



U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

Science and Research

EPA Has Not Met Certain Statutory Requirements to Identify Environmental Impacts of Renewable Fuel Standard

Report No. 16-P-0275

August 18, 2016



Report Contributors:

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Abbreviations

EISA	Energy Independence and Security Act
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse Gas
NAS	National Academy of Sciences
OAR	Office of Air and Radiation
OIG	Office of Inspector General
ORD	Office of Research and Development
RFS	Renewable Fuel Standard

Cover photo: Sign on a gasoline dispenser noting that the gasoline contains ethanol. Ethanol can be derived from a variety of sources, including corn-based ethanol, which is considered a renewable fuel under EISA. Due to a variety of factors, ethanol content in gasoline is generally limited to 10 percent. (EPA OIG photo)

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At a Glance

Why We Did This Review

We conducted this evaluation to determine whether the U.S. Environmental Protection Agency (EPA) complied with statutory reporting requirements pertaining to the Renewable Fuel Standard (RFS). We also sought to determine whether the EPA updated the lifecycle analysis supporting the RFS with findings from the statutorily mandated National Academy of Sciences 2011 study on biofuels, the EPA's 2011 Report to Congress on the Environmental Impacts of Biofuels, and any subsequent reports or relevant research on biofuels.

The RFS program requires a certain volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil or jet fuel. It was created with the intent to reduce greenhouse gas emissions and expand the nation's renewable fuels sector, while reducing reliance on imported oil.

This report addresses the following EPA goals or cross-agency strategies:

- *Addressing climate change and improving air quality.*
- *Embracing EPA as a high-performing organization.*
- *Working toward a sustainable future.*

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EPA Has Not Met Certain Statutory Requirements to Identify Environmental Impacts of Renewable Fuel Standard

What We Found

The EPA's Office of Research and Development has not complied with the requirement to provide a report every 3 years to Congress on the impacts of biofuels. The EPA provided a report to Congress in 2011, but has not provided subsequent reports as required.

The EPA, Congress and other stakeholders lack key information on biofuel impacts needed to make science-based decisions about RFS.

In addition, the EPA's Office of Air and Radiation has not fulfilled the anti-backsliding requirements for RFS, which are to analyze and address any negative air quality impacts of RFS. In 2010, the EPA completed a comprehensive lifecycle analysis to determine greenhouse gas reduction thresholds for RFS. Although not required to do so, the EPA committed to update this analysis as lifecycle science evolves, but does not have a process for initiating an update.

The RFS reporting requirement provides for an objective analysis on the environmental impacts and unintended consequences of U.S. biofuel policy. This analysis is important given conflicting scientific opinions about biofuel impacts, potential impacts outside of the EPA's regulatory control, and divergent RFS interests. The EPA does not have an assessment that meets the requirement to identify whether RFS creates any impacts on air quality and, thus, take required measures to mitigate impacts. This information is needed to fully inform the EPA, Congress and other stakeholders of the environmental impacts of U.S. biofuel policy. In June 2016, Congress held a hearing on RFS implementation. Members expressed bipartisan interest in receiving more information from the EPA on the environmental impacts, to help assess whether the law's original intent is being achieved and at what cost.

Recommendations and Planned Agency Corrective Actions

We recommend the Assistant Administrator for Research and Development provide to Congress triennial reports on the impacts of biofuels as required. We recommend the Assistant Administrator for Air and Radiation complete the anti-backsliding study as required; determine if additional mitigation is needed; and, although not required by statute, develop or identify the process for evaluating the lifecycle science and determining whether to update the greenhouse gas threshold determinations. The EPA agreed with all recommendations and provided planned completion dates; thus, these recommendations are considered resolved and open pending completion.



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

THE INSPECTOR GENERAL

August 18, 2016

MEMORANDUM

SUBJECT: EPA Has Not Met Certain Statutory Requirements to Identify
Environmental Impacts of Renewable Fuel Standard
Report No. 16-P-0275

FROM: Arthur A. Elkins Jr.

A handwritten signature in black ink, appearing to read "Arthur A. Elkins Jr.", is written over the printed name.

TO: Janet McCabe, Acting Assistant Administrator
Office of Air and Radiation

Thomas Burke, Deputy Assistant Administrator and EPA Science Advisor
Office of Research and Development

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). The project number for this evaluation was OPE-FY16-0005. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Action Required

In accordance with EPA Manual 2750, your office provided planned corrective actions in response to the OIG recommendations. All recommendations are considered resolved. You are not required to provide a written response to this final report because you provided agreed-to corrective actions and a planned completion date for the report recommendations. Should you choose to provide a final response, we will post your response on the OIG's public website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epa.gov/oig.

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Chapter 1

Introduction

Purpose

We conducted this evaluation to determine whether the U.S. Environmental Protection Agency (EPA) complied with the statutory reporting requirements pertaining to the Renewable Fuel Standard (RFS). We also sought to determine whether the EPA updated the lifecycle analysis supporting the RFS with findings from the statutorily mandated National Academy of Sciences (NAS) 2011 study on biofuels, the EPA's 2011 Report to Congress on the Environmental Impacts of Biofuels, and any subsequent reports or relevant research on lifecycle impacts of biofuels.

Background

Renewable Fuel Standard Program

The RFS program was authorized under the Energy Policy Act of 2005, and expanded under the Energy Independence and Security Act (EISA) of 2007. The program is a national policy that requires a certain volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil or jet fuel. It was created with the intent to reduce greenhouse gas (GHG) emissions and expand the nation's renewable fuels sector while reducing reliance on imported oil. EISA includes targets designed to increase, over time, the volume of renewable fuels¹ blended into transportation fuels, like gasoline and diesel. It also establishes separate volume targets based on the type of renewable fuel. The Clean Air Act, as amended by the Energy Policy Act of 2005 and EISA, provides the EPA with authority to waive these volume targets as it implements the program, based on specified findings.²

These laws also include requirements for the EPA to regulate and oversee the effects of the RFS program. We focused our review on the following requirements:

- Triennial Report to Congress on environmental and resource conservation impacts of the RFS program.³
- Anti-backsliding study and determination on adverse air quality impacts of the RFS program.⁴

¹ Renewable fuel is fuel produced from renewable sources, such as biomass, that are used to replace or reduce the quantity of fossil fuel present in transportation fuel. The terms "biofuels" and "renewable fuels" are used interchangeably throughout this report.

² 42 U.S.C § 7545(o)(7).

³ 42 U.S.C. § 7545 note.

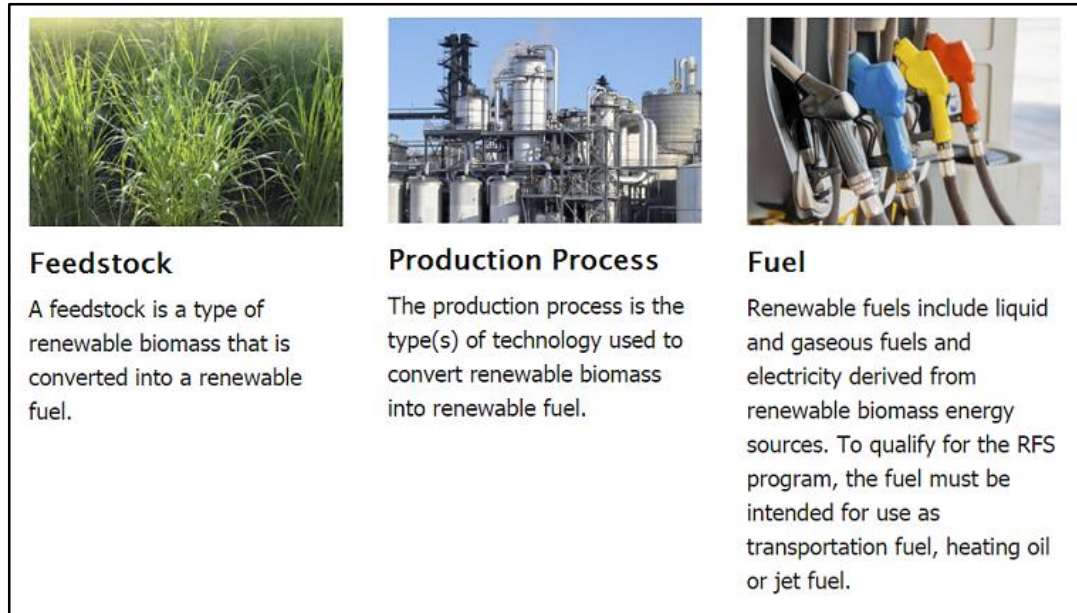
⁴ 42 U.S.C. § 7545(v)(1)-(2).

- Lifecycle GHG emission reduction thresholds⁵ (see blue box at right).

Lifecycle GHG Emissions
 The aggregate quantity of GHG emissions, including direct and significant indirect emissions, related to the full fuel lifecycle, including all stages of fuel and feedstock production, transportation, and use of finished fuel by the ultimate consumer.

Under the RFS, the EPA is required to apply lifecycle GHG emissions performance threshold standards to ensure that the renewable fuel pathway (see Figure 1) emits fewer GHGs than the petroleum fuel it replaces.⁶

Figure 1. Components of renewable fuel pathway



Note: Examples of “feedstock” include corn starch, soybean oil, switchgrass and landfill biogas.

Source: The EPA’s RFS program website (accessed April 25, 2016).

Social Cost of RFS Program
 EPA estimated the cost to society from the increase in required RFS blending volumes from 2015 to 2016 to be between \$933 million and \$2.09 billion. In its December 2015 rulemaking, the EPA said it was not feasible to estimate total social cost since the RFS program’s inception.

The EPA also has the authority to waive or adjust, in whole or in part, the volume targets specified in the statute. A general waiver provision, applicable to all renewable fuel types, allows a waiver based on findings of an inadequate domestic supply of renewable fuel to meet a statutory target, or that implementing the statutory volumes would severely harm the economy or environment. To date, the EPA has only exercised this waiver authority under the provision of an inadequate domestic supply.

⁵ 42 U.S.C. § 7545(o)(2).

⁶ Fuel made at certain facilities does not have to comply with the lifecycle GHG emissions performance threshold standards, either because the facilities are exempt or deemed compliant. See 42 U.S.C. § 7545(o)(2)(A)(i) and § 7545 note, respectively. The fuel produced at these facilities is referred to as “grandfathered” production.

Responsible Offices

The RFS program is administered by the Office of Transportation and Air Quality within the Office of Air and Radiation (OAR). Within the Office of Research and Development (ORD), the Air, Climate, and Energy Research Program, as well as the National Center for Environmental Assessment, conduct renewable fuels research. The National Center for Environmental Assessment was the EPA's lead office for preparing the first Triennial Report to Congress.

Scope and Methodology

We conducted our performance audit from November 2015 to June 2016, 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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We analyzed key background and criteria documents, including the 2010 Regulatory Impact Analysis for RFS,⁷ which contains the lifecycle GHG analysis; ORD's 2011 Report to Congress;⁸ the 2011 NAS Report on Biofuels;⁹ and the latest RFS rule finalized in December 2015.¹⁰ We did not evaluate the scientific veracity of these reports or the technical documents supporting the RFS regulations.

We interviewed ORD technical experts responsible for developing the first report to Congress, as well as senior managers responsible for making resource allocation decisions and prioritizing ORD's research agenda. We met with technical experts and management in OAR in charge of the anti-backsliding analysis and RFS lifecycle GHG analysis. We also communicated with the Office of the Chief Financial Officer, the Office of Congressional and Intergovernmental Relations, and the Office of Policy regarding the EPA's tracking of reports and studies required by statute. Externally, we interviewed authors of the 2011 NAS report.

⁷ U.S. EPA. "Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis." Office of Transportation and Air Quality, Assessment and Standards Division. 2010. EPA-420-R-10-006.

⁸ U.S. EPA. "Biofuels and the Environment: First Triennial Report to Congress." ORD, National Center for Environmental Assessment. 2011. EPA-600-R-10-183F.

⁹ National Research Council of the National Academies. "Renewable Fuel Standard: Potential Economic and Environmental Effects of U.S. Biofuel Policy." 2011.

¹⁰ U.S. EPA. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017; Final Rule." 80 Fed. Reg. 77420, Dec. 14, 2015 (to be codified at 40 CFR Part 80).

Chapter 2

EPA Has Not Fully Met Statutory Requirements in the EISA

The EPA has not met the statutory requirements in EISA to:

- Provide triennial reports to Congress on the environmental and conservation impacts of the RFS program.
- Conduct an anti-backsliding study on the impacts of RFS on air quality.
- Make a determination as to whether mitigation measures are necessary.

EPA management said they have not prioritized compliance with these requirements due to competing priorities and resource constraints. In 2010, the EPA completed a lifecycle analysis to determine whether renewable fuels under RFS met statutorily established GHG thresholds. Although EISA does not require an update of the GHG lifecycle thresholds, the EPA publicly committed to update its analysis as the lifecycle science evolves. Without the required reports on impacts of the RFS program or an anti-backsliding study and related decisions about mitigation measures, it is unclear how the EPA considers or mitigates these impacts. It also remains unclear what types of changes in lifecycle science would trigger an updated analysis of GHG lifecycle thresholds for RFS. As a result, the EPA, Congress and other stakeholders lack key information on impacts needed for making science-based decisions about RFS. During a June 2016 congressional hearing on the implementation of RFS, members of Congress expressed bipartisan interest in receiving more information from the EPA on the environmental impacts of RFS, to help them assess whether the original intent of the law is being achieved and at what cost.

Triennial Reports to Congress on Environmental and Conservation Impacts of RFS Not Provided

EISA Section 204 requires that the EPA report to Congress every 3 years on the environmental and resource conservation impacts of the RFS program, including air and water quality, soil quality and conservation, water availability, ecosystem health and biodiversity, invasive species, and international impacts.

ORD issued EPA's first report to Congress in December 2011. ORD researchers said that, after the 2011 report, there was an expectation that ORD would provide subsequent reports that would include ongoing biofuel research not completed in time for the first report. However, there have been no subsequent reports since 2011, and ORD currently has no plans to issue subsequent reports to Congress as required. EISA identifies a timeline for EPA to meet EISA requirements, as shown in Figure 2; we note those steps not completed.

Figure 2: Timeline of EPA RFS requirements in the EISA



Source: Office of Inspector General (OIG) analysis of EISA and EPA documents.

ORD’s primary reasons for not providing subsequent reports are the need to accommodate competing research priorities and reductions to ORD’s budget. Planning documents and statements from ORD and OAR staff indicate that the EPA intended to provide a second report. However, we found that no report was developed or provided after reductions were made in ORD funding in the 2012– 2013 time period, which, according to ORD, eliminated support for the report to Congress and biofuels research in general.

According to ORD, the EPA spent approximately \$1.7 million and the equivalent of four full-time employees in fiscal years 2010 and 2011 to develop the first report. Our analysis of congressional budget justification documents from fiscal years 2012 through 2015 found that the EPA did not request funding in fiscal year 2012 (after the first report was published), but did request funding for biofuel research in subsequent years, which it did not receive. Regardless, the statutory requirement to complete the report does not hinge on yearly, earmarked funding.

ORD said that the 3-year reporting cycle was too short for significant scientific advances to occur, and that they did not receive any input from Congress on the first report’s utility. These were cited as additional factors in deciding to not meet the reporting requirement. Regarding the reporting cycle length, if the EPA finds there have been no relevant scientific advances, it could simply report out on that fact; lack of scientific advances does not eliminate the EPA’s reporting requirement. Additionally, the EPA has no record of any communication between the EPA and Congress regarding the reporting requirement.

The EPA's 2011 Report to Congress recommended that future assessments would:

... identify gaps and uncertainties in the knowledge base, inform the design and implementation of monitoring strategies and measures for evaluating impacts, provide comprehensive tools for comparing and evaluating development options, and provide the scientific bases for regulatory agencies and the biofuel industry to make environmentally conscious decisions.

Such information—provided in a comprehensive, regular manner—could inform RFS rulemaking and other decision making. For example, it could provide the EPA with information needed in considering waiver authority for situations involving “severe” environmental impact. Without this information, the EPA is impeded in its assessments of environmental impacts of the RFS program and making Congress aware of potential impacts.

EPA Has Not Conducted Anti-Backsliding Analysis or Determined If Mitigation Measures Are Necessary

“Anti-backsliding” provisions ensure that new regulations intended to address one problem do not actually make other environmental problems worse. EISA Section 209 set two anti-backsliding requirements for the EPA:

- (1) Within 18 months, complete an anti-backsliding study to determine whether the required renewable fuel volumes will adversely impact air quality as a result of changes in vehicle and engine emissions of air pollutants.
- (2) No later than 3 years (by December 2010), implement appropriate measures to mitigate any adverse impacts on air quality or make a determination that no such measures are necessary (considering the results of the anti-backsliding study).

The EPA has not met these requirements. As of March 2016, OAR has not identified a time frame for planning and initiating the anti-backsliding study. In addition, OAR has not determined if any mitigation measures are necessary based on the anti-backsliding study.

According to OAR, preliminary efforts to update models have been conducted, but there are many intermediate research steps that still need to be completed before OAR can plan, fund and conduct a comprehensive study to meet this requirement. Examples of steps that remain to be completed include decisions about how many model runs will be used, and boundary conditions on whether the study would quantify upstream impacts on air quality, such as agricultural dust and fertilizer

use. OAR also indicated that resource limitations and competing priorities are factors affecting the completion of the anti-backsliding requirement.



Ethanol refinery in South Dakota. (EPA OIG photo)

In the air quality analysis the EPA conducted as part of its 2010 Regulatory Impact Analysis, the EPA found that the air emission impacts from RFS under a variety of different modeling scenarios show increases in many air pollutants, as well as decreases in others. However, the EPA noted in this document that the air quality modeling it conducted as part of the 2010 Regulatory Impact Analysis does not constitute the required anti-backsliding analysis.

Further, the EPA noted it would be analyzing air quality impacts of increased renewable fuel use through a separate study, and would promulgate appropriate mitigation measures.

During the course of this review, OAR stated that it has ongoing studies related to other authorities included in the Clean Air Act—such as the National Ambient Air Quality Standards—that would address any contributions of adverse air impacts from RFS. We did not determine whether other studies suffice or if the anti-backsliding analysis could add new information. If the anti-backsliding analysis is determined to add new information, the EPA cannot be certain whether it should take additional action to lessen potential adverse air quality impacts.

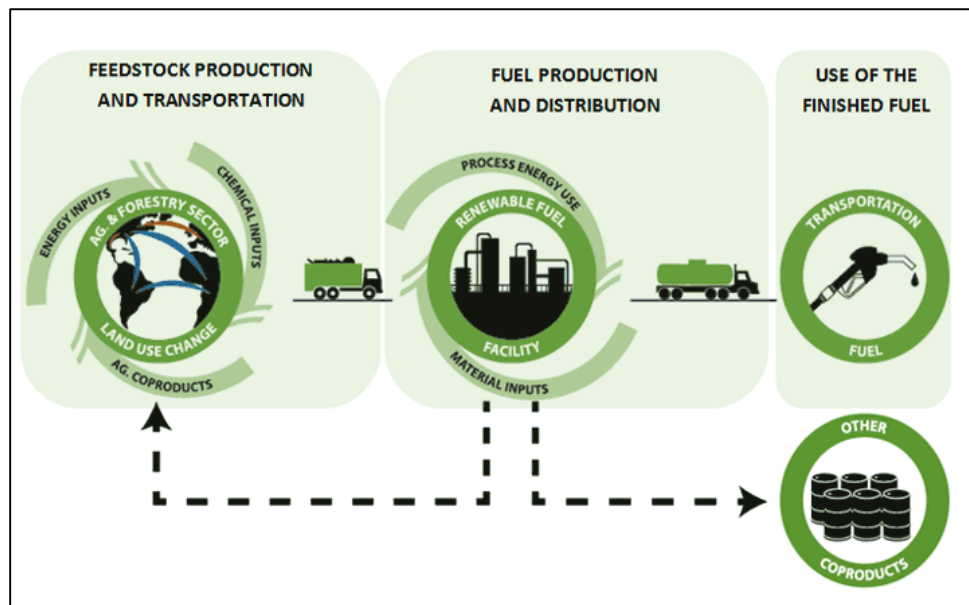
EPA Has Not Identified a Process for Updating RFS Lifecycle GHG Threshold Analysis

EISA Section 202 requires the EPA to apply lifecycle GHG reduction thresholds to ensure that each category of renewable fuel emits fewer GHGs than the fossil fuel it replaces (with exceptions for grandfathered facilities). In 2010, the EPA completed a comprehensive lifecycle analysis to determine whether renewable fuel sources met RFS GHG reduction thresholds. While there is no statutory requirement to update this analysis, the EPA committed to updating its lifecycle analysis as the science evolves. In its response to comments on the 2010 draft GHG lifecycle analysis, the EPA committed to further reassessing the lifecycle GHG estimates, indicating that these new assessments could result in “new determinations of [GHG] threshold compliance.”

Since 2010, OAR has conducted subsequent lifecycle GHG analyses for new RFS fuel sources and feedstock. However, OAR has no plans to update the original 2010 analysis on primary RFS fuel sources (such as corn ethanol), which make up most of the current RFS volume mandates. According to the EPA, the newer,

post-2010 lifecycle analyses do incorporate the latest science and data as much as possible. However, these analyses are for fuel sources (e.g., cottonseed oil) that play a minor role in meeting the current RFS volume mandate. Figure 3 provides a diagram of biofuels lifecycle.

Figure 3: Biofuels lifecycle diagram



Source: The EPA's RFS program website (accessed May 26, 2016).

Importance of Lifecycle Assessments

While EISA does not generally require the consideration of non-GHG lifecycle impacts when implementing renewable fuel volume targets for years specified in the statute, such impacts could be useful to inform OAR's decision to exercise its general waiver authority for those years. In addition, those impacts can inform setting RFS volumes for biomass-based diesel, and for other fuel types after 2022. (Beginning in 2023, the EPA will have the authority to set applicable volumes for all renewable fuel types based on analysis of broader criteria beyond GHG impacts.) Examples of non-GHG lifecycle impacts of biofuel production and use include changes in land use, fertilizer use, runoff, water use and quality, local pollutant emissions from vehicles utilizing biofuels, and use of forestland biomass. OAR did examine impacts of the RFS program on some non-GHG pollutants, as well as impacts on water quality and quantity, as part of its 2010 Regulatory Impact Analysis (which included the 2010 GHG lifecycle analysis). However, it has not done so since. Reports subsequent to OAR's 2010 analysis emphasize the importance of analyzing non-GHG lifecycle impacts. Both ORD's 2011 Report to Congress and the 2011 NAS study referenced the importance of lifecycle assessments for biofuels:

- The ORD's 2011 Report to Congress recommends multiple actions the EPA should take, including "to develop and evaluate environmental lifecycle assessments for biofuels."
- The 2011 NAS study described the impacts of biofuel production and consumption as uncertain and stated that the overall environmental outcome of biofuel production cannot be guaranteed without a strategic "lifecycle vision of where and how the bioenergy feedstocks will be grown to meet the [RFS] consumption mandate."

Lifecycle analysis—both GHG and non-GHG—can help capture the unintended consequences of RFS policy. Furthermore, in its Fiscal Year 2014–2018 Strategic Plan, the EPA highlights that a principle of its "working towards a sustainable future" cross-agency strategy is to "[c]onsider the full life cycles of multiple natural resources, processes, and pollutants in order to prevent pollution, reduce waste, and create a sustainable future." In this context, EPA also commits to reviewing "new and key existing regulations to examine sustainable enhancements."

The EPA may have no immediate regulatory need to revisit the 2010 lifecycle analysis if its original determinations are still valid. The primary purpose of OAR's lifecycle analysis is to determine whether fuel sources meet GHG reduction thresholds. According to OAR, the state of science has not changed enough with respect to lifecycle GHG emissions to warrant revisiting its prior GHG determinations for the 2010 fuel sources. EPA staff within OAR and ORD, and two authors of the 2011 NAS study, varied in their opinions on the frequency with which lifecycle analyses should be updated.

Further, according to OAR, there is minimal utility in updating the 2010 analysis, given that EISA excludes grandfathered production from having to meet any GHG reduction thresholds, and fuel production from existing facilities would not be subject to a revised determination if it was based on a change in analytical methodology. In 2010, grandfathered production that is not subject to any GHG reduction requirements was estimated to be at least 15 billion gallons, or over 80 percent of today's RFS blending volume. According to EISA, even if the EPA updated the 2010 lifecycle analysis, these grandfathered facilities would not have to adhere to the results of the new analysis (and fuel production from existing facilities would only be subject to new determinations if the new determinations did not involve use of a changed analytical methodology).¹¹

While an update to the GHG lifecycle analysis may not be needed, OAR should develop a process for how it identifies whether a significant change in the science would warrant revising the GHG threshold determinations. Without a clear process for synthesizing and evaluating new lifecycle science, the agency risks not knowing when factors have changed enough to justify revisiting the original GHG lifecycle analysis. While the immediate regulatory utility of updating the 2010 analysis may be minimal, ensuring the GHG lifecycle analysis is current could provide other benefits, such as informing the EPA's decisions on setting RFS volumes after 2022, as well as giving policy makers from other agencies and Congress an accurate picture of the GHG emissions from biofuels.

Conclusion

The EISA established requirements for the EPA to provide objective analysis on the environmental impacts of the RFS program that could be used to inform science-based decision making on biofuel policy. The EPA is not meeting these requirements. Not having required reporting and studies impedes the EPA's ability to identify, consider, mitigate and make policymakers aware of any adverse impacts of renewable fuels. Further, the EPA has no record of having communicated to Congress its decision to not meet its congressional reporting requirement. As a result, the EPA has not met the intent of the EISA requirements—to provide science-based information on RFS program impacts for decision-makers of U.S. biofuel policy.

¹¹ 42 U.S.C. § 7545(o)(4)(G).

Recommendations

We recommend that the Assistant Administrator for Research and Development:

1. Provide triennial reports to Congress on the impacts of biofuels as required by the Energy Independence and Security Act.

We recommend that the Assistant Administrator for Air and Radiation:

2. Complete the anti-backsliding study on the air quality impacts of the Renewable Fuel Standard as required by the Energy Independence and Security Act.
3. Determine whether additional action is needed to mitigate any adverse air quality impacts of the Renewable Fuel Standard as required by the Energy Independence and Security Act.
4. Develop or identify the process for evaluating the science relevant to lifecycle analysis and determining whether revisiting the original greenhouse gas threshold determinations is necessary.

Agency Response and OIG Evaluation

The EPA agreed with our recommendations and provided planned completion dates; thus, all recommendations are considered resolved and open pending completion.

In the agency's response to our official draft (Appendix A), the EPA agreed with Recommendation 1 and provided a planned completion date; this recommendation is considered resolved and open pending completion.

The EPA agreed with Recommendations 2 and 3. In subsequent communication, the EPA provided planned completion dates of no later than the fourth quarter of fiscal year 2024. The EPA said it needed this time given:

... multiple intermediate research steps that still need to be completed before OAR can plan, fund and conduct a comprehensive anti-backsliding study. These steps include development of baseline, current, and projected scenarios for how renewable fuels have and might be produced, distributed, and used to fulfill the RFS requirements, generation of emissions inventories, and air quality modeling, all of which are time-consuming and resource-intensive. Furthermore, this work must be conducted on top of other statutorily-required actions under the RFS program, many of which are carried out by the same group of staff and managers.

The EPA initially disagreed with Recommendation 4, stating that there is an existing process in place to inform consideration of the need for any re-evaluation of the GHG determinations. Based on the EPA's comments, we revised Recommendation 4 to ask the EPA to develop or identify the process it uses to assess, evaluate and actively decide whether or not to update the lifecycle GHG analyses used to make the original GHG threshold determinations. The EPA agreed with this revised recommendation and provided a planned completion date. Key elements of what OIG means by "process" include process flow, triggers, timeframes, roles and responsibilities, and decision points. Recommendation 4 is considered resolved and open pending completion.

The EPA also provided technical edits, which we considered and made revisions to our report as appropriate.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status ¹	Action Official	Planned Completion Date	Potential Monetary Benefits (in \$000s)
1	10	Provide triennial reports to Congress on the impacts of biofuels as required by the Energy Independence and Security Act.	O	Assistant Administrator for Research and Development	12/31/17	
2	10	Complete the anti-backsliding study on the air quality impacts of the Renewable Fuel Standard as required by the Energy Independence and Security Act.	O	Assistant Administrator for Air and Radiation	9/30/24	
3	10	Determine whether additional action is needed to mitigate any adverse air quality impacts of the Renewable Fuel Standard as required by the Energy Independence and Security Act.	O	Assistant Administrator for Air and Radiation	9/30/24	
4	10	Develop or identify the process for evaluating the science relevant to lifecycle analysis and determining whether revisiting the original greenhouse gas threshold determinations is necessary.	O	Assistant Administrator for Air and Radiation	9/30/18	

¹ O = Recommendation is open with agreed-to corrective actions pending.
 C = Recommendation is closed with all agreed-to actions completed.
 U = Recommendation is unresolved with resolution efforts in progress.

Agency Response to Draft Report

July 18, 2016

MEMORANDUM

SUBJECT: Response to Office of Inspector General's draft report, *EPA Has Not Met Statutory Requirements to Identify Environmental Impacts of Renewable Fuel Standard*" (No. OPE-FY16-0005).

FROM: Janet G. McCabe
Acting Assistant Administrator
Office of Air and Radiation

Thomas A. Burke
Deputy Assistant Administrator
Office of Research and Development

TO: Carolyn Copper, Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

The EPA's Office of Air and Radiation and Office of Research and Development appreciate the opportunity to review and comment on the OIG's draft report titled "*EPA Has Not Met Statutory Requirements to Identify Environmental Impacts of Renewable Fuel Standard*" (Draft Report).

Congress created the renewable fuel standard (RFS) program in an effort to reduce greenhouse gas emissions and expand the nation's renewable fuels sector while reducing reliance on imported oil. The RFS program was authorized under the Energy Policy Act of 2005 and expanded under the Energy Independence and Security Act of 2007. EPA's Office of Transportation and Air Quality, within the Office of Air and Radiation, is responsible for implementing the RFS program, and coordinates closely with other offices, including the Office of Research and Development, on relevant areas of research and program implementation.

The RFS program is designed to increase the amount of biofuel used in the United States each year. The production and use of biofuels, like other bio-based energy sources, has broad and often complex environmental and economic impacts. In establishing the regulations to implement the program, EPA conducted significant analysis on the potential impacts of the RFS program, both economic and environmental, as the Draft Report acknowledges, and OAR continues to engage in significant scientific and technical analysis related to biofuel use and expansion. EPA's Office of Research and Development issued a first statutorily-required triennial Report to Congress in 2012 that looked broadly at the environmental impacts of the program.

EPA's Air Office continues to work closely with industry and other stakeholders to monitor the state of biofuel-related science and conduct various analyses, as needed. With respect to air quality impacts, as the OIG noted in the report and OAR agrees, additional work needs to be done before a comprehensive anti-backsliding study can be conducted. However, OAR has already made important progress in this area by recently conducting extensive analysis in a variety of key areas, including an evaluation of the impacts of gasoline properties on vehicle exhaust emissions, and updating the fuel effects model for estimating motor vehicle emissions (discussed further below).

OAR continues to monitor the science regarding lifecycle GHG emissions associated with biofuels. As OAR does lifecycle assessments for new fuel pathways, the most recent science and data are incorporated where possible. For example, OAR has updated the analysis to reflect new data on forest carbon stocks, projected yields, and agricultural inputs as appropriate. OAR's analyses have also incorporated advances in process technology efficiencies as biofuel facilities demonstrate improvements in their GHG emissions.

Below are ORD's and OAR's responses to the OIG's specific recommendations. In the technical comments attachment, we provide suggested additional detailed wording changes in the form of a markup.

Deputy Assistant Administrator, Office of Research and Development

Recommendation 1: "Provide triennial reports to Congress on the impacts of biofuels as required by EISA."

Response 1: ORD agrees with this recommendation.

Planned completion date: FY18 Q1 (end of calendar 2017)

Acting Assistant Administrator, Office of Air and Radiation

Recommendation 2: "Complete the anti-backsliding study on the air quality impacts of RFS as required by EISA."

Response 2: OAR agrees with this recommendation, and we acknowledge the statutory obligation for an anti-backsliding study under Clean Air Act section 211(v) (as amended by EISA section 209). EPA has already taken a number of time-consuming and resource-intensive steps that are important prerequisites for the anti-backsliding study. For example, OAR conducted a vehicle emissions test program designed to evaluate the impacts of gasoline properties (including aromatics and ethanol concentration) on vehicle exhaust emissions, <https://www3.epa.gov/otaq/models/moves/epact.htm>. This study is the largest, most comprehensive, and most carefully designed and implemented study to date on the impacts of fuel changes on emissions from recent model year gasoline vehicles. Using the data from this study, OAR then updated the fuel effects model in its tool for estimating motor vehicle emissions, the Motor Vehicle Emissions Simulator (MOVES). This update was released in 2014.

However, as the OIG report correctly notes, there are intermediate research steps that still need to be completed before OAR can plan, fund and conduct a comprehensive anti-backsliding study. These steps include development of baseline, current, and projected scenarios for how renewable fuels have and might be produced, distributed, and used to fulfill the RFS requirements, generation of emissions inventories, and air quality modeling, all of which are time-consuming and resource-intensive.

Planned Completion Date: Given the resource implications this study will have, we will include it, along with other RFS implementation needs, as part of the FY18 budget development process for the Administrator’s consideration. We are unable to estimate a completion date at this time.

Recommendation 3: “Determine whether additional action is needed to mitigate any adverse air quality impacts of RFS as required by EISA.”

Response 3: OAR agrees with this recommendation, and we acknowledge the statute’s requirement to determine whether additional action is needed to mitigate any adverse air quality impacts in light of the anti-backsliding study.

Planned Completion Date: The anti-backsliding study, discussed above, would need to be completed prior to any such determination taking place. Given the resource implications the antibacksliding study and determination will have, we will include them, along with other RFS implementation needs, as part of the FY18 budget development process for the Administrator’s consideration. We are unable to estimate a completion date at this time.

Recommendation 4: “Identify criteria needed to revisit the original GHG threshold determinations.”

Response 4: EPA disagrees with the recommendation. OAR does not believe that formal criteria are needed to determine whether the lifecycle GHG threshold determinations should be revisited. OAR continually monitors the science associated with lifecycle GHG emissions of biofuels, and we would be able to identify whether a significant change in the science would warrant revisiting the GHG threshold determinations. In addition, through OAR’s new pathways rulemakings, OAR regularly receives input on our lifecycle analysis methodology and assumptions. These inputs in and of themselves provide us with a continuous flow of data and other information necessary to inform consideration of the need for any re-evaluation of the GHG determinations. Given the existing processes in place, OAR believes a separate procedure would be duplicative and unnecessary.

* * *

Finally, although the Draft Report’s first recommendation is directed to ORD, OAR notes that OAR and ORD closely coordinate on such work and OAR supports ORD’s agreement with the recommendation to complete further triennial reports to Congress.

If you have any questions regarding this response, please contact Benjamin Hengst, Associate Director, Office of Transportation and Air Quality, at (202) 564-1495.

Attachment

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