Ethanol Blend Wall

CEC Joint IEPR and Transportation Committee Workshop on Transportation Fuel Infrastructure Issues

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Ethanol Blend Wall
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Ethanol Blend Wall
Background

- **Background**
  - **Substantially – Similar (Sub-Sim)**
    - **Current EPA regulations allow up to 10% volume percent ethanol in finished gasoline**
      - **The 10% Ethanol waiver was granted by default as laws in effect at that time automatically granted the waiver if EPA did not act**
      - **The EPA did not act on the 10% ethanol waiver**
      - **Current fuel ethanol content for emissions certification contains 0% ethanol**
  - **Growth Energy Waiver Request**
    - **Growth Energy along with 52 ethanol producers petitioned the EPA to allow 15% ethanol blends (E15)**
      - **The waiver also supports EPA and USDA efforts to issue a waiver for E12 or E13 blends to provide "short term relief"**
      - **Wavier request cites accelerating renewable fuel use, increase energy security, enhance economic development, create American jobs, reduce transportation costs, and improve the environment as reasons**
    - **The EISA requires EPA to rule on a waiver within 270 days, and allow for public comment**
      - **The default option by EPA inaction is no longer available**
    - **NPRA Annual Meeting Presentations**
      - **General Motors points out durability testing of E15 and E20 is missing**
      - **Small equipment manufacturers do not support blends > E10**
      - **RFA admits E12 / E13 or E15 and E20 are temporary, short term solutions**
  - **1 PSI RVP Waiver for Summer Conventional Gasoline**
    - **Does EPA have the authority to extend this to blends >10% ethanol?**
  - **Boutique Fuel Regulations – Is there a conflict?**

The Growth Energy waiver request is a short term solution.

Ethanol Blend Wall
Current Ethanol Limits

- **Current Ethanol Limits**
  - **CARB IIIA**
    - **10% ethanol beginning in 2010 – Limited by predictive model blending constraints**
    - **11% of the U.S. market**
  - **RFG**
    - **10% ethanol max – Limited by complex model and RFG regulations**
    - **30% of the U.S. market**
  - **Conventional (Conv)**
    - **10% ethanol max – Limited by Sub-Sim regulations**
    - **59% of the U.S. market**

Only 59% of the U.S. gasoline market will be impacted if EPA grants a mid-level ethanol waiver.

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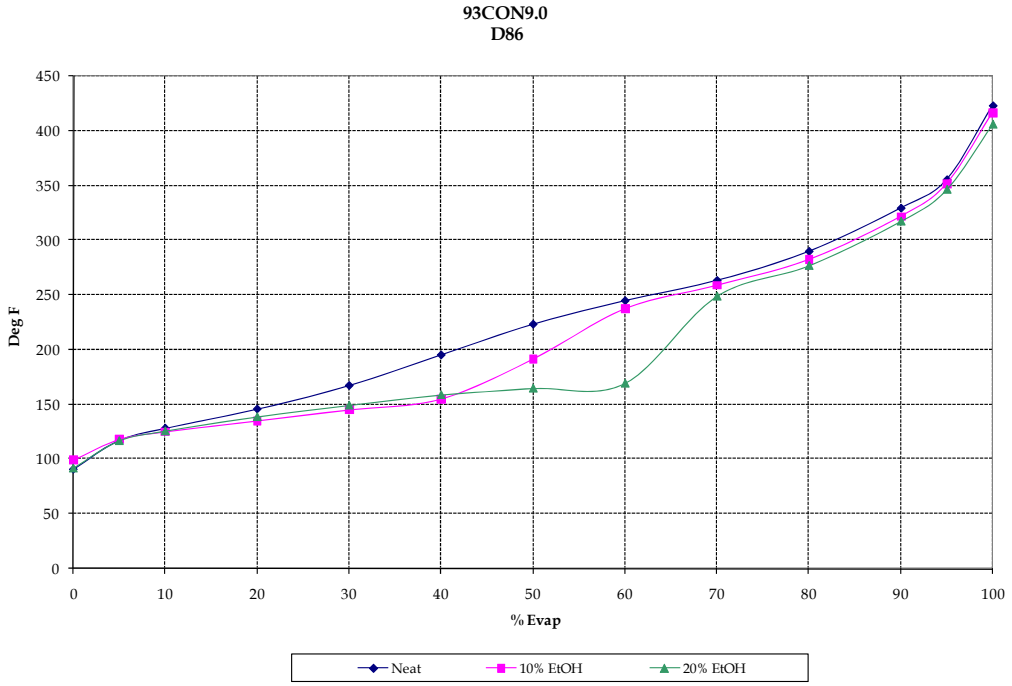
Ethanol Blending



- **Ethanol Blending**
  - **Going from E10 to E20**
    - **Octane increases**
    - **RVP decreases slightly**
    - **T50 decreases for some blends**
    - **V/L increases**
    - **Need to back C5's out of base blend to meet T50 and V/L specifications**

Increased ethanol blending changes the finished properties of gasoline.

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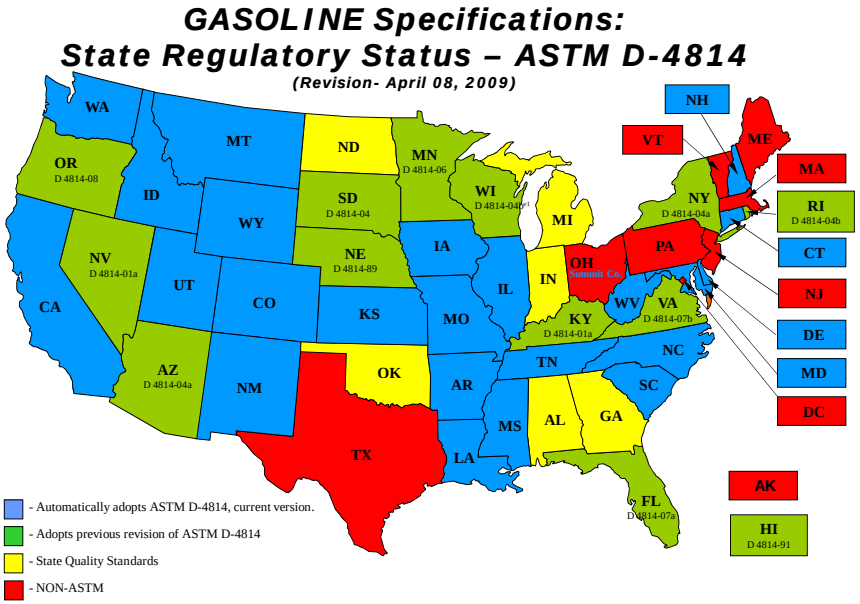
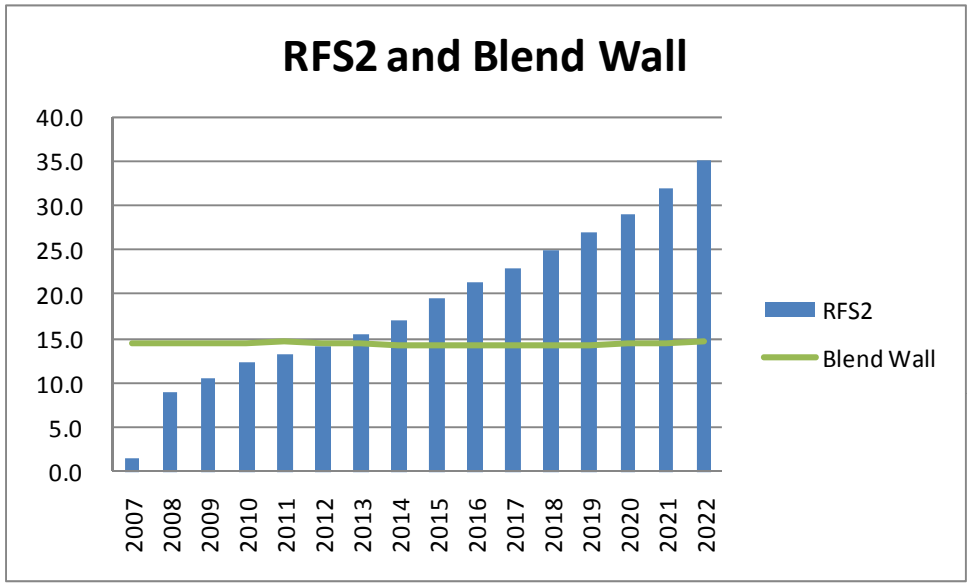
State Regulations



- **State Regulations**
  - **ASTM**
    - **36 states require finish gasoline (after addition of ethanol) to meet ASTM standards**
    - **Each level of ethanol requires a different based gasoline to meet the ASTM standards**
    - **The base gasoline can be full octane Conv or sub-octane Conventional Blendstock for Oxygenate Blending (CBOB)**

State regulations will require a new grade of gasoline for blending with mid-level ethanol blends.

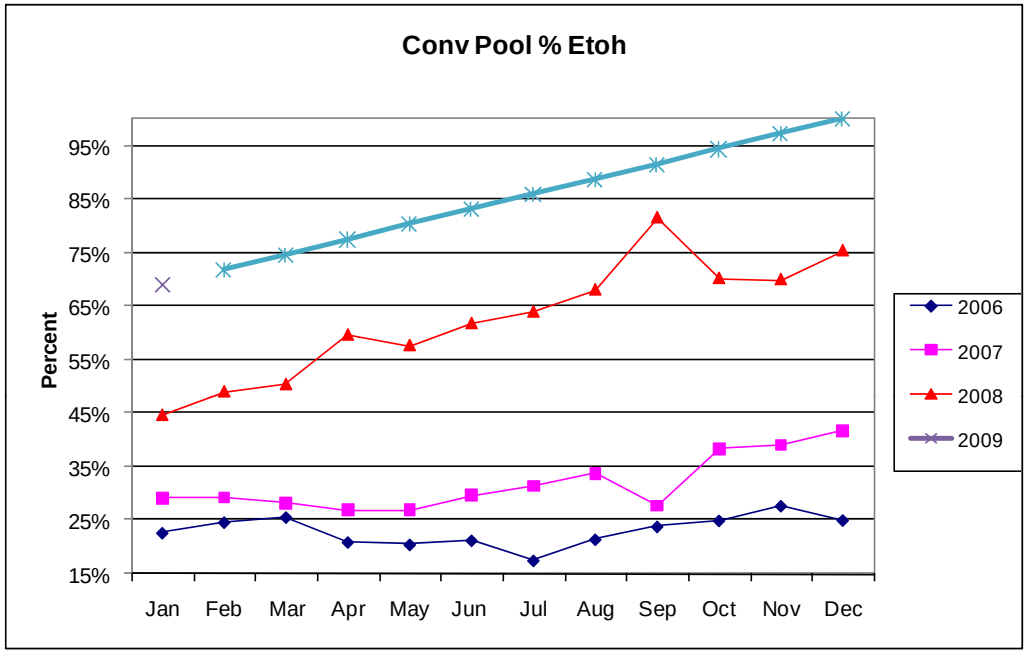
Ethanol Blend Wall
Ethanol Usage Projections - Volumes



- **Ethanol Usage Projections - Volumes**
  - **Based on just RFS2 volume requirements**
    - **Hit the Blend Wall in 2013**

If one just looks at the RFS2 volume requirements the blend wall is hit in 2013, depending on total gasoline demand.

Ethanol Blend Wall
Ethanol Usage Projections - Volumes



- **Ethanol Usage Projections - Volumes**
  - **Based on historical increase in conventional pool penetration**
    - **Could hit the Blend Wall in December 2009**

The industry could blend more ethanol than required and reach full penetration of the conventional pool by the end this year.

Ethanol Blend Wall
Ethanol Usage Projections – RIN Balance

- **Ethanol Usage Projections – RIN Balance**
  - **Based on EIA data**
    - **2007**
      - **1.0 Billion excess RINs generated in 2007**
    - **2008**
      - **0.8 Billion excess RINs generated in 2008**
      - **Total surplus available assuming industry uses 2007 RINs first for compliance is 1.8 billion RINS**
      - **Industry started 2008 blending at an annualized level of 8.0 BG/Y**
      - **Industry ended 2008 blending at an annualized level of 10.9 BG/Y**
      - **Industry blended 9.5 Billion gallons in 2008 versus an RVO of 9.0 Billion gallons**
    - **2009**
      - **In January industry blended at an annualized rate of 9.9 BG/Y**
      - **The RVO for 2009 is 11.1 BG/Y**
      - **If the entire 2008 surplus is used then only 9.0 BG/Y needs to be blended in 2009**
        - **» The industry could blend less if it runs a deficit**
      - **If ethanol penetration reaches 100% by year–end then the 2009 usage could be as high as 11.5 BG/Y creating an even bigger surplus**
    - **Usage of RINs and the ability to run a deficit make compliance with the RFS2 total volume requirements possible through 2014 even with the 10% Blend Wall limitation**
    - **The real near term issue is compliance with the biomass-based diesel, the cellulosic biofuel, and the advanced biofuel requirements of RFS2 beginning in 2011**

Use of previous year RINs could postpone the blend wall limiting RFS2 compliance until 2014. The near term issue is the availability of advanced biofuel beginning in 2011.

Ethanol Blend Wall
Market Issues

- **Market Issues**
  - **Warranties**
    - **Automakers are concerned about the lack of durability testing for higher level ethanol blends in existing cars**
    - **Current Original Equipment Manufactures (OEM) guarantees do not apply if ethanol exceeds 10%**
    - **90% of cars on the road are out of OEM warranties and may be under extended warranties issued by third parties**
    - **Extended warranty companies have been silent on this issue**
    - **All manufactures and all extended warranty companies will have to approve any increase in ethanol usage for the existing fleet whether it be E12 / E13 or E15 or E20 in order for any mid-level ethanol blends not to be a new additional grade at the service station**
  - **Miss-Fueling Issues**
    - **E85**
      - **Same nozzle size as E10**
      - **Need to price E85 at 77.5% of E10 for an equal MPG cost**
      - **Potential for miss-fueling if E85 is priced significantly below E10**
    - **Mid-Level Ethanol Blends**
      - **If approved by EPA and approved by OEM for only future model year vehicles, a separate pump and nozzle size will be needed to avoid miss-fueling**

OEM and extended warranties issues will likely result in any mid-level ethanol blends being a separate new grade.

Ethanol Blend Wall
Infrastructure Requirements

- **Infrastructure Requirements**
  - **Compatibility**
    - **The current gasoline tanks, lines and pumps are only certified by UL for blends up to E10**
    - **The E85 pumps in place today do not have a UL certification and local fire marshal approval is required to operate one**
  - **Retail Equipment**
    - **The majority of retail outlets do not have a spare tank to use for a new mid-level ethanol blend or E85**
    - **A new tank, lines, and pump will be required to handle a new additional grade whether it be E12 / E13, or E15, or E20, or E85**
    - **Mid-level ethanol blends and E85 have the same physical infrastructure issues yet mid level ethanol blends are only a temporary solution to meeting the RFS2 volumes**

Mid-level ethanol blends will have the same infrastructure requirements as E85.

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Infrastructure Issues - Economics

- **Infrastructure Issues - Economics**
  - **High cost to add another grade of fuel (tank, lines, pump) per outlet**
    - **$50,000 - $200,000 (SIGMA 2006)**
  - **80% of gasoline is sold at convenience stores**
    - **62% are one store operation**
    - **70% are 10 store operations or less**
    - **< 3% are owned and operated by one of the 5 major oil companies**
  - **Low profit per store compared to E85 installation costs**
    - **$36,000 profit per store in 2004 (NACS)**
    - **$34,000 profit per store in 2006 (SIGMA)**
    - **$45,000 profit per store (includes stores that do not sell gasoline) in 2008 (NACS)**
  - **Other issues**
    - **Store and equipment may be leased**
    - **May not be room for additional tank or an additional pump**
      - **Switching a regular pump to an E85 pump could result in reduced sales at busy times when all pumps are being used**
    - **Initial sales volumes will be a low % of total sales even if all FFV owners purchase E85**
    - **Refiners and Importers can not force service stations that they do not own to install E85 equipment**

Economics may not justify retailers spending capital to offer E85 or mid-level ethanol blends.

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Solutions

- **Solutions**
  - **Mandate E85 pumps**
    - **Not recommended, a mandate generates unintended consequences that can have significant market impacts**
    - **May drive many small businesses out of business**
  - **Provide incentives**
    - **Could help and work if structured properly**
    - **Need to be applied equally to all retail outlets regardless of ownership**
    - **Need to provide cash flow relief not just tax credits**
  - **Market Solution**
    - **Do nothing and wait for the market to work**
    - **EPA can issue waivers (Can CARB do this for the LCFS?)**
    - **Congress can change the law if it is not workable**

A combined solution of incentives and legislative and regulatory review for feasibility is required to ensure that transportation fuel supplies are adequate to minimize the economic impact of renewable fuel mandates.