farm products which are renewable, sustainable, and expandable. The potential positive impacts on economy and the environment are substantial. SAUBR is the conduit for collaboration, co-ordination, communications and actions, which will result in bringing much needed change.

For more information about SAUBR please contact:

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COOKING OIL POWERS POULTRY HOUSES

Recycled cooking oil is used to produce electricity for a poultry house in Alabama. In an ongoing demonstration project sponsored by Alabama Department of Economic and Community Affairs (ADECA), a specially constructed diesel generator is fueled by 100% used cooking oils for Outlaw Farms of Hartford, Alabama. Dr. Timothy McDonald of Auburn University's Department of Biosystems Engineering is the project manager, and Helms Commodities, Inc. a recycler in Slocomb, AL supplies the recycled oil, named "yellow grease", as the generator fuel. Vinyard Technology Company, Inc. of Hartford, AL, a company that specializes in alternative fuels and waste-to-energy systems, is providing the generator and technical support.

Why the poultry market? High-density poultry production is a large year-round energy consumer. Electricity cost is usually the largest single out-of-pocket expense for growers. Unfortunately maximum electrical need coincides with peak demand for electric distribution companies, which are often small rural cooperatives. This increases their overall cost of providing electricity through higher demand and ratchet charges on the power they purchase from electric generation and transmission companies.

In FY2000, there were approximately 550 million broilers grown in the top 10 counties of Alabama alone. Using an average of 25,000 birds per house, this requires nearly 22,000 poultry houses. These houses are disbursed widely through the state.

This dispersal makes it unfeasible to provide a central power production facility. Most grower houses are supplied with single-phase electrical power. Therefore this market is best serviced by Distributed Generation systems (DG), providing multiple, small generators near each poultry farm. This not only reduces the energy bill for the grower, it also reduces cost for the electrical distribution utility. It allows the utility to provide more energy and/or higher demand to other customers without the increased cost of added infrastructure in lines and substations.

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Why not use Biodiesel for the fuel? A low-cost fuel source is needed to meet this power demand challenge. Biodiesel has been proposed as a direct substitute for diesel fuel in many applications. The fuel feedstock may be southern-grown soybean or peanut oils, or even recycled cooking oils and greases collected from restaurants. Biodiesel is biodegradable, and in some cases has been reported to reduce engine exhaust emissions.

Unfortunately, producing biodiesel increases the fuel cost by at least 30% over the cost of the raw oil feedstock. These additional costs come from chemicals such as methanol and a caustic catalyst such as lye, mixing vessels, settling tanks, and processing labor. Obviously there are substantial savings if the engine could operate on straight cooking oil or vegetable oil.



Vinyard Oil Burner

Therefore the key to demonstrating used cooking oil is providing an engine system that can operate on this thick and viscous fuel. Vinyard Technology Company has provided a system called the **o.g.r.e.**™ (Oil Generates Recycled Energy). This heavy-duty diesel-based unit provides 12-15 kW of electrical power. Critical features of this unit include a safe, low cost connection to the power grid, ability to handle 24/7 continuous operation with low maintenance. This genset is not a stand-by unit, and in no way replaces or interferes with the backup emergency generator system now in place at the poultry farm.

How does the engine run on the cooking oil? Initial tests showed that power was re-

duced by 10% when switching from diesel to cooking oil. This is because cooking oil is an "oxygenated" compound that contains approximately 10% less energy per gallon than diesel fuel. Vinyard reset the engine injector pump so that exhaust gas oxygen was equal to that of diesel, and the original power was regained. Fuel consumption is about 9% higher than diesel, reflecting the lower energy value of cooking oil. A pleasant surprise – The exhaust smells like fried chicken! (Though this may not comfort the flock at the farm.)

Why not just install one large power plant to sell electrical power back into the power grid? Utilities are only required to pay avoided cost of outside-generated power (US PURPA Act of 1978). Such prices vary, but are generally quite low. One Alabama-based power generator only pays \$0.025 per kilowatt-hour (kWh) for off-peak power and \$0.035/kWh for on-peak. However, by connecting the genset on the customer side of the electric meter, power produced offsets that purchased at retail prices of \$0.06 to 0.08/kWh. Thus a small genset would provide over twice the value and economic return as a large, centrally-based unit.

What are the savings? From actual field test data, this single generator drops the electrical cost for the farmer from \$35.50 per day to \$8.00 per day. Long term savings will depend on local cost of recycled oils.

This is great news for the consumer as well. A single, continuously-run genset of only 10-12 kW can provide the energy offset in just one year for four automobiles over their entire lifetime. This saves other valuable fuel sources for heating, power generation, and transportation.

This demonstration project is providing numerous benefits, including economic and environmental feasibility, reduction of electrical demand for farmer and utility, and providing a possible new market for recycled agricultural products. This test is still underway. For further information contact Shannon Vinyard at 334-588-6644 or svinyard@vinyardtech.com.

Written by: Shannon Vinyard

CASTOR: A POSSIBLE SOURCE OF BIODIESEL FOR THE SOUTH

Castor oil is being investigated as part of the biofuels initiative. Other crops being investigated for potential use as biodiesel include; winter crops - several mustard species (*Brassica* spp.), among them Canola, *Hesperis* and *Camelina*. Summer crops include castor (*Ricinus communis*) and gopher plant (*Euphorbia lathyris*). Castor is farthest along in terms of field research.

A number of naturally occurring oils can be converted to biodiesel including those from plant and animal (either virgin or waste oil) sources. The chemical reaction (trans-esterification) of fatty acids with alcohols results in the production of biodiesel and glycerol (a by-product). Current endeavors have focused on soy and rapeseed as the source oil of biodiesel, but castor offers several advantages.

Castor is a semi-tropical perennial that shows potential as an alternative crop in the southern United States. Most people identify castor oil as the vermifuge/laxative used in the 1920s and 30s often bemoaned by children of the time. Castor oil however, has been used in a very large array of industrial and military applications. In the United States oil from castor seed has been used as precur-



Figure 1: Increase field of Hale, a high yielding dwarf castor cultivar

sor of a large number of industrial products and lubricants as well as cosmetics, toiletries, soaps, and food uses.

The innate oil content is the primary advantage of castor. Seed from castor is 50% oil while corn and soybean are 5 and 19%, respectively (*Table 1*). Canola

planted in the South approaches the seed yields of castor, but oil concentration averages 41.5%.

Three years of research at Mississippi State University has shown that average yields of castor can exceed 1700 lbs/A, depending on planting date and location. Yield testing has occurred at four locations; Memphis, Starkville, Shubuta, and Poplarville. Highest yield were obtained at

Crop	Yield/Acre	Percent Oil	Gallon Oil/Acre
Corn	130 bu	4.5	55
High Oil Corn	130 bu	8	97
Soybean	30 bu	19	57
Cottonseed	981 lbs	22	36
Canola	1600 lbs	41.5	111
Castor	1700 lbs	50	142

Table 1: Southern crops, average yield per acre and potential oil production per acre

Memphis and Starkville. Lowest yields were obtained at Poplarville. However, this low yield is probably a consequence of severe shattering of the plants during harvest. Plants ripened off earlier in south Mississippi than farther north, the resulting shatter compromised harvested yield.

Planting date is an important component of maximizing yield. While it is possible to plant castor as early as 1 April. Maximum yields were obtained at all locations with a mid-April planting. Yields drop off severely with plantings after mid May. Highest yields resulted from a 15 April planting with an early October harvest. Initial castor research was completed with a mixed seedlot of dwarf castor seed derived from the cultivar, Cimarron. Variety trials of available germplasm has shown the USDA cultivars, Hale (*Figure 1*) and

Lynn to be highest yielding with less shattering problems. Additional selections have been made from other germplasm lines that show promise for yield.

In addition to the yield and oil concentration, castor offers several advantages to other oil seed crops. Early planting fits well into the current production/rotation crop schemes of existing southern crops. Large seed is generally easier to handle than small seed. Strong nematocidal effects have been documented. This would be an aid to other crops if used in rotation. Low gelling temperature of castor oil and the resulting castor biodiesel would be desirable during winter months. The drawbacks of castor include a harvest date that corresponds to other southern crops.

A seed and meal cake (after oil extraction) that is poisonous. This prevents the meal from being marketed until it is steamed to neutralize ricin, the active poison. Such necessary processing reduces the initial value of the meal cake.

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THE GATOR EATS OIL AND FUELS INDUSTRY



Product Services Company, Inc. (PSC) of Jackson, Mississippi is a product development and manufacturing company. From its inception in 1988, PSC has focused on creating and manufacturing value-added products from industrial and agricultural byproduct wastes and in recent years has had success in generating energy from biomass. PSC has manufactured a number of competitively-priced, environmentally-friendly, products derived from renewable agricultural sources and industry byproducts, while providing waste management and energy solutions to industry and creating beneficial resources for consumers. The cotton and forestry industries have been instrumental in PSC's success and are the primary reason the company is located in Mississippi.

PSC's core product is its patented Oil Gator®—an all-natural, non-toxic, biodegradable bioremediation product used primarily for cleaning up oil and other hydrocarbon spills. Oil Gator® absorbs, encapsulates, suppresses vapors, and bioremediates hydrocarbons into carbon dioxide and water. This product bioremediates hydrocarbons to acceptable levels in as few as 120 days. Oil Gator® is distributed internationally and is recognized as the standard in in-situ bioremediation due to its superior performance. PSC also manufactures and distributes a variety of



Patented Oil Gator® magnified 320 times to demonstrate encapsulation of hydrocarbons.

exceptional bioremediation products under the Gator® trademark and all PSC absorbents are made from 100%-recycled waste products.

Floor Gator™ is used for cleaning up fuel, oil and grease spills on hard surfaces. Floor Gator® is all-natural, biodegradable, and non-carcinogenic and absorbs up to six times its own weight. Cell-U-Sorb™ is used for removing hydrocarbon spills on water. Cell-U-Sorb™ is a 100% cellulose absorbent produced from recycled raw materials. It is harmless to plant, animal and aquatic life.

Acid Gator™ is used for absorbing, encapsulating, suppressing vapors and beginning neutralization of acids in one easy step. Application of Acid Gator® will begin neutralization without splattering, allowing the safe addition of a final neutralization agent to reach the desired pH.

The Gator products are sold via two primary license agreements. An agreement with Gator International covers distribution in the Americas and an agreement with Enretech Australasia Pty Ltd covers Australia, New Zealand and the remainder of the Pacific Rim. PSC also produces a premium line of liquid products.

Gator Trap™ is an organic waste digester used in the restaurant and food service industry, municipal sewer treatment, and industrial wastewater operations. Gator Wash™ is a general purpose cleaner/degreaser used in process industries, petroleum distribution operations, maritime activities, restaurants and hotels, aircraft, and commercial. In addition, the company also produces a complete line of spill response kits for military, industrial, and transportation applications.

PSC has created alliances with local industries to work together to create innovative biomass waste handling solutions. The company's businesses have produced millions of dollars for the local economy and have provided much needed employment in economically depressed communities. Due to PSC's efforts, approximately 24,000 tons per year of biomass material have been removed from State landfills and used to manufacture value-added products and produce alternate energy, while providing solutions to major problems for Mississippi industries.

One of the major functions of PSC is the removal of dated agricultural product from bags, collected from production facilities located in Mississippi. Most of the treated agricultural material was previously disposed in unlined landfills and was not suitable for consumption by animals. However, the material has a high caloric value and is clean burning. PSC worked closely with the involved companies over the past years to secure a permit from the necessary regulatory bodies to utilize the material as an alternate fuel for its facility.

The material is now delivered in bulk to another major industrial complex in the vicinity and is utilized as alternate fuel for its boiler furnace. The discarded paper bags from the process are ground and converted into premium grade consumer products. Current



Oil Gator® encapsulates oil in preference to water.

permits allow up to 50 tons per day, 7 days a week to be consumed at the industrial complex. The result of PSC's alternate fuel program is the removal of approximately 8,000 tons annually from local landfills and the supply of enough energy for industry with equivalent Btus to heat 3500 homes!

Although there are a number of success stories from PSC's activities from all over the world, following are a few closer to home. In late December 1999, one of the largest land-based oil spills in U.S. history occurred near Collins, Mississippi. Approximately 320,000 gallons of crude oil leaked from a corroded pipeline into the wetlands and traveled more than 3 miles to the Leaf River and approximately 15 miles downstream before being discovered.

Traditionally, the contaminated soil would have been removed from the site and disposed. However, with the use of Oil Gator®, most of the contaminated soil was remediated on-site and a relatively small amount of vegetation had to be removed. In a matter of months, the crude oil had been remediated to a non-detect level and results of the cleanup were so dramatic, that the company responsible for the spill had no charges brought against it by Government.

In March of 2001, a pipeline leak of approximately 6500 gallons of hydrocarbons occurred in Purvis, Mississippi and ran approximately 5 miles into a number of small streams. One week after cleanup commenced, a massive flood occurred. Due to *Oil Gator's* unique character of encapsulate oil in preference of water, leaching of the oil deeper into the earth was essentially prevented and non-detect levels of contamination were achieved in a relatively short time. (See Illustration)

PSC is continually active in developing new products from agricultural and industrial wastes and generating energy from renewable biomass sources. Some of the products or projects that are being evaluated are:

- Fuel from Agricultural and Industry Wastes
- Oilfield Drilling Products
- Spill Care Systems
- Wildlife and Livestock Feeds
- Organic Soil Amendments
- Organic Fertilizers
- Litters and Beddings
- Hydromulch

PSC's projects will continue to provide waste management and energy solutions to local industry, while improving the environment via recycling waste and manufacturing products that are environmentally friendly and beneficial to consumers, and will create employment opportunities for local citizens.

Written by: Steve Dickerson

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SOUTHERN BIO-PRODUCTS CONFERENCE & SMALL FARMERS AND WOMEN IN BUSINESS CONFERENCE

The Southern Bio-Products Conference will be held on March 22-23, 2005 at the Holiday Inn-Jackson North in Jackson, Mississippi. The Mississippi Biomass Council, Mississippi State University and Alcorn State University are organizing the third conference to focus on products produced from biomass materials. As in the past, the conference will include research papers, posters, updates on important federal bio-programs, equipment and service exhibitors, and discussion of the latest commercial technologies.

General Session on March 22, will bring special attention to new developments in federal bio-programs. Conference participants will have an opportunity to network with other professionals immediately following the general session at the Networking Reception. Concurrent Technical Sessions for March 23 will focus on the following tracks:

1. Feedstock Management
2. Bio-Fuels
3. Alternative Chemicals
4. Polymers
5. Bio-Power
6. Other Bio-Products

The Wrap-up Session will provide opportunities for participants to discuss new industry directions and opportunities with a panel of nationally recognized speakers. The conference will end with a Closing Reception where participants will be able to continue networking and discuss previously mentioned topics.

For more information:

www.ms-biomass.org



The Alcorn State University Extension Program in cooperation with the Mississippi Association of Cooperatives/Center for Cooperative Development will present the 14th Annual Small Farmers/Women in Business and Marketing Conference 2005. The theme for the conference is "Building Wealth in Rural Mississippi." The conference will be held on March 28-30, 2005 at the Clarion Hotel in Jackson, Mississippi.

THE SPECIFIC OBJECTIVES ARE:

- To provide access to marketing and value-added opportunities.

- To utilize cooperatives as a means to collaborate in accessing financial capital.
- To provide tools to reduce business risks and enhance sustainability in rural Mississippi.
- To provide demonstrations through educational tours.
- To introduce computer usage as a tool for farm and business management.
- To address land loss and retention issues.

REGISTRATION FEE:

Farmers & Women In Business	\$30.00
Non-profit organization personnel	\$100.00
Professional/Organizations	\$175.00

Make Checks/PO's payable to:

ASU Small Farmer's Conference; 233 E. Hamilton Street; Jackson, MS 39202

For more information, please contact the Mississippi Association of Cooperatives at 601-354-2750 or Alcorn State University Extension Program at 601-877-2305.

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