United States Government Accountability Office

Report to Congressional Requesters

RENEWABLE FUEL STANDARD

Actions Needed to Improve Decision-Making in the Small Refinery Exemption Program

Accessible Version

November 2022

GAO-23-105801

GAO Highlights

Highlights of GAO-23-105801, a report to congressional requesters

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RENEWABLE FUEL STANDARD

Actions Needed to Improve Decision-Making in the Small Refinery Exemption Program

Why GAO Did This Study

The RFS requires that gasoline and diesel fuels be blended with a minimum volume of renewable fuel. Small refineries can petition EPA annually for an exemption from their RFS obligations based on disproportionate economic hardship. EPA must evaluate small refinery exemption petitions in consultation with DOE.

GAO was asked to review issues related to EPA's and DOE's implementation of the small refinery exemption program. This report examines (1) information, policies, and procedures EPA and DOE use to make decisions about exemptions; and (2) the extent to which exemption decisions are timely. GAO analyzed data and documents related to exemptions from 2013 through 2021 and interviewed agency officials and industry stakeholders.

What GAO Recommends

GAO is making seven recommendations, including that EPA reassess its conclusion that all small refineries recover their RFS compliance costs in the price of the gasoline and diesel they sell, DOE and EPA develop documented policies and procedures for making small refinery exemption decisions, and EPA develop procedures to ensure that it meets deadlines.

DOE agreed with GAO's recommendations. EPA disagreed with one recommendation and partially agreed with the others. GAO maintains that the recommendations are valid, as discussed in the report.

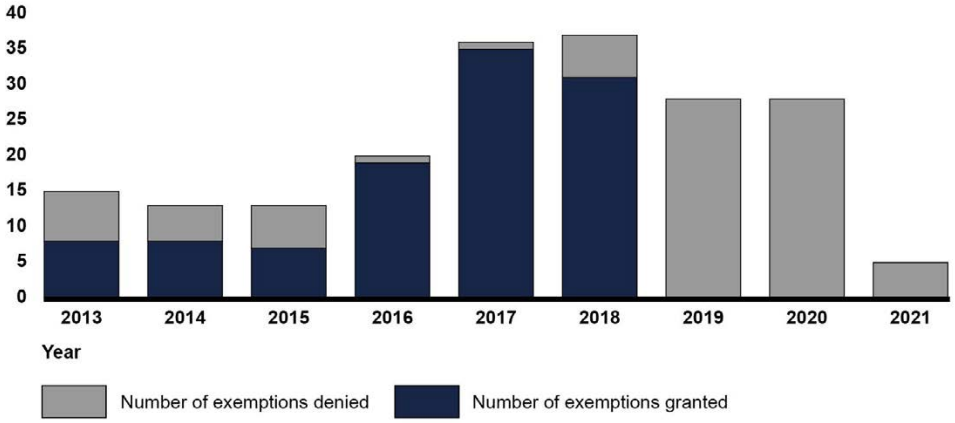
View GAO-23-105801. For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

What GAO Found

The U.S. Environmental Protection Agency (EPA) does not have assurance that its decisions about small refinery exemptions under the Renewable Fuel Standard (RFS) are based on valid information. In addition, EPA and the Department of Energy (DOE) do not have policies and procedures specifying how they are to consult about and make exemption decisions.

- **Information.** Small refinery exemption decisions for compliance years 2019 through 2021 were based on an EPA conclusion that small refineries do not experience disproportionate economic hardship from the RFS. This conclusion relies on a potentially flawed assumption—that all parties pay and receive one price for the tradeable credits used to demonstrate compliance with the RFS. GAO found that EPA has not analyzed whether this assumption is valid. GAO's analysis showed that small refineries have paid more on average for compliance credits than large refineries. Without reassessing its conclusion, EPA does not have assurance that its small refinery exemption decisions are based on valid information.
- **Policies and procedures.** EPA has generally documented its decisions. However, EPA has no policies or procedures for how it assesses petitions and makes exemption decisions. Similarly, DOE does not have policies or procedures for how it provides consultation to EPA. Administration of the program has been inconsistent, and the number of exemptions granted and denied has varied from year to year (see fig.). Consequently, agency decisions appear ad hoc, resulting in market uncertainty. This can harm small refineries and renewable fuel producers by undermining their ability to plan for infrastructure upgrades and renewable fuel demand.

Number of Small Refinery Exemptions Granted and Denied, 2013-2021



Source: GAO analysis of U.S. Environmental Protection Agency data. | GAO-23-105801

Accessible Data for Number of Small Refinery Exemptions Granted and Denied, 2013-2021

Compliance Year	Number of Exemptions Granted	Number of Exemptions Denied	Number of Petitions Declared Ineligible	Number of Petitions Withdrawn
2013	8	7	0	1
2014	8	5	0	0

Compliance Year	Number of Exemptions Granted	Number of Exemptions Denied	Number of Petitions Declared Ineligible	Number of Petitions Withdrawn
2015	7	6	1	0
2016	19	1	0	0
2017	35	1	0	1
2018	31	6	2	3

EPA has routinely missed the 90-day statutory deadline for issuing exemption decisions and does not have procedures to ensure that it meets these deadlines. In 5 of the 9 years GAO analyzed, EPA took more than 200 days to issue a decision for more than half of the petitions submitted. These late decisions diminish the benefit of exemptions, create market uncertainty, discourage investment, and undermine the design of the RFS more broadly.

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Abbreviations

DOE	U.S. Department of Energy
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency

RFS	Renewable Fuel Standard
RIN	Renewable Identification Number
the statute	the Clean Air Act

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Congressional Requesters

The Renewable Fuel Standard (RFS) is a mandate that generally requires gasoline and diesel fuels be blended with a minimum volume of renewable fuels—fuels produced from renewable sources, such as agriculture. Under the Clean Air Act (the statute), the U.S. Environmental Protection Agency (EPA) implements the mandate and may grant exemptions from the RFS to small petroleum refineries on the basis of disproportionate economic hardship.[1] The statute requires that, in evaluating a small refinery exemption petition, EPA, in consultation with the Secretary of Energy, consider the findings of a Department of Energy (DOE) study, as well as other economic factors, and issue a decision within 90 days of receipt of the petition.

Small refinery exemptions may help alleviate the economic burden of compliance with the RFS for small refineries, but fluctuations in the number of exemptions granted each year have contributed to the program being controversial. For the 2013 through 2015 compliance years, EPA granted exemptions to no more than eight small refineries each year—about half of those that had applied. EPA subsequently granted exemptions to more small refineries: 19 for 2016, 35 for 2017, and 31 for 2018—nearly all of the small refineries that had applied in those years.[2]

Most recently, EPA denied all petitions for 2019, 2020, and 2021. These changes in the number of exemptions granted have been criticized by

[1]The statute defines a "small refinery" as a refinery for which the average aggregate daily crude oil throughput does not exceed 75,000 barrels for a calendar year. *See* 42 U.S.C. § 7545(o)(1)(K).

[2]These numbers do not include "gap-filling" petitions that were filed in 2020 for prior compliance years. In January 2020, the Tenth Circuit Court of Appeals held that EPA had exceeded its statutory authority and had impermissibly granted small refinery exemptions when refineries had not received an exemption for all prior years of the RFS program—in other words when there were gaps in a refinery's exemption history—although this holding was later reversed and vacated. Renewable Fuels Ass'n v. EPA, 948 F.3d 1206, 1253 - 54 (10th Cir. 2020) (rev'd sub nom. HollyFrontier Cheyenne Ref., LLC v. Renewable Fuels Ass'n, 141 S. Ct. 2172 (2021); vacated, No. 18-9533, 2021 WL 8269239 (10th Cir. July 27, 2021)). Later in 2020, several small refineries submitted petitions asking EPA either to reconsider exemption denials or grant exemptions for prior years in which the refineries had not sought them to fill their exemption gaps.

both small refineries and renewable fuel producers, who have pointed to difficulty in predicting how EPA would implement the program, in consultation with DOE, in a given year.

In addition, some renewable fuel producers have said that the large number of small refinery exemptions granted in some years may have undercut demand for renewable fuel and created market uncertainty. The 31 exemptions in 2018 represented more than 13 billion gallons of diesel and gasoline exempted from the RFS (or about 5 percent of total refining capacity), compared with 207 billion gallons of gasoline and diesel produced in the U.S. that year.[3]

You asked us to review several issues related to EPA's and DOE's implementation of the small refinery exemption program. This report examines (1) information, policies, and procedures that EPA and DOE use to make decisions about small refinery exemptions from the RFS; and (2) the extent to which decisions about the exemptions are timely.

To examine the information the agencies use to make decisions about small refinery exemptions, we compared the information EPA and DOE collect to information we identified about hardships faced by small refineries. We identified potential sources of hardships by examining small refinery exemption petitions and studies on how the RFS affects different types of refineries. We also interviewed 13 experts and representatives of 31 industry stakeholders, including representatives of 16 refineries, eight groups representing the renewable fuel or agriculture industries, two law firms that represent small refineries, and five fuel blenders.

We identified experts through a literature search and selected experts to interview based on criteria such as their academic qualifications and the relevance of their published work to our review. We identified refineries through U.S. Energy Information Administration (EIA) data and selected refineries to include a range of sizes, locations, and fuel blending

[3]In April 2022, EPA reconsidered and denied 36 2018 small refinery exemptions, 31 of which had previously been granted. 87 Fed. Reg. 24300 (Apr. 25, 2022) ("EPA April 2022 Denials"). EPA did not require that these 31 refineries retroactively comply with the RFS for compliance year 2018 in the manner that EPA had historically required. 87 Fed. Reg. 24294 (Apr. 25, 2022). In June 2022, EPA reconsidered and denied two 2016 exemptions and one 2017 exemption, 87 Fed. Reg. 34873 (June 8, 2022) ("EPA June 2022 Denials") but, similarly, did not require that these three refineries retroactively comply with the RFS for compliance years 2016 or 2017 in the manner that EPA had historically required. 87 Fed. Reg. 34872 (June 8, 2022).

capabilities. We identified other industry stakeholders by reviewing our prior work, reviewing legal cases related to small refinery exemptions, and asking interviewees for recommendations. We selected industry stakeholders to provide a range of perspectives. Views from our sample of interviewees cannot be generalized to those we did not select and interview.

We then compared the potential sources of hardship with the information collected by agencies and assessed the quality of agency and academic studies that the agencies used in their evaluation of small refinery exemption petitions. We compared the information collected by the agencies with internal control standards. We took steps to assess the assumptions underlying EPA's and DOE's evaluation of exemption petitions by examining data on trades for credits used to demonstrate compliance in the program. In particular, we examined the extent to which different-sized market participants paid or received different prices for compliance credits by reviewing data in EPA's Moderated Transaction System from 2013 through 2021—that is, from the first year in which refineries applied annually for small refinery exemptions through the most recent year for which EPA has made exemption decisions. To assess the reliability of the data, we interviewed officials who maintain the data, spoke with researchers who had recently used the data, and tested the data for missing or erroneous values. We found the data to be sufficiently reliable for our purposes.

To examine policies and procedures that EPA and DOE use to make decisions about small refinery exemptions, we examined documentation and information related to decisions from compliance years 2013 through 2021.[4] We reviewed policies and procedures related to the exemptions, discussed them with agency officials, and assessed the extent to which they met standards for internal control.

To examine the extent to which decisions about small refinery exemptions are timely, we reviewed information from EPA on when the agency received petitions and when it sent its decisions to small refineries. We discussed the timing of decisions with the selected experts and industry

[4]We did not examine so-called "gap-filling" petitions because they are not directly comparable to other petitions for two reasons: (1) EPA and DOE's consideration of these "gap-filling petitions" occurred years after their consideration of other petitions for the same compliance years and (2) EPA ultimately denied all of these petitions partially because these small refineries had already successfully complied with their RFS obligations many years prior.

stakeholders, as well as with agency officials. We compared the timing of EPA's decisions to the statutory requirement to make a decision within 90 days of receipt of an exemption petition. We also examined the timing relative to the compliance year, which is the same as a calendar year. A more detailed description of our scope and methodology is included in appendix I.

We conducted this performance audit from April 2020 to November 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The Fuel Industry

U.S. petroleum refineries operate within a broader fuel industry. Refineries produce many products, including blendstock—unfinished petroleum-based gasoline or diesel—which are transported from refineries to blenders at wholesale terminals. Fuel blenders then combine the blendstock with renewable fuel, such as ethanol made from cornstarch, and other additives to make final blended products.

Blenders combine different proportions of renewable fuel and blendstock, depending on market demand, regulatory requirements, and fuel specifications. For example, E10—a blend of up to 10 percent ethanol—is the most widely used blend, representing the overwhelming majority of gasoline sales in the U.S. A blend of up to 15 percent ethanol—E15—is approved for passenger vehicles sold after 2001, and E85—a blend of up to 85 percent ethanol—can be used by cars with special engines. Blenders sell and transport the blended fuel to retail fueling locations, where it is sold to the consumer.

The U.S. petroleum refining industry consists of firms of varying sizes that, in addition to operating refineries, may also have operations in related industry segments. While some refineries only refine petroleum and then sell refined products, others may also do some blending of their own, selling blended products from the refinery. Some refineries are part

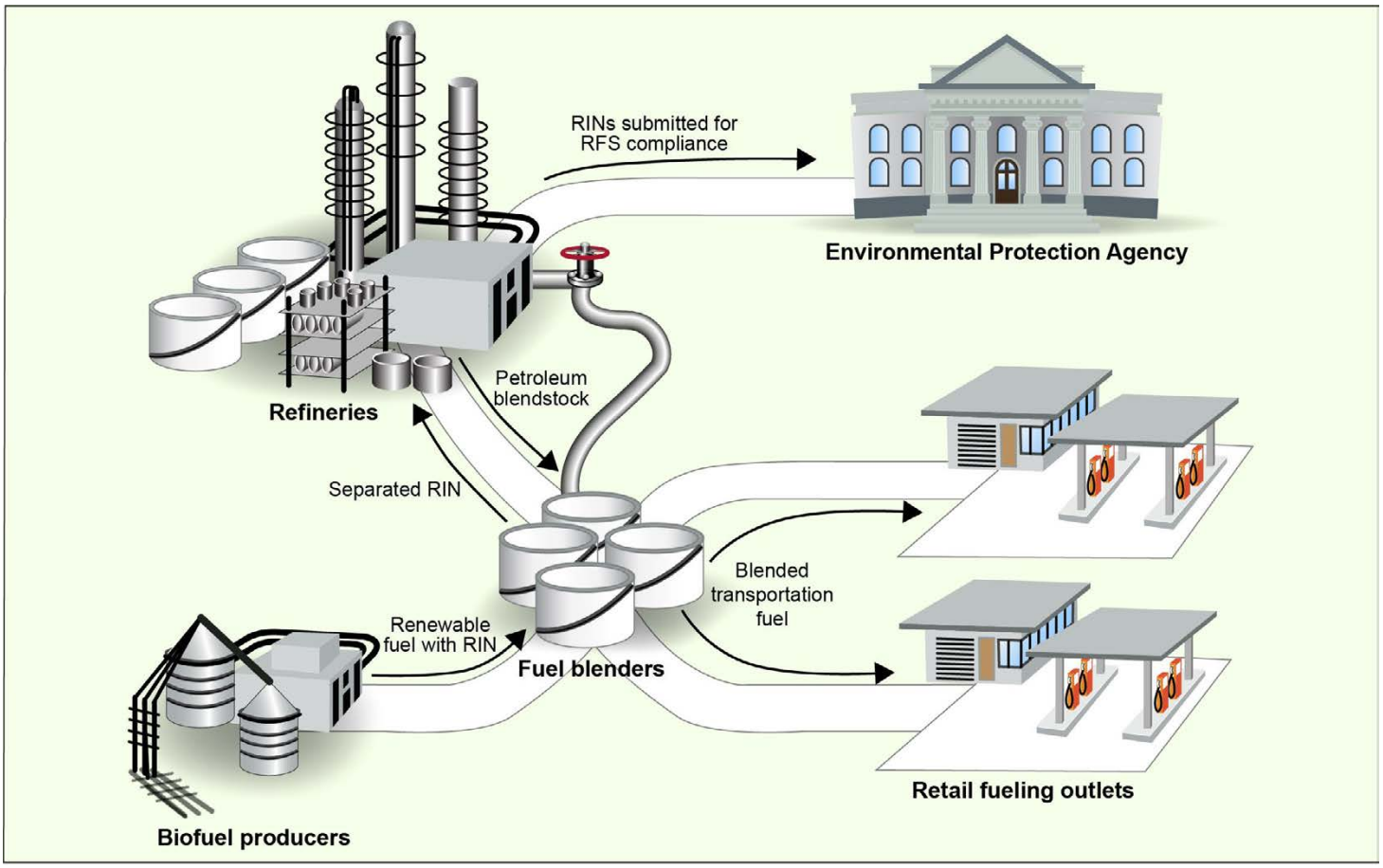
of companies that also produce crude oil and own biorefineries that produce renewable fuel.

The Renewable Fuel Standard and Renewable Identification Numbers

By statute, the RFS sets annual minimum volumes of renewable fuels to be included in transportation fuels sold in the U.S. As part of EPA's responsibilities, EPA translates these annual volume requirements by fuel type into annual percentage of volume standards, which refiners and importers must demonstrate have been blended into transportation fuels.

EPA determines compliance with the RFS using a credit system. Companies in the U.S. that produce or import transportation fuel must submit Renewable Identification Numbers (RIN) to EPA. In accordance with EPA regulations, a renewable fuel producer or importer assigns a unique RIN to a gallon of renewable fuel at the point of production or importation. When renewable fuel changes ownership (for example, when renewable fuel is sold by a producer to a blender), the RIN generally transfers with the fuel. When a gallon of renewable fuel is blended or supplied for retail sale, the RIN is separated from the fuel and may be used by refineries to comply with their annual volume requirement for blended renewable fuels. Figure 1 shows how fuel and RINs are transferred between parties. The number of RINs that a refinery must submit to EPA each year is proportional to the volume of gasoline and diesel fuel that the refinery produces or imports and depends on the annual requirement set by EPA.

Figure 1: Fuel and Renewable Identification Number (RIN) Transfers under the Renewable Fuel Standard (RFS)



Source: GAO. | GAO-23-105801

Through their refining operations, refineries may end up with either more or fewer RINs than they need for compliance, which has created a market for RINs. For example, as discussed above, some refineries do blending of their own, and some of these refineries blend more blendstock than they produce. They therefore may separate and have more RINs than are needed for compliance. Such a refinery can sell any surplus RINs in the RIN market.[5] A refinery that does not have enough RINs to meet its annual requirement can purchase RINs from those with surplus RINs.[6] Alternatively, EPA allows refineries to hold onto surplus RINs and use

[5]Other entities, such as blenders or renewable fuel producers unassociated with a refinery, may also have RINs, but they do not need to comply with the RFS.

[6]The EPA Moderated Transaction System is used to register RIN transactions.

them toward compliance for the following year. However, only 20 percent of RINs used for compliance for the current year can be prior-year RINs. If a prior-year RIN is not used in the current compliance year, it expires.

History of Small Refinery Exemptions

The statute establishing the RFS exempted all small refineries from compliance with the RFS from 2007 through 2010. The statute required that DOE conduct a study for the Administrator of EPA assessing whether the RFS would impose a disproportionate economic hardship on small refineries. DOE's resulting study, issued in 2011, determined that 13 small refineries should receive that exemption for 2011 and 2012.[7]

Starting with compliance year 2013, small refineries have had to petition EPA annually for an extension of the original exemption. The statute requires that, in evaluating a small refinery exemption petition, EPA, in consultation with the Secretary of Energy, consider the findings of the DOE study, as well as other economic factors. DOE has implemented its responsibility to provide consultation to EPA by scoring exemption petitions using the approach developed in its 2011 study and by more generally being available to discuss issues at EPA's request.

Challenges Facing Small Refineries

The number of small refineries has been in long-term decline. For example, according to a report by the Federal Trade Commission looking at 1947 through 2013, the number of small refineries fell steadily over that time, while the number of refineries that are larger generally increased or held steady. Because of market forces, technological changes, and regulatory changes, additional small refineries are expected to close even as some other refineries—larger, more technologically complex and efficient refineries—are likely to expand. According to the Federal Trade Commission, closure is more likely when a refinery is (1) small or (2)

[7]U.S. Department of Energy, *Small Refinery Exemption Study: An Investigation into Disproportionate Economic Hardship* (Washington, D.C.: March 2011). DOE had published an earlier study in 2009 that concluded that if the market was operating competitively, there was no reason why small refineries would suffer disproportionate economic hardship. DOE was required by Congress to conduct a second study because Congress stated that the first contained inadequate small refinery input, and the report did not (1) assess the economic condition of the small refining sector, (2) take into account regional factors, or (3) accurately project RFS compliance costs.

owned by a firm that owns multiple refineries; and multirefinery firms are more likely to close their smaller refineries.[8] In September 2021, the Federal Trade Commission released a statement that its Bureau of Competition was redoubling its commitment to police unfair methods of competition in wholesale and retail gasoline and diesel sales, suggesting ongoing concerns with competition in fuels markets.

According to DOE's 2011 study, small refineries may face challenges in complying with the RFS program. For instance, the study states that small refineries tend to have less integration with other segments of the industry, such as oil production or blending and retail distribution. Because of this, small refineries may have less access to capital needed to modify infrastructure in a way that would allow them to produce the renewable fuel needed to comply with the RFS. Overall, small refineries are less likely to have the infrastructure necessary to blend their own renewable fuel and are less likely to be associated with company-operated retail outlets, although small refineries are able to purchase RINs for compliance.

Small refineries also face general challenges when competing with larger refineries in local markets. Since a small refinery does not have the same economies of scale as a large refinery, the small refinery may not be able to realize efficiencies that would lower operating costs and, therefore, allow it to sell products at lower prices.

Despite this lack of economies of scale, a small refinery might be able to compete with larger refineries in a local market because of the small refinery's enhanced flexibility to respond to increases and decreases in demand in a local market where that is important. Additionally, small refineries are more likely to operate in isolated markets, where issues such as limited fuel transportation options (e.g., pipelines) might isolate them from competition with other refineries.

Insufficient Information, Policies, and Procedures Limit Agencies' Ability to Assess

[8]David W. Meyer and Christopher T. Taylor, *The Determinants of Plant Exit: The Evolution of the U.S. Refining Industry* (Federal Trade Commission Bureau of Economics Working Paper, November 2015).

Hardship and Make Small Refinery Exemption Decisions Consistently

EPA and DOE have not addressed information gaps and, therefore, do not have quality information to make small refinery exemption decisions. Moreover, neither EPA nor DOE has policies and procedures for administering the small refinery exemption program. Administration of the program has been inconsistent, and the decision-making approach has changed several times. Consequently, agency decisions appear ad hoc.

Unaddressed Information Gaps Prevent Full Assessment of Hardships Faced by Small Refineries

EPA and DOE do not have quality information needed to evaluate small refinery exemption petitions.[9] First, EPA relies on a potentially flawed conclusion about RIN markets because it has not fully assessed its underlying assumptions, and its assessment looks at only a few fuels markets. Second, DOE's approach to consultation on exemption petitions no longer provides information useful to EPA to make decisions on exemption petitions. Third, EPA has not identified what information small refineries would need to submit to EPA to prove that small refineries experience disproportionate economic hardship caused by RFS compliance.

EPA's conclusion relies on a potentially flawed assumption and an incomplete assessment. In April and June 2022, EPA denied pending exemption petitions, including all pending petitions for compliance years 2019 through 2021. In its denials, EPA stated that it had concluded that

[9]At the time of this report's publication, there is ongoing litigation involving challenges to the EPA April 2022 Denials, EPA June 2022 Denials, and related EPA actions. See, for example, Sinclair Wyo. Refining Co., LLC v. EPA, Case no. 22-1074 (D.C. Cir., filed May 4, 2022). In presenting the information in this report, we take no position on the disputed facts or disputed legal issues that are before the courts or may be raised in those or future related cases. In this report, we discuss the information gathered and used by EPA and DOE in evaluating small refinery exemption petitions. As explained in more detail in apps. I and II, we reviewed that information, as well as other information on hardships faced by small refineries, and conducted an economic analysis of such information. We then evaluated EPA's economic conclusion with respect to RIN pass-through. We analyze and discuss how EPA uses its conclusion, but we take as a given EPA's definition of the statutory term "disproportionate economic hardship" to deny small refinery exemption petitions in its April and June 2022 decisions and express no opinion on the legal or other interpretation of that term.

all small refineries recover the cost of RINs in the price of the gasoline and diesel they sell (RIN pass-through). EPA stated that RFS compliance costs are equal for all parties and, therefore, small refineries cannot demonstrate that they suffer disproportionate economic hardship caused by the cost of compliance with the RFS.[10]

EPA's conclusion that there is RIN pass-through relied on two assumptions that the agency has not fully assessed. First, EPA assumed that all parties pay and receive one price for RINs. If that is the case, then all refineries that rely on purchased RINs for compliance face the same basic compliance costs.

However, our review of EPA documentation indicates that the agency has not assessed this assumption. Further, our analysis of EPA data suggests the assumption is incorrect. We analyzed EPA's RIN market transaction data to test whether all parties pay and receive the same price for RINs. We found that companies that tended to trade lower quantities of RINs (likely smaller refineries) were either paying more to buy RINs or receiving less when they sell RINs, relative to larger companies from 2013 through 2021. Specifically, we found that for the transactions with the largest differences in size between buyers and sellers, the small party paid or received prices 2.4 percent higher or lower for RINs, on average.[11] (See app. II for additional information on our analysis of RIN market transactions.) This effect is statistically significant but it is unclear the extent to which this difference materially affects individual small refineries.

Second, EPA assumed that the studies it reviewed regarding RIN pass-through could be relied on to draw conclusions about additional markets that were not examined in those studies. EPA reviewed studies related to whether RIN prices are passed through to purchasers. These studies

[10]Congress's direction was expressly to DOE, but EPA incorporated this direction into its decision-making on small refinery exemptions.

[11]We used a measure of relative market size based on market participation during the previous 182 days—namely, the ratio of RINs traded by the buyer to RINs traded by the seller. This estimate is based on the 10 percent of transactions with the largest differences between buyer and seller size in which the buyer is larger, and the 10 percent of transactions with the largest differences between buyer and seller size in which the seller is larger. This estimate is based on transactions by all types of companies. When we looked only at transactions between refineries, we found that the smaller party paid or received prices 2.9 percent higher or lower for RINs on average, as described in app. II. This estimate is for the ethanol (D6) RIN. We found a 0.8 percent difference for the biomass-based diesel (D4) RIN.

have generally found that full pass-through of posted RIN prices is occurring in several large fuel markets.

However, there are important limitations to how the findings of these studies can be applied to the assessment of whether there is full pass-through for all refineries. This is because the studies did not examine RIN cost data for specific trades. Rather, they examined data intended to characterize daily RIN prices for the market as a whole and whether these posted prices are reflected in wholesale petroleum fuels market prices. As discussed above, refineries do not always pay the same price for RINs, so these findings may not reflect the experience of all refineries. In addition, these studies have not assessed whether there is pass-through in all relevant markets.

Major studies on RIN pass-through and some limitations of those studies include the following:

- In 2015, EPA conducted a RIN market analysis of the effect of high posted RIN prices on refineries in 2013.[12] The study found that RIN pass-through of posted prices was generally occurring. However, the study only examined three fuel markets—New York Harbor; the U.S. Gulf Coast; and Des Moines, Iowa.
- In 2017, EPA denied several petitions to change the point of obligation for the RFS, including to make blenders the entities that had to comply with the RFS, rather than refineries. As part of this decision, EPA updated some of the analysis from its 2015 study with data through mid-2016, which was limited to the same three fuel markets. EPA also reviewed information and studies submitted by refineries and blenders but did not systematically analyze these fuel markets. EPA again concluded that RIN pass-through was generally occurring.
- As part of its April and June 2022 decisions, EPA found that local fuel prices submitted by some small refineries were equal to the prices in large markets plus the cost of transportation to get the fuel to that market. This could support the idea that pass-through was occurring

[12]U.S. Environmental Protection Agency, Office of Transportation and Air Quality, *A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects* (May 14, 2015). Specifically, EPA graphed RIN costs against price differentials between fuels with RFS obligations and similar products without. EPA then visually compared these and concluded that they were correlated. EPA also graphed RIN costs against price differentials between blended fuels and volume-weighted average prices of the blend components, visually examining correlation.

in those markets. However, EPA only analyzed these fuel prices for a few markets and did not analyze actual transaction-level costs of RINs. EPA also reviewed and commented on analyses submitted by small refineries using data on their local markets but did not systematically analyze these small markets itself. Instead, EPA reviewed the information it received from each of those small refineries separately but did not aggregate that data to comprehensively analyze it.

- Several studies conducted by experts found full RIN pass-through in a few fuel markets, such as New York, the Gulf Coast, and Chicago.[13] However, a study that looked at the large Los Angeles fuel market found inconclusive results for full RIN pass-through. One of the authors told us that some smaller fuel markets might not function as well as the fuel markets studied in the published articles, which could limit RIN pass-through. The expert also noted that, in order to identify whether small refineries fully pass through the cost of compliance, experts would need better data on the acquisition costs and sales prices at the refinery level to compare small and large refineries.

In light of these limitations, EPA does not have assurance that its conclusion that all small refineries recover the cost of RINs in the price of the gasoline and diesel they sell is based on quality information. EPA has a contractor examining the potential for price manipulation in the RIN market. This examination may provide useful information, but the scope of the work does not include analysis of RIN market performance (e.g., whether small and large refineries pay the same price for RINs) or pass-

[13]C.R. Knittel, B.S. Meiselman, and J.H. Stock, "The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard," *Journal of the Association of Environmental and Resource Economists* (2017) and "The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard: Analysis of Post-March 2015 Data" (working paper). An additional study looked at more detailed data for all refineries and found no significant difference in pass-through between small and large refineries; however, this study also cited data limitations, including imperfect identification of small refineries. Jesse Burkhardt, "The impact of the Renewable Fuel Standard on US Oil refineries," *Energy Policy*, vol. 130 (July 2019): 429, 435.

through in fuel markets beyond those previously analyzed by EPA or experts.[14]

According to federal standards for internal control, management should use quality information to achieve objectives (Principle 13).[15] Specifically, management should identify information requirements, obtain relevant data from reliable sources, and process data into quality information. Without reassessing its conclusion that all small refineries recover the cost of RINs in the price of the gasoline and diesel they sell, including by fully examining and documenting RIN market performance and RIN pass-through in all relevant fuel markets, EPA will continue to make decisions on small refinery exemptions without quality information and, therefore, risks inappropriately denying valid exemption petitions.

DOE's 2011 study no longer provides information useful to EPA. DOE's scoring approach no longer provides information useful to EPA for evaluating exemption petitions, according to EPA officials. DOE has generally provided information to EPA based on an approach developed in DOE's 2011 study. DOE's reliance on the 2011 study to provide information to EPA is limited in that DOE never scored several metrics it had identified as important, the study has not been updated to address industry changes, and the study was critically flawed:

- DOE's 2011 study identified 16 metrics that are important in determining disproportionate economic hardship. However, in evaluating petitions, DOE has never scored five of the metrics because, according to DOE officials, better data are needed to score these metrics. Representatives of refineries cited the importance of scoring all the metrics identified as important in DOE's 2011 study.
- DOE's study has not been updated to reflect industry changes. DOE's study is more than a decade old, and, as acknowledged by a senior

[14]EPA has recently taken steps to study the RIN market but has not completed its work. In 2019, EPA initiated a contract for a study to look at RIN prices and RIN market efficiency. However, the study was not completed before EPA's 2022 conclusion that small refineries do not experience disproportionate economic hardship. The contractor submitted its first draft of findings to EPA on November 30, 2021. EPA directed the contractor to lessen the scope of the report and to analyze the potential for price manipulation in the RIN market. EPA officials told us that they did not use the draft findings to inform the 2022 conclusion. EPA officials stated that they expect the report to be completed this year and may then have the contractor conduct additional analysis of RIN markets.

[15]GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: September 2014).

DOE official, DOE has not formally evaluated whether any parts of the 2011 study need updating.

- We reviewed DOE's 2011 study methodology and found that it was critically flawed. The study collected information to assess various metrics related to economic hardship facing small refineries but did not similarly assess a control group of larger refineries. Without a control group, it is impossible to know whether small refineries are experiencing disproportionate hardship.

Given these limitations, DOE's approach of relying on the 2011 study does not provide quality information, though federal standards for internal control call for management to use quality information to achieve objectives. EPA officials told us that they do not plan to use DOE's scoring in the future because the study was not designed to account for RIN pass-through and, therefore, the study no longer provides information that EPA finds useful. Under statute, EPA is required to consult with DOE on exemption petitions, but DOE has not developed an approach to consulting that addresses the limitations of the 2011 study and that meets EPA's current needs. Without developing an approach for consulting on small refinery exemption petitions that provides quality information to EPA about disproportionate economic hardship, DOE cannot ensure that its consultations on exemption petitions will contain the information that EPA needs to evaluate those petitions.

EPA has not identified the information that small refineries need to submit. Small refineries can still submit petitions claiming that they are experiencing disproportionate economic hardship from RFS compliance although, as previously discussed, EPA concluded in June 2022 that this hardship does not exist. According to federal standards for internal control, management should use quality information to achieve objectives, but the only information EPA requires refineries to submit in their exemption petitions is information that EPA officials stated they do not plan to use. EPA continues to direct small refineries to submit data pertaining to the 2011 DOE study metrics, even though the officials told us that they do not plan to use DOE scoring in the future. EPA has requested that refineries share whatever information shows hardship, including specifically asking for feedback on the finding that the structure of the RIN system put in place by EPA provides all obligated parties with equal access to the same means of compliance. However, EPA officials have not specified exactly what information refineries would need to submit to inform EPA's evaluations.

Without identifying and communicating what information refineries would need to submit to demonstrate disproportionate economic hardship, EPA cannot ensure that it will receive the information it needs to evaluate small refinery exemption petitions.

Neither EPA nor DOE Has Policies and Procedures, Which Undermines Consistent Administration of the Small Refinery Exemption Program

EPA does not have policies and procedures for making small refinery exemption decisions, and DOE does not have policies and procedures for providing consultation to EPA. This lack of policies and procedures has undermined the agencies' ability to consistently administer the small refinery exemption program.

Until recently, EPA made exemption decisions using a process by which DOE scored petitions and made recommendations.[16] As part of this process, EPA first reviewed petitions and ensured that they were complete before providing them to DOE. DOE then evaluated the petitions using an approach developed in the 2011 study.[17] Specifically, DOE scored each petition across 11 metrics; the scores determined whether DOE recommended a full exemption, a partial exemption, or no exemption. EPA officials then considered DOE's recommendation—factoring in their own industry knowledge, relevant court decisions, and current priorities communicated to them by agency leadership—to arrive at proposed exemption decisions to present to EPA senior management. Senior management then finalized exemption decisions.

While EPA generally followed the process outlined above, it has made numerous changes over the years, including the following:

- Starting with the 2015 compliance year, in response to direction from Congress, EPA dropped a requirement that exemptions only be

[16]Throughout this report, we use the word "recommendation" to describe what DOE sends to EPA because it is consistent with language that DOE used throughout most of the period of our analysis. Specifically, DOE used the word "recommend" in its scoring memos for compliance years 2015 through 2018. In 2019, DOE replaced "recommend" with "findings" in the scoring memos.

[17]U.S. Department of Energy, Office of Policy and International Affairs, *Small Refinery Exemption Study: An Investigation into Disproportionate Economic Hardship* (March 2011).

granted when RFS compliance could lead to a small refinery shutting down.[18]

- Starting with the 2016 compliance year, EPA changed from using information in addition to DOE's recommendation to primarily relying on DOE's recommendation.
- For the 2018 compliance year, EPA changed its general process from granting full exemptions only when DOE recommended a full exemption to granting full exemptions when DOE recommended either a partial or a full exemption.
- In August 2019, EPA changed the level of senior management who made final exemption decisions, which affected the 2018 compliance year decisions.
- In June 2022, EPA told us that it will no longer make exemption decisions based on DOE's scoring of petitions. EPA officials stated that their June 2022 *Federal Register* notice, along with its incorporated June 2022 denial document, laid out their new process for making decisions.

Under federal standards for internal control, management is required to document in policies the internal control responsibilities of the organization (Principle 12).[19] In addition, those in key roles for the unit may further define policies through day-to-day procedures, depending on the rate of change in the operating environment and the complexity of the operational process. Procedures may identify the timing of when related activities should occur and include guidance on how to address any corrective actions needed.

EPA officials told us that they have not had formalized policies or procedures for making exemption decisions. Officials stated that their decision memorandum for each refinery—in which EPA communicates its exemption decision for a specific petition—outlines how they considered DOE's recommendation, along with other factors, in making a final decision.

However, EPA's memorandums are neither policies nor procedures, as they do not document any responsibilities or control activities for implementing the exemption program. Instead, they are backward-looking

[18]Congress's direction was expressly to DOE, but EPA incorporated this direction into its decision-making on small refinery exemptions.

[19]GAO-14-704G.

documents that explain how EPA made a decision for a specific small refinery and do not provide any direction for how to carry out the process in the future. EPA's most recent exemption denials were announced via Federal Register notices in December 2021, April 2022, and June 2022. These notices and the underlying decision documents are also backward looking and do not document any responsibilities or control activities for making exemption decisions, identify the timing of when related activities should occur, or include any information on corrective actions.

EPA officials told us that they did not initially develop policies or procedures because they expected that the program would only last a couple of years. They told us that, in the years since, they chose not to develop policies or procedures because leadership priorities, court decisions, and their own experience caused them to change how they administer the RFS from year to year. However, continual change itself is not justification to avoid implementing internal control activities, such as the development of policies and procedures.

DOE officials told us that they have used their 2011 study as a procedural manual. We reviewed the 2011 study, as well as DOE's scoring of petitions from 2013 through 2019. Our review suggests that the study is not sufficient to serve as a procedural manual that would ensure consistent scoring. Specifically, the study includes incomplete guidance for how to assign scores for two metrics and no guidance for how to assign scores for three metrics.[20] The three metrics without guidance are weighted more heavily than the other eight metrics and determine half of DOE's recommendation for an exemption petition.

DOE officials told us that they did not think they needed policies or procedures beyond the 2011 study because, until recently, the DOE staff who developed the study were the staff scoring petitions and making exemption recommendations. However, the DOE staff who developed the study no longer work on scoring petitions, and DOE did not take action to document policies or procedures after those staff left the role. Moreover, EPA did not use DOE scoring in 2019, 2020, or 2021, and the 2011 study

[20]DOE's 2011 study does not contain complete guidance for two metrics: (1) a refinery's access to capital or credit and (2) a refinery operating in a niche market. The study contains no guidance for three metrics: (1) the extent to which compliance reduces the refinery's profitability, thereby impairing future efficiency improvements; (2) individual special events affecting a refinery; and (3) the likelihood of compliance costs leading to shutdown.

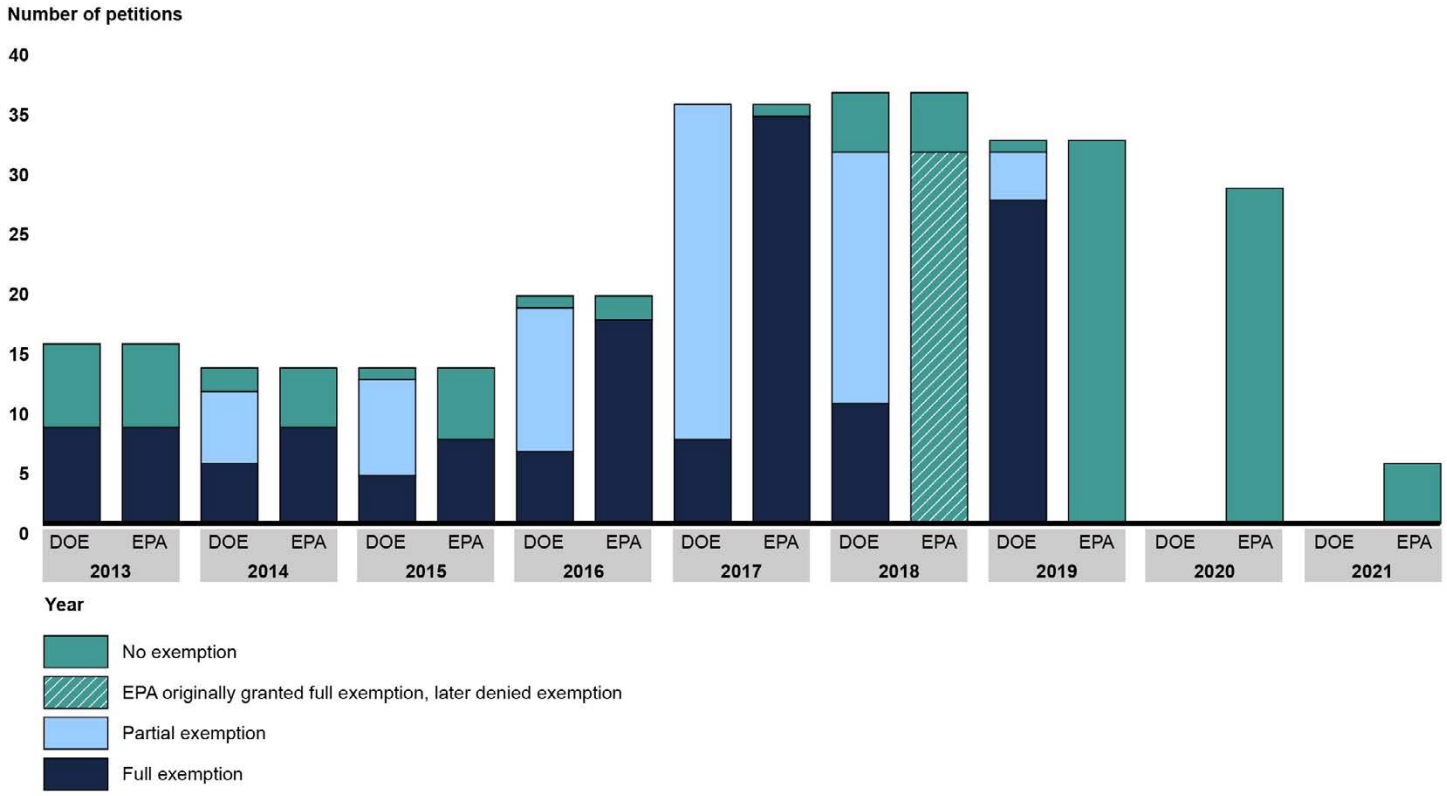
does not address how DOE is to provide consultation to EPA beyond the scoring.

As previously discussed, EPA is required by statute to evaluate exemption petitions in consultation with DOE. DOE officials told us that they would score any petitions EPA sends to them using their old approach, but EPA officials said they do not intend to send petitions to DOE to be scored. EPA could not provide documentation of the policies and procedures it will use to obtain consultation from DOE in the future, and DOE could not provide documentation of the policies and procedures it will use to provide that consultation to EPA. Without developing policies and procedures for consulting and making decisions on small refinery exemptions, EPA and DOE cannot ensure that exemption decisions are consistent or correct, which creates market uncertainty for small refineries and renewable fuel producers.

In the absence of policies and procedures, DOE's recommendations and EPA's decisions appear ad hoc. Representatives of 11 refineries told us that they could not determine why their exemption petitions received the scores they did, nor could we consistently understand how DOE scored petitions or how EPA made final decisions.

As EPA has made changes to its administration of the program, the number of exemptions granted by EPA has fluctuated from year to year, as figure 2 shows, adding to the appearance that the decisions are ad hoc. For example, there was a large increase in the number of exemptions granted beginning with the 2016 compliance year, and no exemptions were granted for the 2019, 2020, and 2021 compliance years. Some of the fluctuations may be explained in part by congressional direction issued in 2015 and 2016 suggesting that EPA and DOE had been too stringent in assessing exemption petitions. According to representatives of one refinery, one law firm that represents small refineries, and one group that represents renewable fuel producers, EPA consequently issued more exemptions in 2016, which caused more small refineries to submit petitions in the following years. In the absence of policies and procedures, however, the details of how EPA responded to the congressional direction and subsequently made its decisions are unclear. Figure 2 shows the DOE recommendations and EPA decisions for each compliance year from 2013 through 2021.

Figure 2: Department of Energy (DOE) Recommendations for Small Refinery Exemption under the Renewable Fuel Standard and U.S. Environmental Protection Agency (EPA) Decisions, 2013–2021



Source: GAO analysis of EPA information. | GAO-23-105801

Accessible Data for Figure 2: Department of Energy (DOE) Recommendations for Small Refinery Exemption under the Renewable Fuel Standard and U.S. Environmental Protection Agency (EPA) Decisions, 2013–2021

Year	DOE grant	DOE partial	DOE deny	EPA grant	EPA deny	EPA originally granted, later denied
2013	8	0	7	8	7	
2014	5	6	2	8	5	
2015	4	8	1	7	6	
2016	6	12	1	17	2	
2017	7	28	0	34	1	
2018	10	21	5	0	5	31
2019	27	4	1	0	32	
2020	0	0	0	0	28	
2021	0	0	0	0	5	

Note: This figure does not include gap-filling petitions that were submitted in 2020 for prior compliance years. There were also a small number of petitions declared ineligible or withdrawn; we did not include these petitions in this figure. A small number of petition decisions were remanded to EPA by courts—in these cases, we show the final decision only. EPA made decisions on compliance years 2019 through 2021 in its 2022 action; although DOE had already scored the 2019 petitions, EPA did not rely on DOE scoring for compliance year 2020 and 2021 decisions.

Representatives of 11 small refineries and five groups that represent renewable fuel producers noted that it is difficult to predict what EPA will do in a given year. Representatives of six small refineries said that they have been treated differently across the years. Representatives of one refinery stated that small refineries do not invest in major infrastructure projects that may allow for blending more renewable fuel because there is too much risk that exemptions will not be administered consistently and that there will be no ability to recoup the investment. Similarly, representatives of seven groups that represent renewable fuel producers told us that uncertainty regarding EPA's administration of the RFS program makes it difficult to anticipate market demand for renewable fuels.[21] Without developing policies and procedures for consulting and making decisions on small refinery exemptions, the agencies cannot ensure that decisions are consistent.

Routinely Late Small Refinery Exemption Decisions Diminish the Benefit of Exemptions, Create Market Uncertainty, Discourage Investment, and Undermine the RFS

EPA has routinely missed statutory deadlines for issuing small refinery exemption decisions and does not have policies and procedures to ensure that it meets these deadlines. Moreover, EPA designed the small

[21]Small refinery exemption decisions are usually made after annual requirements for fuel blending are set for the year; as a result, exemptions can reduce the annual requirements after they are set. For compliance years 2020 through 2022, EPA attempted to reduce uncertainty by projecting how many gallons of fuel would be exempted from annual requirements by small refinery exemptions. Under this approach, the annual requirement for each category of renewable fuel would increase to account for the volume of fuel that small refinery exemptions were projected to exempt. EPA implemented this change to reduce the uncertainty caused by exemptions regarding annual requirements. However, for compliance year 2020, EPA retroactively lowered the 2020 requirement, which undercut its goal of reducing uncertainty by using projections. These projections may reduce uncertainty in the future but only if EPA does not retroactively alter the annual requirement in a manner inconsistent with the projections.

refinery exemption program such that even when it meets deadlines, it makes decisions late in the compliance year. These late decisions diminish the benefit of exemptions, create market uncertainty, discourage investment, and undermine the design of the RFS more broadly.

EPA Routinely Misses Statutory Deadlines for Issuing Small Refinery Exemption Decisions and Does Not Have Procedures to Ensure That It Meets Statutory Deadlines

Though the Clean Air Act requires EPA to issue a decision on small refinery exemptions within 90 days of receiving a petition, EPA has frequently missed this statutory deadline.[22] We analyzed data collected by EPA on the total time elapsed from the date a petition was submitted to EPA to the date EPA issued its decision for compliance years 2013 through 2021. According to our analysis, EPA issued decisions after the 90-day deadline 89 percent of the time (190 out of 214 decisions). In 5 of the 9 years we analyzed, EPA took more than 200 days to issue a decision for more than half of the petitions submitted.

EPA officials told us that some decisions might appear late because the related petitions were not complete when refineries initially submitted them. In these cases, EPA had to work with refineries to complete those petitions. However, agency officials do not track when a petition is considered complete. Instead, they track only the date when the petition is initially submitted.

According to our analysis of EPA data, incomplete petitions were not the only reason why EPA took longer than 90 days to issue a decision. Since DOE could not score an incomplete petition, the petition must have been complete by the time DOE scored it and provided its recommendation to EPA. EPA recorded dates for receipt of recommendations from DOE only for compliance years 2018 and 2019. Our analysis shows that for compliance year 2018 petitions, EPA's decision took, on average, an additional 132 days after DOE provided its recommendation. For compliance year 2019 petitions, it took, on average, more than 700 days.

EPA officials also stated that the results of exemption-related judicial review cause delays in making decisions about exemptions, though not because courts have required EPA to pause making exemption decisions

[22]42 U.S.C. § 7545(o)(9)(B)(iii).

as courts deliberate over cases.[23] Rather, it is because EPA had to deliberate on how to factor judicial decisions into its implementation of the small refinery exemption program. However, there are persistent lawsuits over exemption petitions and other aspects of the program, and EPA has to function in light of this reality, particularly considering the statutory deadline.

As we discussed above, EPA does not have policies and procedures for the small refinery exemption program. This means that EPA does not have policies and procedures to ensure that it issues decisions within the 90-day statutory deadline. For example, EPA does not have policies and procedures for tracking when petitions are considered complete so that the agency knows when to start tracking the time remaining before the deadline. Under federal standards for internal control, management should design control activities to achieve objectives and respond to risks (Principle 10).[24]

Without developing policies and procedures to ensure that it meets statutory deadlines to issue decisions, including tracking when petitions are considered complete, EPA cannot ensure that decisions are timely. The time that it takes EPA to issue decisions, combined with aspects of EPA's program design, creates challenges that potentially lessen the aid provided to small refineries and undermines the blending goals of the RFS, as we discuss in the next section.

EPA's Program Design Results in the Agency Reviewing Petitions Late in the Year

EPA makes decisions late in relation to the compliance year because of how EPA designed the small refinery exemption program. Although not compelled by statute, EPA has directed exemption petitioners to include three quarters of financial data from the current compliance year. EPA officials stated that they require three quarters of financial data to ensure that they base their exemption decisions on the most current information

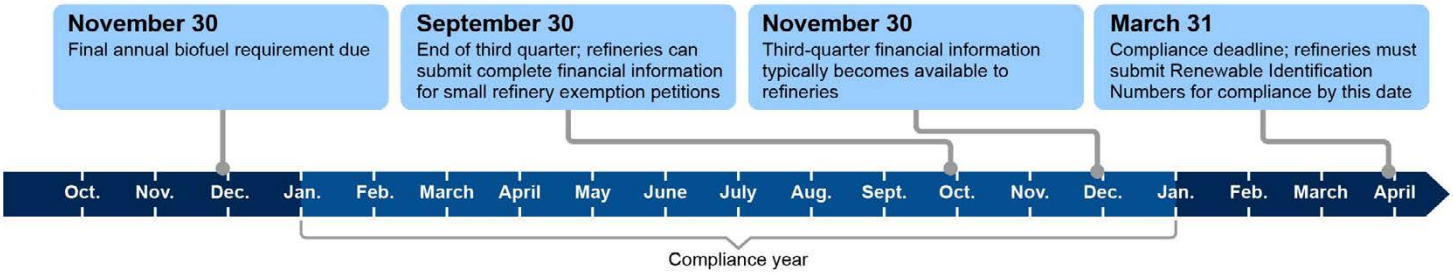
[23]For more information on judicial decisions about small refinery exemptions, see Congressional Research Service, *Supreme Court Holds Small Refineries Remain Eligible for Renewable Fuel Standard Exemptions After Lapse*, LSB10418 (Washington, D.C.: Mar. 10, 2020, updated June 28, 2021); and *The Renewable Fuel Standard (RFS): Frequently Asked Questions About Small Refinery Exemptions (SREs)*, R46244 (Washington, D.C.: Mar. 2, 2020),

[24]GAO-14-704G

available. However, this requirement means that EPA does not consider petitions complete until after September 30 of the compliance year, at the earliest. Representatives of three refineries told us that it takes a month or two for third-quarter financial information to become available to the refineries, so refineries may not be able to submit the required information until late November.

Assuming that EPA started reviewing petitions at the end of November and was able to consistently make decisions within 90 days, as required by statute, exemption decisions would be available in January or February—after the compliance year is over. However, since EPA usually takes longer than 90 days to make exemption decisions, they often occur later—closer to, or even after, the March compliance reporting deadline for the RFS.[25] (See fig. 3 for a timeline of key dates and fig. 4 for the timing of decisions.)

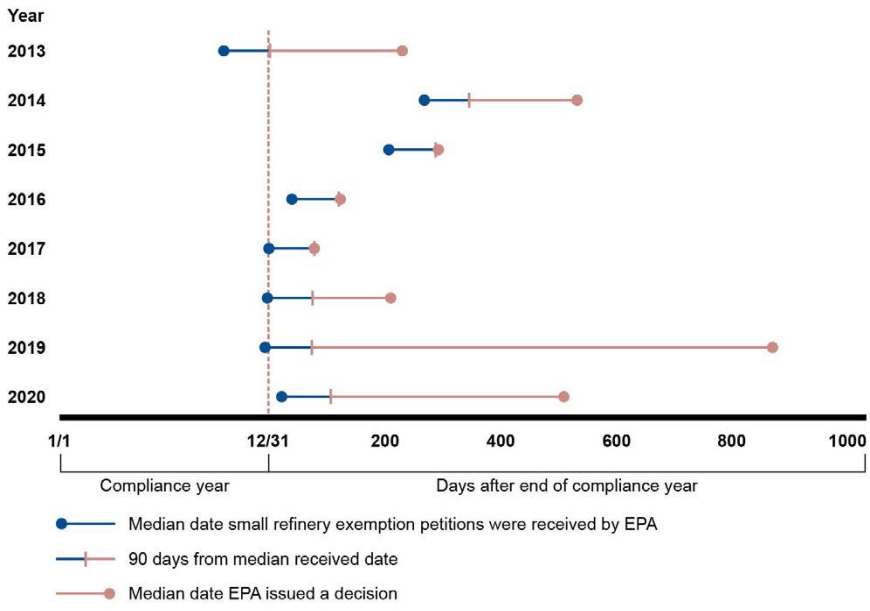
Figure 3: Timeline of Key Dates for the Renewable Fuel Standard



Source: GAO analysis of Clean Air Act, U.S. Environmental Protection Agency documents, and responses from representatives of refineries. | GAO-23-105801

[25]The compliance reporting deadline has varied over time as EPA's RFS regulations have changed. Since mid-2014, the core compliance deadline has typically been specified as March 31 of the year after the compliance year, although the regulations often specify that along with some combination of other dates or compliance deadlines triggered by the date of future issuance of annual percentage standard rules, for particular compliance years.

Figure 4: Median Date That Small Refinery Exemption Petitions under the Renewable Fuel Standard Were Received by EPA, and Median Date That EPA Issued Decision for Compliance Years 2013–2020



Source: GAO analysis of U.S. Environmental Protection Agency (EPA) data. | GAO-23-105801

Accessible Data for Figure 4: Median Date That Small Refinery Exemption Petitions under the Renewable Fuel Standard Were Received by EPA, and Median Date That EPA Issued Decision for Compliance Years 2013–2020

Year	Median Petition Date	90 Days from Median Petition Date	Number of Days Median Decision Date is Past End of Compliance Year	Alternate petition date	Alternate 90 days
2013	10/3/2013	1/1/2014	241		1
2014	9/16/2015	12/15/2015	545	259	349
2015	7/18/2016	10/16/2016	293	200	290
2016	1/31/2017	5/1/2017	124	31	121
2017	12/21/2017	3/21/2018	82		80
2018	12/17/2018	3/17/2019	221		76
2019	12/15/2019	3/14/2020	885		75
2020	11/15/2020	2/13/2021	519	18	44

Year	Column two data	Column three data	Column four data
2013	276	366	606
2014	259	349	910
2015	199	289	658
2016	31	121	489
2017	355	445	447
2018	351	441	586
2019	349	439	1250
2020	319	409	884

Note: EPA did not finalize annual requirements for fuel blending for compliance years 2014 or 2015 until December 14, 2015. This is why the median date that exemption petitions were received by EPA for those years is so late.

Late decisions have created challenges in two ways that potentially lessen the aid provided to small refineries and undermine the blending goals of the RFS. As discussed in greater detail below, (1) small refineries that apply for exemptions often do not know whether they need to comply with the RFS until very close to, or after, the March 31 compliance deadline, which creates financial uncertainty; and (2) exemptions reduce the overall amount of renewable fuel blending, since exemption decisions usually occur after annual requirements for fuel blending are set.

Late exemption decisions mean that refineries do not know whether they will need RINs until close to, or after, the date by which refineries need to show compliance with RFS annual requirements. In recent years, EPA has either granted almost all, or denied all, petitions, and refineries cannot be sure in advance whether they will obtain an exemption. This may result in either an excess or a shortfall of RINs and, in either case, small refineries may lose out.

- Some refineries operate as though they will be subject to the annual requirements, purchasing RINs throughout the year. If such a refinery then receives an exemption, it sells the RINs it had purchased. Since other refineries may have received exemptions at the same time, this may lead to an increase in the market supply of RINs, which tends to drive RIN prices down, forcing the refinery to sell at a loss. Representatives of one refinery stated that in 2017, the refinery received its exemption 10 business days before the RINs would expire; with little time to sell RINs, the refinery lost $16 million on those RINs. Representatives of another refinery stated that in 2017

their refinery received its exemption just a few days before the RINs would expire and sold them for 10 to 15 percent of their original purchase price.

- Representatives of four other refineries told us that some refineries take the opposite approach, operating as though they will obtain an exemption and not need RINs. If such a refinery then does not receive an exemption, it needs to purchase RINs to comply with the RFS. If multiple refineries receive a denial of an exemption, this may lead to a sudden increase in the market demand for RINs, thereby driving up RIN prices and, ultimately, RFS compliance costs.

An EPA official told us that RIN prices had dropped substantially when the agency had granted all exemptions simultaneously for a certain compliance year. This suggests that the timing of EPA actions is associated with volatility in the RIN market, which adds to market uncertainty experienced by refineries. We analyzed data on RIN transactions and on aggregate behavior of the RIN markets from 2013 through 2021. (See app. II for more discussion of this RIN market analysis.) From these data, we found that RIN markets exhibit a relatively high level of volatility compared with that of related markets, including the ethanol market, and other petroleum-based fuels, such as jet fuel, propane, and heating oil.

A second way in which EPA's late exemption decisions create challenges is that they undermine the design of the RFS to increase the amount of renewable fuel blended into gasoline and diesel. Historically, EPA has often made exemption decisions after setting annual RFS requirements for fuel blending, so that when exemptions are granted, they reduce the total renewable fuel volumes required. Representatives of four renewable fuel groups stated that the uncertainty related to the actual required volumes, after accounting for the gallons exempted through small refinery exemptions, has made it harder for that industry to make investments and grow. The extent to which exemptions have actually reduced blending is unclear. According to representatives of three refineries, small refineries that have received exemptions may still have done some blending, and representatives of two refineries told us that small refineries may have sold their fuels to blenders that blended the fuels with renewable fuel. (See app. III for more information on how small refinery exemptions affect the amount of renewable fuel blended into gasoline and diesel.)

Standards for Internal Control in the Federal Government state that management should design control activities to achieve objectives and

respond to risks (Principle 10).[26] Specifically, management should design policies and procedures to achieve the entity's objectives and address related risks.

EPA officials told us that, in deciding to require small refineries to submit three quarters of financial data in their exemption petitions, they did not assess how the resulting late decisions may affect exemption and RFS program objectives. Without assessing the effect of small refinery exemption decision timing on the benefit provided to small refineries, as well as the effect on fuel markets, and reconsidering petition requirements, such as that of three quarters of current year financial information, EPA cannot have assurance that exemptions are providing relief to those small refineries experiencing hardship without also detracting unnecessarily from annual requirements for fuel blending.

Conclusions

Over nearly a decade, EPA and DOE have reviewed over 200 petitions for small refinery exemptions, representing billions of gallons of diesel and gasoline. However, EPA and DOE do not have quality information needed to evaluate exemption petitions. EPA's conclusion that RIN costs are being passed through to purchasers relies on a potentially faulty assumption that all parties pay and receive one price for RINs, something that our analysis brings into question. Without reassessing its conclusion on RIN pass-through, including by fully examining and documenting RIN market performance and RIN pass-through in all relevant fuel markets, EPA will continue to make decisions on exemption petitions without quality information and, therefore, risks inappropriately denying valid exemption petitions.

DOE has similarly not had the information needed to provide its statutorily required consultation on exemption petitions. DOE has relied on an approach developed in its 2011 study, but we found that approach to be outdated and incompletely applied, and EPA officials said that they no longer find the approach useful. Without developing an approach for consulting on exemption petitions that provides quality information to EPA about disproportionate economic hardship, DOE cannot ensure that its

[26]GAO-14-704G

consultations on exemption petitions will contain the information EPA needs to evaluate those petitions.

EPA officials have not specified what information would be useful for them to determine whether small refineries experience disproportionate economic hardship from the RFS. Instead, EPA has requested whatever information refineries think would show hardship, while requiring information that the agency no longer intends to use. Without identifying and communicating what information small refineries would need to submit to demonstrate disproportionate economic hardship, EPA cannot ensure that it will receive the information it needs to evaluate exemption petitions.

Moreover, the agencies do not have policies and procedures for the program, including for how DOE will provide consultation to EPA, how EPA will make decisions, and how EPA will ensure that it meets its statutory deadline to issue decisions within 90 days. Consequently, decisions have been late and appear ad hoc. This results in market uncertainty, which harms small refineries and renewable fuel producers. Without developing policies and procedures for consulting and making decisions on small refinery exemptions, including policies and procedures to ensure that deadlines are met, the agencies cannot ensure that decisions are consistent and timely.

Additionally, EPA does not make decisions until very late in the compliance year because EPA has required exemption petitions to include three quarters of financial data from the current compliance year. Because of late exemption decisions, refineries often do not know how many RINs they need to submit for compliance until very close to, or after, the March 31 compliance deadline, which creates financial uncertainty and may reduce the amount of renewable fuel blended. EPA officials told us that they did not evaluate how the resulting late decisions may affect small refinery exemption and RFS program objectives. Without assessing the effect of small refinery exemption decision timing on the benefit provided to small refineries, as well as the effect on fuel markets, and reconsidering petition requirements, EPA cannot have assurance that exemptions are providing relief to small refineries without detracting unnecessarily from annual requirements for fuel blending.

Recommendations for Executive Action

We are making a total of seven recommendations, including five to EPA and two to DOE. Specifically:

The Administrator of EPA should reassess EPA's conclusion that all small refineries recover their RFS compliance costs in the price of the gasoline and diesel they sell, including by fully examining and documenting RIN market performance and RIN pass-through in all relevant fuel markets. (Recommendation 1)

The Secretary of Energy should develop an approach for consulting on small refinery exemption petitions that provides EPA with useful information on disproportionate economic hardship. (Recommendation 2)

The Administrator of EPA should identify and communicate what information refineries would need to submit to demonstrate disproportionate economic hardship. (Recommendation 3)

The Secretary of Energy should develop policies and procedures for its consultation with EPA on small refinery exemption petitions. (Recommendation 4)

The Administrator of EPA should develop policies and procedures for making small refinery exemption decisions. (Recommendation 5)

The Administrator of EPA should develop policies and procedures to ensure that EPA meets statutory deadlines to issue decisions, including tracking when petitions are considered complete. (Recommendation 6)

The Administrator of EPA should assess the effect of small refinery exemption decision timing on the benefit provided to small refineries, as well as the effect on fuel markets, and reconsider petition requirements, such as that of three quarters of current year financial information. (Recommendation 7)

Agency Comments and Our Evaluation

We provided a draft of this report to EPA and DOE for review and comment. We received comments from both agencies, which are reproduced in appendices IV and V and summarized below.

DOE agreed with our recommendations. DOE also provided technical comments, which we incorporated as appropriate, including adjusting language in our report to further clarify DOE's role in the evaluation of small refinery exemption petitions.

In its comments, EPA disagreed with one recommendation and partially agreed with the other four recommendations.

EPA stated that it fundamentally disagreed with our finding that the agency does not have quality information needed to evaluate exemption petitions. EPA further disagreed with our related recommendation that EPA reassess its conclusion that all small refineries recover their compliance costs, and it stated that the agency does not intend to revisit its 2022 exemption decisions. However, our recommendation is for EPA to reassess its underlying conclusion of RIN cost pass-through, not its past exemption decisions. Although it disagreed with our recommendation, EPA said in responding to our report that it had conducted additional analyses of the same RIN data that GAO analyzed to address what EPA believes are methodological problems with our analytical approach. EPA described preliminary results from its analysis looking at price differences between small and large refineries that are consistent with our results presented above. EPA stated it does not think these price differences are significant enough to affect its evaluation of disproportionate economic hardship. EPA stated that it will make its final analysis available as soon as possible.

Our finding that EPA does not have quality information is based on our assessment that EPA relied on two critical assumptions underlying its original analysis—(1) that the RIN market has been efficient enough that all market participants pay and receive the same price for RINs and (2) that if RIN pass-through was happening in large markets then it was happening in all relevant markets.

Regarding the first assumption, EPA raised numerous concerns about our analysis, many of which were technical in nature. EPA had raised these concerns with us during the course of our audit, and we had incorporated and addressed them in our analysis as appropriate.[27] EPA expressed

[27]After sending the draft report to EPA for comments, we discovered and corrected an error in how we translated our statistical model's results into percentage differences in prices paid by smaller and larger parties that had significantly overstated the magnitude of these differences. However, this change in magnitude did not affect our finding that EPA had not evaluated its assumption that all refineries pay the same prices for RINs.

concerns that our analysis did not directly assess whether small refineries experience disproportionate economic hardship. Given the information available to us at the time, this is not what we analyzed. EPA raised other concerns regarding our analysis that we respond to in appendix IV.

We note that both our work and EPA's preliminary results from its latest analysis point to a difference in the prices paid by small and larger refineries for RINs. Both our analysis and EPA's preliminary analysis also look at average differences in prices paid by smaller companies. Without additional analysis, it is not possible to know if there could be specific market situations or specific small refineries where these differences are more pronounced. Moreover, EPA's preliminary analysis does not attempt to determine at what level these differences may represent disproportionate economic hardship for a small refinery. We therefore maintain that it is important for EPA to fully analyze this difference and its potential causes. This is important both to inform EPA's overall approach to small refinery exemptions and its decision-making regarding specific exemption petitions.

Regarding the second assumption, EPA stated in its comments that the statute does not require EPA to examine all markets and that EPA evaluates the petition and supporting information submitted by a small refinery, plus all other relevant information, to determine whether that particular small refinery experiences disproportionate economic hardship. We made changes to the report to clarify that all markets need not be examined, but all relevant markets should be—such as those in which small refinery petitioners participate. We believe there is relevant information that EPA is not evaluating. Academic studies and EPA's more intensive data analysis look at only a few large markets. In response to data sent with refinery comments on EPA's December 2021 proposal, EPA did conduct some limited analyses in the context of its proposed action on particular exemption petitions but did not systematically analyze these smaller markets. Rather, EPA reviewed the data and analysis sent by any one refinery in isolation from the other information it had available.

EPA partially agreed with our recommendation to identify and communicate what information refineries would need to submit to demonstrate disproportionate economic hardship. EPA stated that it had previously issued guidance about the types of information small refineries should include in their petitions and that it issued a proposed denial that provided small refineries with the ability to provide supplemental information in December 2021. However, as discussed in our report, EPA's current guidance for petitioners asks for information that EPA does

not use in evaluating petitions. EPA stated that it plans to issue and keep updated new guidance on what information small refineries should submit as part of their petitions, which may address our recommendation.

EPA partially agreed with our recommendations to develop policies and procedures for making exemption decisions and for ensuring statutory deadlines are met. EPA stated that it has policies and procedures in place; however, we found EPA's decisions on exemption petitions have appeared to be ad hoc because the number of exemptions granted has varied widely over the years of the program while fundamental market conditions for petitioners do not appear to have undergone similar variation. The documents EPA shared with us during the course of this engagement as evidence of its policies and procedures do not discuss how EPA is to track petitions. EPA described a plan to better document its internal processes, which may address our recommendation.

EPA partially agreed with our recommendation to assess the effect of small refinery exemption decision timing. EPA acknowledged that the timing of its decisions had created volatility and suggested that its new formulation of the annual volume requirements, in which EPA projects the gallons exempted for small refineries when setting the requirements, will reduce this volatility. However, EPA has projected that there will be zero exemptions. Therefore, this formulation will have no benefit if EPA does grant any exemptions. This recommendation also included reconsidering whether three quarters of financial information should be submitted with petitions. EPA's plan to update guidance on what refineries should submit may address this part of the recommendation.

EPA stated that it will, as appropriate, follow up on each recommendation as it continues to improve the program.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Energy, and the Administrator of EPA. In addition, the report is available at no charge on the GAO website at https://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.

Frank Rusco
Director, Natural Resources and Environment

List of Requesters

The Honorable John Barrasso
Ranking Member
Committee on Energy and Natural Resources
United States Senate

The Honorable Shelley Moore Capito
Ranking Member
Committee on Environment and Public Works
United States Senate

The Honorable Steve Daines
United States Senate

The Honorable James M. Inhofe
United States Senate

The Honorable John Kennedy
United States Senate

The Honorable James Lankford
United States Senate

The Honorable Mike Lee
United States Senate

The Honorable Pat Toomey
United States Senate

The Honorable Roger F. Wicker
United States Senate

Appendix I: Objectives, Scope, and Methodology

This report examines (1) information, policies, and procedures that the U.S. Environmental Protection Agency (EPA) and Department of Energy (DOE) use to make decisions about small refinery exemptions from the Renewable Fuel Standard (RFS) and (2) the extent to which decisions about exemptions are timely.

To examine the information that the agencies use to make decisions about small refinery exemptions, we compared the information that EPA and DOE collect to information we identified about hardships faced by small refineries. To understand the hardships faced by small refineries, we reviewed information included in and related to petitions for compliance years 2013 through 2020.[1] We also conducted a literature search for studies on small refinery exemptions and how the RFS affects different types of refineries, such as through the Renewable Identification Number (RIN) market. To identify existing studies, we conducted searches of various databases, such as Scopus and ProQuest, using key words, including “small refinery exemptions,” “RIN,” and “pass-through.” We also asked all of the experts we interviewed (see below) to recommend additional studies.

From these sources, we selected 22 studies that appeared in peer-reviewed journals between 2010 and 2020 and were relevant to our objective on information used by EPA and DOE to make decisions about exemptions. To assess the methodological quality of the selected studies, we obtained information about each study and about the methodology used. In addition, for articles directly cited in the report, we performed an initial in-depth review of the findings and methods. Then a GAO economist performed a secondary review and confirmed the initial review. We determined that the studies were sufficiently sound for our purposes.

We also interviewed a nongeneralizable sample of experts about fuel markets and the RIN market. We used the results of our literature search

[1]We reviewed information included in, and related to, petitions for compliance years 2019 and 2020, but EPA had not yet made decisions for those petitions. We did not receive petitions for compliance year 2021 until April 15, 2022, and so were unable to incorporate a complete review of these applications in our analysis.

to identify experts conducting research in this area. From the search, we identified 14 experts, and we added an additional four to our list by asking for additional names during our initial interviews with experts. From this list, we selected 16 PhD economists who had done research on topics related to small refinery exemptions, the functioning of the RIN market, fuel industry cost pass-through, and the effect on refineries of complying with the RFS, and ultimately interviewed 13.[2]

We also interviewed relevant agency officials and a nongeneralizable sample of 31 industry stakeholders, including representatives of 16 refineries, five fuel blenders, eight groups representing the renewable fuel or agriculture industries, and two law firms that have represented small refineries in lawsuits related to small refinery exemptions.

Refineries were identified through U.S. Energy Information Administration (EIA) data and were selected to include a range of sizes, locations, and fuel blending capabilities. We used the size categories that EIA uses in its Refinery Capacity Report: companies with capacity over 100,000 barrels per day, companies with capacity between 30,001 and 100,000 barrels per day, and companies with capacity between 10,001 and 30,000 barrels per day. Regarding location, we used EIA's geographic aggregation scheme, the Petroleum Administration for Defense Districts. Additionally, we selected refineries with and without their own blending capabilities, as this factor was relevant for whether a refinery could comply with the RFS by obtaining RINs through blending or whether the refinery had to purchase RINs through the market. In total, we interviewed representatives from 16 refineries.

We identified fuel blenders through internet searches, as well as by asking others we interviewed, and we selected them to provide a range of company types: those who operate gasoline stations, those who primarily serve the freight transportation market, and those who do not own retail outlets. We identified groups representing the renewable fuel industry through previous GAO work and because of involvement in legal cases related to small refinery exemptions; they were selected based on the relevance of their mission to renewable fuel and to the RFS. We identified law firms because of their involvement in legal cases related to small refinery exemptions. Views from the experts and stakeholders we interviewed cannot be generalized to those we did not select and

[2]Three experts declined to be interviewed or did not respond.

interview. We analyzed the information obtained through our interviews with experts and stakeholders to identify common themes.

We then compared the potential sources of hardships with the information collected by agencies and assessed the quality of agency and academic studies that the agencies used in their evaluation of exemption petitions. We compared the information collected by the agencies with internal control standards. We took steps to assess the assumptions underlying EPA's and DOE's evaluation of exemption petitions by examining data on trades for credits used to demonstrate compliance in the program. In particular, we examined the extent to which different-sized market participants paid or received different prices for compliance credits by reviewing data in EPA's Moderated Transaction System from 2013 through May 2021. To assess the reliability of the data, we interviewed officials who maintain the data, and spoke with researchers who had recently used the data, to obtain their views on the reliability of the RIN data, and we tested the data for missing or erroneous values. We found the data to be sufficiently reliable for the purposes of our reporting objectives.

To examine policies and procedures that EPA and DOE use to make decisions about exemptions, we examined documentation and information related to decisions from compliance years 2013 through 2021—that is, from the first year in which refineries applied annually for exemptions through the most recent year for which EPA has made exemption decisions. Specifically, we reviewed documents and information from 198 petitions submitted by small refineries for compliance years 2013 through 2020.[3] We also reviewed DOE scoring analyses and recommendation memorandums and EPA decision memorandums. We also interviewed knowledgeable agency officials.

We did not examine so-called "gap-filling" petitions. In January 2020, the Tenth Circuit Court of Appeals held that EPA had exceeded its statutory authority and had impermissibly granted exemptions when refineries had not received an exemption for all prior years of the RFS program—in other words when there were gaps in a refinery's exemption—although

[3]As previously stated, we did not receive petitions for compliance year 2021 until April 15, 2022, and so were unable to incorporate a complete review of these applications in our analysis.

this holding was later reversed and vacated.[4] Later in 2020, several small refineries submitted petitions asking EPA either to reconsider exemption denials or to grant exemptions for prior years in which the refineries had not sought them to fill their exemption extension "gaps." We did not examine these petitions for two reasons: (1) EPA and DOE's consideration of these "gap-filling petitions" occurred years after their consideration of other petitions for the same compliance years and (2) EPA ultimately denied all of these petitions.[5]

We determined that the control activities and information and communication components of internal control were significant to this objective, along with the underlying principles that management should use quality information to achieve program objectives and document in policies the internal control responsibilities of the organization. We assessed the extent to which EPA and DOE had acquired and used quality information to understand economic hardship for small refineries, as well as to make exemption decisions. We assessed the quality of DOE's 2011 study and the academic studies used, and we assessed information collected by agencies. Additionally, we assessed the extent to which agency procedures were developed with an appropriate level of detail to further define policies and to provide direction for how to carry out processes, including the timing of when activities occur, how to perform follow-up corrective actions if deficiencies are identified, and how management is to effectively monitor activities related to exemptions.

To examine the extent to which decisions about exemptions are timely, we reviewed available information from EPA on when petitions were received from small refineries and sent to DOE, as well as when EPA communicated decisions to small refineries, for compliance years 2013 through 2021. We compared the timing of EPA's decisions to the statutory requirement to make a decision within 90 days of receipt of an exemption petition, and we examined the timing relative to the compliance year, which is the same as a calendar year. We discussed the timing of decisions with the selected experts and industry stakeholders (described above) and with agency officials. We examined

[4]Renewable Fuels Ass'n v. EPA, 948 F.3d 1206, 1253 - 54 (10th Cir. 2020) (rev'd sub nom. HollyFrontier Cheyenne Ref., LLC v. Renewable Fuels Ass'n, 141 S. Ct. 2172 (2021); vacated, No. 18-9533, 2021 WL 8269239 (10th Cir. July 27, 2021)).

[5]These were denied partially because these small refineries had already successfully complied with their RFS obligations many years prior.

data on trades for credits used to demonstrate compliance in the program to analyze how the timing of agency decisions affected the RIN market.

We also determined that the control activities component of internal control was significant to this objective, along with the underlying principle that management should design control activities to achieve objectives and respond to risks. We assessed the design of the program to determine how the timing of EPA's exemption decisions affected RFS program objectives. Specifically, we reviewed program requirements to determine whether EPA designed these taking into consideration how the timing of its decisions affects the amount of renewable fuel blended or the assistance provided to small refineries by exemptions.

We conducted this performance audit from April 2020 to November 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Technical Appendix on Analysis of the Size of Market Participants and Market Volatility

This appendix provides additional information on our analysis of the experience of different-sized participants in the Renewable Fuel Standard's (RFS) Renewable Identification Number (RIN) market and the volatility in that market.

Buyer and Seller Size in the D6 and D4 RIN Markets

We examined whether relatively smaller RIN market participants were disadvantaged in the RIN market by either paying higher prices for RINs or selling RINs at lower prices relative to larger participants.

Methods

We obtained data from the U.S. Environmental Protection Agency (EPA) that contained information on individual trades for biodiesel (D4) and ethanol (D6) RINs from 2013 through 2021. We used data on the price and volume of each RIN trade and on the company buying and the company selling the RIN. The RIN price data were checked for records outside EPA's limits, and those records were removed. We then trimmed the data by removing observations with price more than 90 percent above or below the median daily price. The individual-trade-level data allowed us to observe variation in prices within each day of the data and variation between differently sized market participants.

We wanted to test whether a company's ability to trade at more favorable RIN prices was associated with its RIN trading activity relative to its trading partner, either from the buying or the selling side. Some small refineries may be in a weak bargaining position because the blender or refiner with whom they transact has power to set prices of either RINs or the blending stock. This assumes that relative power is important, rather than absolute size. If a pair of companies have the same "size," big or small, neither is expected to have an advantage. If their size is significantly different, the larger company is more likely to have a market advantage. The measure we use allows for size to affect either the buyer

or seller, regardless of which side of the trade the smaller company is on. We calculated a measure of RIN market participant "size" by using the total number of RINs transacted (either bought or sold, depending on which side of the market the trader was on) in the past 182 days. Then, for each transaction, we calculated the size of the buyer relative to the seller and took logs, thus:

$$relative\ size_{bst} = M_{bst} = \log\left(\frac{\#RINs\ bought\ by\ buyer, b\ in\ the\ previous\ 182\ days}{\#RINs\ sold\ by\ seller, s\ in\ the\ previous\ 182\ days}\right).$$

Our dependent variable was the log of the RIN price for a given trade τ at time t. We used the following model to estimate the effect of large versus small RIN market participants:

$$p_{\tau,t} = \alpha M_{bst} + \beta D_t + \gamma X_{\tau t} + u_{\tau t}\ ;\ \tau = 1, \dots, t_\tau\ t = 1, 2, \dots, T$$

where D_t is a dummy variable for day t; X_t contains other control variables, such as whether the RIN is separated or assigned, and the regulatory category of the buyer and the seller; u_t is a random error term; and, α, β and γ are parameters to be estimated. We used a set of daily fixed effects, to control for any market events that occurred on any day during the sample period, which may have influenced the effect of relative size. When M_{bst} is relatively high (the buyer is large relative to the seller), then this may allow the buyer to negotiate a lower price and, conversely, when M_{bst} is relatively small. If this is the case, we expect an inverse or negative relationship between the trade price and the measure of relative size of the RIN buyer and seller. We only include observations where the RIN year was the same as the year when the trade occurred and when the sell reason code indicated that the trade was standard, spot, or term. As a robustness test, we estimated a second model using only trades for separated—that is, nonassigned—RINs, and a third model using only trades for separated RINs, where both the buyer and seller were in the "Obligated Party" regulatory category. In addition, we estimated these same models with an interaction term for each year with M_{bst} to determine whether the effect of relative company size varied over the sample period.

Results

Our regression results from the individual trade-level data are shown in tables 1 and 2. The results for both D4 and D6 RINs suggest that, on

aggregate during our sample period, large-size traders were able to trade on more favorable terms; this was the case for all three models. The size of the effect varied between D4 and D6 RINs and between the three models in our analysis (see tables 1 and 2). In table 3, we present calculations for the percent effect on RIN prices based on our model parameter estimates. We calculated the change in RIN price that would occur if the buyer-to-seller ratio increased from its 25th percentile value to its 75th percentile. In the D4 RIN market, these effects ranged from -0.2 percent to -0.6 percent, and in the D6 RIN market from -1.2 percent to -1.4 percent. This means, for example, that in the D4 RIN market, the smallest 25 percent of companies were paying (receiving) prices 0.6 percent to 0.2 percent higher (lower) for RINs than the largest 25 percent of companies. Similarly, we performed the same calculation for a larger posited change in the buyer-to-seller ratio, from its 10th percentile value to its 90th percentile value. In the D4 RIN market, these effects ranged from -0.5 percent to -1.5 percent, and in the D6 RIN market from -2.4 percent to -2.9 percent. We used the percentile values based on the trimmed data used in the regression models.[1]

Our model estimates that included year and M_{bst} interactions suggest that the effect of company size varied during the sample period. In the case of the D4 RIN model with assignment code and regulatory category dummies, three of the interaction terms were negative and significant compared with four terms that were positive and significant. In the D6 RIN market, eight of the interaction parameters were significant and negative, with one year-interaction term significant and positive. This suggests that whereas the overall effect of size tends to favor companies that had a larger volume of RIN transactions, this effect varied in size and, in some cases, worked in the opposite direction to our maintained hypothesis, especially in the D4 RIN market.

In conclusion, our analysis of ethanol RIN market trades provides some support for the idea that those companies that, on aggregate, buy and sell larger quantities over the course of the previous 6 months tend to receive higher prices when they sell RINs and pay lower prices when they buy RINs. However, the variation in size and direction of this effect during the

[1] We calculated the percent effect on RIN price of changing from the 25th to the 75th percentile as $\left([M_{75}/M_{25}]^{\beta} - 1\right) * 100$, where M_{25} and M_{75} are the 25th and 75th percentile values of the size of the company, and β is the parameter estimate of the relative size effect. The analogous calculation holds for the change from 10th to 90th percentile effect.

sample period suggests that companies trading larger volume of RINs have an advantage only at certain years in the D4 RIN market, although they appear to have mostly a consistent advantage in the D6 RIN market.

Table 1: Regression Results for the D4 Renewable Identification Number (RIN) Market, 2013–2021

Category	Includes assignment code and regulatory category dummies	Only separated RINs and regulatory category dummies	Only separated RINs and only Obligated Party regulatory category for both seller and buyer
Log of buyer-versus-seller ratio of number of trades in past 182 days	-0.00189***	-0.00113***	-0.00369***
	(0.00000)	(0.00000)	(0.00000)
Assigned RIN	0.0178***	variable excluded	variable excluded
	(0.00000)	variable excluded	variable excluded
Regulatory category (seller), omitted category is RIN owner			
Regulatory category (seller), omitted category is RIN owner: Exporter (seller)	-0.0396***	-0.00445*	variable excluded
	(0.00000)	(0.03803)	variable excluded
Regulatory category (seller), omitted category is RIN owner: Obligated Party (seller)	0.0334***	0.0372***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (seller), omitted category is RIN owner: RIN originator (seller)	0.0484***	0.0267***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (buyer), omitted category is RIN owner			
Regulatory category (buyer), omitted category is RIN owner: Exporter (buyer)	-0.0169***	-0.00795	variable excluded
	(0.00005)	(0.11670)	variable excluded
Regulatory category (buyer), omitted category is RIN owner: Obligated Party (buyer)	-0.0297***	-0.0320***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (buyer), omitted category is RIN owner: RIN originator (buyer)	0.0459***	0.0467***	variable excluded
	(0.00000)	(0.00000)	
R-squared	0.844	0.836	0.871
Observations	456,784	378,631	164,932

Legend: — indicates that the variable was excluded from that model.

Source: GAO analysis of U.S. Environmental Protection Agency data. | GAO-23-105801

Notes: Significance levels - * p<0.10, ** p<0.05, *** p<0.01.The RIN price data were trimmed by deleting observations more than 90 percent above and below the median for that day. Dependent variable is the log of the price of a RIN. All estimates control for daily time effects by including a fixed effects for each day in the sample. Significance levels are in parentheses below the parameter estimates. Robust standard errors are used to calculate the significance levels.

Table 2: Regression Results for the D6 Renewable Identification Number (RIN) Market, 2013–2021

Category	Includes assignment code and regulatory category dummies	Only separated RINs and regulatory category dummies	Only separated RINs and only Obligated Party regulatory category for both seller and buyer
Log of buyer-versus-seller ratio of number of trades in past 182 days	-0.00579***	-0.00623***	-0.00695***
	(0.00000)	(0.00000)	(0.00000)
Assigned RIN	-0.348***	variable excluded	variable excluded
	(0.00000)	variable excluded	variable excluded
Regulatory category (seller), omitted category is RIN owner			
Regulatory category (seller), omitted category is RIN owner: Exporter (seller)	-0.0470***	-0.0617***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (seller), omitted category is RIN owner: Obligated Party (seller)	0.0127***	0.0200***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (seller), omitted category is RIN owner: RIN originator (seller)	-0.0228***	0.0557***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (buyer), omitted category is refiner			
Regulatory category (buyer), omitted category is refiner: Exporter (buyer)	-0.0422***	-0.0384***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (buyer), omitted category is refiner: Obligated Party (buyer)	0.00904***	0.00603***	variable excluded
	(0.00000)	(0.00000)	variable excluded
Regulatory category (buyer), omitted category is refiner: RIN originator (buyer)	-0.0175***	-0.0142***	variable excluded
	(0.00000)	(0.00000)	variable excluded
R-squared	0.925	0.893	0.903
Observations	1281531	1192296	523209

Legend: — indicates that the variable was excluded from that model.

Source: GAO analysis of U.S. Environmental Protection Agency data. | GAO-23-105801

Notes: Significance levels - * p<0.10, ** p<0.05, *** p<0.01.The RIN price data were trimmed by deleting observations more than 90 percent above and below the daily median. Dependent variable is the log of the price of a RIN. All estimates control for daily time effects by including a fixed effects for each day in the sample. Significance levels are in parentheses below the parameter estimates. Robust standard errors are used to calculate the significance levels.

Table 3: Estimated Percent Changes in Renewable Identification Number (RIN) Prices Stemming from Variation in Relative Buyer-versus-Seller Size

Category	Model includes assignment code and regulatory category dummies	Model includes only separated RINs and regulatory category dummies	Model includes only separated RINs and only refiner regulatory category for both seller and buyer
D4 RINs: Percent change in RIN price between 25th and 75th percentile of relative buyer/seller size	-0.3	-0.2	-0.6
D4 RINs: Lower 95% confidence interval (25% to 75% effect)	-0.4	-0.3	-0.8
D4 RINs: Upper 95% confidence interval (25% to 75% effect)	-0.3	-0.1	-0.5
D4 RINs: Percent change in RIN price between 10th and 90th percentile of relative buyer/seller size	-0.8	-0.5	-1.5
D4 RINs: Lower 95% confidence interval (10% to 90% effect)	-0.9	-0.6	-1.9
D4 RINs: Upper 95% confidence interval (10% to 90% effect)	-0.6	-0.3	-1.1
D6 RINs: Percent change in RIN price between 25th and 75th percentile of relative buyer/seller size	-1.2	-1.3	-1.4
D6 RINs: Lower 95% confidence interval (25% to 75% effect)	-1.3	-1.3	-1.5
D6 RINs: Upper 95% confidence interval (25% to 75% effect)	-1.1	-1.2	-1.3
D6 RINs: Percent change in RIN price between 10th and 90th percentile of relative buyer/seller size	-2.4	-2.6	-2.9
D6 RINs: Lower 95% confidence interval (10% to 90% effect)	-2.6	-2.7	-3.1
D6 RINs: Upper 95% confidence interval (10% to 90% effect)	-2.3	-2.5	-2.7

Source: GAO analysis of U.S. Environmental Protection Agency data. | GAO-23-105801

Table 4: Regression Results for the D4 and D6 Renewable Identification Number (RIN) Markets, 2013–2021

Includes assignment code and regulatory category dummies and interaction terms of relative company trades with the calendar year

Category	D4 RINs	D6 RINs
Log of buyer-versus-seller ratio of number of trades in past 182 days interacted with calendar year		
2013	0.00325*	-0.0136***
	(0.01226)	(0.00000)
2014	0.000642	-0.00290***
	(0.27559)	(0.00000)
2015	0.00171*	-0.00516***
	(0.01359)	(0.00000)
2016	0.00656***	-0.00645***
	(0.00000)	(0.00000)
2017	-0.00509***	-0.00158***
	(0.00000)	(0.00018)
2018	-0.0225***	-0.0298***
	(0.00000)	(0.00000)
2019	-0.00375***	0.0101***
	(0.00000)	(0.00000)
2020	0.00576***	-0.00356***
	(0.00000)	(0.00000)
2021	-0.00253	-0.000992*
	(0.13377)	(0.04699)
Assigned RIN	0.0149***	-0.353***
	(0.00000)	(0.00000)
Regulatory category (seller), omitted category is RIN owner		
Exporter (seller)	-0.0369***	-0.0511***
	(0.00000)	(0.00000)
Obligated Party (seller)	0.0363***	0.0130***
	(0.00000)	(0.00000)
RIN originator (seller)	0.0544***	-0.00692
	(0.00000)	(0.07409)
Regulatory category (buyer), omitted category is refiner		

Category	D4 RINs	D6 RINs
Exporter (buyer)	-0.0163***	-0.0420***
	(0.00010)	(0.00000)
Obligated Party (buyer)	-0.0316***	0.00516***
	(0.00000)	(0.00000)
RIN originator (buyer)	0.0431***	-0.0229***
	(0.00000)	(0.00000)
R-squared	0.845	0.926
Observations	456,784	1,281,531

Source: GAO analysis of U.S. Environmental Protection Agency data. | GAO-23-105801

Notes: Significance levels - * p<0.10, ** p<0.05, *** p<0.01.The RIN price data were trimmed by deleting observations more than 90 percent above and below the daily median. Dependent variable is the log of the price of a RIN. Includes interaction of relative company RIN trading size with each year. All estimates control for daily time effects by including a fixed effects for each day in the sample. Significance levels are in parentheses below the parameter estimates. Robust standard errors are used to calculate the significance levels.

Volatility

As noted in our report, we analyzed RIN markets to determine the volatility of RIN prices. We used daily D4 and D6 RIN, ethanol, and other related product market data for the years 2016 to 2021 to analyze price volatility.

Methods

We analyzed daily data for September 2016 to December 2021. We used price data for D4 RIN, D6 RIN, soybean oil, and ethanol prices from Bloomberg; and data on propane, heating oil, gasoline, ultra-low sulfur diesel, and jet fuel prices from the U.S. Energy Information Administration (EIA) to measure and compare price volatility in these markets. We analyzed the “return” to holding an asset and defined our volatility measure as the amount of variation in the asset return. In formal terms, we let P_t represent the market price at time t and p_t represent its natural logarithm. The rate of return is the change in the natural logarithm of the price, thus:

$$r_t = p_t - p_{t-1}, t = 1, \ldots, T.$$[2]

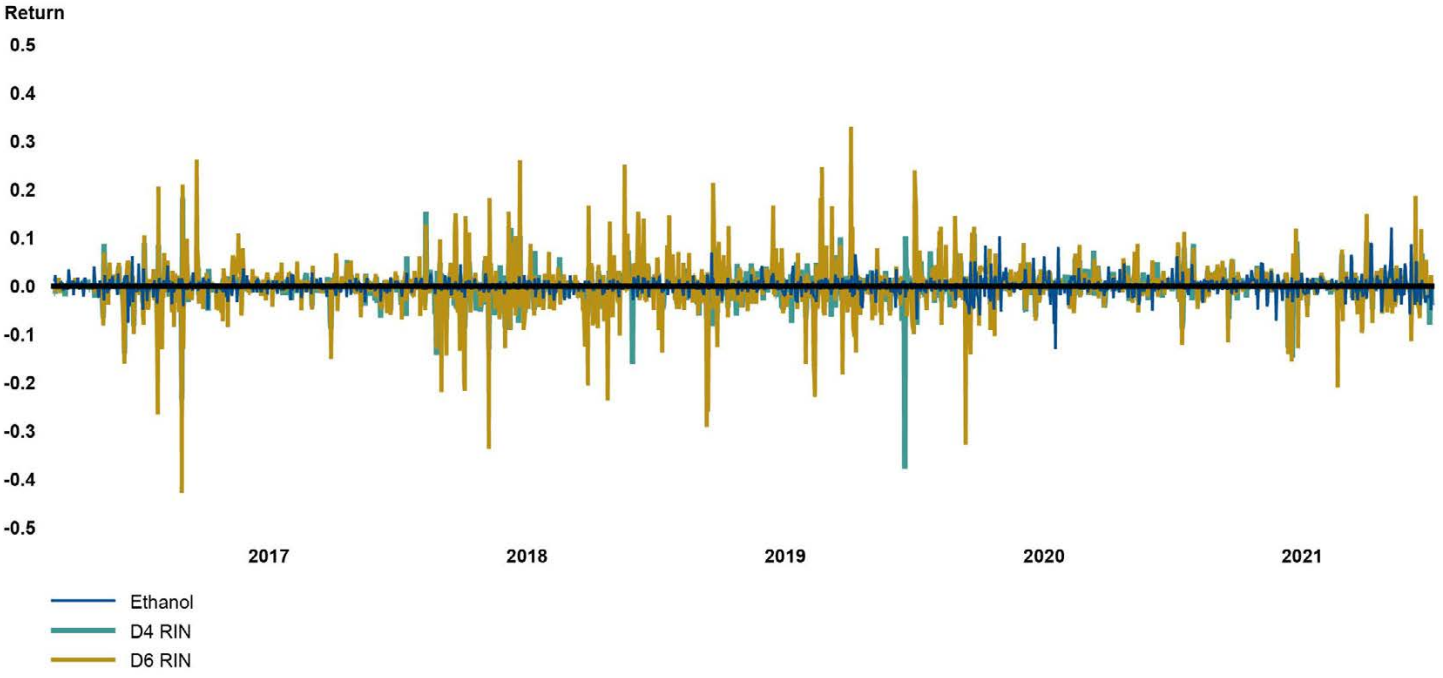
[2] For small returns, this is similar to the percent change in the asset price

Volatility is then defined as the variation or variance in the rate of return, r_t. We used Levene's test, which is robust to nonnormality to test for differences in the unconditional variance between RIN prices and prices of ethanol, and other related products, namely gasoline, heating oil, jet fuel, propane, soybean oil and ultra-low-sulfur diesel.

Results

Figure 5, as an example, compares the returns for D4 and D6 RINs with the returns for ethanol. The figure suggests that the D4 and D6 RIN returns are more volatile compared to those of ethanol; the (unconditional) variance of the D4 and D6 RIN prices series is higher than that of ethanol. Tables 5 and 6 report our pairwise unconditional variance comparison tests, which all rejected the equality of the D4 and D6 RIN variances with those of all the other products in our analysis, with the exception of D4 RINs and propane.

Figure 5: Volatility in Renewable Identification Number (RIN) Prices, 2017-2021



Source: GAO analysis of Bloomberg data. | GAO-23-105801

Table 5: D4 Renewable Identification Number (RIN) Prices—Tests for Equality of Unconditional Variance with Other Related Commodities and Petroleum Products

Product or RIN	Mean	Variance	Levene's F statistic	Levene's p-value
D4 RIN	0.000181	0.000655	NA	NA
Ethanol	0.000334	0.000229	96.24	(0.0000)
Jet fuel	0.000233	0.000416	17.70	(0.0000)
Heating oil	0.000225	0.000296	42.71	(0.0000)
Propane	0.000446	0.000589	0.08	(0.7710)
Ultra low sulfur diesel New York Harbor	0.000225	0.000296	42.71	(0.0000)
Gasoline New York Harbor	0.000242	0.000455	8.86	(0.0029)
Soybean oil (front month future)	0.000259	0.000115	197.20	(0.0000)
Soybean oil (most active future contract)	0.000259	0.000121	194.85	(0.0000)

Source: GAO analysis of Bloomberg and U.S. Energy Information Administration data. | GAO-23-105801

Note: Table reflects daily data from September 1, 2016, to December 31, 2021.

Table 6: D6 Renewable Identification Number (RIN) Prices—Tests for Equality of Unconditional Variance with Other Related Commodities and Petroleum Products

Product or RIN	Mean	Variance	Levene's F statistic	Levene's p-value
D6 RIN	9.66E-05	0.002121	NA	NA
Ethanol	0.000334	0.000229	291.71	(0.0000)
Jet fuel	0.000233	0.000416	181.56	(0.0000)
Heating oil	0.000225	0.000296	227.32	(0.0000)
Propane	0.000446	0.000589	113.90	(0.0000)
Ultra low sulfur diesel New York Harbor	0.000225	0.000296	227.32	(0.0000)
Gasoline New York Harbor	0.000242	0.000455	159.88	(0.0000)
Soybean oil (front month future)	0.000259	0.000115	379.99	(0.0000)
Soybean oil (most active future contract)	0.000259	0.000121	378.54	(0.0000)

Source: GAO analysis of Bloomberg and U.S. Energy Information Administration data. | GAO-23-105801

Note: Table reflects daily data from September 1, 2016, to December 31, 2021.

In conclusion, we found that RIN markets are highly volatile relative to related markets such as ethanol and other petroleum products. This may create more risk and uncertainty, which tends to make business decisions more difficult for market participants, including refiners and blenders of all sizes. The lack of agency adherence to fixed announcement dates regarding, for example, small refinery exemptions decisions and volumetric requirement for renewable fuels under the RFS legislation, likely increased uncertainty and, hence, volatility in the D4 and D6 RIN markets.

Limitations

- Our analysis of volatility is mainly descriptive and compares volatility in RIN markets with that in other related markets. However, this measure of volatility is only the unconditional variance. We did not analyze models of conditional volatility, which may produce different results.
- Our trade-level results may not contain controls for certain factors that might be important. One of these is geographic location of a facility, which could not be obtained on a consistent basis.
- The trade-level analysis used RIN market transaction volumes as a measure of company size. This may be an imperfect measure and may not capture the activities of small versus larger companies. The U.S. Environmental Protection Agency Moderated Transaction

System data do not readily allow consistent tracking of individual companies because of the complex relationship between parent and subsidiary companies and changes in company names and identification numbers over time. Our implicit assumption is that RIN market activity at the company level is an appropriate measure for RIN market power.

- Some of the coefficient estimates using annual dummies interacted with the measure of relative size were not consistent with our hypothesis. There was variation in coefficients across years such that in some cases the coefficients were opposite in sign to that hypothesized. So, whereas overall our estimates suggest that relatively smaller companies are disadvantaged in the RIN market, we cannot rule out the possibility of misspecification because of omitted variables.

Appendix III: How Small Refinery Exemptions Affect Blending of Renewable Fuel into Gasoline and Diesel

This appendix provides information on what is known about how small refinery exemptions affect the amount of renewable fuel that is blended into gasoline and diesel. To provide this overview, we reviewed information from a number of sources. First, we reviewed regulations from the U.S. Environmental Protection Agency (EPA). Second, we reviewed relevant data from EPA, as well as from the U.S. Energy Information Administration (EIA). Third, we summarized the views of a nongeneralizable sample of representatives of refineries, fuel blenders, and renewable fuel groups, as well as experts and agency officials.

Interpretation of Small Refinery Exemptions in the Annual Requirements for Fuel Blending

Small refinery exemptions have effectively reduced the required volume of renewable fuel for a given compliance year because EPA has often granted exemptions for a given compliance year after the applicable annual requirements for fuel blending for that compliance year had been established.

The specific formulas that EPA has used in calculating the renewable fuel percentage standards for each of the renewable fuel categories (total renewable fuel, cellulosic biofuel, biomass-based diesel, and advanced biofuel) start with the annual volume of renewable fuel required by statute, or as reduced under EPA's statutory authority, and apply three factors. These include (1) the projected gasoline and diesel demand for all states and territories where the Renewable Fuel Standard (RFS) applies, (2) renewable fuels projected by EIA to be included in the gasoline and diesel demand, and (3) the amount of gasoline and diesel projected to be produced by exempt small refineries.[1]

[1]40 C.F.R. § 80.1405(c).

Historically, EPA interpreted the terms of the formula referring to the amount of gasoline and diesel projected to be produced by exempted small refineries as the amount that had already been exempted from RFS obligations prior to EPA's issuance of the final rule for the relevant compliance year.

Under its historical approach to calculating the percentage standards, EPA did not account for exemptions granted after setting annual requirements in establishing the percentage standards. Rather, it only accounted for exemptions already granted at the time of the final annual rule. For example, in August 2019, EPA granted 31 small refinery exemptions for the 2018 compliance year after the percentage standards for 2018 had been established.[2] These exemptions reduced the obligated volume of gasoline and diesel for 2018 by 13.42 billion gallons, effectively reducing the required volume of total renewable fuel for 2018 by 1.43 billion Renewable Identification Numbers (RIN).[3]

Extent to which Small Refinery Exemptions Likely Reduce Blending

Because small refinery exemptions have been granted after the annual requirements were set, they have likely reduced blending. According to experts and a representative of a fuel blender, exemptions have reduced the price of RINs, giving less incentive to blend renewable fuel. However, representatives of refineries told us that when exemptions have been granted, those exempted refineries may still have done some blending, or they may have sold their fuels to blenders that blended the fuels with renewable fuel.

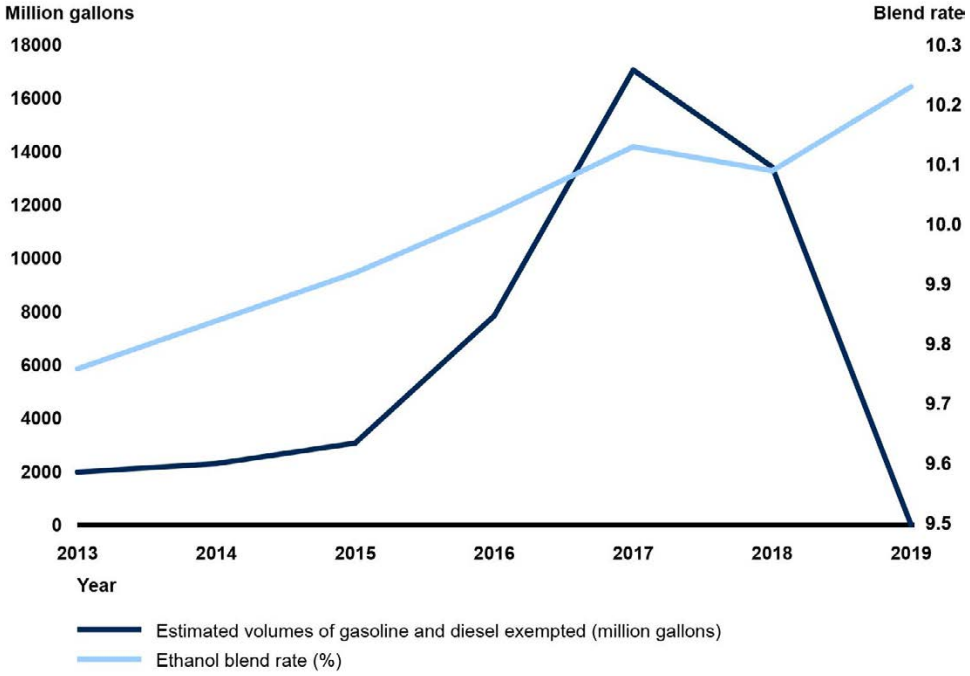
Experts and representatives of refineries that we interviewed agreed that E10 blending is probably unaffected by small refinery exemptions. Data show that the ethanol blend rate has been around 10 percent, and has

[2]In April 2022, EPA retroactively denied these 31 exemptions.

[3]When EPA originally finalized a rule for 2020, it projected exempt volumes based on a 3-year average of the relief recommended by the Department of Energy for 2016 through 2018. Under this approach, the percentage standard for each category of renewable fuel would increase to account for a projection of the exempted volume. EPA has since retroactively altered the 2020 volumes, partially because the COVID-19 pandemic altered the fuel markets that year.

generally increased, since the implementation of the small refinery exemption program.[4] See figure 6.

Figure 6: Ethanol Blend Rate Compared with Estimated Volumes of Gasoline and Diesel Exempted for Small Refineries, 2013–2019



Source: GAO analysis of U.S. Energy Information Administration and U.S. Environmental Protection Agency data. | GAO-23-105801

Accessible Data for Figure 6: Ethanol Blend Rate Compared with Estimated Volumes of Gasoline and Diesel Exempted for Small Refineries, 2013–2019

Year	Blend rate (percentage)	Estimated volume of gasoline and diesel exempted (million gallons)
2013	9.76	1980
2014	9.84	2300
2015	9.92	3070
2016	10.02	7840
2017	10.13	17050
2018	10.09	13420

[4]Data on biodiesel blends are limited, so it is harder to know what is going on with those products in the data.

Year	Blend rate (percentage)	Estimated volume of gasoline and diesel exempted (million gallons)
2019	10.23	0

Note: In April 2022, the U.S. Environmental Protection Agency (EPA) reconsidered and denied 36 2018 small refinery exemptions, 31 of which had previously been granted. EPA did not require that these 31 refineries retroactively comply with the Renewable Fuel Standard (RFS) for compliance year 2018 in the manner EPA had historically required. In June 2022, EPA reconsidered and denied two 2016 exemptions and one 2017 exemption but similarly did not require that these three refineries retroactively comply with the RFS for compliance years 2016 or 2017 in the manner that EPA had historically required. These exempted volumes shown in the figure represent the volumes originally granted for compliance years 2016-2018.

Experts told us that demand for higher ethanol blends and for advanced renewable fuels such as biodiesel is likely diminished by the exemptions. Representatives of refineries told us that these renewable fuels were not significantly affected by exemptions for three reasons: (1) small refinery exemption volumes are small; (2) other factors, such as local market demand and the biodiesel tax credit, play a larger role in determining blending: and (3) the timing of the exemptions late in the compliance year, and uncertainty around getting an exemption, lead refineries to do their best to blend to meet their obligation throughout the year.

Representatives of renewable fuel groups stated that large numbers of exemptions, such as those seen in 2016 through 2018, hurt the renewable fuel industry by exempting volumes that would otherwise have been required to be blended. Representatives of renewable fuel industry groups stated that it would be helpful if EPA issued exemptions first and then set the annual requirements for the following year. This action would lessen the impact on the renewable fuel industry because the annual requirements would be set considering the exemptions.

Appendix IV: Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

October 13, 2022

OFFICE OF
AIR AND RADIATION

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Rusco:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office (GAO)'s draft report, "Renewable Fuel Standard: Actions Needed to Improve Decision-making in the Small Refinery Exemption Program" (GAO-23-104273 & GAO-23-105801) ("Draft Report"). The purpose of this letter is to provide the U.S. Environmental Protection Agency (EPA)'s response to the Draft Report's findings, conclusions, and recommendations. Our response supplements the verbal comments we provided in previous discussions with GAO about its engagement on the small refinery exemption (SRE) program and about GAO's initial conclusions.[1] This response presents a detailed discussion of our most significant concerns. We respectfully request that GAO consider the information we set forth here, which we believe will better inform GAO's understanding of the program. We also request that GAO adjust the Draft Report accordingly before issuing a final report.

At the outset, EPA expresses its appreciation for GAO's significant effort to gain an understanding of a very complex program in a relatively short time and to distill that work into a publicly accessible report. Further, EPA takes GAO's recommendations for improvement very seriously. EPA will, as appropriate, follow up on each of the recommendations as we continue to improve the program. Please see Attachment 1 for our response to the individual recommendations directed to EPA. EPA has also conducted additional analyses to address specific concerns with GAO's analysis. The preliminary results of these analyses are provided in Attachment 2. Given the limited time EPA had to prepare this response to the Draft Report, our final analysis will be available after GAO issues its final report.

GAO's Draft Report describes several conclusions GAO has reached which EPA believes are erroneous and/or unsupported, as explained in more detail below. EPA has especially significant concerns with two statements in GAO's Draft Report. These statements do not accurately reflect the SRE decisions EPA issued in April and June of 2022 ("2022 SRE

[1] These verbal comments were provided on June 13, September 21, September 22, and September 28, 2022.

Decisions"). EPA is concerned that these mischaracterizations, if not corrected, could lead to public misunderstanding of EPA's actions and of the basis for those actions. The two GAO statements that EPA is requesting that GAO reconsider are: (1) GAO's statement that "EPA and DOE (the Department of Energy) do not have sufficient information needed to evaluate exemption petitions"; and (2) GAO's statement that "EPA's conclusion that refineries recover their compliance costs in the prices received for transportation fuels relies on a potentially faulty assumption about whether RIN costs are being passed through to purchasers." Draft Report, pg. 26. These statements do not reflect the facts explained below. EPA respectfully requests that GAO revise its Draft Report to accurately reflect EPA's analysis and supporting documentation.

EPA Response

EPA has reviewed GAO's Draft Report. We provide our detailed comments and concerns here. In general, EPA disagrees with GAO's finding that EPA lacks assurance that its 2022 SRE Decisions are based on valid information. The specific reasons for EPA's disagreement with this finding and EPA's concerns with the methodology GAO applied are described below. In particular, GAO fails to understand the importance of focusing the SRE evaluation on small refinery markets. In addition, GAO's analysis of Renewable Identification Number (RIN) trades suffers from several fundamental flaws. Each of these flaws calls into question the relevance of GAO's analysis for purposes of evaluating whether small refineries suffer disproportionate economic hardship from the RFS, specifically whether small refineries face a higher cost to acquire separated RINs compared to other refineries.

EPA's 2022 SRE Decisions adopted and applied the Agency's interpretation that disproportionate economic hardship must be caused by compliance with the RFS. In doing so, EPA explained this approach in light of its long-standing finding that all obligated parties, including small refineries, recover the cost of acquiring RINs by selling the fuel at the market price, which reflects these RIN costs. EPA further explained that all parties bear the same cost of RFS compliance due to RIN cost pass-through.[2] The 2022 SRE Decisions presented EPA's data and analysis supporting this conclusion, including a discussion of the economic theory supporting RIN cost pass-through and an analysis of how we expect the operations of different market participants to be affected. We analyzed the most current available data (through 2020, including publicly available data from the Energy Information Administration as well as smaller market data submitted by small refinery petitioners) to determine whether the economic theory correctly predicts market behavior, and concluded that it did.[3]

1. EPA does not agree that it lacked sufficient information to evaluate the exemption petitions in the 2022 SRE Decisions.

GAO's statement that EPA and DOE do not have the information necessary to evaluate SRE petitions is fundamentally flawed. It does not account for the scope of review required by the Clean Air Act to evaluate SRE petitions, the notice and comment process that EPA conducted prior to issuing its adjudications, or the information EPA reviewed and evaluated as a result of the

[2] See April 2022 SRE Decision at 29.
[3] See April 2022 SRE Decision at 31-32 and 49.

comments it received.[4] EPA did have the necessary information, evaluated it, and addressed it in its final decisions. EPA also provided this information to DOE and engaged in extensive consultation with DOE on the information before the agencies.

GAO states that EPA's analysis is flawed because it did not assess all fuel markets. Draft Report, pg. 10. This reflects a misunderstanding of the statutory provision governing SREs. The Clean Air Act (CAA, or "the Act") allows a small refinery to petition the Administrator for an exemption from its Renewable Fuel Standard (RFS) obligations "for the reason of disproportionate economic hardship."[5] When evaluating that petition, the Act directs EPA, in consultation with DOE, to consider the findings of the DOE Study and other economic factors. CAA section 211(*o*)(9)(B). EPA therefore evaluates the petition and supporting information submitted by the small refinery, plus all other relevant information, to determine whether a particular small refinery experiences "disproportionate economic hardship" caused by its compliance with its RFS obligations.[6]

Like GAO, EPA puts a high value on ensuring that the information EPA considers is relevant and complete for the Agency's decision making. Furthermore, EPA recognizes that there can be differences in the specific circumstances individual small refineries experience in complying with their RFS obligations.[7] For these reasons, EPA took the additional step of providing a draft decision for public review and publishing a notice in the Federal Register soliciting comments from petitioners and other members of the public as well as any supplemental information regarding EPA's analyses as the Agency adjudicated the pending petitions in 2022. Indeed, EPA invited and encouraged small refineries to share the data that GAO now suggests EPA did not have available to consider (i.e., evidence of RIN cost pass-through, or the lack thereof, in specific markets). 86 Fed. Reg. 70999 (Dec. 14, 2021).[8]

Individual small refineries submitted those data to the Agency in their petitions and in supplemental information. Specifically, small refineries included in their petitions extensive information about the markets in which they compete and presented that information in the form that they believed to most clearly demonstrate the nature of the economic hardship that they perceived in those markets.[9] For example, small refineries provided copies of their actual contracts

[4] *See infra* 86 Fed. Reg. 70999 (Dec. 14, 2021), 87 Fed. Reg. 24300 (Apr. 25, 2022), and 87 Fed. Reg. 34873 (Jun. 8, 2022).
[5] "Small refinery" is defined in the CAA as "a refinery for which the average aggregate daily crude oil throughput for a calendar year … does not exceed 75,000 barrels." Section 211(o)(1)(K).
[6] EPA described the relevant statutory requirements and caselaw in its SRE Decisions. See April 2022 SRE Decision at 12-16.
[7] Some small refineries sell the bulk of their products onto pipelines without any renewable fuel blending, meaning they must buy separated RINs to comply, while other small refineries sell a large fraction of their fuel through their own refinery racks and through terminals where they maintain a position allowing them to blend renewable fuels to acquire RINs. The actual circumstances vary refinery to refinery.
[8] EPA notes that it provided GAO with a similar articulation of our data expectations from small refineries in response to GAO's question, "What, exactly, is EPA looking for to determine whether a small refinery is experiencing disproportionate economic hardship going forward?" However, GAO's Draft Report simply states, "According to EPA officials, they do not know exactly what information refineries would need to submit to inform their evaluations." This statement mischaracterizes EPA's explanation to GAO and, more importantly, it ignores the public notice and comment process EPA undertook and the information that small refineries provided to EPA in their petitions and supplemental comments. See EPA response to GAO's supplemental questions June 27, 2022.
[9] See comments and supplemental materials submitted to Docket ID No. EPA-HQ-OAR-2021-0566.

for the sale of fuel at terminals which showed the price they would receive for their products and how the market price for renewable fuel credits (known as "RINs") related to those contract terms. These contracts revealed the specific posted market price for RINs used in the contract (e.g., the preceding day's OPIS spot price). Notably, very few small refineries claimed that they paid higher prices for separated RINs than larger refineries. Where parties did raise this issue, EPA evaluated the data submitted to substantiate their claims and considered this information in our decisions.[10]

EPA shared with DOE all the data and information that small refineries provided in their petitions and to supplement those petitions, and the two agencies considered the information as described in a memorandum made available to the public.[11] EPA carefully and individually evaluated each of those claims in adjudicating the petitions for the 2022 SRE Decisions, and the small refineries were able to review and comment on EPA's proposed adjudication.

The Draft Report does not properly account for this process. Rather, it presents GAO's conclusion as arising from concerns that EPA's analysis of RIN cost-pass through was not comprehensive. Specifically, the GAO Draft Report states that the multiple analyses and the academic studies EPA considered in reaching the decisions it issued in 2022 do not assess RIN cost pass-through in "all fuel markets." Draft Report, pg. 26. These concerns are misplaced and represent a misunderstanding of the statutory exemption provision as well as of EPA's analysis. First, it is critical to understand that the CAA does not direct EPA to determine whether "disproportionate economic hardship" exists in *all* fuel markets. Rather, EPA's task is to evaluate whether a particular small refinery experiences "disproportionate economic hardship" caused by its compliance with its RFS obligations.[12] Moreover, here, small refineries did in fact submit the very information GAO suggests is needed.[13] While RIN cost pass-through information *from other markets* not served by small refineries is informative as a point of comparison to what we might expect to find in the markets served by small refineries, the absence of information from some fuel markets did not prevent EPA from evaluating the information provided by small refineries from their specific markets.[14] As such, any lack of information from "all fuel markets" is irrelevant to the question of whether EPA and DOE had sufficient information to assess whether an individual small refinery experienced disproportionate economic hardship caused by its compliance with the RFS. For these reasons, EPA has significant concerns with GAO's view that EPA lacked sufficient information to evaluate the exemption petitions. This conclusion fails to acknowledge the statutory directive governing EPA's inquiry in the 2022 SRE Decisions and the fact that EPA had the specific information necessary for its evaluations.

2. EPA disagrees that its 2022 SRE Decisions are based on a faulty assumption about RIN cost pass-through

[10] See, in particular, the CBI appendices to the 2022 SRE Decisions.
[11] See "Memorandum on DOE Consultation from Byron Bunker," in Docket ID No. EPA-HQ-OAR-2021-0566.
[12] See April 2022 SRE Decision at 26-28.
[13] See, in particular, the CBI appendices to the 2022 SRE Decisions. These appendices were made available to GAO.
[14] Id.

EPA also disagrees with GAO's statement that EPA's RIN-cost passthrough analysis is faulty. The basis for GAO's statement appears to be a draft GAO analysis in Appendix II of the Draft Report that attempts to find a relationship between the relative size of two trading partners and the relative price of a RIN. GAO "assumes that relative power is important rather than absolute size. If a pair of companies have the same "size", big or small, neither is expected to have an advantage. If their size is significantly different, the larger company is more likely to have a market advantage." Draft Report, pg. 36. The analysis attempts to quantify this market advantage, the results of which GAO summarizes by saying, "We found that companies that tended to trade lower quantities of RINs (likely smaller refineries) were disadvantaged by either paying more to buy RINs or receiving less when they sell RINs relative to larger refineries from 2013 through 2021. Specifically, we found that for the transactions with the largest differences in size between buyers and sellers, the small party paid or received prices 39 percent higher or lower for RINs on average." Draft Report, pg. 10. The analysis in GAO's Draft Report suggests for example that when the publicly posted RIN prices are $1 small refineries must pay $1.20 to buy RINs and only receive 80 cents when they sell RINs. However, that statement does not hold up to scrutiny. EPA does not believe such a finding by GAO is credible given the size of the purported effect, and the fact that GAO's analysis concludes that the effect changes in direction year-to-year. For example, GAO's analysis finds exactly the opposite effect for D4 RINs for the 2013, 2014, 2015, 2016 and 2020 compliance years when small trading partners inexplicably enjoy an outsize advantage when they trade with companies much larger than them. Draft Report, Table 4 pg. 42-43. In 2016, GAO finds that small parties enjoy a very similar 39% benefit for D4 RINs when they seek out the very largest companies to trade with. In 2019, GAO's draft analysis finds an even bigger effect with small entities enjoying a 68% advantage when trading D6 RINs with the largest companies.[15] Unfortunately for small refineries, if they choose to trade with companies of their same small size, according to the GAO analysis, this benefit disappears. GAO provides no explanation for why these results occur. Absent an explanation for why GAO's analysis gives these results, such findings by GAO from the draft analysis are not credible.

GAO does partially caveat its draft analysis, noting "the variation in size and direction of this effect during the sample period suggests that companies trading larger volume of RINs have an advantage only at certain years in the D4 RIN market, although they appear to have mostly a consistent advantage in the D6 RIN market", Draft Report, pg. 38. However, we think GAO should be more transparent with the reader regarding exactly what the analysis finds in each year of the program. Moreover, GAO should not rely on an analysis as flawed as this one to support the statements it makes. GAO provides no theory to explain why its analysis shows that small RIN market participants are advantaged when buying or selling D4 RINs in more than half of the years it analyzed. We think it is more likely that certain assumptions and simplifications that GAO made in its analysis led to these unexpected and unexplained results. As described below, EPA has conducted its own analysis that corrects the issues we identified to GAO and finds little significant difference in the price that small refineries pay to acquire RINs when compared to the rest of the RIN market and when compared to the 20 largest refiners.

[15] GAO's Draft Report does not present the size of the impacts estimated by GAO's model in the Draft Report. EPA has attempted to quantify them here by using the relative size of the effect GAO reports for the entire period to the size it reports in each of the years.

EPA identified three significant concerns with GAO's draft analysis and raised these concerns to GAO. First, GAO's analysis does not evaluate the cost for small refineries to acquire RINs when compared to the price that other refineries pay. Second, GAO's analysis is not weighted by volume of RINs but rather treats transactions of a single RIN the same as a sale of thousands of RINs. Third, GAO's model forces a symmetric market response assuming the same market characteristics exist when a smaller entity sells RINs compared to when it buys RINs. These three modeling choices by GAO are the basis for an analysis that produces inexplicable results. GAO erred in relying on this fundamentally flawed analysis to conclude that EPA's determination is faulty.

EPA's 2022 SRE Denial Decisions provided detailed analyses of how refineries recover the cost of acquiring RINs by selling the fuel they produce at a market price that reflects these RIN costs, i.e., RIN cost pass-through.[16] As part of this analysis, EPA found that (1) The RFS obligation is the same for every gallon of gasoline and diesel fuel; (2) RINs are generally widely available in an open and liquid market; and (3) The cost of acquiring RINs is the same for all parties.[17] As stated previously, EPA has identified its concerns with GAO's analysis to GAO and explains these concerns in detail here. Further, EPA has conducted additional analyses of the same RIN transaction data that GAO analyzed, and EPA's preliminary results support our conclusions in the 2022 SRE Decisions. Because the price parties pay for RINs is a key element of EPA's RIN-cost passthrough findings, EPA strongly urges GAO to revise its analysis and remove this conclusion to avoid misleading the public.[18]

a. GAO's analysis does not evaluate the cost for small refineries to acquire RINs when compared to the average daily market price

The first issue EPA identified to GAO with the draft analysis is that it does not directly evaluate RIN transactions made by small refineries in comparison to large refineries to evaluate the statutory criterion of whether small refineries face a disproportionately higher cost to acquire RINs to comply with the RFS program when compared to other refineries. Instead, the draft analysis evaluates RIN transactions made by "relatively smaller RIN market participants" when compared "relative to larger participants". Draft Report, pg. 36. In doing so, the GAO draft analysis makes a simplifying assumption that all that matters is the relative size of the company and not the nature of the business the company engages in. Therefore, GAO calculates the relative size of the buyer and seller in RIN transactions without regard to who those market participants are. In fact, there are many RIN market participants that are not petroleum refiners. The result is that through this faulty assumption GAO's analysis overwhelms the data from small refineries with data from a very large number of other market participants including renewable fuel producers, fuel importers and fuel marketers. In fact, more than 98% of the transactions that GAO used to create the results presented in the Draft Report are transactions where neither party in the transaction is

[16] See April 2022 SRE Denial Decision at 28-57.
[17] EPA April 2022 SRE Denial Decision at 29.
[18] EPA respectfully notes that EPA met with GAO on several occasions to raise technical concerns with GAO's draft analysis and asked that GAO update its analysis to address those concerns before finalizing the report. GAO agreed that addressing the concerns would improve the analysis but that, unfortunately, it did not have sufficient time to adjust the analysis. Therefore, EPA addresses the areas of concern with GAO's Draft Report in this written response. EPA/GAO Meetings on September 21, 22, and 28.

a small refinery.[19] As explained above, only small refineries can petition for an exemption from the RFS program. Therefore, any analysis of smaller RIN market participants that are not small refineries as defined by the statute for purposes of the RFS program is not relevant to assessing whether that small refinery would experience "disproportionate economic hardship" from any alleged differences in RIN costs.

As noted above, EPA previously raised this concern with GAO. In response, GAO officials explained that they would have preferred to directly evaluate small refinery RIN transactions, but they understood from EPA program experts that some small refineries do not individually purchase RINs at the facility level but rather acquire RINs at a corporate level, making it impossible to distinguish between RIN purchases associated with a small refinery and RIN purchases made for other larger refineries owned by the same corporate refiner. EPA's understanding of GAO's view is that if GAO cannot evaluate this characteristic for every small refinery, then it should not do so for any small refinery. It is in fact correct that certain large refiners including ExxonMobil, Chevron, and Phillips66, own small refineries and report their compliance at a corporate level. Such a compliance approach does make it impossible to evaluate the RIN prices that those particular small refineries pay, isolated from the prices that the other refineries owned by these large corporations pay. However, the RIN purchases by these large corporations on behalf of the small refineries they own need not be considered in an analysis intended to determine if relative market size of refineries impacts the price paid to acquire RINs as RIN purchases by companies the size of Exxon Mobil, Chevron, and Phillips66 are highly unlikely to reveal that those particular small refineries are unable to buy RINs at market prices. EPA identified to GAO 24 small refineries that transacted RINs on a facility-specific basis which would allow GAO to directly evaluate the specific RIN transactions those small refineries undertook to determine if they in fact paid a higher price to acquire RINs. EPA recommends that GAO update the draft Appendix II analysis to directly evaluate the relative cost for these specific 24 small refineries to acquire RINs rather than rely on an analysis that draws conclusions from data that is overwhelmingly from companies other than small refineries and that do not accurately reflect the price for RINs paid by small refineries.

b. GAO's analysis is not weighted by volume of RINs but rather treats transactions with a single RIN the same as a sale of thousands of RINs

EPA previously recommended that GAO properly weight each transaction based upon the number of RINs transferred in the transaction. This weighting is necessary to accurately determine whether small refineries pay a higher cost to acquire RINs. GAO's draft model is based upon transaction prices weighted equally for all evaluated RIN sales, regardless of the number of RINs sold in a given transaction, which skews the results. This can best be understood with an example. If a refinery needing to acquire 100 RINs purchased 90 RINs for $1 and 10 RINs for $2, that refinery's cost to comply would be $110 with an average RIN price of $1.10. However, GAO's analysis simply averages those two transactions (weights them equally) suggesting that the cost to

[19] GAO's analysis of D6 RINs documented in Appendix II analyzed 1,281,531 D6 RIN transactions between companies of all sizes. During that same time period, the data includes only 22,624 separated D6 RIN transactions by the identified small refineries, which represents only 1.8% of the more than 1.28 million transactions GAO used in its analysis. In response to EPA raising this issue, GAO told EPA that 97% of the small refinery transactions were captured within the 25th percentile of the 1.28 million transactions. However, this would only raise the small refinery prevalence in that subset of the data to six percent, meaning that 94% of the data within that quartile of the data were from transactions not involving small refineries.

comply is $1.50 per RIN rather than $1.10. We do not believe this is appropriate if the intent is to better understand the price small refineries are paying for RINs relative to large refineries (or relative to the average market price) because it inaccurately captures the actual cost of acquiring RINs. EPA recommends that GAO correct for this misleading indicator by weighting each RIN transaction based upon the number of RINs acquired in the transactions. Without this correction, the draft analysis cannot be relied upon to make any conclusions regarding the economic impact of the RFS on small refineries.

c. GAO's model forces a symmetric market response assuming the same market characteristics exist when a smaller entity sells RINs compared to when it buys RINs

GAO's draft model also groups "buy" and "sell" transactions together. This is based on GAO's assumption that if small refineries pay a premium over the average market price to buy RINs, they must also discount the RINs they sell by that exact same amount. If this assumption were accurate, and if for example the discount were 10%, when the market price for RINs is $1 small refineries would sell their RINs for $0.90 and buy RINs at $1.10. GAO's assumption is not supported by the data and its use in the model likely skews GAO's results. Further, GAO could update the analysis to separately consider buy and sell transactions to determine if its assumption is in fact correct. If it is, then a separate evaluation of the buy and sell data will find the same result for both analyses. However, if GAO's assumption is wrong, as EPA believes it is, then artificially enforcing it in the model skews the results as the model tries to fit data with two different responses with a single estimate. Updating the model to separately consider "buy" transactions would be especially important as the very purpose of this analysis is to determine if small refineries face a disproportionately higher cost to acquire (i.e., buy) RINS for RFS compliance.

d. EPA's Assessment Correcting for GAO Deficiencies

Given our very significant concerns with GAO's draft analysis, EPA has conducted additional analyses of the same RIN transaction data that GAO analyzed using an updated approach that addresses the various methodological problems with GAO's draft Appendix II analysis. Preliminary results from EPA's analyses show little significant difference in the estimated prices that small refineries pay to acquire separated RINs when compared to other companies. Specifically, EPA's analysis indicates that small refineries paid 0.8 cents (1.2%) more to acquire D6 RINs and 1.4 cents (1.6%) more to acquire D4 RINs when compared to the average daily market price for RINs. When compared to just the largest twenty refiners, the differences are similarly small at 0.5 cents (0.7%) for D6 RINs and 1.7 cents (2.0%) for D4 RINs. These differences are diminishingly small and may simply reflect noise in the data rather than an actual characteristic of the RIN market. Even if these results do reflect actual economic conditions given the small magnitude of the observed differences, EPA does not think the differences are significant enough to impact an evaluation of potential disproportionate economic hardship by a small refinery. EPA will make the final analysis available as soon as possible after GAO produces its final report. A summary of EPA's methodological approach is provided as Attachment 2 for GAO to consider in updating Appendix II of the Draft Report.

Conclusion

In summary, EPA appreciates GAO's significant effort to understand the SRE program and prepare the Draft Report you have shared with EPA. As described above, EPA has fundamental objections to and very significant concerns with several of the statements in the Draft Report that we believe are not accurate and are not supported by the record or by GAO's draft analysis. EPA does take GAO's recommendations for improvement very seriously and will follow up on each of the recommendations after the final report is issued. Please see Attachment 1 for our response to the individual recommendations directed to EPA. I appreciate the opportunity to be of service and trust the information provided is helpful. If you have further questions, please contact Courtney Herbolsheimer at (202) 564-5767 or *Herbolsheimer.Courtney@epa.gov*.

Sincerely,

Joseph Goffman
Principal Deputy Assistant Administrator

cc: EPA GAO Liaison Team
Sarah Dunham
Benjamin Hengst
Betsy Shaw
Eunjee Koh
Marc Vincent
Tiffany Purifoy
Daniel Hopkins
Sue Perkins
Amir Ingram

Attachment 1: GAO Recommendations and EPA Response

GAO identified seven recommendations in its Draft Report, five for EPA and two for DOE. Each recommendation is presented below with EPA's response.

GAO Recommendation 1: "The Administrator of EPA should reassess EPA's conclusion that all small refineries recover their RFS compliance costs in the price of the gasoline and diesel they sell, including by examining RIN market performance and RIN pass-through in all relevant fuel markets."

EPA Response: EPA disagrees with this recommendation. EPA does not intend to revisit the 2022 SRE Decisions. The decisions have been challenged by multiple parties in the U.S. Court of Appeals for the District of Columbia Circuit, as well as in multiple other circuit courts of appeal, and EPA intends to defend the decisions, which are consistent with the Act and with relevant caselaw, and which are supported by the administrative record.

We understand that GAO's recommendation is focused on the results of the draft analysis in Appendix II of the report. EPA has therefore conducted additional analyses of the same RIN transaction data that GAO analyzed using an updated approach that addresses the various methodological problems with GAO's draft analysis. Preliminary results from EPA's analyses show little significant difference in the price that small refineries pay to acquire separated RINs when compared to other companies. Specifically, EPA's analysis indicates that small refineries paid 0.8 cents (1.2%) more to acquire D6 RINs and 1.4 cents (1.6%) more to acquire D4 RINs when compared to the rest of the industry. When compared to just the largest twenty refiners, the differences are similarly small at 0.5 cents (0.7%) for D6 RINs and 1.7 cents (2.0%) for D4 RINs. These differences are diminishingly small and may simply reflect noise in the data rather than an actual characteristic of the RIN market. Even if these results do reflect actual economic conditions, given the small magnitude of the observed differences EPA does not think the differences are significant enough to impact an evaluation of potential disproportionate economic hardship for a small refinery. EPA will make the final analysis available as soon as possible after GAO produces its final report.[20] A summary of EPA's methodological approach is attached for GAO to consider in updating Appendix II of the Draft Report (see Attachment 2).

Recommendation 2 (directed to DOE)

GAO Recommendation 3: "The Administrator of EPA should identify and communicate what information refineries would need to submit to demonstrate disproportionate economic hardship."

EPA Response: EPA partially agrees with this recommendation. EPA has previously issued guidance about the types of information small refineries should include in their petitions. Then in December 2021, EPA chose to issue a Proposed Denial that served this purpose for the petitions EPA had pending in front of it at that time, providing a robust description of EPA's proposed

[20] Note that EPA's decisions on SRE petitions in 2022 include consideration of the possibility that small refineries may choose to preferentially purchase RINs that have gone through the quality assurance program (so called, QAPed RINs) at a marginally higher cost when compared to the average market price for all RINs.

conclusions and providing small refineries with the ability to provide supplemental information to directly address evidence of economic hardship small refineries may face due to compliance with the RFS program.[21] As evidenced by their submittals, small refineries understood this to include data and contract information to show the relative cost of compliance for refineries that acquire RINs by blending renewable fuels when compared to those that bought separated RINs, data to show whether the small refinery received prices for its refined products that were below the market prices received by other program participants, and analysis to show that the markets in which they operate do, or do not, pass through RFS compliance costs. EPA's new guidance will help make clear that those same kinds of information, updated to reflect the time period covered by the future petitions, are appropriate for future petition evaluations as well. EPA intends to continue to update the guidance it provides for future SRE petitions.

Recommendation 4 (directed to DOE)

GAO Recommendations 5 and 6: "The Administrator of EPA should develop policies and procedures for making small refinery exemption decisions." (5) "The Administrator of EPA should develop policies and procedures to ensure EPA meets statutory deadlines to issue decisions, including tracking when petitions are considered complete." (6)

EPA Response: EPA partially agrees with these recommendations. EPA has policies and procedures in place for making SRE decisions, and for tracking petitions from receipt through completeness determination, as well as through the consultation process with DOE. However, EPA intends to better document its internal processes for receiving petitions, the processes for checking the petitions for completeness and more completely tracking the internal decision making and review steps including coordination with DOE. This improved documentation will also include tracking of these steps to help ensure more timely review.

GAO Recommendation 7: "The Administrator of EPA should assess the effect of small refinery exemption decision timing on the benefit provided to small refineries, as well as the effect on fuel markets, and reconsider petition requirements, such as that of 3 quarters of current year financial information."

EPA Response: EPA partially agrees with this recommendation. We acknowledge that SRE decisions, in particular for the 2016-2018 compliance years, contributed to significant volatility in RIN prices and uncertainty for all program participants due less to the timeliness of the decision and more to the outsize impacts they had on the demand for RINs. To address this, EPA finalized new regulations that applied first for the 2020 compliance year that project SRE volumes and reallocate those volumes to other program participants, helping to ensure a consistent demand for RINs (and the associated renewable fuels) and through that consistent demand, more consistent and predictable RIN prices.

[21] EPA, Proposed RFS Small Refinery Exemption Decision, EPA-420-D-21-001 ("Proposed Denial"); *see also* Notice of Opportunity to Comment on Proposed Denial of Petitions for Small Refinery Exemptions, 86 Fed. Reg. 70,999 (Dec. 14, 2021).

Appendix 2: EPA Moderated Transaction System (EMTS) Price Data Preliminary Analysis

EPA has conducted additional analysis of the EMTS RIN transaction data to compare the prices that 24 specific small refineries paid in acquiring RINs in the period from 2013-2021 with the prices that all RIN market participants paid and the prices that the 20 largest refiners paid. EPA then presents the differences in the prices on a cents per RIN basis and on a percentage basis. EPA's approach obviates the need to create a model to represent the market as the approach instead directly compares the actual sales data reported to EPA by the program participants including the 24 small refineries whose data is reported in a manner that allows EPA to directly consider their transactions alone.

Documented here are the key elements of the analysis along with EPA's preliminary results. We intend to complete this work and more fully document it after GAO issues its final report.

Data Source

The data source for this analysis is the same as that used by GAO, namely Renewable Identification Number (RIN) transactions for separated RINS under the Renewable Fuel Standard as reported to EPA in EPA's Moderated Transaction System (EMTS). Only transactions where the buyer and seller's self-reported prices match are included. The dataset includes transactions from 2013-2021.

Data Filters

This analysis uses a similar set of price filters as those that EPA uses to remove outliers for the RIN price information provided on its public website (https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information). The price filters are:

- 2013 – 2019 RINs with transfer date before January 1, 2020
  - D4 RIN Price – Min. Price: $0.05 & Max. Price: $2.00
  - D6 RIN Price – Min. Price: $0.05* & Max. Price: $2.00
- Any RINs with transfer date after December 31, 2019
  - D4 RIN Price – Min. Price: $0.05 & Max. Price: $3.00
  - D6 RIN Price – Min. Price: $0.05 & Max. Price: $3.00

*The Min. D6 price is changed from $0.01 to $0.05 so that all the minimum prices for all the years are equal. While D6 RIN prices at or below $0.05 were prevalent in the early years of the program from 2010-2012, in the time period of this analysis D6 RIN prices were consistently above $0.05.

EPA also removed any transactions with a sell reason code that indicated that the transactions was a "Remedial Action - Incorrect Trade" (Code 80).

Daily Average Market Price

EPA calculated daily average market prices for each day when RINs were traded. Separate daily prices were calculated for each fuel code (D4, D6) and RIN vintage. To calculate these daily average prices EPA weighted the prices from each transaction by the quantity of RINs traded in that transaction.

Small Refineries

EPA used a list of 24 small refineries that purchased RINs on a facility basis. All of these small refineries have petitioned EPA for an exemption in at least one year of the program.

RIN Prices for small refineries

EPA calculated the daily average price for each day when small refineries purchased RINs. Separate daily prices were calculated for each fuel code (D4, D6) and RIN vintage. EPA weighted the prices from each transaction by the quantity of RINs traded. The average market prices from the same day, fuel code and vintage were then subtracted from the daily average prices paid by small refineries. These daily differences in prices were then summarized for all years from 2013-2021 using an average weighted by the quantity of RINS. A percent difference in these averages was also calculated.

The table below summarizes EPA's preliminary results showing the average difference in price paid by small refineries relative to the average daily market price relative to the entire RIN market and then separately relative to just the largest 20 refiners.

Size of refinery	Fuel Code	Difference in price per RIN ($)	Difference in price per RIN (%)	Trades (#)	RINs (#)
Small relative to market	4	$0.014	1.6%	5,799	814,945,040
Small relative to market	6	$0.008	1.2%	16,806	2,233,659,957
Small relative to largest refiners	4	$0.017	2.0%	5,799	814,945,040
Small relative to largest refiners	6	$0.005	0.7%	16,806	2,233,659,957

Accessible Text for Appendix IV: Comments from the Environmental Protection Agency

October 13, 2022

OFFICE OF AIR AND RADIATION

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Rusco:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office (GAO)'s draft report, "Renewable Fuel Standard: Actions Needed to Improve Decision-making in the Small Refinery Exemption Program" (GAO-23-104273 & GAO- 23-105801) ("Draft Report"). The purpose of this letter is to provide the U.S. Environmental Protection Agency (EPA)'s response to the Draft Report's findings, conclusions, and recommendations. Our response supplements the verbal comments we provided in previous discussions with GAO about its engagement on the small refinery exemption (SRE) program and about GAO's initial conclusions.[1] This response presents a detailed discussion of our most significant concerns. We respectfully request that GAO consider the information we set forth here, which we believe will better inform GAO's understanding of the program. We also request that GAO adjust the Draft Report accordingly before issuing a final report.

At the outset, EPA expresses its appreciation for GAO's significant effort to gain an understanding of a very complex program in a relatively short time and to distill that work into a publicly accessible report. Further, EPA takes GAO's recommendations for improvement very seriously. EPA will, as appropriate, follow up on each of the recommendations as we continue to improve the program. Please see Attachment 1 for our response to the individual recommendations directed to EPA. EPA has also conducted additional analyses to address specific concerns with GAO's analysis.

[1] These verbal comments were provided on June 13, September 21, September 22, and September 28, 2022.

The preliminary results of these analyses are provided in Attachment 2. Given the limited time EPA had to prepare this response to the Draft Report, our final analysis will be available after GAO issues its final report.

GAO's Draft Report describes several conclusions GAO has reached which EPA believes are erroneous and/or unsupported, as explained in more detail below. EPA has especially significant concerns with two statements in GAO's Draft Report. These statements do not accurately reflect the SRE decisions EPA issued in April and June of 2022 ("2022 SRE Decisions"). EPA is concerned that these mischaracterizations, if not corrected, could lead to public misunderstanding of EPA's actions and of the basis for those actions. The two GAO statements that EPA is requesting that GAO reconsider are: (1) GAO's statement that "EPA and DOE (the Department of Energy) do not have sufficient information needed to evaluate exemption petitions"; and (2) GAO's statement that "EPA's conclusion that refineries recover their compliance costs in the prices received for transportation fuels relies on a potentially faulty assumption about whether RIN costs are being passed through to purchasers." Draft Report, pg. 26. These statements do not reflect the facts explained below. EPA respectfully requests that GAO revise its Draft Report to accurately reflect EPA's analysis and supporting documentation.

EPA Response

EPA has reviewed GAO's Draft Report. We provide our detailed comments and concerns here. In general, EPA disagrees with GAO's finding that EPA lacks assurance that its 2022 SRE Decisions are based on valid information. The specific reasons for EPA's disagreement with this finding and EPA's concerns with the methodology GAO applied are described below. In particular, GAO fails to understand the importance of focusing the SRE evaluation on small refinery markets. In addition, GAO's analysis of Renewable Identification Number (RIN) trades suffers from several fundamental flaws. Each of these flaws calls into question the relevance of GAO's analysis for purposes of evaluating whether small refineries suffer disproportionate economic hardship from the RFS, specifically whether small refineries face a higher cost to acquire separated RINs compared to other refineries.

EPA's 2022 SRE Decisions adopted and applied the Agency's interpretation that disproportionate economic hardship must be caused by compliance with the RFS. In doing so, EPA explained this approach in light of its long-standing finding that all obligated parties, including small refineries, recover the cost of acquiring RINs by selling the fuel at the market price, which reflects these RIN costs. EPA further explained that all parties bear the same cost of RFS compliance due to RIN cost pass-through.[2] The 2022 SRE Decisions presented EPA's data and analysis

[2] See April 2022 SRE Decision at 29.

supporting this conclusion, including a discussion of the economic theory supporting RIN cost pass-through and an analysis of how we expect the operations of different market participants to be affected. We analyzed the most current available data (through 2020, including publicly available data from the Energy Information Administration as well as smaller market data submitted by small refinery petitioners) to determine whether the economic theory correctly predicts market behavior, and concluded that it did.[3]

1. **EPA does not agree that it lacked sufficient information to evaluate the exemption petitions in the 2022 SRE Decisions.**

GAO's statement that EPA and DOE do not have the information necessary to evaluate SRE petitions is fundamentally flawed. It does not account for the scope of review required by the Clean Air Act to evaluate SRE petitions, the notice and comment process that EPA conducted prior to issuing its adjudications, or the information EPA reviewed and evaluated as a result of the comments it received.[4] EPA did have the necessary information, evaluated it, and addressed it in its final decisions. EPA also provided this information to DOE and engaged in extensive consultation with DOE on the information before the agencies.

GAO states that EPA's analysis is flawed because it did not assess all fuel markets. Draft Report, pg. 10. This reflects a misunderstanding of the statutory provision governing SREs. The Clean Air Act (CAA, or "the Act") allows a small refinery to petition the Administrator for an exemption from its Renewable Fuel Standard (RFS) obligations "for the reason of disproportionate economic hardship."[5] When evaluating that petition, the Act directs EPA, in consultation with DOE, to consider the findings of the DOE Study and other economic factors. CAA section 211(o)(9)(B). EPA therefore evaluates the petition and supporting information submitted by the small refinery, plus all other relevant information, to determine whether a particular small refinery experiences "disproportionate economic hardship" caused by its compliance with its RFS obligations.[6]

[3] See April 2022 SRE Decision at 31-32 and 49

[4] See infra 86 Fed. Reg. 70999 (Dec. 14, 2021), 87 Fed. Reg. 24300 (Apr. 25, 2022), and 87 Fed. Reg. 34873 (Jun. 8, 2022).

[5] "Small refinery" is defined in the CAA as "a refinery for which the average aggregate daily crude oil throughput for a calendar year … does not exceed 75,000 barrels." Section 211(o)(1)(K).

[6] EPA described the relevant statutory requirements and caselaw in its SRE Decisions. See April 2022 SRE Decision at 12-16.

Like GAO, EPA puts a high value on ensuring that the information EPA considers is relevant and complete for the Agency's decision making. Furthermore, EPA recognizes that there can be differences in the specific circumstances individual small refineries experience in complying with their RFS obligations.[7] For these reasons, EPA took the additional step of providing a draft decision for public review and publishing a notice in the Federal Register soliciting comments from petitioners and other members of the public as well as any supplemental information regarding EPA's analyses as the Agency adjudicated the pending petitions in 2022. Indeed, EPA invited and encouraged small refineries to share the data that GAO now suggests EPA did not have available to consider (i.e., evidence of RIN cost pass-through, or the lack thereof, in specific markets). 86 Fed. Reg. 70999 (Dec. 14, 2021).[8]

Individual small refineries submitted those data to the Agency in their petitions and in supplemental information. Specifically, small refineries included in their petitions extensive information about the markets in which they compete and presented that information in the form that they believed to most clearly demonstrate the nature of the economic hardship that they perceived in those markets.[9] For example, small refineries provided copies of their actual contracts for the sale of fuel at terminals which showed the price they would receive for their products and how the market price for renewable fuel credits (known as "RINs") related to those contract terms. These contracts revealed the specific posted market price for RINs used in the contract (e.g., the preceding day's OPIS spot price). Notably, very few small refineries claimed that they paid higher prices for separated RINs than larger refineries. Where parties did raise this issue, EPA evaluated the data submitted to substantiate their claims and considered this information in our decisions.[10]

[7] Some small refineries sell the bulk of their products onto pipelines without any renewable fuel blending, meaning they must buy separated RINs to comply, while other small refineries sell a large fraction of their fuel through their own refinery racks and through terminals where they maintain a position allowing them to blend renewable fuels to acquire RINs. The actual circumstances vary refinery to refinery.

[8] EPA notes that it provided GAO with a similar articulation of our data expectations from small refineries in response to GAO's question, "What, exactly, is EPA looking for to determine whether a small refinery is experiencing disproportionate economic hardship going forward?" However, GAO's Draft Report simply states, "According to EPA officials, they do not know exactly what information refineries would need to submit to inform their evaluations." This statement mischaracterizes EPA's explanation to GAO and, more importantly, it ignores the public notice and comment process EPA undertook and the information that small refineries provided to EPA in their petitions and supplemental comments. See EPA response to GAO's supplemental questions June 27, 2022.

[9] See comments and supplemental materials submitted to Docket ID No. EPA-HQ-OAR-2021-0566.

[10] See, in particular, the CBI appendices to the 2022 SRE Decisions.

EPA shared with DOE all the data and information that small refineries provided in their petitions and to supplement those petitions, and the two agencies considered the information as described in a memorandum made available to the public.[11] EPA carefully and individually evaluated each of those claims in adjudicating the petitions for the 2022 SRE Decisions, and the small refineries were able to review and comment on EPA's proposed adjudication.

The Draft Report does not properly account for this process. Rather, it presents GAO's conclusion as arising from concerns that EPA's analysis of RIN cost-pass through was not comprehensive. Specifically, the GAO Draft Report states that the multiple analyses and the academic studies EPA considered in reaching the decisions it issued in 2022 do not assess RIN cost pass-through in "all fuel markets." Draft Report, pg. 26. These concerns are misplaced and represent a misunderstanding of the statutory exemption provision as well as of EPA's analysis. First, it is critical to understand that the CAA does not direct EPA to determine whether "disproportionate economic hardship" exists in all fuel markets. Rather, EPA's task is to evaluate whether a particular small refinery experiences "disproportionate economic hardship" caused by its compliance with its RFS obligations.[12] Moreover, here, small refineries did in fact submit the very information GAO suggests is needed.[13] While RIN cost pass-through information from other markets not served by small refineries is informative as a point of comparison to what we might expect to find in the markets served by small refineries, the absence of information from some fuel markets did not prevent EPA from evaluating the information provided by small refineries from their specific markets.[14] As such, any lack of information from "all fuel markets" is irrelevant to the question of whether EPA and DOE had sufficient information to assess whether an individual small refinery experienced disproportionate economic hardship caused by its compliance with the RFS. For these reasons, EPA has significant concerns with GAO's view that EPA lacked sufficient information to evaluate the exemption petitions. This conclusion fails to acknowledge the statutory directive governing EPA's inquiry in the 2022 SRE Decisions and the fact that EPA had the specific information necessary for its evaluations.

[11] See "Memorandum on DOE Consultation from Byron Bunker," in Docket ID No. EPA-HQ-OAR-2021-0566.

[12] See April 2022 SRE Decision at 26-28.

[13] See, in particular, the CBI appendices to the 2022 SRE Decisions. These appendices were made available to GAO.

[14] Id.

2. EPA disagrees that its 2022 SRE Decisions are based on a faulty assumption about RIN cost pass-through

EPA also disagrees with GAO's statement that EPA's RIN-cost passthrough analysis is faulty. The basis for GAO's statement appears to be a draft GAO analysis in Appendix II of the Draft Report that attempts to find a relationship between the relative size of two trading partners and the relative price of a RIN. GAO "assumes that relative power is important rather than absolute size. If a pair of companies have the same "size", big or small, neither is expected to have an advantage. If their size is significantly different, the larger company is more likely to have a market advantage." Draft Report, pg. 36. The analysis attempts to quantify this market advantage, the results of which GAO summarizes by saying, "We found that companies that tended to trade lower quantities of RINs (likely smaller refineries) were disadvantaged by either paying more to buy RINs or receiving less when they sell RINs relative to larger refineries from 2013 through 2021. Specifically, we found that for the transactions with the largest differences in size between buyers and sellers, the small party paid or received prices 39 percent higher or lower for RINs on average." Draft Report, pg. 10. The analysis in GAO's Draft Report suggests for example that when the publicly posted RIN prices are $1 small refineries must pay $1.20 to buy RINs and only receive 80 cents when they sell RINs. However, that statement does not hold up to scrutiny. EPA does not believe such a finding by GAO is credible given the size of the purported effect, and the fact that GAO's analysis concludes that the effect changes in direction year-to-year. For example, GAO's analysis finds exactly the opposite effect for D4 RINs for the 2013, 2014, 2015, 2016 and 2020 compliance years when small trading partners inexplicably enjoy an outsize advantage when they trade with companies much larger than them. Draft Report, Table 4 pg. 42-43. In 2016, GAO finds that small parties enjoy a very similar 39% benefit for D4 RINs when they seek out the very largest companies to trade with. In 2019, GAO's draft analysis finds an even bigger effect with small entities enjoying a 68% advantage when trading D6 RINs with the largest companies.[15] Unfortunately for small refineries, if they choose to trade with companies of their same small size, according to the GAO analysis, this benefit disappears. GAO provides no explanation for why these results occur. Absent an explanation for why GAO's analysis gives these results, such findings by GAO from the draft analysis are not credible.

GAO does partially caveat its draft analysis, noting "the variation in size and direction of this effect during the sample period suggests that companies trading larger volume of RINs have an advantage only at certain years in the D4 RIN market,

[15] GAO's Draft Report does not present the size of the impacts estimated by GAO's model in the Draft Report. EPA has attempted to quantify them here by using the relative size of the effect GAO reports for the entire period to the size it reports in each of the years.

although they appear to have mostly a consistent advantage in the D6 RIN market", Draft Report, pg. 38. However, we think GAO should be more transparent with the reader regarding exactly what the analysis finds in each year of the program. Moreover, GAO should not rely on an analysis as flawed as this one to support the statements it makes. GAO provides no theory to explain why its analysis shows that small RIN market participants are advantaged when buying or selling D4 RINs in more than half of the years it analyzed. We think it is more likely that certain assumptions and simplifications that GAO made in its analysis led to these unexpected and unexplained results. As described below, EPA has conducted its own analysis that corrects the issues we identified to GAO and finds little significant difference in the price that small refineries pay to acquire RINs when compared to the rest of the RIN market and when compared to the 20 largest refiners.

EPA identified three significant concerns with GAO's draft analysis and raised these concerns to GAO. First, GAO's analysis does not evaluate the cost for small refineries to acquire RINs when compared to the price that other refineries pay. Second, GAO's analysis is not weighted by volume of RINs but rather treats transactions of a single RIN the same as a sale of thousands of RINs. Third, GAO's model forces a symmetric market response assuming the same market characteristics exist when a smaller entity sells RINs compared to when it buys RINs. These three modeling choices by GAO are the basis for an analysis that produces inexplicable results. GAO erred in relying on this fundamentally flawed analysis to conclude that EPA's determination is faulty.

EPA's 2022 SRE Denial Decisions provided detailed analyses of how refineries recover the cost of acquiring RINs by selling the fuel they produce at a market price that reflects these RIN costs, i.e., RIN cost pass-through.[16] As part of this analysis, EPA found that (1) The RFS obligation is the same for every gallon of gasoline and diesel fuel; (2) RINs are generally widely available in an open and liquid market; and (3) The cost of acquiring RINs is the same for all parties.[17] As stated previously, EPA has identified its concerns with GAO's analysis to GAO and explains these concerns in detail here. Further, EPA has conducted additional analyses of the same RIN transaction data that GAO analyzed, and EPA's preliminary results support our conclusions in the 2022 SRE Decisions. Because the price parties pay for RINs is a

[16] See April 2022 SRE Denial Decision at 28-57.

[17] EPA April 2022 SRE Denial Decision at 29.

key element of EPA's RIN-cost passthrough findings, EPA strongly urges GAO to revise its analysis and remove this conclusion to avoid misleading the public.[18]

a. GAO's analysis does not evaluate the cost for small refineries to acquire RINs when compared to the average daily market price

The first issue EPA identified to GAO with the draft analysis is that it does not directly evaluate RIN transactions made by small refineries in comparison to large refineries to evaluate the statutory criterion of whether small refineries face a disproportionately higher cost to acquire RINs to comply with the RFS program when compared to other refineries. Instead, the draft analysis evaluates RIN transactions made by "relatively smaller RIN market participants" when compared "relative to larger participants". Draft Report, pg. 36. In doing so, the GAO draft analysis makes a simplifying assumption that all that matters is the relative size of the company and not the nature of the business the company engages in. Therefore, GAO calculates the relative size of the buyer and seller in RIN transactions without regard to who those market participants are. In fact, there are many RIN market participants that are not petroleum refiners. The result is that through this faulty assumption GAO's analysis overwhelms the data from small refineries with data from a very large number of other market participants including renewable fuel producers, fuel importers and fuel marketers. In fact, more than 98% of the transactions that GAO used to create the results presented in the Draft Report are transactions where neither party in the transaction is a small refinery.[19] As explained above, only small refineries can petition for an exemption from the RFS program. Therefore, any analysis of smaller RIN market participants that are not small refineries as defined by the statute for purposes of the RFS program is not relevant to assessing whether that small refinery would experience "disproportionate economic hardship" from any alleged differences in RIN costs.

[18] EPA respectfully notes that EPA met with GAO on several occasions to raise technical concerns with GAO's draft analysis and asked that GAO update its analysis to address those concerns before finalizing the report. GAO agreed that addressing the concerns would improve the analysis but that, unfortunately, it did not have sufficient time to adjust the analysis. Therefore, EPA addresses the areas of concern with GAO's Draft Report in this written response. EPA/GAO Meetings on September 21, 22, and 28.

[19] GAO's analysis of D6 RINs documented in Appendix II analyzed 1,281,531 D6 RIN transactions between companies of all sizes. During that same time period, the data includes only 22,624 separated D6 RIN transactions by the identified small refineries, which represents only 1.8% of the more than 1.28 million transactions GAO used in its analysis. In response to EPA raising this issue, GAO told EPA that 97% of the small refinery transactions were captured within the 25th percentile of the 1.28 million transactions. However, this would only raise the small refinery prevalence in that subset of the data to six percent, meaning that 94% of the data within that quartile of the data were from transactions not involving small refineries.

As noted above, EPA previously raised this concern with GAO. In response, GAO officials explained that they would have preferred to directly evaluate small refinery RIN transactions, but they understood from EPA program experts that some small refineries do not individually purchase RINs at the facility level but rather acquire RINs at a corporate level, making it impossible to distinguish between RIN purchases associated with a small refinery and RIN purchases made for other larger refineries owned by the same corporate refiner. EPA's understanding of GAO's view is that if GAO cannot evaluate this characteristic for every small refinery, then it should not do so for any small refinery. It is in fact correct that certain large refiners including ExxonMobil, Chevron, and Phillips66, own small refineries and report their compliance at a corporate level. Such a compliance approach does make it impossible to evaluate the RIN prices that those particular small refineries pay, isolated from the prices that the other refineries owned by these large corporations pay. However, the RIN purchases by these large corporations on behalf of the small refineries they own need not be considered in an analysis intended to determine if relative market size of refineries impacts the price paid to acquire RINs as RIN purchases by companies the size of Exxon Mobil, Chevron, and Phillips66 are highly unlikely to reveal that those particular small refineries are unable to buy RINs at market prices. EPA identified to GAO 24 small refineries that transacted RINs on a facility-specific basis which would allow GAO to directly evaluate the specific RIN transactions those small refineries undertook to determine if they in fact paid a higher price to acquire RINs. EPA recommends that GAO update the draft Appendix II analysis to directly evaluate the relative cost for these specific 24 small refineries to acquire RINs rather than rely on an analysis that draws conclusions from data that is overwhelmingly from companies other than small refineries and that do not accurately reflect the price for RINs paid by small refineries.

b. GAO's analysis is not weighted by volume of RINs but rather treats transactions with a single RIN the same as a sale of thousands of RINs

EPA previously recommended that GAO properly weight each transaction based upon the number of RINs transferred in the transaction. This weighting is necessary to accurately determine whether small refineries pay a higher cost to acquire RINs. GAO's draft model is based upon transaction prices weighted equally for all evaluated RIN sales, regardless of the number of RINs sold in a given transaction, which skews the results. This can best be understood with an example. If a refinery needing to acquire 100 RINs purchased 90 RINs for $1 and 10 RINs for $2, that refinery's cost to comply would be $110 with an average RIN price of $1.10. However, GAO's analysis simply averages those two transactions (weights them equally) suggesting that the cost to comply is $1.50 per RIN rather than $1.10. We do not believe this is appropriate if the intent is to better understand the price small refineries are paying for RINs relative to large refineries (or relative to the average market price) because it inaccurately captures the actual cost of acquiring RINs. EPA

recommends that GAO correct for this misleading indicator by weighting each RIN transaction based upon the number of RINs acquired in the transactions. Without this correction, the draft analysis cannot be relied upon to make any conclusions regarding the economic impact of the RFS on small refineries.

c. GAO's model forces a symmetric market response assuming the same market characteristics exist when a smaller entity sells RINs compared to when it buys RINs

GAO's draft model also groups "buy" and "sell" transactions together. This is based on GAO's assumption that if small refineries pay a premium over the average market price to buy RINs, they must also discount the RINs they sell by that exact same amount. If this assumption were accurate, and if for example the discount were 10%, when the market price for RINs is $1 small refineries would sell their RINs for $0.90 and buy RINs at $1.10. GAO's assumption is not supported by the data and its use in the model likely skews GAO's results. Further, GAO could update the analysis to separately consider buy and sell transactions to determine if its assumption is in fact correct. If it is, then a separate evaluation of the buy and sell data will find the same result for both analyses. However, if GAO's assumption is wrong, as EPA believes it is, then artificially enforcing it in the model skews the results as the model tries to fit data with two different responses with a single estimate. Updating the model to separately consider "buy" transactions would be especially important as the very purpose of this analysis is to determine if small refineries face a disproportionately higher cost to acquire (i.e., buy) RINS for RFS compliance.

d. EPA's Assessment Correcting for GAO Deficiencies

Given our very significant concerns with GAO's draft analysis, EPA has conducted additional analyses of the same RIN transaction data that GAO analyzed using an updated approach that addresses the various methodological problems with GAO's draft Appendix II analysis. Preliminary results from EPA's analyses show little significant difference in the estimated prices that small refineries pay to acquire separated RINs when compared to other companies. Specifically, EPA's analysis indicates that small refineries paid 0.8 cents (1.2%) more to acquire D6 RINs and 1.4 cents (1.6%) more to acquire D4 RINs when compared to the average daily market price for RINs. When compared to just the largest twenty refiners, the differences are similarly small at 0.5 cents (0.7%) for D6 RINs and 1.7 cents (2.0%) for D4 RINs. These differences are diminishingly small and may simply reflect noise in the data rather than an actual characteristic of the RIN market. Even if these results do reflect actual economic conditions given the small magnitude of the observed differences, EPA does not think the differences are significant enough to impact an evaluation of potential disproportionate economic hardship by a small refinery. EPA will make the final analysis available as soon as possible after GAO produces its final report. A

summary of EPA's methodological approach is provided as Attachment 2 for GAO to consider in updating Appendix II of the Draft Report.

Conclusion

In summary, EPA appreciates GAO's significant effort to understand the SRE program and prepare the Draft Report you have shared with EPA. As described above, EPA has fundamental objections to and very significant concerns with several of the statements in the Draft Report that we believe are not accurate and are not supported by the record or by GAO's draft analysis. EPA does take GAO's recommendations for improvement very seriously and will follow up on each of the recommendations after the final report is issued. Please see Attachment 1 for our response to the individual recommendations directed to EPA. I appreciate the opportunity to be of service and trust the information provided is helpful. If you have further questions, please contact Courtney Herbolsheimer at (202) 564-5767 or *Herbolsheimer.Courtney@epa.gov*.

Sincerely,

Joseph Goffman
Principal Deputy Assistant Administrator

cc: EPA GAO Liaison Team
Sarah Dunham
Benjamin Hengst
Betsy Shaw
Eunjee Koh
Marc Vincent
Tiffany Purifoy
Daniel Hopkins
Sue Perkins
Amir Ingram

Attachment 1: GAO Recommendations and EPA Response

GAO identified seven recommendations in its Draft Report, five for EPA and two for DOE. Each recommendation is presented below with EPA's response.

GAO Recommendation 1: "The Administrator of EPA should reassess EPA's conclusion that all small refineries recover their RFS compliance costs in the price of the gasoline and diesel they sell, including by examining RIN market performance and RIN pass-through in all relevant fuel markets."

EPA Response: EPA disagrees with this recommendation. EPA does not intend to revisit the 2022 SRE Decisions. The decisions have been challenged by multiple parties in the U.S. Court of Appeals for the District of Columbia Circuit, as well as in multiple other circuit courts of appeal, and EPA intends to defend the decisions, which are consistent with the Act and with relevant caselaw, and which are supported by the administrative record.

We understand that GAO's recommendation is focused on the results of the draft analysis in Appendix II of the report. EPA has therefore conducted additional analyses of the same RIN transaction data that GAO analyzed using an updated approach that addresses the various methodological problems with GAO's draft analysis. Preliminary results from EPA's analyses show little significant difference in the price that small refineries pay to acquire separated RINs when compared to other companies. Specifically, EPA's analysis indicates that small refineries paid 0.8 cents (1.2%) more to acquire D6 RINs and 1.4 cents (1.6%) more to acquire D4 RINs when compared to the rest of the industry. When compared to just the largest twenty refiners, the differences are similarly small at 0.5 cents (0.7%) for D6 RINs and 1.7 cents (2.0%) for D4 RINs. These differences are diminishingly small and may simply reflect noise in the data rather than an actual characteristic of the RIN market. Even if these results do reflect actual economic conditions, given the small magnitude of the observed differences EPA does not think the differences are significant enough to impact an evaluation of potential disproportionate economic hardship for a small refinery. EPA will make the final analysis available as soon as possible after GAO produces its final report.[20] A summary of EPA's methodological approach is attached for GAO to consider in updating Appendix II of the Draft Report (see Attachment 2).

Recommendation 2 (directed to DOE)

[20] Note that EPA's decisions on SRE petitions in 2022 include consideration of the possibility that small refineries may choose to preferentially purchase RINs that have gone through the quality assurance program (so called, QAPed RINs) at a marginally higher cost when compared to the average market price for all RINs.

GAO Recommendation 3: “The Administrator of EPA should identify and communicate what information refineries would need to submit to demonstrate disproportionate economic hardship.”

EPA Response: EPA partially agrees with this recommendation. EPA has previously issued guidance about the types of information small refineries should include in their petitions. Then in December 2021, EPA chose to issue a Proposed Denial that served this purpose for the petitions EPA had pending in front of it at that time, providing a robust description of EPA’s proposed conclusions and providing small refineries with the ability to provide supplemental information to directly address evidence of economic hardship small refineries may face due to compliance with the RFS program.[21] As evidenced by their submittals, small refineries understood this to include data and contract information to show the relative cost of compliance for refineries that acquire RINs by blending renewable fuels when compared to those that bought separated RINs, data to show whether the small refinery received prices for its refined products that were below the market prices received by other program participants, and analysis to show that the markets in which they operate do, or do not, pass through RFS compliance costs. EPA’s new guidance will help make clear that those same kinds of information, updated to reflect the time period covered by the future petitions, are appropriate for future petition evaluations as well. EPA intends to continue to update the guidance it provides for future SRE petitions.

Recommendation 4 (directed to DOE)

GAO Recommendations 5 and 6: “The Administrator of EPA should develop policies and procedures for making small refinery exemption decisions.” (5) “The Administrator of EPA should develop policies and procedures to ensure EPA meets statutory deadlines to issue decisions, including tracking when petitions are considered complete.” (6)

EPA Response: EPA partially agrees with these recommendations. EPA has policies and procedures in place for making SRE decisions, and for tracking petitions from receipt through completeness determination, as well as through the consultation process with DOE. However, EPA intends to better document its internal processes for receiving petitions, the processes for checking the petitions for completeness and more completely tracking the internal decision making and review steps including coordination with DOE. This improved documentation will also include tracking of these steps to help ensure more timely review.

[21] EPA, Proposed RFS Small Refinery Exemption Decision, EPA-420-D-21-001 (“Proposed Denial”); see also Notice of Opportunity to Comment on Proposed Denial of Petitions for Small Refinery Exemptions, 86 Fed. Reg. 70,999 (Dec. 14, 2021).

GAO Recommendation 7: “The Administrator of EPA should assess the effect of small refinery exemption decision timing on the benefit provided to small refineries, as well as the effect on fuel markets, and reconsider petition requirements, such as that of 3 quarters of current year financial information.”

EPA Response: EPA partially agrees with this recommendation. We acknowledge that SRE decisions, in particular for the 2016-2018 compliance years, contributed to significant volatility in RIN prices and uncertainty for all program participants due less to the timeliness of the decision and more to the outsize impacts they had on the demand for RINs. To address this, EPA finalized new regulations that applied first for the 2020 compliance year that project SRE volumes and reallocate those volumes to other program participants, helping to ensure a consistent demand for RINs (and the associated renewable fuels) and through that consistent demand, more consistent and predictable RIN prices.

Appendix 2: EPA Moderated Transaction System (EMTS) Price Data Preliminary Analysis

EPA has conducted additional analysis of the EMTS RIN transaction data to compare the prices that 24 specific small refineries paid in acquiring RINs in the period from 2013-2021 with the prices that all RIN market participants paid and the prices that the 20 largest refiners paid. EPA then presents the differences in the prices on a cents per RIN basis and on a percentage basis. EPA's approach obviates the need to create a model to represent the market as the approach instead directly compares the actual sales data reported to EPA by the program participants including the 24 small refineries whose data is reported in a manner that allows EPA to directly consider their transactions alone.

Documented here are the key elements of the analysis along with EPA's preliminary results. We intend to complete this work and more fully document it after GAO issues its final report.

Data Source

The data source for this analysis is the same as that used by GAO, namely Renewable Identification Number (RIN) transactions for separated RINS under the Renewable Fuel Standard as reported to EPA in EPA's Moderated Transaction System (EMTS). Only transactions where the buyer and seller's self-reported prices match are included. The dataset includes transactions from 2013-2021.

Data Filters

This analysis uses a similar set of price filters as those that EPA uses to remove outliers for the RIN price information provided on its public website (https://www.epa.gov/fuels-registration- reporting-and-compliance-help/rin-trades-and-price-information). The price filters are:

- 2013 – 2019 RINs with transfer date before January 1, 2020
    - D4 RIN Price – Min. Price: $0.05 & Max. Price: $2.00
    - D6 RIN Price – Min. Price: $0.05* & Max. Price: $2.00
- Any RINs with transfer date after December 31, 2019
    - D4 RIN Price – Min. Price: $0.05 & Max. Price: $3.00
    - D6 RIN Price – Min. Price: $0.05 & Max. Price: $3.00

*The Min. D6 price is changed from $0.01 to $0.05 so that all the minimum prices for all the years are equal. While D6 RIN prices at or below $0.05 were prevalent in the early years of the program from 2010-2012, in the time period of this analysis D6 RIN prices were consistently above $0.05.

EPA also removed any transactions with a sell reason code that indicated that the transactions was a “Remedial Action - Incorrect Trade” (Code 80).

Daily Average Market Price

EPA calculated daily average market prices for each day when RINs were traded. Separate daily prices were calculated for each fuel code (D4, D6) and RIN vintage. To calculate these daily average prices EPA weighted the prices from each transaction by the quantity of RINs traded in that transaction.

Small Refineries

EPA used a list of 24 small refineries that purchased RINs on a facility basis. All of these small refineries have petitioned EPA for an exemption in at least one year of the program.

RIN Prices for small refineries

EPA calculated the daily average price for each day when small refineries purchased RINs. Separate daily prices were calculated for each fuel code (D4, D6) and RIN vintage. EPA weighted the prices from each transaction by the quantity of RINs traded. The average market prices from the same day, fuel code and vintage were then subtracted from the daily average prices paid by small refineries. These daily differences in prices were then summarized for all years from 2013- 2021 using an average weighted by the quantity of RINS. A percent difference in these averages was also calculated.

The table below summarizes EPA’s preliminary results showing the average difference in price paid by small refineries relative to the average daily market price relative to the entire RIN market and then separately relative to just the largest 20 refiners.

Size of refinery	Fuel Code	Difference in price per RIN ($)	Difference in price per RIN (%)	Trades (#)	RINs (#)
Small relative to market	4	$0.014	1.6%	5,799	814,945,040

Size of refinery	Fuel Code	Difference in price per RIN ($)	Difference in price per RIN (%)	Trades (#)	RINs (#)
Small relative to market	6	$0.008	1.2%	16,806	2,233,659,957
Small relative to largest refiners	4	$0.017	2.0%	5,799	814,945,040
Small relative to largest refiners	6	$0.005	0.7%	16,806	2,233,659,957

GAO Comments

In its comments, EPA raised several concerns with the analysis underlying our assessment of the quality of the information EPA uses to decide on exemptions, and in particular our analysis of the performance of the RIN market. We respond to EPA's concerns below:

- Although EPA states in its comments that it has conducted a preliminary analysis correcting for GAO deficiencies, EPA actually conducted analysis of a different question. Our analysis looked at whether all parties pay the same price for RINs, while EPA's preliminary analysis appears to look more directly at the question of whether small refineries experience disproportionate economic hardship.
- EPA states in its comments that the "cost of acquiring RINs is the same for all parties" and that the RIN market is an "open and liquid market." Our model, which uses RIN market data to evaluate prices paid and received for RINs, indicates that all parties do not pay the same for RINs. Specifically, we found that smaller buyers pay more, and smaller sellers receive less, when buying or selling RINs compared to larger buyers and sellers.
- EPA states that our analysis cannot be relied upon to make any conclusions regarding the economic impact of the RFS on small refineries. We agree with this statement by EPA; our analysis alone does not show that there is disproportionate economic hardship for small refineries. For example, while most of the small refineries that have applied for small refinery exemptions from RFS blending requirements are included in our definition of small buyers and sellers, there are other entities that appear in that group that are not small refineries that have applied for exemptions. Our finding that small buyers pay more and small sellers receive less only means that the RIN market is not functioning as EPA assumes it is.
- We would have liked to have examined disproportionate economic hardship more directly ourselves, but an EPA official told us as we were designing our work that it was not possible to identify individual refineries reliably in the data. When we showed EPA preliminary results of our analysis in June 2022, EPA officials again told us that it would not be possible to identify the refineries in the data in a reliable

way, although they did express concern that our analysis did not speak directly to disproportionate economic hardship.[1]

- Since we recommend that EPA further evaluate RIN market performance and RIN pass-through to inform its analysis of whether there is disproportionate hardship, we are heartened that EPA has begun to do so since receiving our draft report. While it is premature to evaluate EPA's analysis because, as EPA states in its comments, this effort is not complete, EPA's preliminary results align with our own in that small refineries appear to pay more for RINs.
- EPA stated in its comments and when meeting with us that if small refineries could not demonstrate that they paid more than larger refineries to purchase RINs, then EPA could assume they do not. We disagree. While small refineries could provide information on prices they paid for RINs, these refineries could not know if they paid more or less than the refineries with which they compete. EPA manages the RIN market data necessary to make such an assessment. Although EPA made this data available for our analysis, they are not publicly available, and therefore EPA cannot expect refineries to be able to analyze these data.

[1]Following discussions on this with EPA in June and July, we altered our analysis such that all of the results shown in the report are based on changes made in response to EPA comments. These changes did not substantially alter the nature of our results.

Appendix V: Comments from the Department of Energy

Department of Energy
Washington, DC 20585

October 14, 2022

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Mr. Rusco,

The Department of Energy ("DOE" or "Department") appreciates the opportunity to comment on the Government Accountability Office's ("GAO") draft report titled *RENEWABLE FUEL STANDARD – Actions Needed to Improve Decision-making in the Small Refinery Exemption Program*.

DOE appreciates GAO's thorough investigation into the small refinery exemption program and intends to review and amend its practices and procedures in light of GAO's recommendations. The draft report contained seven recommendations, of which GAO directed two recommendations to DOE. We note that DOE has had and continues to have a robust consultative process in place to provide the Environmental Protection Agency (EPA) with information and expertise useful to its decision making. Historically, DOE has provided EPA petitioner-specific scores derived from the study, *Small Refinery Exemption Study: An Investigation Into Disproportionate Economic Hardship* ("2011 Study"), as well as additional information.

In light of changes to EPA's adjudication of small refinery exemption petitions that EPA adopted in 2022, EPA and DOE adopted and documented a new consultation process *(see DOE Consultation from Byron Bunker* in Docket ID No. EPA-HQ-OAR-2021-0566, or "Consultation Memo to Docket"). DOE consulted with EPA through regular meetings and discussion and evaluation of relevant materials. Consistent with GAO's recommendation, going forward, DOE intends to review and formalize through documentation DOE's approach to consultation with EPA on small refinery exemption petitions. Further discussion of the two GAO recommendations for DOE, and DOE's responses, are detailed in Attachment I.

While DOE agrees with GAO's recommendations, DOE notes that there are several points we would like to clarify in the GAO draft report including DOE's role in the administration of the small refinery exemption process. As communicated to GAO during the audit engagement, and consistent with each agency's statutory responsibilities under section 211(*o*) of the Clean Air Act, DOE provides consultation to EPA regarding small refinery exemption petitions. EPA independently decides to grant or deny a small refinery exemption petition. In doing so, EPA relies upon information provided by DOE as part of that consultation process—including 2011 Study and DOE's evaluation of materials or documents provided by EPA—as well as other information EPA determines is applicable. Please see further clarifications in DOE's general comments in Attachment II and technical comments in Attachment III.

GAO should direct any questions to John Powell (202-586-1814, john.powell@hq.doe.gov) or Lametia Browne (202-586-8401, lametia.browne@hq.doe.gov).

Sincerely,

CARLA FRISCH

Digitally signed by CARLA FRISCH
Date: 2022.10.14 13:59:21 -04'00'

Carla Frisch
Acting Executive Director
Office of Policy
U.S. Department of Energy

Enclosure

2

Attachment I

Response to GAO Recommendations

Recommendation 2: The Secretary of Energy should develop an approach for consulting on small refinery exemption petitions that provides EPA with useful information on disproportionate economic hardship.

DOE Response:
DOE and EPA have consistently engaged in a robust consultative process as required by section 211(*o*) of the Clean Air Act. Historically, DOE consultation has consisted of petitioner-specific scores ("findings") derived from the 2011 Study, as well as additional information regarding the state of markets and individual petitions. As documented in the Consultation Memo to Docket, in 2022 the approach to consultation between DOE and EPA shifted, consistent with changes EPA made to its small refinery exemption process. That consultation took the form of regular and repeated meetings and other communications between technical, legal, and policy staff at EPA and DOE. We understand EPA used information provided by DOE in its December 2021 Proposed Small Refinery Exemption Denial and April 2022 Small Refinery Exemption Denial, and we intend to continue to provide relevant and useful information and expertise to EPA.

DOE recognizes that, as a result of changes in industry and markets, as well as shifting legal obligations, EPA's informational needs may change over time. Therefore, collaboratively with EPA, DOE intends to further develop and formalize the consultative approach to ensure that DOE continues to provide EPA with information on disproportionate economic hardship that is useful to EPA as it adjudicates small refinery exemption petitions.

Estimated Completion Date: October 31, 2023

Recommendation 4: The Secretary of Energy should develop policies and procedures for its consultation with EPA on small refinery exemption petitions.

DOE Response:
Going forward, DOE concurs that DOE should further develop and formalize an updated procedure for consultation with EPA on small refinery exemption petitions.

Before finalizing new consultative procedures, DOE will work with EPA to ensure the approach will provide useful information, in addition to the 2011 Study, consistent with EPA's current approach to adjudicating small refinery petitions. Developing and formalizing a new approach may take a year to complete.

Estimated Completion Date: October 31, 2023

3

Accessible Text for Appendix V: Comments from the Department of Energy

October 14, 2022

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

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GAO should direct any questions to John Powell (202-586-1814, john.powell@hq.doe.gov) or Lametia Browne (202-586-8401, lametia.browne@hq.doe.gov).

Sincerely,

Carla Frisch
Acting Executive Director
Office of Policy
U.S. Department of Energy

Enclosure

Attachment I

Response to GAO Recommendations

Recommendation 2: The Secretary of Energy should develop an approach for consulting on small refinery exemption petitions that provides EPA with useful information on disproportionate economic hardship.

DOE Response:

DOE and EPA have consistently engaged in a robust consultative process as required by section 211(o) of the Clean Air Act. Historically, DOE consultation has consisted of petitioner-specific scores ("findings") derived from the 2011 Study, as well as additional information regarding the state of markets and individual petitions. As documented in the Consultation Memo to Docket, in 2022 the approach to consultation between DOE and EPA shifted, consistent with changes EPA made to its small refinery exemption process. That consultation took the form of regular and repeated meetings and other communications between technical, legal, and policy

staff at EPA and DOE. We understand EPA used information provided by DOE in its December 2021 Proposed Small Refinery Exemption Denial and April 2022 Small Refinery Exemption Denial, and we intend to continue to provide relevant and useful information and expertise to EPA.

DOE recognizes that, as a result of changes in industry and markets, as well as shifting legal obligations, EPA's informational needs may change over time. Therefore, collaboratively with EPA, DOE intends to further develop and formalize the consultative approach to ensure that DOE continues to provide EPA with information on disproportionate economic hardship that is useful to EPA as it adjudicates small refinery exemption petitions.

Estimated Completion Date: October 31, 2023

Recommendation 4: The Secretary of Energy should develop policies and procedures for its consultation with EPA on small refinery exemption petitions.

DOE Response:

Going forward, DOE concurs that DOE should further develop and formalize an updated procedure for consultation with EPA on small refinery exemption petitions.

Before finalizing new consultative procedures, DOE will work with EPA to ensure the approach will provide useful information, in addition to the 2011 Study, consistent with EPA's current approach to adjudicating small refinery petitions. Developing and formalizing a new approach may take a year to complete.

Estimated Completion Date: October 31, 2023

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Quindi Franco (Assistant Director), Jaci Evans (Analyst-in-Charge), Adrian Apodaca, Austin Barvin, Bethany Benitez, Ellen Fried, Wil Gerard, Cindy Gilbert, Michael Kendix, Susan Sawtelle, Courtney Thacker, and Jeremy Williams made key contributions to this report.

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