# Overview of U.S. Ethanol Program and the Energy Policy Act of 2005

## MISSISSIPPI BIOMASS COUNCIL

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# U.S. Ethanol Industry

- After more than 5 years of deliberation, the Renewable Fuels Standard has been established!
- For the first time ever, a course has been charted that ensures sustained ethanol development. Not Goals, Not Targets, but *Mandated, Required* levels of ethanol use.
- Focus of this presentation is to look at where we have been, where we are now, and where we are going.

# Looking Back

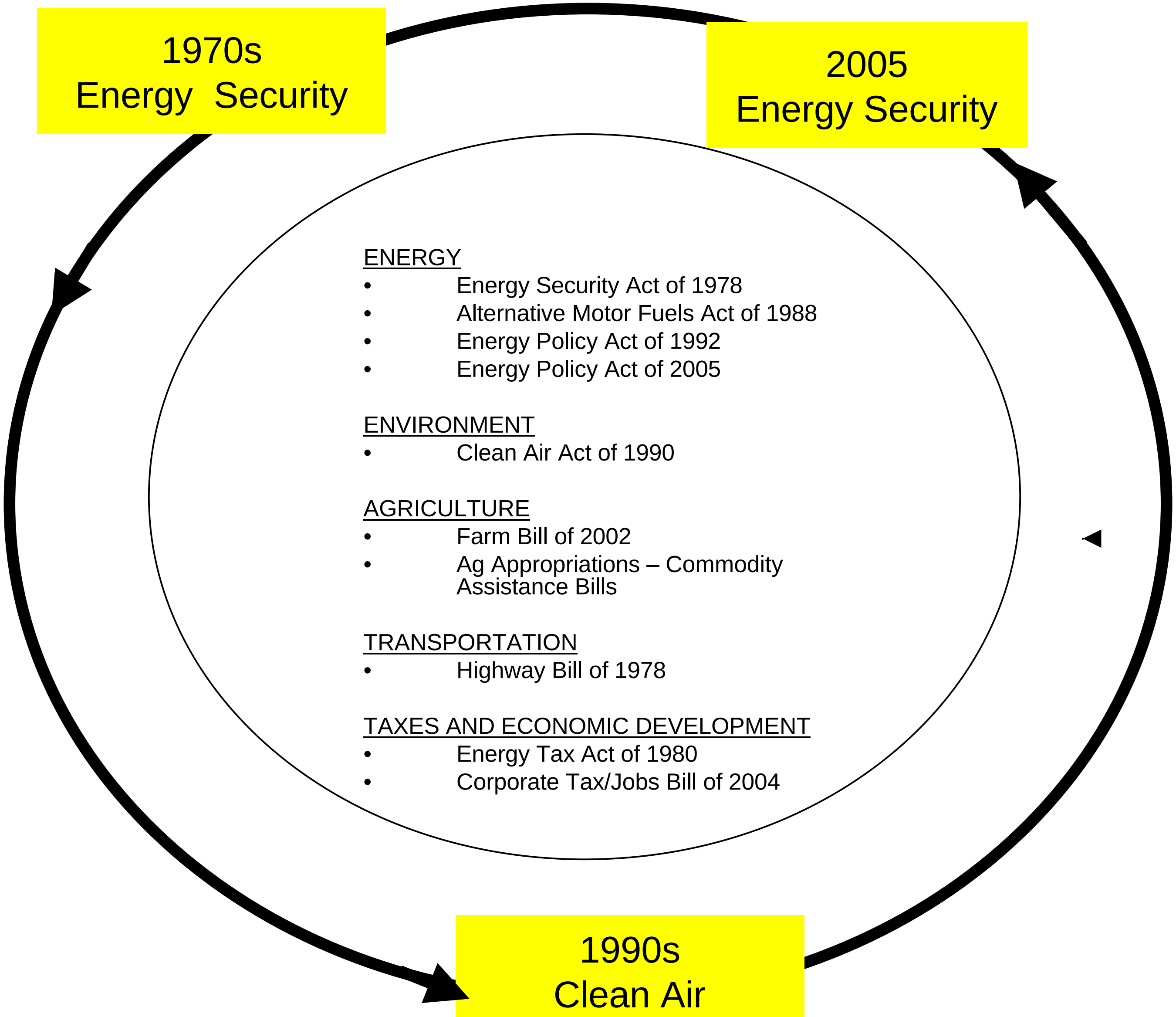
- As recently as 8 years ago ethanol was nearly legislated out of existence.
- As recently as 3-4 years ago ethanol was struggling to remain a viable component of clean air programs and was getting trounced in the market by MTBE.
- As recently as 3 years ago we saw prices so low as to threaten the operation of several plants, and raise serious doubts as to long term survival.
- Those days are gone.

# U.S. Ethanol Industry

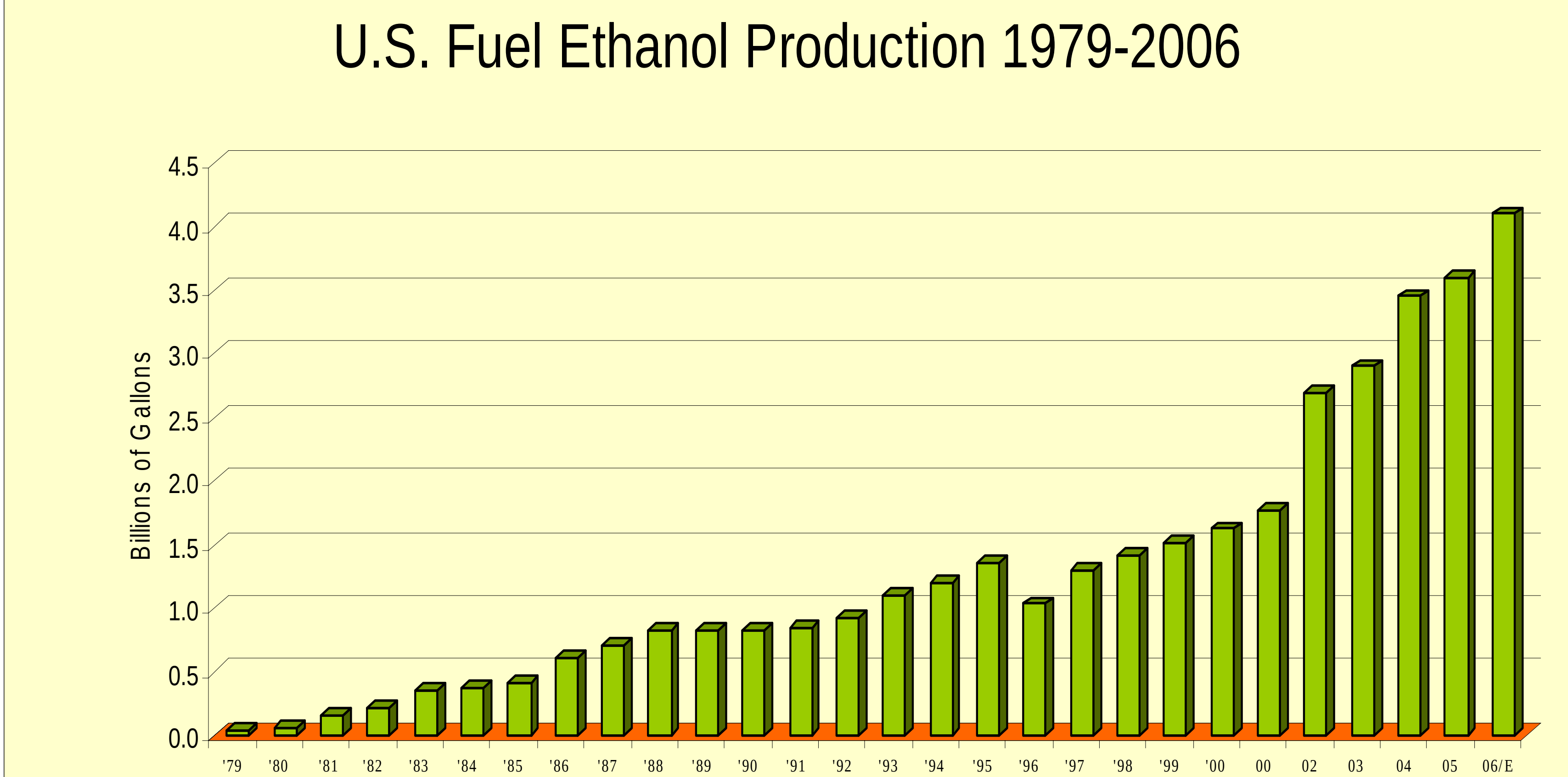
- In just a few short years, the U.S. ethanol industry has:
  - Expanded at an unprecedented rate;
  - Grown from less than 30 plants to nearly 100;
  - Extended its partial tax exemption;
  - Seen its competitor MTBE all but eliminated;
  - Established a guaranteed market for the next 7 years;
  - Been given highest priority for cellulose and biomass development;
  - Become the darling of politicians at all levels;
  - Become a *major* force in Energy Policy and American politics.

How did this happen?

# Ethanol has Come Full Circle

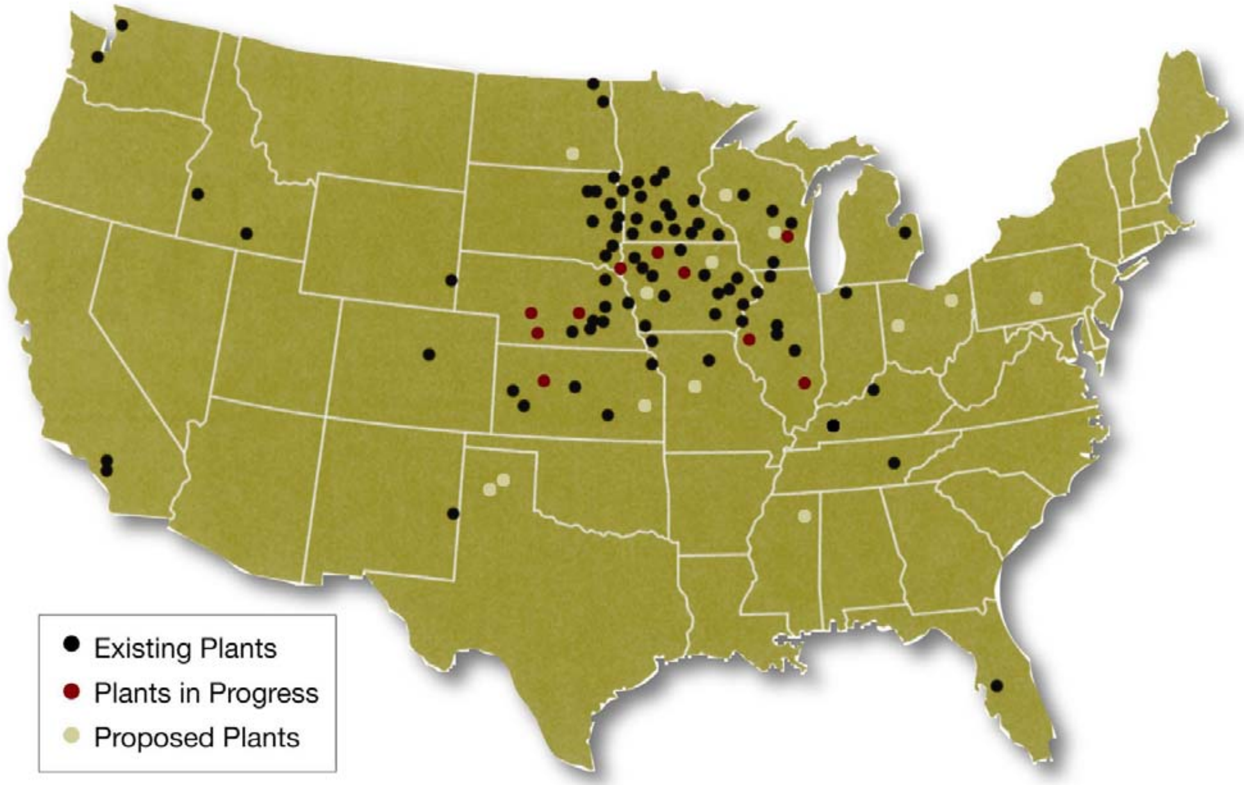


# Despite Lack of Consistency in Approach, Growth Continued




*Source: Clean Fuels Development Coalition*

# U.S. Ethanol Plants




95 operating facilities – 4.1 BGPY capacity
800+ MGPY on-line in 2006
22 under construction/expansion
1.4 BB corn or 12% U.S. crop

*Source: Clean Fuels Development Coalition*

# How to Get More “Dots on the Map”

## Lessons Learned From 20+ Years of Incentives

- Tax Incentives lifeblood of industry:
  - Successful in making ethanol competitive
  - Critical element of project financing

BUT………………….

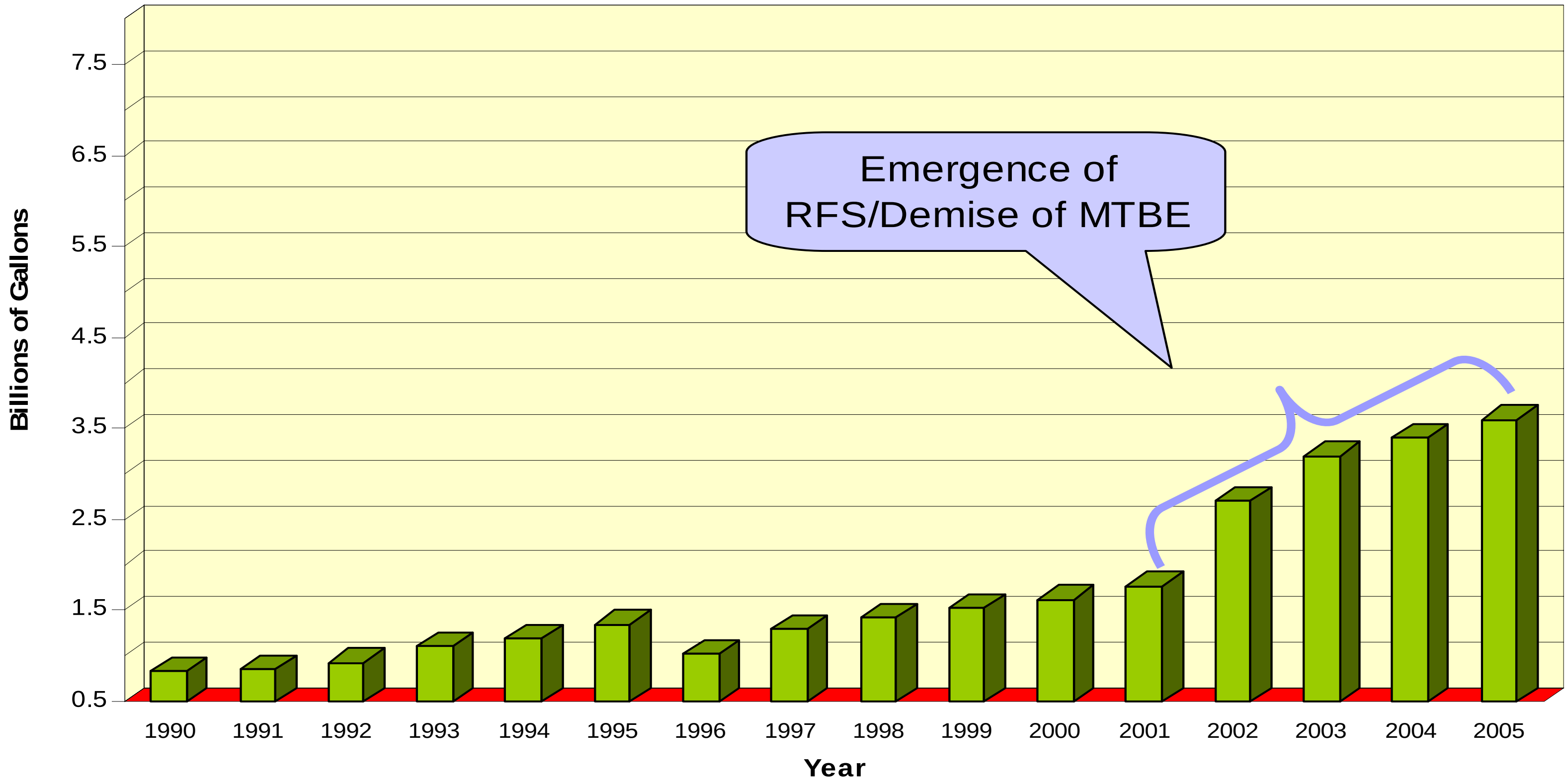
- Economics alone insufficient market driver -- ethanol price swings too volatile.
- Most effective incentives tied to market assurance.
- Tax incentives never drove market like assured demand.

# Clean Air Programs Not Sustainable as Demand Driver

- Despite significant success……….
  - Too many issues associated with oxygenates;
  - Intense opposition by oil industry;
  - Improved auto technology;
  - Advances in fuel technology.

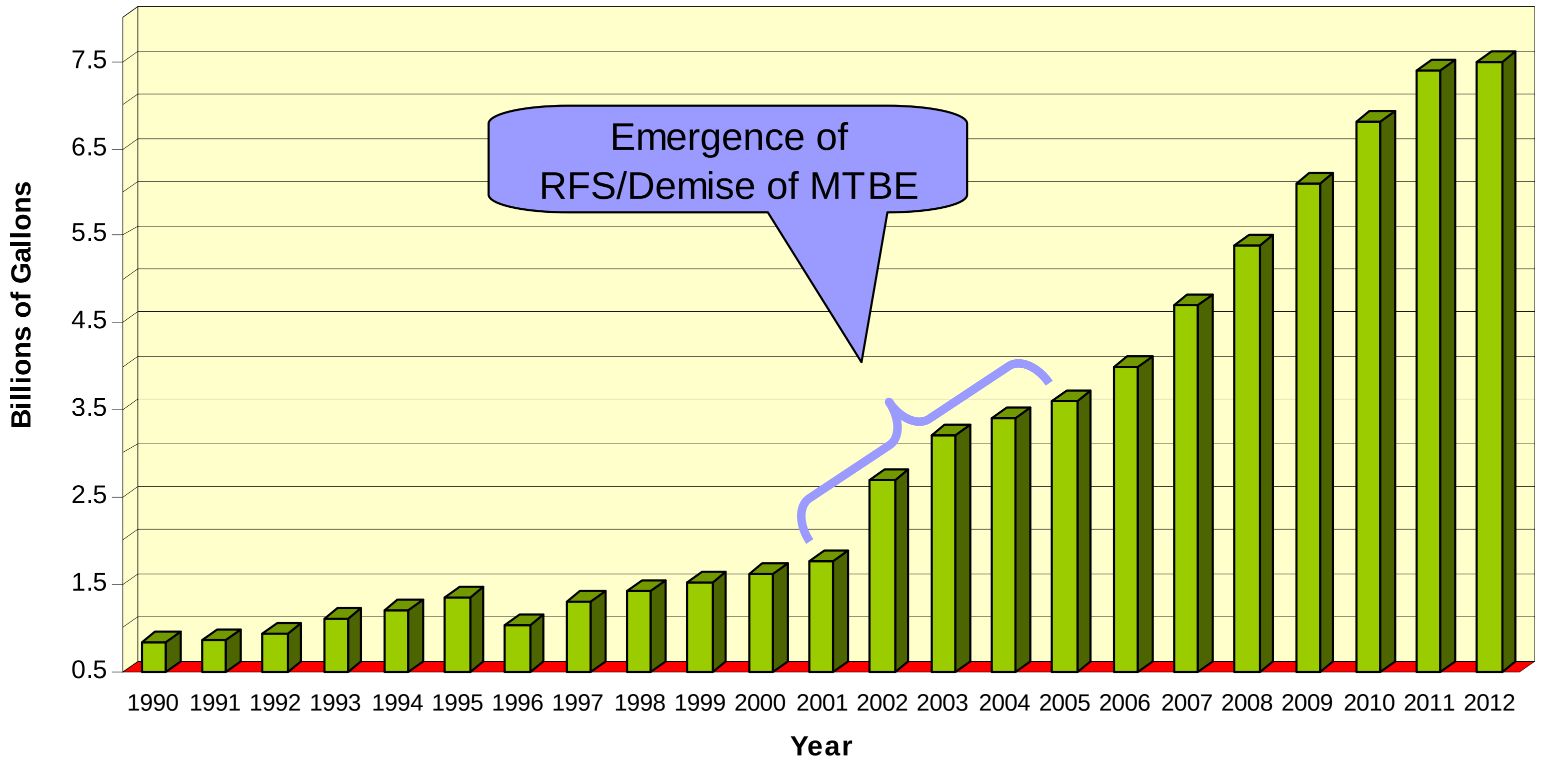
Back to the drawing board?

# Most Aggressive Period of Growth
# Results of Market Assurance




*Source: Clean Fuels Development Coalition*

# New Legislation Captures Growth of 2001-2006




*Source: Clean Fuels Development Coalition*

# Establishment of the Renewable Fuels Standard (Section 1501)

- Legislation establishes the RFS at the following levels:
  2006 - 4.0 billion gallons
  2007 - 4.7 billion gallons
  2008 - 5.4 billion gallons
  2009 - 6.1 billion gallons
  2010 - 6.8 billion gallons
  2011 - 7.4 billion gallons
  2012 - 7.5 billion gallons

- Required amount in 2013 to be determined, but not less than that used in 2012.

- Eliminates oxygen in RFG.

# RFS Details

- Regs expected in January 2007, program to be governed by EPA.
- Subsequent years refiner requirement determined by gasoline ÷ ethanol (approx. 3 percent).
- Use above base amount results in accumulation of credits – a gallon of ethanol/biodiesel = 1 credit.
- Credits are transferable/saleable.
- Initially designed to ease refiner compliance:
  - Refiner could conceivably meet obligation without any “wet” gallons.

# Credits as a Tool to Help Cellulose to Ethanol

- 2.5 to 1 value.

- Cellulosic biomass ethanol is defined as that which is produced from:
  - Dedicated energy crops and trees;
  - Wood and wood residues;
  - Plants and grasses;
  - Agricultural residues;
  - Fibers;
  - Animal wastes and other waste materials;
  - Municipal solid waste.

- Process heat provision (substitution of fossil fuel as process heat allows grain based to equal cellulose).

# Financial Assistance Programs

DOE/USDA/EPA charged with a significant push for cellulosic ethanol (Title 15 of Energy Bill):

- Advanced Biofuels Technologies Program – 4 Paths (EPA).
- CB and MSW Loan Guarantees.
- Conversion assistance for CB.
- Sugar Ethanol Programs.

Total over $1.5 billion!

# Tax Related Provisions

- VEETC passed previously.
- 30%/$30K refueling credit (E-85).
- Biodiesel tax credit.
- Extends Small Producer Credit to 60 MGPY.

# Transition to RFS Has Far Reaching Implications

- Changes ethanol’s role as an *environmental* tool.
- Allows ethanol to be used, but doesn’t force it.
- *Changes, not eliminates:*
  - CO programs continue;
  - GHG remains of interest;
  - Low sulfur;
  - Clean octane – aromatic and benzene restrictions.

# Implications (Continued)

- Eliminating oxygen standard frees up oil companies to make choices.

- Could have significant impact on *where* ethanol is used, e.g., how much will remain in California?

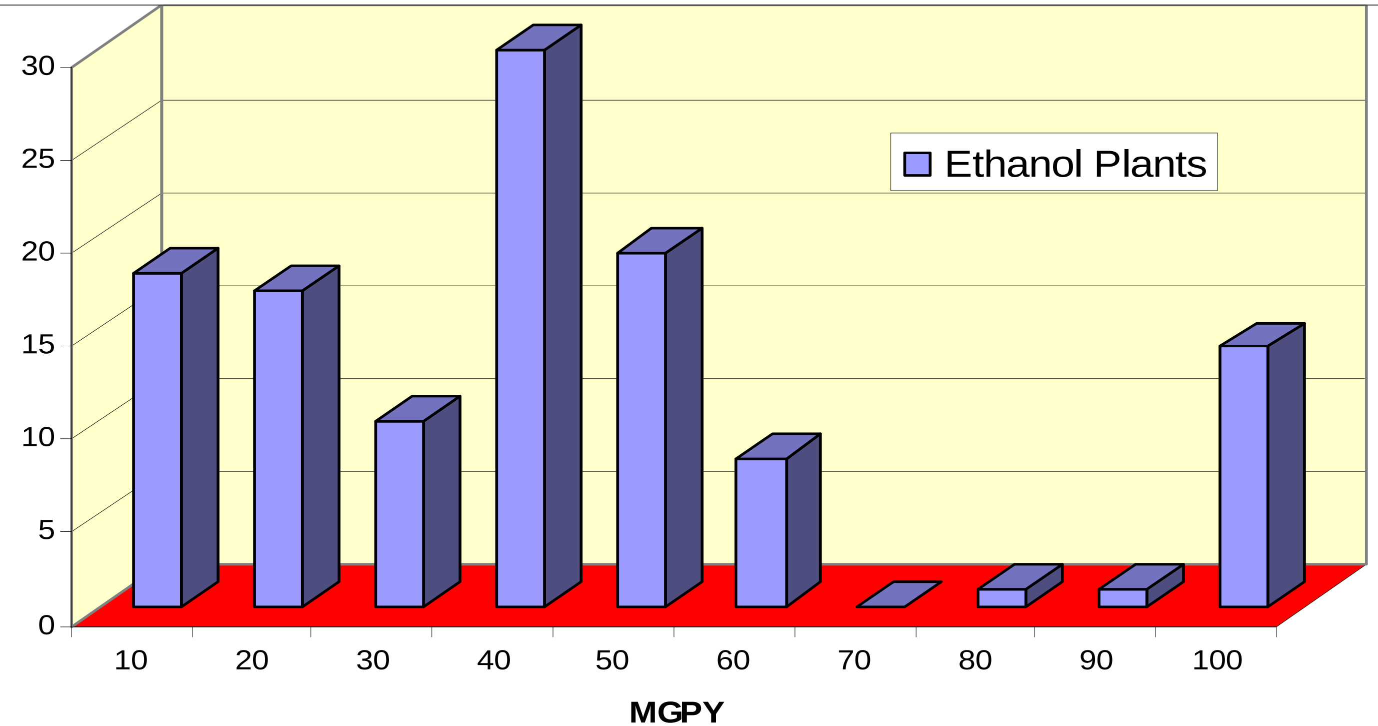
- Likely to continue to be used in Clean Fuel Programs, perhaps more in Northeast than in California.

- All of these changes ultimately impact blending economics and ethanol value.

# Implications (Continued)

- Changes the *Business o*f Ethanol:
  - Meeting the RFS will require $$ Billions $$ in Investment;
  - By virtue of the mandate, ethanol goes from an unknown to a known;
  - New, major sources of funds are pouring in to the industry;
  - Investment community getting comfortable with a commodity based, tax & regulatory driven industry;
  - ROI is undeniable.

# Trends in Plant Building:  Is Bigger Better?




117 Plants in Operation or Under Construction
17 of the 22 Under Construction Between 40-60 MGPY
2 are at 100 MGPY or More

*Source:  Clean Fuels Development Coalition*

# Bigger = Better Theory

- <u>40 MGPY @ $60 million</u>
  - @ 45% equity; $27 million; $33 million loan; revenue @ $1.50 ethanol = $60 million

- <u>100 MGPY @ $90 million</u>
  - @ 45% equity; $40 million; $50 million loan; revenue @ $1.50 ethanol = $150 million

  However,
  - Much greater risk
  - Equity beyond ability of most
  - Greater challenges in transportation, DDG/co-products
  - Risk of raising feedstock costs
  - All other costs increase with size

Apparently not too risky – 10 plants @ 100 MGPY in advanced planning/serious development.

# Comfort Factors

- Increase in yields.
- Dramatic improvements in efficiency/reliability.
- Process guarantees
- Performance bonds.
- Equity participation by builders/design firms.
- Off take contracts.
- States joining Feds in requiring renewables.

# What's Next? Is it all Wine and Roses for U.S. Program from Here?

- Challenges remain:
  - High energy costs
  - Decreasing co-product cost
  - Oversupply always an issue
  - Environmental issues
  - Financing – need larger pool of lenders
  - Maintain small plants
  - Tax exemption
  - Imports
  - Limitations of corn
  - Funding for new technologies
  - Limitations of construction, fabrication, services.

# What's Next? (Continued)

Up Side

- American public finally "gets it" -- demanding action.
- Energy crisis.
- Gasoline prices high to stay.
- MTBE gone.
- Ethanol meets refined product needs.
- Ethanol = a domestic, renewable, job creating, imported oil fighting, supply extending fuel.

No question in my mind we can meet and exceed the RFS, and eventually reach 10% market.

# Thank you!

For more information log on to

www.cleanfuelsdc.org
www.ethanolacrossamerica.net