



The Biofuel Industry in Southeast – The Implications on Transportation Systems

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THE STREET OF THE FUTURE IS A LIVABLE STREET

by CARLY CLARK and AARON NAPARSTEK

BEFORE **AFTER** **NOW WHAT?**



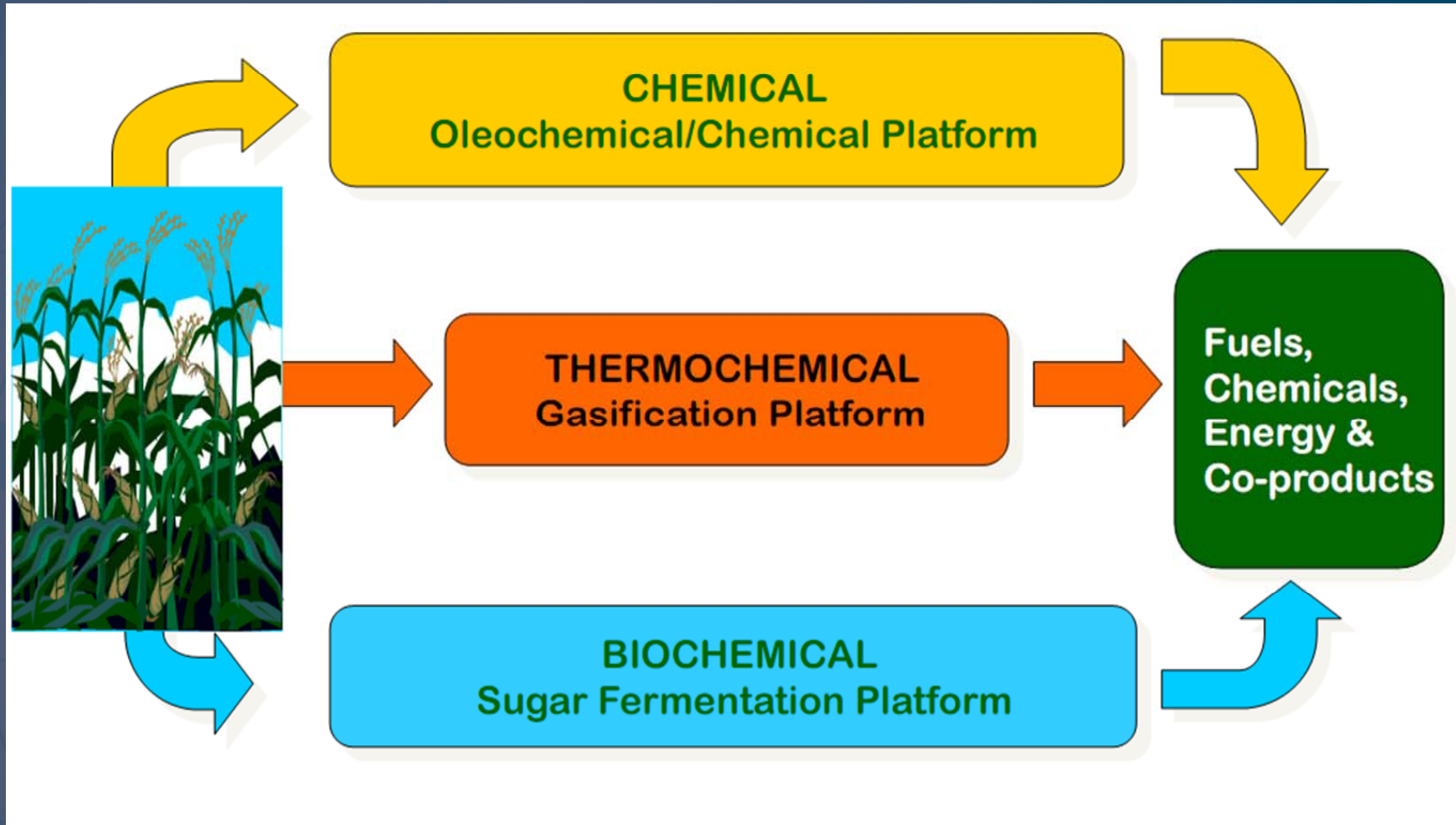
What is a Biofuel, BioMass?

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

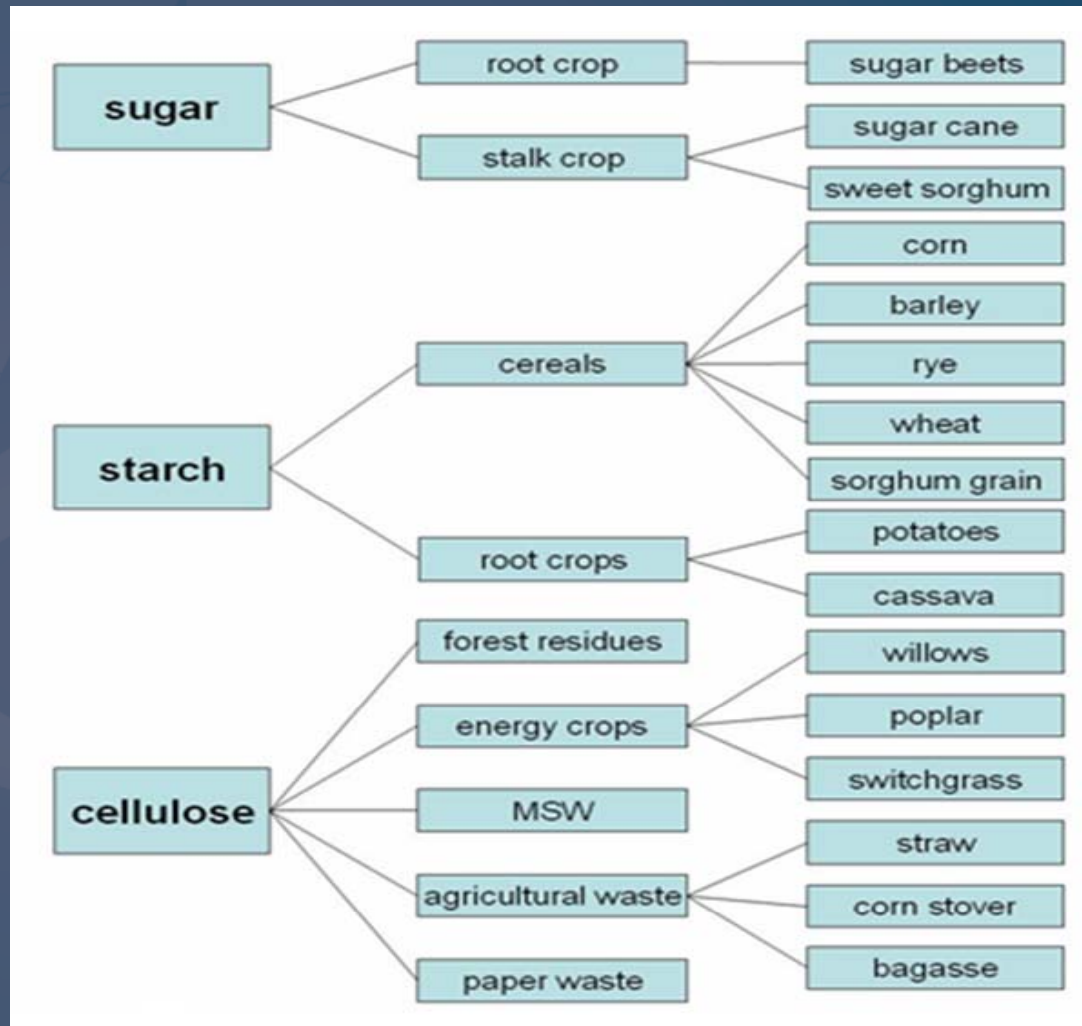
Factors Driving Growth in Biofuels

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

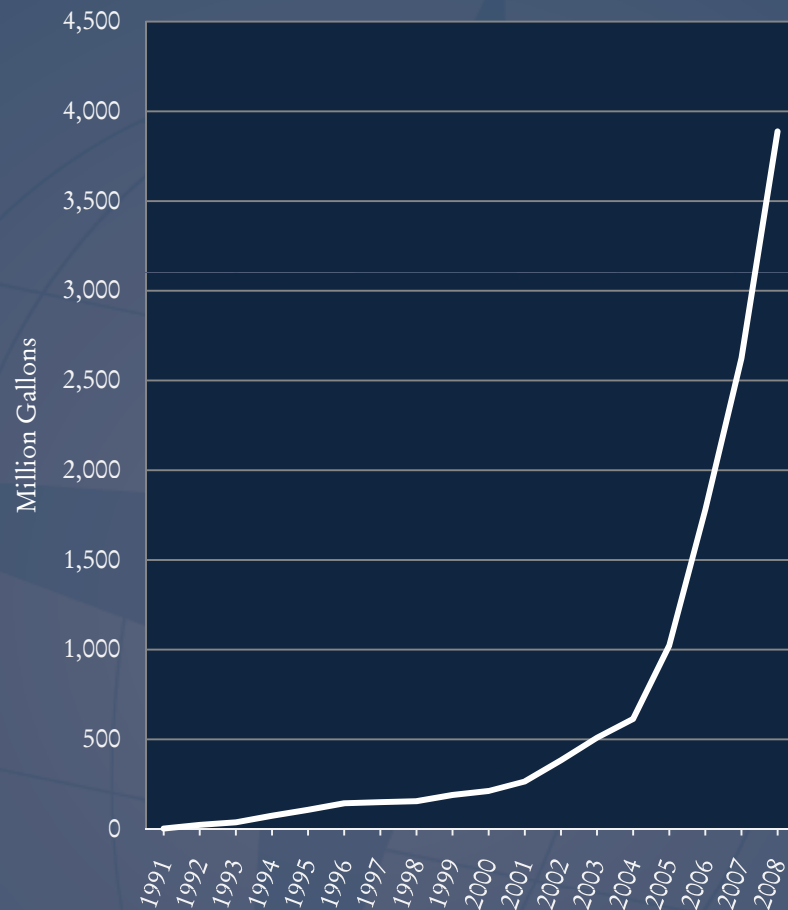
Processes and Biofuel Production



Sources of Biofuels in the Southeast

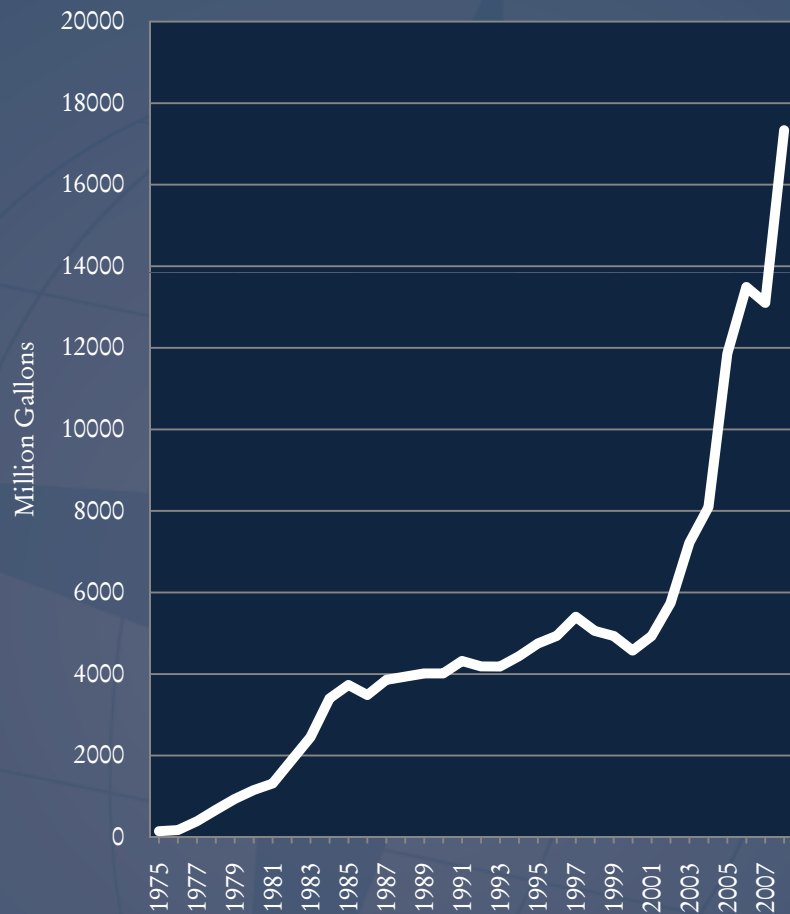


World Biodiesel Production (1975-2008)



- 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

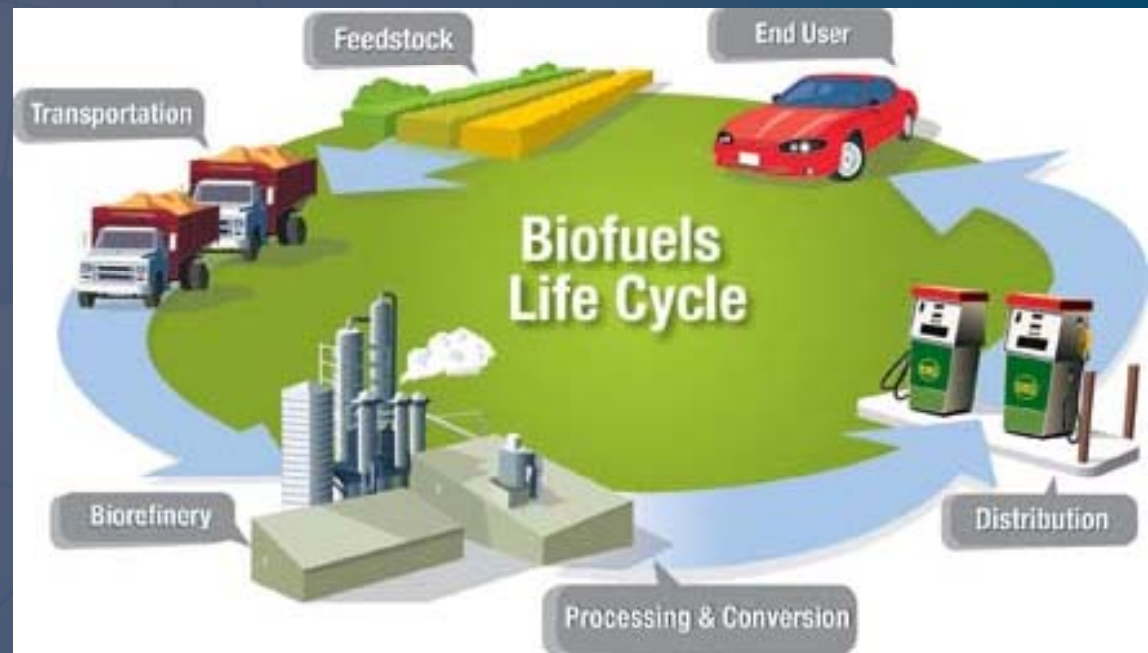
Federal Policies

- 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

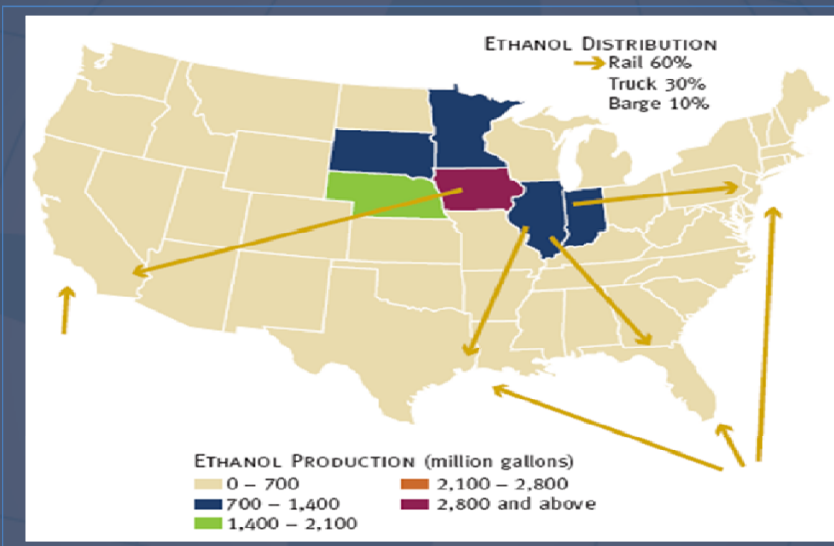
At each point:

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

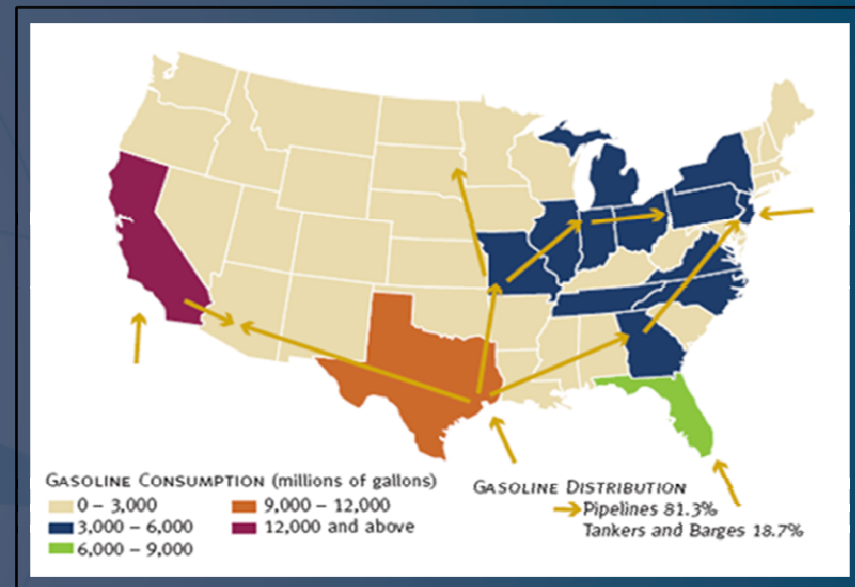


Current Production and Distribution

Ethanol



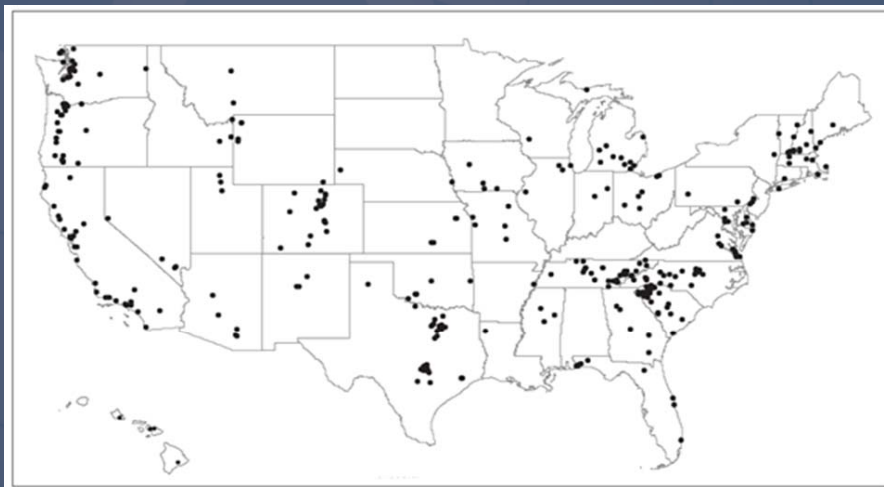
Petroleum



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 ...

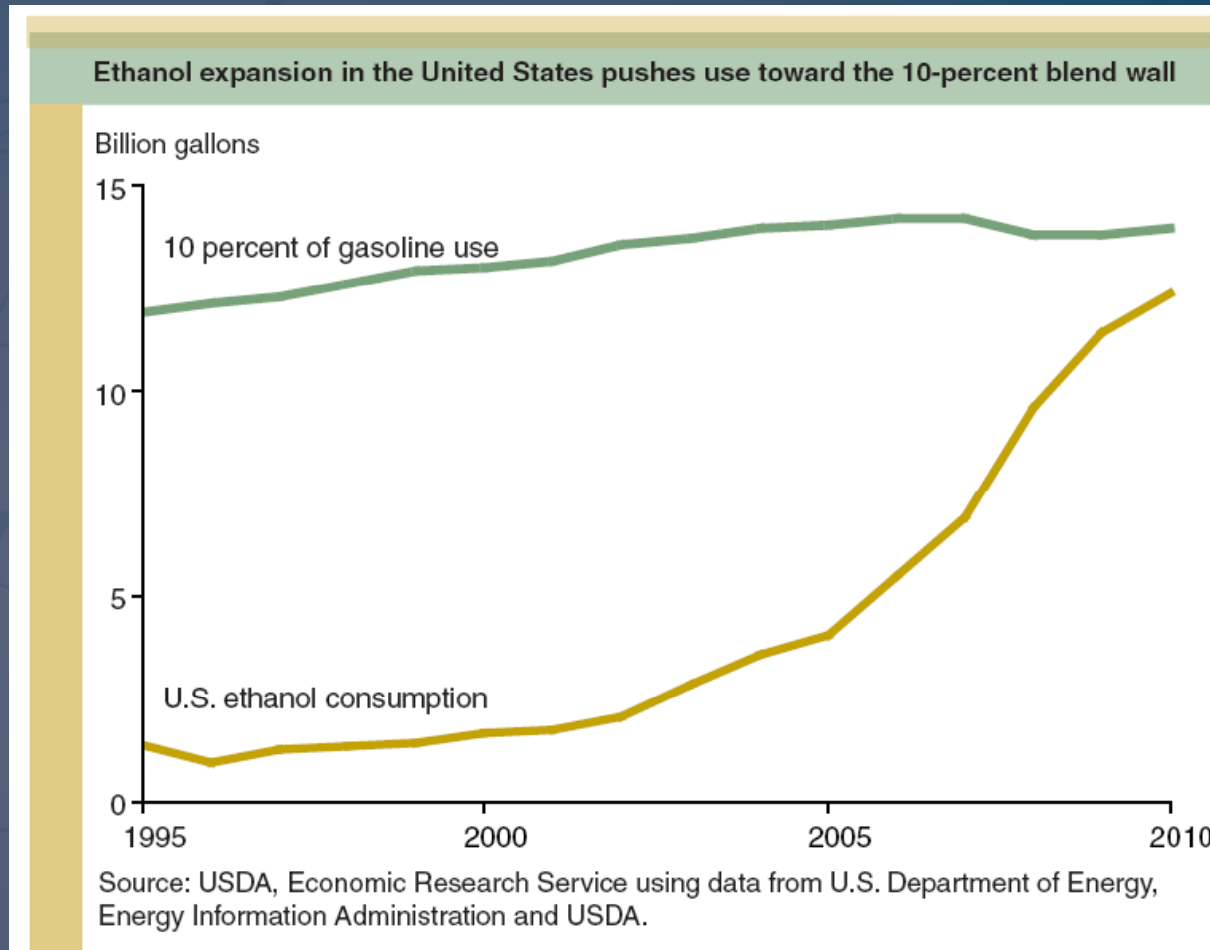
- Overcoming challenges of cellulosic feedstocks
- Expand Cellulosic Ethanol and E85 Demand
- Moving ethanol from major producing regions
- Refitting/Constructing E85 Fueling Stations
- Additional Demands on Rail, Truck and Barge
- Availability of local feedstocks year round

Seasonal production and mode

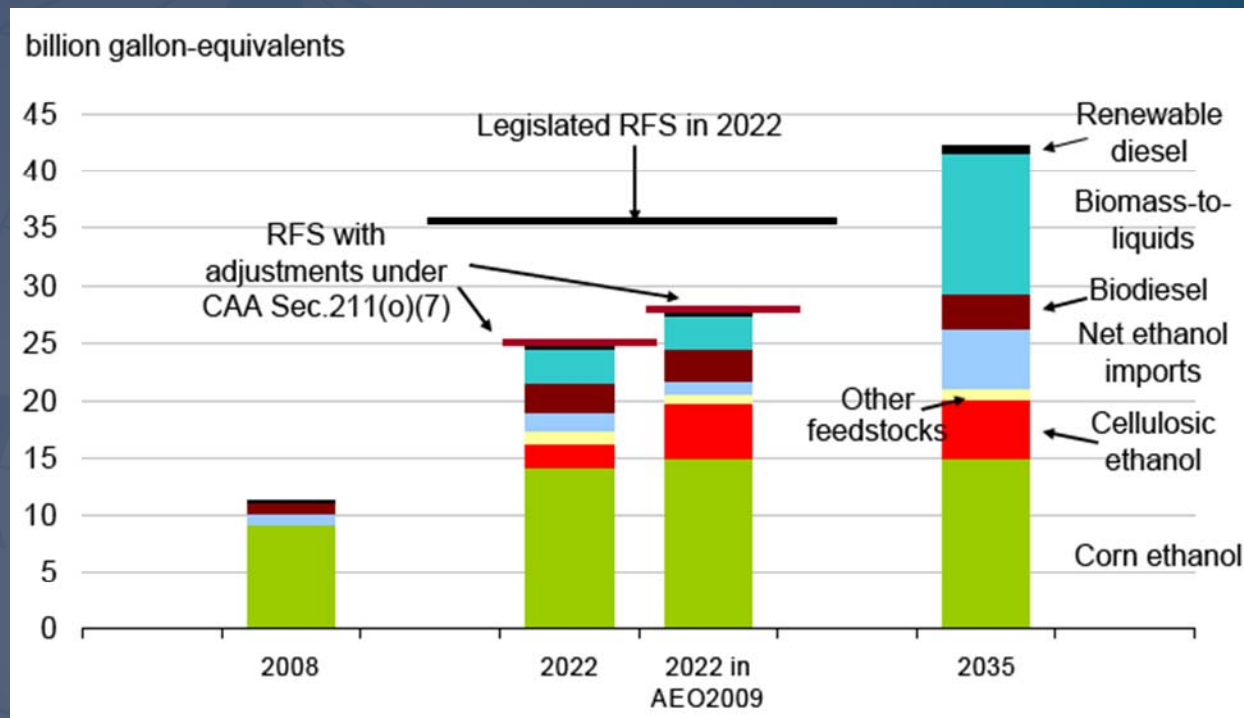
Crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Corn										Gravity Fed/Dump		
Rice									Gravity Fed / Dump			
Sorghum										Gravity Fed/Dump		
Winter Wheat					Gravity Fed / Dump							
Camelina			Gravity Fed / Dump									
Castor										Gravity Fed/Dump		
Flax						Gravity Fed / Dump						
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

Source: StrataG

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?