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Inflation Reduction Act

Impact on Renewable Fuels Markets

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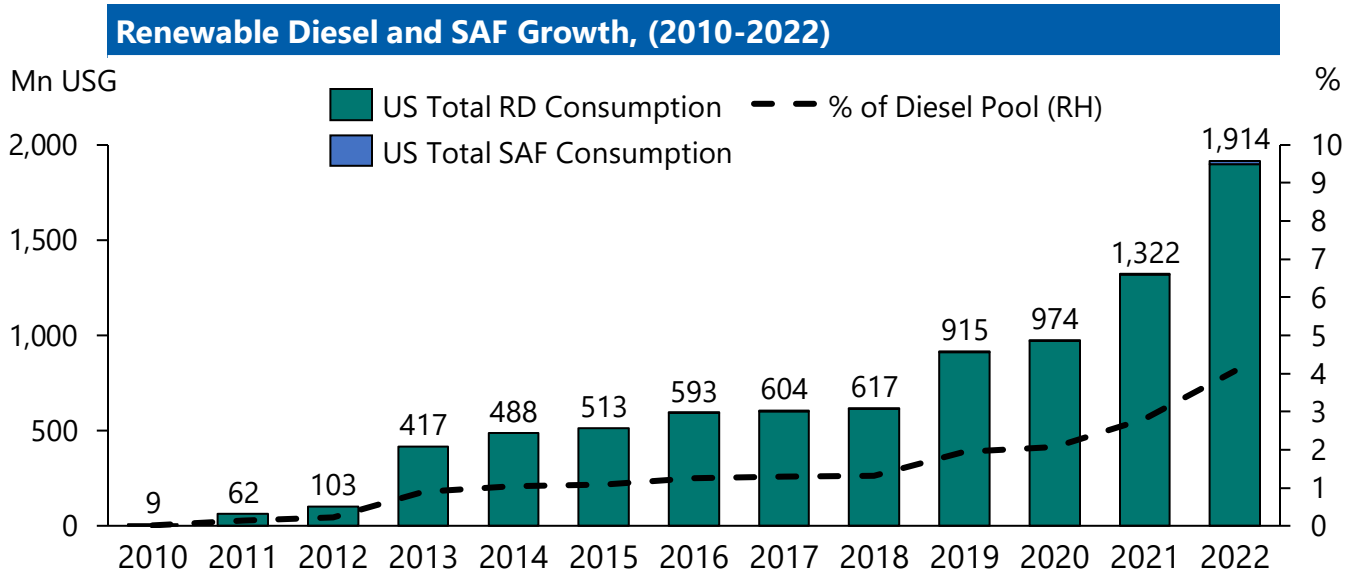
Holistic View of Legislative Framework

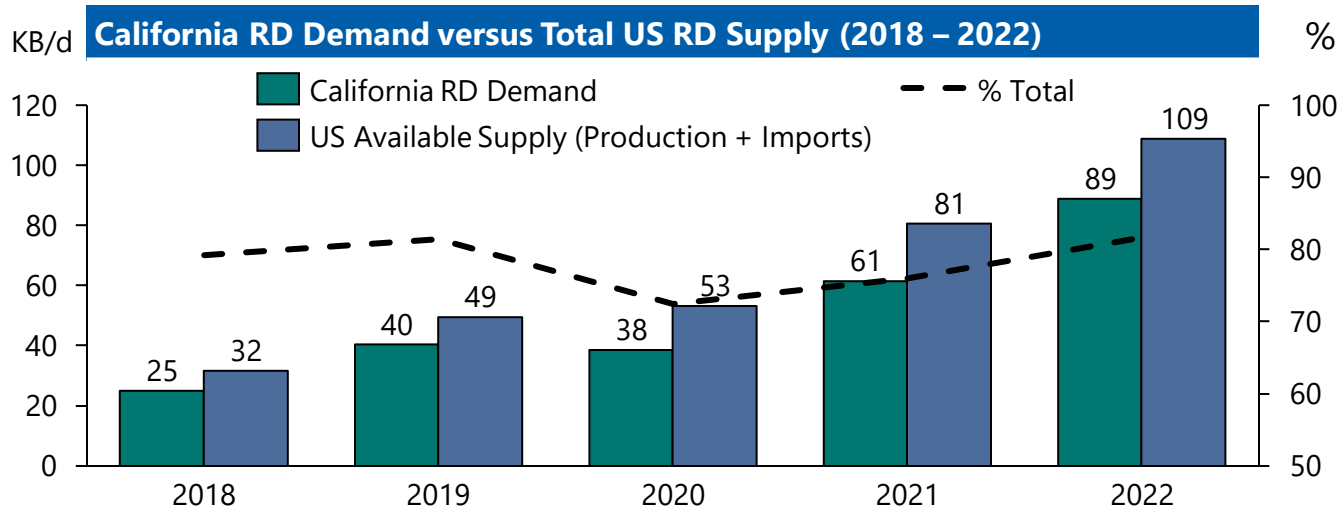
- Federal and state level mandates and incentives have driven tremendous growth in renewable fuel volumes in the United States.
- In 2022, 13% of total US energy consumption and 6% of US transportation fuel was from renewable energy sources (EIA).
- Federal
  - RFS (Renewable Fuel Standard)
  - Blending and production tax credits
  - Investment tax credits
  - Import tariffs
  - Loans and loan guarantees
  - Research grants for new technologies
- State
  - LCFS (Low Carbon Fuel Standard)
  - Cap-and-Trade

- **Key point:** The national RFS creates an increasing volumetric demand for specific renewable fuel types through mandates and local LCFS programs create additional incentives for the lowest-CI fuels, the largest market in California. Production tax credits have the ability to add to producer margins.

RD/SAF Historical Growth as a Result of Policy

- Federal and state level mandates and incentives have driven tremendous growth in renewable fuel volumes.
- Renewable diesel and biodiesel volumes have grown to account for 8% of the US and 45% of the California diesel pool.
- In states with LCFS programs, consumption of clean fuels has grown substantially faster than the national average.
- RD consumption in California has contributed to 72-82% of total available US RD in the past 5 years.
- Due to the extra financial incentive, the large majority of RD is expected to be consumed in states with current or emerging LCFS programs.
- RD penetration is also expected much faster in new LCFS markets given the maturity of the technology and projected new supply.





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Potential tax credits related to renewable fuel production

- **45Q - Credit for Carbon Oxide Sequestration:**
  - Program expansion and 7-year extension.
  - Increases credits for permanently stored and used CO2 for enhanced oil recovery or other industrial uses.
    - Conventional projects: $85/t for permanently stored and $60/t for used CO2.
    - Direct air capture (DAC) projects: $180/t for permanently stored and $140/t for used CO2.
  - Changes to capacity requirements.
- **45V – Credit for Production of Clean Hydrogen:**
  - Creates a production tax credit (PTC) or investment tax credit (ITC). Taxpayers have option to elect.
  - To qualify, hydrogen must have lifetime GHG emissions of no more that 4 kg CO2 per kg of hydrogen.
  - PTC – Up to $3/kg of clean hydrogen produced. (Base credit of 60 cents/kg multiplied by an emissions factor and multiplier.)
  - ITC – Up to 30 percent investment tax credit.
  - Facility must not already qualify for 45Q.
- **45Z – Clean Fuel Production Credit:**
  - Extension of $1/gal biodiesel and $0.5/gal alternative fuel tax credits to 2024 with additional incentives for SAF.
  - SAF credit is now $1.25-1.75/gal based on lifecycle GHG emissions.
  - Transition to Clean Fuel Production Credit starting 2025 through 2027.
  - New credit based on life-cycle GHG emission levels and requires a minimum of roughly 50% reduction versus conventional fuel.
  - Facility must not already qualify for either 45Q or 45V.

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Biodiesel Tax Credit (BTC) vs Clean Fuels Production Credit (CFPC)

Biodiesel Tax Credit

- **Timeframe:** Expires in 2024
- **Eligibility:** Producers and blenders
- **Credit Amount:** $1.00/g for qualified fuel biodiesel and renewable diesel.
- Additional credit for SAF with >50% GHG reduction
  - Base credit of $1.25/gal
  - $0.01/gal for each 1% reduction below 50%

Clean Fuels Production Credit

- **Timeframe:** Current legislation for 2025-27.
- **Eligibility:** Producers credit, (importers excluded)
- Must meet employment criteria for full credit. (Includes wage/apprenticeship requirements)
- **Credit Amount:** $\text{CFPC} = \frac{50-\text{ER}}{50} x\ Base\ Rate$
- *Base Rate:* Either $1.00/gal for most fuels or $1.75/gal for SAF.
- *ER:* The emissions rate (in kgCO2e/mn BTU), rounded to nearest multiple of 5 kgCO2e/mn BTU.
- Credit adjusts based on lifecycle GHG emissions.
- Theoretically, fuel pathways with negative emissions rates would receive a credit higher than the base rate.
- It is not possible to determine exactly how this credit will be applied until the IRS publishes the rules and regulations.

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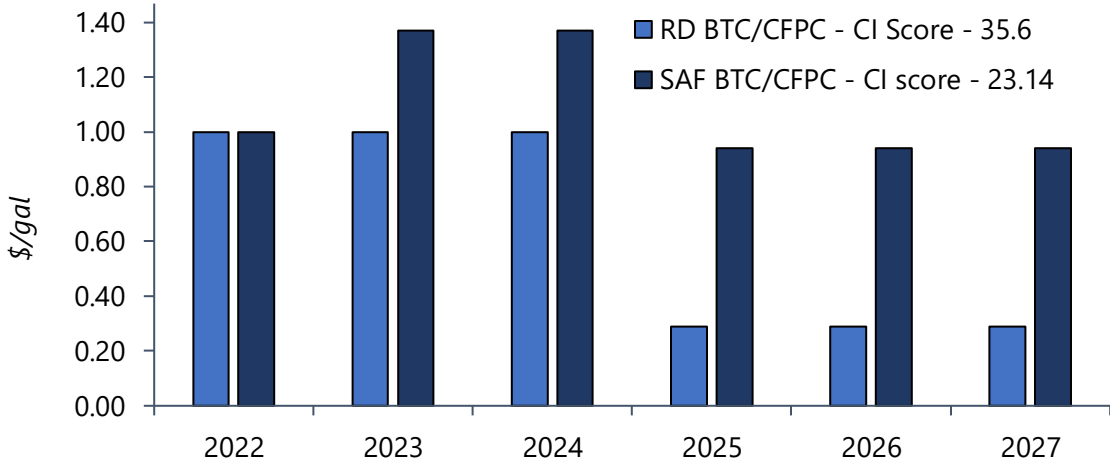
BTC vs CFPC economics and potential impacts to renewable fuel credits

- The tax credit for RD is expected to be radically lower under the CFPC for most fuels, especially for marginal crop-based feedstocks.
- Larger base SAF credits are attractive for low-CI feedstocks to bridge additional cost.
- **RIN price considerations:**
  - **D4 RINs:** Marginal RD/SAF may not qualify for the CFPC
    - RD produced from feedstocks like soybean oil may not qualify for the CFPC due to minimum lifecycle GHG emission reduction requirements.
  - **D3 RINs:** Cellulosic fuels to receive greater benefit from the CFPC
    - Fuels derived from cellulosic feedstocks are expected to continue to grow and account for a larger share of D3 RIN generation as technology and commercial scale develop in the long term.
    - Cellulosic fuels from waste-based feedstocks are expected to have extremely low CI and may qualify for the maximum potential CFPC, possibly even surpassing the base rate.

IRA 45Z Credit for representative RD and SAF, (2022-2027)



D4 RINs price, impact of active BTC