

Preliminary Observations on EPA's Renewable Fuel Standard NPRM

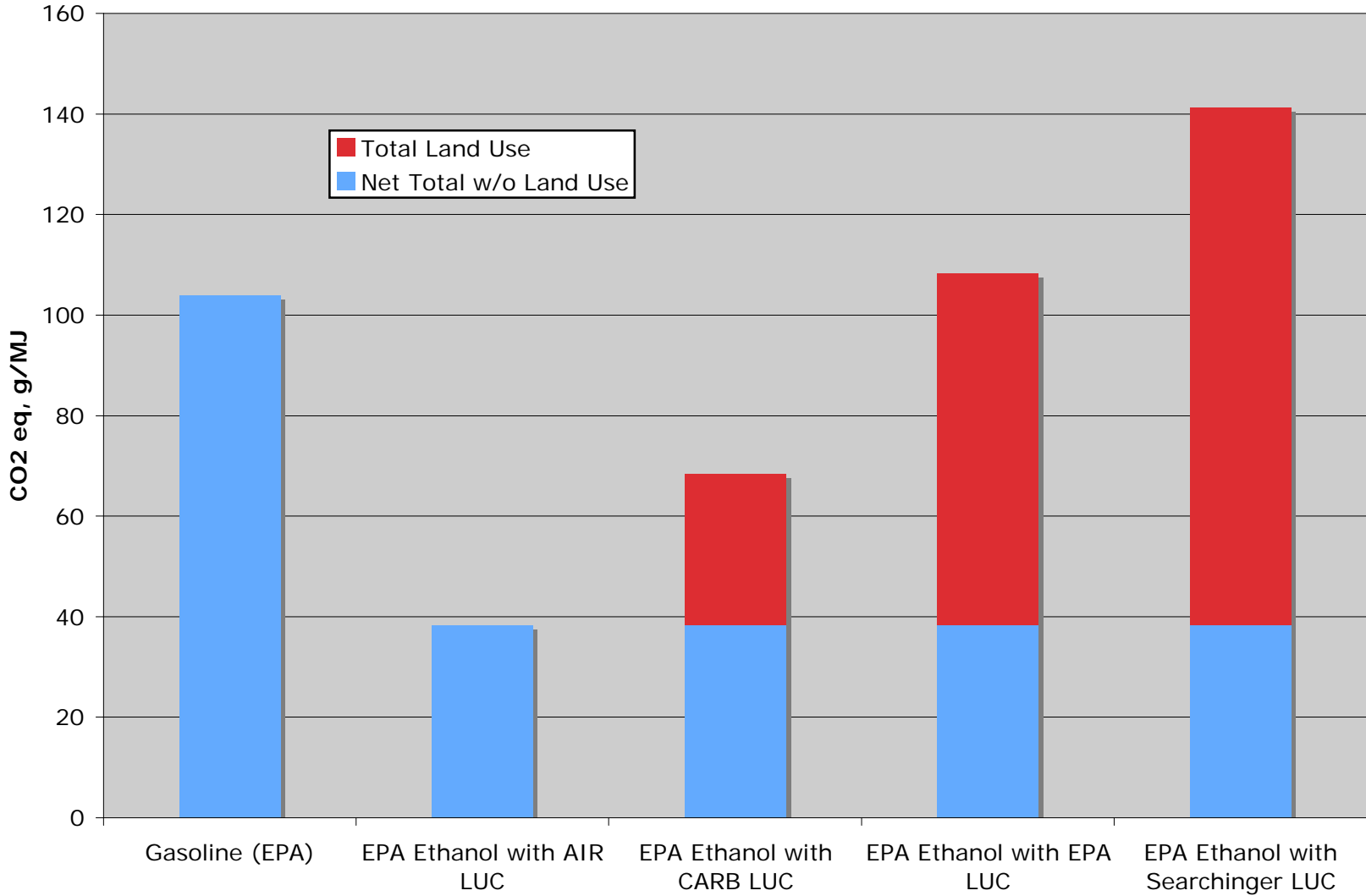
Air Improvement Resource, Inc.
For Renewable Fuels Association

June 10, 2009

Comparison of EPA with Recent Corn Ethanol Land Use Estimates

Item	AIR for RFA	CARB LCFS	EPA	Searchinger, et al
LUC, g CO ₂ eq/MJ	Could be 0	30	~70	103
Ethanol Volume increase (bggy)	2 to 15	2 to 15	12.4 to 15	15 to 30
Discounting, Time Period	0%, 30 years			
Modeling System	Informa, LLC projections of land use	GTAP	FASOM, FAPRI, etc.	FASOM, FAPRI
Impact on international land use of changes in US exports	None, if US exports are constant or increasing	Estimates international land use impact caused by modeled U.S. export decline		
Projected baseline w/o biofuels?	No	No	Yes	No

CO2eq Emissions, 30 year, 0% (Ethanol = NG dry mill with dry DGs)

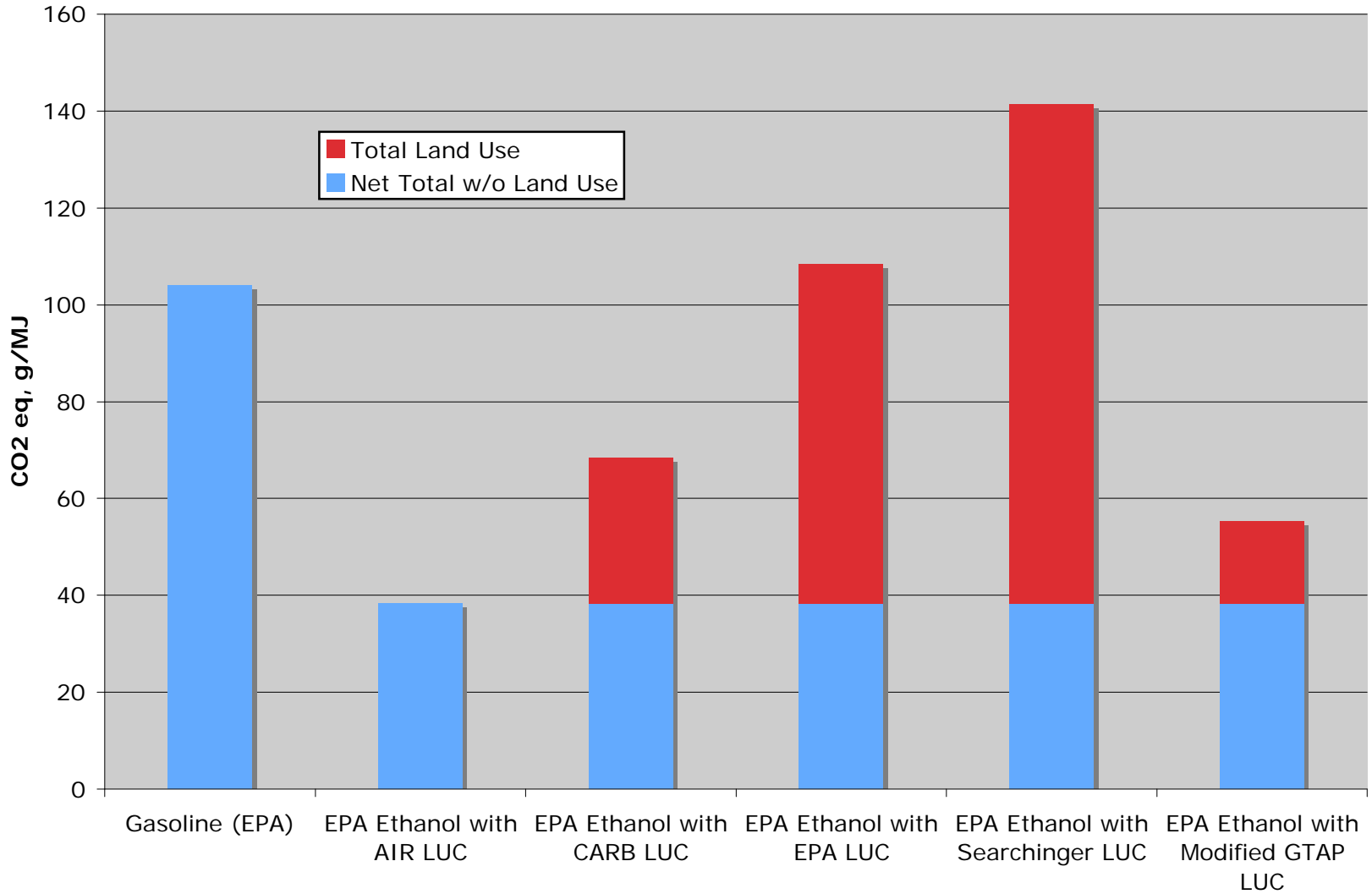


EPA Also Evaluating GTAP

- We support this parallel path analysis
- RIA: “FASOM and FAPRI...do not take into account **changes in productivity** as crop production shifts to marginal acres or the **impact of price-induced yield** changes...We would expect these two factors to work in opposite directions, and therefore serve as offsetting impacts”
- This was also the general conclusion of Dr. Hertel of Purdue in a conference call with ARB, RFA, Purdue, NERA, Informa on April 16, 2009
- When AIR modified GTAP for these 2 factors, we obtained a GTAP LUC value of 17 g/MJ for corn (reduced from 30)

CO2eq Emissions, 30 year, 0%

(Ethanol = NG dry mill with dry DGs)



EPA's Sensitivity Analysis

- EPA's land use sensitivity items:
 - Types of land converted
 - Foregone carbon sequestration
 - Soil carbon analysis
 - Pasture replacement analysis
 - Year of analysis
 - Fuel volumes
- All are “downstream” of FAPRI/FASOM except last 2
- Need more FAPRI/FASOM sensitivity
 - **Impact of different DG replacement scenarios**
 - **DG land use credit can vary from 31%-75%; BIG impact on domestic (and international) land use**
 - **CARB also ignored this factor in their sensitivity analyses**

EPA's Planned Updates to Land Use Analysis in NPRM

- Conducted search where EPA indicated it would “analyze and update and include in the final rule”
- Found 26 separate items where updates or new factors are going to be added/evaluated for corn ethanol alone
- None of these mentioned “model validation” or “modeling system validation”, or validation of results of any kind
- Modeling system, already complex, will get more complex
 - Analysis of those 26 items will lead to identification of even more items
- **Does more complex = better?**

Emissions Timing

- Need to include the concept that the social cost of carbon likely increases over time
- What is the long-term use of land after conversion?

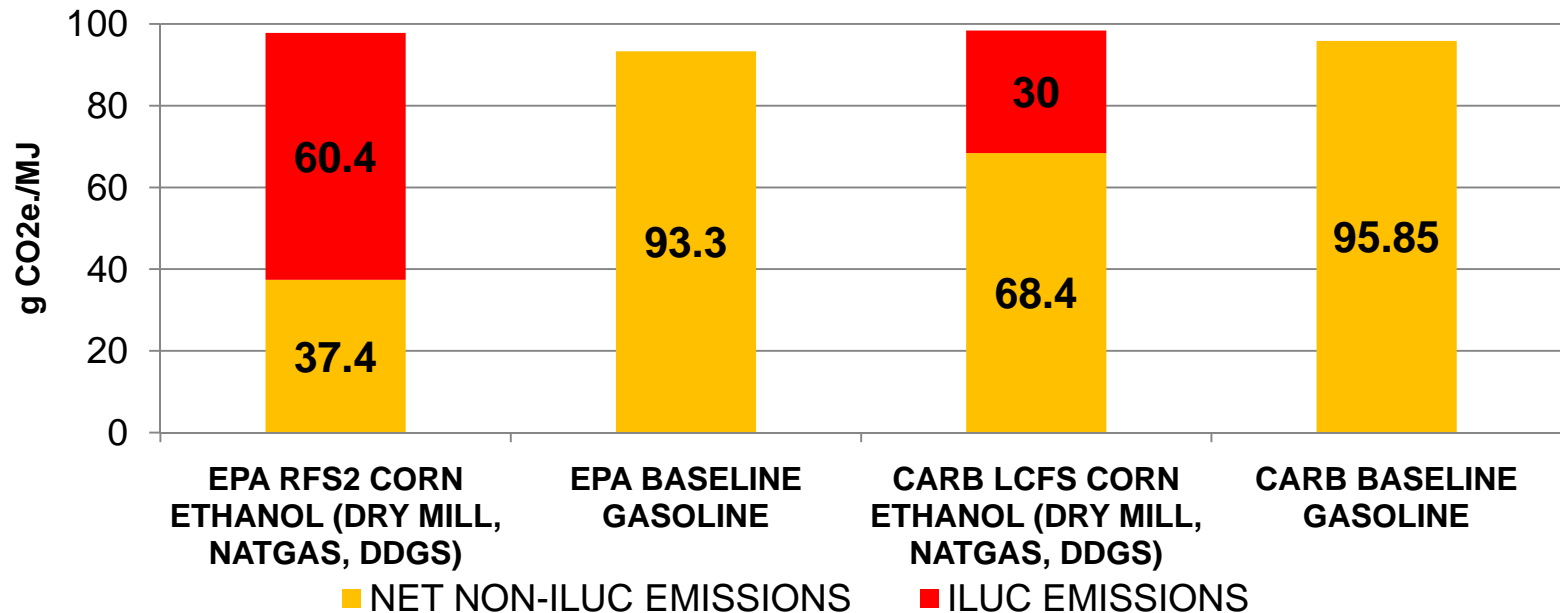
Replication and Validation

- EPA guidance suggests that documentation and data should be provided “...***such that third parties can replicate the model results***”
 - RFA intends to attempt replication of EPA results
 - RFA intends to perform independent analysis, including certain sensitivities (crop yield, EtOH yield, DG, etc.)
 - Details to obtain “FAPRI/CARD Model” posted to docket *yesterday* [June 9, 2009] (EPA-HQ-OAR-2005-0161-0967)
 - FASOM “Model Access Instructions” posted to docket *yesterday* [June 9, 2009] (EPA-HQ-OAR-2005-0161-0968)
 - 60-day comment period started May 26, 2009 and ends July 27, 2009
 - ~800 documents posted to docket in since NPRM publication in Fed. Reg.

Replication and Validation

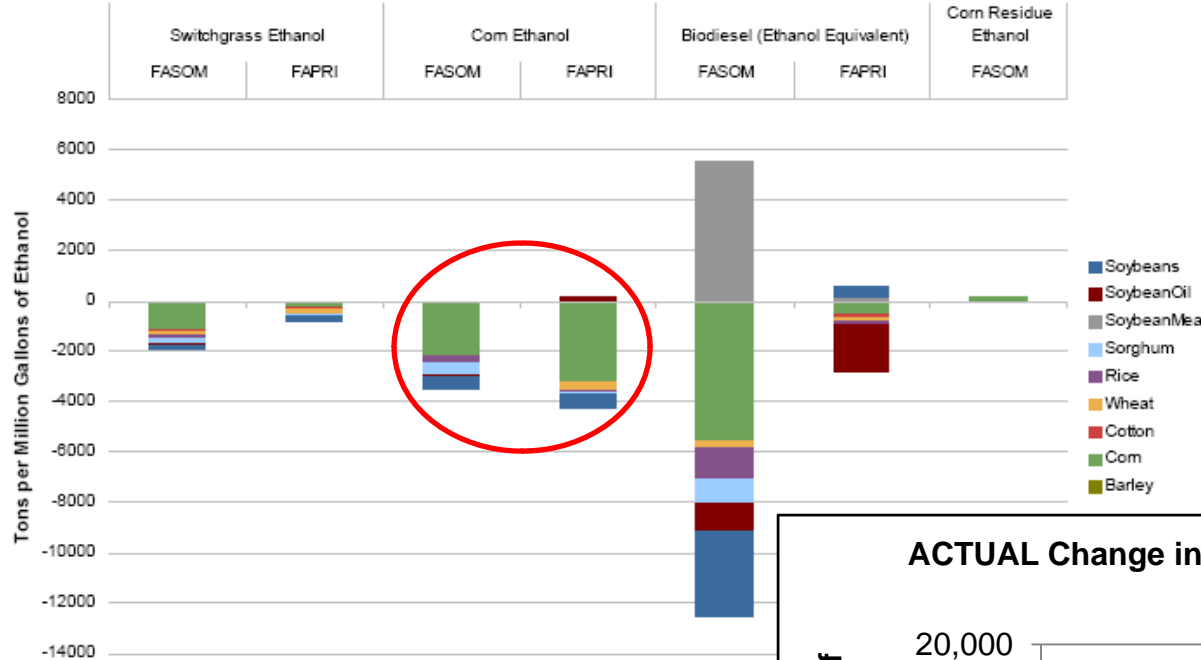
- *Model results should be corroborated (validated) against real data whenever possible*
 - EPA: “Corroboration (model): Quantitative and qualitative methods for **evaluating the degree to which a model corresponds to reality**. In some disciplines, this process has been referred to as validation.”
- *Model results should be compared to outcomes from similar modeling exercises; reasons for differences should be evaluated*

**Net Lifecycle GHG Emissions for Corn Ethanol, EPA v. CARB
(30 years, 0% discount)**



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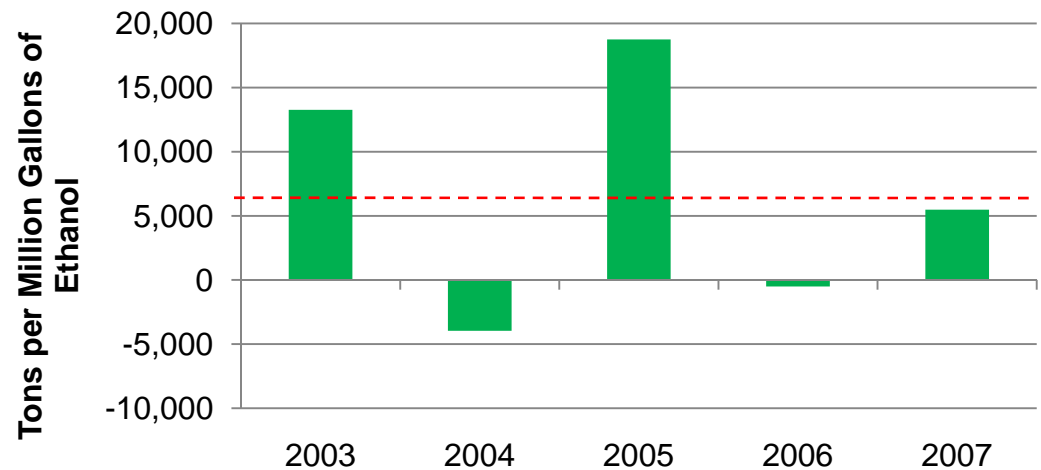
Change in U.S. Exports per Million Gallons of Biofuel



Export changes trigger intl. LUC

FAPRI & FASOM predict a significant export loss (- ~3,000 tons corn per 1 million gals.)

ACTUAL Change in U.S. Exports per Million Gallons of Ethanol



Empirical data shows average of +6,600 tons per million gals. for last 5 years

Highlights need for back-casting