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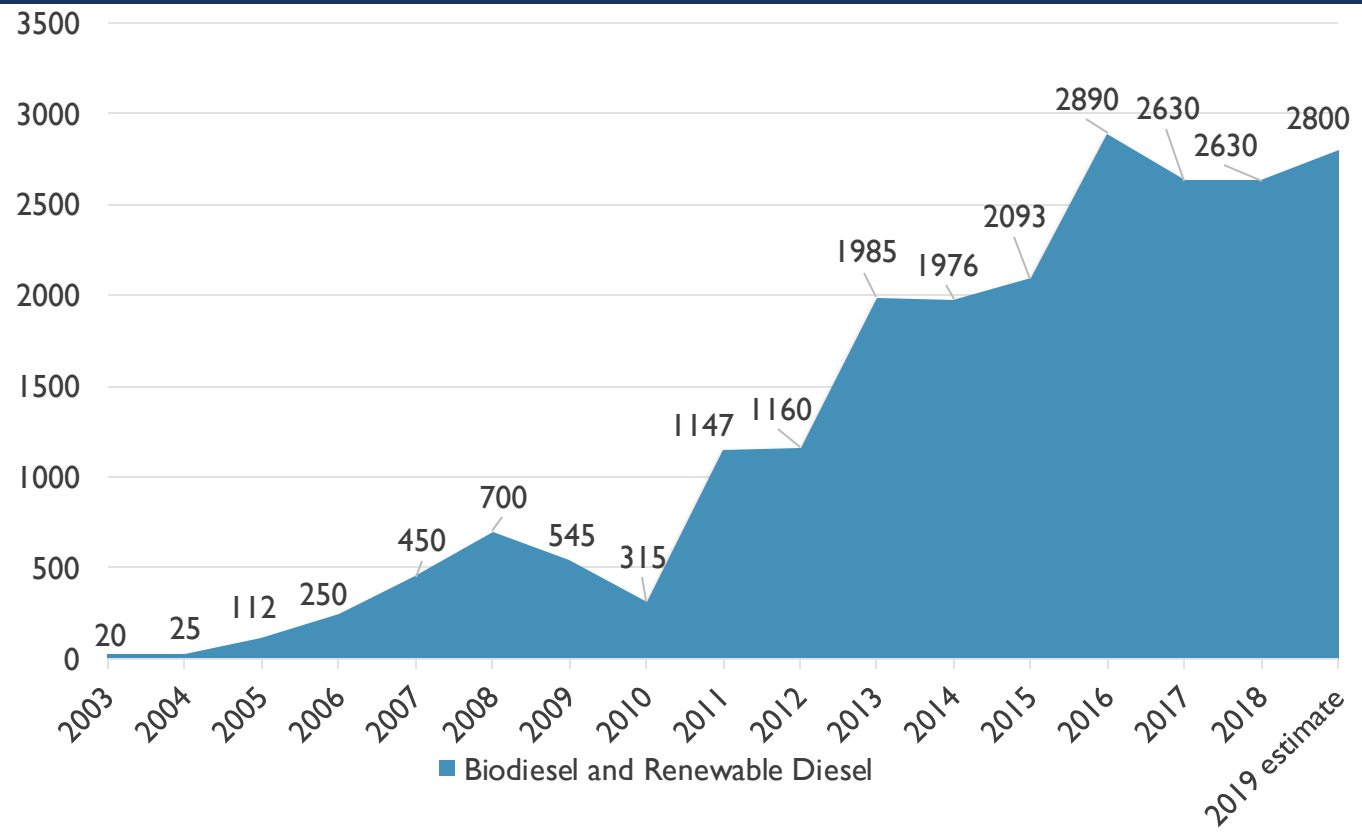
Renewable Energy Roundtable

State of Biodiesel Industry

U.S. BIODIESEL MARKET
(MILLIONS OF GALLONS)
SOURCE: EPA EMTS*



*Volumes reported under the RFS in the D4, D5, and D6 categories.

Current US biodiesel production capacity 4.0 billion gallons

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Soybean Oil Used in Biomass Diesel

- 2008 350,000,000-gallon market
- 2019 2,800,000,000-gallon market

Soybean Oil Use

- 2008 – 2.0 billion pounds
- 2016 – 5.7 billion pounds
- 2017 – 6.2 billion pounds
- 2019 – 8.1 billion pounds
- 300% increase

Projected Soybean Oil Use (USDA)

- **2020 – 8.0 billion pounds plus.**

Today – Adds 13% to cash soybean price.

- **StoneX (was INTL FC Stone) – Biodiesel adds $1.09 bu.**

Good for MN Soybean Farmers:

- Added $49 per acre in 2019.
- Added $330,000,000 MN soybean value in 2019.
- Per USDA Ag Stats.

Good for Livestock, too:

- Decreases soy protein meal prices by $20-40 per ton.
- Increases value of animal fat:

  Beef Tallow

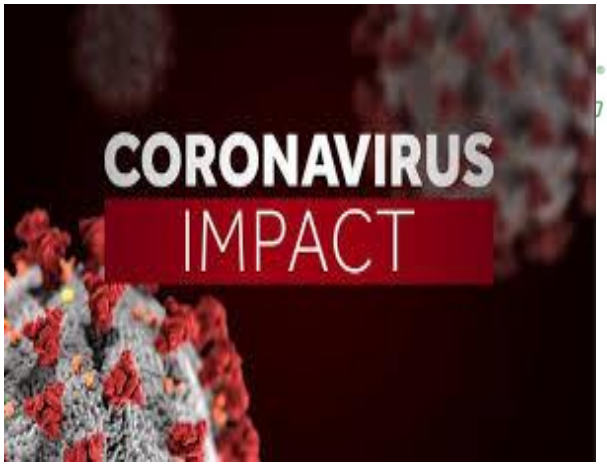
  – Biodiesel adds $10-$12 per head

  Swine Fat

  – Biodiesel adds $1.00 to $1.25 per animal

  – Saved livestock producers $5 billion in reduced soymeal cost from 2006 – 2014.

2020



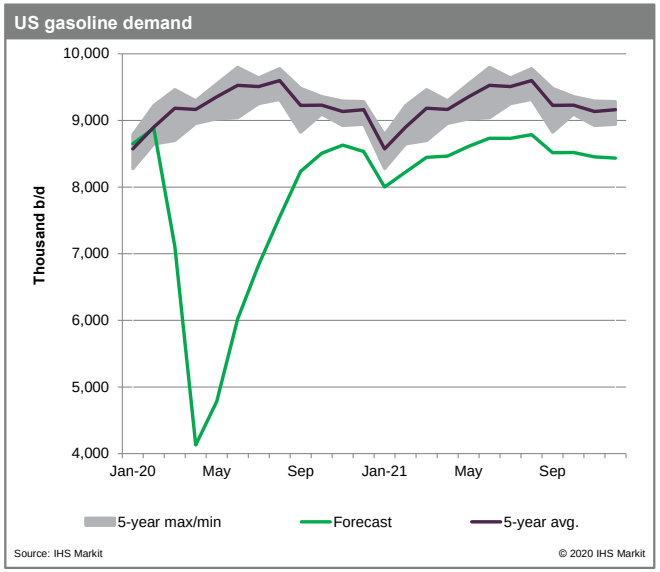
Pre Covid – 3.0 billion gal. plus.

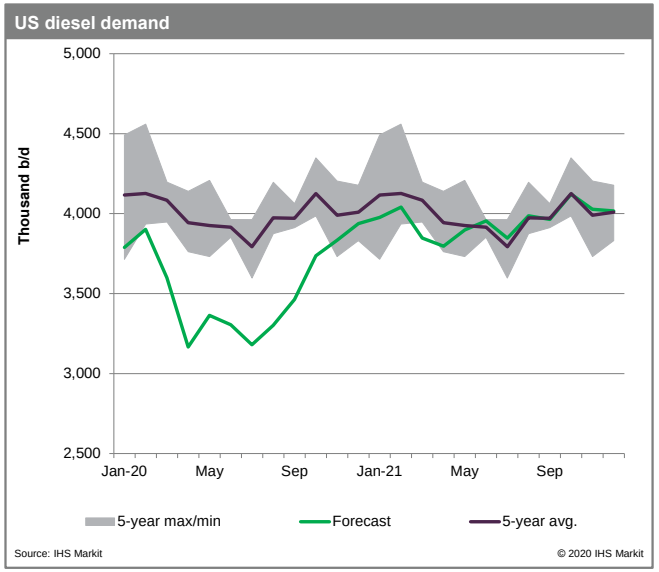
Post Covid

- Diesel demand and gasoline demand down by 10%.
- Market size 2.6 – 2.7 billion gal?.
- Delayed 8 plants coming back on-line.
- Soybean oil went from 46% to 70% of feedstocks.
- Did the biodiesel industry adjust? **Sure looks like it!!**

GASOLINE AND DIESEL USE IMPACTED BY COVID-19

In March, IHS Markit forecasted that gasoline consumption in the US would drop by 55% for March and April due to COVID-19. They also indicated that jet fuel demand would be halved over the same period. Lastly, they suggest that diesel demand would be down by 20%.





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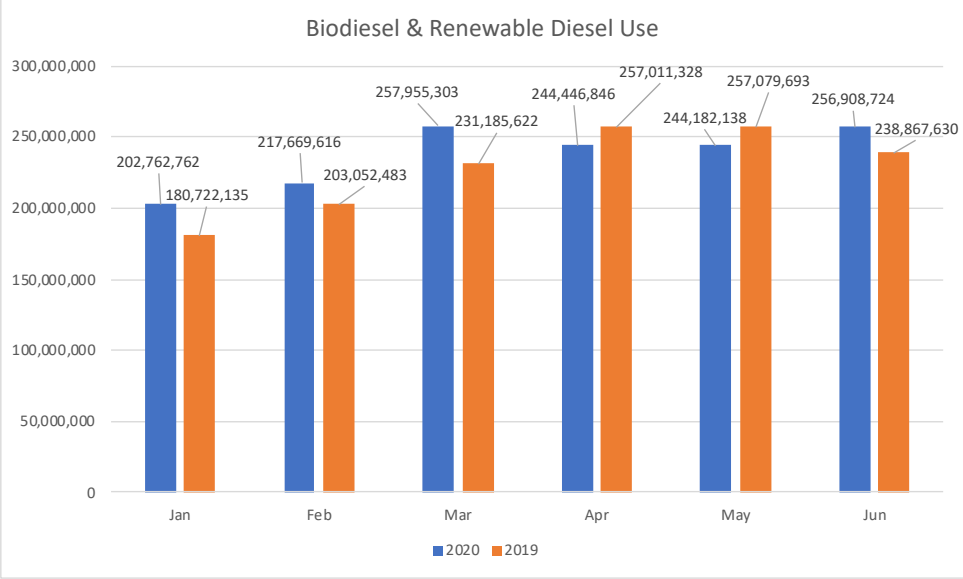
DEMAND FOR BIODIESEL HAS BEEN RESILIENT



Source: EMTS

- EIA now forecasts gasoline and distillate consumption will decrease approximately 10% compared with 2019. (July STEO)
  - Since gas and diesel consumption impact the amount of biomass-based diesel required under the RFS, more than 300 million gallons of biomass-based diesel could be impacted.
- However, demand for BBD in 2020 remains strong relative to 2019.

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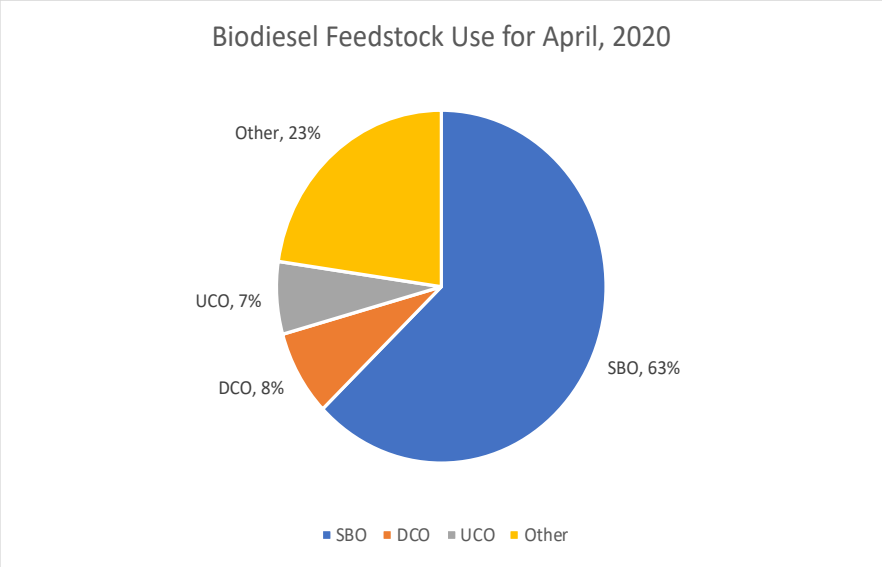
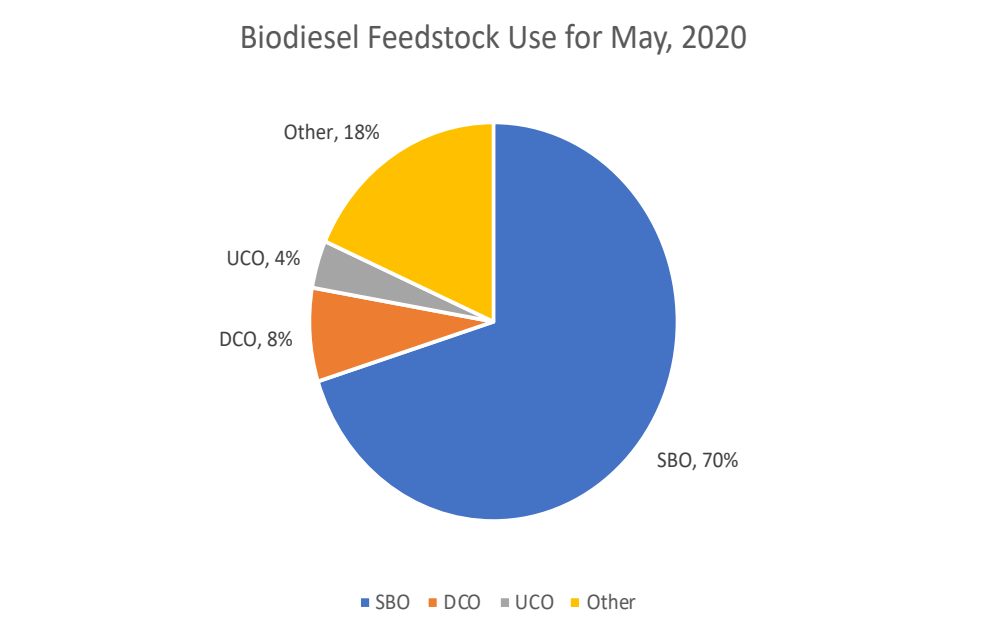
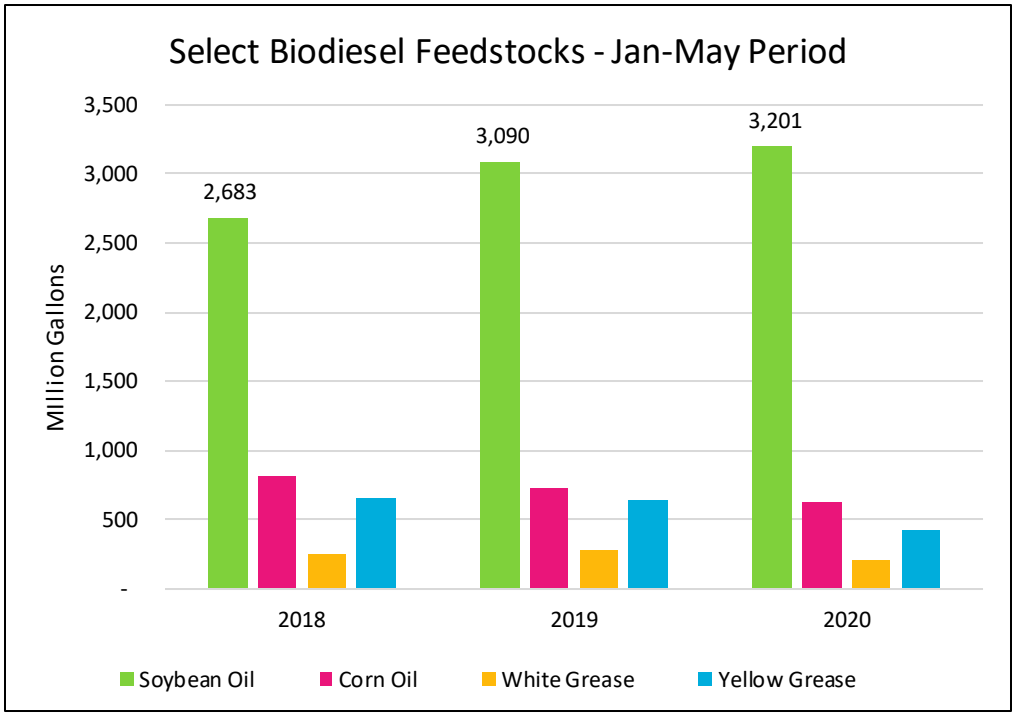
Quickly changing Feedstock situation –UCO/DCO/SBO





Source: EIA Monthly Biodiesel Production Report (biodiesel only)

Domestic Utilization - Biodiesel



Data Source: Energy Information Administration

- Through May, domestic soybean oil disappearance for use in biodiesel is up 3.6% from 2019 and up 19.3% from 2018
- May SBO biodiesel use of 778 million lbs up 18% from May 2019; highest monthly use over past 3 years

Demand Drivers Going Forward

U.S.

- Five-year biodiesel tax credit to 2022- $15 billion value.
- Argentine trade case – 300,000,000 gals.
- 15% increase in 2022 RFS volumes = 330 million gal. increase. Now on hold until after November.
- Previous Small Refinery Exemptions – 200,000,000 gal
- **98 total exemptions proposed = 600,000,000 gallons.**

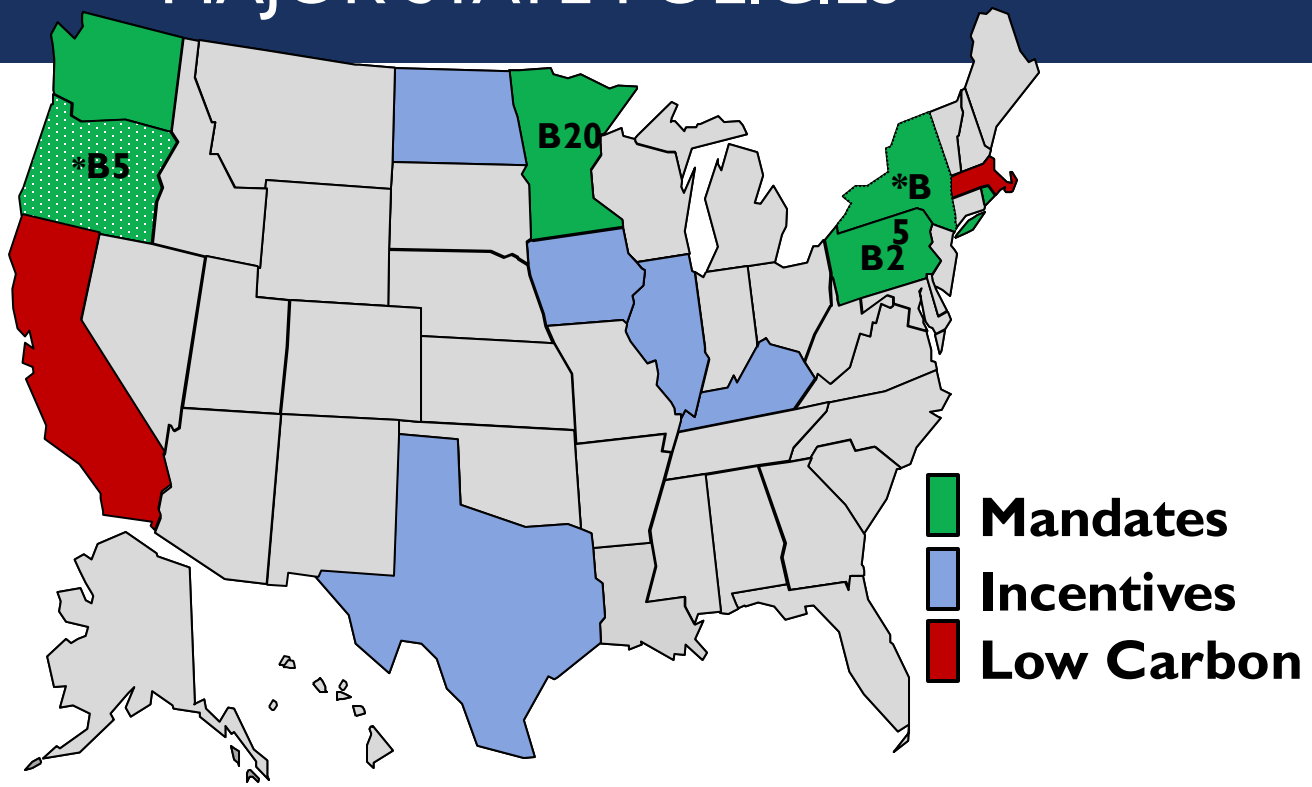
Demand Drivers – States

States
- 1.8 billion gal. market 2020
- 2.57 billion gal. market 2025
- 3.59 billion gal. market 2030

CA
- 11 million gal. market 2014
- 689 million gal. market 2018
- 829 million gal. market 2019
- **1.0 billion gal. market 2020**
- 2.0 **billion** gal. market 2023

Northeast – Bioheat "Providence Resolution"
- 800 million gal. 2023
- 2 billion gal. 2030
- 4 billion gal 2050 "net zero"

MAJOR STATE POLICIES



*New York City plus Westchester, Suffolk, and Nassau Counties.
*Oregon has all three types of policies.

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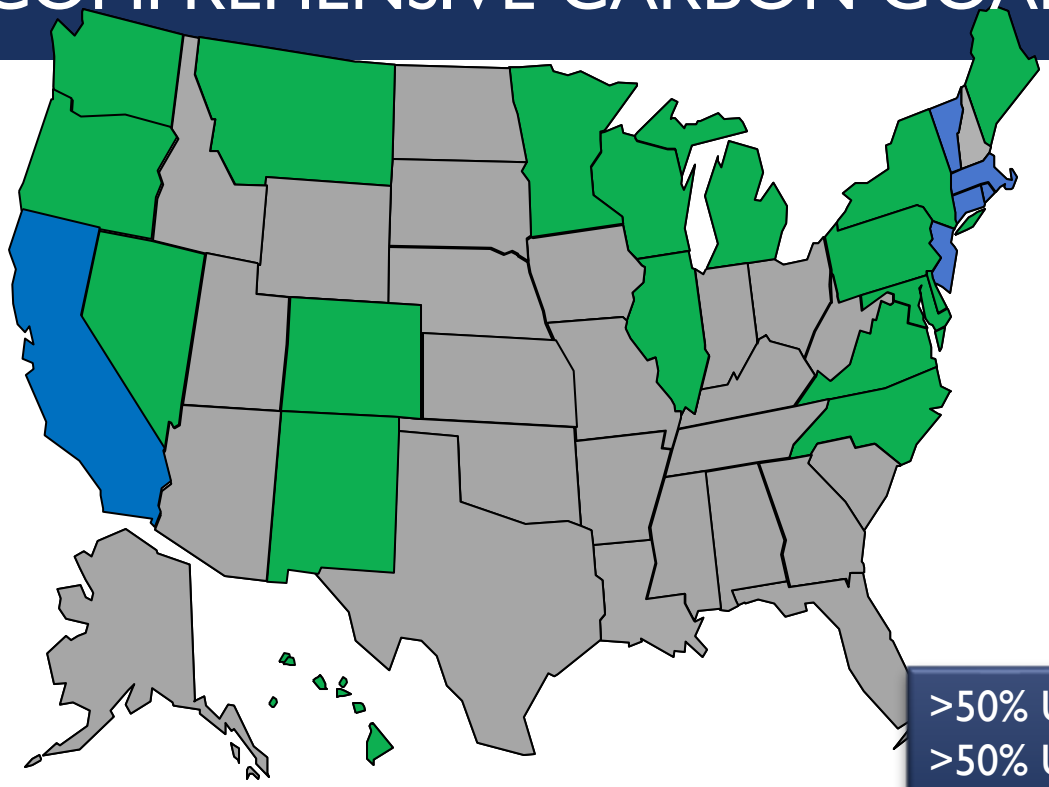
COMPREHENSIVE CARBON GOALS



2015

2020

By 2020, 24 states adopted carbon goals.

>50% U.S. population.
>50% U.S. GDP.
>40% of on-road fuel.
>90% of heating oil.

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Future CI Technology:

Ultra Low Emissions Diesel Engine (ULEDE)

New Diesel NOx Standards:

- U.S EPA's "Cleaner Trucks Initiative"
- CARB Heavy Duty Diesel Changes
- 2020 or later timing

➢ New Step Change in NOx After-Treatment

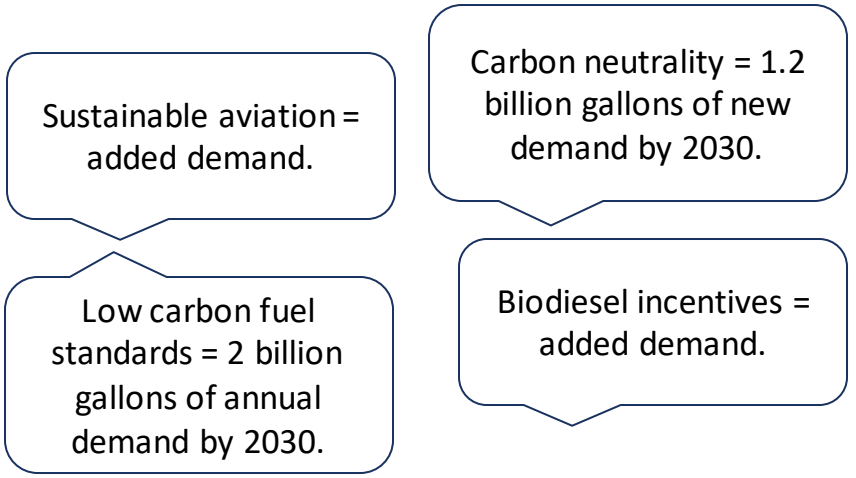
- ➢ From 0.2 g to ~0.02 g NOx, new tech needed
- ➢ PM from 0.01 to ~0.005, met with existing DPF

Strong Diesel Future

- Ultra Low NOx Under All Uses….
- Extreme Durability…
- **<u>Low Carbon Fuels Like Biodiesel….</u>**
- Make Diesel the Engine of Choice for Medium and Heavy Duty Applications for Years to Come….

KEY DEMAND TRENDS THROUGH 2030

- Population growth = higher protein meal demand.
- New technology in agriculture and energy.
- Concern about carbon emissions = demand for low-carbon fuels.
- Continued strong diesel fuel demand.
- Biodiesel and renewable diesel remain the lowest-cost, lowest-carbon option for transportation and heating.



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FEEDSTOCK SUPPLY UPDATE

Distillers Corn Oil

Animal Fats

Soybean Oil

Yellow Grease

Canola Oil

Camelina

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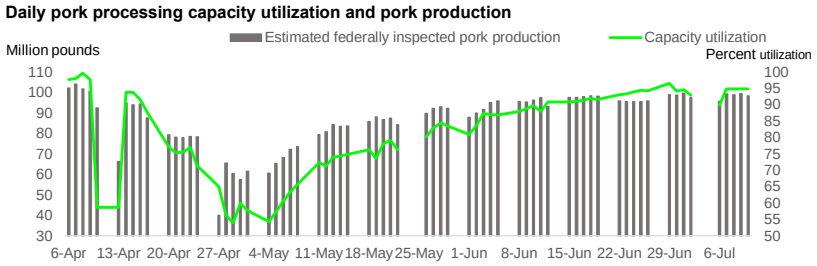
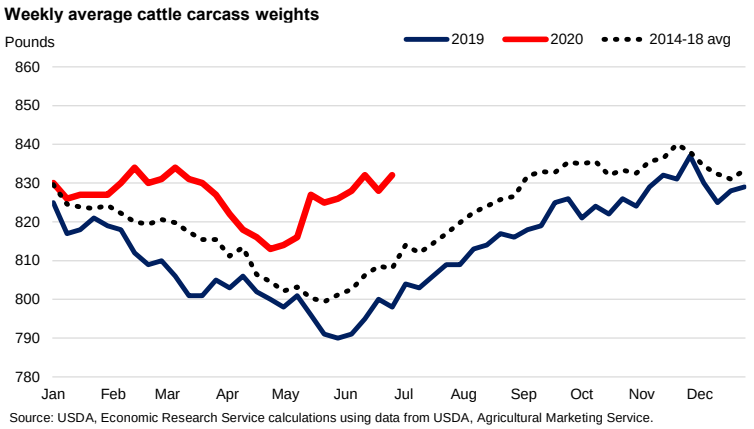
ANIMAL FATS AND USED COOKING OIL

- Livestock industry has experienced volatility, however
  - Slaughter rates have recovered to more than 90% of processing capacity.
  - Slaughter weights have increased.
  - Backlog of animals to be processed.
  - Watch for impact of low producer prices on future supply outlook.
- Industry reports edible oil sales 80 to 85% of pre-Covid levels with some reporting “almost back to normal.”.





Source: USDA, Economic Research Service calculations using data from USDA, Agricultural Marketing Service.

Source: Livestock, Dairy, and Poultry Outlook (July, 2020)

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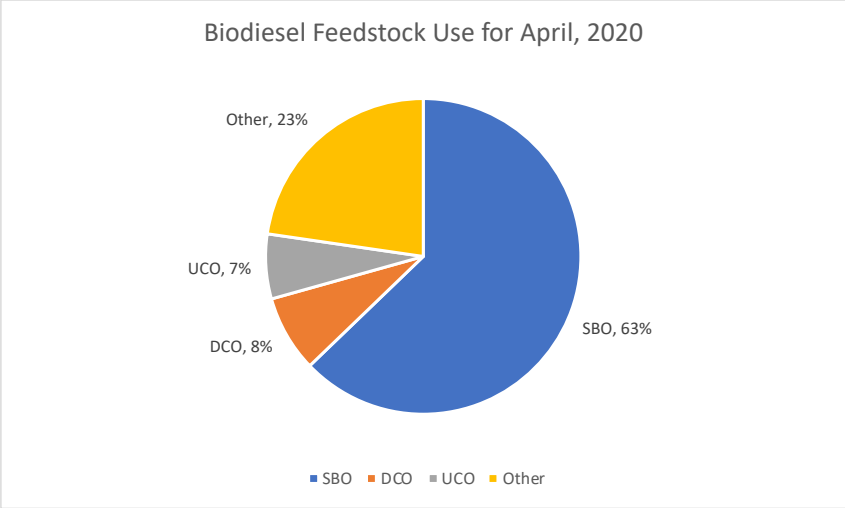
DISTILLERS CORN OIL, SOYBEAN OIL & OTHER FEEDSTOCKS



Source: EIA Monthly Biodiesel Production Report (biodiesel only)

- Ethanol production recovering from April low when approximately ½ of ethanol capacity idled.
  - Incremental recovery and currently back to 80 to 85% of pre-Covid production levels, but may plateau at this level.
- Continued strong oilseed crush.
  - Strong soybean oil production due to record crush.
  - Increased use of soy oil during height of Covid-19 impacts.
- New non-crop feedstocks coming to the market, i.e. pennycress, camelina, fats and oils from wastewater treatment and others.

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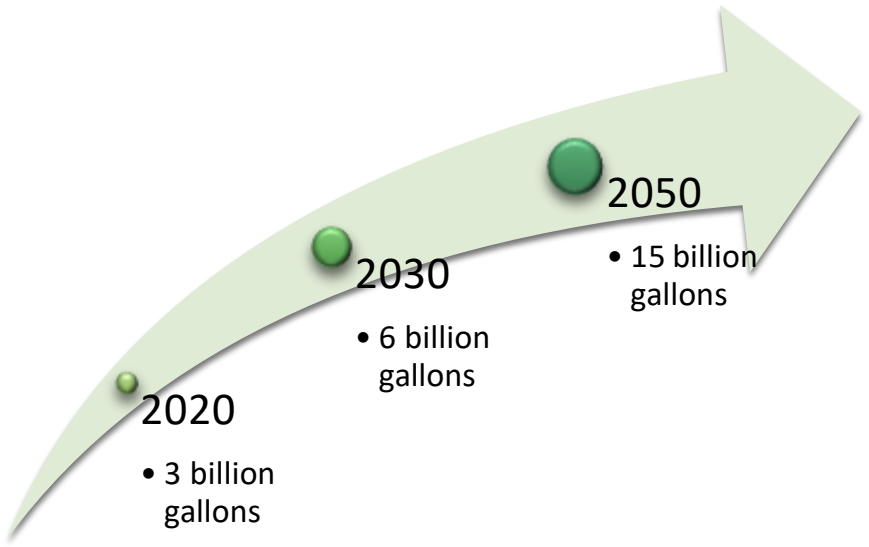
NBB VISION 2020

- **Biodiesel, renewable diesel, and renewable jet fuel** will be recognized as mainstream low-carbon fuel options with superior performance and emission characteristics. In on road, off road, air transportation, electricity generation, and **home heating** applications, use will exceed **6 billion gallons by 2030**, eliminating over 35 million metric tons of CO_2 equivalent greenhouse gas emissions annually. With advancements in feedstock, use will reach 15 billion gallons by 2050.



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