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The Impact of Biofuels Mandates on Grain and Oilseed Markets

Scott Irwin
sirwin@illinois.edu
University of Illinois

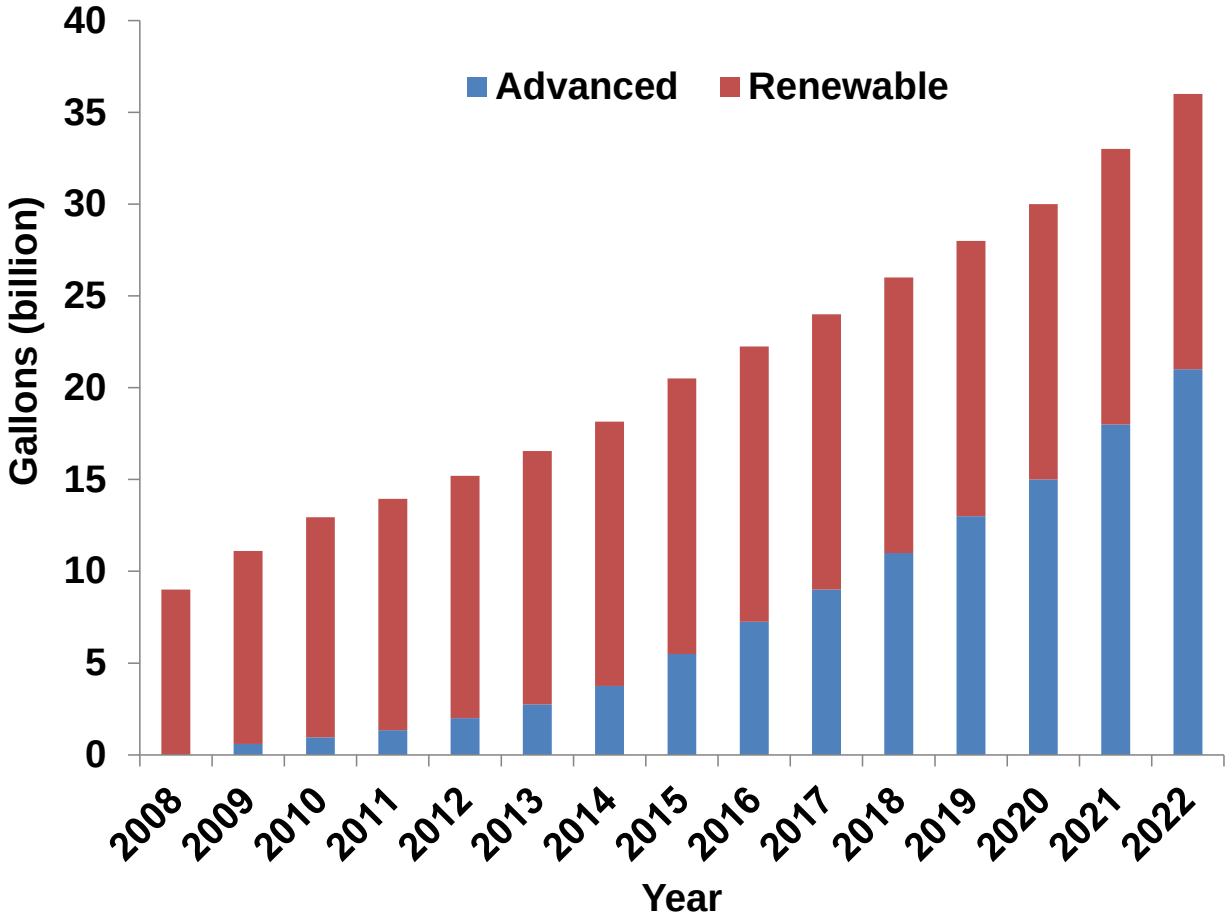


Agricultural and Consumer Economics

2012 Illinois Farm Economics Summit
The Profitability of Illinois Agriculture: Managing in a Turbulent World

What is the RFS?

U.S. Renewable Fuels Standards, 2008-2022



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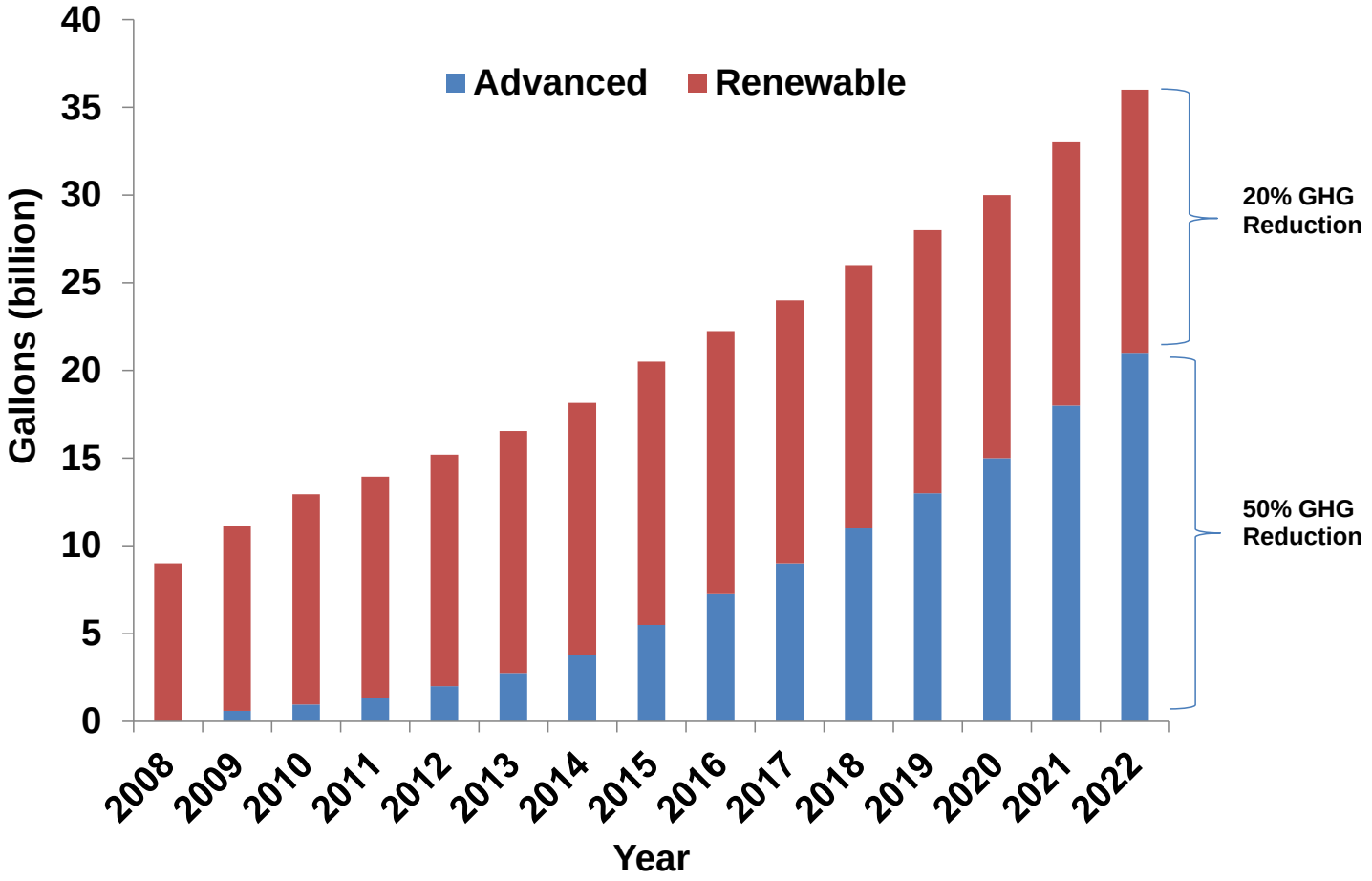

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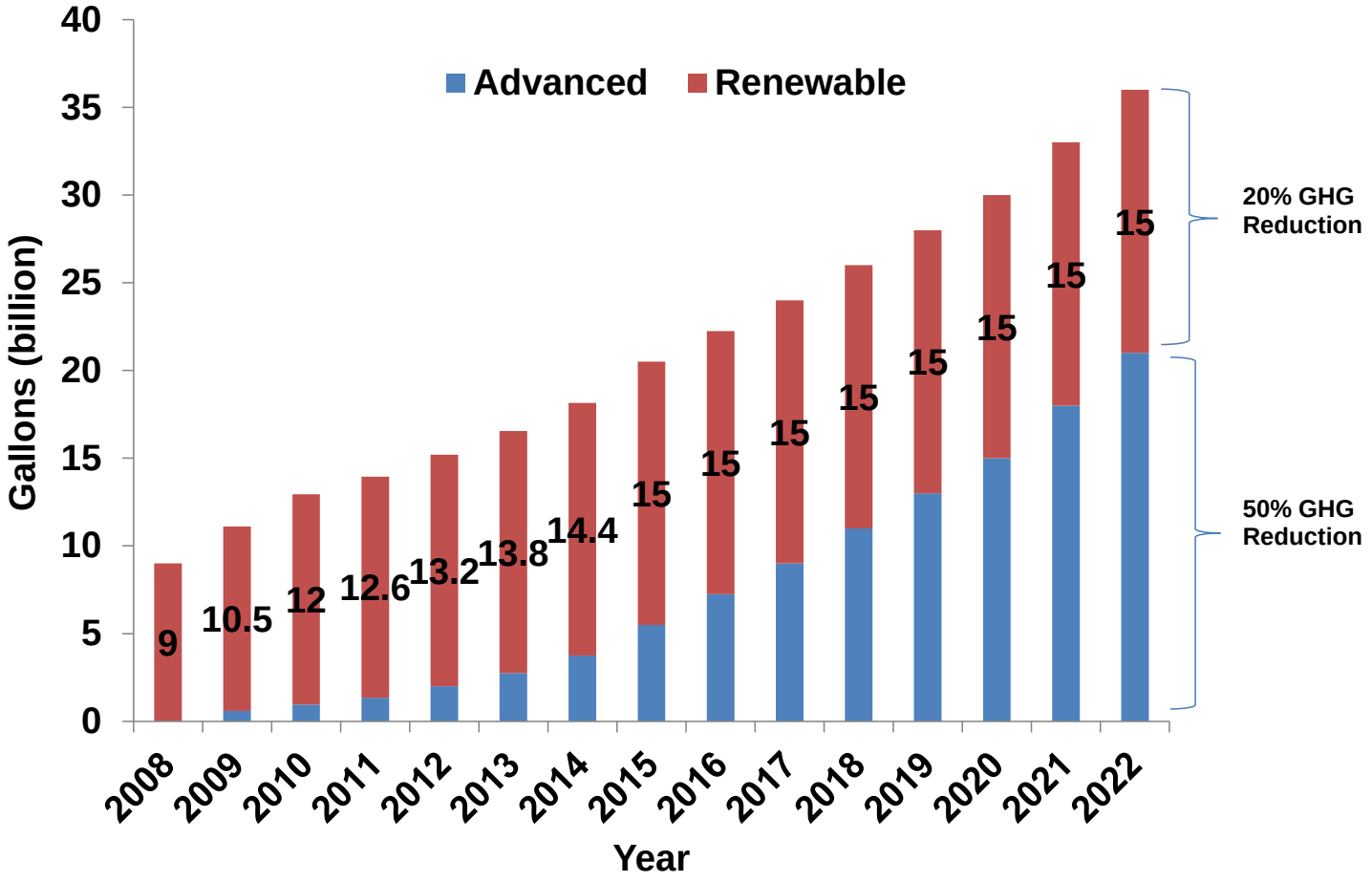

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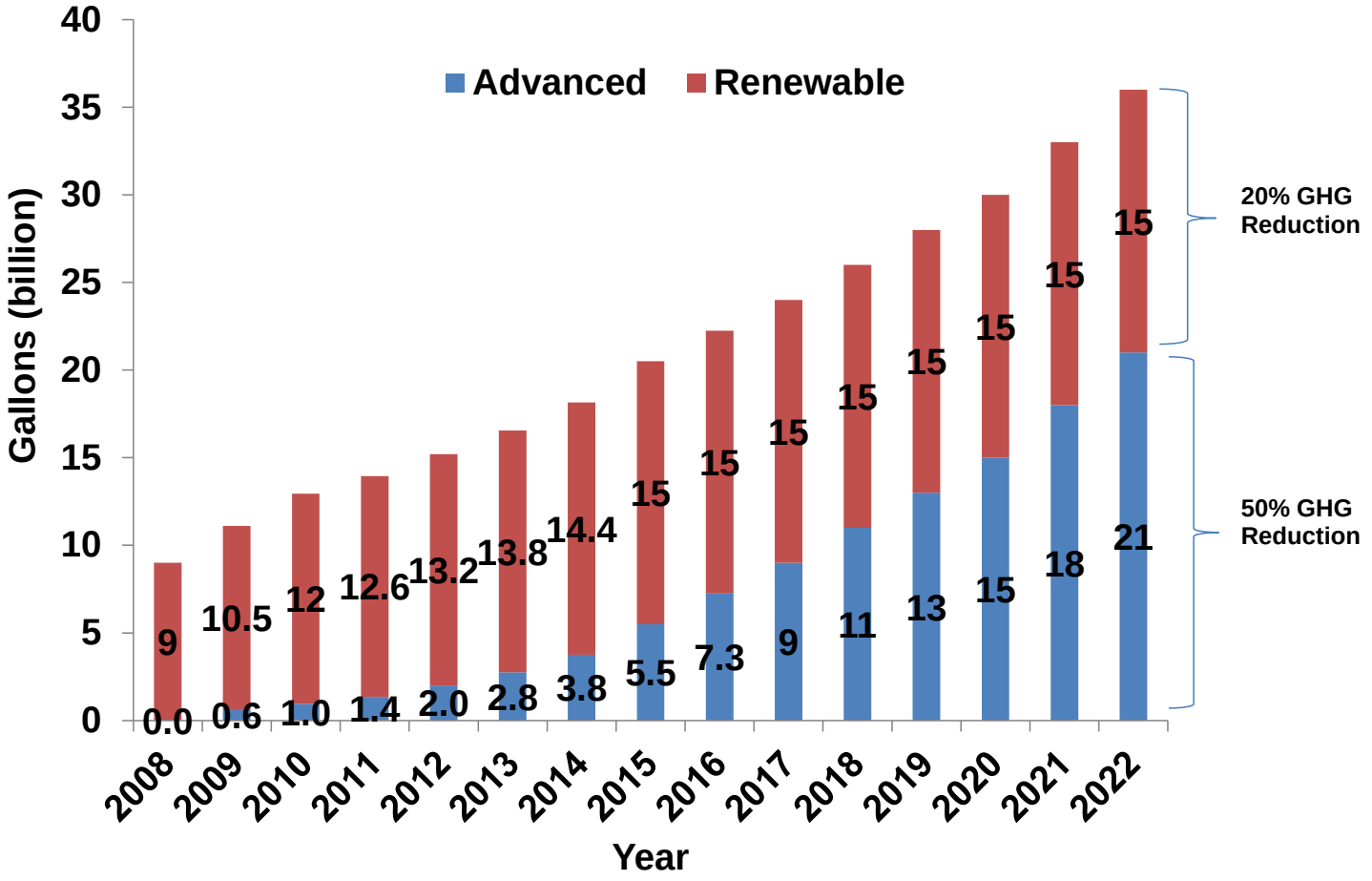

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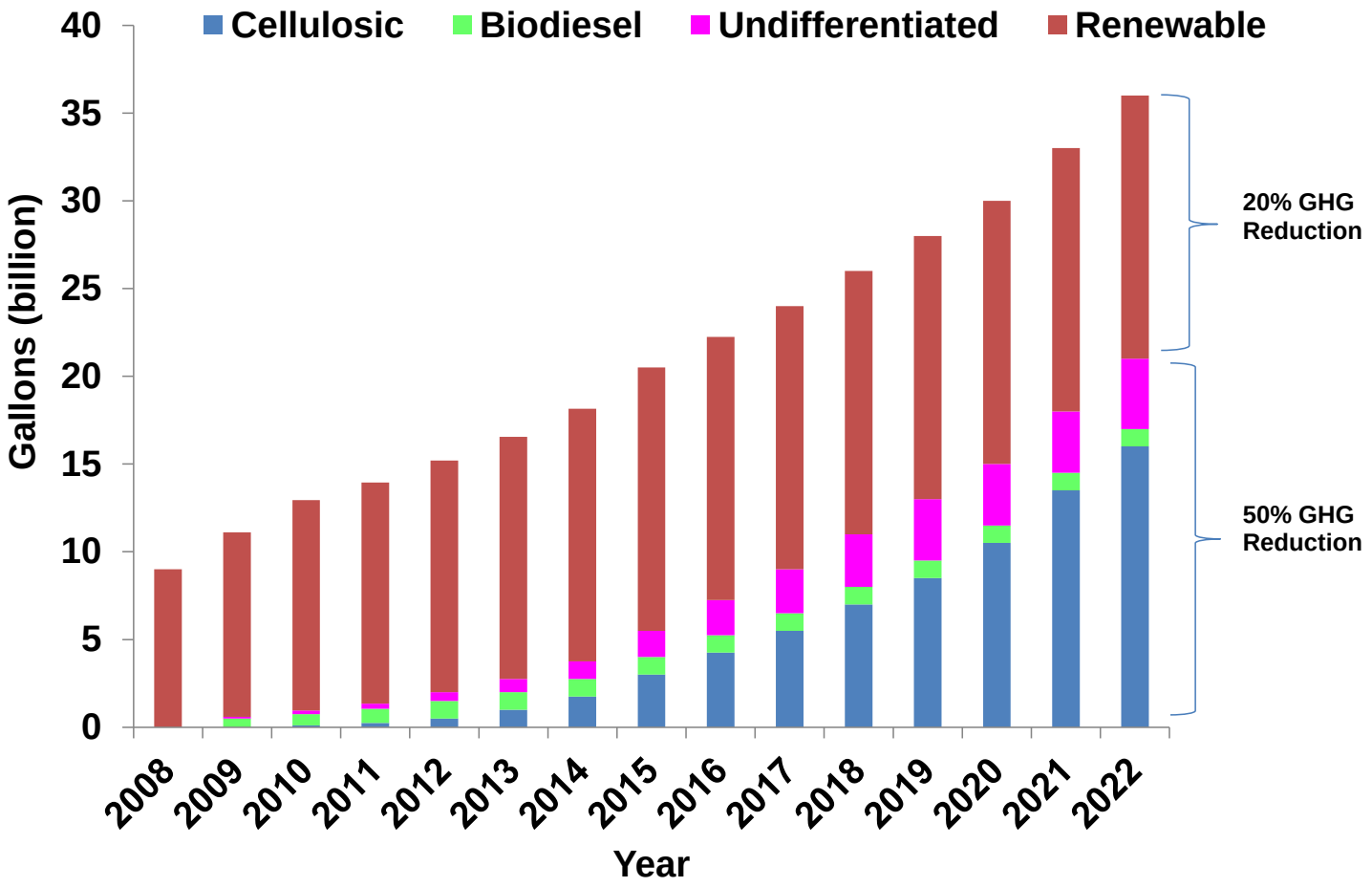


How is the RFS Enforced?

Renewable Fuel Standard Formulas for 2012

Cellulosic

$$\text{Std}_{\text{CB},i} = 100\% \times \frac{\text{RFV}_{\text{CB},i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

Biodiesel

$$\text{Std}_{\text{BBD},i} = 100\% \times \frac{\text{RFV}_{\text{BBD},i} \times 1.5}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

Advanced

$$\text{Std}_{\text{AB},i} = 100\% \times \frac{\text{RFV}_{\text{AB},i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

Total

$$\text{Std}_{\text{RF},i} = 100\% \times \frac{\text{RFV}_{\text{RF},i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

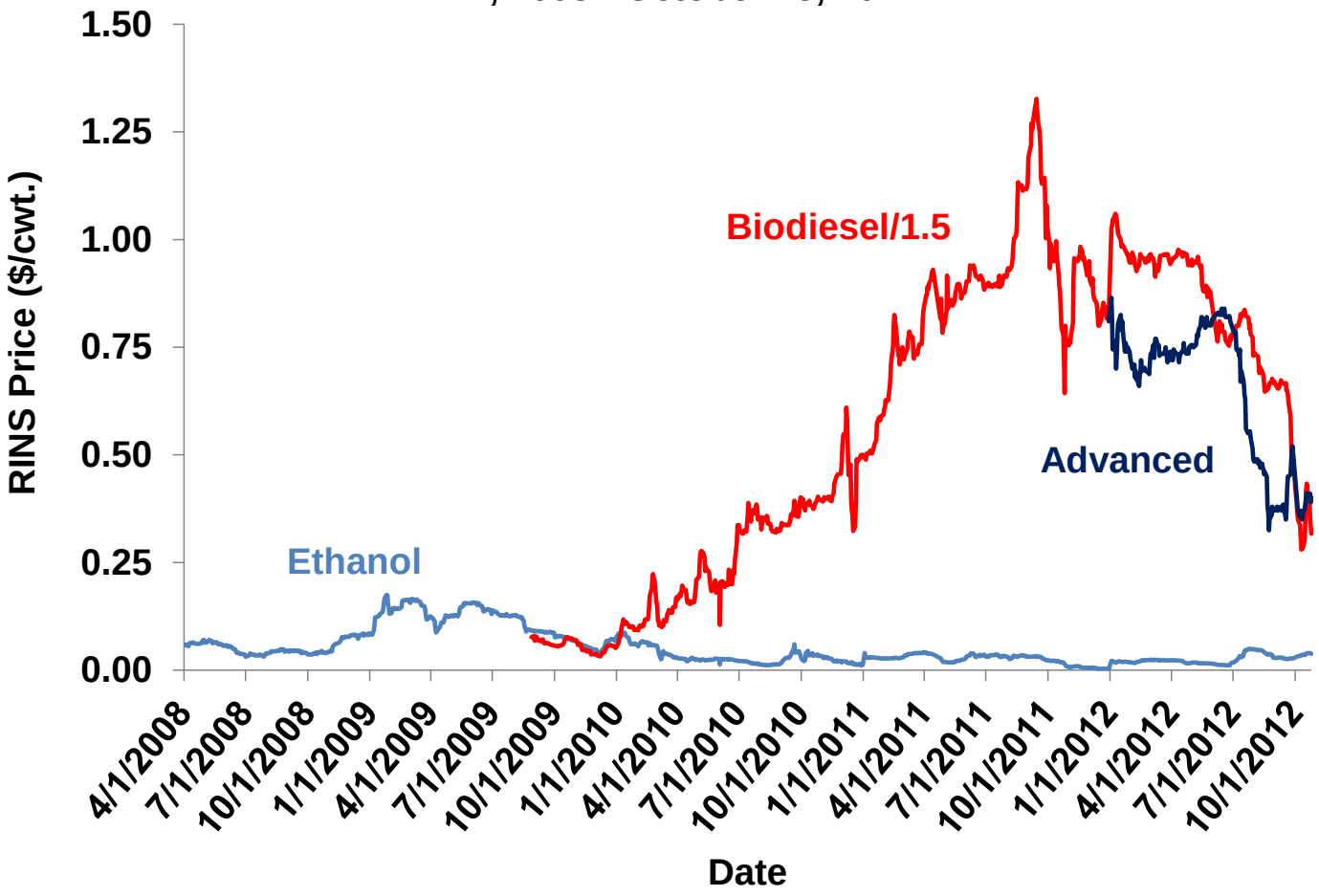
TABLE III.B.3–3—FINAL PERCENTAGE STANDARDS FOR 2012

Cellulosic biofuel	0.006%
Biomass-based diesel	0.91%
Advanced biofuel	1.21%
Renewable fuel	9.23%

Renewable Identification Numbers (RINS)

- RFS is actually enforced using RINS, a tradable credit system administered by the U.S. EPA
- A RIN is a 38-digit number assigned to each gallon or batch of renewable fuel produced or imported into the U.S.
- Each RIN travels with the biofuel as it moves through the supply chain
- RINs are actively traded in a secondary market
- RINs allow obligated parties to meet their individual mandates by applying RINs representing biofuels which they have physically purchased and blended, or those which were purchased from another party through RIN trading

Daily Price of Current Year RINS in the Secondary Market, April 1, 2008 - October 25, 2012

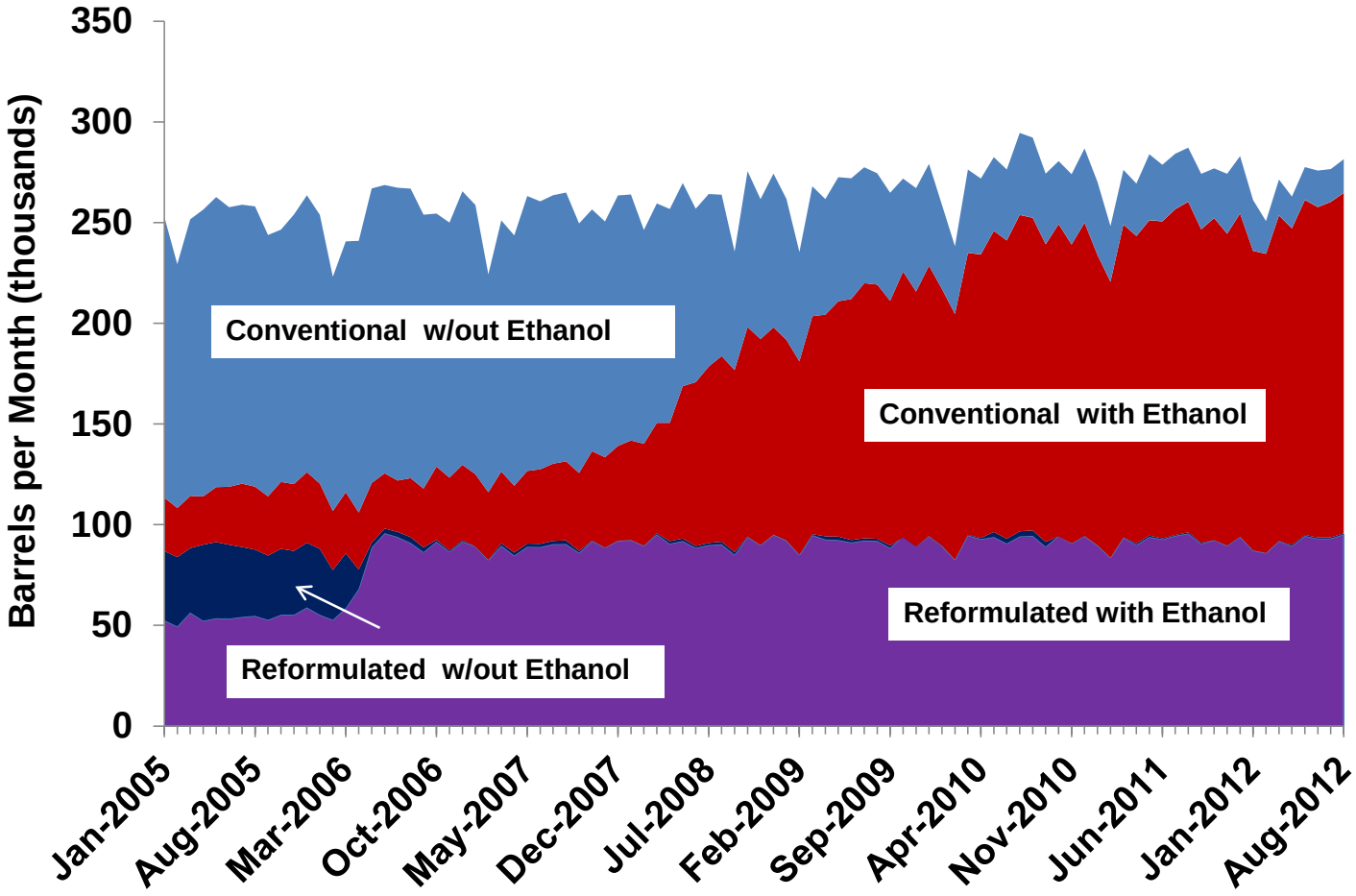


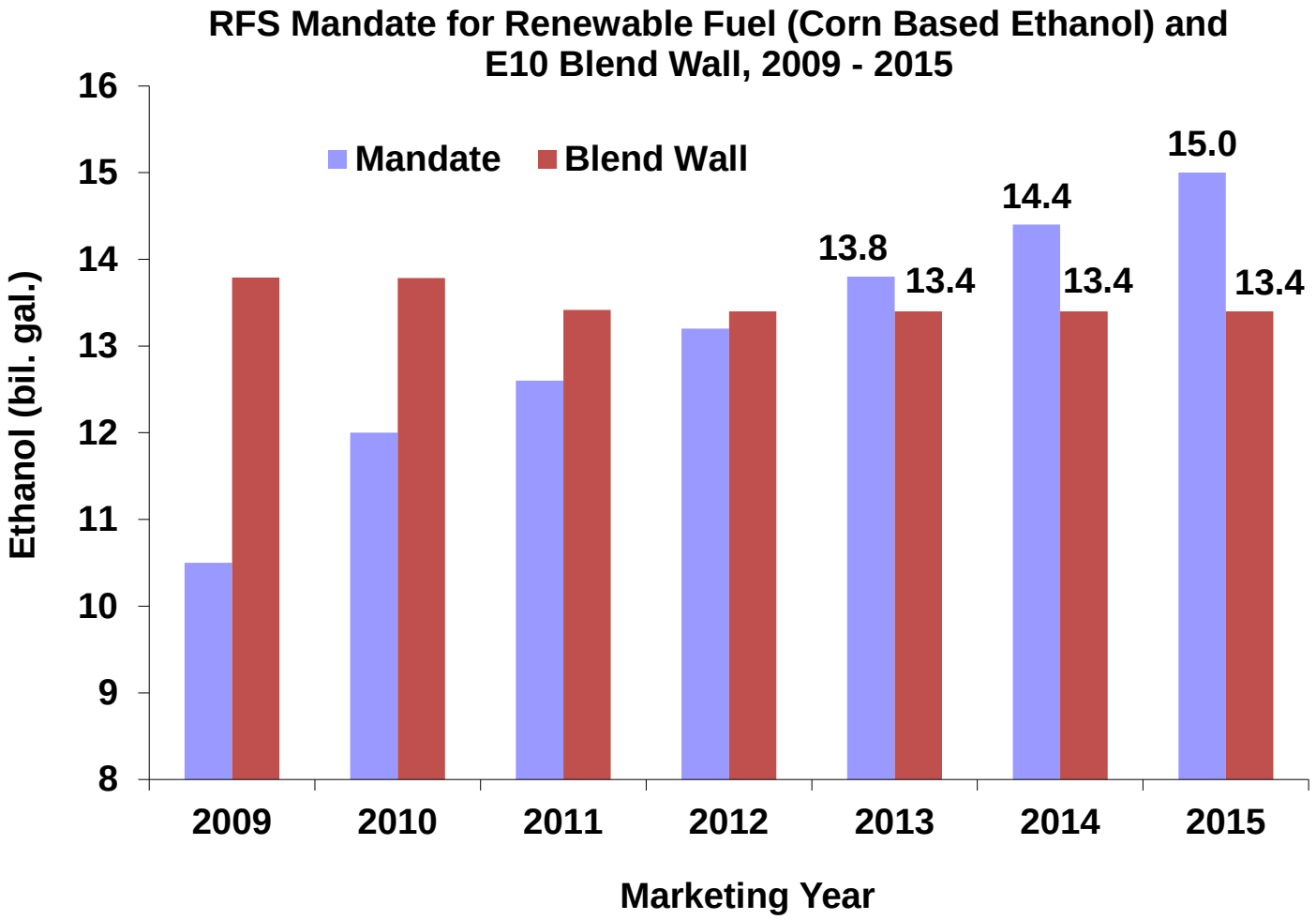
What is the Ethanol Blend Wall?

Ethanol-Gasoline Blending

- The most common blend of ethanol and gasoline is known as E10
  - A mixture of 10% anhydrous ethanol and 90% gasoline
  - Can be used in the engines of most cars and light duty trucks without modification of the engine or fuel system
- Uncertainty whether higher blends of ethanol will damage engines without modification
- If E10 is the maximum blend, then the blend wall equals 10% of total motor gasoline supply
  - Puts an upper limit on the size of ethanol production and use of corn for fuel ethanol

U.S. Refinery and Blender Monthly Net Production of Finished Motor Gasoline, January 2005 - August 2012




RFS Mandate for Renewable Fuel (Corn Based Ethanol) and E10 Blend Wall, 2009 - 2015
Mandate
Blend Wall
Ethanol (bil. gal.)
16
15
14
13
12
11
10
9
8
13.8
13.4
14.4
13.4
15.0
13.4
2009
2010
2011
2012
2013
2014
2015
Marketing Year

Is E15 the Way Around the Blend Wall?

- US EPA approved E15 blends for 2001 and newer vehicle models in January 2011
- Implementation, has been delayed by a number of factors
  - Lack of clarification of liability issues associated with dispensing E15
  - Cost of installing blender pumps at retail stations
  - Engine warranties using E15
- E85 has been approved for "flex fuel" vehicles for some time
  - 10 million flex fuel vehicles on the road
  - E85 only offered by a very small number of retailers at the present time

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Bottom-line: US is likely to be stuck at the E10 blend wall for at least the next several years

How Will the RFS be Implemented in the Next Several Years Given the Blend Wall?

U.S. Renewable Fuels Standard for 2012-2015--Billion Gallons

Calendar Year	Total	Advanced				Renewable
		Cellulosic	Biodiesel(a)	Undifferentiated	Total	
2012	15.20	0.50	1.00	0.50	2.00	13.20
2013	16.55	1.00	1.28	0.47	2.75	13.80
2014	18.15	1.75	*	2.00	3.75	14.40
2015	20.50	3.00	*	2.50	5.50	15.00

(a) each gallon of biodiesel receives 1.5 gallons credit towards RFS

* minimum of 1.0 billion gallons

http://en.wikipedia.org/wiki/File:Ethanol_plant.jpg

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2013	16.55	0.00	1.28	0.83	2.75	13.80
2014	18.15	0.00	1.28	1.83	3.75	14.40
2015	20.50	0.00	1.28	3.58	5.50	15.00

(a) each gallon of biodiesel receives 1.5 gallons credit towards RFS

* minimum of 1.0 billion gallons

http://en.wikipedia.org/wiki/File:Ethanol_plant.jpg

U.S. Ethanol Balance Sheet and Implied Corn Consumption for 2012-2015---Billion Gallons except Corn

Calendar Year	Ethanol				
	RFS	Consumption	Imports	Exports	Production
2012	13.2	13.1	0.50	0.74	13.34
2013	13.8	13.3	0.83	0.50	12.97
2014	14.4	13.4	1.00	0.50	12.90
2015	15.0	13.5	1.00	0.50	13.00

Note: Assumes zero stock change each year.

http://en.wikipedia.org/wiki/File:Ethanol_plant.jpg

U.S. Biodiesel Production for 2012 and Assumed for 2013-2015--Billion Gallons except Feedstock

Calendar Year	Mandate	Undifferentiated Biodiesel Gap	Renewable Gap	Total	Feedstock Requirement (bil. lbs.)
2012	1.00	0.00	0.00	1.00	7.5
2013	1.28	0.00	0.00	1.28	9.6
2014	1.28	0.55	0.95	2.79	20.9
2015	1.28	1.72	1.67	4.67	35.0

http://static.ddmcdn.com/gif/biodiesel3.jpg