Renewable Energy Roundtable

State of Biodiesel Industry
Current US biodiesel production capacity 4.0 billion gallons

*Volumes reported under the RFS in the D4, D5, and D6 categories.
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!!
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%.
DEMAND FOR BIODIESEL HAS BEEN RESILIENT

- 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.

Source: EMTS
Quickly changing Feedstock situation – UCO/DCO/SBO

Source: EIA Monthly Biodiesel Production Report (biodiesel only)
Domestic Utilization - Biodiesel

- 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

Data Source: Energy Information Administration
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”
New York City plus Westchester, Suffolk, and Nassau Counties.

Oregon has all three types of policies.
COMPREHENSIVE CARBON GOALS

By 2020, 24 states adopted carbon goals.

>50% U.S. population.
>50% U.S. GDP.
>40% of on-road fuel.
>90% of heating oil.
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...
- **Low Carbon Fuels Like Biodiesel....**
- 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.

 Sustainable aviation = added demand.

 Low carbon fuel standards = 2 billion gallons of annual demand by 2030.

 Carbon neutrality = 1.2 billion gallons of new demand by 2030.

 Biodiesel incentives = added demand.
FEEDSTOCK SUPPLY UPDATE

- Distillers Corn Oil
- Soybean Oil
- Animal Fats
- Yellow Grease
- Camelina
- Canola 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.”

**ANIMAL FATS AND USED COOKING OIL**

**Weekly average cattle carcass weights**

Counts: 2019, 2020, 2014-18 avg


**Daily pork processing capacity utilization and pork production**

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

Source: EIA Monthly Biodiesel Production Report (biodiesel only)
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 CO₂ equivalent greenhouse gas emissions annually. With advancements in feedstock, use will reach **15 billion gallons by 2050**.