



ETHANOL BLENDWALL

A Marathon Perspective

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RFS 1&2 FLAWS



- ◆ **As designed by Congress in EPACT05 and EISA07 the RFS's have many problems and two major flaws.**
 - **Wrong obligated party**
 - **Refineries never see or touch current biofuels. Rather than place direct responsibility on biofuels blenders, Congress decided to use a very complicated, indirect and problematic credit system.**
 - **Failed to properly align the biofuel mandates with the ability of the vehicle fleet to use them**
 - **This has resulted in the approaching E10 blendwall problem**

What is the E10 blendwall?



- ◆ The E10 blendwall is the point at which no more ethanol can be blended into the US gasoline pool due either to regulation or infrastructure.
- ◆ Currently there are only two legal routes for blending ethanol
 - E10 – blending up to 10% ethanol in gasoline
 - E85 – can only be used in FFV's
 - FFV's make up less than 3% of gasoline fleet
 - Currently less than 1% of FFV's use E85

When Does Industry Hit the Theoretical E10 Blendwall?



- ◆ 2009 & 2010 – *Obligated parties only*
 - Not small refiners
 - Required to blend over 10% (must rely on RIN market)
- ◆ 2012 – If gasoline demand reductions continue
- ◆ 2013 – Current estimate based on EIA projections (AEO2009)
- ◆ 2014 – Assuming cellulosic biofuels waivers which also reduce overall mandate

Other Blendwalls*



- ◆ **E12 Blendwall - 2014**
- ◆ **E15 Blendwall - 2017**
- ◆ **E20 Blendwall - 2020**
- ◆ **E85 Blendwall - 2020**

*Based on EIA projections (AEO2009)

How is the Real World E10 Blendwall different from the Theoretical Blendwall?



- ◆ The real world blendwall results from some E10 blending infrastructure not being installed due to remote locations and lack of sufficient and timely financial incentives.
 - Also includes the failure to use existing blending infrastructure due to state blending laws/bans.
- ◆ The real world blendwall will be hit earlier than the theoretical blendwall

HOW TO GET TO ETHANOL LEVELS ABOVE E10?



- ◆ **E15/E20-We really know nothing about these**
 - No ASTM or U/L specifications
 - No real world experience
 - Limited research
 - Vehicle warranty/owners manuals-no mention
 - Retail infrastructure limitations

- ◆ **E85**
 - Requires FFV's and retail infrastructure
 - Doesn't work in non-FFV's (97% of current fleet)
 - 25% Fuel economy decrease
 - Gives ethanol in E85 a value less than 75% of gasoline
 - Problems meeting ASTM specs and U/L certification

Status of Midlevel Ethanol Engine/Vehicle Research



- ◆ **Recently there have been many Midlevel research studies reported by DOE, universities and ethanol interests**
 - Mainly looked at short term effects
 - Many had very small vehicle fleets
 - Some were not peer reviewed
 - Some had inexplicable results
- ◆ **The Auto and Oil Industries have worked with DOE and EPA to find data gaps in the existing research and define a complete research program to cover these gaps.**
 - CRC has been tasked to develop many of these research programs
- ◆ **The Oil industry is working with DOE, EPA and OSHA to determine what technical and regulatory barriers there may be to storing and distributing a mid-level ethanol blend fuel in the existing retail infrastructure**

Components of Test Plan

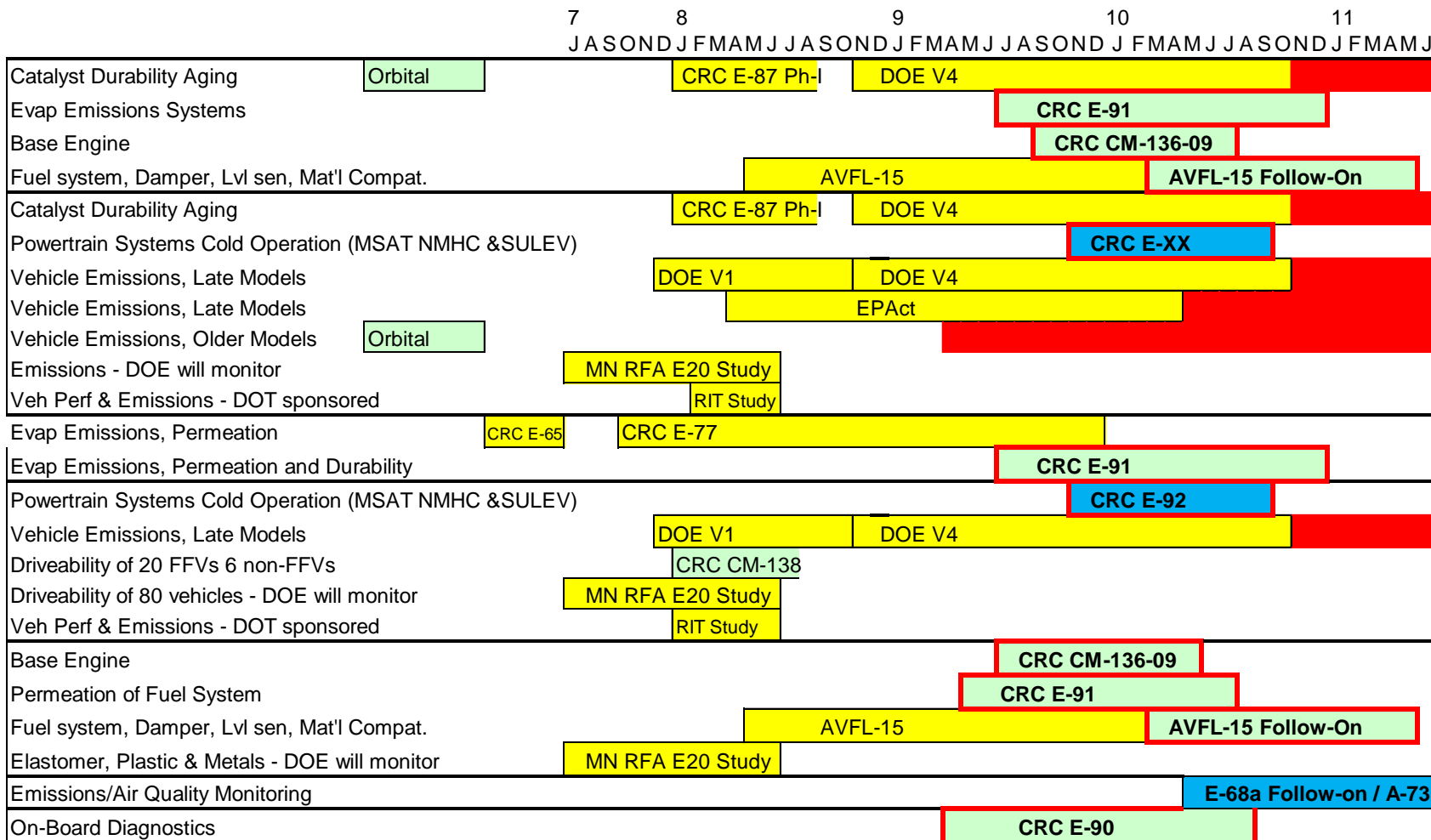


- ◆ **Fuel Storage and Handling**
 - Pump, Tank, Level Sender, Fuel Line Damper, Fuel Injector and Rail

- ◆ **Base Engine Durability**
- ◆ **On-Board Diagnostics Evaluation**
- ◆ **SULEV & Cold Ambient (20F) Operation**
- ◆ **Catalyst Durability & Degradation**
- ◆ **Evaporative Emissions**
 - Long-Term Permeation and Durability of Fuel System Components

- ◆ **Emission Inventory and Air Quality Modeling**
- ◆ **In-use vehicle driveability**
- ◆ **Non-automotive engines must also be tested using a plan endorsed by the small engine community**

CRC, DOE and other Midlevel Ethanol Highway Fleet Research Programs



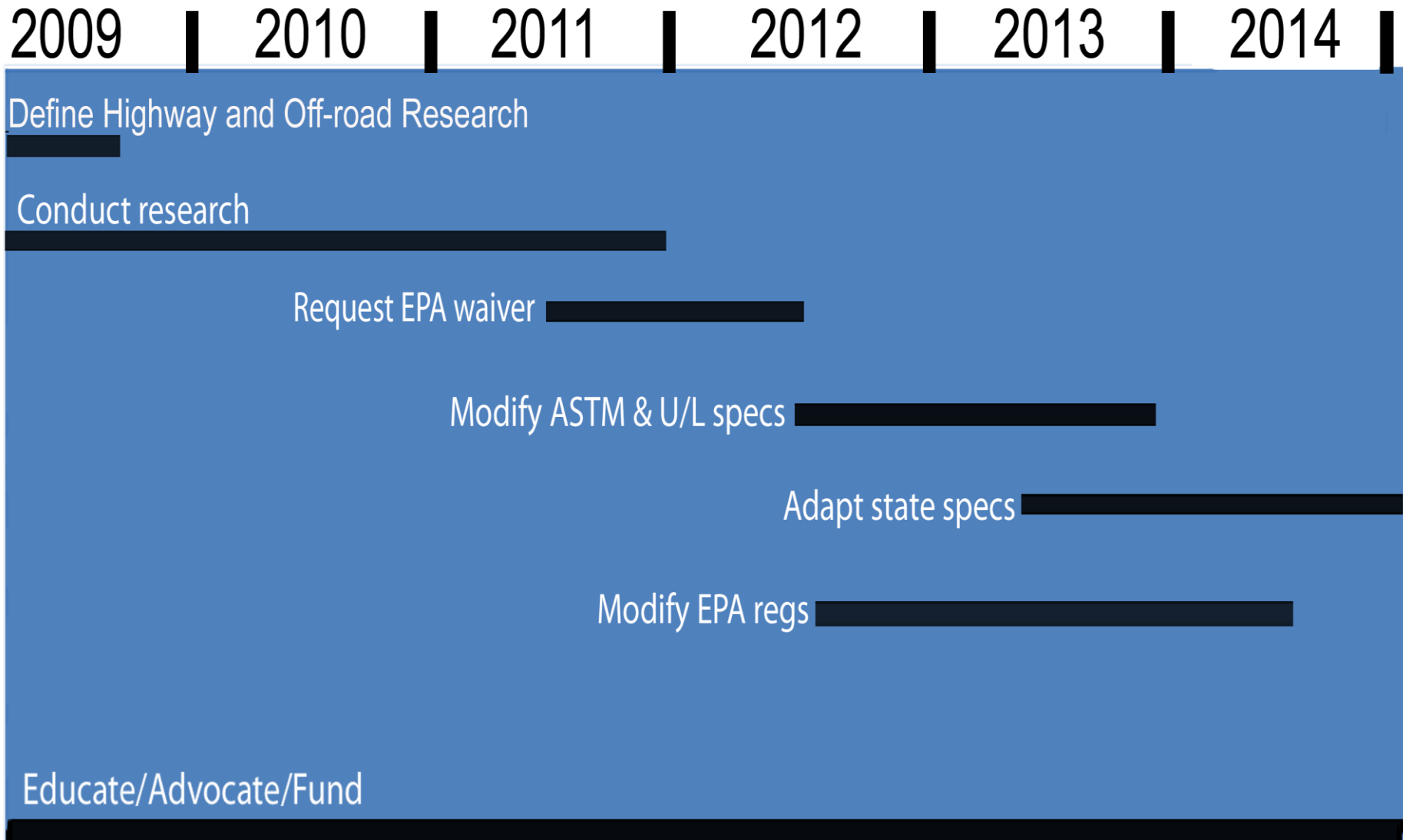
I Study includes preliminary data for tests & materials compatibility.

Key:

	Comprehensive
	Comprehensive in development
	Preliminary, partial or screening
	Gap

Programs with Red Borders are Unfunded

Mid-level Ethanol Approval Timeline



Some Thoughts



- ◆ **Midlevel ethanol research, EPA waiver and the various other approval processes will not be completed in time to avoid the E10 blendwall.**
- ◆ **Significant retail volumes of E85 and as well as ethanol blends above E10 are likely to encourage misfueling problems.**
- ◆ **Only completion of the full research program has a chance of providing the data for deciding the appropriate level of ethanol for the current fleet and the future fleet.**
- ◆ **Until EPA approves an E?? waiver and the various other approval processes are complete, the levels of mandated ethanol in the RFS's must be aligned with the current vehicle fleet capability.**

Next Steps



- ◆ **Need to acquire funding for unfunded projects**
 - Without timely funding, research completion date will keep moving out on a month by month basis
- ◆ **Need to carefully manage projects**
 - Nothing of this magnitude has been attempted since the last Auto/Oil program
 - Member companies have fewer experts and fewer resources
 - May need significant retiree support
- ◆ **Need to continuously review project results to identify any new data gaps that become apparent**

