

Stillwater Associates Insights

Analysis of Feedstock Policy on U.S. Renewable Fuels Production

Executive Summary

- Imported feedstocks are critical to maximize the utilization of U.S. renewable fuels manufacturing facilities, with domestic fuel production capacity in 2025 exceeding 2024's domestic feedstock supply by 87%. Increasingly stringent low carbon fuel (LCF) programs in California, Oregon, and Washington require imported feedstocks such as used cooking oil (UCO) and tallow which have lower carbon intensity scores relative to soy or canola-based feedstocks.
- Recent policies that restrict foreign feedstocks – the U.S. Environmental Protection Agency (EPA) Renewable Fuel Standard (RFS) Set II proposal and the 45Z Clean Fuel Production Tax Credit (CFPC) – increase the risk of:
 - Reduced utilization or idling of domestic renewable fuels manufacturing facilities, while giving a cost advantage to foreign producers.
 - An RFS RIN bank deficit.
 - Increased transportation fuel prices for U.S. consumers. Proposed RFS changes coupled with import limits under the CFPC are expected to increase RIN prices by 100%, predominantly due to feedstock restrictions.
 - Constrained sustainable aviation fuel (SAF) production as available feedstock supplies are diverted to RD, potentially ceding U.S. leadership in SAF to international producers.
- To ensure sufficient volumes are available to maximize U.S. renewable fuel production capacity, feedstock sources should not be limited.
 - If this policy is not feasible, the risks noted above can be mitigated while maintaining EPA's proposed RFS RVO and preserving opportunities and advantage for the domestic soybean industry by allowing:
 - 100% RFS RIN generation for renewable diesel (RD) produced by U.S. manufacturing facilities using feedstocks sourced from preferred U.S. trade partners, including U.S.-Mexico-Canada Agreement (USMCA) and free-trade agreement (FTA) partners. This approach aligns with the restrictions included in the CFPC.
 - 100% RIN generation for U.S production of SAF from all feedstock sources. This approach would establish U.S. leadership in the global SAF market, stimulate the growth of the U.S SAF market, and support higher utilization of domestic manufacturing capability.

Background

1. EPA's June 13, 2025 Set II rule proposes cutting RIN generation by 50% for imported biofuels and feedstocks,^[1] while biofuels produced from imported feedstocks also lose eligibility for the CFPC.
2. With imports comprising one-third of U.S. biomass-based diesel (BBD) feedstock supply, these policy changes significantly worsen import economics and create substantial market impacts requiring analysis of potential adjustments.
3. When developing the Set II rule, EPA relied on data available in late 2024, including the U.S. Energy Information Administration's (EIA's) Annual Energy Outlook (AEO) 2023 and other EIA and U.S. Department of Agriculture (USDA) data, which represented the most recent information available at the time of their analysis.^[2] In contrast, Stillwater's analysis incorporates more current data, including the EIA's 2025 AEO and updated USDA information.

Imported Feedstocks are Necessary for RFS Compliance and Fully Utilizing Domestic Manufacturing Capacity

Figure 1: U.S. BBD Feedstock Supply and Facility Capacity Sources: *EIA, USDA, Foreign Agricultural Service – GATS, USDA ERS*

Key import sources are:

1. **Canola oil** – Canada supplies ~80% of total U.S. consumption of canola oil (biofuels and food).
2. **Used cooking oil (UCO)** Historical U.S. biofuel demand is ~70% import-dependent with key supply coming from North America and Asia.
Note: Future U.S. policy enabling imports from only preferred U.S. trading partners (USMCA and FTA) would directionally support utilization of domestic production capacity while reducing imports from non-preferred trading partners.
3. **Tallow** – Imports make up around one-third of the total U.S. biofuel feedstock supply, with key importers being North America, South America and Australia

Overall BBD feedstock imports now contribute ~1.5 billion gallons per year (bgy) (~11 billion pounds [lbs]), or around a third of total U.S. supply. Despite the recent growth in feedstock supply the U.S. still has nearly 1.6 bgy in surplus biodiesel (BD) and RD capacity; therefore, in the short- to medium term, imports will play a key role in supporting the continued growth of the U.S. BBD sector. Further adding to the demand for feedstock imports is the increasing

stringency in low carbon fuel (LCF) programs in California, Oregon, and Washington, since UCO and tallow have lower carbon intensity scores relative to either soy or canola-based feedstocks. EPA concurs with this assessment and, in the Draft Regulatory Impact Assessment (DRIA), projects BBD feedstock imports forming >45% of total BBD supply in line with the proposed 2026/2027 RFS RVOs.^[3]

Finally, under the CFPC and the RFS Set II proposal, limited feedstock availability will constrain SAF production as available supplies are diverted to RD, potentially ceding U.S. leadership in SAF to international producers. Ensuring adequate imports of low carbon intensity feedstocks such as UCO is essential to unlock domestic SAF production capacity and maintain the U.S. as a competitive leader in the growing SAF market.

Imported Feedstocks will Determine the Price of RFS RINs

As Table 1 demonstrates:

1. RFS and CFPC changes are expected to double RIN prices, predominantly due to feedstock restrictions.
2. Replacing imports with domestic feed would require an additional 30 million acres of soybeans. Replacing imports with domestic soybean oil feed would require an increase in U.S. soybean crush capacity by about 1,500 million bushels per year — compared with the 2,335 million bushels crushed in 2024 — and announced plans for 445 million bushels of new capacity by 2030.
3. The soybean oil supply for 2026 was set by planting prior to the proposed rule.
4. Most of the RIN price increases will pass to consumers, about 10 cents per gallon (cts/gallon) of gasoline.

Table 1. RFS Set II and CFPC Impact on Key Importing Countries Sources: *USDA Foreign Agricultural Service – GATS, Stillwater Analysis*

Alternative Scenario to Mitigate RIN Price Impacts

1. USMCA feedstocks to qualify for 100% RIN generation on renewable diesel, and
2. FTA country feedstocks to qualify for 100% RIN generation on renewable diesel, and
3. All foreign waste feedstocks to qualify for SAF 100% RIN generation

Table 2: 2024 U.S. BBD Feedstock Imports from USMCA and FTA Countries Sources: *USDA Foreign Agricultural Service – GATS*

As Table 2 demonstrates, Elements 1 and 2 of the Alternative Scenario would ensure that >50% (on a 2024 basis) of U.S. BBD feedstocks would qualify for 100% RIN generation, significantly reducing the penalty and cost. Element 1 would also align the treatment of RFS imports to the CFPC. This proposal would:

1. Mitigate the supply shock risk and price volatility risk of immediately moving all imported feedstocks to 50% RIN generation, by limiting the loss of CFPC and RIN value to <50% of U.S. feedstock imports.
2. Support the continued growth of the BBD sector, while more closely linking U.S. BBD feedstock supply to its most preferred trading partners.
3. Reduce U.S. dependence on feedstocks from non-preferred trading partners, such as UCO from China.
4. Enable a transition to grow domestic sources of supply, such as soybean, and novel crops (e.g. intermediate/cover crops) with additional benefits for U.S. agriculture.

Element 3 of the proposal would make SAF the preferred compliance option (vs RD and BD) once the USMCA and FTA feedstock supply sources have been fully utilized. This would stimulate the development of a U.S. SAF market that has otherwise stalled following the loss of the additional CFPC premium.

Impacts on the RIN Bank: Scenario Comparison

The potential impact of the RFS Set II rule on the RIN Bank under several scenarios is shown in Figure 2.

Figure 2: U.S. RFS RIN Bank ProjectionSources: *EPA DRIA June 13, 2025, Stillwater Analysis*

Stillwater modeled the following scenarios:

1. **EPA Projection:** The implied EPA RIN Bank projection shows a fall from ~1 billion RINs to ~0.5 billion RINs, suggesting RFS feasibility despite supply tightening. However, this analysis has critical flaws:
 - The EPA assumes unchanged 2026/2027 BBD feedstocks imports from 2024 levels, which is unlikely given the economic impact due to the CFPC loss, reduced RIN value, and probable higher tariffs on a proportion of feedstock imports.
 - EPA's assumption that feedstock imports will remain unchanged contradicts the policy's intended goal of altering RIN generation for imported feedstocks.

- EPA projects 30-45% increases in U.S. soybean oil use for biofuels (2.2 and 2.44 billion gallons in 2026/2027), exceeding USDA World Agricultural Supply and Demand Estimates' (WASDE)^[4] 10 billion gallon projection for crop year 2025/2026. Since 2026 soybean oil supply is determined by spring 2025 plantings (before the proposed Set II rule was published), increased biofuel use requires diversion from exports/food causing price impacts, and contradicting the policy's import reduction objective. This incremental demand, 17.7 billion lbs exceeds all domestic non-biofuel uses for soybean oil, predominantly food (14.0 billion lbs) and represents approximately 9% of global trade in all vegetable oils in a very tightly supplied market. The largest potential source for importing vegetable oils is palm oil from Indonesia and Malaysia, both of which are currently subject to high tariffs.
- The EPA projection also appears ambitious on its assessment on the growth of DCO and U.S. canola oil for BBD feedstock.

2. Stillwater Base Case: Stillwater's assessment of the impact of EPA's proposed changes, incorporating recent USDA WASDE data and trade measure impacts, shows the RIN Bank falling sharply into negative territory in 2026 (-1.2 billion RINs) before recovering slightly in 2027 due to U.S. domestic feedstock growth, primarily soybean oil. This suggests RFS infeasibility and/or high levels of price volatility as obligated parties compete for limited supplies.

3. Alternative Scenario: This scenario (based off the Stillwater Base Case) ameliorates the potential RIN Bank deficit, reducing it to -0.2 billion RINs in 2026, and +0.2 billion RINs in 2027. The measure, allowing 100% RFS RIN generation produced by U.S. facilities using feedstocks sourced from preferred USMCA and FTA trade partners aligns with the restrictions included in the CFPC. The Alternative Scenario offers a number of other important benefits in terms of reducing the supply shock risk, more closely linking the U.S. BBD supply to its closest trading partners, and supporting U.S. leadership in SAF production by ensuring adequate imports of low carbon intensity feedstocks.

4. Phillips 66 Rodeo Closure: This scenario considers the implications of idling the Phillips 66 Rodeo Renewable Energy Complex (RREC) due to several recent federal policy actions that create significant economic challenges for the facility. The closure

case (based off the Stillwater Base Case) shows an additional sharp drop to the RIN Bank in 2026 (- 2.0 billion gallons). Despite ~1.2 billion gallons of unutilized U.S. BBD capacity (assuming max 90% utilization), recovery to - 0.9 billion RINs by 2027 assumes successful diversion of U.S. feedstock, Canadian canola oil, European Union (EU), United Kingdom (UK), and other non-FTA tallow to other U.S. facilities. The proportion of Rodeo's feedstock slate at risk of being lost to the U.S. market is the Asian UCO and tallow imports due to the limited spare capacity on the U.S. West Coast (USWC). However, risks of RFS infeasibility and price volatility remain.

Cost and Compliance Risk and Unintended Consequences

The proposed RFS and CFPC changes could significantly disadvantage BBD feedstock imports:

1. Imports are essential for BBD supply growth and diversification.
2. Abrupt changes in supply risks high price volatility due to supply shocks.
3. Proposed regulations will advantage foreign producers over domestic producers using imported feedstocks.
4. The Alternative Scenario mitigates these risks with a focus on imports from preferred U.S. trade partners.

Additional Analysis Detail

Impact Assessment on proposed RFS Set II revisions and the CFPC on the key BBD feedstocks imports: Key Assumptions

1. Imports of BBD feedstocks remain the marginal source of U.S. feedstock supply for the D4/D5 RVO RIN category. The potential for a domestic feedstock supply response is considered later.
2. The marginal BBD producer is a coast-located (e.g., U.S. Gulf Coast) BD producer using imported feedstocks, operating at or close to variable cost margins.
3. Therefore, the marginal BD (and RD) price must increase to offset the loss of value incurred due to the CFPC, and RFS revisions, and potentially the tariff changes as well (included as additional case).
4. In turn, therefore the D4/D5 RIN price must increase commensurate with the increase in spread between BD and ULSD.

5. The impacts are valued on a 2026 basis, using the following assumptions for the key economic parameters:

- D4 RIN price: **\$0.90 / RIN**, based on 2025 YTD prior to the June 13th Set II proposal announcement.
- Full value 45Z CFPC: **10 \$/gal in 2026\$** vs 2022\$ adjusting for U.S. Bureau of Economic Analysis GDP implicit price deflator.
- UCO and Tallow 45Z CI: **19 gCO₂e / MJ**.
- Canola Oil Price: **50 cts/lb** 2025 YTD Midwest Price
- UCO Price: **4 cts/lb** 2025 YTD Illinois
- Tallow Price: **3 cts/lb** Chicago Packer

Current Soybean Cultivation and Crush Capacity is not Sufficient to Meet U.S. BBD Production Needs

The increase of D4/D5 RIN prices by ~90 cts/RIN or more would clearly stimulate a U.S. domestic feedstock supply response over time. This is highly likely to be additional soybean cultivation (e.g. by displacing corn acres) given its position as the U.S.'s marginal BBD feedstock supply option and its now favorable CI treatment under the 45Z CFTC.

However, based on current yields and oil content, U.S. soybean cultivation would need to expand by ~30 million acres (35% of current cultivation) to completely displace the EPA projected BBD imports in 2026/2027, assuming no diversion from food and other applications. As Figure A1 demonstrates, historically the growth of U.S. soybean sector in the last 20+ years has delivered approximately half of this amount. In addition, the crop available for 2026 production will be harvested in Fall 2025 and so is already pre-determined. It will be the Spring 2026 planting that will be the first opportunity of the U.S. soybean sector to respond to new demand signals and that crop will only start to become available to BBD producers in late 2026.

The 1.5 billion bushels of soybean required to supply the additional soybean oil implies a very significant ~50% increase in the U.S.'s soybean crush capacity, which today only crushes 55% U.S.'s crop with limited spare capacity. While announced expansions and new builds could deliver a 20-25% increase in capacity, that is likely to be in the 2027-2030 timeframe and is still insufficient to completely displace imports. There is also the challenge of the U.S. placing significantly more soybean meal on the market, which will likely depress crush margins. Moreover, specifically in the case of the California LCFS where ~90% of the U.S. RD is currently blended, soybean as well as other food-based crops are capped at 20%.^[5]

While not discounting the ability of the U.S. soybean sector to respond to the increased price signals it is likely to take a number of years for additional soybean cultivation to materially displace the current levels of BBD feedstock imports and hence mitigate the RIN price impact.

Figure A1: U.S. Incremental Soybean Cultivation and Soybean Oil Production vs 2000
Sources: *USDA ERS Oil Crops Yearbook*

Policy Proposal Impacts on the RIN Bank: Scenarios and Associated Assumptions

The scenarios and associated assumptions modelled are as follows:

1. **EPA projection** – the implied RIN Bank projection based on the EPA’s projected 2026/27 BBD supply volumes in the June Draft Regulatory Impact Analysis (DRIA).^[6]
2. **Stillwater Base Case** – Stillwater’s projection on 2025/2027 BBD supply volumes based on the latest available data. By feedstock this includes:
 - Soybean Oil – USDA’s July 2025 WASDE report for soybean oil 25/26 production for biofuels incorporating the CFPC changes and assuming the EPA RFS changes are implemented as proposed, with 2027 production estimated assuming an additional 2.5 million acres of soybean cultivation (consistent with the maximum 5 year rolling average increase since 2020) and the diversion of total soybean oil exports to biofuel production.
 - S. UCO – Stillwater estimate for year over year (YOY) growth (~4.5%) assuming increases in overall supply combined with increases in collection rates and diversion from other uses.
 - S. DCO – ~7% YOY growth based on recent demand growth for biofuel demand.
 - Imported Canola – 10% estimate for YOY growth based on 10 year import average YOY growth.
 - Imported fats, oils, and greases (FOG) – ~60% reduction due to the assumed loss of Chinese UCO and Brazilian tallow imports, that are not made good (due to size) from other import sources.
3. **Alternative Scenario** – modelling of the Alternative Scenario to the RFS Set II rule changes, based off the Stillwater Base Case.
 - USMCA / FTA canola oil and FOG imports were projected based off 2024 share of imports (after correcting for Chinese and Brazilian

removals) and allowing for YOY growth.

- The impact of the SAF proposal was modelled assuming a SAF demand from foreign feedstock of ~380 million gallons based on production announcements from Phillips 66 Rodeo and Diamond Green.

4. Rodeo Closure – Stillwater modelled the impact of the potential closure of Phillips 66's 800-million-gallon Rodeo hydroprocessed esters and fatty acids (HEFA) facility (assumed to occur in the first half of 2026) assuming the impact of the RFS Set II rule changes makes processing of imported feedstocks uneconomic.

A Note About DCO and Canola Oil

1. As nearly all DCO is already utilized as BBD feedstock – due to its non-food grade quality –there is very limited ability to divert DCO from other uses. DCO supply can only grow in proportion to ethanol production (which is unlikely to increase as the ethanol RVO is flat) or slow growth due to increasing extraction efficiency.
2. As is the case with soy, U.S. and Canadian canola oil availability for 2026 is already set by crops planted prior to publication of the proposed rule.

[1] *Biofuel feedstocks from Canada and Mexico do qualify for the 45Z CFPC tax credit.*

[2] U.S. EPA Renewable Fuel Standard (RFS) Program: Standards for 2026 and 2027 Proposed Rule. June 17, 2025. <https://www.govinfo.gov/content/pkg/FR-2025-06-17/pdf/2025-11128.pdf>

[3] *U.S. EPA Draft Regulatory Impact Assessment 13th June 2025, Table 3.2-6*

[4] *USDA WASDE Report, July 11 2025 <https://www.usda.gov/about-usda/general-information/staff-offices/office-chief-economist/commodity-markets/wasde-report>*

[5] *CARB, Low Carbon Fuels Standard, Final Regulation Order, §95482 Fuels Subject to Regulation (i), 1st July 2025 https://ww2.arb.ca.gov/sites/default/files/2025-07/atta1_finalcomparison_070125.pdf*

[6] *EPA DRIA June 13th 2025, Table 3.2-6*