

Soybeans, Renewable Diesel and the Future

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Biomass based diesels (BBD's)

Biodiesel

Created through transesterification, a process that reacts a fat or oil with a small amount of alcohol to produce a diesel like fuel.

ESTABLISHED

Renewable Diesel

Produced through hydrotreating, a process like a traditional oil refinery operation. Creates a fuel that meets the same standards as petroleum-based diesel.

ESTABLISHING

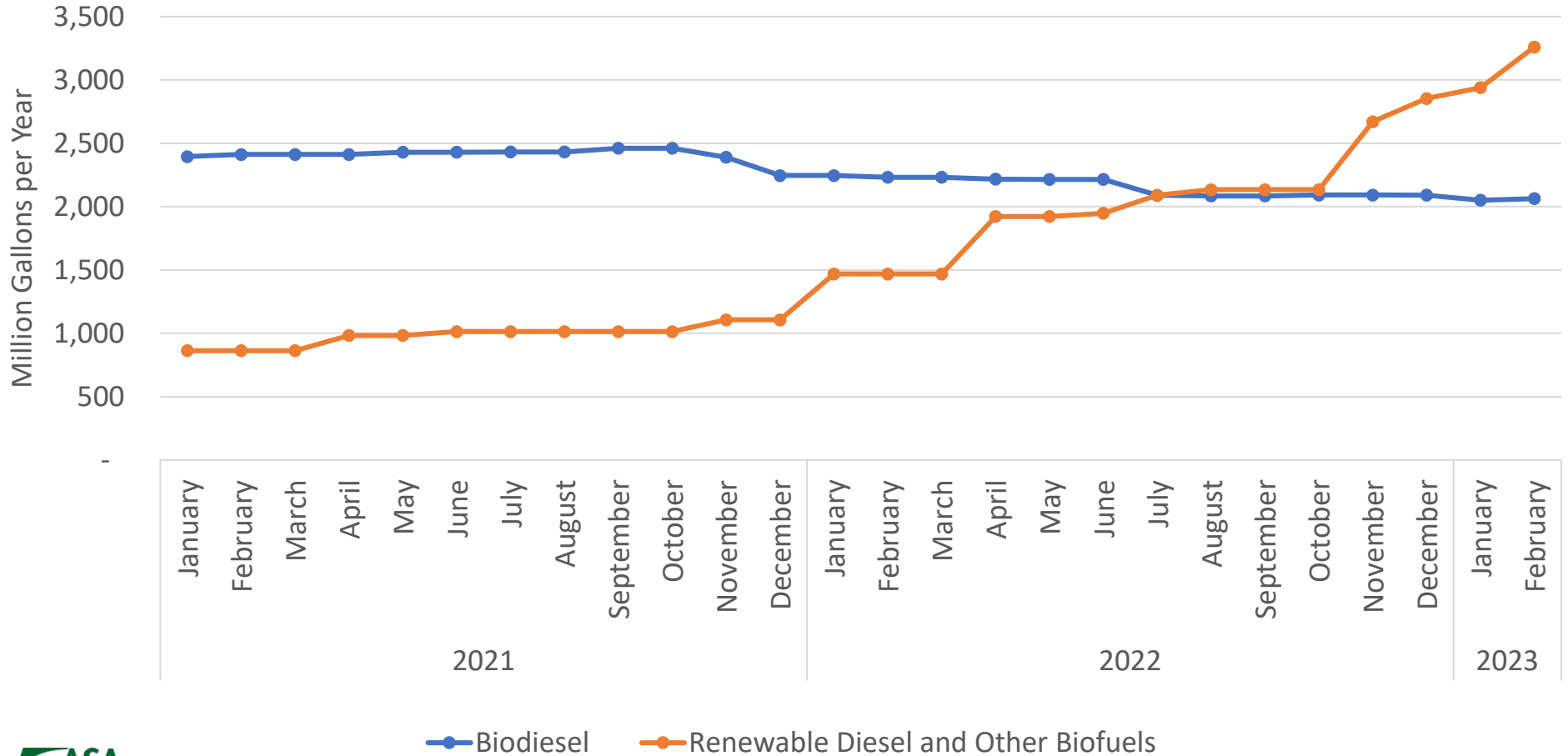
Sustainable Aviation Fuel

Produced from a wide variety of raw material and processes, including from sugars, fats and waste gases. Primary commercial production utilizes the renewable diesel process.

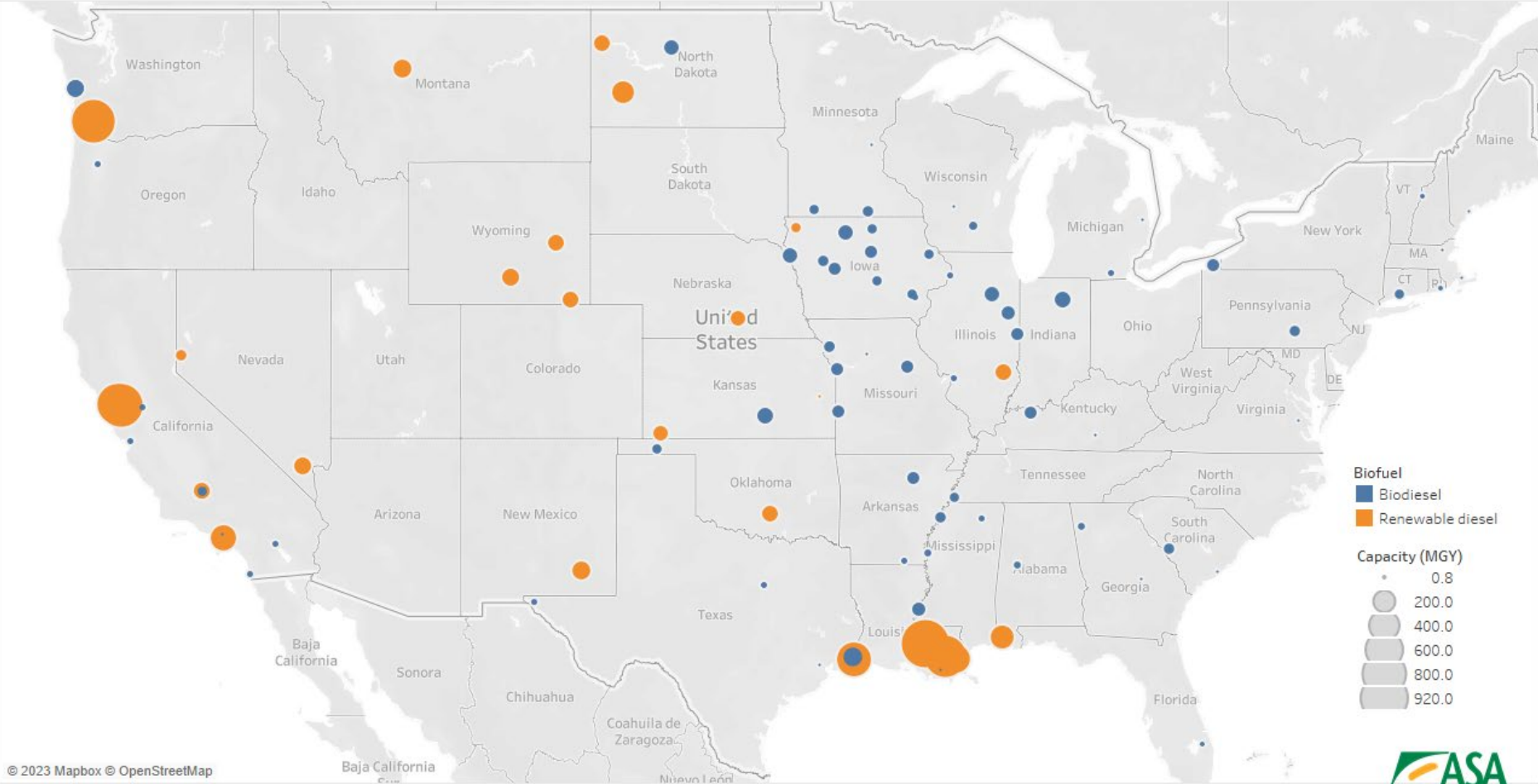
ASPIRATIONAL

Source: Clean Fuels Alliance America

U.S. Biomass Based Diesel Capacity

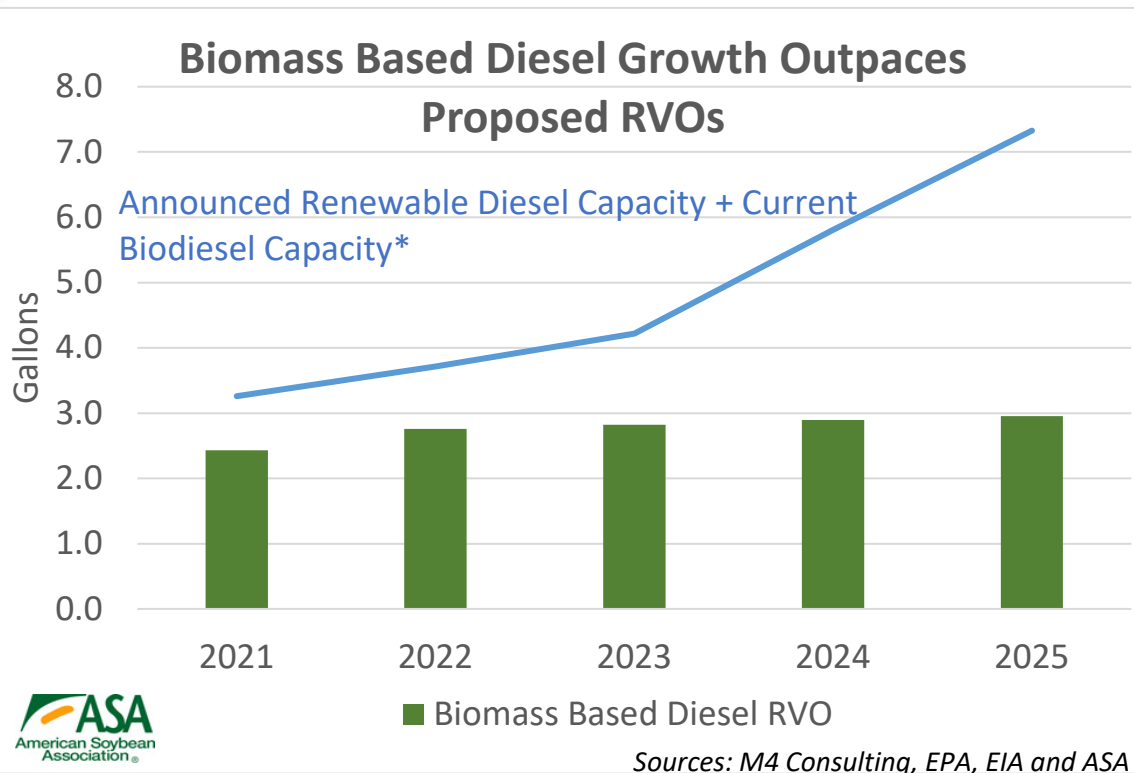


U.S. Biomass-Based Diesel Plants



Policies supporting BBD

- Renewable Fuel Standard
- Blenders' Tax Credit/45Z
- California LCFS



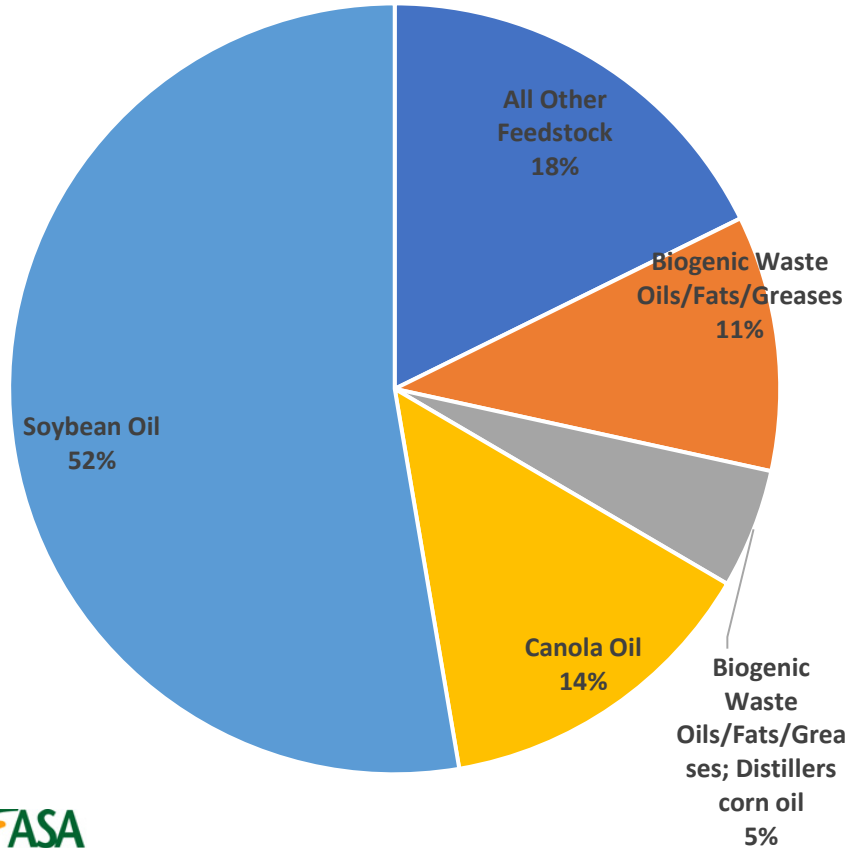
* Biodiesel capacity for 2021 is based on actual December capacity for the prior year. For 2023, the biodiesel capacity numbers are based upon the latest data (September 2022). The capacity for 2023 through 2025 is held at the 2022 levels.

Renewable diesel LCFS credits and costs by feedstock

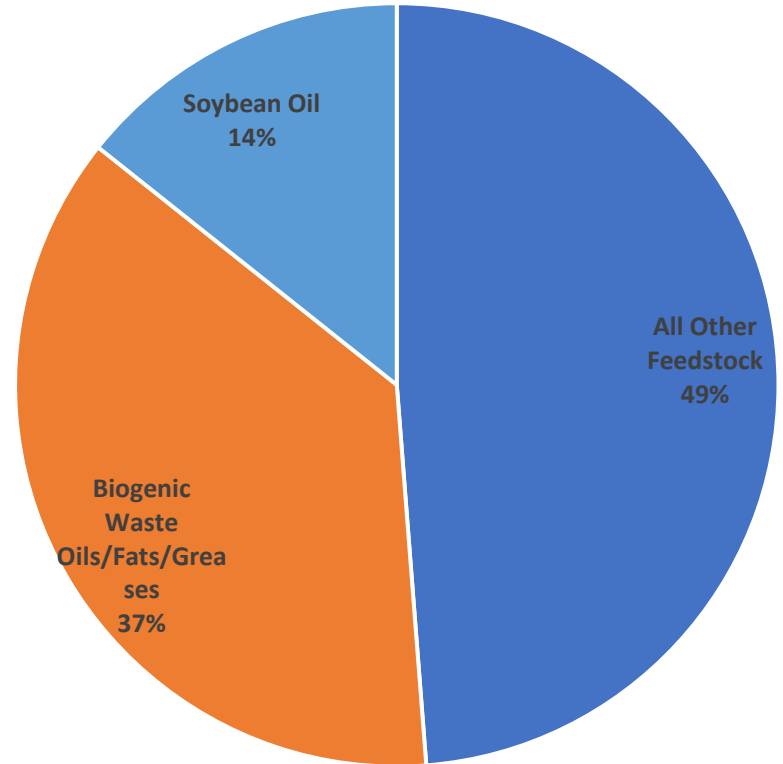
	LCFS credit per gal.
Canola oil	\$0.39
Corn oil	\$0.54
Soybean oil	\$0.33
Animal fat	\$0.58
Used cooking oil	\$0.70

LCFS credit per gallon based upon average of approved pathways as reported by CARB. Based upon compliance year 2023.

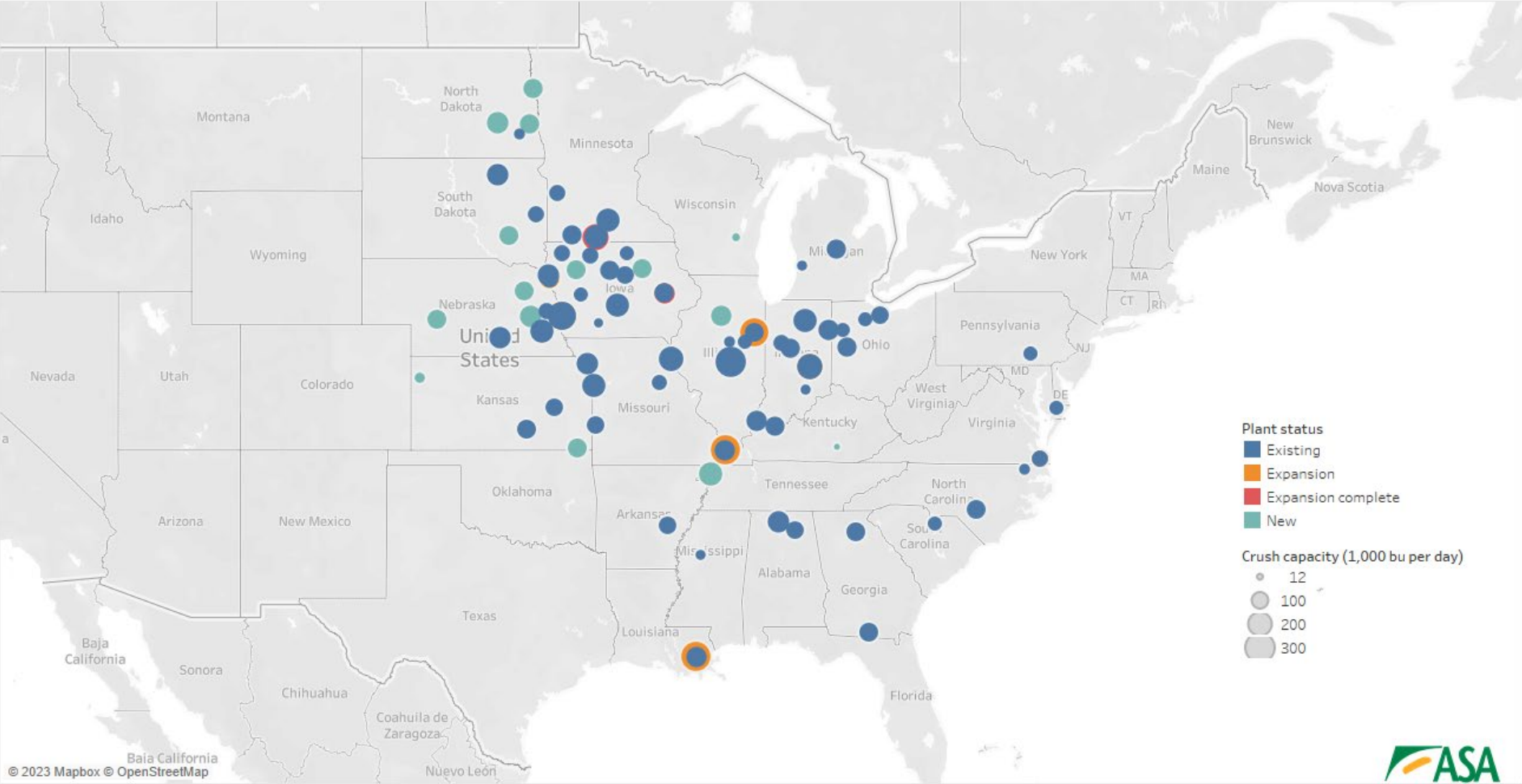
Biodiesel Feedstocks for 2022



Renewable Diesel Feedstocks for 2022



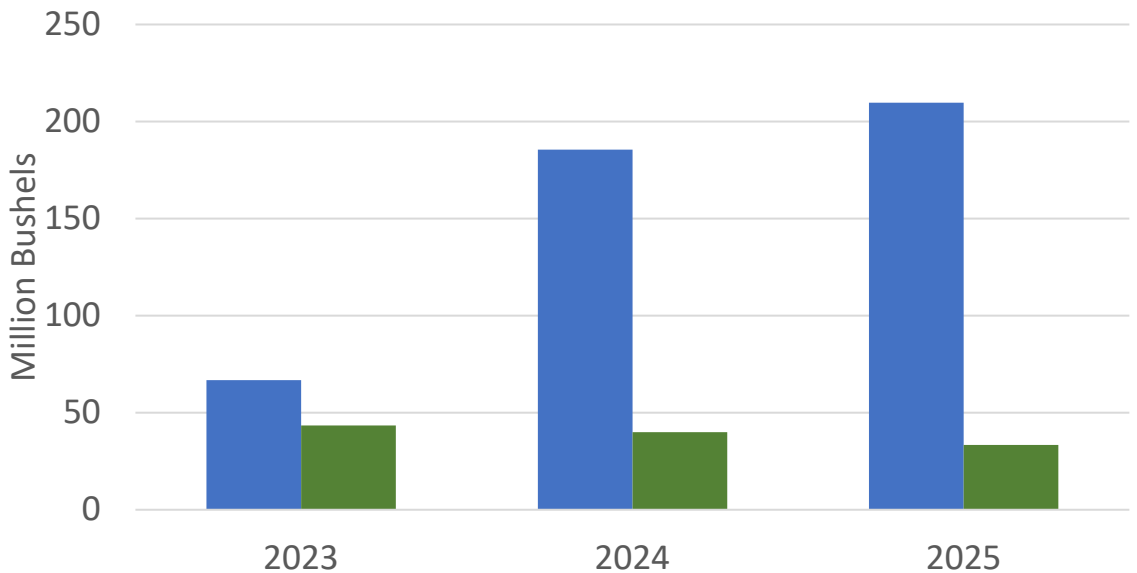
U.S. Soybean Crush Plants



Source: Gordon Denny and American Soybean Association



Increase in U.S. Crush Capacity



USDA crush is converted from marketing year to calendar year by taking 1/3 of the new marketing year and 2/3 of the last marketing year. Increased practical crush capacity is 92% of nameplate capacity at 350 days per year. Since a new plant may come online partway through the year, 1/2 of the past year's announced increase is averaged with 1/2 of the current year's announced increase.

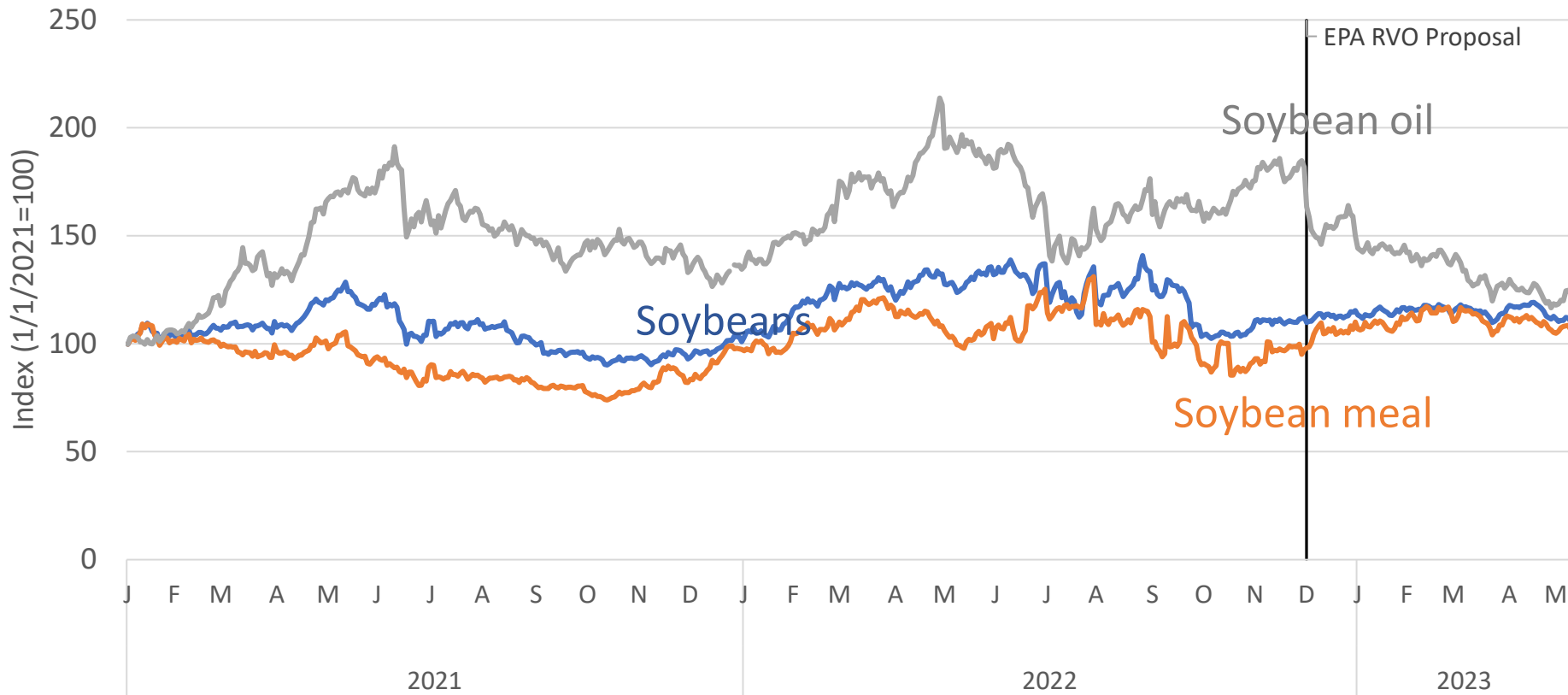
Actual Production?

- Over the next three years, the expanded crush capacity announced by companies would increase soybean oil supplies by about 5.5 billion pounds. This translates into about 700 million gallons of renewable diesel, far above the EPA's three-year growth in the RVO of only about 200 million gallons.
- EPA estimated the expected growth in BBD from feedstocks other than soy and projects 180 million gallons of growth between 2022 and 2025 in BBD produced from them. This is almost the same level as the RVO increase for the category but doesn't even include canola oil for renewable diesel.

Central Illinois Soybean Crushing Margin



Index of Soybean and Product Prices

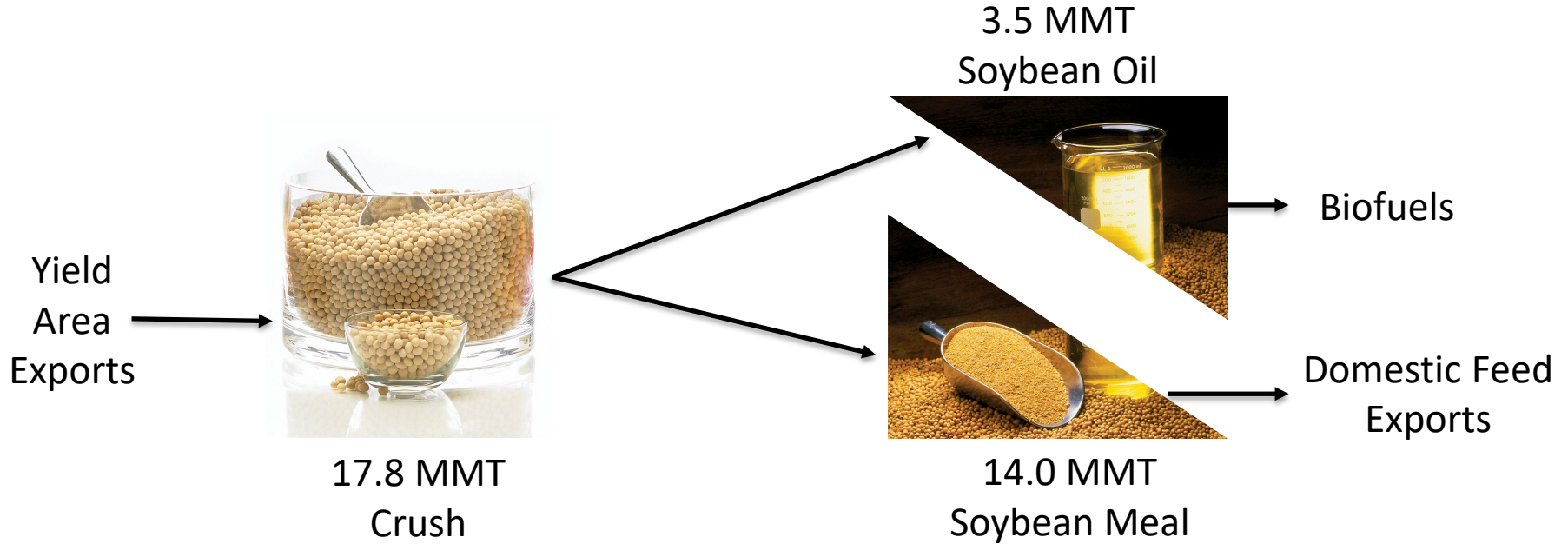


Oil Value Share of Soybean Crush



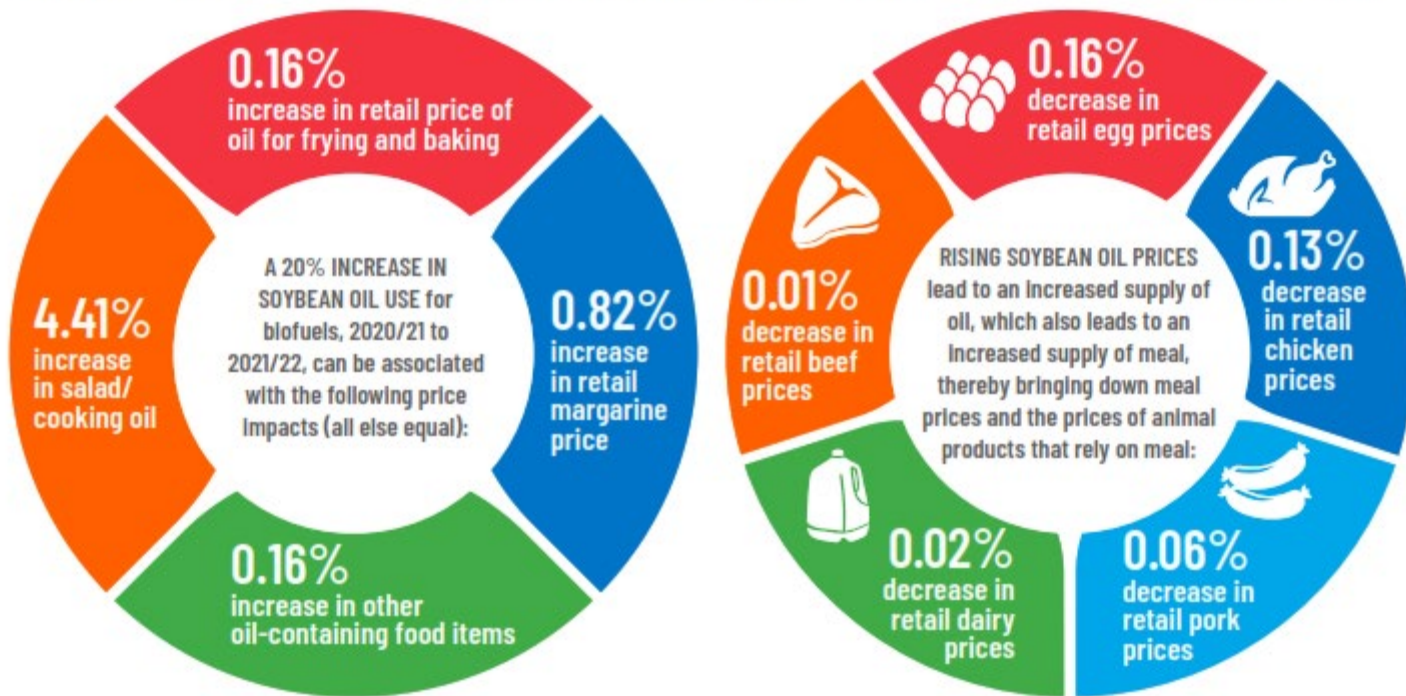
EPA RVO Proposal

If all announcements are built...



BOTTOM LINE

Increasing use of soybean oil for biofuels has almost no net impact on food price inflation: The low cost of oil used in food and abundant supply of meal help lower meat prices, which balances consumer costs.



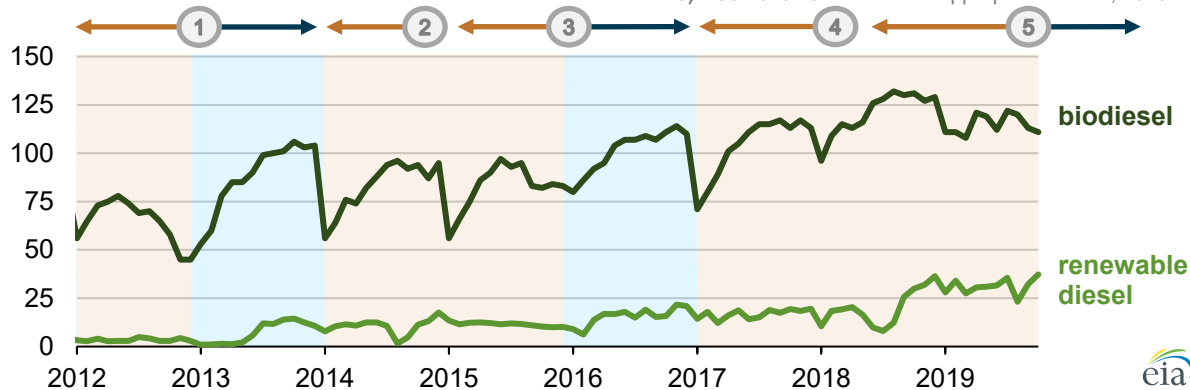
BTC History

Biomass-based diesel production (Jan 2011-Oct 2019)

thousand barrels per day

tax credit applied retroactively
tax credit applied to future

- 1) Jan 2013: American Taxpayer Relief Act of 2012
- 2) Dec 2014: Tax Increase Prevention Act of 2014
- 3) Dec 2015: Consolidated Appropriations Act, 2016
- 4) Feb 2018: Bipartisan Budget Act of 2018
- 5) Dec 2019: Consolidated Appropriations Act, 2019



Inflation Reduction Act (IRA)

- Signed into law on September 16, 2022
- Extends the BTC through 2024 and establishes a SAF credit for 2023 and 2024
- Both credits would transition into a Clean Fuel Production Credit which is a producers' tax credit (45Z) from 2025 to 2027. Imported biofuels are ineligible for the PTC.

Credits per Gallon for Soy-Based Biofuels*

	2022	2023	2024	2025	2026	2027	2028+
Biodiesel	\$1	\$1	\$1	\$0.36	\$0.36	\$0.36	\$0
Renewable diesel	\$1	\$1	\$1	\$0.31	\$0.31	\$0.31	\$0
SAF (CORSA)	\$1	\$0	\$0	\$0	\$0	\$0	\$0
SAF (GREET)	\$1	\$1.25-\$1.34	\$1.25-\$1.34	\$0.12-\$0.40	\$0.12-\$0.40	\$0.12-\$0.40	\$0

*PTC not indexed for inflation



California LCFS Credit Price

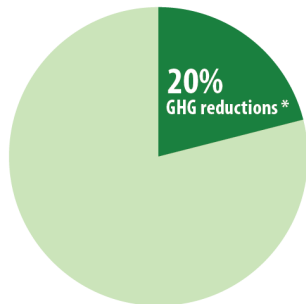


The Renewable Fuel Standard

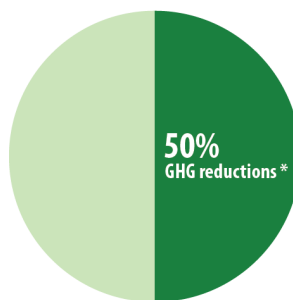
Lifecycle Greenhouse Gas (GHG) Emissions

GHG emissions must take into account direct and significant indirect emissions, including land use change.

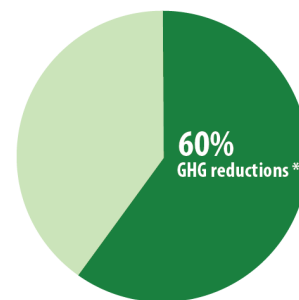
Renewable Fuels



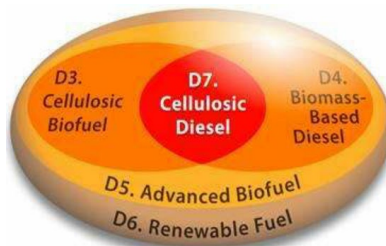
Advanced & Biodiesel Fuels



Cellulosic Fuels




* compared to a 2005 petroleum baseline




Thank you!

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