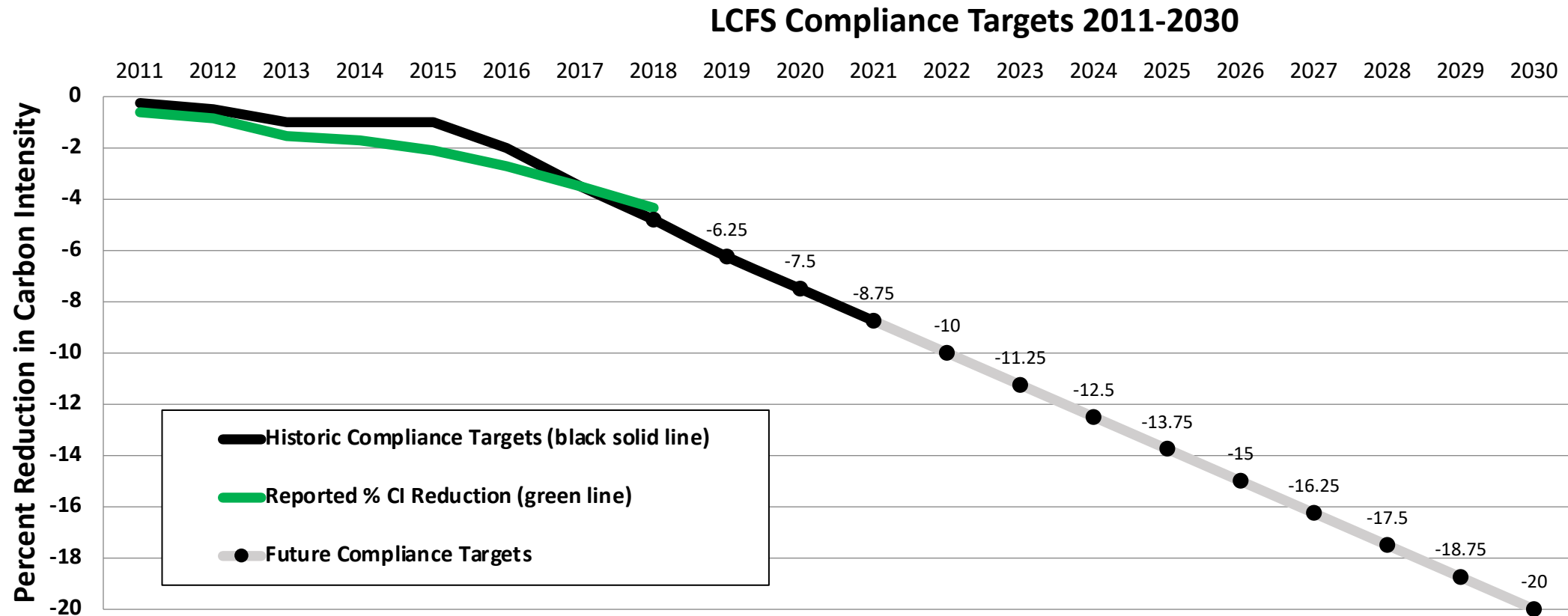


CALIFORNIA COMPLIANCE SCHEDULE FOR DIESEL FUEL, GASOLINE, Jet Fuel, AND THEIR SUBSTITUTES

Year	Diesel Compliance Standard (gCO ₂ e/MJ)	Gasoline Compliance Standard (gCO ₂ e/MJ)	Conventional Jet Fuel Compliance Standard
2016	99.97	96.50	NA
2017	98.44	95.02	NA
2018	96.91	93.55	NA
2019	94.17	93.23	89.37
2020	92.92	91.98	89.37
2021	91.66	90.74	89.37
2022	90.41	89.50	89.37
2023	89.15	88.25	89.15
2024	87.89	87.01	87.89
2025	86.64	85.77	86.64
2026	85.38	84.52	85.38
2027	84.13	83.28	84.13
2028	82.87	82.04	82.87
2029	81.62	80.80	81.62
2030	80.36	79.55	80.36

DECLINING CARBON INTENSITY CURVE



LCFS

DEFICIT CALCULATION

gCO₂e/MJ – grams of carbon dioxide equivalent per megajoule of energy

Cost of Compliance in 2016 (\$183.50 Credit Price)
\$0.01 per gallon

Cost of Compliance in 2030 (\$183.50 Credit Price)
\$0.50 per gallon

Cost of Compliance Today (\$100 Credit Price)
\$0.12 per gallon

Cost of Compliance 2030 (\$100 Credit Price)
\$0.27 per gallon

Cost of Compliance 2030 (\$220 Credit Price)
\$0.59 per gallon

LCFS Deficit Calculation Formula ULSD	
Baseline CI 2021	91.66
less: ULSD CI	-100.45
	-8.79
x Energy Density of Fuel	134.47
	(1,181.99)
/by a million to calculate	1,000,000
deficits of CO ₂ e per Metric Ton	(0.0012)
X by LCFS credit price \$/MT	183.50
LCFS \$/Gallon	-0.22

LCFS

DEFICIT CALCULATION

Cost of Compliance in 2016 \$0.09 per gallon

Cost of Compliance in 2030 \$0.47 per gallon

LCFS Deficit Calculation Formula CARBOB	
Baseline CI 2021	90.74
less: CARBOB CI	-100.82
	-10.08
x Energy Density of Fuel	119.53
	(1,204.86)
/by a million to calculate deficits of	1,000,000
CO2e per Metric Ton	(0.0012)
X by LCFS credit price \$/MT	183.50
LCFS \$/Gallon	-0.22

LCFS

CREDIT CALCULATION

LCFS Credit Calculation Formula Biodiesel	
Baseline CI 2021	91.66
less: Feedstock CI (UCO)	-21.58
	70.08
x Energy Density of Fuel	126.13
	8,839.19
/by a million to calculate credits of CO2e per Metric Ton	1,000,000
	0.0088
X by LCFS credit price \$/MT	183.50
LCFS \$/Gallon	1.62

LCFS

CREDIT CALCULATION

LCFS Credit Calculation Formula Renewable Diesel	
Baseline CI 2021	91.66
less: Feedstock CI (UCO)	-20.84
	70.82
x Energy Density of Fuel	129.65
	9,181.81
/by a million to calculate credits of CO2e per	1,000,000
Metric Ton	0.0092
X by LCFS credit price \$/MT	183.50
LCFS \$/Gallon	1.68

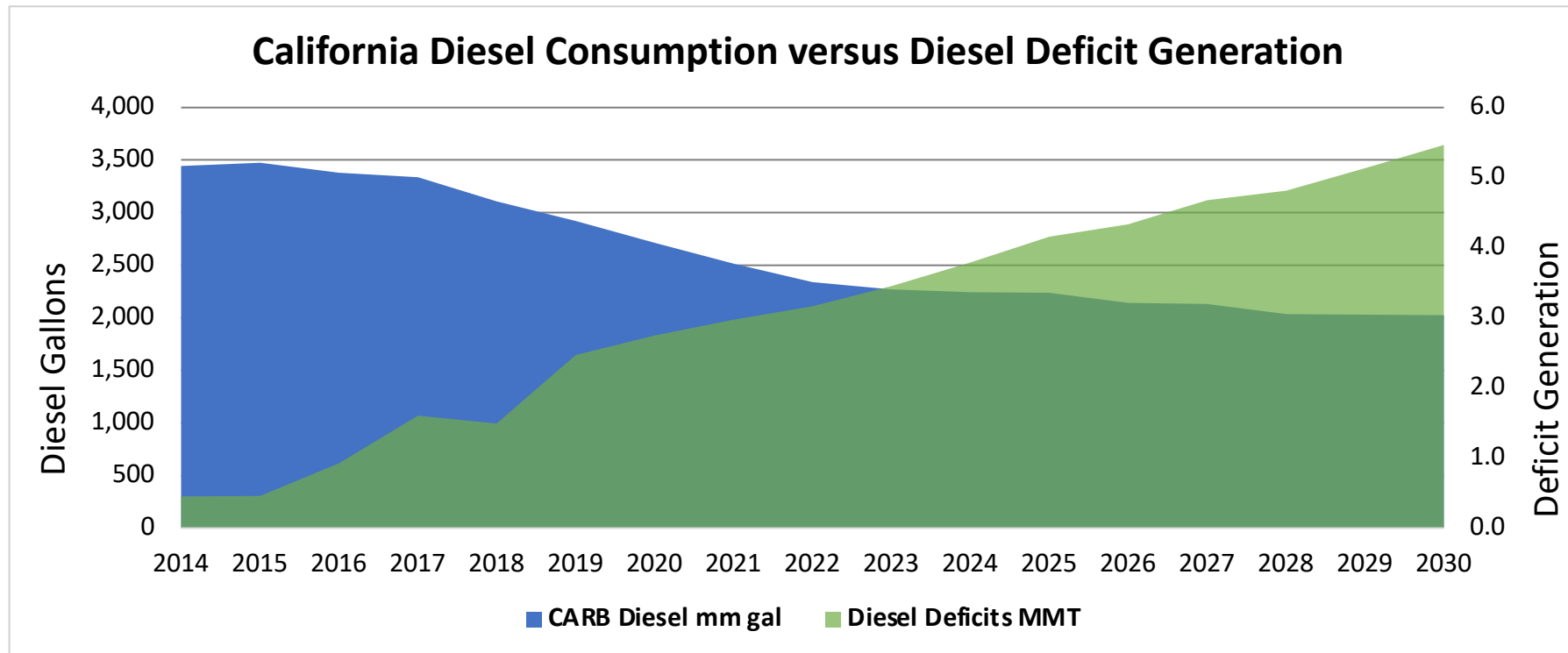
LCFS

CREDIT CALCULATION

LCFS CREDIT CALCULATION FORMULA			
Renewable Diesel			
	2020	2021	2030
Baseline CI	92.92	91.66	80.36
Less: ULSD CI (UCO)	-20.84	-20.84	-20.84
	72.08	70.82	59.52
Multiply by Energy Density of Fuel	129.65	129.65	129.65
	9,345.17	9,181.81	7,716.77
Divide by 1,000,000 to calculate credits of CO2e [er Metric Ton	1,000,000	1,000,000	1,000,000
	0.0093	0.0092	0.0077
Multiply by LCFS Credit Price MT	183.5	183.5	183.5
LCFS \$/Gallon	1.71	1.68	1.42

DIESEL CONSUMPTION & DEFICIT GENERATION

- A Declining compliance curve leads to decreased diesel usage and increased biofuel consumption
- Despite reduced diesel production, deficit generation will climb.
- As the compliance benchmark falls each year, less credits and more deficits will be created from the same fuel supply



LCFS CREDIT VALUE IN TERMS OF FEEDSTOCK CENTS PER POUND

How Much is my Feedstock Worth?

Divide LCFS Credit Price by pounds
of feedstock required per gallon of
fuel

LCFS MARKET CLOSE 08/05/2021

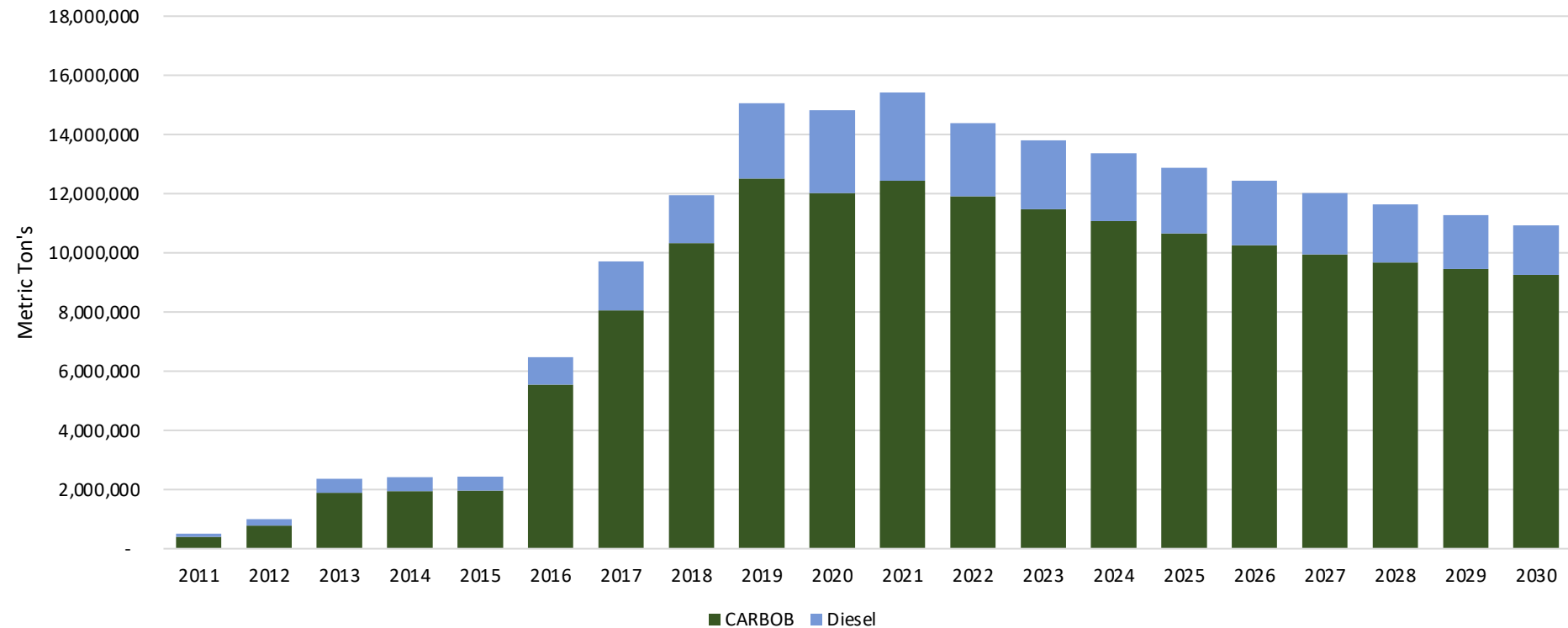
\$183.50

Biodiesel Feedstock	Biodiesel CI Score	LCFS Cents/gal	LCFS Cents/lb
Corn Oil	33.66	134.24	16.37
Tallow	34.86	131.46	16.96
Soybean Oil	54.26	86.56	11.70
Canola Oil	53.91	87.37	11.81
UCO (North America)	21.58	162.20	20.25
UCO (CA)	17.08	172.61	21.55

Renewable Diesel Feedstock	Renewable Diesel CI Score	LCFS Cents/gal	LCFS Cents/lb
Corn Oil	34.33	136.39	14.55
Tallow	37.71	128.35	13.69
Soybean Oil (REG)	56.57	83.48	9.82
Soybean Oil (DG)	53.86	89.93	10.58
UCO (North America)	20.84	168.49	17.97

Deficit Generation Actual & Projected

LCFS Deficit Generation
2011-2020 actual 2021-2030 Projected
Standard CARB Scenario

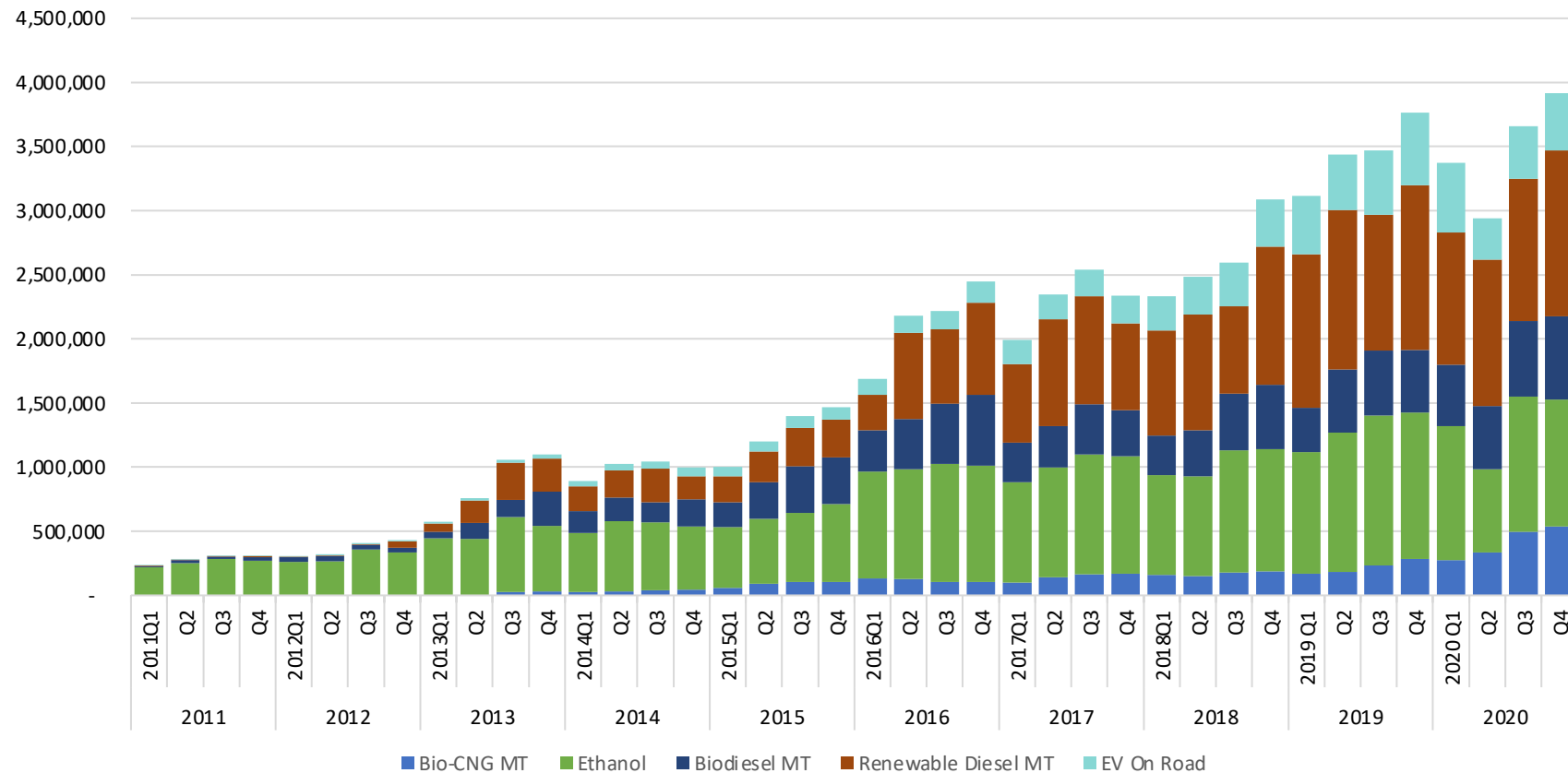


Credit Generation Actual & Projected

LCFS Credit Generation

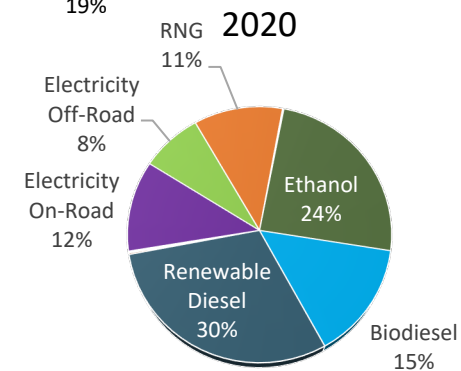
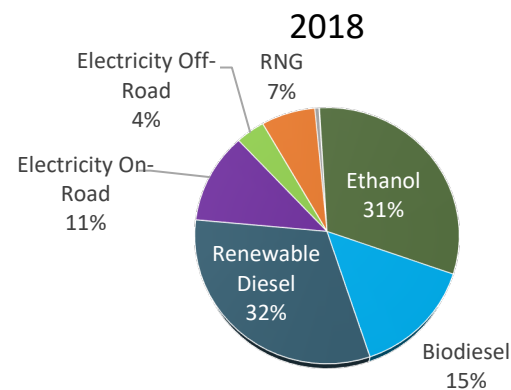
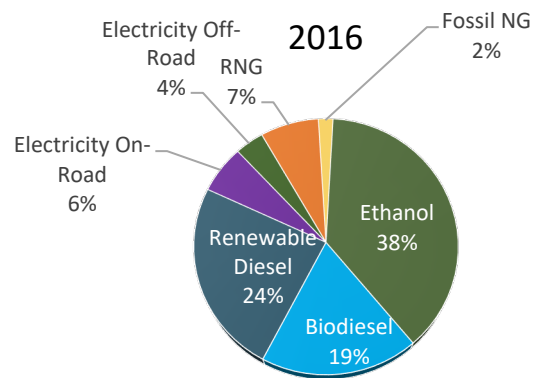
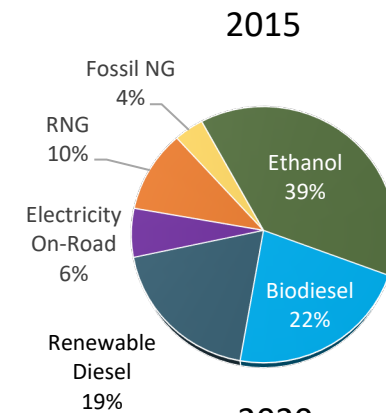
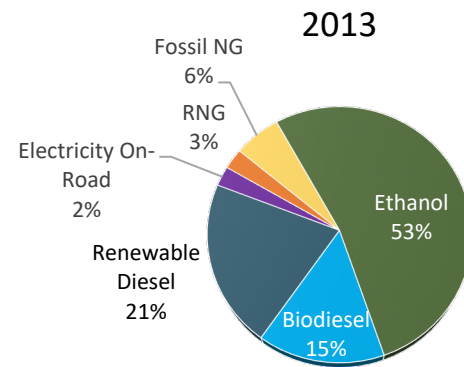
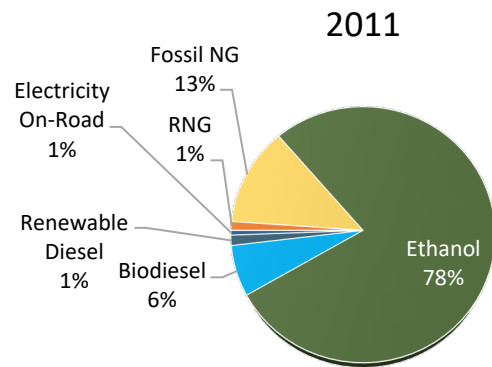
2011- 2020

Top Fuel Credit Generators



The Evolution of Compliance

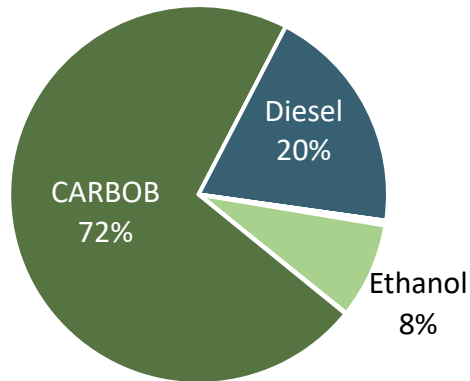
Credit Generation



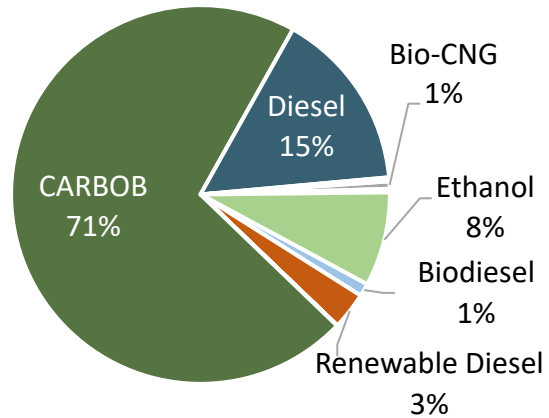
LCFS is Two Programs in One

Program Fuel Volumes

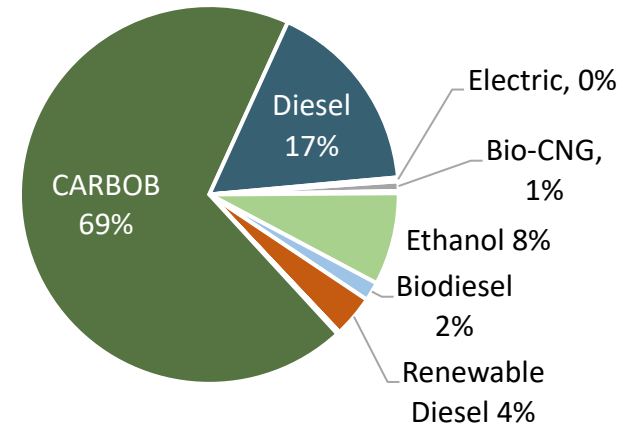
LCFS Volume 2011



LCFS Volume 2019

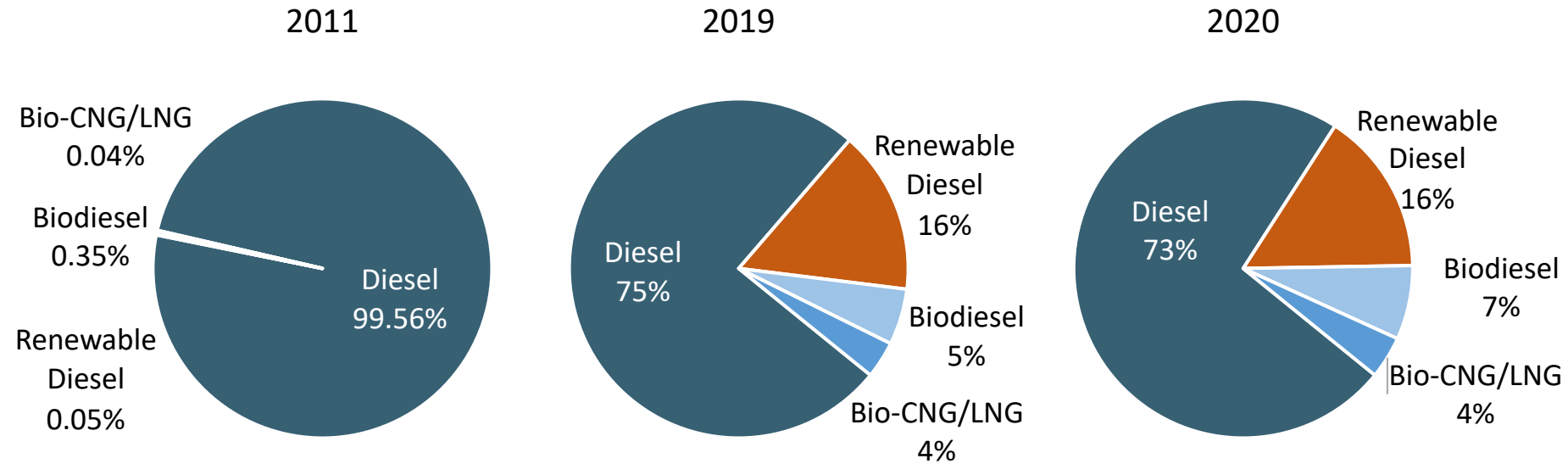


LCFS Volume 2020



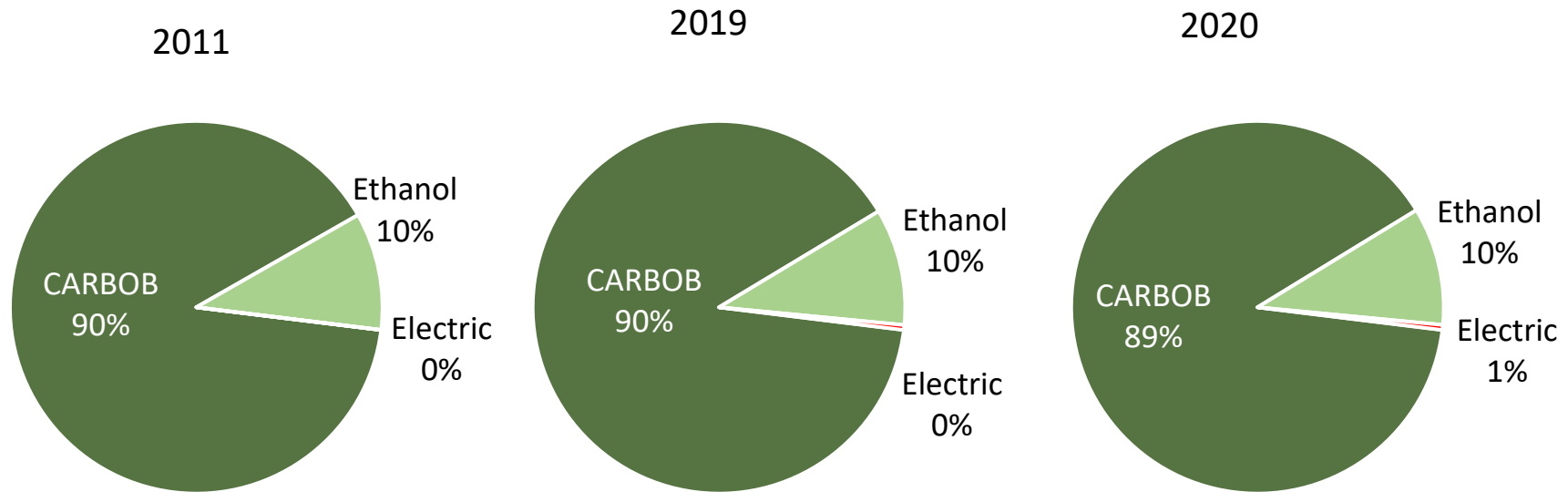
The Evolution of Compliance

Diesel and Substitute Fuel Volumes



The Evolution of Compliance

Gasoline and Substitute Fuel Volumes



RENEWABLE DIESEL PRODUCTION (Coming/"Rumored")

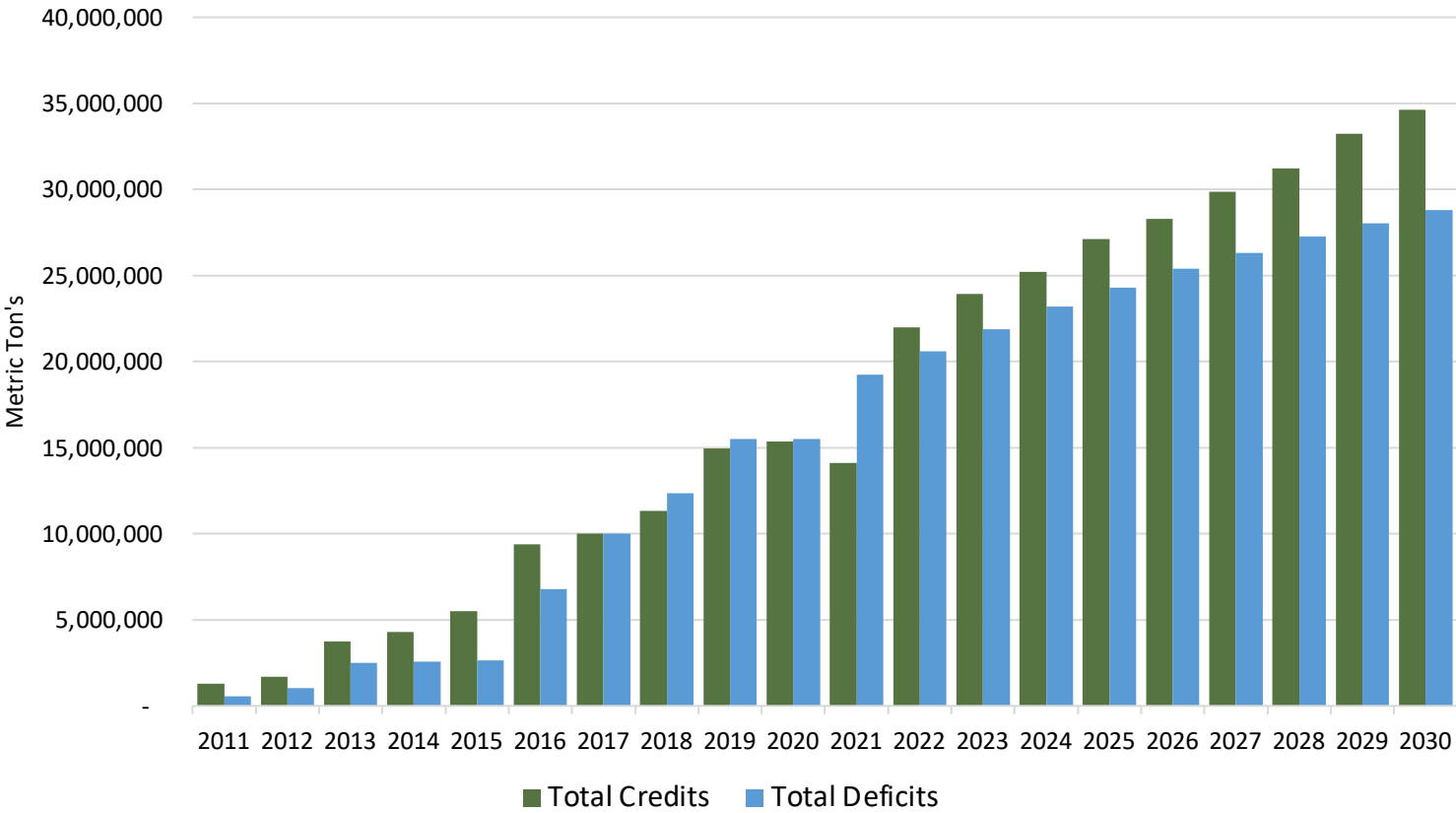
Owner	Location	Gallons Per Year	Probability
Ryze Renewables	Las Vegas, Nevada (USA)	114,975,000	50%
NEXT Renewable Fuels	Port Westward Industrial Park Oregon (USA)	558,600,000	5%
Global Clean Energy	Bakersfield, CA USA	210,000,000	65%
Emerald Biofuel	Port Arthur, TX	110,000,000	25%
ReadiFuels	Hull, IA	36,000,000	1%
HollyFrontier	Artesia, New Mexico USA	125,000,000	90%
HollyFrontier	Cheyenne, WY USA	90,000,000	90%
Fulcrum Bioenergy	Sierra, Nevada USA	11,000,000	90%
Fulcrum Bioenergy	Gary, Indiana	33,000,000	1%
CVR Refining	Wynnewood, OK	100,000,000	75%
Marathon Petroleum	Martinez, CA	735,840,000	75%/50%
Seaboard Energy	Hugoton, Kansas	85,000,000	80%
Phillips 66	San Francisco, CA - Rodeo Jr	122,640,000	98%
Phillips 66	San Francisco, CA - Rodeo Refinery	643,860,000	80%
Diamond Green Diesel	Port Arthur, TX	470,000,000	90%
LanzaJet/(backed by Suncor/Mitsui)	Demonstration Plant - Soperton, Georgia	10,000,000	35%
CVR Refining	Coffeyville, KS	150,000,000	50%
Grön Fuels/Fidelis Infrastructure	Port of Greater Baton rouge, LA	919,800,000	15%
Red Rock Biofuels	Lakeview, OR - USA	16,100,000	1%
PBF Energy	Chalmette, LA - USA	306,600,000	25%
Northwest Advanced Biofuels	WA State	60,000,000	5%
Calumet Specialty Products	Great Falls, MT	150,234,000	70%
Chevron	El Segunda, CA	153,300,000	95%
Cargill/Loves - Heartwell Renewables	Hastings, Nebraska	80,000,000	40%
Strategic Biofuel	Port of Columbia in Caldwell Parish, Louisiana	32,000,000	5%
Vertex	Mobile, Alabama - old Shell Refinery Transaction	153,300,000	40%
SAFuels X - AIC Energy	Williams County/Buford Township North Dakota	110,000,000	1%
Slate/Starwood	Douglas, Wyoming	137,970,000	5%
Total		5,725,219,000	2,867,781,000

RENEWABLE DIESEL EXPANSIONS

Owner	Location	Gallons Per Year	Probability
Diamond Green LA	Norco, Louisiana (USA)	400,000,000	100%
World Energy	Alt-Air Paramount CA	261,000,000	80%
REG	REG - Geismar	265,000,000	100%
TOTAL	3,393,000	926,000,000	873,800,000

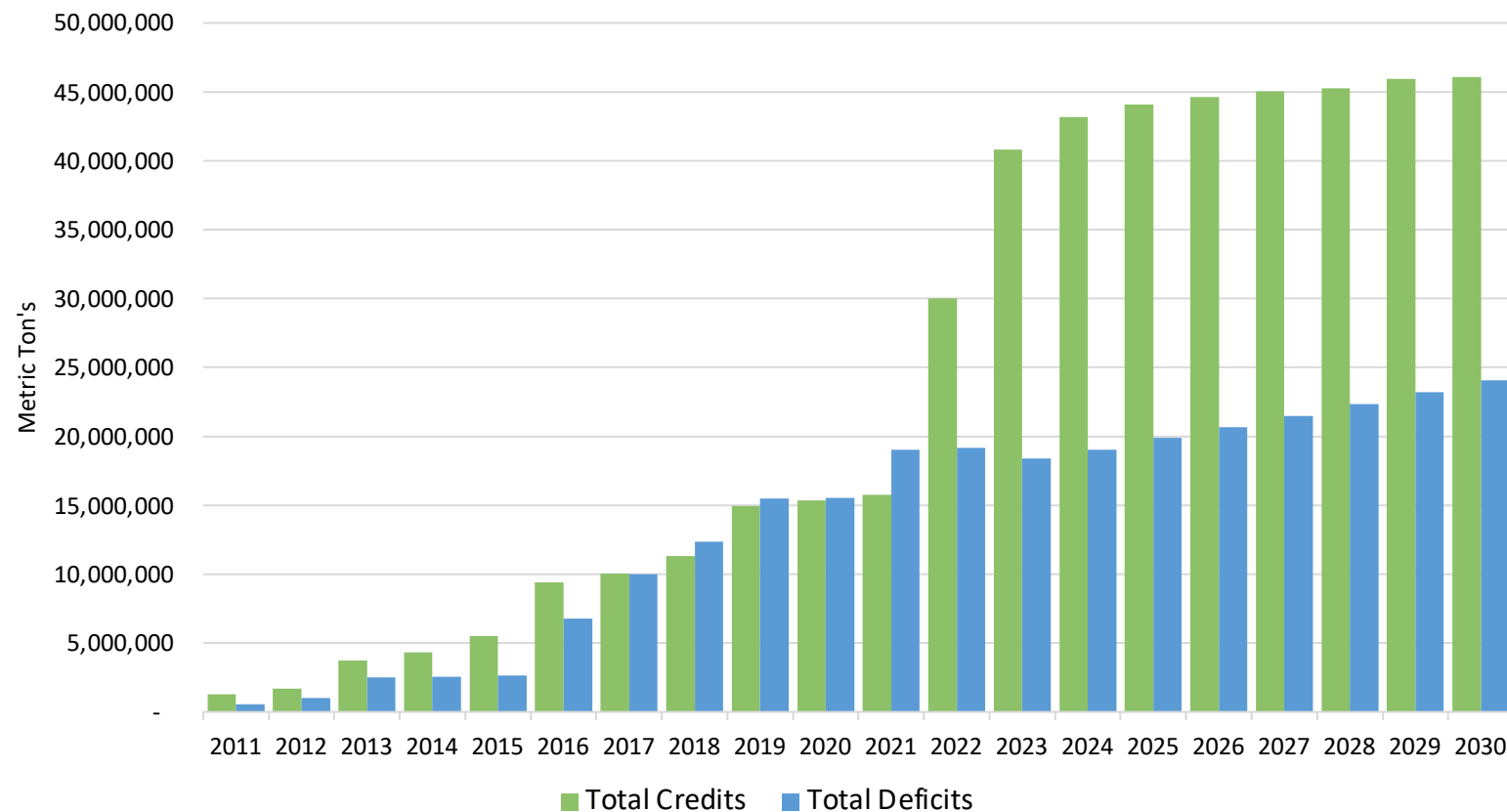
LCFS Credits vs Deficits CARB High Demand Scenario

Actual Through 2020 – Projected Through 2030



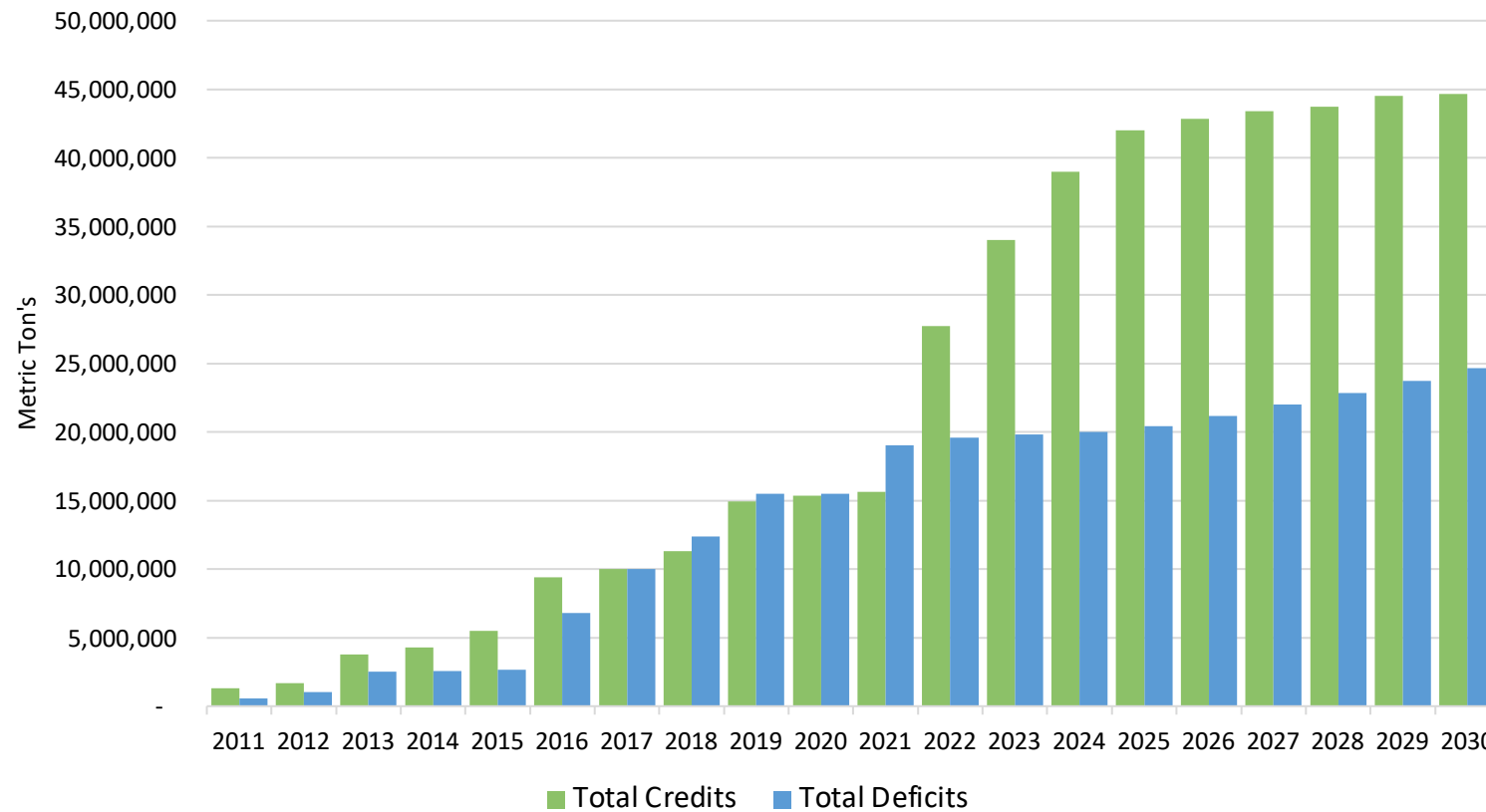
LCFS Credits vs Deficits If All RD Comes Online

Actual Through 2020 – Projected Through 2030



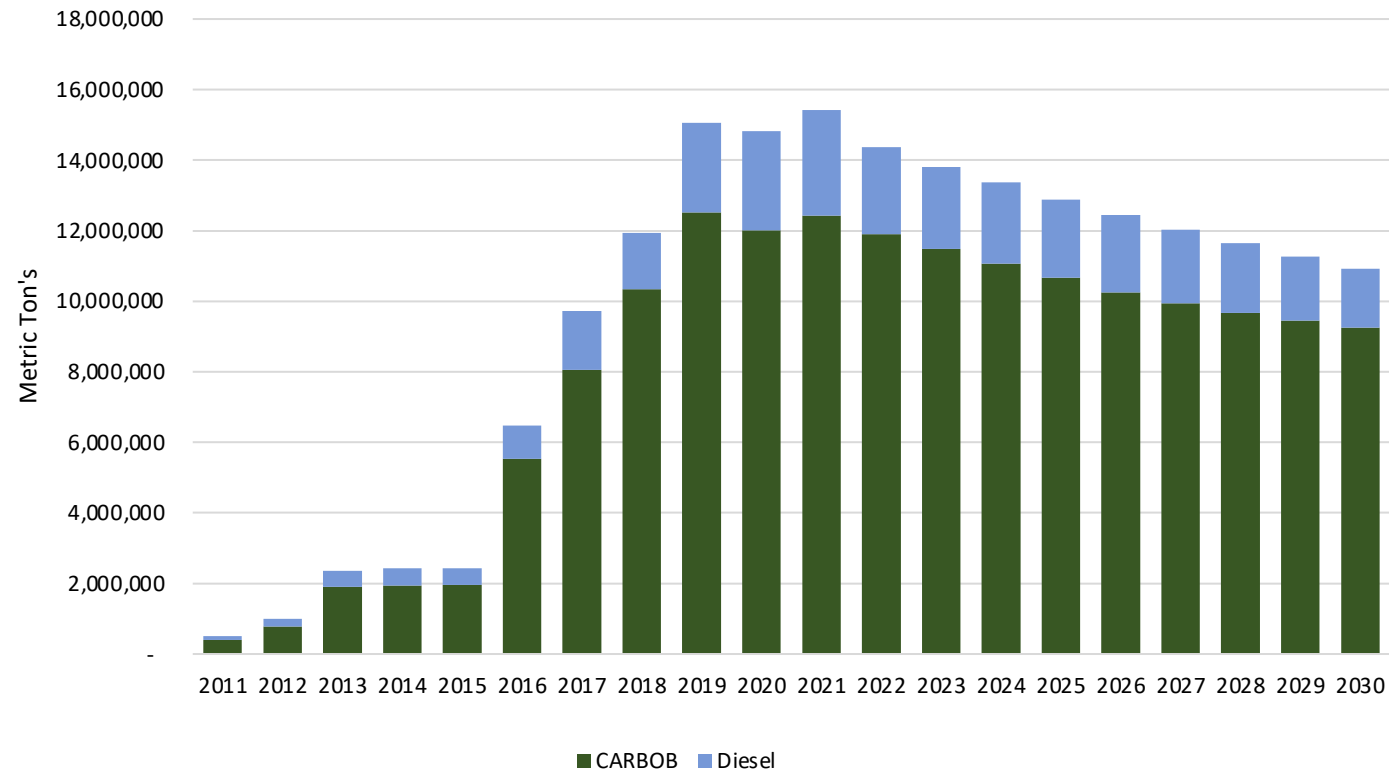
LCFS Credits vs Deficits Probability Based RD

Actual Through 2020 – Projected Through 2030



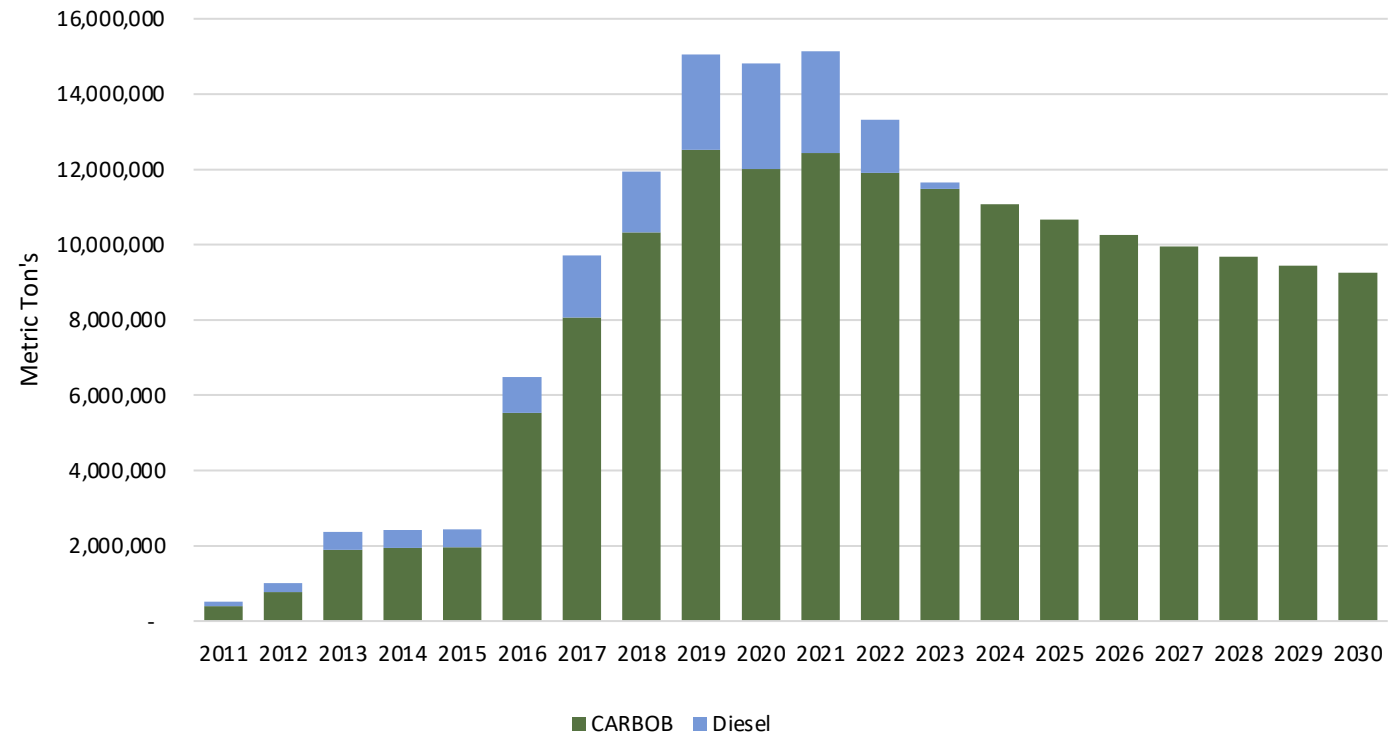
LCFS Deficit Generation Standard CARB Scenario

2011-2020 Actual – 2021-2030 Projected



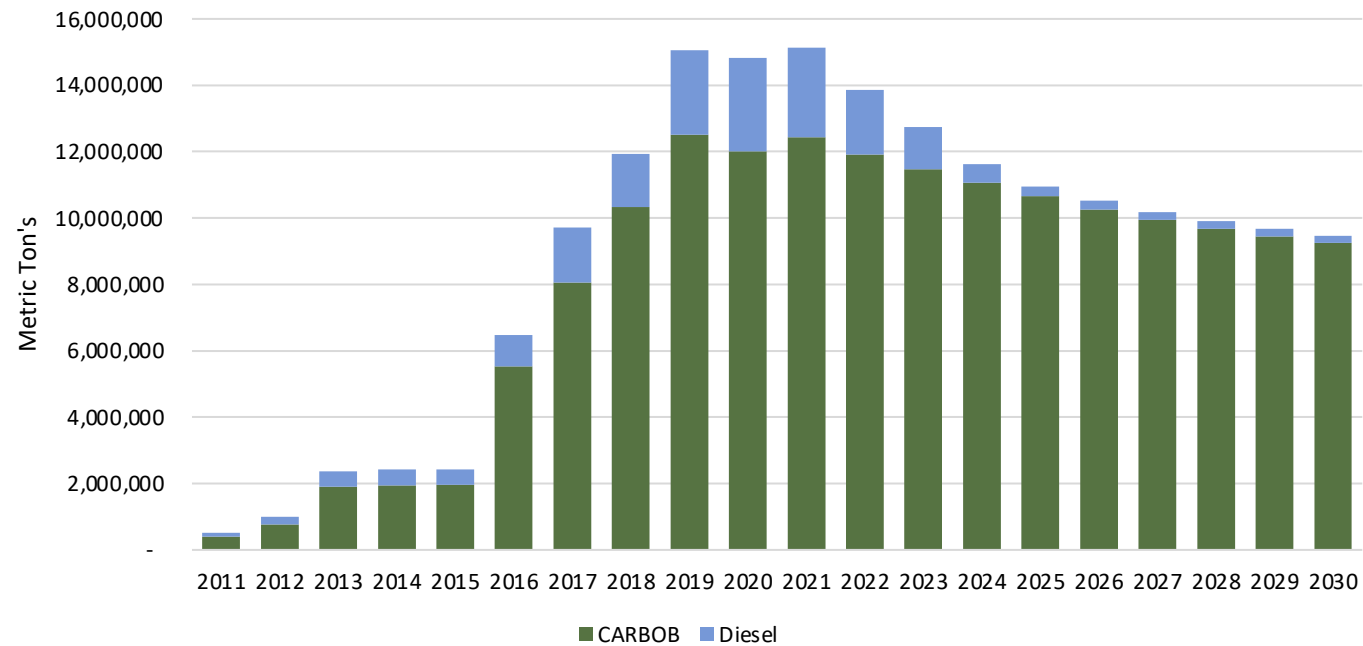
LCFS Deficit Generation All RD Projects Scenario

2011-2020 Actual – 2021-2030 Projected



LCFS Deficit Generation Probability Based RD Scenario

2011-2020 Actual – 2021-2030 Projected



Factors That Might Limit The RD Capacity Explosion

- Cracks Forming in the Renewable Diesel Capacity Bubble
- Oil Companies May Not Capitalize on Additional Phase Buildouts
- Federal SAF LCFS?
- CARB

Thank You

Questions or Comments?

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