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Implementation and Pricing Risks to Climate Control Programs

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Implementation Risk Factors

- Fiscal Fatigue
- Poor Program Design
- Too Much Complexity
- Price Volatility **(killed by surprises)**
- Too Costly **(costs exceed benefits)**
- Politics Not Sustainable

Cracks Now Appearing

- New Jersey Pulls Funds for Alternative Fuels (**RGGIcide)**
- LA County Pushes Back on Cost of RFS
- New York Cancels Biodiesel Tax Credit
- W-M Harmful to Economic Growth?
- Public Backlash Against LCFS in California

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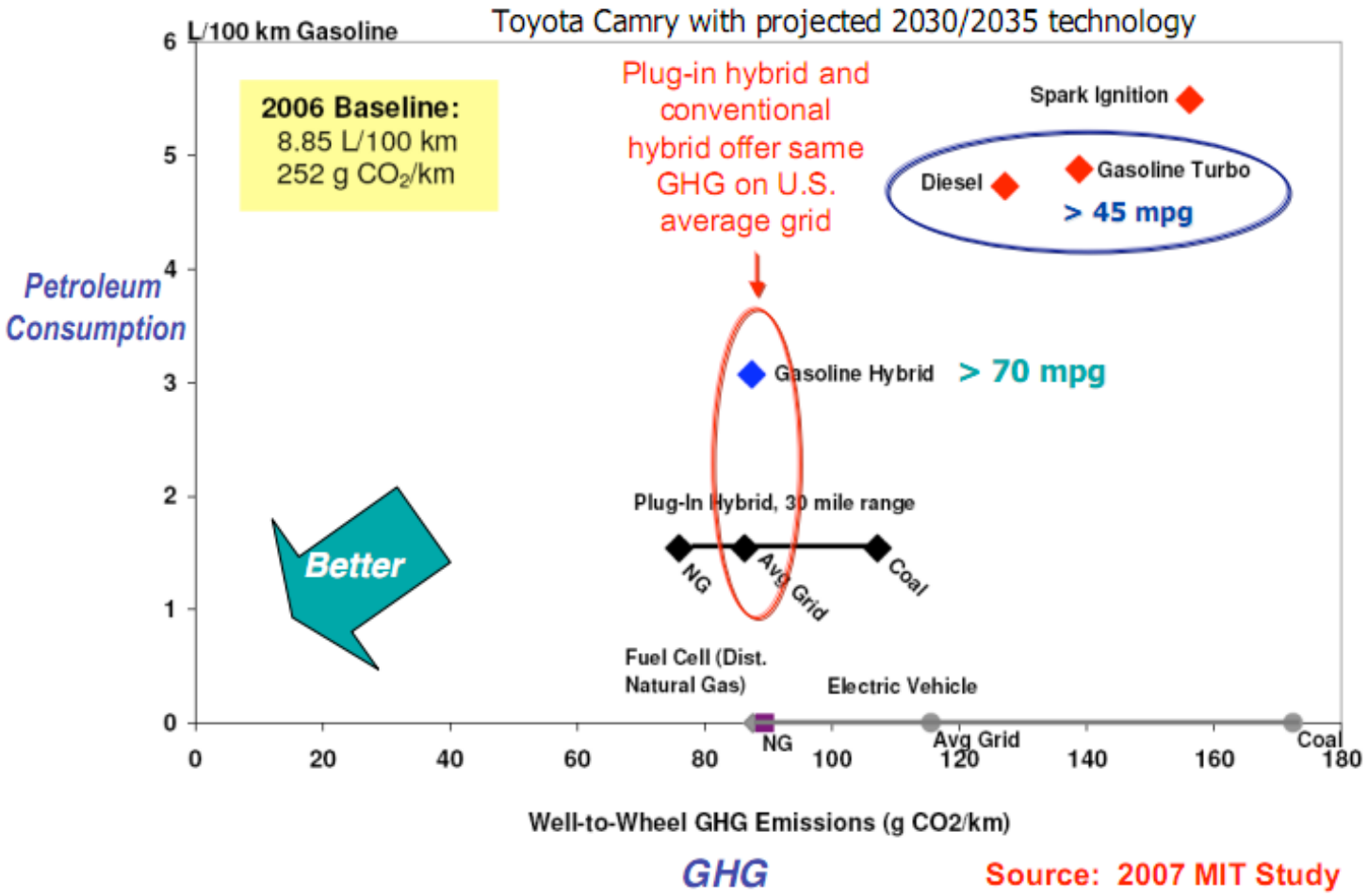
Cost and Effectiveness of Cash for Guzzlers Program

Baseline=18 mpg, 12,000 VMT	Voucher Value	Program Cost for One Million Vehicles	Gallons Saved Per Vehicle, Annually	Total Fuel Savings for One Million Vehicles Over Eight Years, Gallons	Cost Per Gallon Saved Over Eight Years	Fleet Fuel Consumption Reduction Compared to 2008 Rate
New Car, +4 MPG	$3,500	$3,500,000,000	121.2	969,600,000	$3.61	0.0882%
New Car, +10 MPG	$4,500	$4,500,000,000	238.1	1,904,800,000	$2.36	0.1733%
New Light Truck/SUV, +2 MPG	$3,500	$3,500,000,000	66.7	533,600,000	$6.56	0.0485%
New Light Truck/SUV, +5 MPG	$4,500	$4,500,000,000	144.9	1,159,200,000	$3.88	0.1054%
Sources: EIA Data, EPA Data, EPRINC Calculations						

2030/2035 Technology Comparison



Source: 2007 MIT Study

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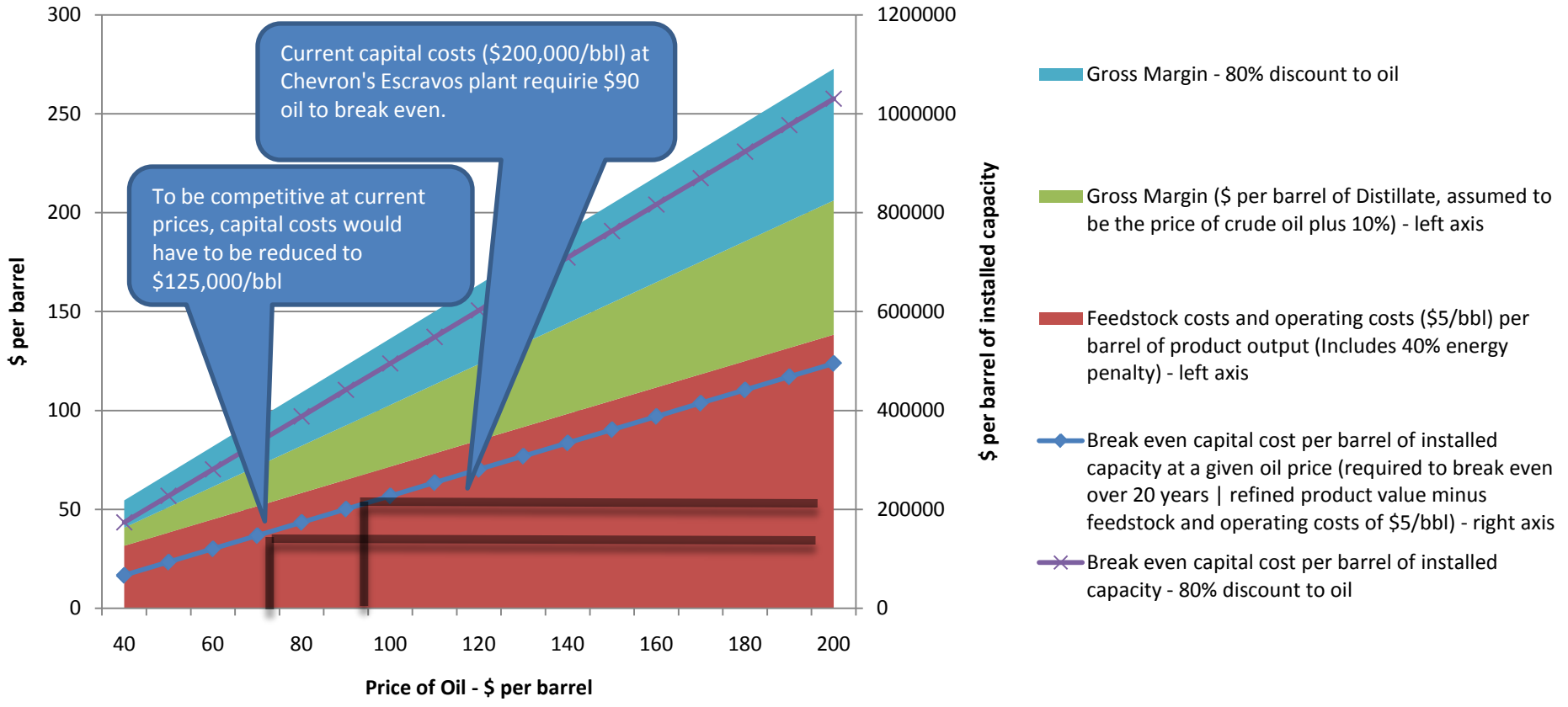
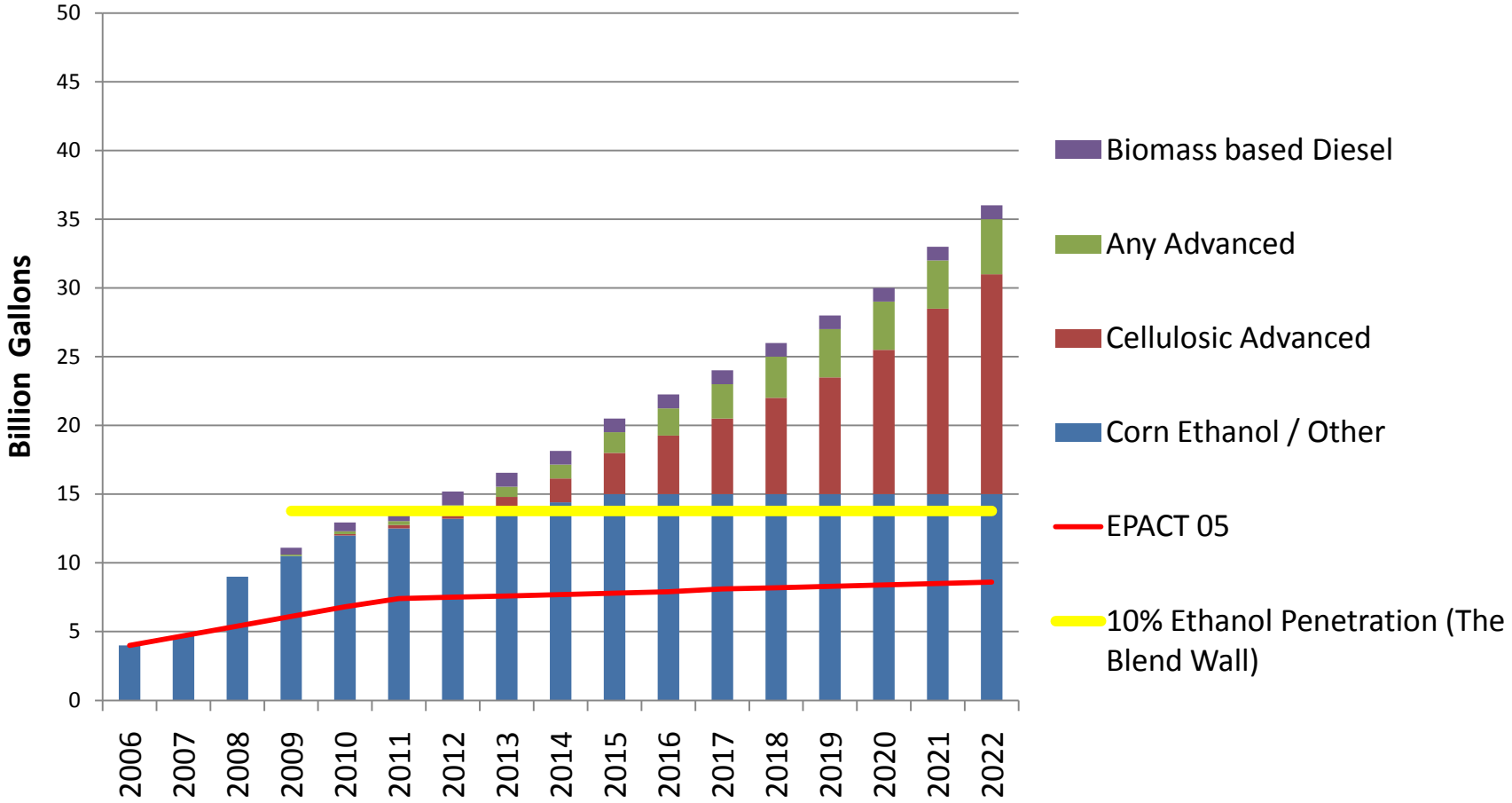
Capital Costs and the Gas Crude Spread*



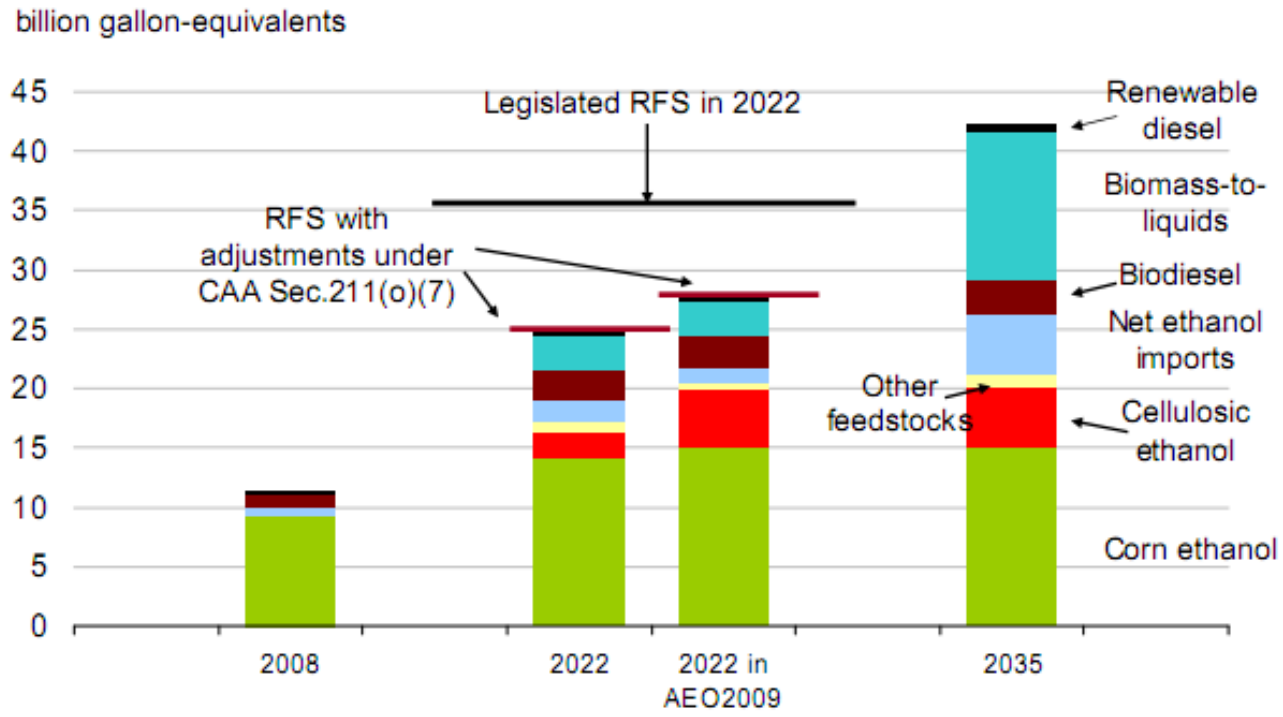
*EPRINC preliminary estimates

EISA ’07 Renewable Fuels Standard



Source: DOE, EIA Data and June 2009 STEO. Blend wall assumes projected 2009 gasoline consumption found in the June 2009 EIA STEO.

EIA AEO 2010 Biofuels Projection



- **"Biofuels grow, but fall short of the 36 billion gallon RFS target in 2022, exceed it in 2035."**
  - **Richard Newell, EIA, at SAIS, December, 2009**

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Lifecycle GHG Emissions

Table 1. Draft Lifecycle GHG Emission Reduction Results For Different Time Horizon And Discount Rate Approaches.		
Fuel Pathway	**100 year, 2% Discount Rate**	**30 year, 0% Discount Rate**
Corn Ethanol (Natural Gas Dry Mill)	-16%	+5%
Corn Ethanol (Best Case Natural Gas Dry Mill)[2] (footnote)	-39%	-18%
Corn Ethanol (Coal Dry Mill)	+13%	+34%
Corn Ethanol (Biomass Dry Mill)	-39%	-18%
Corn Ethanol (Biomass Dry Mill with Combined Heat and Power)	-47%	-26%
Soy-Based Biodiesel	-22%	+4%
Waste Grease Biodiesel	-80%	-80%
Sugarcane Ethanol	-44%	-26%
Switchgrass Ethanol	-128%	-124%
Corn Stover Ethanol	-115%	-116%

Source: EPA, http://www.epa.gov/OMS/renewablefuels/420f09024.htm

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A Selection of Ethanol Subsidies

2008 Ethanol Subsidies	$ Million
Market Price Support on Domestic Production	2,240
Market Price Support on Exports	30
Volumetric Excise Tax Credit (Blender's Credit)*	4,335
Reductions in State Motor Fuels Tax	440
Federal Small Producer Tax Credit	170
Excess of Accelerated Over Cost Depreciation	680
Federal Grants, Demonstration Projects, R&D	350
Access to Tax-Exempt Solid Waste Bonds	110
Deferral of gain on sale of farm refineries to coops	20
Crop Support to Corn	730
Crop Support to Sorghum	20
Credits for Clean Fuel Refueling Infrastructure	20

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Ethanol Subsidies

Total 2008 Ethanol Subsidies:	**$9.15 billion**
Total Subsidy Per Gallon of Ethanol:	$1.08
Total Subsidy Per Gallon of Gasoline Displaced, BTU Equivalent	$1.63

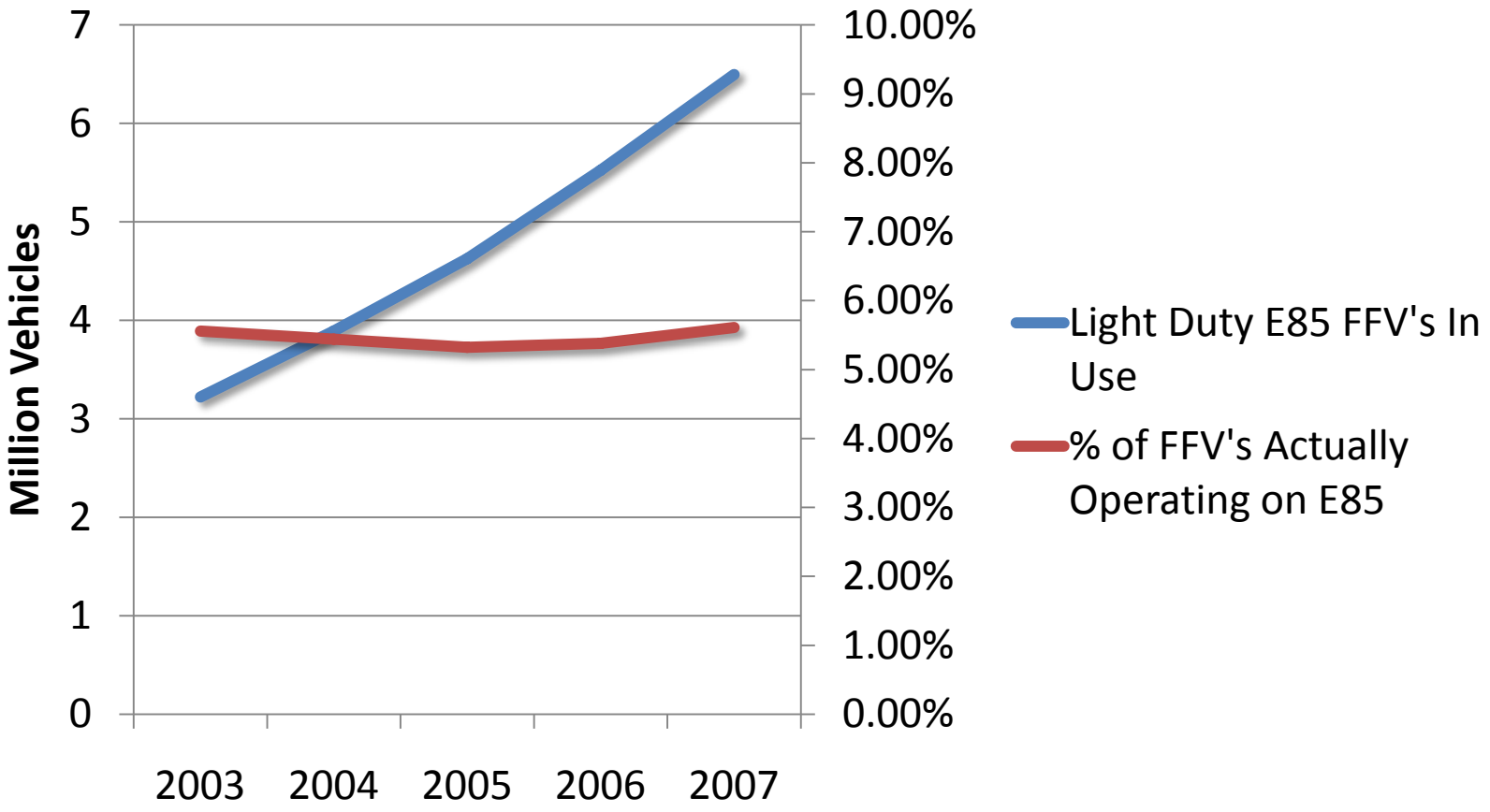
(Total does not include cost of fuel, only the fuel subsidy), * = EPRINC Estimate, not all subsidies are listed

Source: http://www.globalsubsidies.org/files/assets/Brochure_-_US_Update.pdf , EPRINC calculated Blender's Credit

Energy Subsidies Not Related to Electricity Production

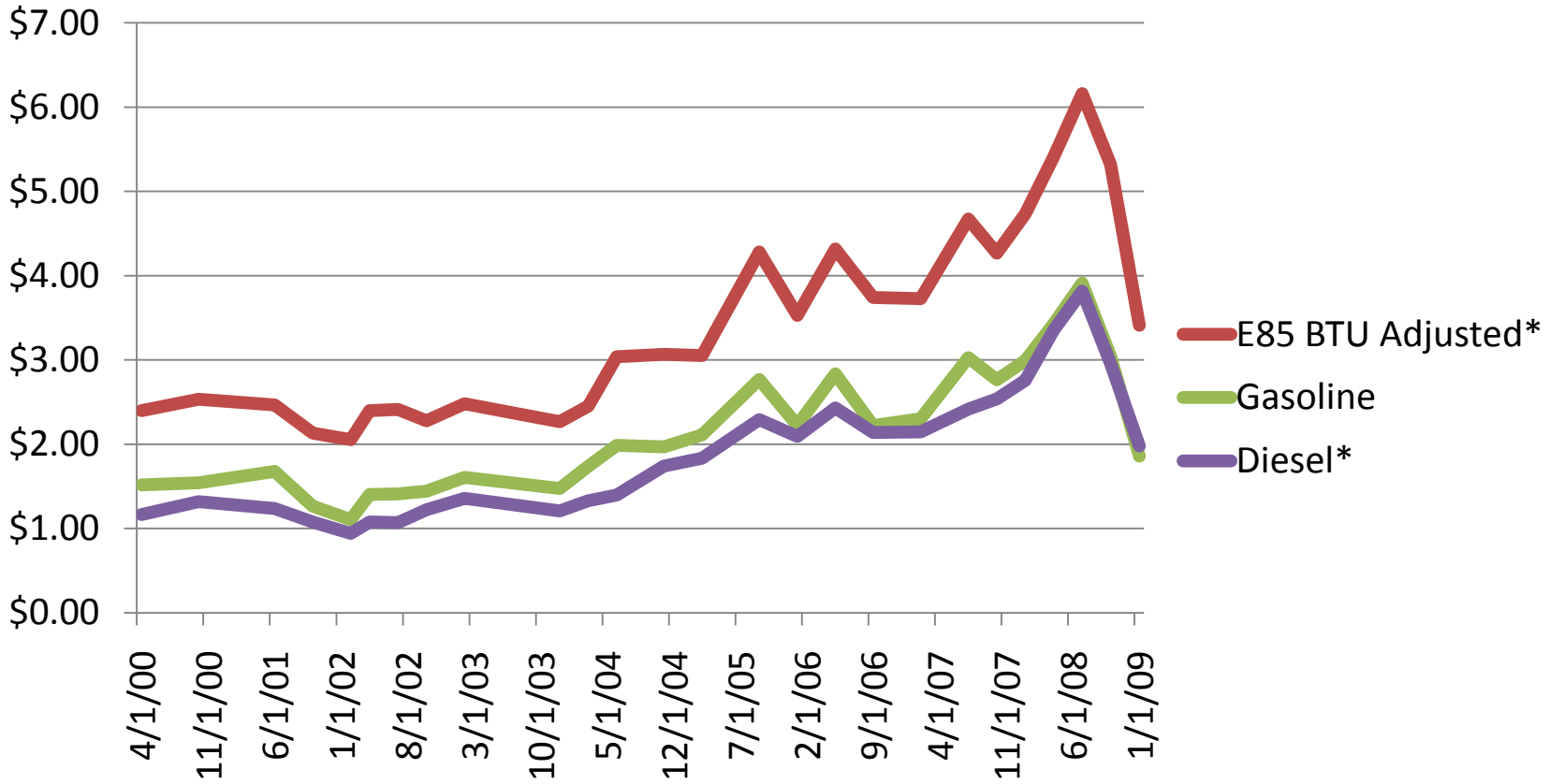
Category	Fuel Consumption (Quadrillion BTU)	FY 2007 Subsidy and Support (million 2007 dollars)	Subsidy (dollars per Million BTU)
Coal	1.93	78	0.04
Refined Coal	0.16	214	1.35
Natural Gas and Petroleum Liquids	55.78	1921	0.03
Ethanol/Biofuels	0.57	3249	**5.72**
Geothermal	0.04	1	0.02
Solar	0.07	360	**2.82**
Other Renewables	2.5	184	0.14
Hydrogen	*	230	NM
Total Fuel Specific	60.95	6237	0.1
Total Non-Fuel Specific	NM	3597	NM
Total End-Use and Non-Electricity	NM	9834	NM
Source: EIA Data			

FFVs and E85 Usage



Source: EIA Data, DOE Data, EPRINC Calculations

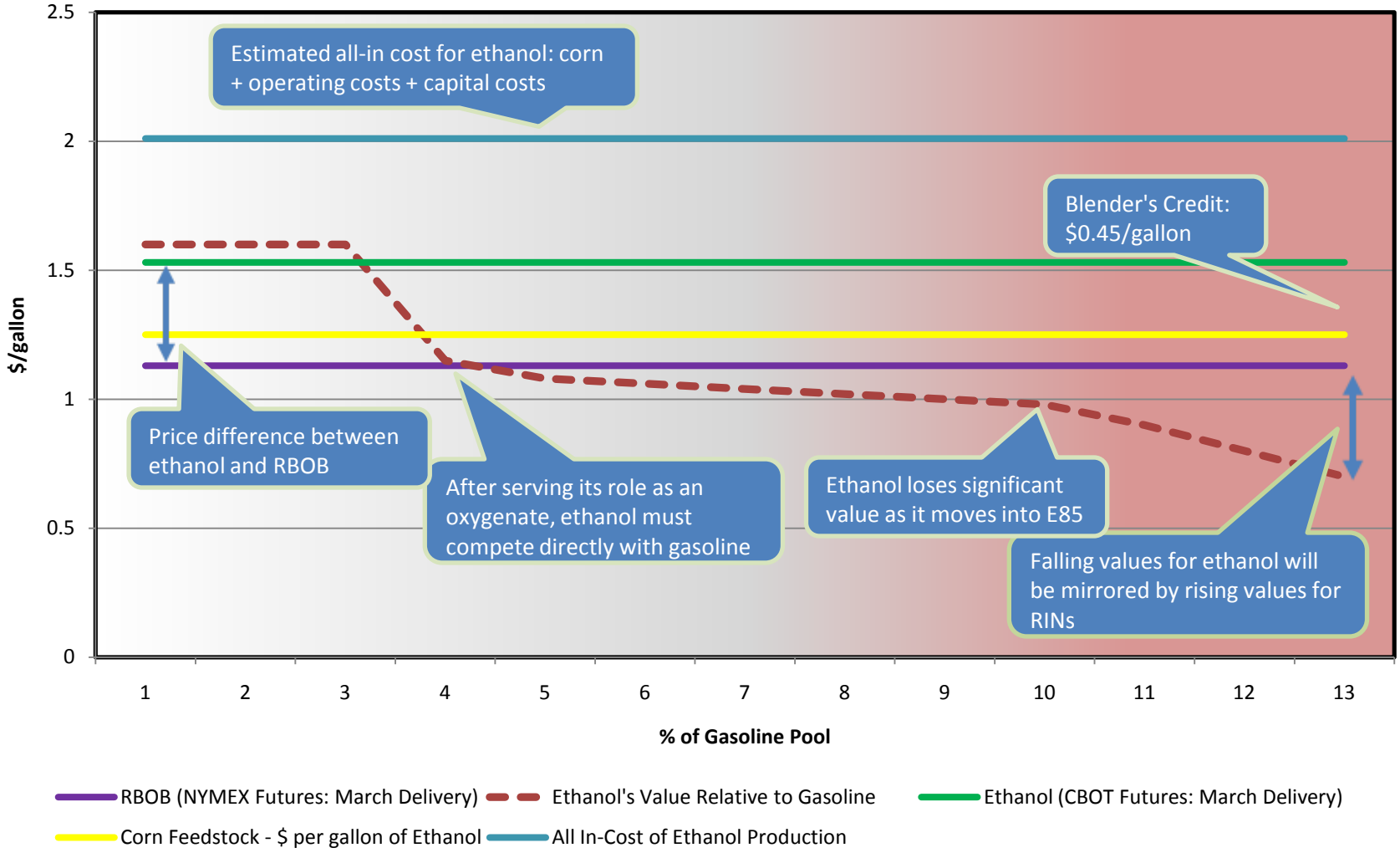
Retail Fuel Prices



*Price is per gallon of gasoline equivalent (BTU basis), according to DOE conversion standards: 1 Gallon of Gasoline = 1.333 gallons of E85 and 0.904 gallons of diesel.

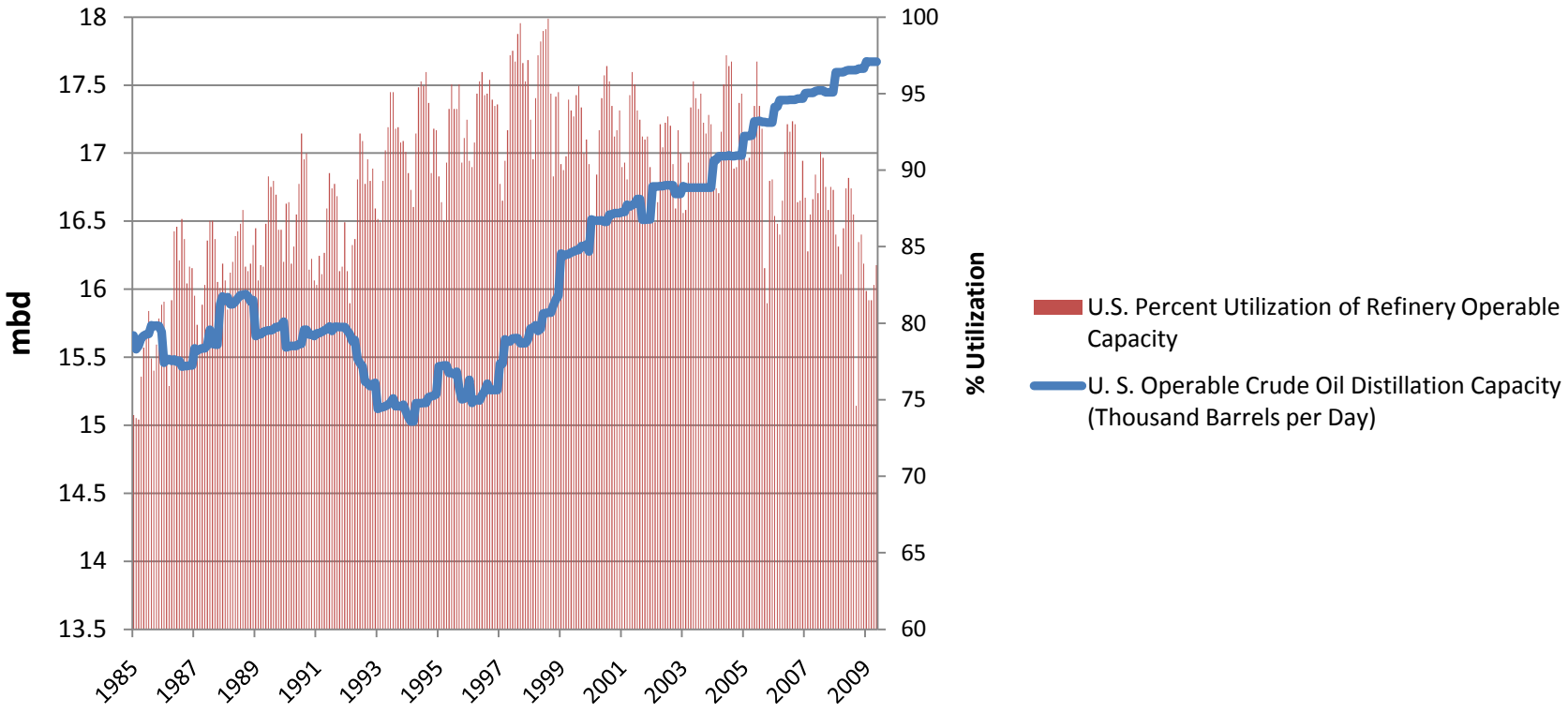
Source: DOE Data

The Blend Wall in a low RBOB World



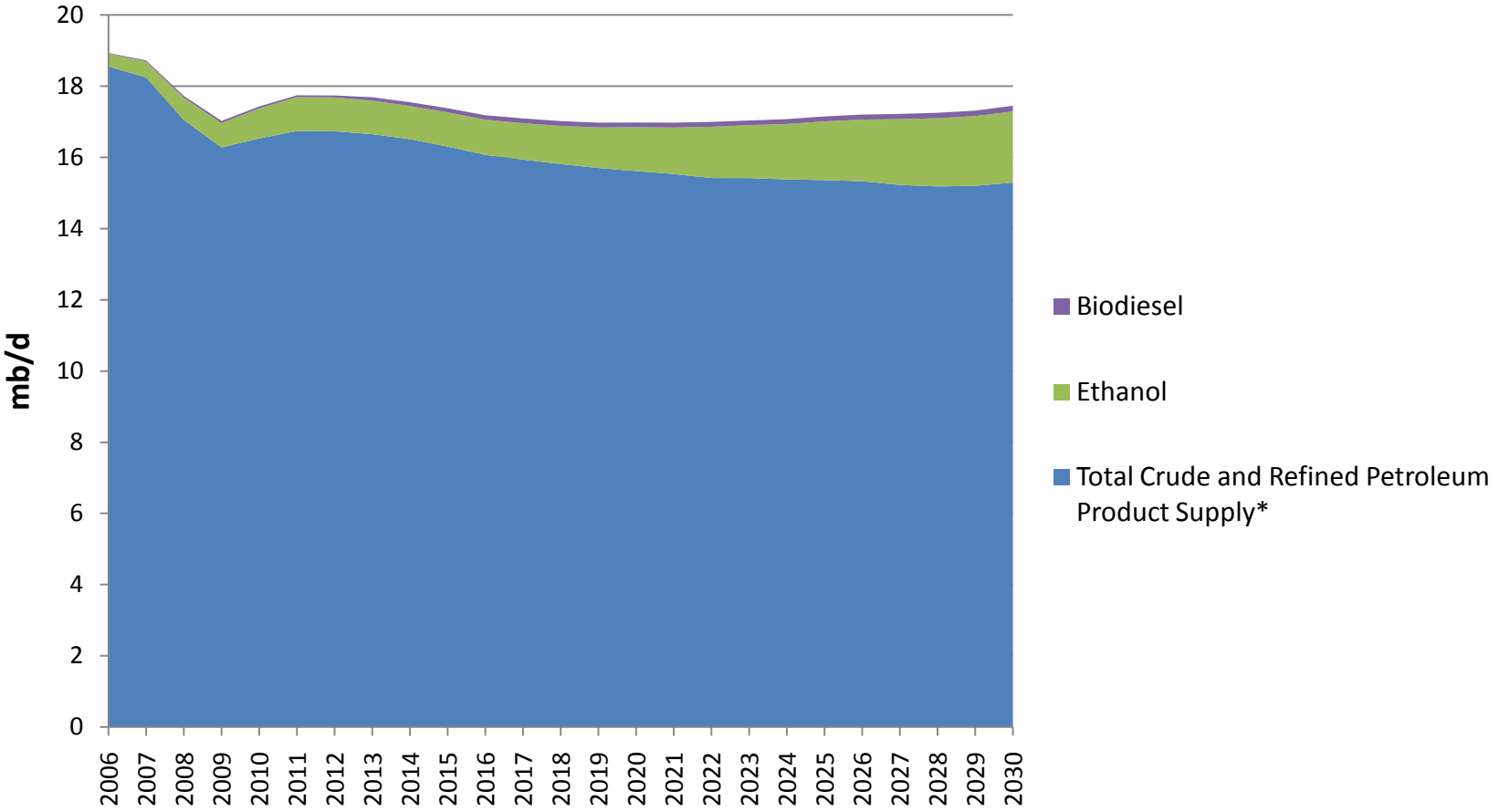
US Refinery Capacity Utilization

1985-2009



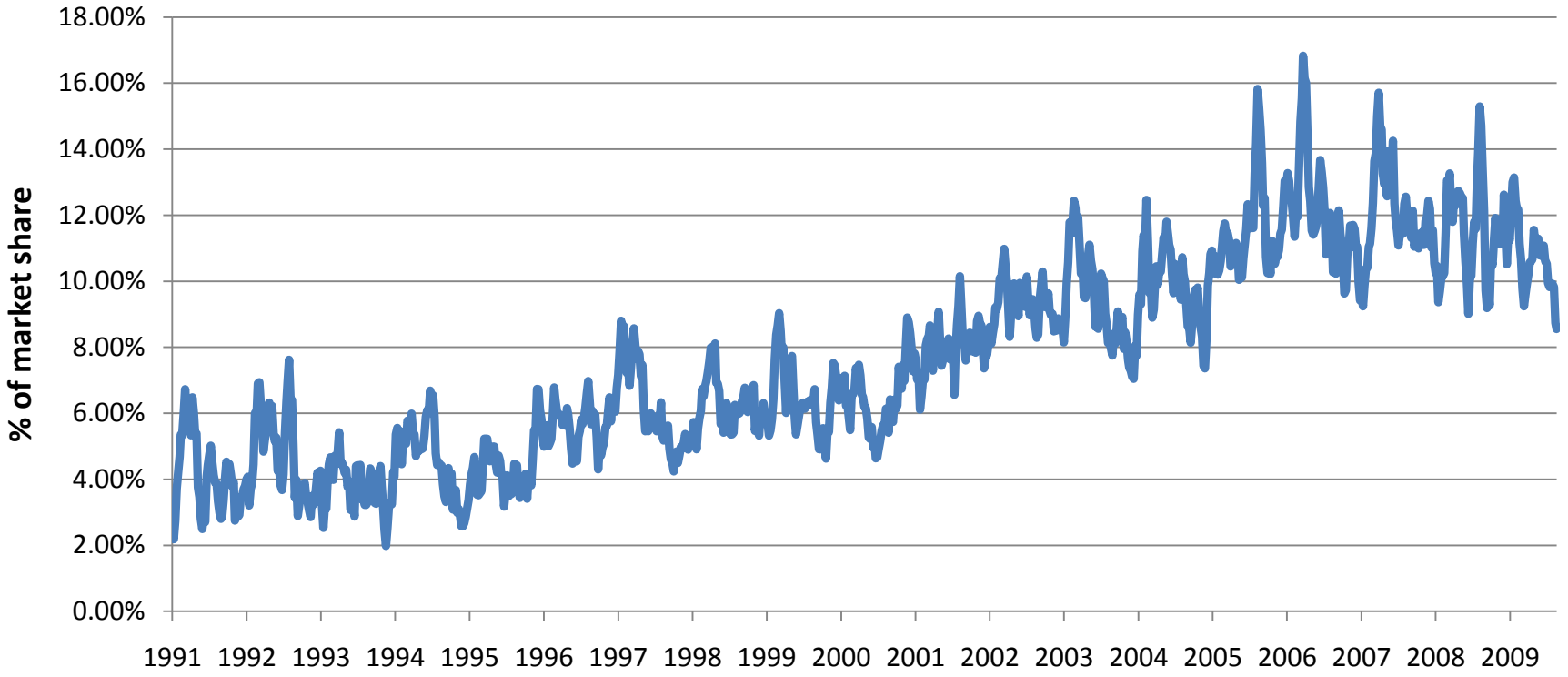
Source: EIA data, EPRINC Calculations

EIA W-M Base Case Petroleum Demand



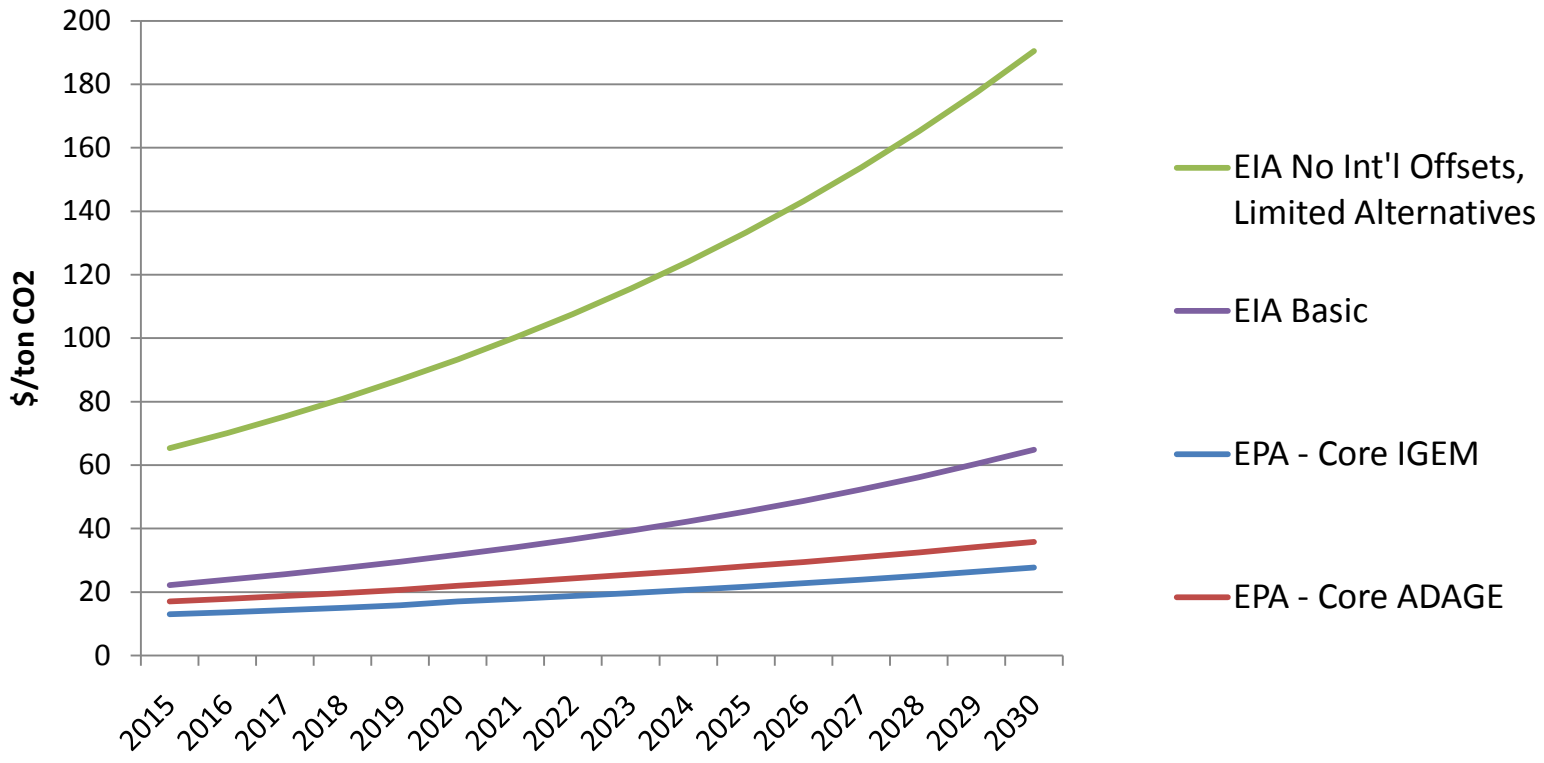
Source: EIA Forecasts

Total Gasoline Imports Share of Finished Motor Gasoline Product Supplied



Source: EIA data, EPRINC calculations

EPA and EIA Allowance Price Forecasts



Source: EPA and EIA Forecasts

Emission Allowances for Refiners Under W-M (Millions of Metric Tons of CO2 per Annum)

Year	Total CO_2 Emissions Permitted for US Economy	U.S. Refiners' Emissions (Stationary Source)	U.S. Refiners' Emissions (Product Combustion)	Refiners' Total Emission Compliance Obligation	Emission Allowances Provided at No Cost	Net Emission Allowance Purchase Requirement
2015	5,003	256	2,029	2,285	100	2,185
2020	5,056	250	1,980	2,230	101	2,129
2025	4,294	248	1,964	2,212	86	2,126
2030	3,533	249	1,973	2,222	0	2,222

Source: EPRINC report: ***The American Clean Energy and Security Act: An EPRINC Assessment of Capacity and Employment Losses in the Domestic Refining Industry*.**

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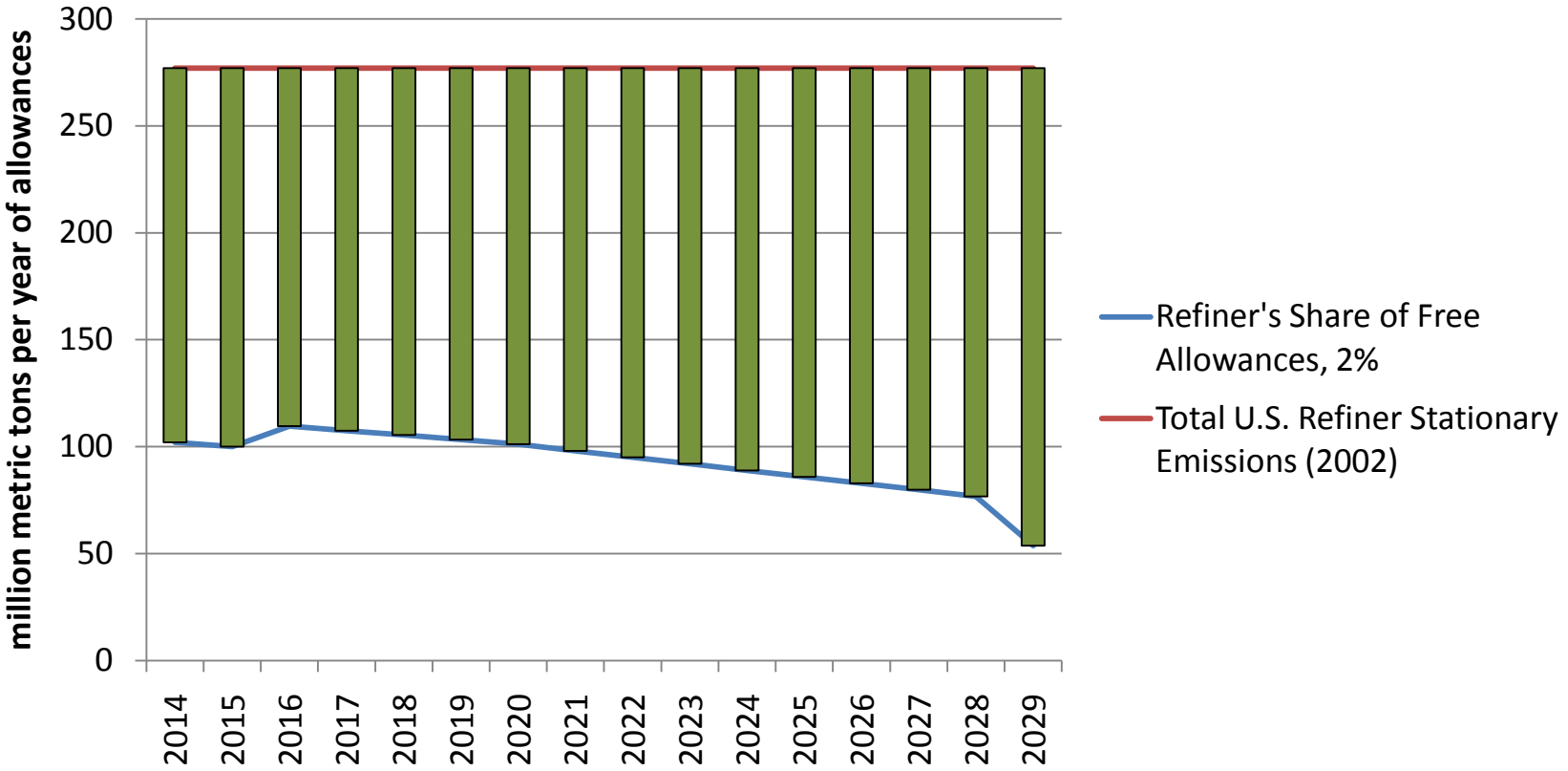
Annual Compliance Cost for U.S. Refiners Under W-M

(U.S. dollars in billions, carbon prices derived from EPA estimates)

Year	Cost of Allowances to Cover Stationary Source Emissions	Cost of Allowances to Cover Product Combustion	Value of Allowances Allocated under W-M to U.S. Refiners	Total Cost of Allowances, Stationary Source and Product Combustion – net of 2 % allocation
2005	----------	----------	----------	----------
2015	$3.3---$4.4	$26.4---$34.5	$1.30---$1.70	$28.4---$37.1
2020	$4.3---$5.5	$33.7---$43.5	$1.72---$2.22	$36.2---$46.8
2025	$5.4---$7.0	$42.6---$55.2	$1.86---$2.41	$46.1---$59.7
2030	$6.9---$8.9	$54.6---$70.7	$0	$61.5---$79.6

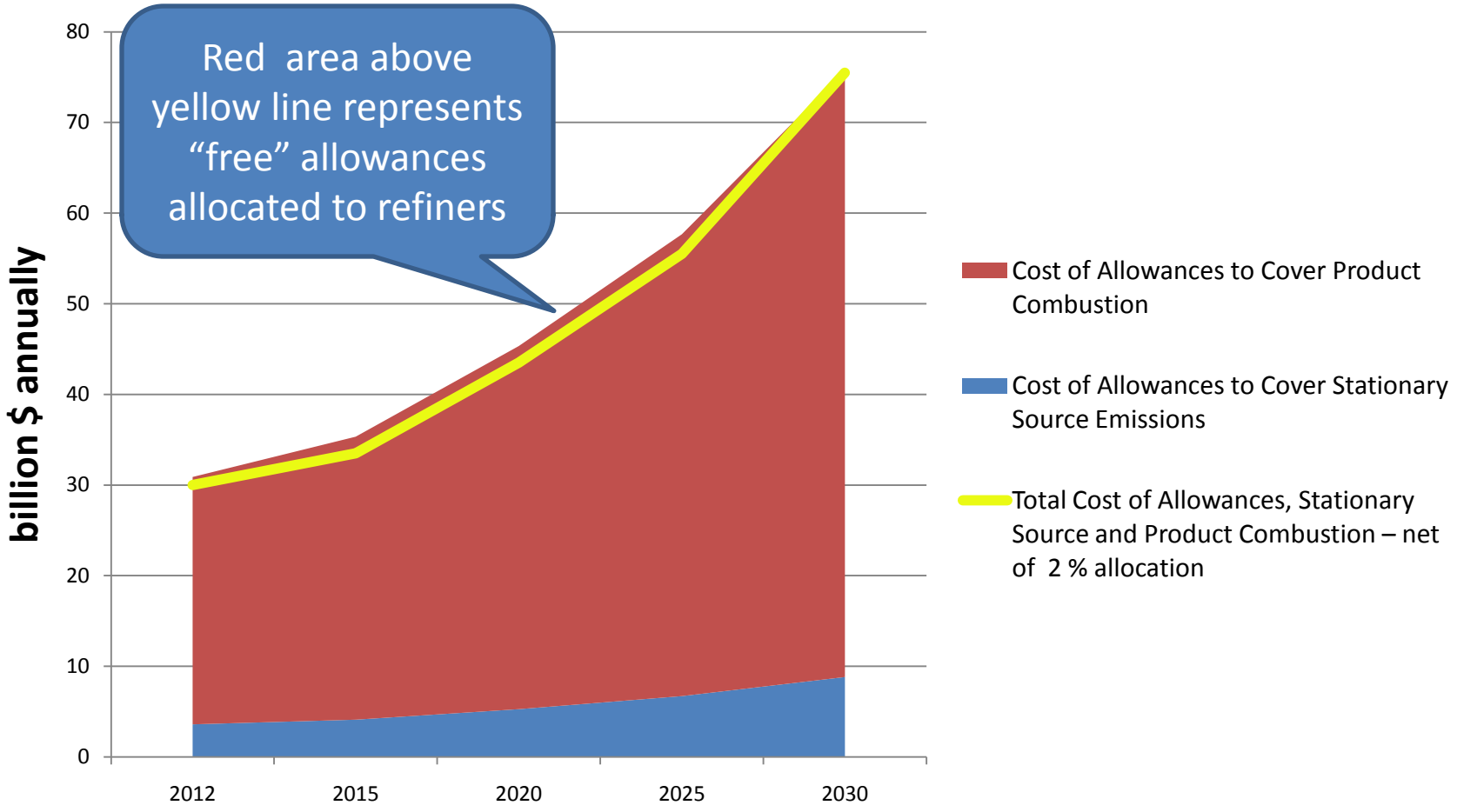
Source: EPRINC report: ***The American Clean Energy and Security Act: An EPRINC Assessment of Capacity and Employment Losses in the Domestic Refining Industry***

Stationary Emissions not Covered by Free Allowances

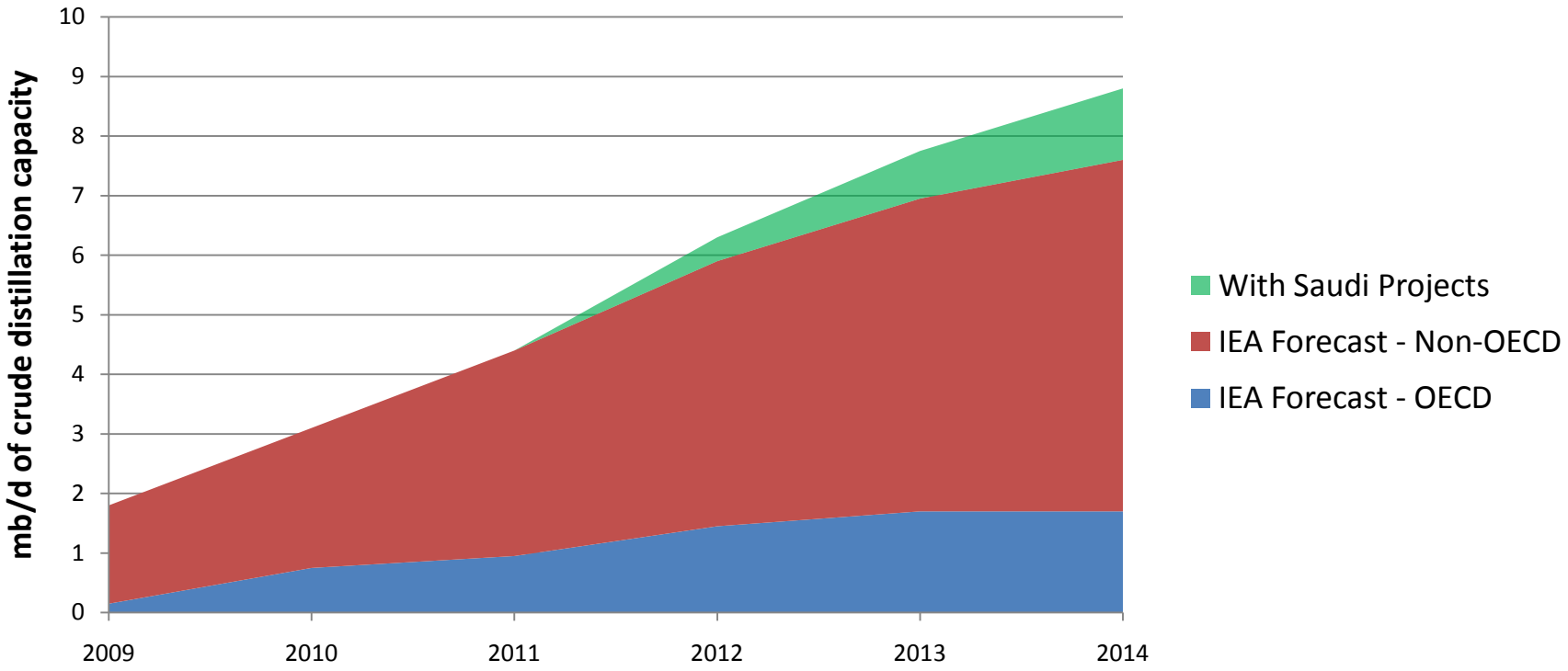


Source: EIA Data, EPRINC Calculations

Compliance Costs: US Refining Industry

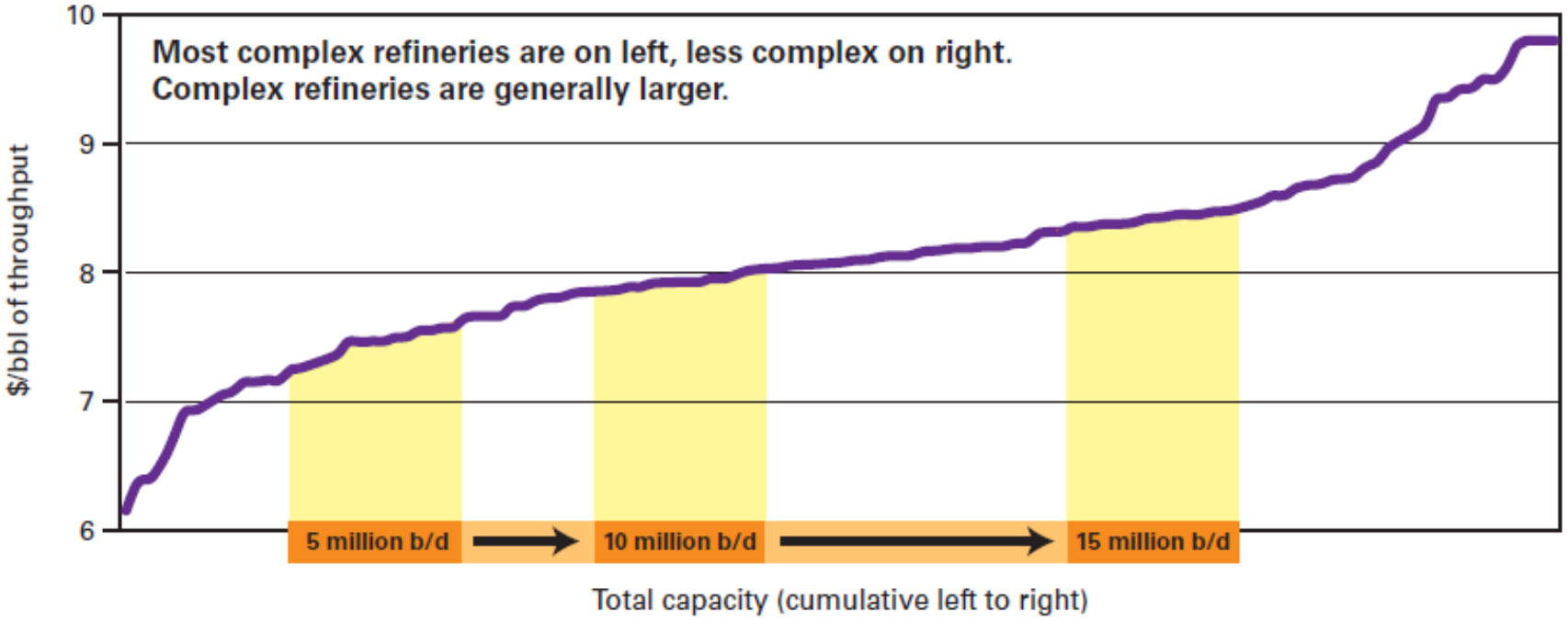


Projected Worldwide Refining Capacity Additions



Source: IEA Forecasts, EPRINC Calculations

Effective Cost of Production: US Product Slate



*Some lubricant and small niche refineries have been excluded.
Source: EPRINC calculations

Source: EPRINC Calculations from OGJ and proprietary refinery data sets of complexity, product slate valuations, and location. Product slate standardized to common EPRINC product/cost value index.

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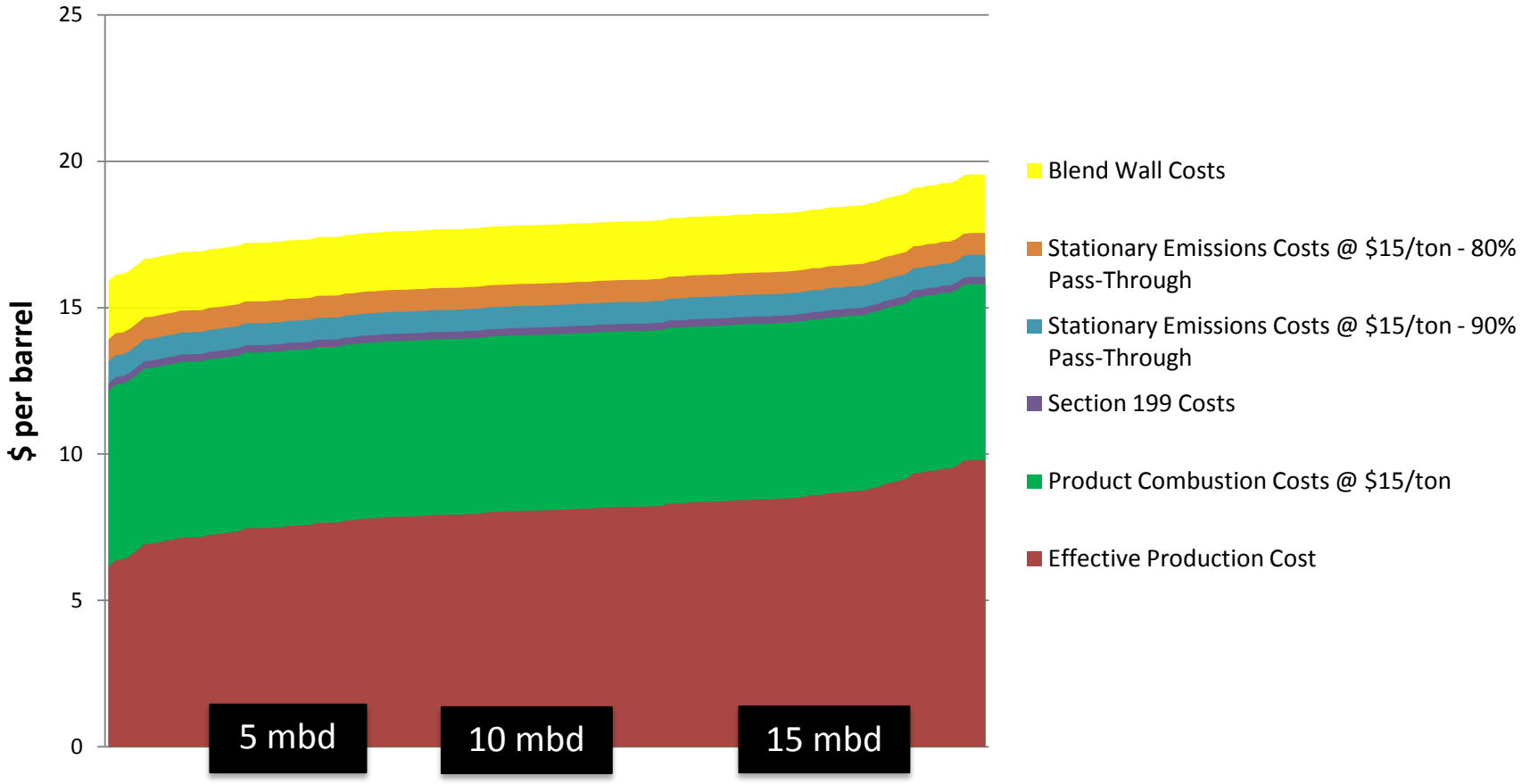
U.S. Refiners' Future Cost of Production

(2015 - 2030)



Source: EPRINC report: ***The American Clean Energy and Security Act: An EPRINC Assessment of Capacity and Employment Losses in the Domestic Refining Industry.***

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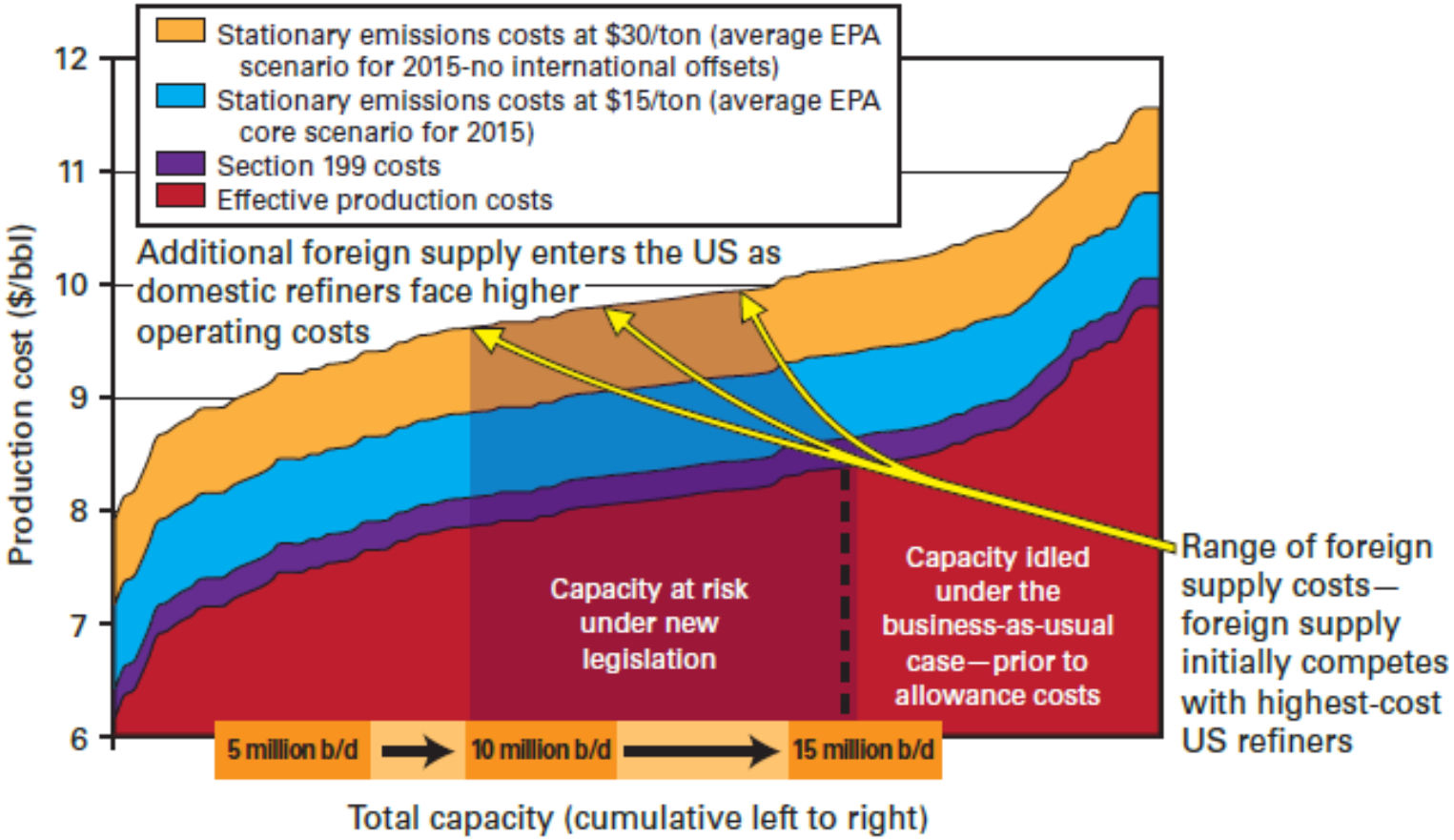
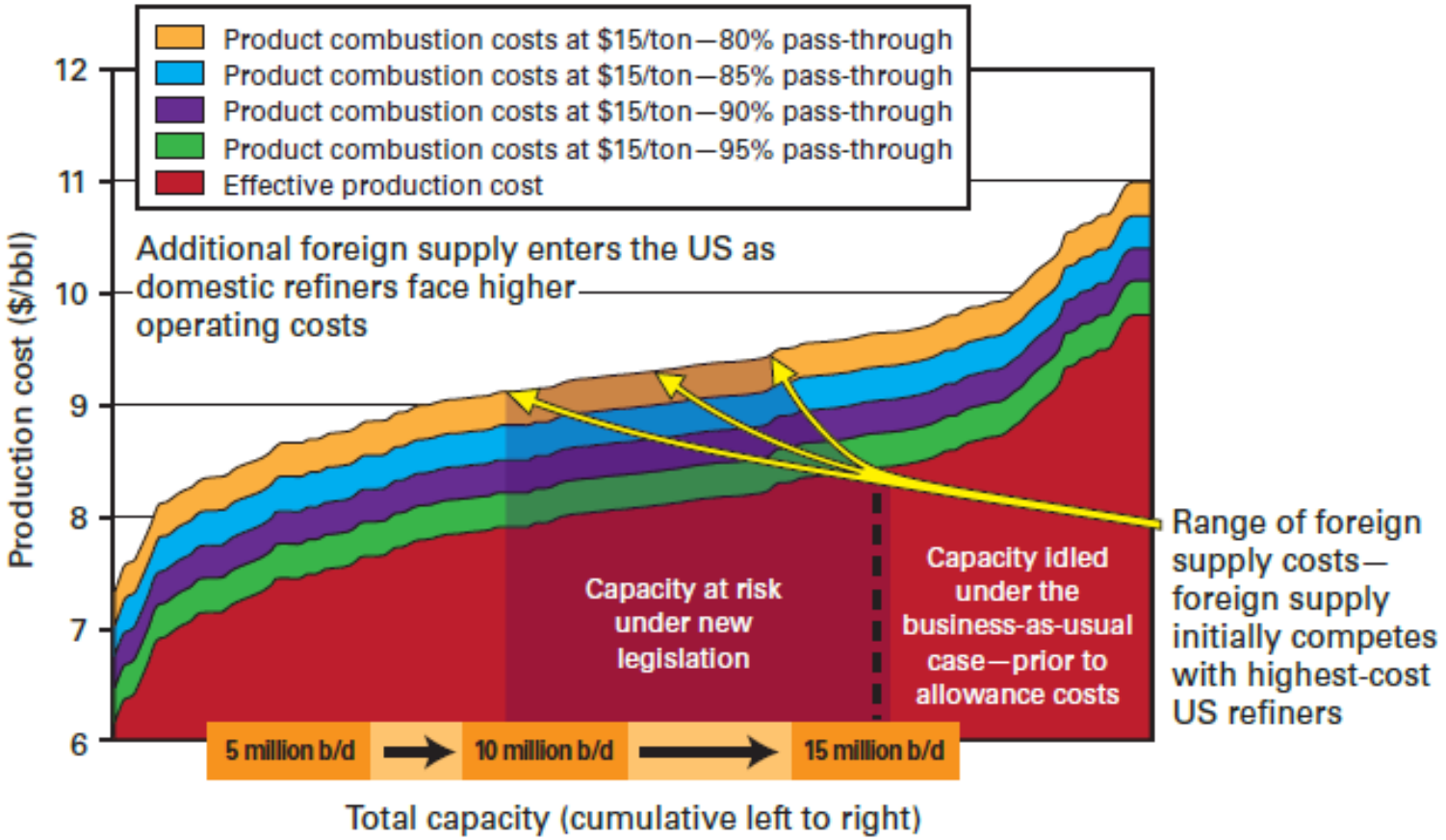
Stationary Emission Costs and Potential Capacity Losses 2015-2030



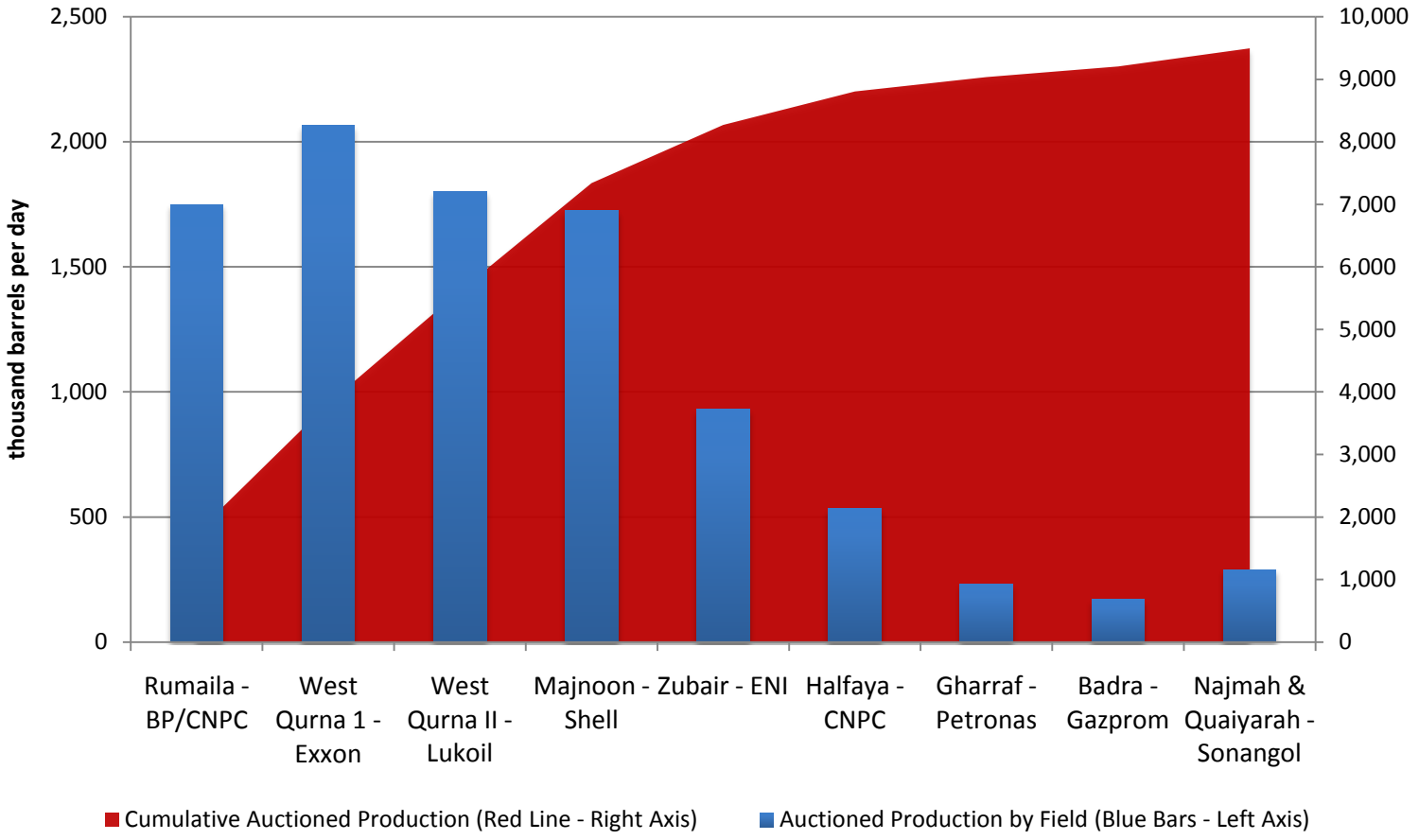
Source: EPRINC report: ***The American Clean Energy and Security Act: An EPRINC Assessment of Capacity and Employment Losses in the Domestic Refining Industry*.**

Product Combustion Pass-Through Costs and Potential Capacity Losses - 2015-2030



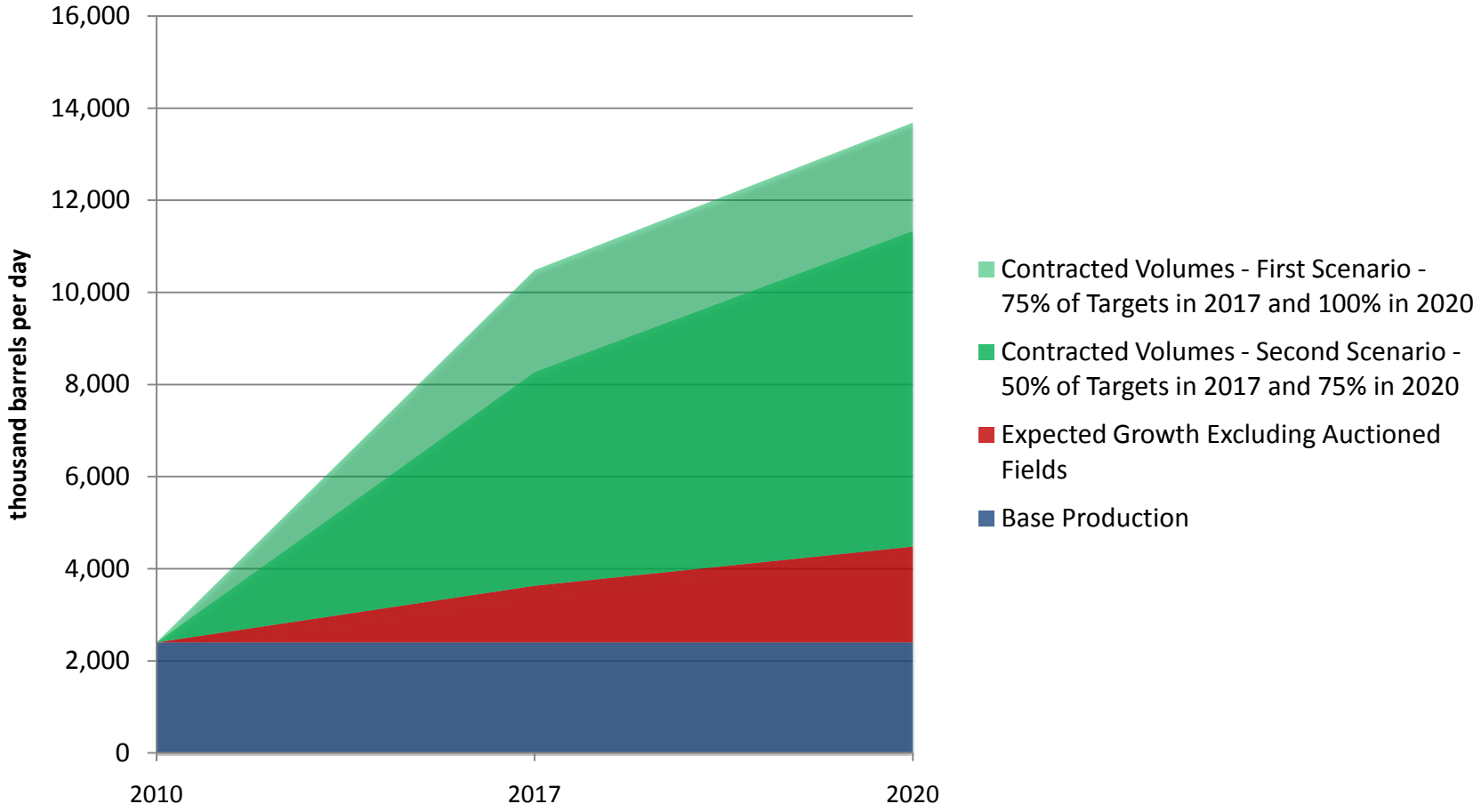
Source: EPRINC report: ***The American Clean Energy and Security Act: An EPRINC Assessment of Capacity and Employment Losses in the Domestic Refining Industry*.**

Auctioned Production at Peak by Field and Cumulative



Source: ***Iraq-First Look****, March 17, 2010, EPRINC Publication*

Iraqi Production Growth Under Several Scenarios



Source: ***Iraq-First Look****, March 17, 2010, EPRINC Publication*