



Alternative Fuels 101

Georgia Environmental
Facilities Authority



**When we say
Alternative Fuels,
what exactly are we
talking about?**





BIODIESEL & ETHANOL



What is Biodiesel?



Biodiesel is a biodegradable non-toxic alternative fuel produced from natural renewable sources such as new and used vegetable oils and animal fats.

Biodiesel



- Domestically produced
- Renewable
- Displaces imported petroleum
- Reduces harmful emissions

BIODIESEL FEEDSTOCKS



- **Soybean Oil**
- **Peanut Oil**
- **Sunflower Seed Oil**
- **Canola Oil**
- **Chicken Fat**
- **Waste Grease**

Biodiesel History



- In 1898 when Rudolph Diesel first demonstrated his engine at the Paris World Exhibition, he used peanut oil.
- Vegetable oils were used until the 1920's when petroleum diesel became available.

CURRENT BIODIESEL FACTORIES



- US Biofuels, Rome Georgia, is designed to produce more than 10 million gallons of biodiesel per year.
- Soymet, Rome Georgia, is designed to produce 2 million gallons of Biodiesel per year.
- Middle Georgia Biofuels, Dublin Georgia, is designed to produce 2 million gallons of Biodiesel per year.
- Sunshine Biofuels, Camilla Georgia, is designed to produce 4 million gallons of Biodiesel per year.

PROJECTS UNDER CONSTRUCTION



- **Bulldog Biodiesel, Ellenwood Georgia, is being designed to produce 10 million gallons of Biodiesel per year.**
- **Inland Oil, Bainbridge Georgia, is being designed to produce over 10 million gallons of Biodiesel per year.**
- **Dec 2007 – Alterra Biofuels, Plains Georgia, is being designed to produce 25 million gallons or more of Biodiesel per year.**
- **Sept 2007 - Alterra Biofuels, Gordon Georgia, is being designed to produce 10 million gallons or more of Biodiesel gallons per year.**



What is Ethanol?



Ethanol is a clean-burning, high-octane fuel that is produced from renewable sources. At its most basic, ethanol is grain alcohol, produced from crops such as corn.

Ethanol



- **Ethanol can be blended with gasoline to create E85, a blend of 85% ethanol and 15% gasoline.**
- **Vehicles that run on E85 are called Flexible Fuel Vehicles (FFVs) and are offered by several vehicle manufacturers.**
- **Any gasoline engine can burn E10.**

ETHANOL FEEDSTOCKS



- **Corn**
- **Sugar Cane**
- **Sugar Beets**
- **Sweet Potatoes**

ETHANOL HISTORY



- **Pre-Civil War** – Ethanol is major illuminating oil
- **1896** - Henry Ford builds his first automobile-- the quadricycle to run on pure ethanol
- **1908** - Ford produced the Model T - It was a true FFV
- **1917-1918** – World War I drives ethanol demand to 50M gal
- **1920's** – Gasoline becomes motor fuel of choice
- **1930's** – Fuel ethanol gamed a market in the Midwest; over 2,000 stations sold gasohol
- **1941-1945** – Production increases but mostly due to non-fuel wartime uses
- **1945-1978** – With end of WWII, ethanol demand subsides considerably; practically no fuel ethanol used
- **1974** – Legislation leads to SERD&D Act and kick starts development of conversion of cellulose and wastes into fuel
- **1979** – First marketing of alcohol-blended fuels begins
- **1980-1984** – First U.S. survey finds 10 production facilities exist producing 50M gal/yr - Congress enacts tax benefits; import tariff begins on imported ethanol; tax benefit increased to \$0.50/gal
- **1988** – First use as oxygenate; CO mandates for CO reduction; MTBE use begins as oxygenate
- **1992** – Blend called “E85” defined as alternative transportation fuel
- **2000** – EPA recommends MTBE be phased out

OPERATING ETHANOL FACTORIES



Windgap Farms, Baconton Georgia, produces around 500,000 gallons of Ethanol from waste yeast per year.

UNDER CONSTRUCTION



US Ethanol, Cordele Georgia, will be capable of producing 4 – 10 million gallons of Ethanol per year.

UNDER CONSTRUCTION



First United Ethanol, Camilla Georgia, will produce 100 million gallons of Corn Ethanol per year.



What is Cellulosic Ethanol?



Cellulosic Ethanol is produced from a great diversity of biomass.

CELLULOSIC ETHANOL FEEDSTOCKS



- **Switchgrass**
- **Wood**
- **Hay**
- **Plants**
- **Garbage**

UNDER CONSTRUCTION



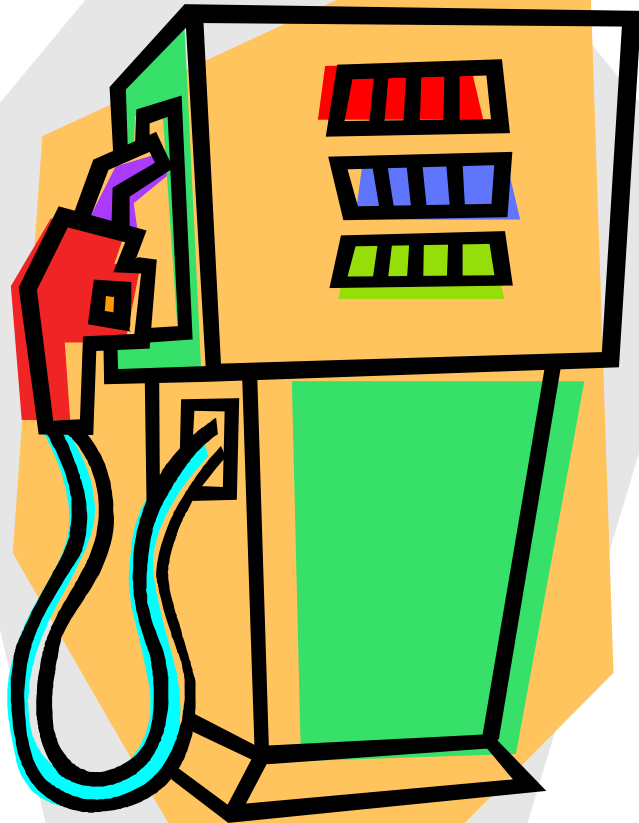
Range Fuels, Soperton Georgia, will produce 20 – 100 million gallons of Cellulosic Ethanol per year.



**The United States is 2% of
the World Population.**

**The U.S. consumes 25% of
crude oil produced.**

Georgia Fuel Usage Per Year



By the Gallon:

- **Diesel - 1.7 billion**
- **Gasoline - 4.9 billion**

Estimated Crude and Products Imports to the U.S. from Leading Supplier Countries



August 2006 Imports	% of (Thousand Barrels per day)	% of Total Imports		Domestic Product supplied
Countries				
Canada	2,335	17.5%	11.0%	
Mexico	1,560	11.7%	7.3%	
Saudi Arabia	1,513		11.3%	7.1%
Venezuela	1,376	10.3%	6.5%	
Nigeria	1,026	7.7%	4.8%	
Algeria	794	6.0%	3.7%	
Iraq	620	4.6%	2.9%	
Angola	544	4.1%	2.6%	
Russia	485	3.6%	2.3%	
Virgin Islands*	377		2.8%	1.8%
Other	2,704	20.3%	12.7%	
Total	13,334	100.0%	62.5%	
OPEC Countries	5,644		42.3%	26.5%
Persian Gulf Countries	2,310		17.3%	10.8%

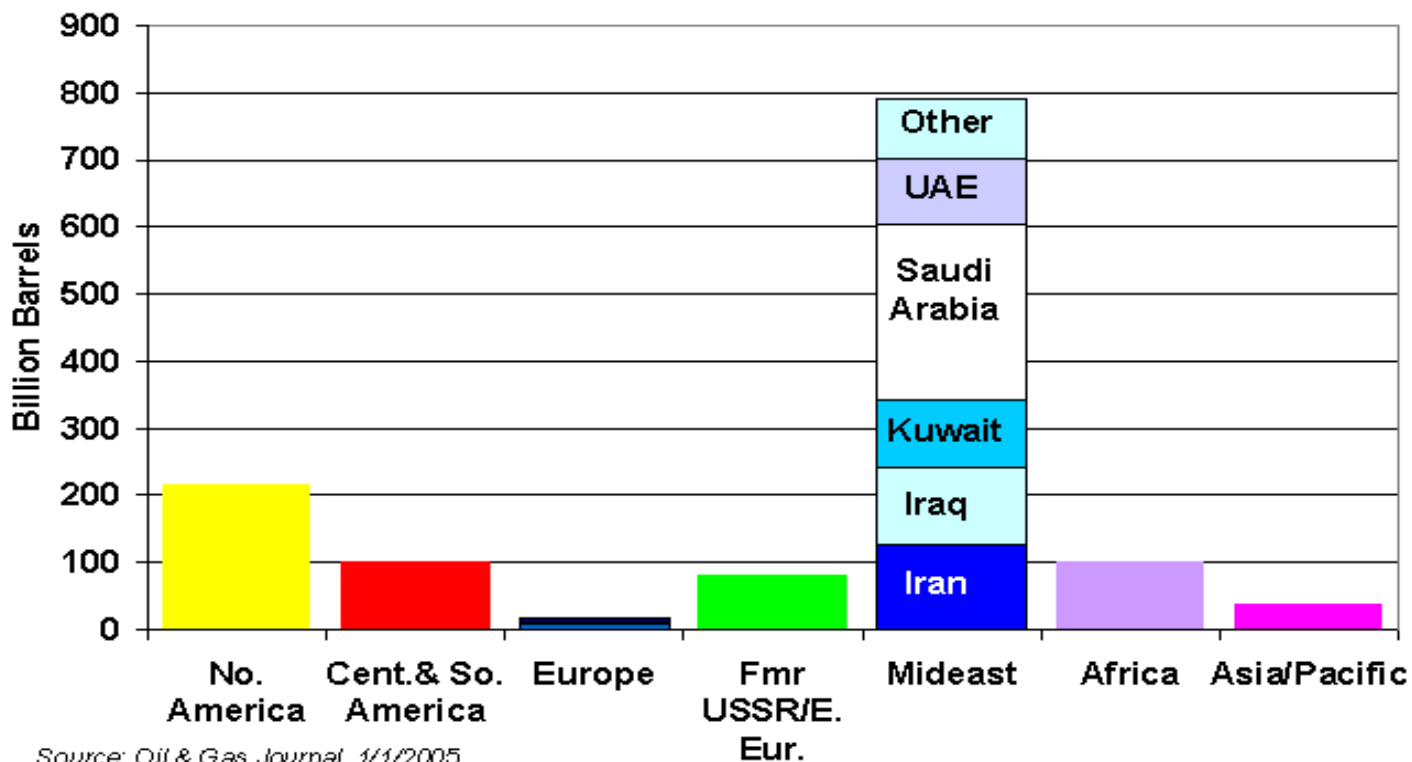
***Supplier of products made from crude oil**

Source: DOE, Petroleum Supply Monthly, October 2006

Estimated Crude and Products Imports to the U.S. from Leading Supplier Countries



Oil Reserves, Jan. 1, 2005



What has Georgia accomplished?



- **The State fleet has over 750 alternatively fueled vehicles**
- **Some State fueling stations have CNG & propane dispensers**
- **Biodiesel is available and is being used**
- **Legislation has been passed to reduce sales taxes on ethanol and biodiesel companies**
- **We are incubating companies that are working on alternative fuel technologies**
- **The State Energy Office has completed a comprehensive state energy plan**
- **Many well attended meetings, conferences, seminars, etc**
- **We have educated the legislature and have developed a curriculum for school children**
- **The state has awarded grants that have moved the industry forward**
- **Our colleges have gained global recognition for their researching efforts**

ONE STOP SHOP



- Environment Protection Department
- Department of Revenue
- Department of Community Affairs
- Georgia Forestry Commission
- University of Georgia
- U.S. Department of Agriculture
- State Fire Marshall's Office
- Georgia Department of Agriculture
- Department of Economic Development
- Georgia Environmental Facilities Authority
- Environment Protection Agency
- Governor's Agriculture Liaison
- Agriculture Innovation Center

Monthly Meetings

Each company has a minimum of one hour to present plans

Questions & Answers

Contact information provided concerning all participants

Southeast Bioenergy Conference

Governor Sonny Purdue

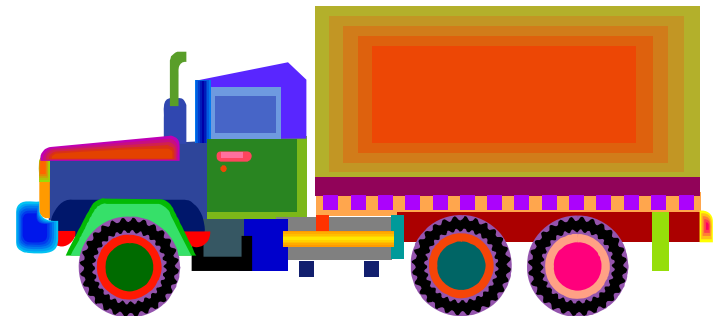
July 31, 2007



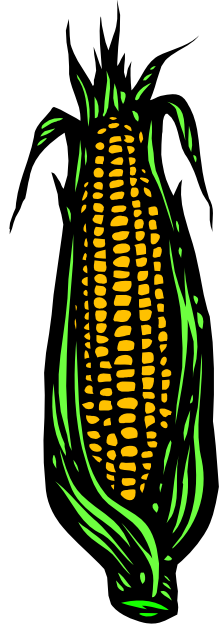
Biofuels are emerging as a more viable alternative to gasoline. This is the future of energy.

Companies like Range Fuels, Bulldog Biodiesel, First United Ethanol and Alterra have pledged a total of over \$460 million to process an astounding 215 million gallons of biofuel every year in Georgia.

What does Georgia have to offer an alternative fuels producer?



FEEDSTOCKS



- **Wood**
- **Soybean Oil**
- **Canola Oil**
- **Cottonseed Oil**
- **Chicken Fat**
- **Corn**
- **Grasses**
- **Landfill Waste**



Georgia's Biodiesel Future



- **By 2010 we could be producing 100 million gallons per year**
- **More positive biodiesel legislation is very likely**
- **Farmers will be growing new oil crops**
- **Poultry producers will find new ways to generate more fat during the processing of chickens**

Georgia's Ethanol Future



- By 2010 we could be producing 400 million gallons per year
- More positive ethanol legislation is very likely
- Tree farmers will be selling trees to produce fuel



STATE ENERGY STRATEGY PROJECT

State Energy Strategy Development Governor's Executive Order



- **Governor Perdue issued an Executive Order stating that GEFA shall “lead a statewide stakeholder process to develop a Comprehensive State Energy Strategy.”**



Overview of Public Comment Process

Strong Participation from Diverse Stakeholders

726 people registered on the website:

www.georgiaenergyplan.org

Responses to Framework chapters:

- 222 registrants to website submitted 358 comments

Responses to First Draft:

- 530 registrants submitted 727 comments

Responses to Second Draft:

- 381 citizens attended public meetings and 108 offered oral comments
- 98 submitted written comments
- 500 signed two group e-mails

Overview of the *State Energy Strategy*

Five Broad Themes



Key Elements

- **Prioritize Energy Resource Development**
- **Leadership Role in Development of Alternative Fuels**
- **Encourage State Government to Lead by Example**
- **Educate the Public about Energy Issues and Provide Appropriate Incentives toward Wise Energy Choices**
- **Continue Prudent Energy Planning for the State**



For More Information Contact:

Jill Stuckey

GEFA

233 Peachtree Street, NE

Suite 900

Atlanta, GA 30303

404-584-1041

jill@gefa.ga.gov

Or visit **www.gefa.org**