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Oil Market Study Group:
RFS, the Blend Wall & Refinery Issues

Ben Montalbano, Senior Research Analyst
Energy Policy Research Foundation, Inc.
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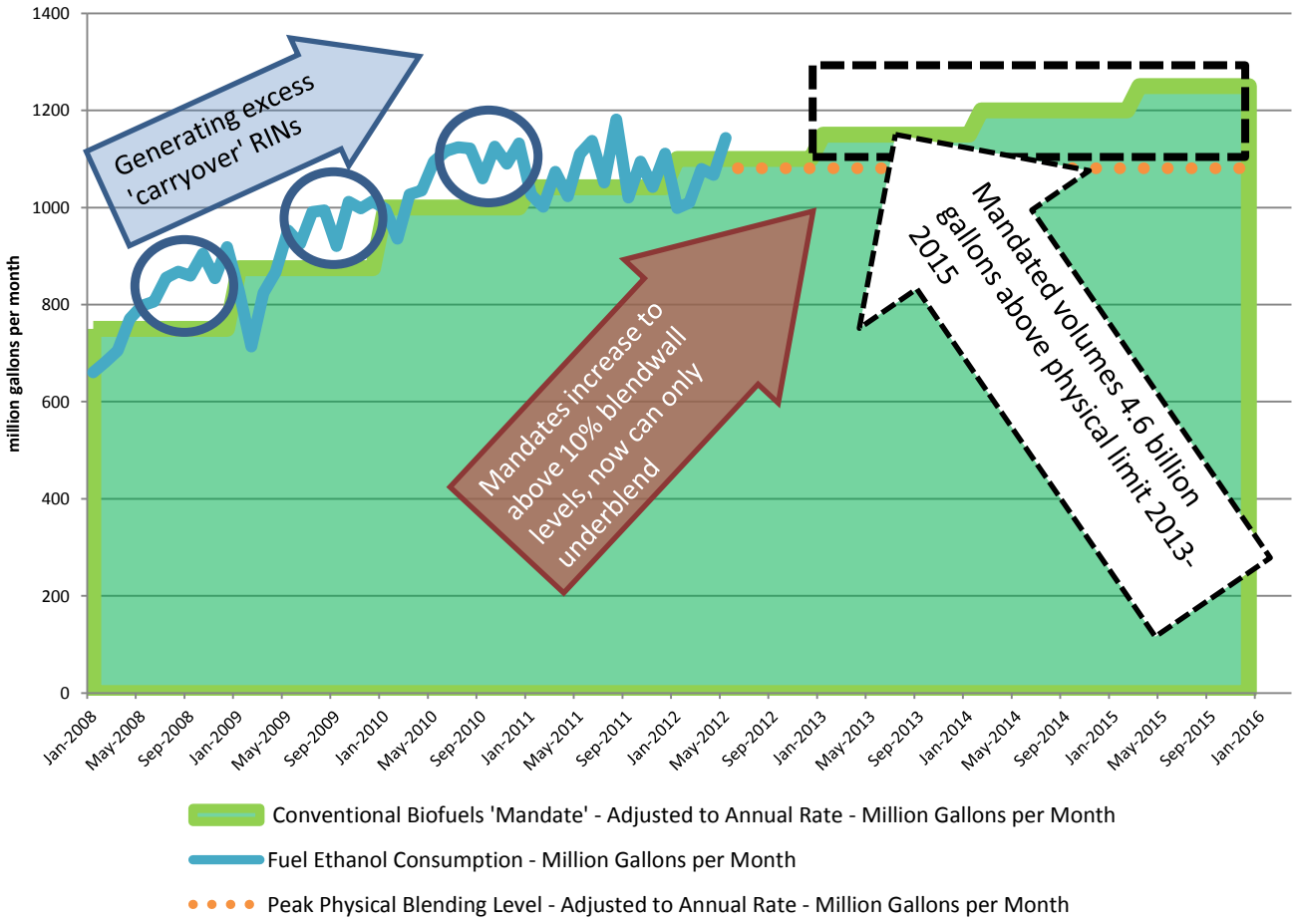
Blendwall Reached in 2010, RINs to be Scarce



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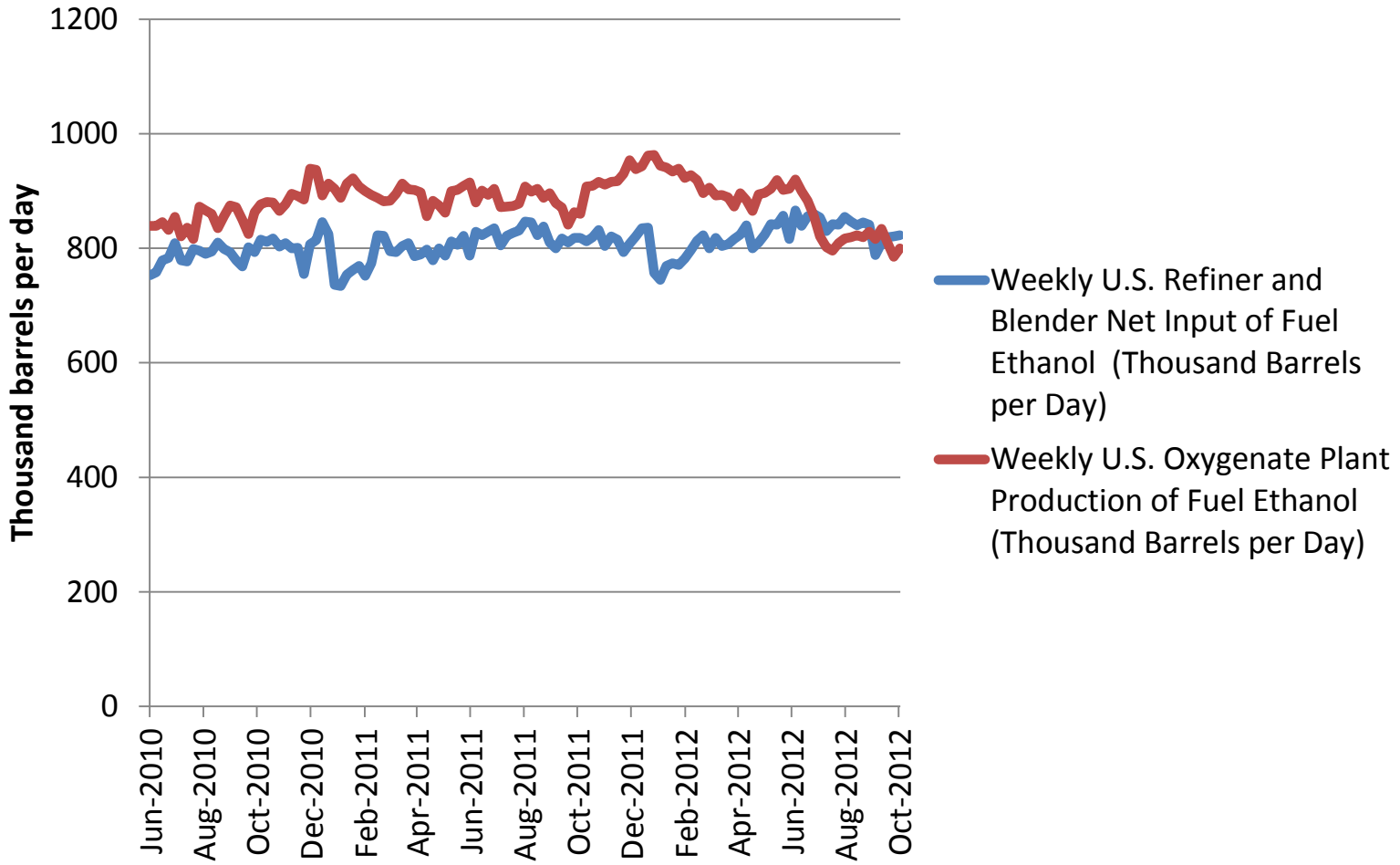
Blending has Not Reacted to Ethanol Prod. Drop



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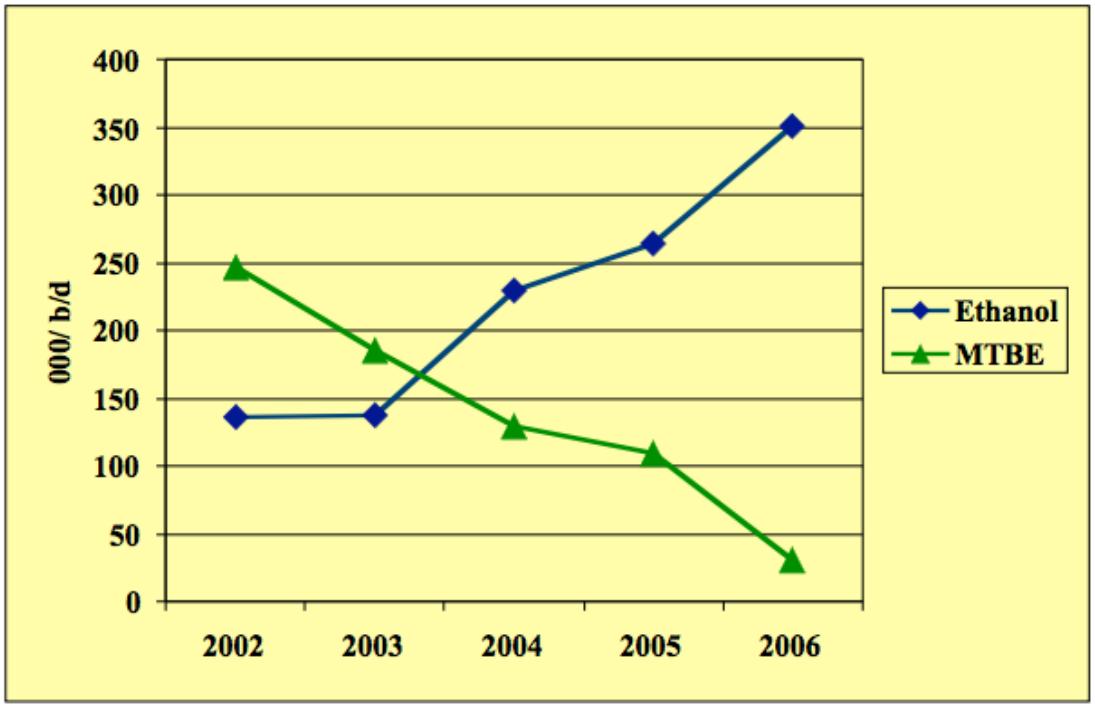
Ethanol and MTBE



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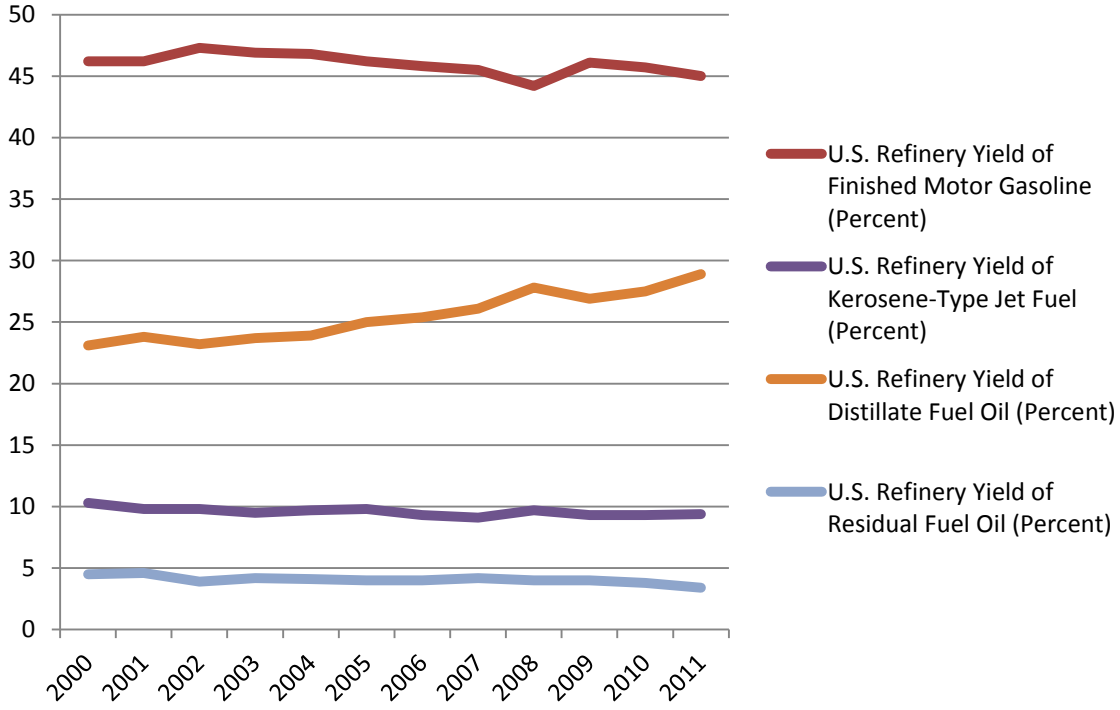
US Refinery Yields



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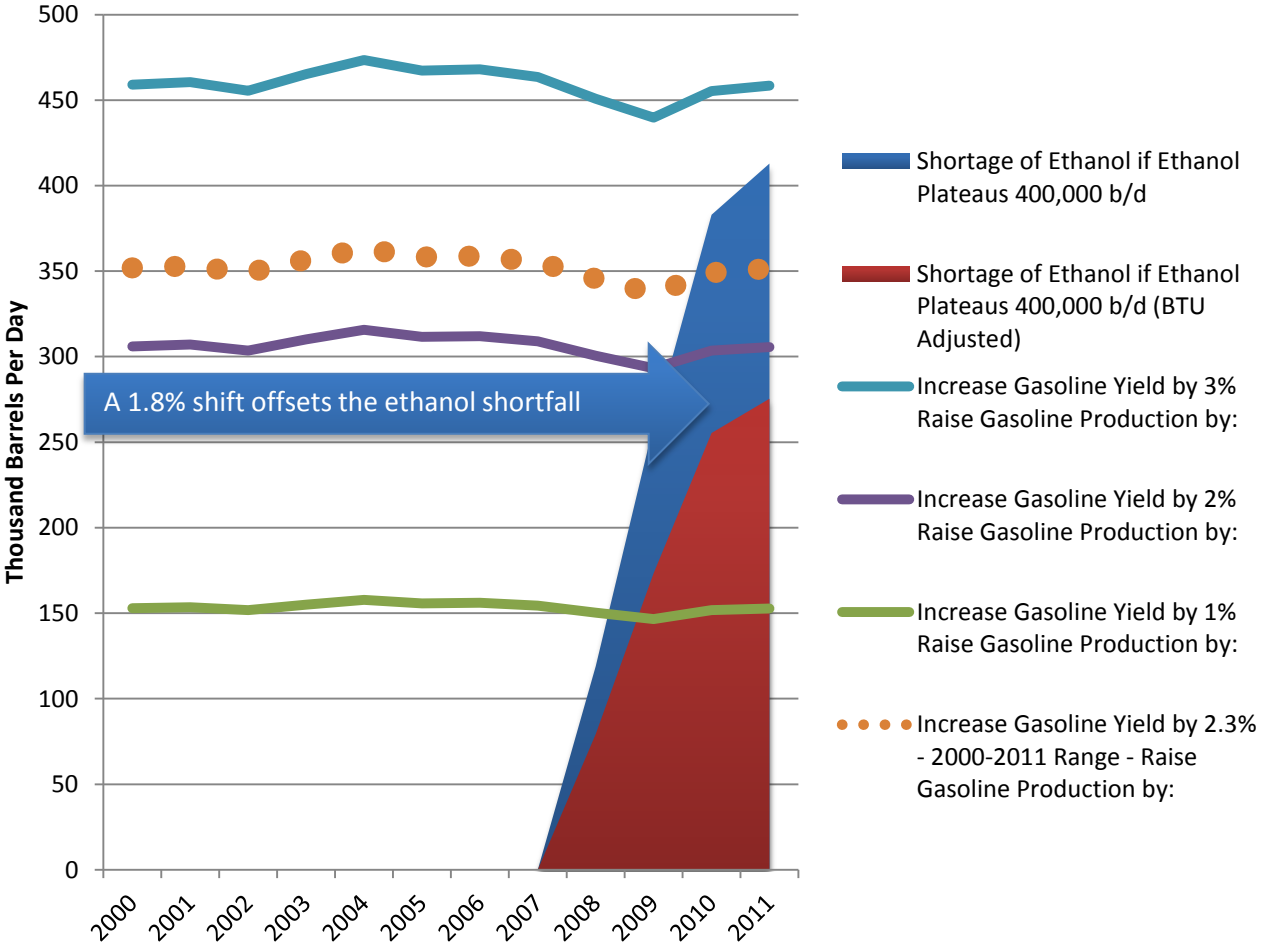
Yield Shift Needed to Offset 400,000 b/d of Ethanol



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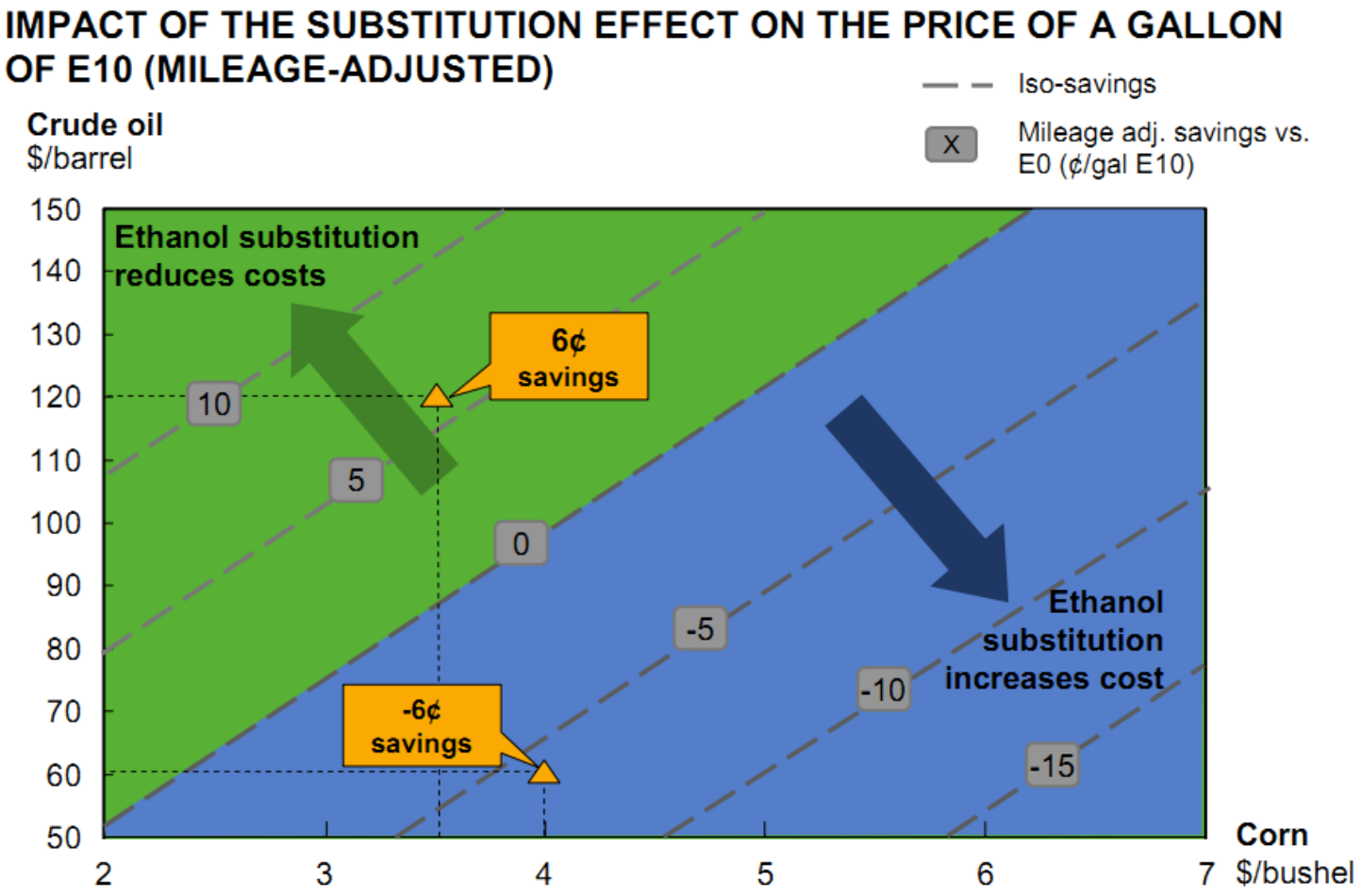
NREL Study on Blending Economics



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Crop Planting, Prices and Ethanol Use

Crop Year	Alcohol for fuel ethanol	Planted acreage (Million acres)	Production (Million bushels)	Yield per harvested acre (Bushels per acre)	Weighted-average farm price (dollars per bushel)
2005/06	1,603.32	81.78	11,112.19	147.90	2.00
2006/07	2,119.49	78.33	10,531.12	149.10	3.04
2007/08	3,049.21	93.53	13,037.88	150.70	4.20
2008/09	3,708.89	85.98	12,091.65	153.90	4.06
2009/10	4,591.16	86.38	13,091.86	164.70	3.55
2010/11	5,021.21	88.19	12,446.87	152.80	5.18
2011/12	5,050.00	91.92	12,358.41	147.20	6.20
05/06 vs 11/12	***214.97%***	***12.40%***	***11.21%***	***-0.47%***	***210.00%***

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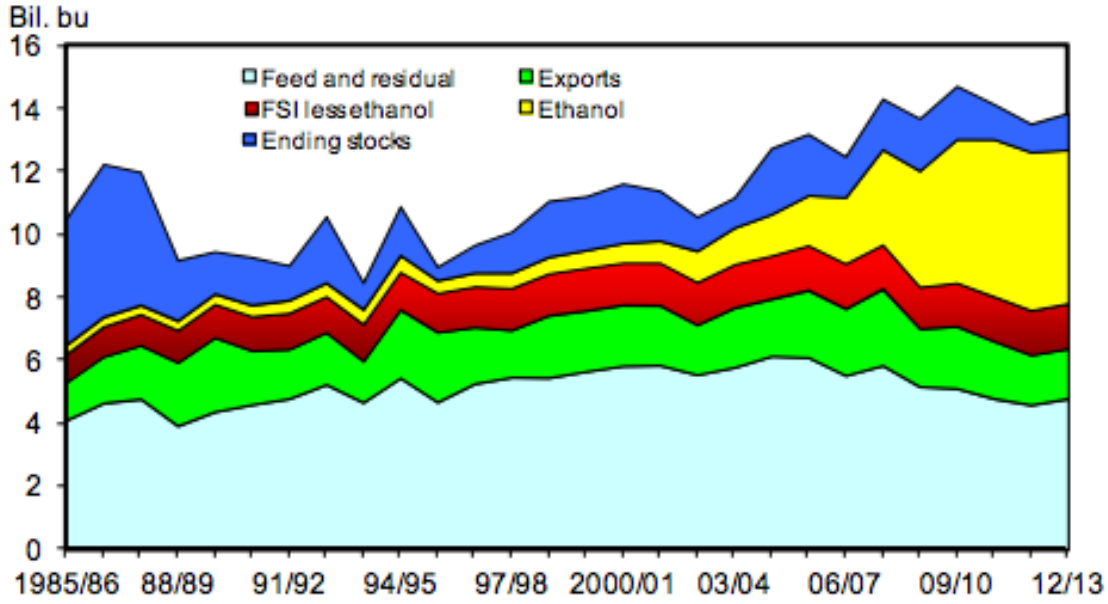
Corn Consumption by Sector



Source: USDA, World Agricultural Outlook Board, *WASDE*.

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Biofuel Crop Use – 400,000 b/d of Ethanol

Current Net Acreage for Fuel (after DDGS 'offset'), million acres	**27.51**
Net Acreage for Fuel in waived RFS scenario - 400,000 bbl/d ethanol (excludes exports), no soy-based biodiesel	9.04
Biofuel Land Use Reduction	*18.47*
Biofuel Land Use Reduction, % change	*67.13%*
% of 2011/2012 corn and soy harvested acreage not needed for biofuels	11.47%
DDGS Shortfall, Million Acres of Corn and Soy Equivalent	-7.60
Net Biofuel Land Use Reduction after DDGS Shortfall	*10.86*
Net Biofuel Land Use Reduction after DDGS Shortfall, %	*39.49%*

Takeaways

- **For a waiver to be effective it must cover multiple years – but this is outside of EPA's authority**
  - **As long as obligated parties have RVOs looming, they will be inclined to blend at ~10% in order to generate RINs for future compliance**
- **RFS mandates are creating distortions in fuel and food production – flexibility needed.**
  - **Must include biodiesel – soy needed for DDGS offset**
  - **Ethanol is an important part of the gasoline pool and is unlikely to drop below 5% of the gasoline pool in a mandate free environment**
  - **At current levels ethanol is largely supporting exports rather than reducing crude oil consumption**
  - **Blendwall hinders next-gen biofuels entrance into market**
- **A few refiners would drop ethanol completely, others would blend at 10%, most somewhere in between.**
  - **UC Davis study submitted for EPA waiver comments found 7% blend rate given long term waiver**
- **Low cost RFS compliance options have been exhausted – the next compliance option for obligated parties is to export product (distillate)**

$$RVO = Standard \times (gasoline + diesel) + Deficit$$

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RFS Mandates