The Renewable Fuels Standard

Presentation for STAPPA Annual Meeting

October 23, 2006

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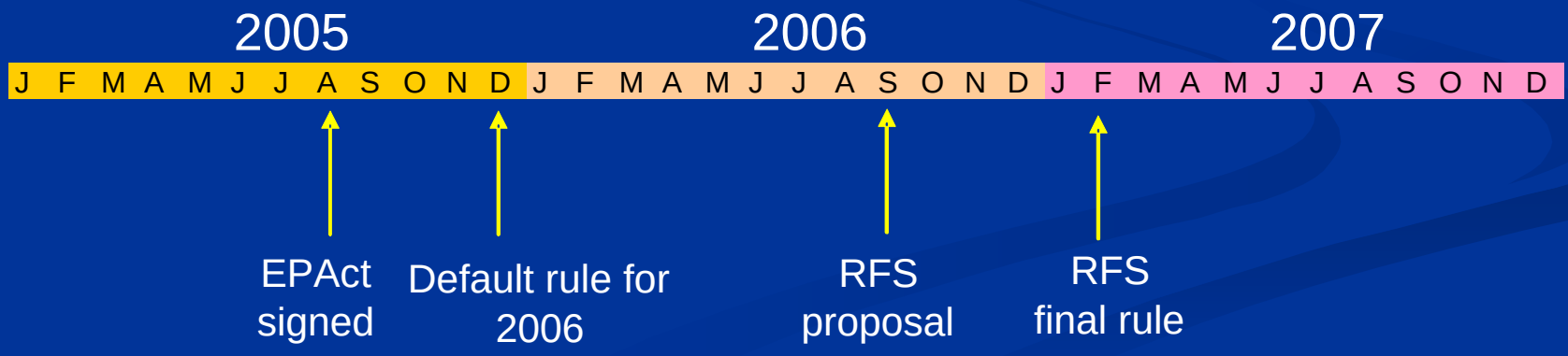
Timeline

- The Renewable Fuel Standard (RFS) program was required by the Energy Policy Act of 2005 (EPAct), and started on January 1, 2006
- To cover 2006 we promulgated a rule that implemented default provisions in the Act
- Need to promulgate the full program to cover 2007+
- With substantial collaboration with our stakeholders and commitment from multiple government agencies, we have been able to accelerate the rulemaking schedule



The RFS – The Program Basics

- EPA must promulgate regulations that ensure the use of renewable fuels
  - 2006: 4.0 billion gallons/yr
  - 2007: 4.7
  - 2008: 5.4
  - 2009: 6.1
  - 2010: 6.8
  - 2011: 7.4
  - 2012: 7.5
  - 2013+: Same percent of renewables for 2012 (0.25 billion gal of which must be cellulosic ethanol)

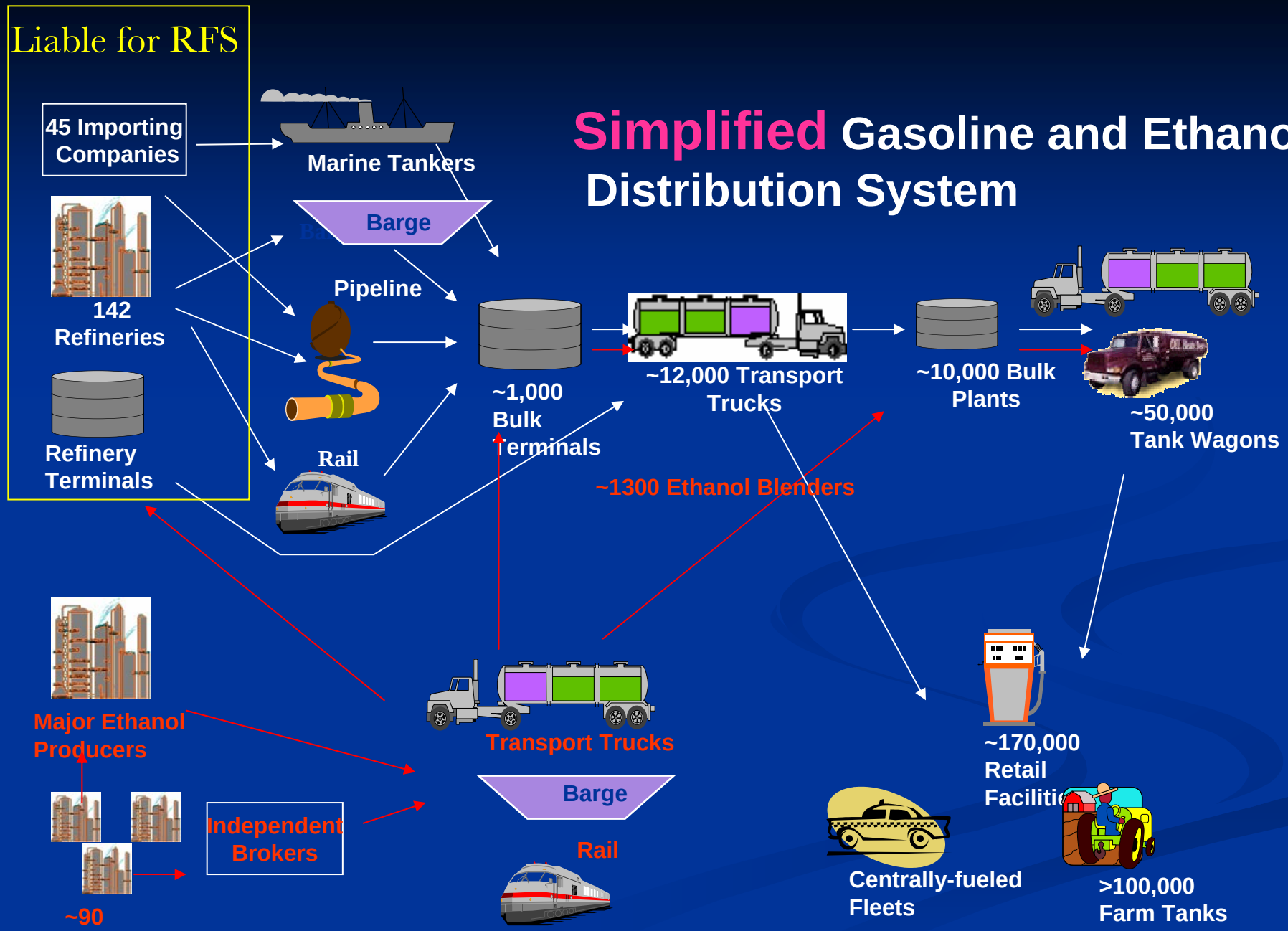
- EPA must convert RFS into percent of gasoline production
  - Based on annual EIA predictions of gasoline consumption given to EPA each Oct 31
  - Applies to refiners, importers, gasoline blenders

Calculating The Standard

$$\text{Standard} = \frac{\text{Required volume of renewable fuel}}{\text{48-State gasoline volume (Less small refiners)}}$$

- For 2007, the standard would only apply to gasoline produced after the effective date of the final rule
  - Proposed standard for 2007 is 3.71%
  - Will rise to approx. 4.85% for 2012
- For 2013+ we must conduct another rulemaking to set the RFS program standard based on a review of impact of renewable use from 2006-12 on
  - Environment, air quality, energy security, job creation, rural economic development, expected cellulosic ethanol production
  - Must be no smaller than 2012 standard

Simplified Gasoline and Ethanol Distribution System



The Mechanics of Compliance

- Renewable fuel producers assign a unique serial number, a Renewable Identification Number (RIN) to each batch of renewable fuel
- These RINs are the currency for the credit trading program and used for compliance
- Obligated parties acquire RINs in order to show compliance
- Compliance is assured by comparing records and reports of RINs generated by renewable producers and RINs used for compliance by gasoline producers

Potentially Qualifying Renewable Fuels

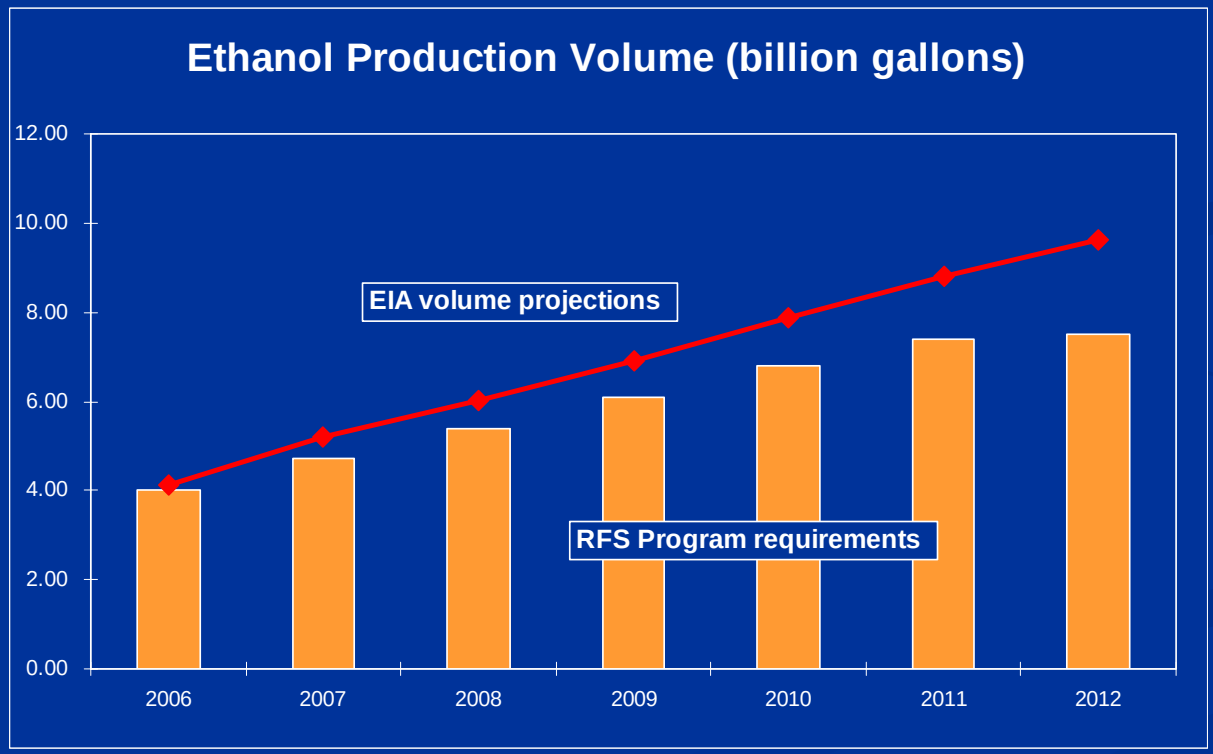
- Ethanol
  - Corn
  - Other Starches
  - Cellulose
  - Sugar
- Biodiesel (ester) and Renewable Diesel
  - Veg Oils and Animal Fats
- Biocrude
  - Veg Oils and Animal Fats
- ETBE (if used)
- Bibutanol
- Fischer-Tropsch-diesel/gasoline, MTBE (if used), Methanol
  - Biogas
  - Biomass gasification
  - Sewage plant
- Others

Relative Value of Different Renewables

- EPAct specifies that 1 gal of cellulosic ethanol counts as 2.5 gallons for compliance purposes
- We are proposing to base value for other renewables on volumetric energy content in comparison to ethanol (adjusted for renewable content)
  - Corn-ethanol: 1.0
  - Cellulosic biomass ethanol: 2.5
  - Biodiesel (alkyl esters): 1.5
  - Renewable diesel: 1.7
  - Biobutanol: 1.3
- Seeking comment on life cycle energy, petroleum, GHG emissions

Projected Renewable Use

- RFS program standard provides an important foundation for ongoing renewable investments
- But demand for renewable fuels are already projected to outpace the RFS program requirements



- As a result we analyzed the impacts of increases in renewable fuels, not impacts of the program per se
- We analyzed the range from required to projected

* Plus ~300M gallons of biodiesel

Emissions & Air Quality*

	Nationwide average	Localized maximum
CO	1.3 - 3.6 % decrease	N/A
Benzene	1.7 - 6.2 % decrease	N/A
NOx + VOC	0.5 - 1.0 % increase	3 - 6 % increase (Summer)
Ozone	~ 0.1 ppb increase	0.1 - 0.2 ppb increase

- Impacts will vary by region, since renewable fuel use varies significantly

* Incremental Impacts in 2012 compared to 2004 reference case

Emissions & Air Quality

- The emission impact analyses for the RFS rule are preliminary
  - Due to the short timeframe available, we used existing models and data even though there are significant data gaps
- The localised maximums generally do not occur in areas with worst ozone problems
  - Many RFG areas already have ethanol
  - Increase in ethanol use mostly expands E10 to some low RVP areas and rural areas
- Impacts on ozone are too small to warrant benefits analyses
- Despite small ozone increases, there are also reductions in CO, benzene, and CO_2

Energy and CO_{2*}

- Petroleum consumption in the transportation sector will be reduced 1.0 - 1.6 %
  - Equivalent to 2.3 - 3.9 billion gal petroleum in 2012
  - ~95% of the reduction is estimated to be from imports
- Transportation sector greenhouse gases (CO2 equivalent) will be reduced by 0.4 - 0.6 %
  - Equivalent to 9 - 14 million tons in 2012

* Incremental Impacts in 2012 compared to 2004 reference case

Costs of Renewable Fuels

Production & Distribution Costs

Ethanol	$1.30 - 1.36 per gal
Biodiesel	$2.00 - 2.22 per gal

- Increases in the use of renewable fuels are expected to add 0.3 - 1 cent per gallon to the cost of gasoline for the nation as a whole (at $47/bbl crude)*

- For the Final Rulemaking we will assess impacts on market prices of corn and soybeans that might impact the Ag sector economy and the impacts on energy security from reduced imports

* Incremental Impacts in 2012 compared to 2004 reference case

Current Events

- Working towards completion of Final RFS Rule by early 2007
- Developing RFS implementation tools for 2007
  - Recordkeeping & reporting (electronic web-based system)
  - Compliance Monitoring
- Proceeding on several fronts for actions required in the Energy Act this year
  - Aircraft study
  - Boutique fuels study
  - VOC standards consolidation for RFG
  - Also beginning efforts for new data collection
- Preparing for other actions required in Energy Act
  - Fuel Harmonization Study
  - Anti-Backsliding Analysis
  - Study on health and environmental impacts of oxygenates
  - Update to the Complex Model