

# Today's U.S Ethanol Industry

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# Today's Transportation Fuels

- ▶ Gasoline - 140 billion gallons
- ▶ Diesel - 45 billion gallons
- ▶ E85 - 150 million gallons (2008 est.)
  
- ▶ Ethanol as an additive (E-10)
  - ~9 billion gallons in 2008
  - Extends Gasoline - blended in nearly 60% of gasoline
  - Adds 510,000 barrels of supply daily (January 2008, EIA data)



# U.S. Gasoline Demand

Gasoline Stream	July 2006	July 2007
Conventional	4,996	4,746
Conventional w/ Ethanol	1,409	1,702
RFG w/ Ethanol	3,096	3,123
RFG no Ethanol	74	53
Totals	9,585	9,624

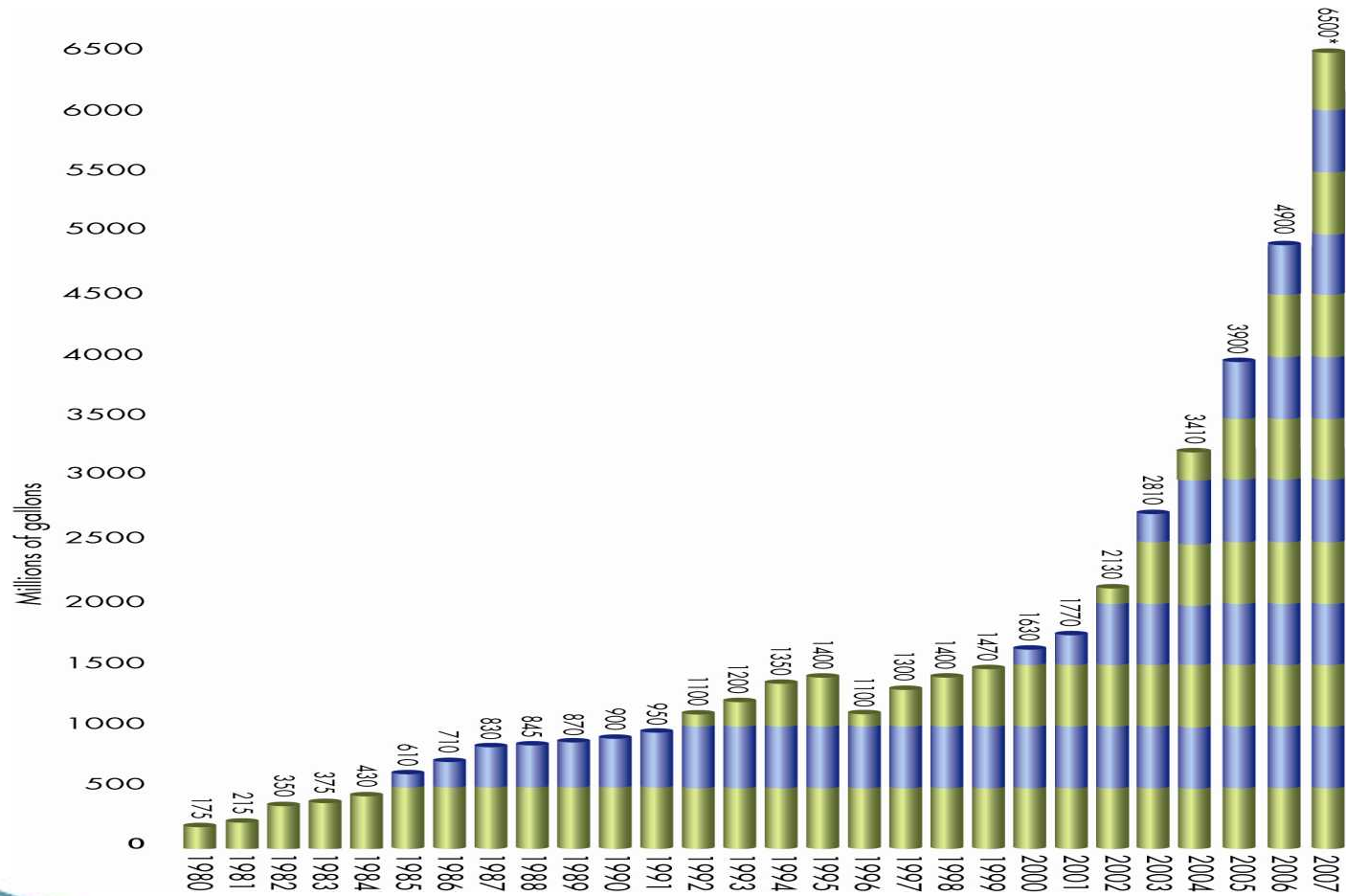
• JJ&A EIA Oxygenates- Gasoline Data for July 2007

# U.S. Ethanol Industry Today

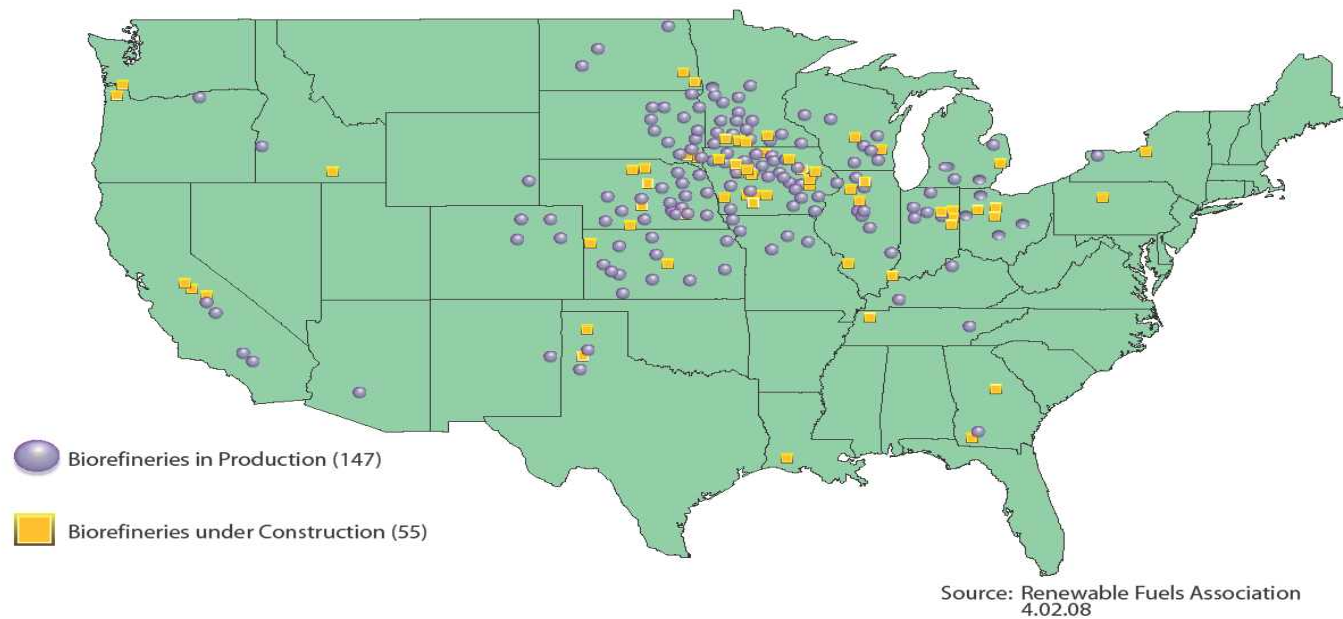
- ▶ Annual production capacity of 8.5bgy  
Actual 2007 production of 6.5 bgy
- ▶ 145 plants in 24 states (April 2008)
- ▶ 62 plants under construction and planned expansions, will increase industry capacity by an additional 5 bgy (April 2008)

Source: RFA

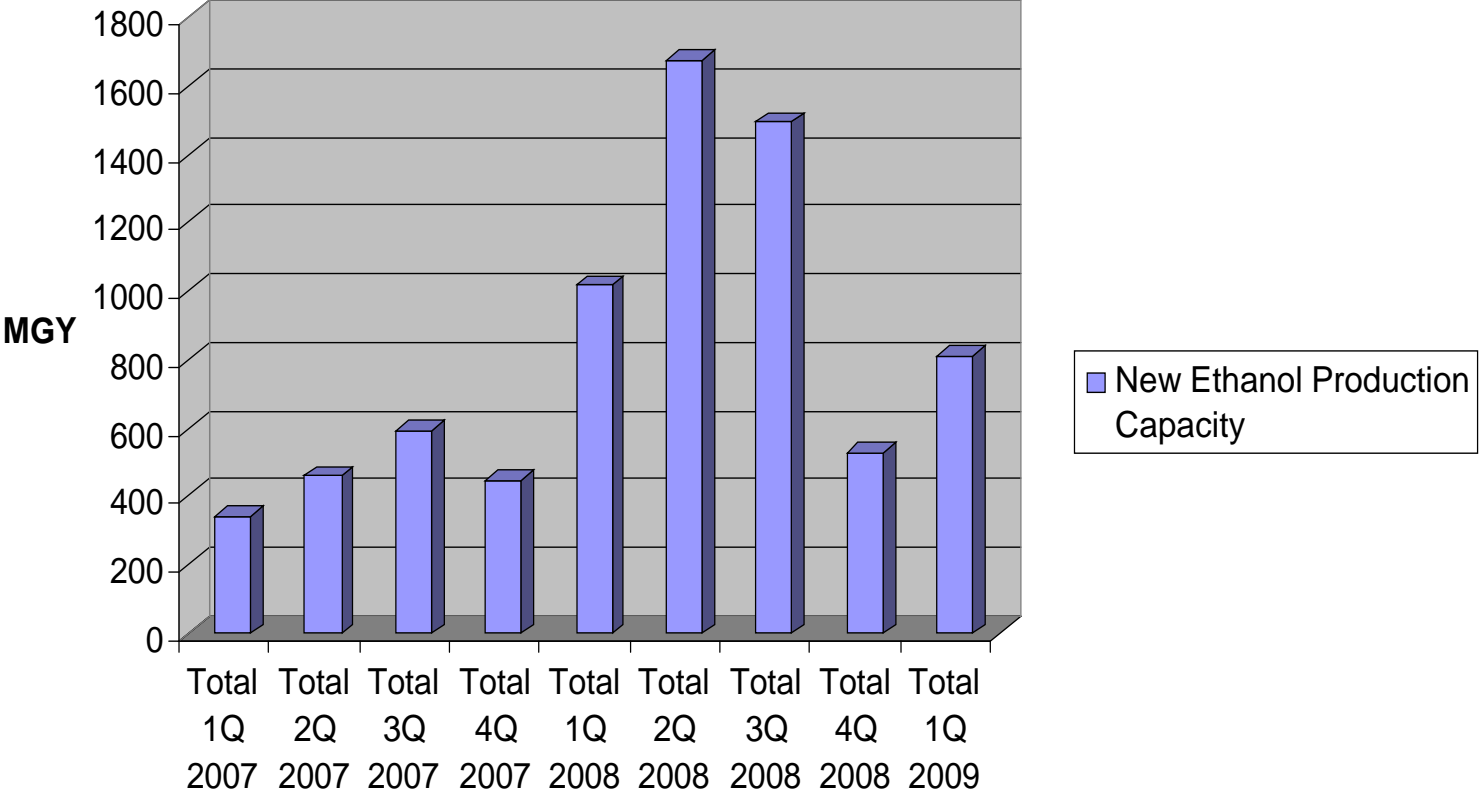
# U.S. Ethanol Production 1980 - 2007



# U.S. Ethanol Biorefinery Locations



### New Ethanol Biorefinery Construction Capacity



# Nationwide Economic Benefits of Ethanol Demand in 2007

- ▶ Added \$47.6 billion to gross output
- ▶ Created 238,000 jobs in all sectors of the economy – 46,000 in the manufacturing sector alone.
- ▶ Increased economic activity and new jobs from ethanol increased household income by \$12.3 billion, money that flows directly into American consumers' pockets
- ▶ Contributed \$4.6 billion of tax revenue for the Federal government and \$3.6 billion for State and Local governments
- ▶ Reduced imports by 228 million barrels of oil, valued at \$16.5 billion or \$45 million a day

Source: "Contribution of the Ethanol Industry to the Economy of the United States," LECG, LLC, February 2008





# Energy Independence and Security Act of 2007

- ▶ Requires the use of 36 billion gallons of renewable fuels annually by 2022
- ▶ Requires that 16 billion of the 36 billion gallons goal must come from ethanol produced from cellulosic feedstocks
- ▶ Creates greenhouse gas emission reduction requirements for alternative fuels
- ▶ Amends the Petroleum Marketers Act to prohibit discrimination against E85 infrastructure
- ▶ Calls for the federal study of an ethanol pipeline



## NEW RENEWABLE FUELS STANDARD SCHEDULE

Year	Renewable Biofuel	Advanced Biofuel	Cellulosic Biofuel	Biomass-based Diesel	Undifferentiated Advanced Biofuel	Total RFS
2008	9.0					9.0
2009	10.5	.6		.5	0.1	11.1
2010	12	.95	.1	.65	0.2	12.95
2011	12.6	1.35	.25	.8	0.3	13.95
2012	13.2	2	.5	1	0.5	15.2
2013	13.8	2.75	1		1.75	16.55
2014	14.4	3.75	1.75		2	18.15
2015	15	5.5	3		2.5	20.5
2016	15	7.25	4.25		3.0	22.25
2017	15	9	5.5		3.5	24
2018	15	11	7		4.0	26
2019	15	13	8.5		4.5	28
2020	15	15	10.5		4.5	30
2021	15	18	13.5		4.5	33
2022	15	21	16		5	36

# Economic Impacts of 36 Billion Gallon RFS (2007 dollars)

- ▶ Add more than \$1.7 trillion to the Gross Domestic Product between 2008 and 2022;
- ▶ Generate an additional \$436 billion of household income for all Americans between 2008 and 2022;
- ▶ Support the creation of as many as 1.1 million new jobs in all sectors of the economy by 2022;
- ▶ Generate \$209 billion in new Federal tax receipts; and,
- ▶ Improve America's energy security by displacing 11.3 billion barrels of crude oil between 2008 and 2022 and reduce the outflow of dollars to foreign oil producers by \$817 billion between 2008 and 2022.



# Infrastructure Needs for Expanding Ethanol Supplies

- ▶ Transportation

  - Expanded Truck access
  - Expanded Rail access
  - Expanded Barge access

- ▶ Terminals

  - 1352 terminals in US Petroleum and Chemicals

- ▶ Ethanol is clean non toxic product, easy storage commodity





# Sewaren, New Jersey Ethanol Terminal





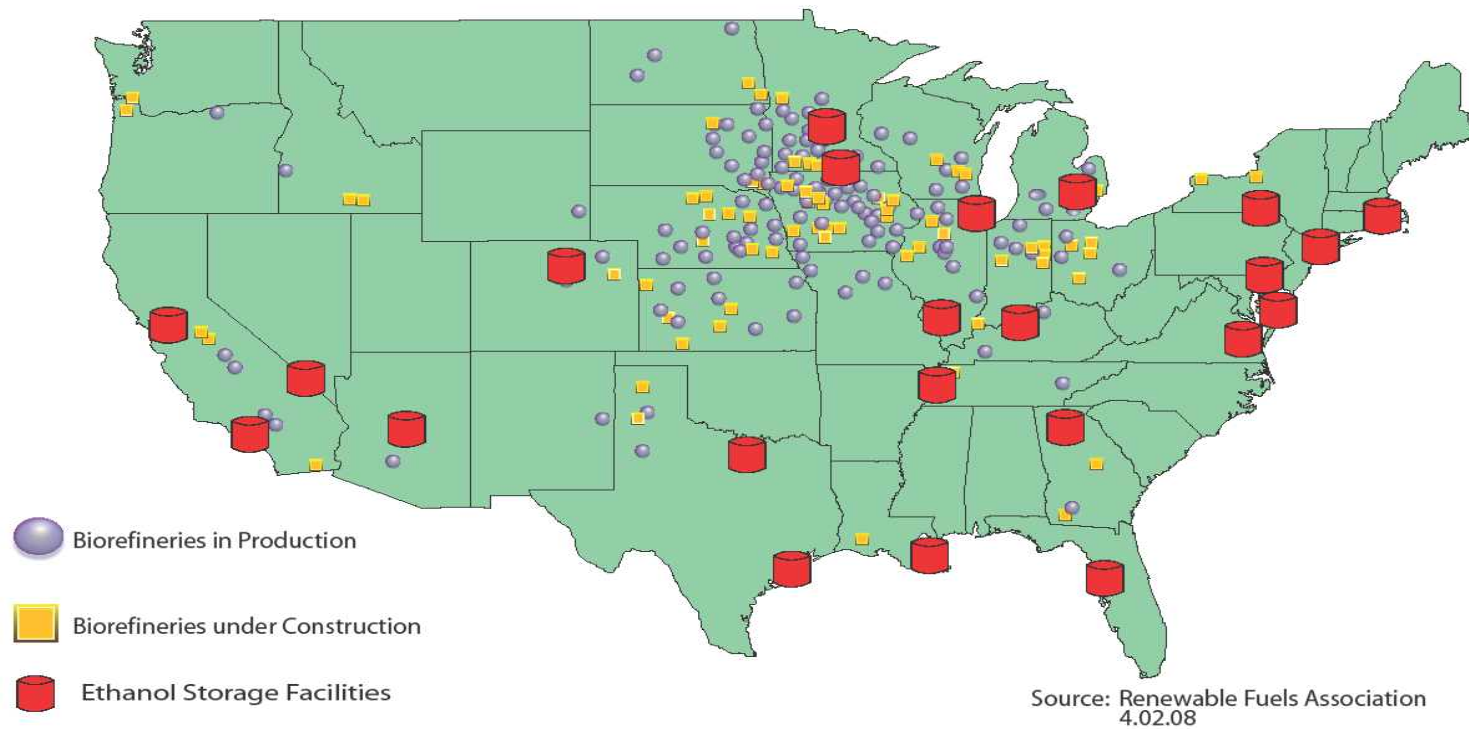
# Sewaren, New Jersey Ethanol Terminal



# Sewaren, New Jersey Ethanol Terminal



# Major Ethanol Storage Terminals





# Ethanol Terminal Development

- ▶ Motiva
- ▶ Kinder Morgan
- ▶ US Development
- ▶ Magellan
- ▶ Exxon-Mobil
- ▶ Marathon
- ▶ Sunoco
- ▶ Numerous Smaller Terminals



# What it takes to keep product moving..

Transportation is 3<sup>rd</sup> Highest Cost at a Plant

Typical Ethanol Plant capacity:  
100 Million Gal./ Year

- Logistics needs per year
  - 3448 railcars of Fuel Ethanol  
10 tank cars per day
  - 9867 railcars of Corn  
60% by Rail, 17 railcars per day
  - 3048 railcars of DDGs  
9 hopper cars per day

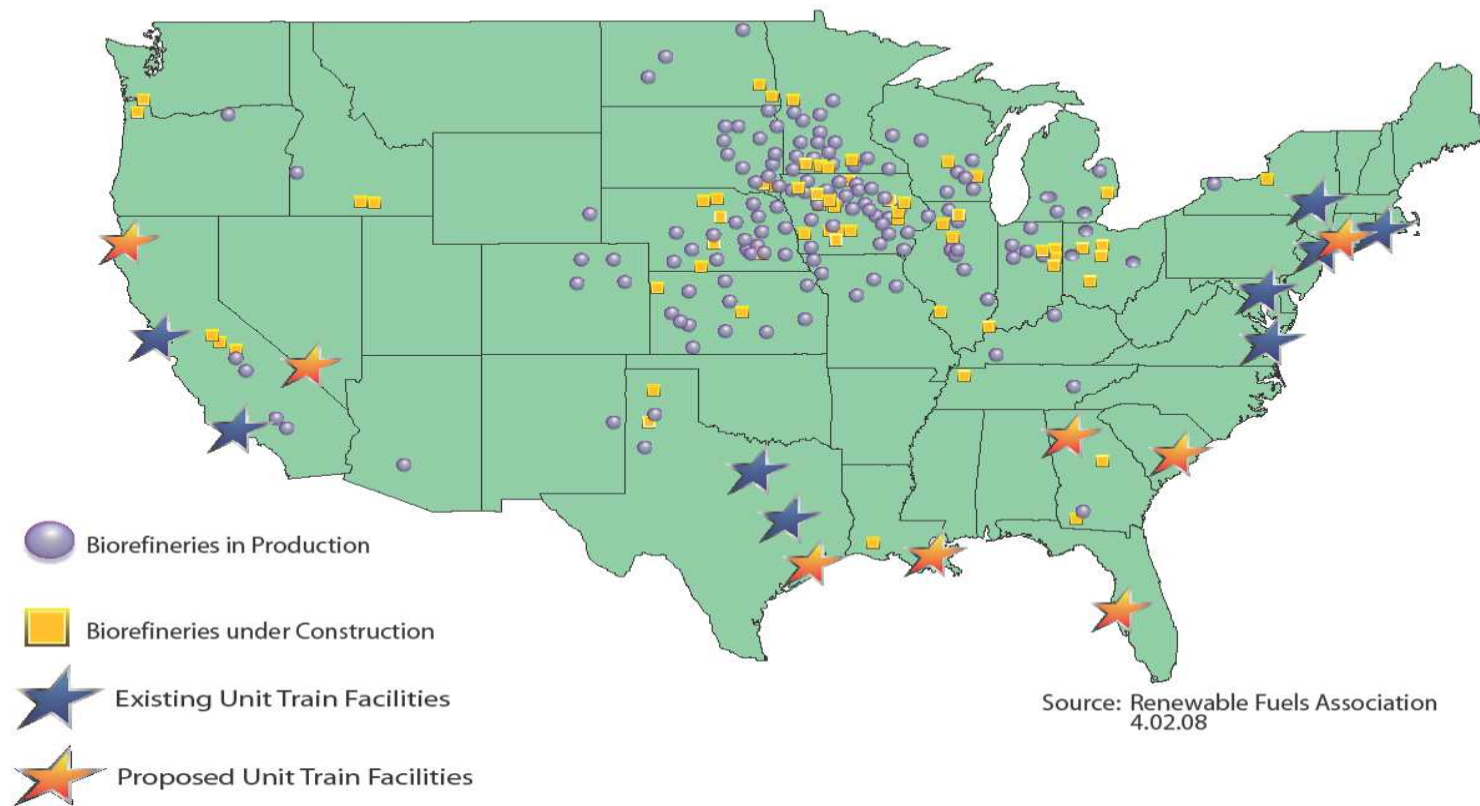


# The Virtual Pipeline

- ▶ Ethanol in Unit Trains  
“Ethanol Express”  
Based on coal unit train success
- ▶ Shipment volumes ~3 million gallons  
Similar to traditional pipeline movements
- ▶ Single trains consisting of 65, 75, 95 ethanol cars  
Unit Train building sites expanding
- ▶ Origination in Midwest- Destination all coasts



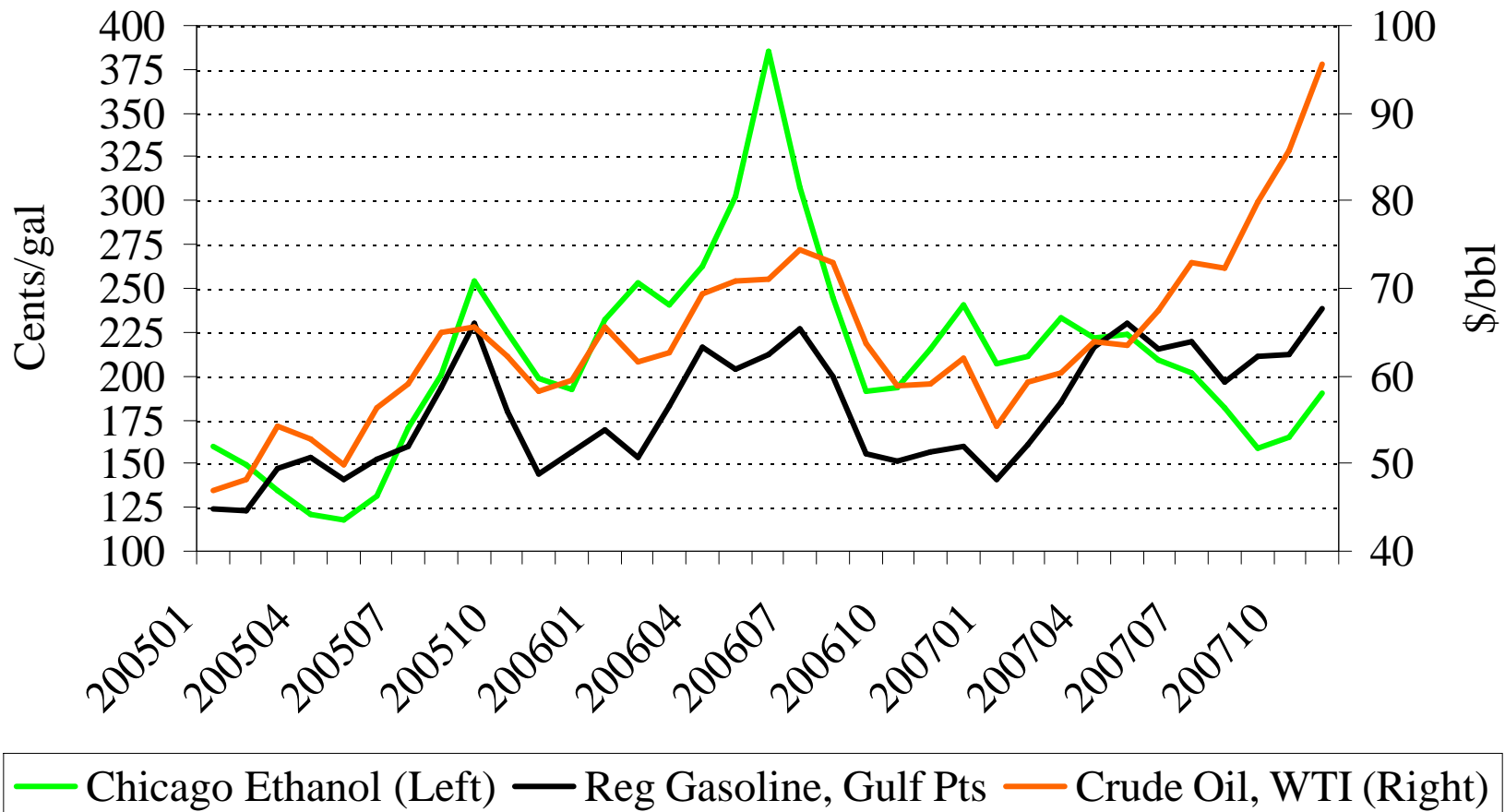
# Unit Train Locations



# Real Market Impacts of Increased Ethanol Use



# Spot Market Ethanol, Gasoline, and Crude Oil Prices



Source: OPIS; EIA. November 2007 to date

# Reducing Oil Dependence

- ▶ “The slowing economy combined with high petroleum prices is expected to constrain growth in U.S. consumption of liquid fuels and other petroleum products to just 40,000 barrels per day (bbl/d) in 2008. After accounting for increased ethanol use, U.S. petroleum consumption falls by 90,000 bbl/d.”

• Source: EIA



# Displacing Gasoline Demand, Imports

- ▶ Bill Day, a spokesman for Valero Energy Corp, the largest U.S. oil refiner, said his company foresees ethanol growth "offsetting gasoline imports to the U.S."

Source: "Ethanol boom may stifle U.S. gasoline demand," *Reuters*, 2.14.08.





# Saving Consumers Money at the Pump

- ▶ “Today, ethanol is substantially less expensive than gasoline. That is why it is being blended for economic reasons...And today, our national average base, it is just a nickel a gallon if you do the math of 10 percent times the 40- or 50-cent difference.”
- ▶ “Today, ethanol is substantially less expensive than gasoline. That is why it is being blended for economic reasons. If you are a distributor and you are looking at 40 or 50 cents less, you are going to blend it.”

Source: Press conference by Dr. Mark Cooper, Research Director at the Consumer Federation of America, National Press Club, March 26, 2008.



# Keeping Oil and Gas Prices Lower

- ▶ “Merrill Lynch commodity strategist Francisco Blanch says that oil and gasoline prices would be about 15% higher if biofuel producers weren't increasing their output. That would put oil at more than \$115 a barrel, instead of the current price of around \$102. U.S. gasoline prices would have surged to more than \$3.70 a gallon, compared with an average of a little more than \$3.25 today.”

Source: “As Biofuels Catch On, Next Task Is to Deal With Environmental, Economic Impact,” *Wall Street Journal*, March 24, 2008

