

The Biofuel Industry in Southeast – The Implications on Transportation Systems

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How will we live?



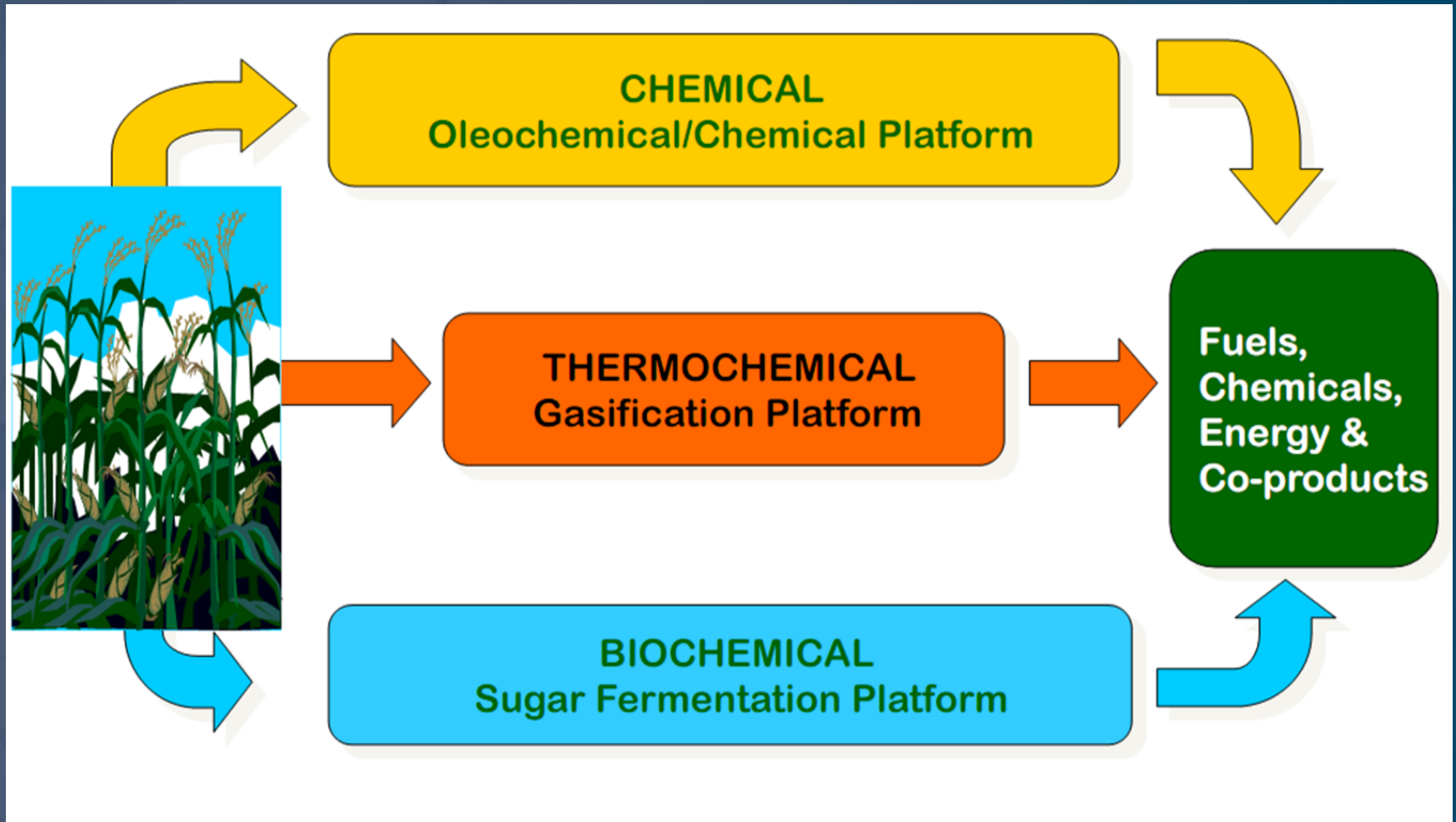
What is a Biofuel, BioMass?

- Biofuel
- Biomass – feedstocks
- Electricity or portable fuel?
- The Southeast – “The Saudi Arabia of Biomass”?

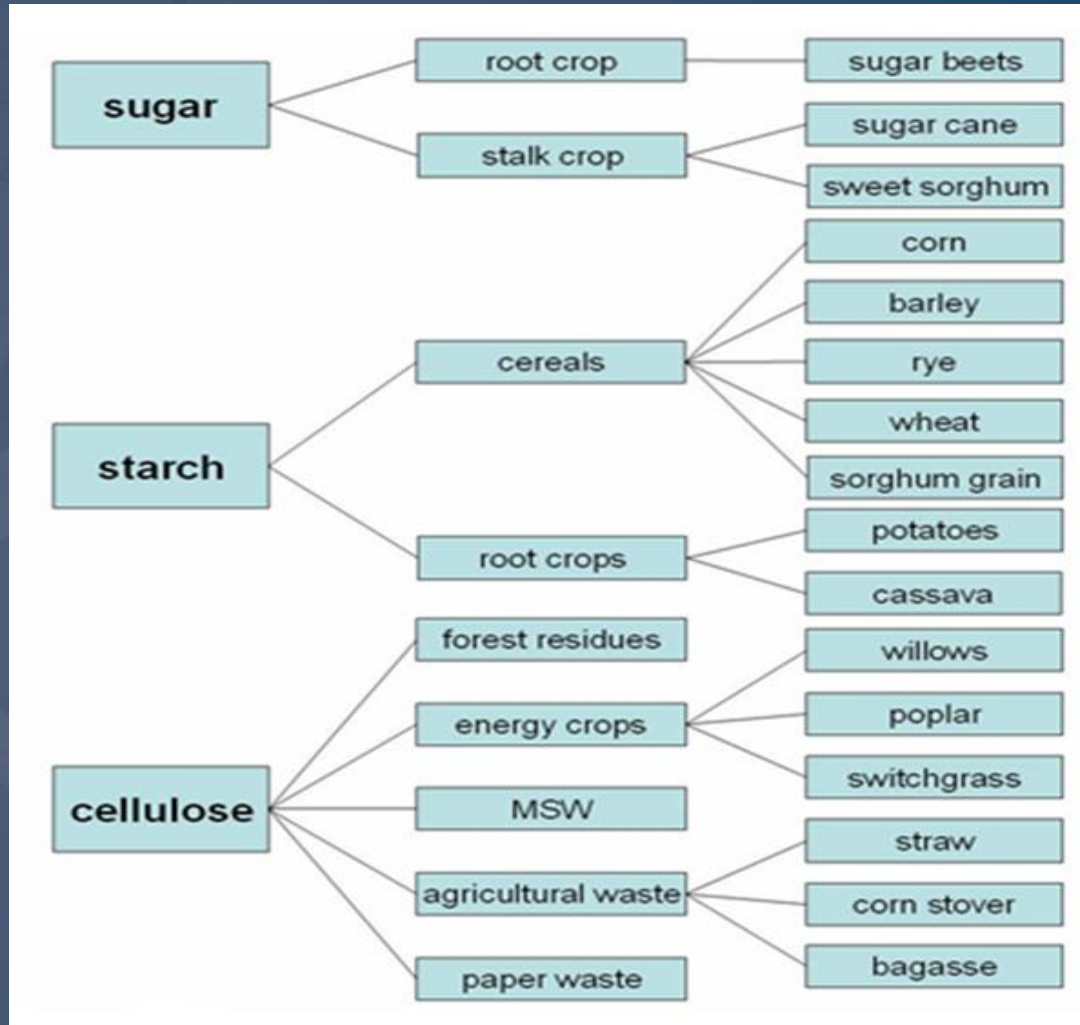
Factors Driving Growth in Biofuels

- Energy Independence & Environmental Concerns
- Public Policies that Support the Biofuels Industry
 - Mandatory Blending, Production Incentives, Tax Credits
- High Oil Prices and Relatively Cheap Corn

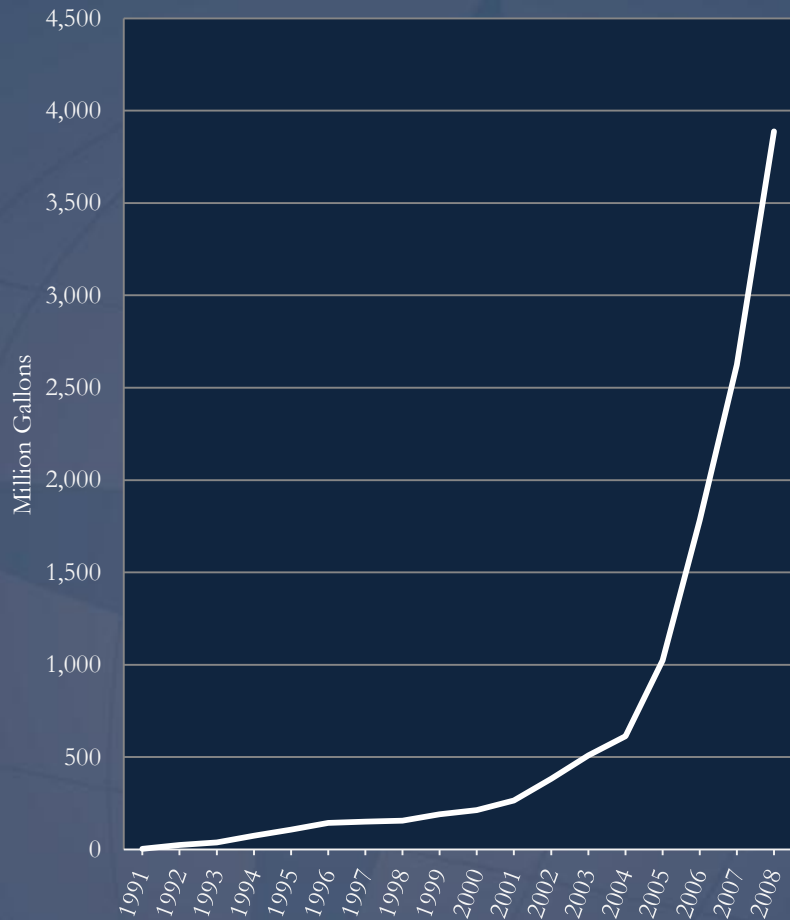
Processes and Biofuel Production



Sources of Biofuels in the Southeast

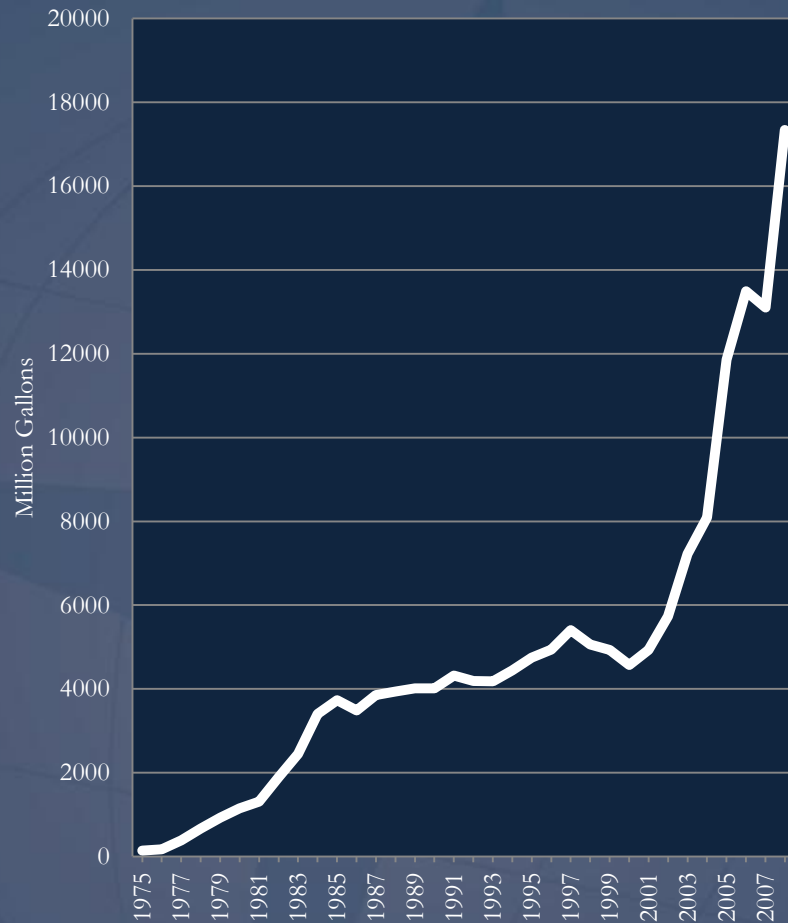


World Biodiesel Production (1975-2008)



- 3.9 Billion Gallons
- EU, US, Brazil – 90% of World Supply
- Feedstocks
 - Rapeseed and Sunflower Oil in EU
 - Soybean Oil and Waste Grease in US and Brazil

World Ethanol Production (1975-2008)



- 17.3 Billion Gallons in 2008
- Ethanol Suppliers –
 - United States (corn)
 - Brazil (cane)
 - 88% of World Supply

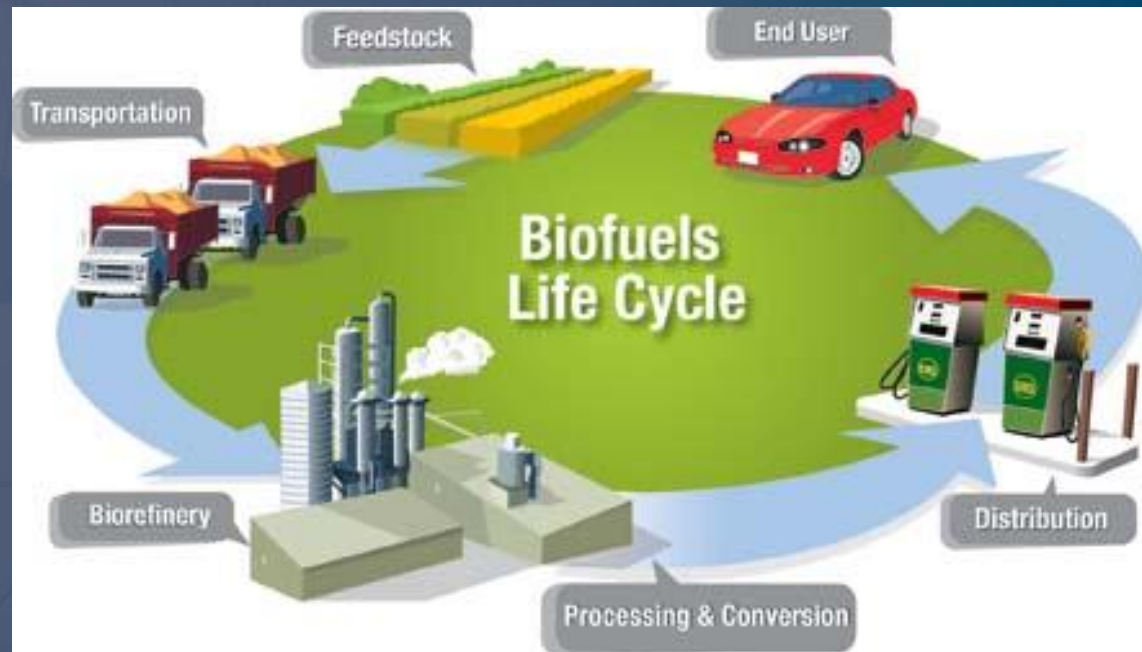
Federal Policies

- 2004
 - American Jobs Creation Act
 - Federal Tax Credits
- 2005 - Energy Policy Act
- 2007 - Energy Independence and Security Act
- 2008
 - The Emergency Economic Stabilization Act;
 - The Energy Improvement and Extension Act
 - The Food, Conservation and Energy Act (The Farm Bill)

Economic Viability at Regional or State Level

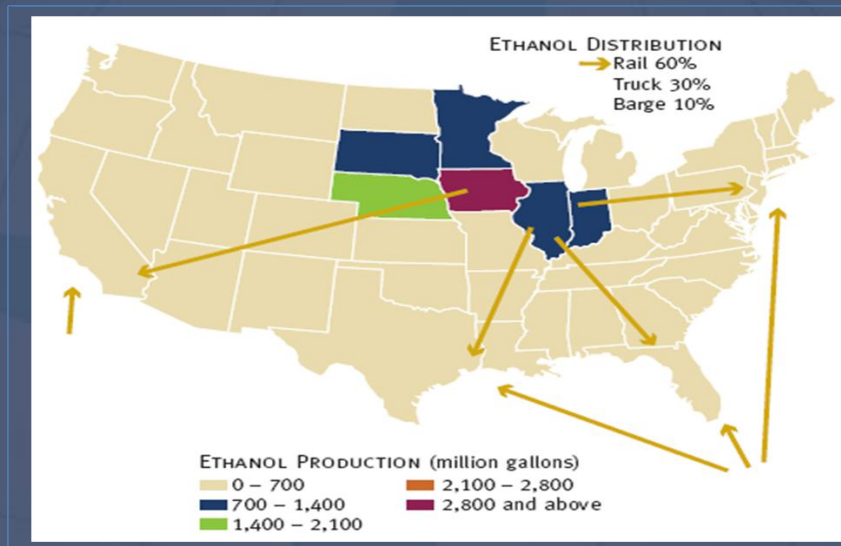
At each point:

- technical and economic feasibility
- political factors
- capital investment and infrastructure
- other factors

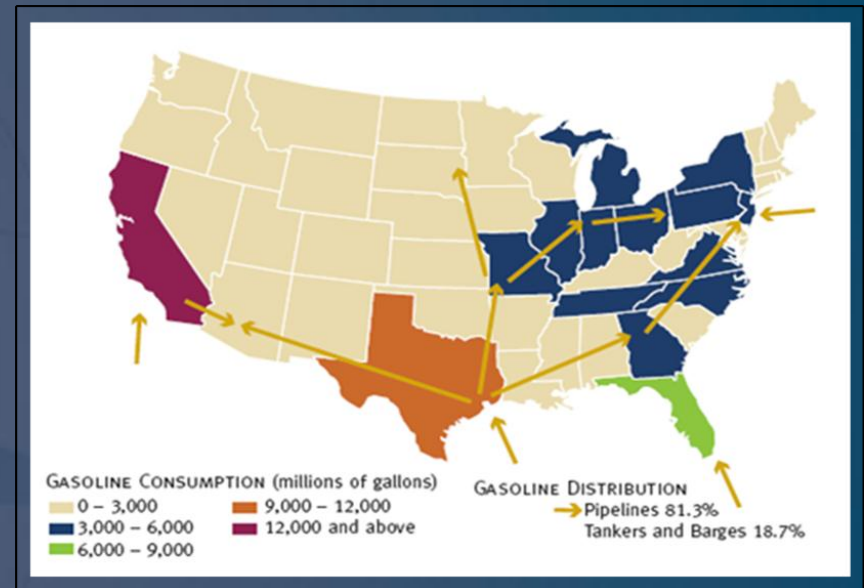


Current Production and Distribution

Ethanol



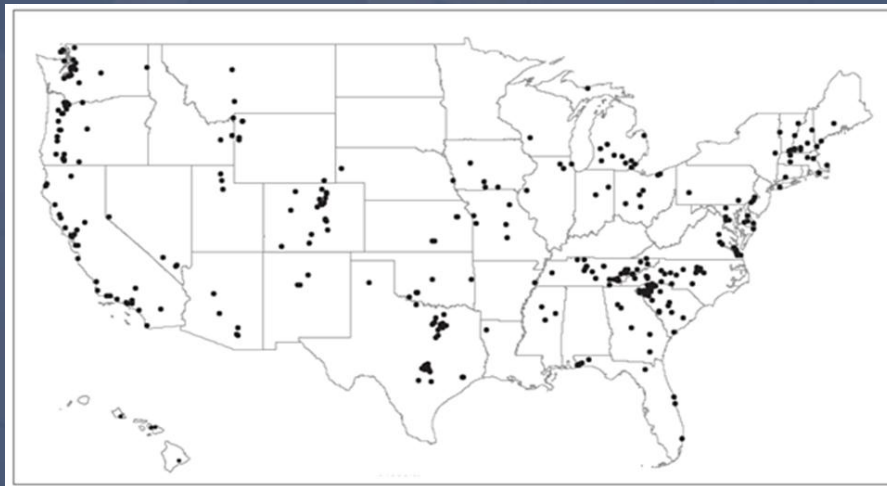
Petroleum



Source: National Commission on Energy Policy. Biofuels Infrastructure Task Force. 2008

State and Local Incentives

- Production Incentives
- Distribution Incentives
 - Clean Fleet
 - Filling Station Locations



Southeast Regional Energy Market

	Number	Share of U.S. (%)
Population, projection 2030 (1000) ^b	97570.0	26.8
Gasoline consumption (mil. gal.) ^c	39736.2	28
Ethanol consumption (mil. gal.) ^c	837	12
Ethanol to gasoline ratio (percent) ^c	2.1	(4.7 for U.S.)
E85 consumption (mil. gal.) ^d	17.6	33
Number of ethanol plants (operating) ^e	7	4
Ethanol production capacity (operating, mil gal) ^f	461.3	4
Number of licensed FFVs (million) ^g	1.07	24
Number of E85 fuel stations ^g	249	13
Biodiesel production (mil. gal.) ^f	449.9	20

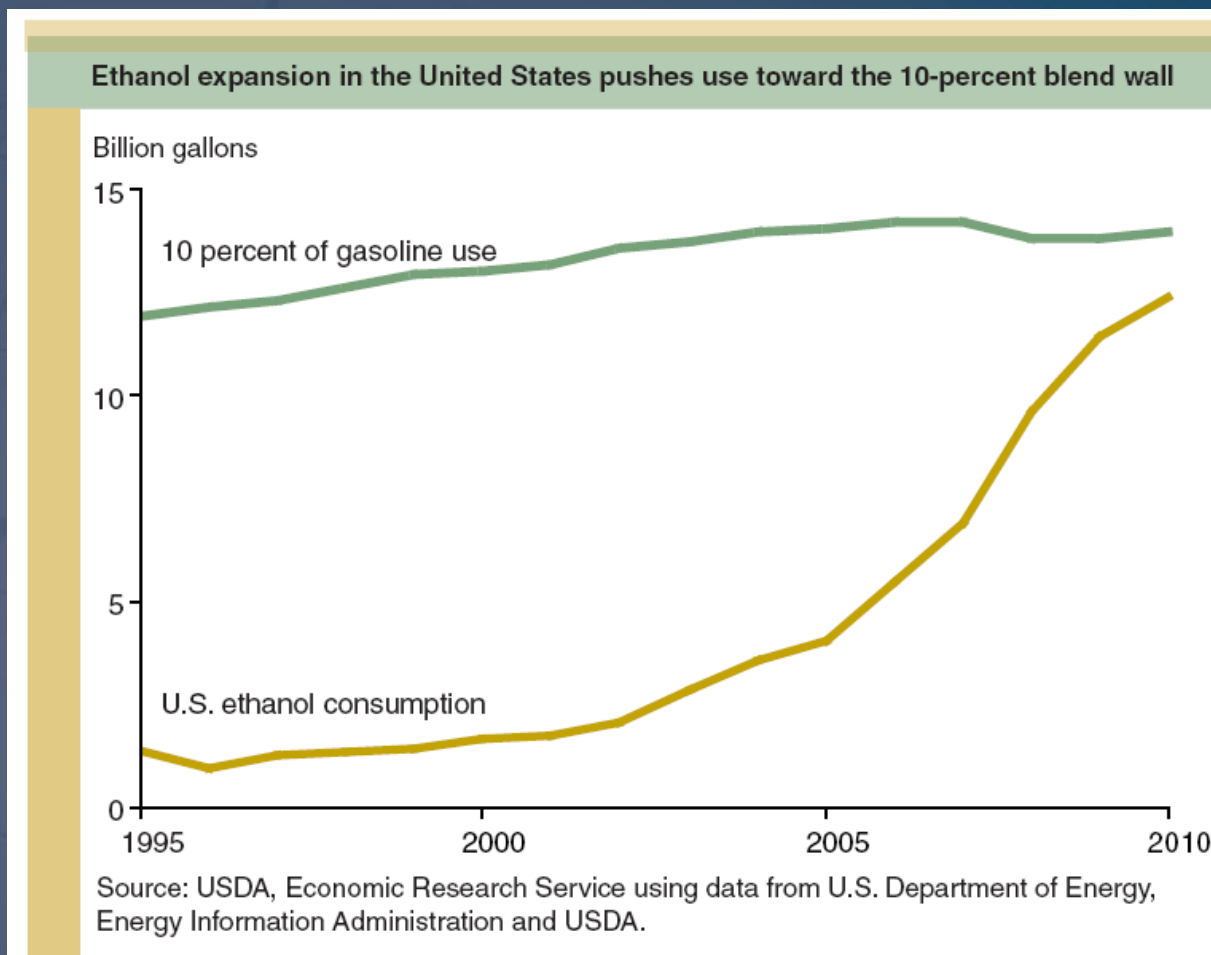
Despite Rapid Growth in Recent Years, Future Expansion Depends on ...

- Overcoming challenges of cellulosic feedstocks
- Expand Cellulosic Ethanol and E85 Demand
- Moving ethanol from major producing regions
- Refitting/Constructing E85 Fueling Stations
- Additional Demands on Rail, Truck and Barge
- Availability of local feedstocks year round

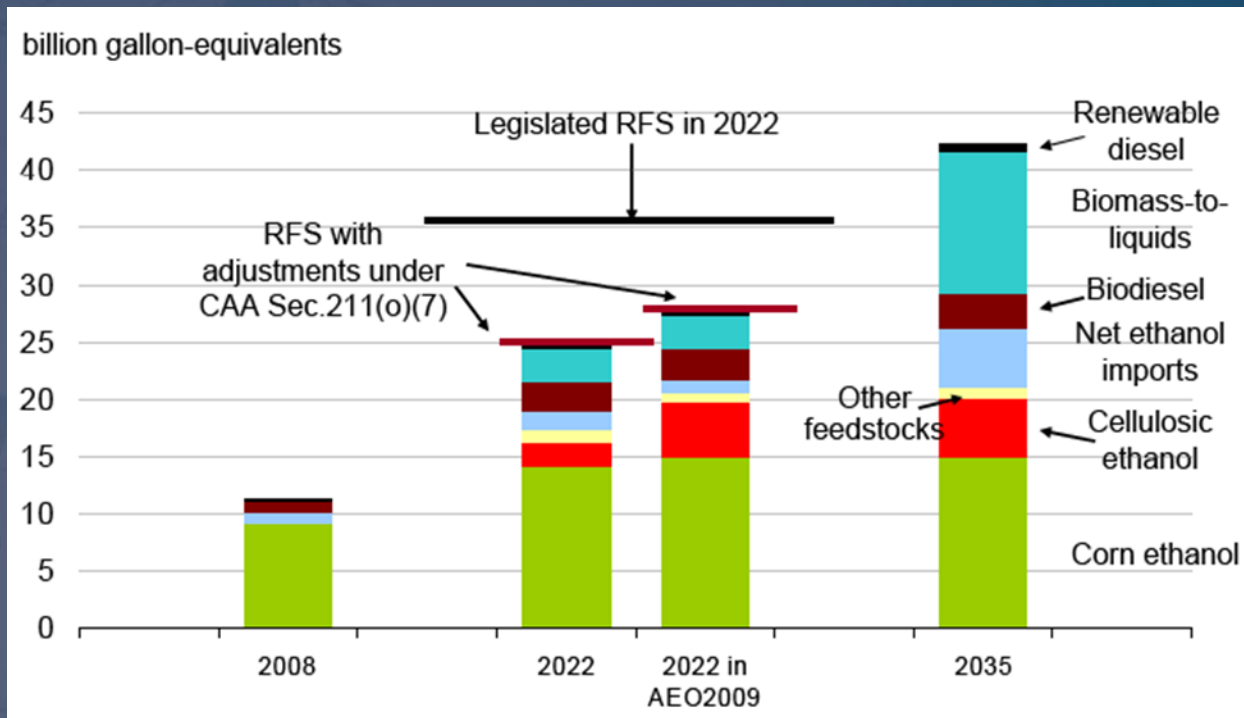
Seasonal production and mode

Crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Corn										Gravity Fed/Dump		
Rice									Gravity Fed / Dump			
Sorghum										Gravity Fed/Dump		
Winter Wheat					Gravity Fed / Dump							
Camelina			Gravity Fed / Dump									
Castor										Gravity Fed/Dump		
Flax						Gravity Fed / Dump						
Soybean									Gravity Fed / Dump			
Sunflower										Gravity Fed/Dump		
Winter Canola					Gravity Fed/Dump							
Sugarcane	Dump										Dump	
Kenaf										Flatbed		
Cotton										Flatbed (module trucks)		
Crop Residues	Flatbed					Flatbed						Flatbed
Miscanthus		Flatbed								Flatbed		
		Semi								Semi		
Switchgrass	Flatbed											Flatbed
	Semi											Semi
SRWC	Pole Frame / Dump Bed											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Ethanol Expansion Approaches E10 “Blend Wall”



U.S. Biofuels Are Not Projected to Reach 36 Billion by 2022 – Cellulosic Challenges?



Source: Annual Energy Outlook, 2010

Rural Development Issues

- Equipment not necessarily compatible
- Transportation Costs may limit effective range (yields per acre, sources, etc.)
- Economic Incentives may work where existing infrastructure can source feedstocks
- Size and density of plants
- Road deficiencies

Final Thoughts

- Can we develop regional Corn Ethanol Substitutes in Southeast
- Can we develop biomass given concerns over natural gas production?
- What about electricity as a fuel substitute?
- What are implications for rural economies?