





Renewable Fuels Association

About the RFA

- The Renewable Fuels Association (RFA) promotes policies, regulations and research and development initiatives that will lead to the increased production and use of fuel ethanol.
- RFA membership includes a broad cross-section of businesses, individuals and organizations dedicated to the expansion of the U.S. fuel ethanol industry.

Ethanol Facts

2008 Production / 2009 Estimate

9.2 billion gallons / 10.5 billion gallons

2008 Ethanol Imports

556 million gallons

Current Annual Production Capacity

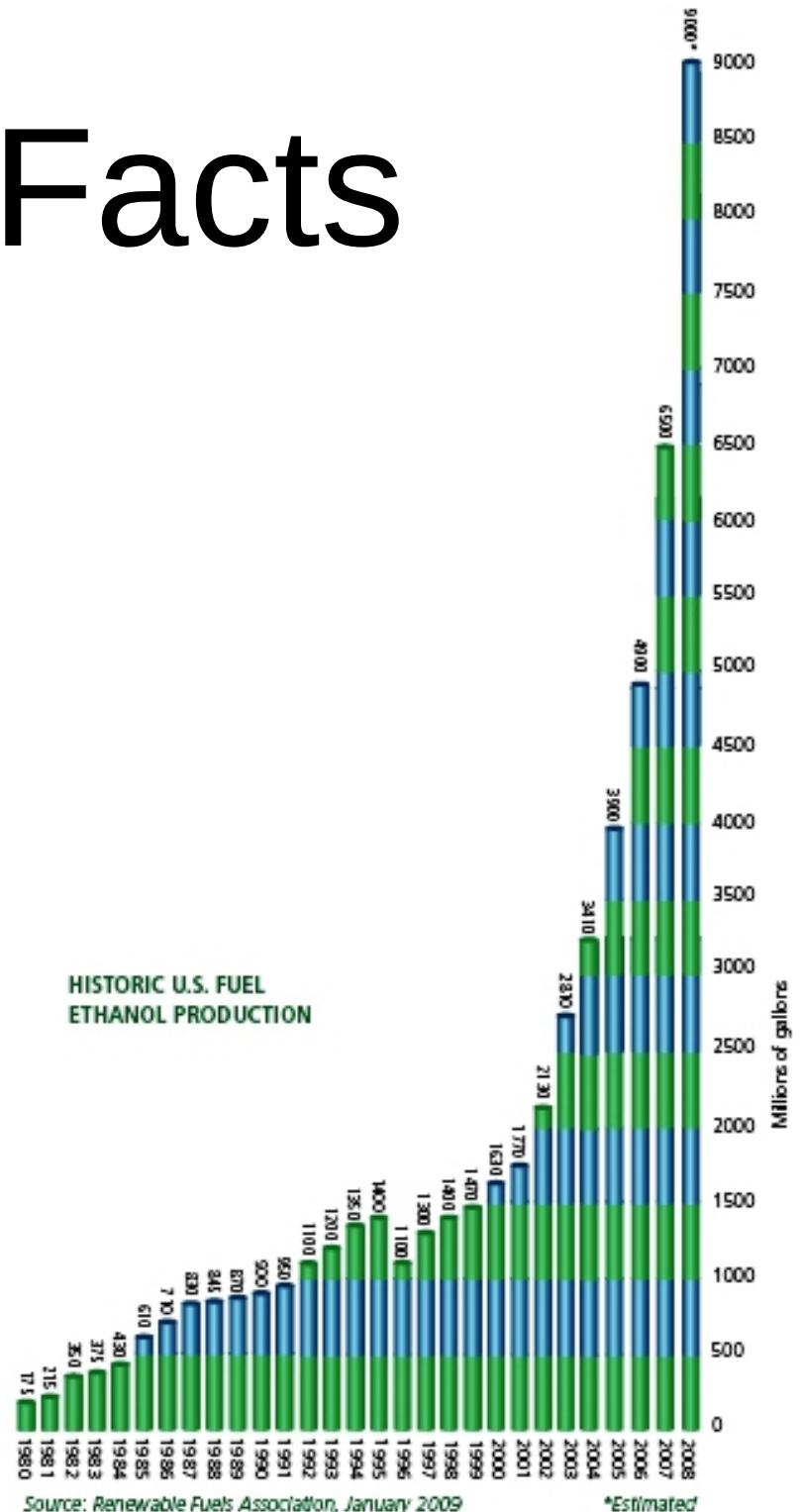
12.4 billion gallons

Under Construction

2 billion gallons

Total Annual Operating Capacity

10.3 billion gallons at 170 locations



Ethanol Production Facilities



1. Abengoa

Cornstover, wheat straw, milo stubble, switchgrass and other biomass.

2. Abengoa**3. AE Biofuels**

Switchgrass, grass seed, grass straw and corn stalks.

4. Bluefire

Green waste, wood waste, and other cellulosic urban wastes.

5. Bluefire**6. California Ethanol + Power, LLC**

Local Imperial Valley grown sugarcane facility powered by sugarcane bagasse.

7. Coskata

Any carbon-based feedstock, including biomass, municipal solid waste, bagasse, and other agricultural waste.

8. DuPont Danisco Cellulosic Ethanol LLC

Switchgrass, corn stover and corn cobs.

9. Ecofin, LLC

Corn cobs.

10. Flambeau River Biofuels LLC

Softwood chips, wood, and forest residues.

11. ICM Inc.

Switchgrass, forage, sorghum, stover.

12. Iogen Corp.

Agricultural residues including wheat straw, barley straw, corn stover, switchgrass and rice straw.

13. KL Process

Softwood, waste wood, including cardboard and paper.

14. Lignol Innovations

Woody biomass, agricultural residues, hardwood and softwood.

15. Mascoma

Lignocellulosic biomass, including switchgrass, paper sludge, and wood chips.

16. Mascoma

Consolidated bioprocessing refinery using bacteria to break down and ferment local wood chips

17. Newpage Corp.

Woody biomass, mill residues.

18. New Planet Energy

Municipal solid waste (MSW); unrecyclable paper; construction & demolition debris; tree, yard and vegetative waste; and energy crops.

19. Pacific Ethanol

Wheat straw, stover, and poplar residuals.

20. POET

Corn fiber, corn cobs and corn stalks.

21. POET**22. Range Fuels Inc.**

Wood residues and wood-based energy crops, grasses and corn stover.

23. RSE Pulp & Chemical LLC

Woodchips (mixed hardwood).

24. Verenium

Sugarcane bagasse and specially bred energy cane.

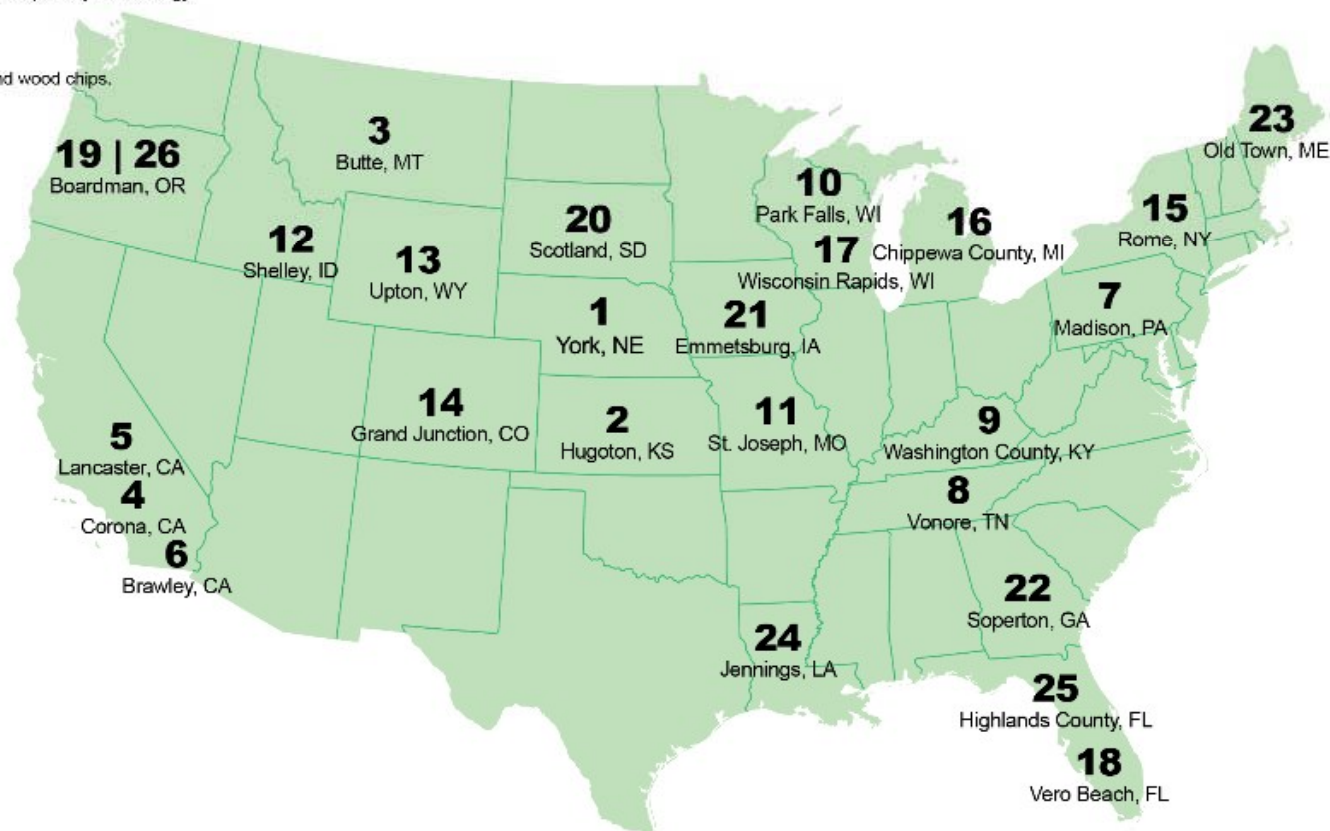
25. Verenium

Sugarcane bagasse and specially bred energy cane.

26. ZeaChem

Poplar trees, sugar, and wood chips.

U.S. Cellulosic Ethanol Projects Under Development And Construction

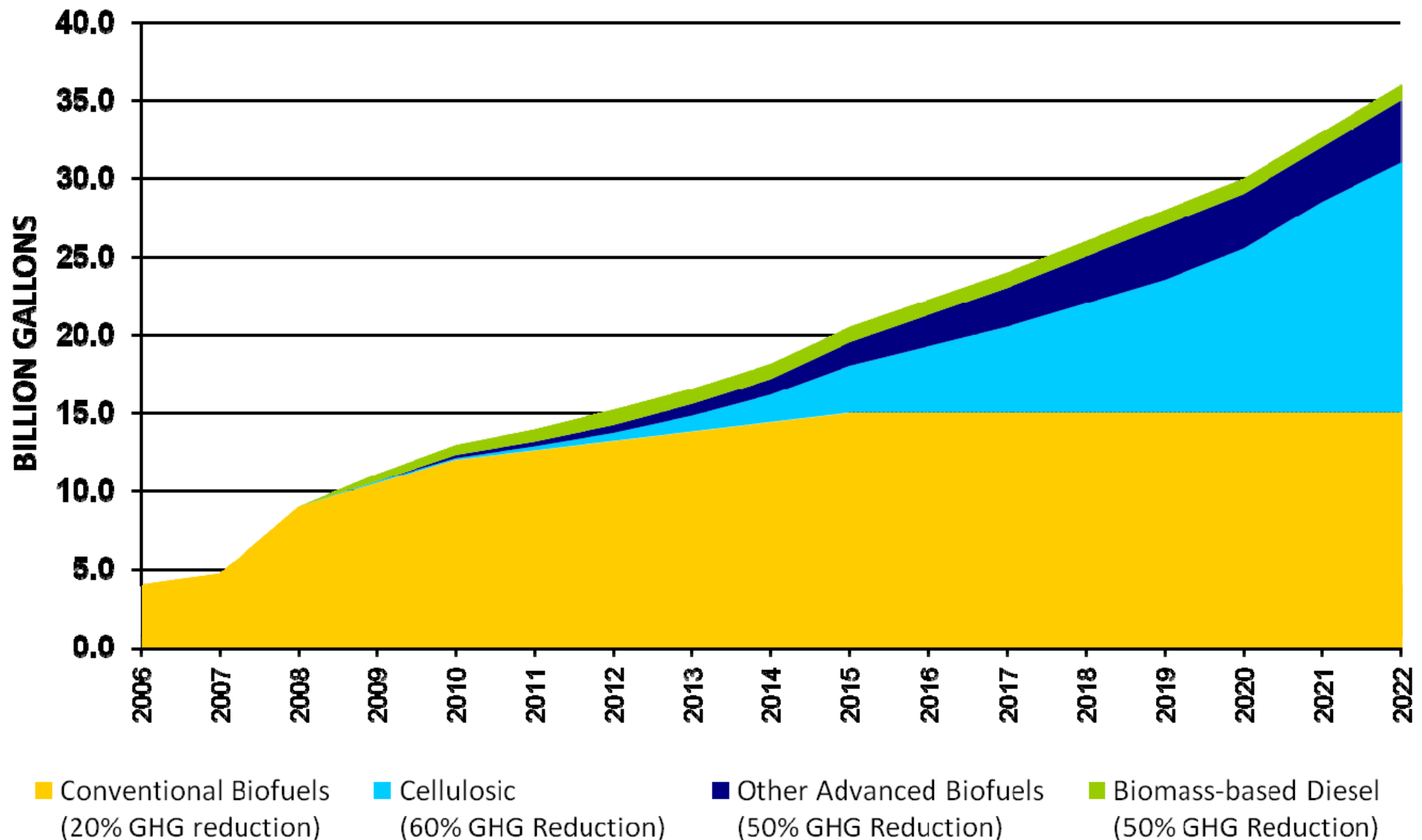


Renewable Fuels Standard

NEW RENEWABLE FUELS STANDARD SCHEDULE

Year	Renew-able Biofuel	Advanced Biofuel	Cellulosic Biofuel	Biomass-based Diesel	Undiffer-entiated Advanced Biofuel	Total RFS
2008	9.0					9.0
2009	10.5	.6		.5	0.1	11.1
2010	12	.95	.1	.65	0.2	12.95
2011	12.6	1.35	.25	.8	0.3	13.95
2012	13.2	2	.5	1	0.5	15.2
2013	13.8	2.75	1		1.75	16.55
2014	14.4	3.75	1.75		2	18.15
2015	15	5.5	3		2.5	20.5
2016	15	7.25	4.25		3.0	22.25
2017	15	9	5.5		3.5	24
2018	15	11	7		4.0	26
2019	15	13	8.5		4.5	28
2020	15	15	10.5		4.5	30
2021	15	18	13.5		4.5	33
2022	15	21	16		5	36

Renewable Fuels Standard (RFS2)



Note: 20% reduction for conventional biofuels applies only to new construction

RFS2 Implementation

- Requires GHG reductions for each renewable fuel technology
 - 20% Reduction for Conventional
 - 50% Advanced Biofuels/Biodiesel
 - 60% Cellulosic Ethanol
- Questions abound over modeling, assumptions used by EPA to determine GHG emissions
- Precursor to national low carbon fuel standard

Current Ethanol GHG Profile

- Ethanol production yields between 30 and 59% reduction in GHG emissions compared to gasoline (*Journal of Industrial Ecology*, Liska et al., 2009 and IEA Bioenergy Task 39)
- Future GHG reductions from corn ethanol could rival estimates for cellulosic ethanol
- Trend line for ethanol improving, petroleum is getting worse

Indirect Land Use

- No scientific consensus on how to measure indirect land use change, if it exists
- Current assumptions underestimate impact of livestock feed co-product, yield improvements
- Being applied selectively to biofuels at the exclusion of petroleum
 - Tar sands, methane flaring

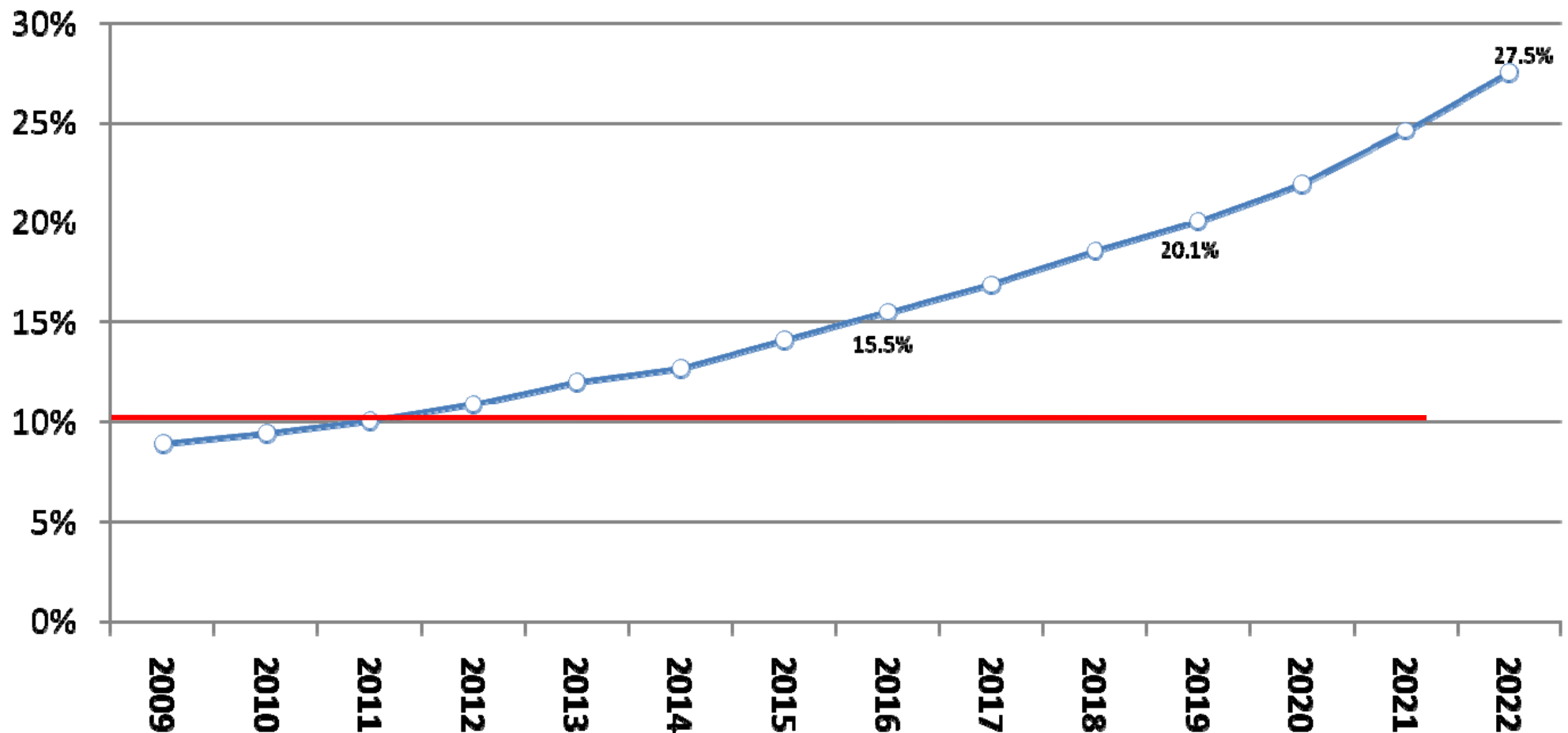
Steps Forward on RFS2

- EPA should issue NOPR on RFS2
- Include calculations for both direct and domestic indirect emissions from land use change
- List calculations that show GHG emissions with and without international indirect land use change
- Properly account for co-product generation and efficiency, productivity improvements

RFS Ethanol Requirements (% of projected gasoline use)

Ethanol Use Required Under EISA, as Implied % of Total (Blended) Gasoline Consumption

NOTE: Does not include effect of small refiners exemption through 2010



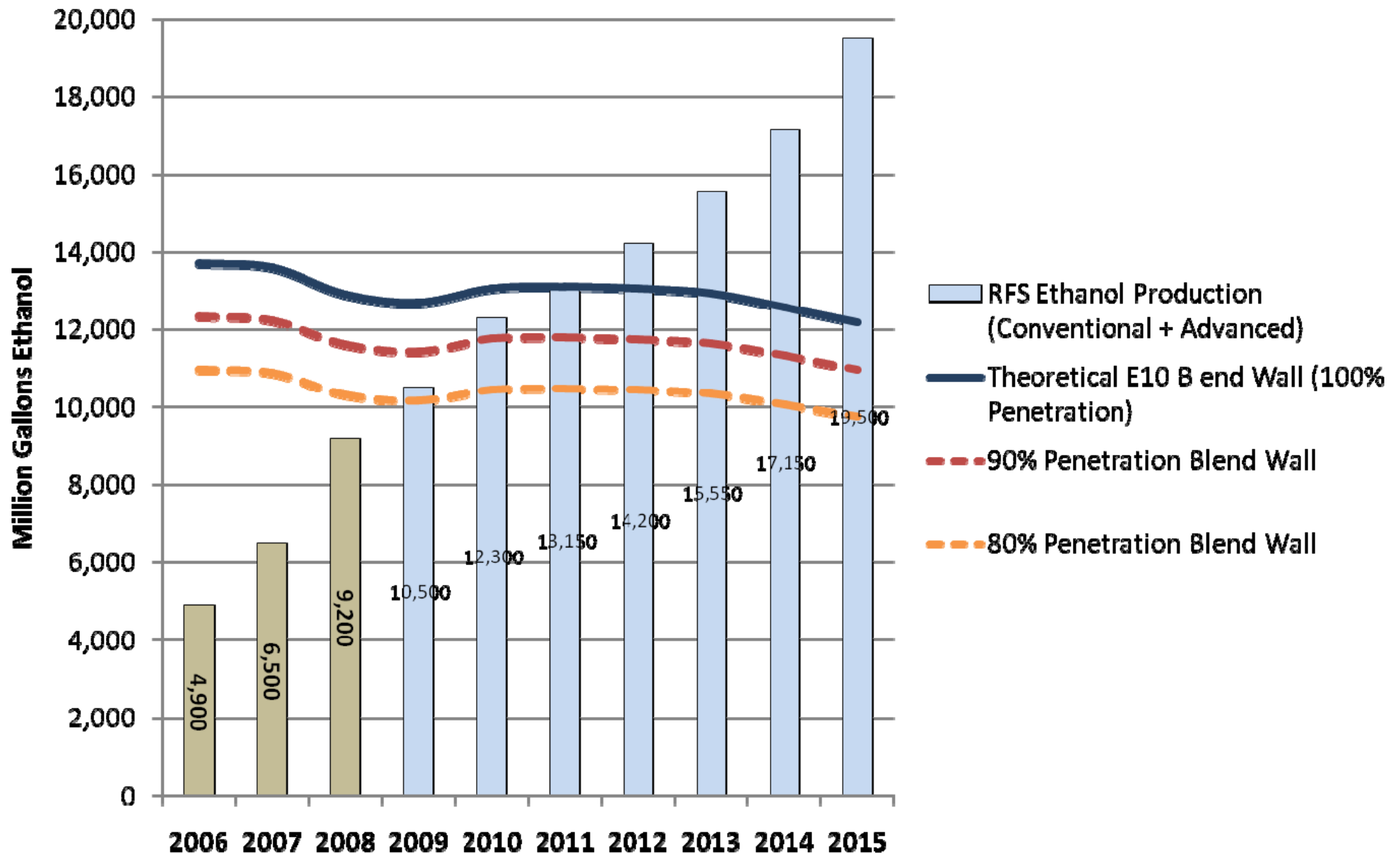
Meeting RFS Ethanol Targets

- E10 reaches saturation at ~12.5-14 billion gals.
- 2010 RFS = 10.6 bg (conventional + undifferentiated advanced)
- 2011 RFS = 12.3 bg (conv. + und. advanced + cellulosic)
- 2012 RFS = 13.15 bg (conv. + und. advanced + cellulosic)
- 2013 RFS = 14.2 bg (conv. + und. advanced + cellulosic)

Meeting mid- and long-term RFS targets will require:

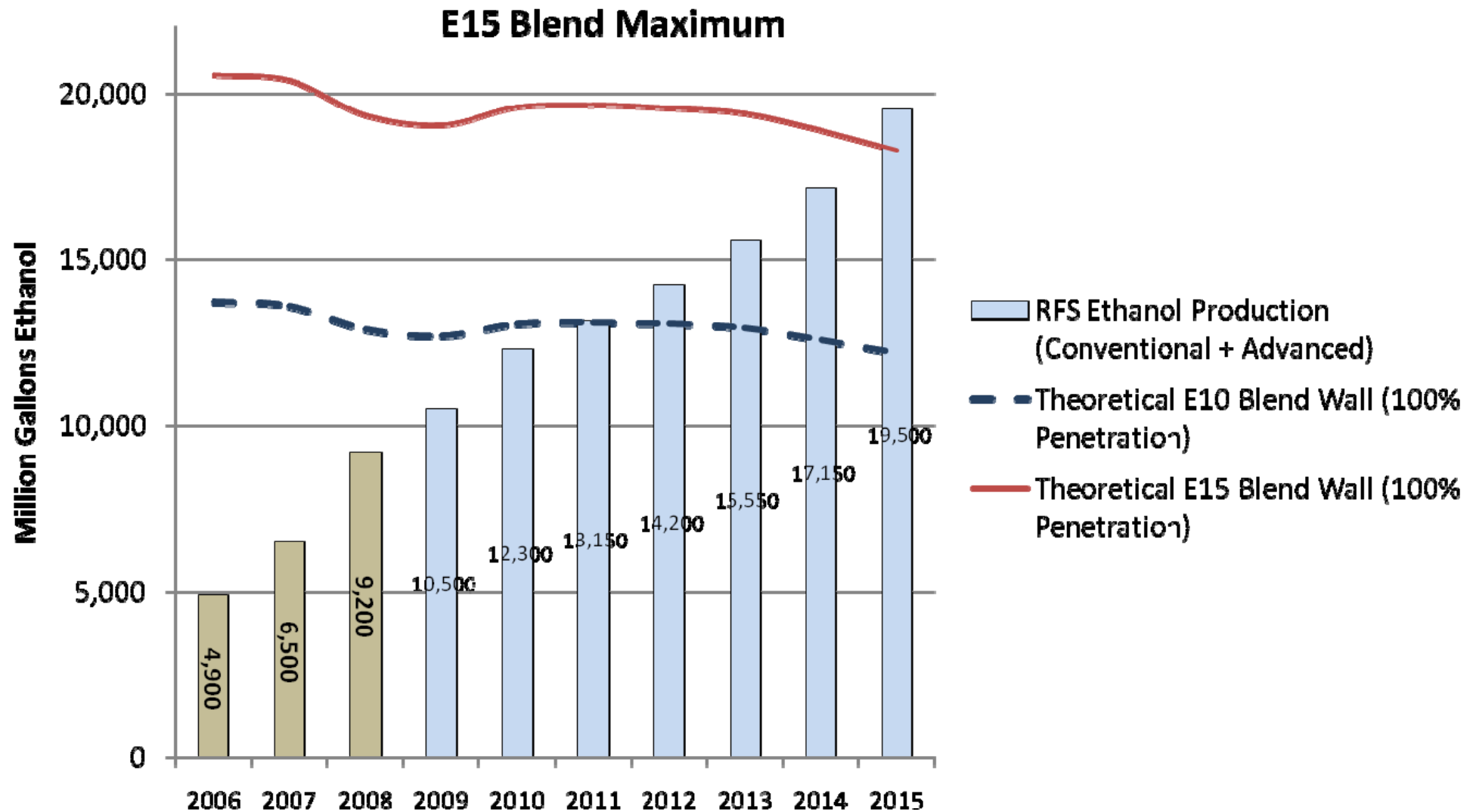
- Rapid proliferation of E85 (FFVs & infrastructure); **and**
- Approval of blends >E10 for conventional autos

The E10 Blend Wall



Notes: (1) Assumes undifferentiated biofuel will be ethanol in mid-term;
(2) Does not account for small refiner exemption through 2010

Impact of E15 Approval on Ethanol Market and RFS Compliance



Long-term goals likely to require mid-level blends higher than E15

A Possible RFS Compliance Path for Ethanol? (Illustrative Only)

