Preliminary Regulatory Analyses:

Including the:

- Preliminary Cost-Benefit Analysis
- Least-Burdensome Alternative Analysis
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

Chapter 173-424 WAC

Clean Fuels Program Rule

By

Kasia Patora

Emma Diamond

For the

Climate Pollution Reduction Program

Washington State Department of Ecology

Olympia, Washington

June 2025, Publication 25-14-039

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/SummaryPages/2514039.html

Contact Information

Climate Pollution Reduction Program

P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6004
Website: Washington State Department of Ecology[1]

ADA Accessibility

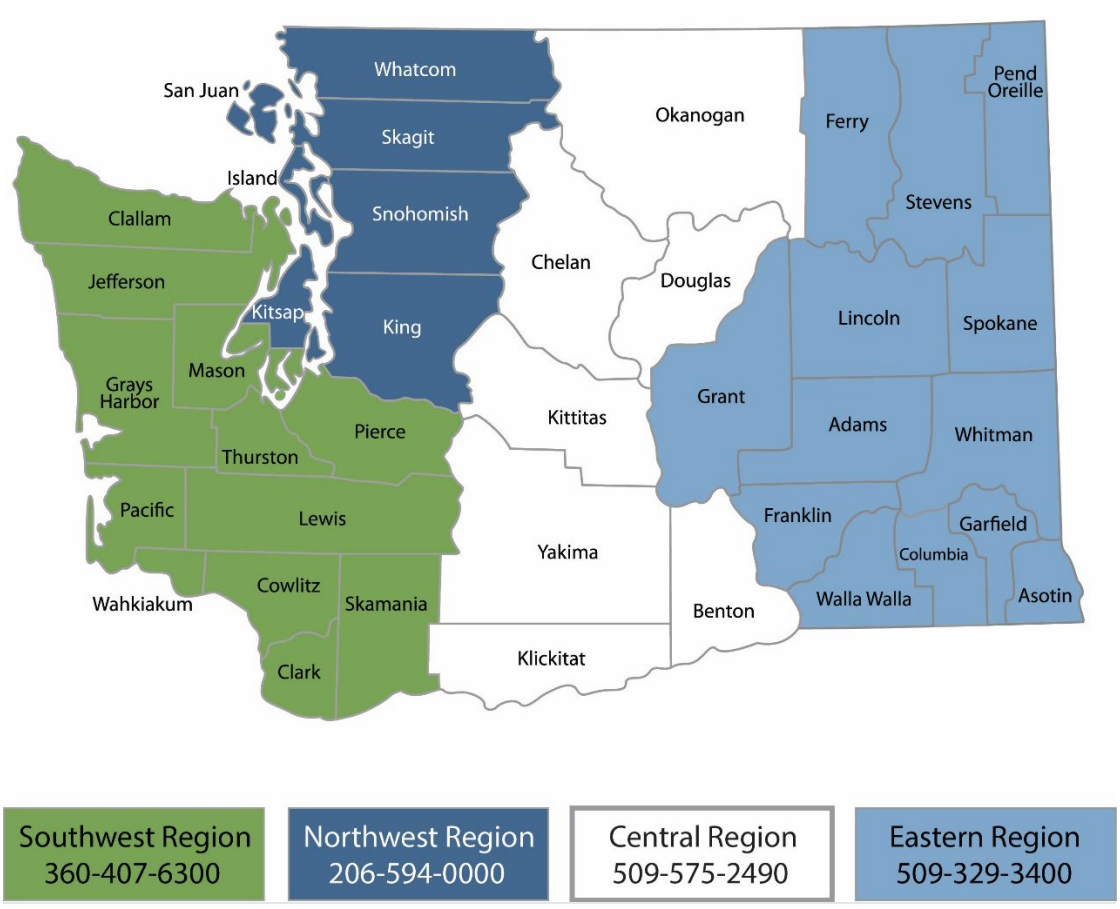
The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 360-407-6831 or email at ecyADAcoordinator@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

[1] www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	P.O. Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	P.O. Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	P.O. Box 46700 Olympia, WA 98504	360-407-6000

Preliminary Regulatory Analyses

Including the:

Preliminary Cost-Benefit Analysis

Least-Burdensome Alternative Analysis

Administrative Procedure Act Determinations

Regulatory Fairness Act Compliance

Chapter 173-424 WAC, Clean Fuels Program Rule

Climate Pollution Reduction Program
Washington State Department of Ecology

Olympia, WA

June 2025 | Publication 25-14-039

Table of Contents

Tables

Figures

Abbreviations and Acronyms

APA	Administrative Procedure Act
CARB	California Air Resources Board
CBA	Cost-Benefit Analysis
CETA	Clean Energy Transformation Act
CFS	Clean Fuel Standard
CNG	Compressed natural gas
eCHE	Electric cargo handling equipment
EER	Energy economy ratio
eGSE	Electric ground support equipment
eOGV	Electric ocean-going vessel
eTRU	Electric transport refrigeration unit
EV	Electric vehicle
FCV	Fuel cell vehicle
FCI	Fast charging infrastructure
FSE	Fueling supply equipment
GREET	Greenhouse gases, Regulated Emissions, and Energy use in Technologies (emissions model)
HDV	Heavy-duty vehicle
HRI	Hydrogen refueling infrastructure
LBA	Least Burdensome Alternative analysis
LCFS	(California) Low Carbon Fuel Standard
L-CNG	Liquefied compressed natural gas
LDV	Light-duty vehicle
LMD	Light- and medium-duty
LNG	Liquefied natural gas
MDV	Medium-duty vehicle
MHD	Medium- and heavy-duty
MW	Megawatt
OEM	Original equipment manufacturer
OR-DEQ	Oregon state Department of Environmental Quality

RCW	Revised Code of Washington (statutes, laws)
REC	Renewable Energy Certificate
RFA	Regulatory Fairness Act
RNG	Renewable natural gas
SEPA	State Environmental Policy Act
TOA	Total obligated amount
WA	Washington State
WAC	Washington Administrative Code (rules)
WFRS	Washington Fuel Reporting System
WREGIS	Western Renewable Energy Generation Information System
ZEV	Zero-emissions vehicle

Executive Summary

This report presents the determinations made by the Washington State Department of Ecology as required under Chapter 70A.535 RCW, for proposed amendments to the Clean Fuels Program Rule (Chapter 173-424 WAC; the "rule"). The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules to "determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented." The Washington Regulatory Fairness Act (RFA; Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected.

This rulemaking seeks to update the Clean Fuels Program Rule to align it with recent legislation (ESSB 5447, 2023-2024 Legislative session) that amended the rule's authorizing statute (Chapter 70A.535 RCW). The amendments would also make adjustments to the rule to improve program workflows and efficiencies.

ESSB 5447 amended the rule's authorizing statute to promote the production and use of low-carbon alternative jet fuel in Washington. Alternative jet fuel reduces emissions from aviation, which has been identified as one of the most difficult transportation sectors to decarbonize. Cleaner fuels will generate more credits, thereby incentivizing the production of low carbon intensity alternative jet fuel.

This rulemaking also aims to amend multiple sections of the rule to increase program efficiency and streamline compliance. This includes establishing requirements for a third-party verification program, refining the compliance and enforcement process, and aligning requirements with programs in other jurisdictions.

The proposed rule amendments would:

- Add flexibility and clarity
- Make adjustments to reporting and documentation efforts
- Redistribute potential credit generation
- Require metering of forklift charging
- Shift potential program participation (including amendments to indirect accounting and avoided methane crediting)
- Adjust crediting and deficit calculations
- Modify Zero Emissions Vehicle (ZEV) capacity crediting.
- Add third-party verification.

Costs and benefits of the proposed rule amendments

We identified multiple likely quantitative and qualitative costs and benefits of the proposed rule amendments. Recall that the APA requires us to determine whether "the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented."

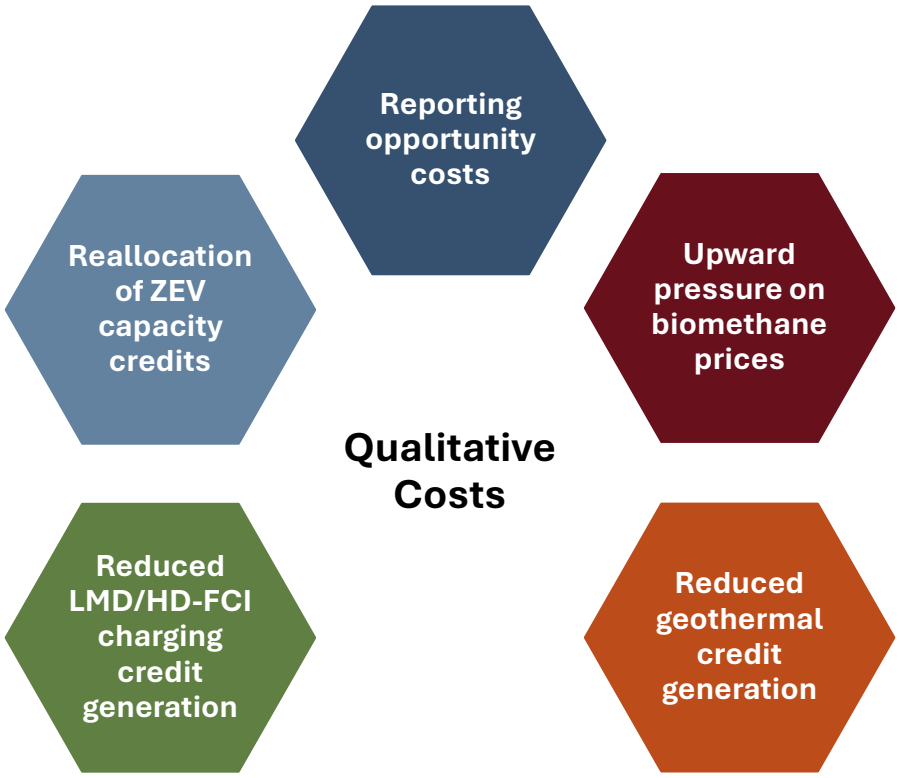
The tables of quantifiable impacts and lists of qualitative impacts below include only those amendments for which we identified a likely non-zero cost or non-zero benefit. Some rule amendments are likely to result in only benefits. We have briefly summarized relevant qualitatively discussed or illustrative impacts, in addition to those that are monetized. For detailed discussion of the rule amendments as compared to the baseline, see Chapter 2. For more information about the associated costs and benefits, see chapters 3 and 4, respectively.

Costs

Table 1. Estimated quantifiable costs of the proposed amendments (millions of 2024$; 20-year present value compared to baseline)

Proposed amendments	Cost Low; millions of $	Cost High; millions of $
Designation of electric credit generators	$0.021	$0.021
Change in ownership	$0.009	$0.009
Inactive registrations	$0.155	$0.155
Registration of eTRU	$0.013	$0.013
Fuel transfers	$0.012	$0.012
Pathway attestation	$0.058	$0.058
Encourage use of PNW renewable electricity	$28	$28
Requiring metering of forklift charging	$0.487	$18
Modifying ZEV capacity crediting	$0.303	$0.303
Adding third-party verification	$107	$367
Total quantified cost (millions):	**$136**	**$414**

Figure 1. Overview of qualitatively described costs of the proposed rule amendments



Qualitatively described costs include:

- Use of renewable electricity products: **Opportunity cost** of up to 1% of fuel pathway reporting cost.
- Book-and-claim pipeline-injected biomethane: **Potential upward pressure on biomethane prices** or reduction in supplied volume if production in the region would be out of the region and lower cost under baseline. These impacts would be delayed or avoided for biomethane used as a feedstock in alternative jet fuel.
- Switching to continuous review of carbon intensities: 1/3 of one cent per 1% carbon intensity change, per credit or deficit (illustrative).
- Adjustments for geothermal pathway carbon intensity:
    - **Potential reduced credit generation**. No currently known projects in Washington.
    - Impacts depend on the degree to which process emissions contribute to overall carbon intensity. **Low-end costs are potentially $0**.
- Modifying ZEV capacity crediting:
    - **Reallocation of credits** across LMD-FCI facilities.

- Some circumstances in which cumulative **credit generation falls** for LMD-FCI and HD-FCI charging.

Benefits

Table 2. Estimated quantifiable benefits of the proposed amendments (millions of 2024$; 20-year present value compared to baseline)

Proposed amendments	Benefit Low; millions of $	Benefit High; millions of $
Aggregator notifications	$0.049	$0.049
Registration of electric transport refrigeration units	$0.058	$0.058
Encourage use of Pacific Northwest renewable electricity	$84	$84
Adjustments to pathway carbon intensity calculator tiers *Illustrative; see text for detail*	$0.058	$0.058
Modifying ZEV capacity crediting	$0.874	$0.874
Adding third-party verification	$314	$399
Total quantified benefit (millions):	**$400**	**$485**

Figure 2. Overview of qualitatively described benefits of the proposed rule amendments

Qualitatively described benefits include:

- Mass balance reporting flexibility: Potential **cost-savings** from increased opting to use mass balance reporting.
- Aligning specified feedstocks:
  - Improved regulatory **consistency** across jurisdictions.
  - **Expanded pathways** available to generate credits.
- Pathway application flexibility:
  - **Improved accuracy** of utility-specific carbon intensity values.
  - **Flexibility** and **transparency**.
- Clarifying without material impact: **Clarity**.
- Designation of electric credit generators:
  - Clarity in roles and responsibilities, facilitating smooth compliance with **reduced risk of delays or missing data or documentatio**n.
  - **Transparency to market participants** in revenue generated from their FSE.
  - Program **confidence and efficiency**.
- Electric utility notifications: Transparent **tracking of utility participation**, confidence, and administration.
- Change in ownership or control: Potential **reduction of errors and compliance delays**.
- Inactive registrations:
  - Streamlined program with **up-to-date information**.
  - **Regulatory consistency**.
  - **Reduced abandoned credits**.
  - Increased credits and revenues for the backstop aggregator, resulting in **further decarbonization in communities with the most air pollution**.
- Registration of fueling supply equipment:
  - **Meeting program goals** through registration of only equipment capable of being used for fueling or charging.
  - **Reduced risk** of incorrect credit generation.
- Follow-up information requests:
  - Streamlined program with **up-to-date and comprehensive information**.
  - **Earlier resolution** of registration problems.
- Fuel transfers: Clear **understanding of obligations and responsibilities**.
- Exported fuel sales: Improved fuel exporter **awareness of responsibilities**.
- Updated report corrections: None if all corrections are updated within two days under the baseline. Otherwise **process efficiency** and use of up-to-date information.
- Credit transfers: **Improved program planning**.
- Specified source pathway attestation:
  - Ensured **integrity of specified source feedstocks**.
  - **Consistency** across jurisdictions.
  - Improved and clear **accountability**.
- Pathways approved by California or Oregon programs: Assurance that carbon intensities are **accurate and appropriately verified**.

- Use of carbon intensity calculators: **Reduced duplicative or repeated work** for applicants.
- Use of renewable electricity products and power purchase agreements: **Consistent and comprehensive reporting** that accounts for necessary timing of verification requirements.
- Amending designation of fuel exporters: **Resolution of conflicting baseline** rule language.
- Encourage use of Pacific Northwest renewable electricity: Transfer and increased spending on **RECs generated in the Pacific Northwest**.
- Reporting electric fueling of eTRU: Potential **efficiencies from direct reporter ownership** of FSEs.
- Requiring metering of forklift charging: **Accurate measurement** of electricity used for forklift charging, consistent with requirements for other vehicle fueling.
- Alternative jet fuels and alternative marine fuels: Increased **early incentive to reduce** carbon intensities in difficult-to-decarbonize sectors.
- Book-and-claim pipeline-injected biomethane:
    - **Ensuring emissions reductions are happening in Washington** rather than elsewhere in the country.
    - **Washingtonians receiving the benefits** for which they pay costs.
- Avoided methane from livestock and organic waste:
    - **Increased incentives** for livestock and organic waste use as feedstocks in RNG production.
    - **Reductions in livestock and landfill emissions**.
- Switching to continuous review of carbon intensities:
    - **Greater flexibility** in ensuring that carbon intensities reflect up-to-date science and lifecycle analysis models.
    - **Reduced risk** of over- or under-generation of credits and deficits.
- Adjustments in cases where operating and certified carbon intensities differ: Added **disincentive for operating carbon intensities to exceed certified carbon intensities**.
- Adjustments for geothermal pathway carbon intensity: Ensuring carbon intensities for geothermal pathways **accurately reflect actual emissions**.
- Modifying ZEV capacity crediting:
    - **Consistent tracking** of applications and **up-to-date information**.
    - **Increased participation** through shared refueling stations, **for HD-HRI and HD-FCI**.
    - **Increased participation due to increased capacity eligibility** and cumulative credit generation.
    - **Accurate understanding** of LMD-FCI drawing from the same power source whether eligible or not.
    - Increased **diversity and distribution of charging sites** across more LMD-FCI applicants.
    - More **flexibility for HD-FCI** due to removal of the limit on effective simultaneous power rating.

    - Increased **incentive for higher power rating chargers**, for HD-FCI.
- Adding third-party verification:
    - **Reduced risk** of program failing to achieve public and environmental health benefits while appearing to do so.
    - **Increased assurance** that data and reports receiving third-party verification are accurate and complete.
    - Ensuring the program is **accurately assigning deficits and credits** to program participants.
    - Increased assurance that **no entity gains advantage** in the program based on inaccurate information.

Distributional impacts

We also noted the following distributional impacts related to environmental justice:

- No significant expected costs as compared to the baseline, though the proposed rule amendments would have different distributional impacts across communities than alternative rule amendments considered during this rulemaking. See section 3.2.9 for discussion of potential environmental justice costs compared to alternative rule requirements.
- Distributional benefits of:
    - Ensuring effective program function, supporting real and verifiable reductions in contributions to climate change. Climate change disproportionately affects some Washingtonians more heavily than others. This happens because they are more exposed to climate hazards such as smoke and heat, have higher existing health burdens, or do not have enough resources to sufficiently prepare, prevent, or recover from harmful events. Disproportionately affected populations include people who:
        - Have lower incomes.
        - Live or work in locations with limited air filtration or cooling.
        - Live in areas that absorb and retain more heat.
        - Are unsheltered or have inadequate housing.
        - Have a higher existing health burden.
    - Ensuring efficient program function, supporting the achievement of program goals and objectives at the lowest cost possible. Lower-income populations have less flexibility to handle higher costs passed on to them by producers, given household budget limitations.

Conclusion – Cost-Benefit Analysis

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the proposed rule amendments, as compared to the baseline, that the benefits of the proposed rule amendments are greater than the costs.

Least-burdensome alternative

We considered the following alternative rule requirements, and did not include them in the proposed rule amendments. This list includes alternatives that were suggested by the public during development of the rule, with the intent of mitigating negative impacts, including environmental harms on rural populations living near existing or potential biomethane facilities, and equitably distributing benefits.

- Use current avoided methane crediting rules, extend timelines, or limit timelines.
- Phase out avoided methane credits.
- Extend timeline for utility-specific carbon intensities.
- Remove the deficit modification.
- Change the timeline for directional flow requirements.
- Use current book-and-claim rules for biomethane.
- Require a percentage of RNG to be Washington produced.
- Set the same compliance timelines for all book-and-claim biomethane.
- Amend third-party verification requirements for electricity reported as transportation fuel.
- Revise the WA-GREET model.
- Exempt biogas-to-electricity facilities from the start date requirement for REC eligibility.
- Exempt crude oil reports from quarterly third-party verification requirements.
- Remove additionality provisions for RECs used to lower the carbon intensity of electricity.
- Remove or amend provisions allowing credit/deficit modifications for illegitimate credits and unclaimed deficits.

After considering alternatives, within the context of the goals and objectives of the authorizing statute, we determined that the proposed rule represents the least-burdensome alternative of possible rule requirements meeting the goals and objectives.

Relative compliance costs for small versus the largest businesses

We calculated the estimated per-business costs to comply with the proposed rule amendments, based on the costs estimated in Chapter 3 of this document. We conclude that the proposed

rule amendments are likely to have disproportionate impacts on small businesses (though in cases where a cost-savings occurs, small businesses would receive a disproportionately larger benefit as well), and therefore Ecology must include elements in the proposed rule amendments to mitigate this disproportion, as far as is legal and feasible.

Impacts to jobs and economic output

Accounting for costs, cost-savings, and what funds are spent on (e.g., labor, equipment, services) we used REMI E3+ to model the proposed rule's impacts on the entire state economy and identified more heavily impacted sectors. The model accounts for dynamic adjustments within and outside the state to multiple economic interactions across sectors, such as inter-industry spending, prices and wages, trade, population, and labor markets.

We identified overall positive impacts to employment and output across the state economy:

- Initial gains of 346 to 392 jobs (full-time employee equivalents) growing to over a thousand jobs total across all sectors in the state by 2031, and declining thereafter.
- Initially $64 million to $70 million, growing to over $200 million per year total across all sectors in the state by 2031, and declining after 2036.

Positive impacts were primarily in sectors such as construction and real estate, food and retail trade, engineering services, and electric power generation. Some sectors were modeled to experience negative impacts, though these were smaller than positive impacts to other sectors. Sectors such as healthcare, air transportation, and agriculture were modeled to experience losses of between one and nine jobs, and between $1 million and $8 million, over time.

The above impacts are driven by increased economic activity across sectors, driven largely by spending on contracted services such as third-party verification, equipment and installation, and local REC development. These become wages and revenues to sectors providing equipment and services. Additional spending on labor that becomes personal income is also a contributor to increased economic activity. This increase in economic activity across sectors and to the labor force subsequently supports other sectors in the model across the entire state economy.

Inputs to the model reflected annual real costs and benefits for only those variables for which we were able to estimate quantified, monetized impacts. This means the model results do not capture the value of impacts we were not able to monetize in this analysis, including aspects such as growth in regional fuel production from dairy and swine farms, or shifts in participating biomethane producers and production.

Chapter 1: Background and Introduction

1.1 Introduction

This report presents the determinations made by the Washington State Department of Ecology, for proposed amendments to the Clean Fuels Program Rule (Chapter 173-424 WAC; the "rule"). This includes the:

- Preliminary Cost-Benefit Analysis (CBA)
- Least-Burdensome Alternative Analysis (LBA)
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules to "determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented." Chapters 1 – 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

The APA also requires Ecology to make several other determinations (RCW 34.05.328(1)(a) – (c) and (f) – (h)) about the rule, including authorization, need, context, and coordination. Appendix A of this document provides the documentation for these determinations.

The Washington Regulatory Fairness Act (RFA; Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected. Chapter 7 of this document documents that analysis, when applicable.

All determinations are based on the best available information at the time of publication. We encourage feedback (including specific data) that may improve the accuracy of this analysis.

1.1.1 Background – the Clean Fuels Program

The Clean Fuels Program curbs carbon pollution from transportation, the largest source of greenhouse gas emissions in Washington, by reducing these emissions from the production and supply of transportation fuels. It provides an increasing range of low-carbon and renewable alternatives that reduce dependency on petroleum and improve air quality.

California, Oregon, British Columbia, and New Mexico have adopted or are in the process of adopting their own clean fuel standards. In Washington, the Clean Fuels Program works beside the Climate Commitment Act to target the largest source of emissions in Washington. The Clean

Fuels Program law requires fuel suppliers to gradually reduce the carbon intensity of transportation fuels to 20% below 2017 levels by 2034. There are several ways for fuel suppliers to achieve these reductions, including:

- Improving the efficiency of their fuel production processes.
- Producing and/or blending low-carbon biofuels into the fuel they sell.
- Purchasing credits generated by low-carbon fuel providers, including electric vehicle charging providers.

The program is a market-based policy designed to provide incentives for low carbon fuels. Program implementation is paid for by an annual participation fee.

Under the Clean Fuels Program, fuels are assessed to determine their carbon intensity. Cleaner fuels – those with a carbon intensity below the standard – generate credits that can be kept or sold to producers of high-carbon fuels. Fuels with a carbon intensity above the standard generate deficits. Those producers must then buy enough credits to meet the carbon-intensity reduction for that year. The requirement to reduce carbon intensity increases over time, making more low-carbon transportation fuel available in Washington. Reducing carbon intensity means fewer greenhouse gas emissions entering the atmosphere over time, which helps to address impacts of climate change.

1.2 Reasons for the proposed rule amendments

This rulemaking seeks to update the Clean Fuels Program Rule to align it with recent legislation (ESSB 5447, 2023-2024 Legislative session) that amended the rule's authorizing statute (Chapter 70A.535 RCW). The amendments would also make adjustments to the rule to improve program workflows and efficiencies.

ESSB 5447 amended the rule's authorizing statute to promote the production and use of low-carbon alternative jet fuels in Washington. Alternative jet fuel reduces emissions from aviation, which has been identified as one of the most difficult transportation sectors to decarbonize. Cleaner fuels will generate more credits, thereby incentivizing the production of low carbon intensity alternative jet fuels.

This rulemaking also aims to amend multiple sections of the rule to increase program efficiency and streamline compliance. This includes establishing requirements for a third-party verification program and refining the compliance and enforcement process.

1.3 Summary of the proposed rule amendments

The proposed rule amendments would:

- Add flexibility and clarity
- Make adjustments to reporting and documentation efforts
- Redistribute potential credit generation

- Require metering of forklift charging
- Shift potential program participation (including amendments to indirect accounting and avoided methane crediting)
- Adjust crediting and deficit calculations
- Modify ZEV capacity crediting.
- Add third-party verification.

See Section 2.3 for the full lists of specific changes under each bullet above.

1.4 Document organization

The chapters of this document are organized as follows:

- **Chapter 2 - Baseline and the proposed rule amendments:** Description and comparison of the baseline (what would occur in the absence of the proposed rule amendments) and the proposed rule requirements.
- **Chapter 3 - Likely costs of the proposed rule amendments:** Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the proposed rule amendments.
- **Chapter 4 - Likely benefits of the proposed rule amendments:** Analysis of the types and sizes of benefits we expect to result from the proposed rule amendments.
- **Chapter 5 - Cost-benefit comparison and conclusions:** Discussion of the complete implications of the CBA.
- **Chapter 6 - Least-Burdensome Alternative Analysis:** Analysis of considered alternatives to the contents of the proposed rule amendments.
- **Chapter 7 - Regulatory Fairness Act Compliance:** When applicable. Comparison of compliance costs for small and large businesses; mitigation; impact on jobs.
- **Appendix A - APA Determinations:** RCW 34.05.328 determinations not discussed in chapters 5 and 6.

Chapter 2: Baseline and Proposed Rule Amendments

2.1 Introduction

We analyzed the impacts of the proposed rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules). This context for comparison is called the baseline and reflects the most likely regulatory circumstances that entities would face if Ecology does not adopt the proposed rule.

This rulemaking includes multiple separate amendments as well as larger program additions or reorganizations with multiple elements themselves. We have therefore organized this analysis and document:

- Largely in terms of the types of costs or benefits expected (e.g., labor effort, capital costs, credits/deficits, program participation, etc.).
- Separately grouping the likely impacts of the following proposed amendments in their own sections, as they involve either new concepts or multiple amendments and reorganization.
    - ZEV capacity crediting.
    - Third-party verification.

2.2 Baseline

The baseline for our analyses generally consists of existing laws and rules. This is what allows us to make a consistent comparison between the state of the world with and without the proposed rule amendments.

For this rulemaking, the baseline includes:

- The existing rule: Chapter 173-424 WAC, Clean Fuels Program.
- The authorizing statute: Chapter 70A.535 RCW, Transportation Fuels – Clean Fuels Program.

2.3 Proposed rule amendments

The proposed rule amendments would:

- Add flexibility or clarity by:
    - Adding or amending definitions and carbon intensity benchmarks to support other rule amendments.
    - Adding mass balance reporting flexibility.
    - Adding specified feedstocks to align with California and Oregon clean fuels programs.

    - Adding pathway application flexibility
    - Adding or amending rule language in multiple sections to clarify without material impact.
- Make adjustments to reporting and documentation efforts related to:
    - Exempt use transactions.
    - Aggregator notifications.
    - Designation of electric credit generators.
    - Electric utility notifications.
    - Changes in ownership or control.
    - Inactive registrations.
    - Registration of fueling supply equipment (FSE).
    - Registration of electric transport refrigeration units (eTRU).
    - Follow-up information requests.
    - Fuel transfers.
    - Exported fuel sales.
    - Updated report corrections.
    - Reporting forklift charging.
    - Credit transfers
    - Specified source pathway attestation.
    - Pathways approved by California or Oregon clean fuel programs.
    - Use of carbon intensity calculators.
    - Use of renewable electricity products and power purchase agreements.
- Redistribute potential credit generation by:
    - Amending designation of fuel exporters.
    - Encouraging use of offsite renewable electricity located in the pacific Northwest.
- Require metering of forklift charging.
- Shift potential program participation in:
    - Alternative jet fuels and alternative marine fuels.
    - Book-and-claim pipeline-injected biomethane.
    - Avoided methane from livestock and organic waste.
- Adjust crediting and deficit calculations through:

- Allowing alternative utility-specific carbon intensities.
- Switching to continuous review of carbon intensities.
- Adjustments to pathway carbon intensity calculator tiers.
- Adjustments to situations where operating and certified carbon intensities differ.
- Adjustment to geothermal pathway carbon intensity.

- Modify ZEV capacity crediting.
- Add third-party verification requirements.

2.3.1 Adding flexibility or clarity

2.3.1.1 Definitions and benchmarks

Baseline

The baseline rule and law include multiple definitions necessary for the implementation of the Clean Fuels Program. The baseline rule also includes annual carbon intensity benchmarks for alternative fuels intended for use in a single-fuel vehicle.

The baseline law also directs Ecology to, "adopt rules that are harmonized with the regulatory standards, exemptions, reporting obligations, and other clean fuels program compliance requirements and methods for credit generation of other states."

Proposed

The proposed rule amendments would add or amend multiple definitions to support other amendments to the Clean Fuels Program, discussed in the other sections of this chapter. These include:

- Clarification that conventional jet fuel has a carbon intensity of 90.12 gCO2e/MJ in the WA-GREET 3.0 model.[2]
- Addition of specific points of origin for used cooking oil from US municipal and public sites and international or other sources.
- Alignment and specificity in the definition of renewable naphtha.

[2] "WA-GREET" means the greenhouse gases, regulated emissions, and energy in transportation (GREET) model developed by Argonne National Laboratory that ecology modifies and maintains for use in the Washington clean fuels program. The model contains emission factors for calculating greenhouse gas emissions from site-specific inputs to fuel pathways and standard values for parts of the life cycle not included in the applicant-specific data submission. The most current version WA-GREET 3.0 is adapted from California's CA-GREET 3.0 (August 13, 2018). The model includes contributions from the oil production greenhouse gas estimator (OPGEE2.0) model (for emissions from crude extraction) and global trade analysis project (GTAP-BIO) together with the agro-ecological zone emissions factor (AEZ-EF) model for land use change (LUC). Ecology will make available a copy of WA-GREET 3.0 on its website (www.ecology.wa.gov). As used in this rule, WA-GREET refers to both the full model and the fuel-specific simplified calculators that the program has adopted.

- Deletion of irrelevant terms.
- Addition or amendments of definitions supporting other proposed rule amendments or clarify meanings of existing terms and phrases, including definitions of:
    - "Alternative marine fuel"
    - "Book-and-claim accounting"
    - "Break ground"
    - "By-product"
    - "Co-product"
    - "eCHE Fueling", "eGSE (Ground Support Equipment)", "eOGV Fueling", and "eTRU Fueling"
    - "Feedstock transfer document"
    - "Fixed Guideway Electricity Fueling"
    - "Forklift Electricity Fueling"
    - "Forklift Hydrogen Fueling"
    - "Fugitive methane"
    - "H2/FCV Fueling"
    - "HD-ZEV capacity credits"
    - "Operating condition"
    - "Operational data period"
    - "Primary product"
    - "Renewable diesel"
    - "Renewable hydrocarbon diesel"
    - "Renewable naphtha"
    - "Shared HD-HRI refueling station"
    - "Shared HD-FCI charging site"
    - "Total obligated amount (TOA)"
- Addition of information about the WA-GREET model.

The proposed rule amendments would also add annual carbon intensity benchmarks for hydrogen intended for use in single-fuel vehicles. These benchmarks would be:

- Effective January 1, 2030, hydrogen dispensed as a vehicle fuel must be at least 80 percent renewable.

- Effective January 1, 2035, hydrogen produced using fossil gas as a feedstock is ineligible for Clean Fuel Standard (CFS) credit generation unless biomethane attributes are matched to hydrogen production as described in the amended rule.
- Any volumes of hydrogen produced using fossil gas as a feedstock beginning January 1, 2035 must be assigned the carbon intensity found in the rule and an energy economy ratio (EER) of one.

Expected impact

These proposed amendments do not have impacts in and of themselves, beyond clarity and beneficial alignment with the California and Oregon clean fuel programs, or facilitation of covered entities' use of the WFRS. Impacts occur based on where and how these terms and fuels are used throughout the rule. Where each is relevant in the sections below, and in subsequent analysis of costs and benefits, we also account for these definition and benchmark amendments.

2.3.1.2 Mass balance reporting flexibility

Baseline

The baseline rule includes specific parameters for liquid fuels including gasoline, diesel, diesel fuel blends, alternative fuels, and alternative jet fuel. These include requirements such as (but not limited to) the transaction type for each fuel, records including the destination associated with each fuel transaction, information to be reported for renewable hydrocarbon diesel or renewable gasoline co-processed at a petroleum refinery, temperature correction, and reporting of exempt gallons.

Unless stated otherwise, Ecology interprets the current CFS statue and rule to require all regulated parties to report the carbon intensity of actual physical gallons of all regulated fuels. Unlike electricity and renewable natural gas, the current rule does not extend opportunities to separate environmental attributes from fuel volumes to any liquid fuels. Ecology understands this to mean additional effort must be undertaken to track the carbon intensity of all physical gallons, including commingled fuels, under the baseline. However, because the baseline rule does not specifically address methods for reporting fuels that are commingled in storage, production, or transport, Ecology has approved several requests from regulated parties to report comingled fuels according to the mass balance requirements in Oregon Administrative Rules 340-253-0640(6)(a). We note, however, that during the development of the proposed rule, stakeholders indicated they interpret the baseline differently – already allowing them to separate environmental attributes from physical gallons and claim the environmental attributes in any transactions taking place within the state.

Proposed

The proposed rule amendments would add specific options and requirements as to how to report gallons transferred in and out of commingled storage tanks or that are commingled in production or transport:

- Reporting entities may mass balance transfers out of a commingled tank or multiple commingled tanks at the same facility by fuel pathway code based on the gallons input into the tank or facility in the current or prior quarter.
- Liquid gallons reported under a specific fuel pathway code that were put into a tank two or more quarters prior may only be reported as transferred out of commingled storage if the reporting entity demonstrates to Ecology that the tank has not fully turned over by the quarter it is reporting, and volume is being transferred out.

Expected impact

Given baseline requirements to track the carbon intensity of all physical gallons of liquid fuel, and the lack of clarity on allowable methods of tracking carbon intensity for comingled fuels, we expect this proposed rule amendment to add clarity and flexibility for reporters with fuels that are commingled in storage, production, or transport tanks. Adding flexibility to choose mass balance reporting would be a potential cost savings and would be chosen by reporters who have previously defaulted to substitute fuel pathway codes or the fossil baseline carbon intensity when the actual carbon intensity of the fuel has not been able to be determined due to comingled storage. Reporters would do this when the actual carbon intensity of the fuel is lower than the substitute or fossil carbon intensity scores, resulting in additional credits generated. For entities who have already requested Ecology approval to use mass balancing, there would be no change to cost.

As noted above, however, we received feedback from stakeholders during development of the proposed rule, that they should be able to comply with baseline requirements by mass balancing at the state level rather than the facility level, not tracking physical gallons once they've entered the state system. Ecology determined this approach is not sufficient, however, as it does not sufficiently track the carbon intensity of the fuel as it moves through the state system or is exported outside of the state which results in carbon intensity reporting that is not reflective of what is actually consumed in Washington.

2.3.1.3 Aligning specified feedstocks with California and Oregon

Baseline

The baseline rule sets the standards for obtaining carbon intensity values for fuel pathways. This includes making certain fuels produced from specified source feedstocks eligible for a reduced carbon intensity value when applying under WAC 173-424-600, as long as they meet certain requirements. One of the sets of criteria is that feedstocks are nonprimary products of commercial or industrial processes for food, fuel, or other

consumer products and include (but are not limited to) used cooking oil, animal fats, fish oil, yellow grease, distiller's corn oil, distiller's sorghum oil, brown grease, and other fats, oils, and greases.

Proposed

The proposed rule amendments would add the following types of specified source feedstocks that are nonprimary products of commercial or industrial processes:

- Small-diameter, non-merchantable forestry residues removed for the purpose of forest fire fuel reduction, or forest stand improvement, and from a treatment where non-clear cutting occurred.
- Organic portion of municipal solid waste that is diverted from landfill disposal.
- Corn stover.
- Other feedstocks designated as specified-source at the time of pathway review and prior to certification.
    - Adding specified feedstocks to align with California and Oregon clean fuels programs.

Expected impact

The proposed amendments would align the Clean Fuels Program with the California and Oregon clean fuel programs. This would improve regulatory consistency across jurisdictions and expand potential pathways available for alternative fuels production and credit generation. We do not expect net costs of this proposed amendment, as entities would only be likely to voluntarily participate if they expected a net private benefit.

2.3.1.4 Pathway application flexibility

Baseline

The baseline rule, WAC 173-424-620(8) requires entities applying to be added as joint applicants to a vehicle manufacturer's application for an Energy Economy Ratio (EER) adjusted carbon intensity to provide a letter from the manufacturer stating that the manufacturer supports the addition of the joint applicant.

The baseline rule also sets requirements for Ecology's annual determination of utility-specific carbon intensity, including a December 31 deadline to post the updated values and add new fuel pathway codes.

Proposed

The proposed rule amendments would add the option of providing a letter from the qualified vehicle owner or the vehicle manufacturer that has an approved EER, in order to add joint applicants to the EER-adjusted carbon intensity applications.

They would also delineate the process and annual timing for:

- Ecology to propose a draft utility-specific carbon intensity of electricity to state utilities for review.
- Utilities that disagree with their draft carbon intensity to provide information to adjust it.
- Ecology finalizing the utility-specific carbon intensities.

Expected impact

We expect these proposed amendments to result in potential cost-savings of effort on the joint EER applicant's part, if it is easier to obtain a letter from the vehicle owner that has an approved EER, in cases the manufacturer does not have approved-EER.

We also expect the provision of a specific process for revising Ecology's utility-specific carbon intensities to result in added clarity for program participants, as well as improved accuracy of utility-specific carbon intensity values. While the proposed revision process includes a deadline for disagreement documentation, it is overall more flexible and transparent than the baseline rule language that only sets the deadline for Ecology to post final values. This amendment is to codify the current practice in the rule.

2.3.1.5 Clarifying without material impact

Baseline

During program implementation and development of the proposed rule, Ecology noted multiple areas of rule language that were potentially unclear, and which could be improved to facilitate compliance and administration of the program.

Proposed

The proposed rule amendments would add or amend language in multiple sections to improve clarity and consistency without materially impacting the rule's requirements. This includes, but is not limited to:

- Rewording edits for consistency with terms used in the Washington Fuel Reporting System (WFRS).
- Rewording edits for clarity, without material impact on meaning.
- Using terminology consistently throughout the rule.
- Using terminology that is consistent with terms used in the California and Oregon clean fuel programs.
- Including a column in the Land Use Change Values table that specifies which geographic regions the indirect land use change values apply to. This is consistent with the most recent version of CARB and OR-DEQ's rules.
- Adding clarifying language consistent with Oregon's clean fuels program, that exempt fuel volumes must be claimed by the end of the regular reporting period for a given quarter, and would otherwise be deemed voluntarily included. This is

consistent with existing language in the rule related to correcting a previously submitted report.[3]

Expected impact

As these proposed amendments do not change the meanings or requirements in the rule, they would not result in costs or benefits beyond the benefit of clarity and consistency. This would serve to streamline compliance by covered and opt-in entities, potentially reducing the need for technical assistance or resulting in fewer delays.

2.3.2 Making adjustments to reporting and documentation efforts

2.3.2.1 Exempt use transactions

Baseline

The baseline rule requires the person asserting that a fuel has an exempt fuel use to maintain supporting records (such as individual receipts or invoices for each fuel sale that list the customer and fuel type, or electronic or paper records that document the customer's vehicle(s) being fueled are an exempt category under the rule) for seven years.

Proposed

The proposed rule amendments would clarify that the person reporting the exempt use transaction in WFRS and asserting the exemption is responsible for the accuracy of the submitted information, even if they are not the fuel end user. This person would be subject to the seven-year retention requirement.

Expected impact

In cases where the person asserting the exemption is not the fuel end user, this proposed rule amendment may result in additional costs associated with acquiring and retaining additional records held by end users. Where this occurs, this amendment would also result in the benefit of clarity in who is responsible for both accuracy and records. As the exchange of this information is likely already part of the business relationships involved in fuel sales for purposes of tracking and accounting, we do not expect this change to result in significant costs or benefits over the baseline.

2.3.2.2 Aggregator notifications

Baseline

The baseline rule requires credit aggregators to notify when a credit generator or regulated party has withdrawn designation of the aggregator. These withdrawals may only take affect at the end of the calendar quarter when Ecology receives the notice.

Proposed

[3] WAC 173-443-420(10)

The proposed rule amendments would specify that, in order to be excluded from the annual fee for the current year, aggregators must notify Ecology of the withdrawal by March 31st.

Expected impact

This proposed amendment may result in aggregators needing to notify Ecology earlier than they would under the baseline. This would mean making the same effort earlier, with a benefit of being excluded from the annual fee.

2.3.2.3 Designation of electric credit generators

Baseline

The baseline rule sets requirements for how credits are generated for electricity when used as a transportation fuel. It includes responsibilities to generate credits, and the process for designating another entity as a credit generator.

Proposed

The proposed rule amendments would add requirements for designation of another entity as a credit generator:

- Starting January 1, 2026, new contracts that designate another entity as the credit generator would be required to use specific language related to waiving credit generation and allocating credits, as well as agreement for designated entities and first fuel reporting entities to fulfil CFS responsibilities and provide supporting electricity data, respectively.
- Credit generators would be required to notify the first fuel reporting entity of the total credit revenue generated during the previous year from all FSE owned by the first fuel reporting entity.

Expected impact

These proposed rule amendments are likely to result in additional costs of:

- Adding boilerplate language to contracts.
- Annual notifications.

They would also result in benefits of:

- Clarity in roles and responsibilities, facilitating smooth compliance with reduced risk of delays or missing data or documentation.
- Transparency to market participants in revenue generated from their FSE.

2.3.2.4 Electric utility notifications

Baseline

To generate residential electric vehicle charging credits for the following year, the baseline rule requires the electric utility to notify Ecology by October 1st whether it will

generate base credits or designate an aggregator to act on its behalf. Designations of aggregators remain in effect unless the utility requests a change in writing to Ecology.

Proposed

The proposed rule amendments would add that the notification to Ecology must be submitted electronically, on the utility's letterhead, and include specific contact information, intent to participate, whether the utility will generate base credits or designate an aggregator, and authorized officer signature.

Expected impact

Depending on how utilities interpret the baseline language, this proposed amendment may result in minor added notification costs of using the specific format and including the required contents. It is also likely to result in benefits of improved program tracking of utility participation, confidence, and administration.

2.3.2.5 Changes in ownership or control

Baseline

The baseline rule sets requirements for program registration, including eligibility, required information, WFRS account establishment and management, and modifications.

Proposed

The proposed rule amendments would add requirements for when a change in ownership or control of a registered party occurs. These include:

- Previous owner notification to Ecology, containing specific contact and ownership information, account representatives, and credit disposition.
- New owner notification to Ecology, containing specific contact and ownership information, and account representatives.
- Specification of the owner or operator or record.
- Clarification that a single report must be submitted for an entire reporting period, regardless of change in ownership during that period, and that annual report compliance applies to the new owner or operator.

Expected impact

This proposed amendment is likely to result in incremental notification costs in cases of a change in ownership. It is also likely to result in clarity in the responsibilities of regulated parties, potentially reducing errors and delays in compliance.

2.3.2.6 Inactive registrations

Baseline

The baseline rule includes registration requirements including for cancellation of registration, but does not specify what occurs in cases of inactive registrations.

Proposed

The proposed rule amendments would specify what happens if an account is inactive. If a registered party does not have any fuel transactions reported in four consecutive quarters:

- The party will receive a 30-day notice from Ecology that:
  - Its account in WFRS will be deactivated.
  - Any remaining credits in its WFRS account will be transferred to the Backstop Aggregator.
- The party will be able to re-register and have its account reactivated after having qualifying fuel transactions.

Expected impact

In cases where an account is inactive for four quarters, this proposed amendment would result in costs of potentially needing to re-register, or potentially losing remaining credits in the system. It would also result in benefits of a well-functioning, streamlined program with up-to-date information and in which residual credits are not abandoned. Credits that sit idle under the baseline would instead go to the backstop aggregator, and credit revenues would be spent on further decarbonization. This amendment would also make Washington's program consistent with the California and Oregon clean fuel programs, resulting in regulatory consistency for registered parties across jurisdictions.

2.3.2.7 Registration of fueling supply equipment

Baseline

The baseline rule sets requirements for registration of fueling supply equipment (FSE). This includes general requirements for all FSE and specific requirements by fuel type.

Proposed

The proposed rule amendments would add a requirement for FSE registration, to include the date that equipment became operational. All equipment being registered would be required to be operational at the time of registration, meaning the FSE is fully constructed and available for fueling or charging.

Expected impact

This proposed amendment is likely to result in minor additional registration costs for registering FSE. It would also result in benefits of clearly meeting program goals through registering only equipment that is capable of being used for fueling or charging purposes.

2.3.2.8 Registration of electric transport refrigeration units

Baseline

The baseline rule sets requirements for registration of FSE, including general requirements for all FSE and specific requirements by fuel type. For electric forklifts,

eCHE, eOGV, and eGSE, FSE refers to the facility or location where electricity is dispensed for fueling. If there are multiple FSEs capable of measuring electricity dispensed at the facility or location, then an entity may provide the serial number assigned to each individual FSE by the original equipment manufacturer (OEM) and the OEM's name in the registration.

Under the baseline rule, electric transport refrigeration units (eTRU) must frequently re-register their FSE, as they do not have the same requirements as the fueling types above. They instead register the serial number and OEM name for each eTRU.

Proposed

The proposed rule amendments would add electric transport refrigeration units (eTRU) to the specification the baseline rule gives to eCHE, eOGV, and eGSE (under "Baseline" above).

Expected impact

The proposed rule is likely to result in initial, one-time registration costs meeting the new requirements for lasting registration of eTRU FSE. It would also result in a cost-savings of avoiding the costs of needing to repeatedly re-register these FSE under the baseline.

2.3.2.9 Follow-up information requests

Baseline

The baseline rule sets requirements for registration of fueling supply equipment (FSE). This includes general requirements for all FSE and specific requirements by fuel type.

Proposed

This proposed amendment would add that Ecology may request additional documentation or evidence prior to approving FSE registration, and that Ecology may deny the registration if the requested documentation is not provided within 7 days or other deadline that Ecology sets for it.

Expected impact

This amendment may result in costs of re-registration if additional information is requested but is not provided by the deadline. Like the proposed amendments related to inactive registrations, it would also result in benefits of a well-functioning, streamlined program with up-to-date and comprehensive information.

2.3.2.10 Fuel transfers

Baseline

The baseline rule sets requirements for documenting fuel transfers reported in WFRS. These include that a product transfer document must include:

- Transferor company contact information.
- Recipient company contact information.

- Transaction date
- Fuel pathway code.
- Carbon intensity.
- Fuel quantity.
- A statement identifying whether the obligation to act as credit or deficit generator is passed to the recipient.
- Fuel production company identification number and facility identification number.
- Destination of the fuel.

Proposed

The proposed rule amendments would reorganize the baseline requirements for clarity, describing them separately for transfers where the credit or deficit generation obligation is passed versus is not passed to the recipient. For cases where the obligation is retained by the transferor, the amendments would add a requirement that the product transfer document must include the specific statement: "This transportation fuel has been reported to the Washington Clean Fuels Program for intended use in Washington. If you export this fuel from Washington, you must contact Washington State Department of Ecology via WFRSAdmin@ecy.wa.gov to report the transaction."

Expected impact

The actual change resulting from these proposed amendments, as compared to the baseline, is the requirement to include specific language in the fuel transfer document in cases where the transferor retains credit or deficit generation obligations. In such cases, the amendments would result in minor cost of adding the standard language to document boilerplate. This would result in benefits of transparent obligations and responsibilities, as well as reiteration of requirements for entities that then export the fuel out of state.

2.3.2.11 Exported fuel sales

Baseline

The baseline rule sets specific reporting parameters for liquid fuels, including gasoline, diesel, diesel fuel blends, alternative fuels, and alternative jet fuel. These include a requirement for registered parties that are position holders that sell fuel below the rack for export to identify each recipient of such fuel that is registered in the program.

Proposed

The proposed rule would delete baseline language specifying that identified recipients are those registered in the Clean Fuels Program.

Expected impact

This proposed amendment could expand the number of recipients identified by registered parties that are position holders that sell fuel below the rack for export. Correspondingly, this would result in better program knowledge of exported fuel recipients to the extent Ecology is not currently aware of them. Knowledge of these recipients of fuel sold below the rack for export would ensure they are aware of the requirements they must meet under the baseline, including registration, which would support comprehensive implementation of the program and meeting its goals.

2.3.2.12 Updated report corrections

Baseline

The baseline rule requires fuel reporting entities to request to have previously submitted quarterly reports reopened to make corrections when they discover an error. Corrections are done via a correction request form in the WFRS. The fuel reporting entity must specify the corrections and provide justification for them.

Similarly, the baseline rule allows regulated parties, credit generators, and aggregators to ask Ecology to reopen a previously submitted quarterly or annual compliance report for corrections and resubmittal. This is done using an "unlock report request form" in WFRS.

Proposed

The proposed rule amendments would add that the corrections made to quarterly reports, or to quarterly or annual compliance reports, must only be those specified in the request Ecology has approved. If there are additional corrections, the entity would need to submit an additional request after the initial corrections are made. The amendments would also require entities to submit corrections within two days of a request being approved.

Expected impact

These proposed amendments are largely clarifications, but would potentially result in a need for entities to resubmit their correction requests, if they take longer than two days to submit corrections. This would result in a corresponding benefit of an efficient process during which information is up-to-date and potential corrections are completed in a timely fashion. We do not expect this impact to occur frequently, as additional corrections are likely to be identified and specified within a short time of identifying initial corrections.

2.3.2.13 Reporting forklift charging

Baseline

The baseline rule allows the quantity of electricity used in electric forklifts to be determined by either:

- Quantity of electricity used during a reporting period, as measured per FSE.

- If the quantity of electricity as measured per FSE is unavailable, the reporting entity may submit a written statement to Ecology demonstrating the reasons they are unable to provide measured electricity data. Upon approval from Ecology, they may use an Ecology-approved estimation method.

Proposed

The proposed rule amendments would remove the baseline language above, to correspond to other proposed amendments that would require metering of forklift charging (see Section 2.3.4).

Expected impact

As other proposed amendments would require metering of forklift charging, and the baseline language above includes the default (without request for an alternative approach) requirement that quantity of electricity measured per FSE must be reported, we do not expect this change to result in costs or benefits. See Section 2.3.4 for discussion of the impacts of requiring metering for forklift charging.

2.3.2.14 Credit transfers

Baseline

The baseline rule sets requirements for transacting credits in the Clean Fuels Program. This includes activities allowed or prohibited for regulated parties, credit generators, and aggregators, as well as requirements related to transfers between registered parties, credit seller requirements, credit buyer requirements, aggregator abilities, and prohibited transfers.

Proposed

The proposed rule amendments would define two types of credit transfers, based on whether the over-the-counter agreement for the sale or transfer of credits includes delivery up to 10 days (Type 1) versus over 10 days (Type 2) after the transaction agreement.

The amendments would also shorten the time during which credit seller and buyer requirements must be met before a transaction is voided, from 20 days to 10 days.

Expected impact

We do not expect the proposed definition of Type 1 and Type 2 credit transfers to result in significant costs, as this information should be known and readily available as part of the credit transaction agreement. Understanding of the timing of credit delivery would improve Clean Fuels Program planning.

Shortening the time during which seller and buyer requirements must be met would align rule requirements with the existing functions of the WFRS. While this is a change in rule language, taking longer than 10 days without a transaction voiding is not possible under the baseline.

2.3.2.15 Specified source pathway attestation

Baseline

The baseline rule, WAC 173-424-600, sets requirements for establishing carbon intensity values for fuel pathways. This includes the requirement that carbon intensities must be calculated using the WA-GREET model, timing of Ecology review of carbon intensities, established carbon intensities, and alternative fuel pathways classifications. It also includes criteria for specified source feedstocks, fuel production facility operation period to be used for carbon intensity determination, and fuel producer's obligation to maintain the carbon intensity of fuels they produce below the approved carbon intensity value.

The rule includes requirements to maintain pathways, including requirements to maintain records, and ensure Ecology and verifier access to transfer documents. It also includes required information that must be prominently stated on feedstock transfer documents for specified source feedstocks, including transferor and recipient contact information, type and amount of feedstock, and transaction date.

Proposed

The proposed rule amendments would add requirements for a feedstock attestation letter. Each entity in the supply chain of a specified source feedstock would need to maintain such attestation letter, and each letter would need to contain specific attestations in the proposed rule. Attestations would include:

- The feedstocks have not undergone additional processing outside the pathway described by the fuel producers in lifecycle analysis and pathway carbon intensity.
- All data and information supplied to Ecology and third-party verifier towards determination of carbon intensity of the feedstock and fuel are true and accurate. This includes feedstocks meeting program definitions, deliveries being entirely what is documented and not mixed or altered, and feedstocks not being intentionally produced, modified, or contaminated to meet definitions).

The amendment also requires singed attestations to:

- Be maintained and submitted upon verifier or Ecology request.
- Be on company letterhead.
- Be maintained separately for each feedstock.
- Be signed by an authorized representative of the supplier.
- Include a specific signed and dated attestation as worded in rule.

Expected impact

This proposed amendment would result in additional documentation costs for entities in the supply chain for specified source feedstocks. It would also benefit the program by ensuring the integrity of specified source feedstocks, and the accuracy of the carbon

intensity value of fuels produced using such feedstocks. This would align the program with the California and Oregon clean fuel programs.

2.3.2.16 Pathways approved by California or Oregon programs

Baseline

The baseline rule, WAC 173-424-610(2), sets the required documents fuel producers must provide to apply to obtain a carbon intensity based on CARB or OR-DEQ certified pathway. For applicants seeking approval to use a carbon intensity that is currently approved under the California or Oregon clean fuel programs, the rule requires them to provide:

- The application package submitted to the California Air Resources Board (CARB) or Oregon Department of Environmental Quality (OR-DEQ).
- The Tier 1 or Tier 2 CA-GREET or OR-GREET calculator approved by the respective agency, and the WA-GREET 3.0 equivalent as modified for the fuel's pathway to Washington.
- The CARB or OR-DEQ review report.
- Annual fuel pathway report, if submitted to CARB or OR-DEQ.

Proposed

The proposed rule amendments would add a requirement that applicants using the above process also submit verified annual fuel pathway report or validated pathway application and a positive or qualified positive validation or verification statement for the pathway issued under the CARB or OR-DEQ verification program.

Expected impact

This proposed rule amendment is to codify the current practice in the program to improve transparent and consistent implementation of the program. This amendment does not incur additional cost as the required documents are expected to be produced for compliance with CARB LCFS or OR-DEQ clean fuels program. It would result in corresponding benefits of improved program assurances that the carbon intensities being sought are accurate.

2.3.2.17 Use of carbon intensity calculators

Baseline

The baseline rule sets the process for fuel producers to apply to obtain a carbon intensity. For applicants seeking to obtain a carbon intensity using either the Tier 1 or Tier 2 calculator, the rule requires them to submit information about the company, facility, and consultants, as well as information specific to their use of the calculator, documentation, data, and results.

Proposed

The proposed rule amendments would specify that non-liquid fuel producers must provide facility nameplate capacity equivalent to liquid fuels in specific units.

The amendments would also clarify:

- The criteria for classification of Tier 1 versus Tier 2 fuel pathways; and appropriate datasets for use in a fuel pathway application, including period covered, and selection of the subregions of the electricity grid used.
- The application requirements for applicants using the Tier 2 calculator, adding an explicit process to first request approval of their proposed approach to modeling carbon intensity, and Ecology's responsibilities when approving or denying. If denied, applicants would be able to resubmit information to seek an approval.

Expected impact

The additional requirement to provide the equivalent nameplate capacity for non-liquid fuels could result in minor costs of providing this known information, if not already provided as an interpretation of the baseline rule. We expect that this information is already known and accessible, as it is being provided under the baseline. We therefore do not expect this proposed amendment to result in costs.

The specified process for initial approval of Tier 2 methodology before submitting additional application materials may result in reduced repeated work effort for applicants by establishing agreed upon approach and methods for calculating carbon intensity of fuel pathways. Under the baseline, Ecology does not approve applications with inadequate methodology, and the proposed amendment could reduce the need to compile and submit additional information again when reapplying if it would otherwise be submitted with an application that would be denied.

2.3.2.18 Use of renewable electricity products and power purchase agreements

Baseline

The baseline rule sets requirements of demonstrating the use of offsite renewable electricity to lower the carbon intensities of electricity purchased through utility renewable electricity products and power purchase agreements. The rule requires Renewable Energy Certificates (RECs) to be retired in the program to be generated after 2023 and be registered by Western Renewable Energy Generation Information System (WREGIS). The rule also requires applicants to use RECs certified by WREGIS, which is not being practiced.

Proposed

The rule amendment removes the requirements for certification of RECs by WREGIS, as it is not practiced by WREGIS. The proposed rule amendments would require annual fuel pathway reports for applicants using renewable electricity purchased through power purchase agreements or utility renewable electricity products to be submitted by June 30th of each year. This is partly because Ecology calculates the amount of energy used for residential EV charging twice a year, and determines the annual electricity

consumption in Q1 and utilities submit their annual fuel pathway reports at the end of Q2 of the next calendar year. The amendments also require these reports to include a verification statement, if the product is subject to third-party verification under the amended rule (see Section 2.3.8). These amendments are related, in that earlier completion of the report would occur before proposed verification deadlines.

Expected impact

The requirement for reporting in the annual fuel pathway report is part of the baseline. The amendment would establish the deadline for submitting the annual fuel pathway report. These amendments would result in potential costs associated with earlier submittal of annual fuel pathway reports, if they would otherwise be submitted in the second half of a calendar year under the baseline. They would also result in minor costs of submitting existing third-party verification reports, if the entity is subject to third-party verification (see section 2.3.8 for discussion of third-party verification requirements). Benefits would include consistent and comprehensive reporting accounting for verification requirements.

2.3.3 Redistributing potential credit generation

2.3.3.1 Amending designation of fuel exporters

Baseline

The baseline rule specifies requirements for designation of fuel reporting entities for liquid fuels. First this section states that while CFS obligation cannot transfer to below the rack purchasers, those purchasers do have to report if they export the fuel.

Second, this section lists the following criteria for designation of fuel exporters:

- When the fuel is sold or delivered above the rack for export, the entity holding the title to the fuel as it crosses the Washington border must report it.
- When the fuel is sold across the rack for export, the entity holding the title as it crosses the rack must report.
- When the fuel is diverted out of state below the rack, the entity holding the title as it crosses the border must report.

These two portions of rule text are not fully harmonized, so in implementation, Ecology has defaulted to the earlier requirement that the entity purchasing below the rack for export must report the export

Proposed

The proposed rule amendments would clarify contradictory rule text and simplify designation of the entity responsible for reporting exports of fuel as the entity holding the title of the fuel as it crosses the Washington border.

Expected impact

This proposed amendment would resolve unclear rule text and align with current implementation of the rule. This is technically a change in written rule requirements, which could conceptually result in a potential shift in who is required to report (though not changing aggregate costs through redistribution). Because of the contradictory baseline language, however, Ecology must make a choice to be able to implement this part of the rule and law, and given that Ecology would continue to need to do so under the baseline, we do not expect this amendment to result in real impacts beyond clarity.

2.3.3.2 Encouraging use of Pacific Northwest renewable electricity

Baseline

The baseline rule sets requirements for determining the carbon intensity of electricity. This includes requirements for lowering the carbon intensity of electricity claimed as a vehicle fuel, using retired renewable electricity certificates (RECs). RECs must meet the following qualifications:

- RECs retired to claim carbon intensity other than the statewide or utility-specific mix must be certified by WREGIS or another Ecology-approved certification system.
- Unbundled RECs used through book-and-claim accounting must be certified at the wholesale level.
- RECS used in a power purchase agreement or utility renewable electricity product may be certified at the retail level.
- RECS must be generated in and after 2023.
- RECs must be generated from facilities located in the western electricity coordinating council.
- RECs must be recorded and retired in a recognized REC tracking system.
- Unbundled RECs must meet safeguards to prevent double counting.

Proposed

The proposed rule amendments would delete inapplicable language related to WREGIS, as it does not function as a certification body. The amendments would clarify that RECs must be retired in the CFS program account in WREGIS each quarter, in alignment with existing program guidance. They would also phase in a requirement that beginning January 1, 2026, RECs must be generated from facilities located in Washington, Oregon, or Idaho that started operations January 1, 2019 or later, or from efficiency improvements after that date. Amended language would clarify that eligible RECs from

hydroelectric generation would also need to meet the requirements of the Clean Energy Transformation Act.[4]

Expected impact

Starting in 2026, these proposed amendments would result in entities seeking to lower carbon intensity based on retired RECs only being able to use RECs generated from facilities in Washington, Oregon, or Idaho. This would shift demand for RECs from their baseline distribution to increased demand for Pacific Northwest RECs, resulting in constrained applicable REC supply and increased prices for those RECs. This could affect the distribution of credits across participating entities, depending on their choices resulting from changes in REC supply or prices. Benefits would include alignment with statewide emissions reduction targets and renewable electricity generation goals. We also note that the proposed requirements to register and retire RECs in program accounts, while a change in rule language, are consistent with Ecology guidance and interpretation of baseline needs. This change ensures RECs meet program requirements and avoid program inefficiencies that would result from double counting.

2.3.3.3 Reporting electric fueling of eTRU

Baseline

For electricity supplied to eTRU, the baseline rule defines the fuel reporting entity and credit generator as the eTRU fleet owner.

Proposed

The proposed rule amendments would define the FSE owner as the fuel reporting entity and credit generator.

Expected impact

This amendment would not result in aggregate costs as compared to the baseline, as it would redistribute reporting burden and credit generation across entities (if they are different owners). As the FSE owner may have better access to relevant data and information, this amendment could result in an aggregate reporting cost savings. Additionally, since the FSE owner would be more likely to be making decisions about additional investments in FSE capacity, this amendment could create more incentive for FSE owners to enter the market or make additional investments.

2.3.4 Requiring metering of forklift charging

Baseline

[4] The Clean Energy Transformation Act (CETA), Chapter 19.405 RCW, committed Washington to an energy supply free of greenhouse gas emissions by 2045. The law requires at least 80 percent of electricity used in Washington to come from clean energy sources by 2030, and all electricity used in the state to come from clean energy sources by 2045. Ecology implements parts of this law through Chapter 173-444 WAC, the Clean Energy Transformation Rule.

The baseline rule allows the quantity of electricity used in electric forklifts to be determined by either:

- Quantity of electricity used during a reporting period, as measured per FSE.
- If the quantity of electricity as measured per FSE is unavailable, the reporting entity may submit a written statement to Ecology demonstrating the reasons they are unable to provide measured electricity data. Upon approval from Ecology, they may use an Ecology-approved estimation method.

Proposed

The proposed rule amendments would remove the option of requesting approval of an alternative method of calculating the quantity of electricity used in electric forklifts.

Expected impact

This proposed amendment would result in some facilities needing to install metering for charging of electric forklifts, if they could use an alternative method under the baseline. We note that Ecology guidance implementing the baseline rule has specified a phase-out of the use of alternative measurement or estimation methods after 4 quarters per facility, so facilities may already be planning for this change. Benefits would include accurate measurement of electricity used for forklift charging, consistent with measurement requirements for other vehicle fueling. This would reduce the risk of the program either over-providing or under-providing associated credits.

2.3.5 Shifting potential program participation

2.3.5.1 Alternative jet fuels and alternative marine fuels

Baseline

The baseline rule includes specific reporting requirements for fuels, including quarterly reporting parameters for natural gas, electricity, hydrogen, propane, and liquid fuels including gasoline, diesel, diesel fuel blends, alternative fuels, and alternative jet fuel. It also includes specific reporting requirements for annual reporting of electric utility credit revenue and correcting previously submitted reports.

Proposed

The proposed rule amendments would add specific reporting parameters for alternative jet fuel and alternative marine fuel using electrolytic hydrogen as process energy. These would include the following:

- Producers of alternative jet fuel or alternative marine fuel may claim a utility-specific carbon intensity for electrolytic hydrogen used as process energy through December 31, 2033. After that date, producers must use the statewide grid average carbon intensity or directly-connected renewable electricity.
- To claim a utility-specific carbon intensity, a registered party must:

- Obtain written approval from Ecology before submitting the first quarterly report where the reporting party intends to claim that carbon intensity.
- Provide any rate schedule documentation or agreement between the reporting party and the relevant utility upon request.
- Register RECs for low or zero utility-specific carbon intensity in WREGIS and retire them in the CFS program account each quarter, or demonstrate they are retired in the Washington Utilities and Transportation Commission or Washington Department of Commerce account.

Expected impact

This proposed amendment would add circumstances in which a utility-specific carbon intensity for electrolytic hydrogen used as process energy can be reported in the Clean Fuels Program. We note that these fuels are eligible under the baseline, and the proposed amendment would adjust the carbon intensity accounting options available to their producers. While costs of meeting the new requirements related to approval and documentation would result from these amendments, we do not expect any net costs of this amendment. This is because entities would only choose to participate and use this utility-specific carbon intensity option if they expected a net benefit. Consideration of net benefit would account for associated costs of meeting the requirements in the amendment and associated benefits of being able to use a lower carbon intensity and therefore generate additional credits. We also note that the proposed requirements to register and retire RECs in program accounts, while a change in rule language, are consistent with Ecology guidance and interpretation of baseline needs to ensure RECs meet program requirements and to avoid program inefficiencies that would result from double counting.

2.3.5.2 Book-and-claim pipeline-injected biomethane

Baseline

The baseline rule contains various requirements related to book-and-claim accounting. These include:

- 10-year recordkeeping requirements for attestations regarding environmental attributes associated with book-and-claim accounting for renewable electricity or biomethane used as a transportation fuel or for hydrogen production.
- Specific (quarterly) reporting parameters, including requirement to submit records showing the retirement of renewable thermal certificates representing the biomethane environmental attributes from that facility in a tracking system.
- Specified source feedstock requirements including that the specified source feedstocks are used in pathways for biodiesel, renewable diesel, alternative jet fuel, co-processed refinery products, biomethane supplied using book-and-claim

accounting and claimed as a feedstock for CNG, LNG, L-CNG, or hydrogen produced using steam-methane reformation.

- One of the qualifications for use of a lower carbon intensity of electricity using retired RECs, certified at the wholesale level if they are unbundled and claimed through book-and-claim accounting.

The authorizing statute was also recently amended to require Ecology to add book-and-claim biomethane as a feedstock for alternative jet fuels.

Proposed

The proposed rule amendments would add a section to the carbon intensity requirements, specifying requirements for book-and-claim accounting for pipeline-injected biomethane.

They would allow indirect accounting of biomethane injected to a common carrier pipeline if it is used as transportation fuel, to produce electricity using a fuel cell for EV charging, to produce alternative jet fuel, alternative marine fuel, or renewable diesel, or to produce hydrogen used in fuel cell vehicles. Indirect accounting could be applied to biomethane used for these purposes if requirements for temporal matching, sourcing, and documentation are met (in addition to existing recordkeeping and reporting requirements). These requirements would be:

- Temporal matching: Book-and-claim (indirect) accounting of biomethane may only be reported within three quarters of when the renewable thermal credit was generated. If a quantity of biomethane and associated environmental attributes is pipeline-injected in the first calendar quarter, the quantity of biomethane claimed for Clean Fuel Standard reporting must be matched to natural gas sold in Washington as biomethane no later than the end of the third quarter.
- Sourcing requirements (all uses except alternative jet fuel):
    - Through December 31, 2029, biomethane injected into the common carrier pipeline in North America can be reported without regard to physical traceability.
    - Beginning January 1, 2030, the biomethane must demonstrate one or more of the following:
        - Production in Washington and injection into any pipeline in Washington.
        - Injection into an interstate pipeline that flows into Washington. The injection point must be upstream of (based on direction of pipeline flow) or within Washington. Injection into a feeder pipeline that directly connects the production facility to an interstate pipeline that flows into Washington.

        - Injection into an international pipeline that flows into Washington or interconnects with a Washington pipeline through a border crossing. The injection point must be upstream of (based on direction of pipeline flow) or within Washington. Injection into a feeder pipeline that directly connects the production facility to an international pipeline that flows into Washington.
    - Sourcing requirements (alternative jet fuel):
        - Through December 31, 2045, biomethane injected into the common carrier pipeline in North America can be reported without regard to traceability.
        - Beginning January 1, 2046, biomethane associated with alternative jet fuel projects that broke ground on or before December 1, 2029 may continue to report without regard to traceability.
        - Beginning January 1, 2046, biomethane associated with alternative jet fuel projects that broke ground on or after January 1, 2030 must demonstrate one or more of the following:
            - Production in Washington and injection into any pipeline in Washington.
            - Injection into an interstate pipeline that flows into Washington. The injection point must be upstream of (based on direction of pipeline flow) or within Washington. Injection into a feeder pipeline that directly connects the production facility to an interstate pipeline that flows into Washington.
            - Injection into an international pipeline that flows into Washington or interconnects with a Washington pipeline through a border crossing. The injection point must be upstream of (based on direction of pipeline flow) or within Washington. Injection into a feeder pipeline that directly connects the production facility to an international pipeline that flows into Washington.
    - Documentation requirements: The pathway application and subsequent Annual Fuel Pathway Reports must include a specified set of documents including invoices, contracts, and maps or charts to substantiate the environmental attributes of pipeline-injected biomethane.

Expected impact

These proposed rule amendments could result in new biomethane production increasingly located along the specified pipelines over time. This may result in more biomethane injected into the common carrier pipeline over time, displacing fossil natural gas.

They would also align requirements for biomethane used as a feedstock for alternative jet fuel with standards in California, where this requirement becomes effective in 2046. The delayed compliance timeline for this biomethane would also serve to support decarbonization efforts in the aviation sector. This sector is currently difficult to decarbonize, due to a lack of viable low- or zero-emissions alternatives to current jet technologies, requiring the use of lower-emissions drop-in fuels to decrease greenhouse gas emissions. Current alternative jet fuel production is a developing industry, and fuels are produced in small quantities compared to other biomethane-derived fuels.

Benefits of this set of proposed rule amendments would include ensuring emissions reductions are happening in Washington, on timelines that are viable for fuel producers including those producing biomethane used as a feedstock for alternative jet fuel production, in support of Clean Fuels Program efficacy and Washington receiving the benefits as well as the costs of the program.

2.3.5.3 Avoided methane from livestock and organic waste

Baseline

The baseline rule does not specifically address crediting for avoided methane generated from biomethane production from dairy cattle or swine manure digestion, or organic material diverted from decomposition in a landfill. However, Ecology is accepting pathways that are approved by CARB or OR-DEQ, which allow for avoided methane crediting for up to three crediting periods of 10 years.

Proposed

The proposed rule amendments would add a section establishing specific criteria for the generation of avoided methane credits from biomethane production from the above operations. They would establish an up to 15-year avoided methane crediting period for project that began operating in or after 2023, while gradually decreasing credit amounts and timelines for facilities that began operations before 2023.

The amendments would also grant avoided methane credits for generating biogas from organic material that would have otherwise been disposed of at a landfill, and allow for avoided methane credit generation from incremental biomethane production at an existing facility, if the avoided methane emission is additional from the start date of the program in 2023.

The amendments also establish that avoided methane credits will be calculated against any legal or regulatory requirement for the destruction of biomethane. While no such requirement currently exists for biomethane generated from dairy and swine operations, a future regulation could reduce the amount of avoided methane credits available.

Expected impact

These amendments would incentivize new and additional methane capture and RNG production from dairy and swine manure, and from organic waste diverted from

landfills. Methane capture projects occurring directly as a result of CFS incentives would receive the most generous incentives. This provision is intended to establish additionality by verifying that the highest level of credits are allocated towards projects creating new environmental methane reduction benefits for Washington. This additionality benefit is created by:

- Establishing the baseline for each new facility built after Jan. 1, 2023, as its operational date for a period up to 15 years. Facilities operational before Jan. 1, 2023, would receive gradually decreasing avoided methane credits for a maximum of 14 years, depending on the start date, with more recent projects receiving a longer crediting period.
- Applicants using dairy and swine manure as a feedstock would be required to demonstrate their use of a liquid manure management system prior to their participation in the program. Liquid manure management produces higher methane emissions and is utilized to establish the baseline avoided methane benefit.

Extension of crediting to organic material that would have otherwise been disposed of at a landfill would better incentivize the reduction in landfill methane emissions as well as dairy and swine methane emissions.

While there would be costs associated with program participation using these pathways, we expect that entities will only choose to participate if they expect a net benefit, accounting for costs of participation and expected credit generation. Additional credit generation opportunities would also benefit the public and environment through incentivizing greenhouse gas emissions reductions.

2.3.6 Adjusting credit and deficit calculations

2.3.6.1 Switching to continuous review of carbon intensities

Baseline

The baseline rule requires Ecology to review carbon intensities for fuel pathways every three years, or sooner if Ecology determines that new information becomes available that warrants an earlier review.

Proposed

The proposed rule amendments would replace the baseline requirement with a requirement to regularly review the carbon intensities used in the Clean Fuels Program.

Expected impact

This amendment would allow Ecology greater flexibility in ensuring that carbon intensities reflect the most up-to-date science and lifecycle analysis models. While this could mean that the carbon intensities that underlie calculation of credits or deficits change more frequently, it could also result in reduced risk of going longer periods

allowing over-generation or under-generation of credits or deficits relative to the actual lifecycle emissions associated with fuels and pathways.

2.3.6.2 Adjustments to pathway carbon intensity calculator tiers

Baseline

Under the baseline rule, use of the fuel pathways classification in Tiers (Tier 1 or Tier 2) is delineated as follows:

- Tier 1: Conventionally-produced alternative fuels pathways that have been well-evaluated are classified as Tier 1, and include:
    - Starch-based and sugar-based ethanol;
    - Biodiesel produced from conventional feedstocks (plant oils, tallow, and related animal wastes and used cooking oil);
    - Renewable diesel produced from conventional feedstocks as above;
    - Natural gas; and
    - Biomethane from landfills; anaerobic digestion of dairy and swine manure or wastewater sludge; and food, vegetative, or other organic waste.
- Tier 2: Includes all fuel pathways not included in Tier 1 including, but not limited to:
    - Cellulosic alcohols;
    - Biomethane from other sources;
    - Hydrogen;
    - Renewable hydrocarbons other than renewable diesel produced from conventional feedstocks;
    - Biogenic feedstocks co-processed at a petroleum refinery;
    - Alternative jet fuel;
    - Renewable propane; and
    - Tier 1 fuels using innovative methods including, but not limited to, carbon capture and sequestration or a process that cannot be accurately modeled using the simplified calculators.

Proposed

The proposed rule amendments under WAC 173-424-600(5) would:

- Add ethanol from corn kernel fiber cellulose and naphtha to Tier 1.
- Move renewable propane, renewable naphtha, and alternative jet fuel produced from conventional feedstocks from Tier 2 to Tier 1.

Expected impact

These proposed amendments would reduce costs associated with use of the carbon intensity calculators for the fuel pathways moved or added to Tier 1, as they may not go through public review process. The resulting carbon intensity values may not be impacted.

2.3.6.3 Adjustments in cases where operating and certified carbon intensities differ

Baseline

The baseline requires fuel producers to maintain their fuel carbon intensity not to exceed the certified carbon intensity value, and allow them to establish margin of safety to meet this requirement. This includes the approval process to use carbon intensities for fuels other than electricity.

Proposed

The proposed rule amendments under WAC 173-424-610(9)(l) would establish requirements for handling cases in which the verified operational carbon intensity is found to be greater than the certified carbon intensity. This would include:

- Invalidation of excess credits.
- Generation of deficit obligations.
- Equations for calculating deficit obligations, as four times the difference in carbon intensities.
- Exemption for pathway holders that demonstrate that the carbon intensity exceedance is solely due to calculator updates.

The proposed rule under WAC 173-424-610(9)(m) allow fuel producers to generate additional credits through credits true up if the operational carbon intensity of the fuel they produce is found to be lower than the certified carbon intensity of the fuel through the annual fuel pathway report.

Expected impact

Generally, we must analyze the impacts of proposed rules by assuming accurate compliance with requirements. That makes it difficult to assess the impacts of this proposed amendment in a way that is comparable to other impacts, as it is inherently based on exceeding their certified carbon intensity. Holding this assumption consistent across this analysis, this proposed amendment would have only the benefits of creating disincentive for exceeding from certified carbon intensities, as the rule amendment provides opportunity to true up credits if the operational carbon intensity of fuel is below the certified carbon intensity. Correcting for such inconsistencies in truing up credits and deficits brings the program back into balance with actual carbon intensities associated with fuel pathways.

2.3.6.4 Adjustment for geothermal pathway carbon intensity

Baseline

The baseline rule sets the carbon intensity of solar, wind, geothermal, hydropower, and ocean power renewable electricity as zero.

Proposed

The proposed rule amendments under WAC 173-424-620(6) would instead require renewable electricity generating facilities using geothermal resources to file a Tier 1 or Tier 2 fuel pathway application to determine the relevant carbon intensity.

Expected impact

This proposed amendment would result in costs of using and filing a pathway application using the relevant calculator. If it results in non-zero carbon intensity (e.g., due to process emissions), this could reduce the credits available to the electricity generator. This amendment would generate benefits of ensuring carbon intensities associated with geothermal electricity pathways accurately reflect their actual emissions.

2.3.7 Modifying ZEV capacity crediting

Baseline

The baseline rule sets requirements for generating and calculating credits for ZEV fueling infrastructure pathways. It includes requirements for:

- Hydrogen refueling infrastructure (HRI) pathways:
    - Located in Washington.
    - Must be open to the public.
    - Application received by the end of 2030.
    - Ineligibility of stations receiving or spending funds pursuant to a settlement related to enforcement, or stations built as a required mitigation measure under the State Environmental Policy Act (SEPA).[5]
    - Application requirements, including the HRI refueling capacity either determined using the lesser of the HySCapE 1.0 model or:
        - 800 kg/day, of which 250 kg/day is eligible for capacity crediting for light-duty vehicle (LDV) stations.
        - 3,000 kg/day, of which 1,500 kg/day is eligible for capacity crediting for medium-duty vehicles (MDV) and heavy-duty vehicles (HDV).
    - Approval process.

[5] Chapter 43.21C RCW and associated rules implementing it.

    - Requirements to generate credits and credit calculation. HRI crediting is limited to 15 years starting with the quarter following application approval. Limitation of the estimated cumulative value of credits to the difference between total capital expenditure and total external funding.
    - Reporting and recordkeeping.
    - Capacity expansions.
- DC fast charging infrastructure (FCI) pathways:
    - Located in Washington.
    - Open to the public.
    - Potential credits per entity up to 0.5 percent of the deficits in the prior quarter. Above this, additional sites applied for must meet connector variety requirements.
    - Applications must be received by the end of 2029.
    - Ineligible FSE, including those permitted before 2023 and those built as a required mitigation measure under SEPA.
    - Minimum nameplate power rating of 50 kW Networked FSE capable of monitoring and reporting availability for charging.
    - Application requirements, including total nameplate power rating for all FSE at a single site not exceeding 1,500 kW.
    - Ability to request allowance of higher total nameplate power rating up to 3,600 kW.
    - Approval process.
    - Requirements to generate credits and credit calculation. Limitation of the estimated cumulative value of credits to the difference between total capital expenditure and total external funding.
    - Reporting and recordkeeping.

Proposed

The proposed rule amendments would reorganize requirements related to ZEV capacity crediting, retaining multiple baseline requirements and aggregate credit pools, but adjusting certain requirements. Generally, the reorganization would result in requirements and associated credit pools for:

- HD-HRI (HRI would no longer be available for LMD vehicle charging)
- LMD-FCI.
- HD-FCI.

Resulting changes in requirements include:

- For HD-HRI:
    - Shortening the application deadline from 180 days to during the quarter.
    - Shifting reporting of costs borne and revenues received per station from quarterly to annual.
    - Expand eligibility to shared refueling stations.
    - Increase the capacity cap from the baseline 3,000 kg/day with 1,500 kg/day eligible for capacity crediting, to all 3,000 kg/day eligible for capacity crediting.
    - Combining HD-HRI and HD-FCI applications within the same credit pool, capped at 2.5 percent of the previous quarter's deficits
- For LMD-FCI:
    - Shortening the application deadline from 180 days to during the quarter.
    - Adding an application requirement to include all onsite FSE drawing from the same power source that are not eligible for LMD-FCI credits.
    - Shifting reporting of costs borne and revenues received per station from quarterly to annual.
    - Removing LMD diverse connector requirements for applicants for over 0.5 percent of credits, and set the 0.5 percent as a cap.
    - Shifting capacity crediting timeframe forward by one quarter (retaining a total of 5 years).
    - Raising the limit on cumulative credit generation value to the difference between 1.5 times initial capital expenditure minus external funding, and not adjusting over time.
- For HD-FCI:
    - Shortening the application deadline from 180 days to during the quarter.
    - Removing the limits on effective simultaneous power rating.
    - Shifting capacity crediting timeframe forward by one quarter (retaining a total of 5 years).
    - Raising the limit on cumulative credit generation value to the difference between 1.5 times initial capital expenditure minus external funding, and not adjusting over time.
    - Modifying the capacity calculation to 0.2 times power rating times 24.
    - Placing HD-FCI applications in the same credit pool as HD-HRI, rather than with LMD-FCI.
    - Increasing total nameplate power rating for a single site to 10 MW

Expected impact

We expect the general reorganization proposed for these requirements to result in no impact beyond the changes identified above. This is because we do not expect (under the baseline or proposed rule) significant participation of LMD HRI, which is the category eliminated under the proposed amendments.[6]

For HD-HRI, we expect the proposed amendments to result in:

- Potential costs of earlier application completion or reapplication. Benefits of consistent tracking of applications and up-to-date information.
- Reduced costs (benefits) of reduced reporting frequency for costs borne and revenues received per station.
- Potential increased participation through shared refueling stations. As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits.
- Potential increased participation due to increased capacity eligibility. As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits.

For LMD-FCI, we expect the proposed amendments to result in:

- Potential costs of earlier application completion or reapplication. Benefits of consistent tracking of applications and up-to-date information.
- Additional minor application costs of including all onsite FSE drawing from the same power source that are not eligible for LMD-FCI credits.
- Reduced costs (benefits) of reduced reporting frequency for costs borne and revenues received per station.
- Increased diversity and distribution of charging sites across more applicants due to the credit cap per applicant. Impacts on the types of available connectors due to removal of the connector requirements is likely to be mitigated by limiting individual applicants to 20 percent of the credit pool. Individual applicants reliant

[6] See, e.g.:

- Interagency Electric Vehicle Coordinating Council, 2024. Washington Transportation Electrification Strategy. February 2024.
- WA Department of Commerce, 2024. Green Electrolytic Hydrogen and Renewable Fuels: Recommendations for Deployment in Washington. Report to the Legislature. January 5, 2024.

on the connector requirements for approval of additional crediting may receive fewer credits.

- Potential increased participation through shared refueling stations. As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits.
- Minor avoided opportunity costs for the first quarter and incurred opportunity costs for the last quarter of the shifting 5-year capacity crediting timeframe.
- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. This also allows for greater transparency up front for credit generators to set expectations for capacity credit generation over time.

For HD-FCI, we expect the proposed amendments to result in:

- Potential costs of earlier application completion or reapplication. Benefits of consistent tracking of applications and up-to-date information.
- Potential increased access and participation for HD-FCI charging providers, due to the addition of shared refueling stations and the transition to a separate credit pool for HD-HRI and HD-FCI.
- More flexibility for applicants due to removal of the limit on effective simultaneous power rating. We expect that most sites will be shared fleet vehicle stations where the site is making regular decisions about how to allocate power while fleets are charging. HD-FCI has a limit of 10 MW cumulative power rating, and under the proposed amendments a site would be able to choose the power rating they apply for each charger. This would allow them the opportunity to allocate their 10 MW across more chargers, but receive fewer credits per charger.[7]
- Minor avoided opportunity costs for the first quarter and incurred opportunity costs for the last quarter of the shifting 5-year capacity crediting timeframe.
- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. This also allows

[7] For example, a site that registered one hundred 100-kW chargers at 100 kW capacity under the baseline, could instead choose to register two hundred 100-kW chargers at 50 kW capacity.

for greater transparency up front for credit generators to set expectations for capacity credit generation over time.

- Increased relative incentive for higher power rating chargers, due to the modified capacity calculation. While this would not affect the total credits available, it would potentially shift more credits for higher-powered chargers to be received sooner (making them more likely to recoup investment). This could, in turn, incentivize participation by entities that would otherwise not choose to apply due to economic timing factors.

2.3.8 Adding third-party verification requirements

Baseline

The baseline does not automatically require third-party verification. Fuel producers submitting pathways certified under California or Oregon's clean fuels programs must submit the third-party verification reports provided under those programs to Ecology.

Proposed

The proposed rule amendments would add third-party verification requirements for entities that generate more than 6,000 credits or deficits annually. These entities would be required to have third-party verification of their quarterly and annual compliance reports. Third-party verification would also be required for pathway applications and annual reports.

Verification would be required beginning in 2027 for operational data from 2026 for fuel transactions data 2025 and 2026 for fuel pathway reports.

The amendments themselves include requirements for:

- General requirements for verification of reports and fuel pathway applications, including requirements of each responsible entity, verification deadlines, requirements for full or less-intensive verification, and verification and verifier body rotation.
- Requirements for verification of CFS reports and validation of fuel pathway applications, including:
    - Validation of fuel pathway applications:
        - Applicability to fuel pathway applicants and specified source feedstock suppliers and others with site-specific carbon intensity data that have elected to be responsible for validation and verification.
        - Validation schedule, at time of application submittal or submittal of documentation required for pathways that have been validated under the California or Oregon clean fuel programs.
    - Annual verification of annual fuel pathway carbon intensity reports:

        - Applicability to holders of certified fuel pathways and specified source feedstock suppliers and others with site-specific carbon intensity data that have elected to be responsible for verification.
        - Verification schedule, at time of annual Fuel Pathway Report submission, or deferred for two years for alternative fuel pathway holders generating fewer than 6,000 credits or deficits annually. Annual verification of pathways certified through California or Oregon would be required to submit within ten days of submittal to those programs (or notify Ecology of deferred verification).
    - Annual verification of quarterly reports:
        - Applicability to regulated parties, credit generators, and aggregators for relevant covered transaction types.
        - Verification schedule, annually or deferred for two years for entities that generate fewer than 6,000 credits or deficits annually. Deferred verification is not available to fuel quantities reported under a pathway with biomethane or hydrogen supplied using book-and-claim.
        - Verification exemptions for certain transaction types meeting conditions.
    - Verification of crude oil quarterly and annual volumes reports.
    - Verification of annual carbon sequestration project reports.
- Requirements for validation and verification services, including:
    - Notice of verification services to Ecology, including contents specified in the amended rule.
    - What verification services must include, including scoping, plan, site visits, sampling plan, data checks, documentation of differences and modifications to reports and fuel pathway applications, findings, log of issues, material misstatement assessments, review of missing data substitution.
    - Independent review and completion of verification services.
    - Ecology review and approval of validation or verification statement and re-verification services.
- Applications and criteria for Ecology approval of verification bodies or verifiers:
    - Application for approval.
    - Application information and accreditation criteria for approval.
    - Application information and criteria for approval for a verification body.
    - Application information and criteria for approval as a verifier.

- Application information and criteria for approval as a lead verifier for the program.
- Application information and criteria for approval as a sector-specific verifier.
- Verification training and exam requirements.
- Ecology application review and approval process.
- Requirements to maintain approval.
- Modifications, suspension, or revocation of approval.
- Voluntary withdrawal.

- Conflict of interest requirements.

Expected impact

These proposed rule amendments are likely to collectively result in:

- New costs to pathway applicants and holders generating over 6,000 credits or deficits annually, for third-party verification services for fuel pathway applications and annual fuel pathway reports.
- New costs to responsible regulated parties, credit generators, and aggregators generating over 6,000 credits or deficits annually, for third-party verification services for quarterly and annual reports.
- New costs of annual third-party verification to regulated parties submitting crude oil quarterly and annual volumes reports.
- New costs of annual third-party verification to credit generators submitting annual carbon sequestration project reports.
- Application and maintenance costs for verifiers. This includes a conflict of interest evaluation performed by both the verifier and responsible entity.[8]
- Benefits of assurance that the data and reports receiving third-party verification are accurate and complete. This benefits the program and public by assuring the program is accurately assigning deficits and credits to program participants, and no entity is gaining advantage in the program based on inaccurate information. This, in turn, benefits the public and environment by ensuring the program is meeting the goals and objectives of the statute to reduce the aggregate carbon intensity of fuels used in the state.

[8] We expect costs incurred by verifiers to be reflected in the rates they charge responsible entities. To consider the potential impacts to verifiers and verification bodies seeking certification in Washington, we also consider these underlying (non-additive) costs separately.

Chapter 3: Likely Costs of the Proposed Rule Amendments

3.1 Introduction

We analyzed the likely costs associated with the proposed rule amendments, as compared to the baseline. The proposed rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

This rulemaking includes multiple separate amendments as well as larger program additions or reorganizations with multiple elements themselves. We have therefore organized this analysis and document:

- Largely in terms of the types of costs or benefits expected (e.g., labor effort, capital costs, credits/deficits, program participation, etc.).
- Separately grouping the likely impacts of the following proposed amendments in their own sections, as they involve either new concepts or multiple amendments and reorganization.
    - ZEV capacity crediting.
    - Third-party verification.

3.2 Cost analysis

The proposed rule amendments would:

- Add flexibility or clarity.
- Make adjustments to reporting and documentation efforts.
- Redistribute potential credit generation.
- Require metering of forklift charging.
- Shift potential program participation (including amendments to indirect accounting and avoided methane crediting).
- Adjust crediting and deficit calculations.
- Modify ZEV capacity crediting.
- Add third-party verification.

See Section 2.3 for the full lists of specific changes under each bullet above.

3.2.1 Adding flexibility or clarity

3.2.1.1 Definitions and benchmarks

These proposed amendments do not have impacts in and of themselves, beyond clarity and beneficial alignment with the California and Oregon clean fuel programs, or facilitation of covered entities' use of the WFRS. Impacts occur based on where and how these terms and fuels are used throughout the rule. Where each is relevant in the sections below, we also account for these definition and benchmark amendments.

3.2.1.2 Mass balance reporting flexibility

Given baseline requirements to track the carbon intensity of all physical gallons of liquid fuel, and the lack of clarity on allowable methods of tracking carbon intensity for comingled fuels, we expect this proposed rule amendment to add clarity and flexibility for reporters with fuels that are commingled in storage, production, or transport tanks. Adding flexibility to choose mass balance reporting would be a potential cost savings and would be chosen by reporters who have previously defaulted to substitute fuel pathway codes or the fossil baseline carbon intensity when the actual carbon intensity of the fuel has not been able to be determined due to comingled storage. For entities who have already requested Ecology approval to use mass balancing, there would be no change to cost.

As noted above, however, we received feedback from stakeholders during development of the proposed rule, that they should be able to comply with baseline requirements by mass balancing at the state level rather than the facility level, not tracking physical gallons once they've entered the state system. Ecology determined this approach is not sufficient, however, as it does not sufficiently track the carbon intensity of the fuel as it moves through the state system or is exported outside of the state which results in Carbon Intensity reporting that is not reflective of what is actually consumed in WA.

3.2.1.3 Aligning specified feedstocks with California and Oregon

We do not expect net costs of this proposed amendment, as entities would only be likely to voluntarily participate if they expected a net private benefit.

3.2.1.4 Pathway application flexibility

We do not expect likely costs to result from this proposed amendment as compared to the baseline.

3.2.1.5 Clarifying without material impact

We do not expect likely costs to result from this proposed amendment as compared to the baseline.

3.2.2 Making adjustments to reporting and documentation efforts

3.2.2.1 Exempt use transactions

In cases where the person asserting the exemption is not the fuel end user, this proposed rule amendment may result in additional costs associated with acquiring and retaining additional records held by end users. As the exchange of this information is likely already part of the business relationships involved in fuel sales for purposes of tracking and accounting, we do not expect this change to result in significant costs over the baseline.

3.2.2.2 Aggregator notifications

This proposed amendment may result in aggregators needing to notify Ecology earlier than they would under the baseline. This would mean making the same effort earlier, with a benefit of being excluded from the annual fee.

We assumed a notification to Ecology would take 0.5 hours. As this work could be done by a variety of staff, we conservatively (to avoid underestimating costs) assumed that this work would be done by a manager. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[9] Similarly, to estimate the opportunity cost of submitting this notification earlier in the year, we conservatively assumed one year of opportunity cost.[10]

Assuming up to ten aggregators need to submit this notification per year, this would result in a total opportunity cost of $4 per year. Ecology reports streams of costs and benefits in terms of present value over 20 years.[11] The total present value of this cost is $72.

3.2.2.3 Designation of electric credit generators

These proposed rule amendments are likely to result in additional costs of:

- Adding boilerplate language to contracts.
- Annual notifications.

We assumed a one-time cost of 8 hours to add boilerplate language to contract templates. As this work could be done by a variety of staff, we conservatively (to avoid underestimating costs) assumed that this work would be done by a manager. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[12] This resulted in a one-time cost of $645 per entity. We also assumed annual notifications would take 1 hour of manager time, resulting in an annual cost per entity of $80.

Assuming up to 10 initial designations are affected each year, this proposed amendment would result in approximately $7,000 in first-year costs, followed by annual costs of $807. Ecology

[9] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[10] Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[11] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations.

[12] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

reports streams of costs and benefits in terms of present value over 20 years.[13] The total present value of this cost is approximately $21,000.

3.2.2.4 Electric utility notifications

Depending on how utilities interpret the baseline language, this proposed amendment may result in minor added notification costs of using the specific format and including the required contents. We do not expect the nature of the format specification and contents to significantly impact the time it takes to complete these notifications.

3.2.2.5 Changes in ownership or control

This proposed amendment is likely to result in incremental notification costs in cases of a change in ownership. We assumed the additional requirements in the proposed amendments would result in similar additional costs to both prior and new owners, of one hour of manager time, and conservatively assumed this would occur three times per year. As this work could be done by a variety of staff, we conservatively (to avoid underestimating costs) assumed that this work would be done by a manager. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[14] This resulted in a total annual cost of approximately $500.

Ecology reports streams of costs and benefits in terms of present value over 20 years.[15] The total present value of this cost is approximately $9,000.

3.2.2.6 Inactive registrations

In cases where an account is inactive for four quarters, this proposed amendment would result in costs of potentially needing to re-register, or potentially losing remaining credits in the system. We assumed re-registration could take up to 4 hours of manager time. We used the BLS

[13] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[14] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[15] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

hourly wage rate for "Managers, all other" of $80.70 in current dollars.[16] Based on existing registrations left inactive that could potentially need to resubmit, but excluding those that were likely submitted in error, we assumed about 27 would need to re-register annually. This resulted in a total annual cost of approximately $8,600.

Ecology reports streams of costs and benefits in terms of present value over 20 years.[17] The total present value of this cost is approximately $155,000.

3.2.2.7 Registration of fueling supply equipment

This proposed amendment is likely to result in minor additional registration costs for registering FSE. We assumed registration of each FSE would take an additional 5 minutes of manager time. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[18] For the 21,000 FSE registered in a year, this would be an annual cost of approximately $21.

Ecology reports streams of costs and benefits in terms of present value over 20 years.[19] The total present value of this cost is approximately $400.

3.2.2.8 Registration of electric transport refrigeration units

The proposed rule is likely to result in initial, one-time registration costs meeting the new requirements for lasting registration of eTRU FSE. We assumed registration would involve 40 hours of manager time. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[20] For the four aggregators currently known that have eTRU, this would be a

---

[16] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[17] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[18] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[19] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[20] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

one-time cost of approximately $13,000. If this cost was conservatively incurred immediately, the equivalent present value cost would also be $13,000.

3.2.2.9 Follow-up information requests

This amendment may result in costs of re-registration if additional information is requested but is not provided by the deadline. Since we expect that follow-up information would be readily available within the timeframe in most cases, or that entities would need to arrange for different staff to complete the request for information under staff timing constraints, we do not expect this to result in quantifiable costs as compared to the baseline.

3.2.2.10 Fuel transfers

The actual change resulting from these proposed amendments, as compared to the baseline, is the requirement to include specific language in the fuel transfer document in cases where the transferor retains credit or deficit generation obligations. In such cases, the amendments would result in minor cost of adding the standard language to document boilerplate. Due to potential variability in transfer documentation, we assumed that it would take 4 hours of manager time to add the boilerplate language in the proposed amendments. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[21]

Based on the number of entities reporting a sale with obligation in the past year, we assumed this cost would be incurred by 38 entities, resulting in a one-time cost of approximately $12,000. If this cost was conservatively incurred immediately, the equivalent present value cost would also be $12,000.

3.2.2.11 Exported fuel sales

This proposed amendment could expand the number of recipients identified by registered parties that are position holders that sell fuel below the rack for export, adding minor reporting costs. We do not expect the costs of identifying these entities to significantly affect reporting costs. We discuss potential costs associated with registration for currently unregistered exporters in Section 3.2.3.1.

3.2.2.12 Updated report corrections

These proposed amendments are largely clarifications, but would potentially result in a need for entities to resubmit their correction requests, if they take longer than two days to submit corrections. We do not expect this impact to occur frequently, as additional corrections are likely to be identified and specified within a short time of identifying initial corrections.

3.2.2.13 Reporting forklift charging

As other proposed amendments would require metering of forklift charging, and the baseline language includes the default (without request for an alternative approach) requirement that quantity of electricity measured per FSE must be reported, we do not expect this change to

[21] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

result in costs or benefits. See Section 3.2.4 for discussion of the costs of requiring metering for forklift charging.

3.2.2.14 Credit transfers

We do not expect the proposed definition of Type 1 and Type 2 credit transfers to result in significant costs, as this information should be known and readily available as part of the credit transaction agreement.

Shortening the time during which seller and buyer requirements must be met would align rule requirements with the existing functions of the WFRS. While this is a change in rule language, taking longer than 10 days without a transaction voiding is not possible under the baseline. We therefore do not expect costs associated with this amendment.

3.2.2.15 Specified source pathway attestation

This proposed amendment would result in additional documentation costs for entities in the supply chain for specified source feedstocks. We assumed that providing this information would take an additional 8 hours of manager time. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[22] This would result in a cost of approximately $650 per affected entity.

We conservatively assumed approximately 90 uniquely identified businesses performing transactions in the past year could incur this cost. This would result in a one-time cost of additional documentation of approximately $59,000. If this cost was conservatively incurred immediately, the equivalent present value cost would also be $59,000.

3.2.2.16 Pathways approved by California or Oregon programs

This proposed rule amendment would result in costs of providing additional documentation to Ecology during application to use carbon intensities approved in California or Oregon. As we expect this documentation would be readily available during planning for application to use these carbon intensities, we do not expect this amendment to result in costs significantly different from the baseline.

3.2.2.17 Use of carbon intensity calculators

The additional requirement on non-liquid fuel producers to provide the equivalent nameplate production capacity could result in minor costs of providing this known information, if not already provided as an interpretation of the baseline rule. We assume this interpretation would follow from the required information for liquid fuels, and expect this proposed amendment to function as a clarification.

We do not expect costs as compared to the baseline, from the specified process for initial approval of Tier 2 methodology before submitting additional application materials. While the process specifies an order of operations, we expect all materials to already be compiled under

[22] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

the baseline. Providing an explicit process would instead prevent instances of rework in cases where methodology or approaches would eventually need to be refined.

3.2.2.18 Use of renewable electricity products and power purchase agreements

These amendments would result in potential costs associated with earlier submittal of annual fuel pathway reports, if they would otherwise be submitted in the second half of a calendar year under the baseline. They would also result in minor costs of submitting existing third-party verification statements.

Earlier submittal would facilitate appropriate timing in line with third-party verification, and would result in minor opportunity costs as compared to the baseline (incurring the same costs, but earlier). Making the conservative assumption that this could cause up to one year of opportunity cost, this amendment would cost, at the high end, one percent of annual fuel pathway reporting costs.[23]

3.2.3 Redistributing potential credit generation

3.2.3.1 Amending designation of fuel exporters

This proposed amendment would resolve unclear rule text and align with current implementation of the rule. This is technically a change in written rule requirements, which could conceptually result in a potential shift in who is required to report (though not changing aggregate costs through redistribution). Because of the contradictory baseline language, however, Ecology must make a choice to be able to implement this part of the rule and law, and given that Ecology would continue to need to do so under the baseline, we do not expect this amendment to result in real impacts beyond clarity.

3.2.3.2 Encouraging use of Pacific Northwest renewable electricity

Starting in 2026, these proposed amendments would result in entities seeking to retire RECs to lower the carbon intensity of electricity used to charge electric vehicles only being able to use RECs generated from generation facilities in Washington, Oregon, or Idaho. This would shift demand for RECs from their baseline distribution to increased demand for Pacific Northwest RECs, potentially resulting in constrained applicable REC supply and increased prices for those RECs. This could affect the distribution of credits across participating entities, depending on their choices resulting from changes in REC supply or prices.

It is difficult to quantify the degree to which RECs, including the shift to Pacific Northwest RECs, would be used over time under future supply and demand scenarios, especially as the proposed rule may incentivize additional local development and reduce REC prices. Their use will also vary across entities, depending on their needs and requirements under the baseline (e.g., CETA).

[23] Ecology estimates opportunity costs based on an estimated Social Rate of Time Preference, which is based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

We examined the potential costs and benefits of this proposed amendment by considering an illustrative scenario in which about 300,000 RECs are impacted. The total RECs claimed in the program between the third quarter of 2023 and the second quarter of 2024 is 312,102. Assuming a nationwide REC price of $10, and assuming switching to local RECs would increase prices by 50 percent (to $15), shifting this entire set of RECs to the Pacific Northwest would ultimately result in annual costs of $1.6 million. Using the above assumptions, the total 20-year present value costs of this amendment would be over $28.2 million.

We note also that the relative prices of RECs and credits would influence these choices. If faced with a REC price significantly higher than credit prices, entities have less incentive to reduce carbon intensity of electricity being claimed as vehicle fuel, as this could result in net costs depending on volume. This would serve to mitigate costs associated with this proposed amendment, but potentially reduce credit generation.

We also note that the proposed requirements to register and retire RECs in WREGIS and the CFS program account, while a change in rule language, are consistent with Ecology guidance and interpretation of baseline program efficiency and oversight needs. We do not expect this proposed amendment to result in significant costs as compared to the baseline, as the proposed amendment only specifies the locations RECs must be retired.

3.2.3.3 Reporting electric fueling of eTRU

This amendment would not result in aggregate costs as compared to the baseline, as it would redistribute reporting burden and credit generation across entities (if they are different owners). As the FSE owner may have better access to relevant data and information, this amendment could result in an aggregate reporting cost-savings (see Section 4.2.3.3 for discussion).

3.2.4 Requiring metering of forklift charging

This proposed amendment would result in some facilities needing to install metering for charging of electric forklifts, which are voluntary opt-in participants, if they would not under the baseline. We note that Ecology guidance implementing the baseline rule has specified a phase-out of the use of alternative measurement or estimation methods after 4 quarters per facility, so some facilities are already planning for this change while others have withdrawn from the program after finding installing metering to be more costly than their estimated revenue from participating.

Based on surveys performed by the US Department of Energy, we assumed a median cost of installing metered equipment of between approximately $1,000 (simple addition) to $26,000 (complex addition) per FSE. In reporting data, we identified four facilities that were approximating their facility forklift charging rather than specifying individual amounts. If these facilities each installed between 5 and 10 chargers, it would result in costs of between approximately $27,000 to $1.0 million.

In subsequent years, we assumed the forklift charging population would be similar to the current population, in terms of installing metering under the baseline or not. We therefore assumed the above cost range would be incurred annually as a result of the proposed rule

amendments. Ecology reports streams of costs and benefits in terms of present value over 20 years.[24] The total 20-year present value of this cost range, based on the above assumptions, would be between approximately $487,000 and $18.7 million.

3.2.5 Shifting potential program participation

3.2.5.1 Alternative jet fuels and alternative marine fuels

This proposed amendment would add circumstances in which a utility-specific carbon intensity of electricity is used for an electrolysis process to produce alternative jet fuel and alternative marine fuel under the Clean Fuels Program. We note that these fuels are eligible under the baseline rule, and the proposed amendment would adjust the carbon intensity accounting options available to their producers. While there may be costs of meeting the new requirements related to approval and documentation, we do not expect any net costs of this amendment. This is because entities would only choose to participate and use this utility-specific carbon intensity option if they expected a net benefit. Consideration of net benefit would account for associated costs of meeting the requirements in the amendment and associated benefits of being able to use a lower carbon intensity and therefore generate additional credits. We also note that the proposed requirements to register and retire RECs in WREGIS and the CFS program account, while a change in rule language, are consistent with Ecology guidance and interpretation of baseline program efficiency and oversight needs. We do not expect this proposed amendment to result in significant costs as compared to the baseline, as the proposed amendment only specifies the locations RECs must be retired.

3.2.5.2 Book-and-claim pipeline-injected biomethane

Book-and-claim (indirect) accounting is the process of buying biomethane that is injected into a common carrier pipeline and to claim it as consumed in Washington State. These proposed rule amendments could result in new biomethane production increasingly located along the specified pipelines over time, and more biomethane displacing fossil natural gas in the pipeline system over time.

This could be associated with costs such as:

- Differential costs of locating biomethane production regionally or locally, rather than farther away.
- Depending on plans to locate facilities in WA or the region defined by the proposed rule with direct access to the listed pipelines, this cost may be zero if these facilities were

[24] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

planned under the baseline, or were incentivized to opt in under the amendments when they would not have done so under the baseline. In this case, the proposed rule would potentially redistribute credit generation to a different set of facility owners (from those foregoing program participation to those choosing to opt in).

- If the proposed rule amendments caused a shift to facilities with higher capital or operating costs than those that exist under the baseline, or to facilities producing lower aggregate fuel volumes, it would put upward pressure on producers and sources of biomethane-derived RNG.
- Reduced credit generation from potentially reduced supply of biomethane.

Due to the differing compliance timelines for biomethane that is used as a feedstock in production of alternative jet fuel, the above potential impacts would be delayed for producers of biomethane used in alternative jet fuel. In terms of compliance deadlines, biomethane used in alternative jet fuel would incur costs 15 years later, if at all (for projects that break ground on or before December 31, 2029).

We could not confidently estimate the degree to which any of the above situations might occur, as multiple factors go into not only the siting of a biomethane production facility, but also into the choice to opt into the program, and how much biomethane to generate in different locations (for multiple facility owners). To better understand the scope of potential impacts, we considered the following illustrative scenario.

Note that this scenario approaches the question of net benefits of the rule amendments conservatively, in that it considers a situation in which costs are significant. This is not necessarily the case, as biomethane producers may be able to meet the proposed rule amendments at lower cost, or the production costs at newly incentivized facilities would not necessarily be higher. Designed production capacity at new facilities may also change based on costs associated with crediting requirements. Finally, the geography of biomethane demand may change over time, which would in turn change incentives to sell into Washington versus other locations.

Illustrative example

For a long-term illustrative scenario, we considered the proposed rule amendments causing the siting of a facility in a location with higher costs of production for the same amount of biomethane (e.g., due to use of a different feedstock, even if it is of the same type), in order to have direct access to a pipeline listed in the proposed rule amendments. We note that production costs are one of many factors that go into new project development, so for this simplified illustration we assume other factors are the same at either location. (Recall that a facility that would already have done so under the baseline would not be affected by the proposed rule amendments.)

Production costs can range between $6.50 to $32.60 per million British thermal units (MMBtu) depending on the production method and feedstock.[25] Landfill gas and water resource recovery facilities were found to have the lowest RNG production costs, as compared to animal manure and food waste. Taking the uniform feedstock example of shifting from a producer using animal manure as feedstock with low-end $20 per MMBtu production costs, to one with a high-end $35 per MMBtu costs would add $15 (a 75 percent increase) in cost per MMBtu to produce the same amount of RNG and associated credits.

Using the proposed rule amendments' animal manure biomethane carbon intensity of -150 gCO_2e/MJ and converting the above cost increase to approximately 1.4 cents per MJ, we find that generating one credit in the Washington Clean Fuels Program would cost 75 percent more at the highest-cost example facility than a lowest-cost example facility. This could constrain the supply of credits and RNG by putting upward pressure on their prices, if all participating facilities faced the same cost increase. Since our illustration assumes an animal manure-based feedstock, biomethane supply may be relatively inelastic (less able to adjust volumes in response to price changes, based on limited ability to scale waste inputs), mitigating associated reductions in volume and price increases to some degree.

It is not necessarily the case, however, that all participating facilities would have higher prices. Upward price pressures would be moderated by:

- New facilities with various production-cost profiles beginning production near the listed pipelines.
- Improved technology and efficiency over time, which new facilities may be more able to take advantage of when making design decisions.
- Increased availability, selection, or access to feedstocks over time, which new facilities may be more able to take advantage of when making siting and infrastructure decisions.

Note that the proposed rule amendments may not result in existing biomethane RNG producers changing locations. Location choice would depend on multiple factors in internal business decisions, including potentially significant startup costs such as differential capital costs of establishing production in a different geography. The proposed amendments may instead result in redistribution of credit generation to other existing and future producers that meet sourcing requirements opting into the Washington Clean Fuels Program. This would particularly be the case when Washington's credit price is higher than that of other jurisdictions offering clean fuel credit options.

3.2.5.3 Avoided methane from livestock and organic waste

These amendments would incentivize new and additional methane capture and RNG production from dairy and swine manure, and from organic waste diverted from landfills.

[25] Moriarti, K, T McCarran, A Bhatt, J Kenny, L Tao, and A Milbrandt, 2022. 2022 Bioenergy Industry Status Report. National Renewable Energy Laboratory. Technical Report NREL/TP-5400-88998.

Methane capture that otherwise would not have occurred in the absence of the CFS program would receive the most generous incentives from avoided methane crediting.

Extension of crediting to organic material that would have otherwise been disposed of at a landfill would better incentivize the reduction in landfill methane emissions as well as dairy and swine.

While there would be costs associated with program participation using these pathways, we expect that entities will only choose to participate if they expect a net benefit, accounting for costs of participation and expected credit generation. We acknowledge that, by limiting crediting periods, the proposed rule amendments may also limit the potential credit revenue generated by some projects (compared to offering up to three 10-year periods of avoided methane credits). To the extent this changes the expected credit-based revenues expected by a future project in a way that makes it less economically feasible, the proposed amendments would balance the incentive for avoided methane credits against its impact on the credit price (which would reduce incentives for all credit-generating fuels). This factor is complicated by expected revenues over time being a function of both the number of credits and expected credit prices, meaning higher credit prices would mitigate disincentives of limited crediting periods.

3.2.6 Adjusting crediting and deficit calculations

3.2.6.1 Switching to continuous review of carbon intensities

This amendment would allow Ecology greater flexibility in ensuring that carbon intensities reflect the most up-to-date science and lifecycle analysis models. While this could mean that the carbon intensities that underlie calculation of credits or deficits change more frequently, it could also result in reduced risk of going longer periods allowing over-generation or under-generation of credits or deficits relative to the actual lifecycle emissions associated with fuels and pathways.

As future science and technologies are unknown, it is difficult to quantify how any given carbon intensity would change in the future, or how much sooner Ecology would update it. To examine potential impacts of this proposed amendment, we considered an illustrative scenario that could result in costs. (See Chapter 4 for discussion of a scenario resulting in benefits.)

For this illustrative scenario, we assumed future carbon intensities increased across the board by one percent. In terms of cost of deficits or value of credits, this would be equivalent to a one percent increase in total obligation costs, or a one percent decrease in the total value of credits. Assuming a $10 future credit price, this would be like each credit becoming worth ten cents less.

Since these new carbon intensities would eventually be adopted under the baseline, at latest every three years, we also assumed in our scenario that the one-percent change in deficits or credits would occur at most three years earlier. A ten-cent reduction in the value of credits generated, or a ten-cent increase in the costs of deficits generated, occurring three years earlier would result in opportunity costs of 1/3 of a cent per credit or deficit.

This opportunity cost would scale up or down by the actual degree of:

- How much adopted carbon intensities increase.
- Future credit prices.

It would, however, remain the opportunity cost of needing to comply with the new carbon intensities sooner, rather than the total cost of complying with the new carbon intensities, as these would eventually be adopted under the baseline.

We note also that evaluating carbon intensities continuously does not necessarily mean that they will increase. Where they decrease sooner as a result of the proposed rule amendments, entities would receive a benefit (avoided opportunity cost) of revising them sooner.

3.2.6.2 Adjustments to pathway carbon intensity calculator tiers

We do not expect costs associated with this proposed amendment as compared to the baseline.

3.2.6.3 Adjustments in cases where operating and certified carbon intensities differ

We do not expect costs associated with this proposed amendment as compared to the baseline. Generally, we must analyze the impacts of proposed rules by assuming accurate compliance with requirements. That makes it difficult to assess the impacts of this proposed amendment in a way that is comparable to other impacts, as it is inherently based on deviation from pathways having their certified carbon intensity. Holding this assumption consistent across this analysis, this proposed amendment would have only the benefits of creating disincentive for deviation from certified carbon intensities, and correcting for such inconsistencies in truing up credits and deficits to bring the program back into balance with actual carbon intensities associated with fuel pathways.

3.2.6.4 Adjustment for geothermal pathway carbon intensity

This proposed amendment would result in costs of using and filing a pathway application using the relevant calculator for geothermal pathways. If it results in non-zero carbon intensity (e.g., due to process emissions), this could reduce the credits available to the electricity generator.

Process emissions may be a contributor to overall carbon intensity of geothermal energy. We could not, however, confidently quantify the degree to which (if any) future geothermal projects would be affected by the proposed rule amendments. We note, though, that carbon intensities being revised upward (from zero) would result in reduced credit generation and associated reduced benefits (costs) of participating in the program.

3.2.7 Modifying ZEV capacity crediting

We do not expect costs associated with these proposed amendments' limitation of HRI ZEV capacity crediting, as we do not expect (under the baseline or proposed rule) significant participation of LMD HRI, which is the category eliminated under the proposed amendments.[26]

For HD-HRI, we expect the proposed amendments to result in costs of:

- Potential costs of earlier application completion or reapplication. We assumed re-application would take up to 4 hours of manager time. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[27] This would result in costs of approximately $300 per entity. As there are currently no HD-HRI participants in the Clean Fuels Program, it is uncertain how many will participate over time. We conservatively assumed one additional entity per year would need to re-apply. This assumption may be highly conservative, since the rule imposes limitations on the credit pool available to these entities. Ecology reports streams of costs and benefits in terms of present value over 20 years.[28] The 20-year present value of this annual cost would be approximately $6,000.

For LMD-FCI, we expect the proposed amendments to result in costs of:

- Potential costs of earlier application completion or reapplication. We assumed re-application would take up to 4 hours of manager time. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[29] This would result in costs of approximately $300 per entity. Based on current program participation, we assumed up to 50 entities could potentially incur this cost each year, and additional applicants over

---

[26] See, e.g.:
- Interagency Electric Vehicle Coordinating Council, 2024. Washington Transportation Electrification Strategy. February 2024.
- WA Department of Commerce, 2024. Green Electrolytic Hydrogen and Renewable Fuels: Recommendations for Deployment in Washington. Report to the Legislature. January 5, 2024.

If LMD HRI were to exist in the future that would have participated in the program under the baseline, the proposed rule would not affect the total credits in this credit pool, but rather would redistribute them across entities – from a mix of LMD and HD HRI to only HD-HRI.

[27] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[28] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[29] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

time might not be able to apply. Ecology reports streams of costs and benefits in terms of present value over 20 years.[30] The 20-year present value of this annual cost would be approximately $300,000.

- Additional minor application costs of including all onsite FSE drawing from the same power source that are not eligible for LMD-FCI credits. We expect that this information would be readily available and not significantly impact the overall application time.
- Individual applicants reliant on the connector requirements for approval of additional crediting may receive fewer credits. It is difficult to confidently forecast the degree to which entities would rely on connector requirements to have additional crediting approved, particularly as the electric vehicle market and technologies continue to evolve. We note, however, that this does not necessarily mean that in the aggregate fewer credits would be generated. Rather, they could be reallocated across multiple entities also seeking capacity crediting for LMD vehicles.
- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. In this cost chapter, we discuss situations in which this would be a net cost.

  A net cost would occur in cases where fewer credits received later outweigh increased initial credit generation. This would result in a net loss of value if the total baseline value of future credits was more than the total baseline value of initial credits. In turn, that would only happen if:

  - Assuming constant prices, the total future credits exceed total initial credits.
  - Initial credit prices are significantly higher than future credit prices.

  If entities expect the above scenario to be true, based on their planned expenditures, facility attributes, and credit price expectations, this proposed amendment could result in reduced incentives for program participation for entities with these expectations and plans. We note that some entities reducing participation does not necessarily mean that in the aggregate fewer credits would be generated. Rather, they could be reallocated across other entities with different financing, facility, and credit price expectations.

For HD-FCI, we expect the proposed amendments to result in:

[30] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

- Potential costs of earlier application completion or reapplication. We used the BLS hourly wage rate for "Managers, all other" of $80.70 in current dollars.[31] This would result in costs of approximately $300 per entity. As there are currently no HD-FCI participants in the Clean Fuels Program, it is uncertain how many will participate over time. We conservatively assumed one additional entity per year would need to re-apply. This assumption may be highly conservative, since the rule imposes limitations on the credit pool available to these entities, and additional applicants over time might not be able to apply. Ecology reports streams of costs and benefits in terms of present value over 20 years.[32] The 20-year present value of this annual cost would be approximately $6,000.
- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. In this cost chapter, we discuss situations in which this would be a net cost.

  A net cost would occur in cases where fewer credits received later outweigh increased initial credit generation. This would result in a net loss of value if the total baseline value of future credits was more than the total baseline value of initial credits. In turn, that would only happen if:

  - Assuming constant prices, the total future credits exceed total initial credits.
  - Initial credit prices are significantly higher than future credit prices.

  If entities expect the above scenario to be true, based on their planned expenditures, facility attributes, and credit price expectations, this proposed amendment could result in reduced incentives for program participation for entities with these expectations and plans. We note that some entities reducing participation does not necessarily mean that in the aggregate fewer credits would be generated. Rather, they could be reallocated across other entities with different financing, facility, and credit price expectations

[31] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[32] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

3.2.8 Adding third-party verification

These proposed rule amendments are likely to collectively result in:

- New costs to pathway applicants and holders generating over 6,000 credits or deficits, for third-party verification services for fuel pathway applications and annual fuel pathway reports.
- New costs to responsible regulated parties, credit generators, and aggregators generating over 6,000 credits or deficits, for third-party verification services for quarterly and annual reports.
- New costs of annual third-party verification to regulated parties submitting crude oil volume quarterly and annual reports.
- New costs of annual third-party verification to credit generators submitting annual carbon sequestration project reports.
- Application and maintenance costs (including the conflict of interest evaluation) and accreditation training costs for verifiers. These are likely passed through and recouped as revenues for services above.

We reached out to potential verifiers, as well as considered input received from covered entities and participants in the Clean Fuels Program, about the potential costs of third-party verification. Based on that input, we developed a broad range of potential verification costs, from $15,000 for a simple pathway or facility with straightforward centralized recordkeeping and possibility of remote assessment, to $70,000 for complex pathways or facilities requiring multiple site visits, detailed and diversified data systems, and multiple fuel categories. Based on limited information about the potential verification needs of different applicants and reporters, we chose to make the simplifying assumption that this entire range of incremental costs was possible for any entity. This helps to ensure we neither overestimate nor underestimate these costs.

Based on information received during the development of the proposed rule amendments, we note that verification costs would be highly specific to the pathway or entity undergoing verification. Factors affecting these costs include, but are not limited, to:

- Number and locations of facilities.
- Degree of data and records centralization.
- Number of site visits.
- Number of fuel types.
- Complexity of pathways and number of units.
- Robustness of data management, tracking, and aggregation procedures.
- Use of remote tracking and data interface attributes.
- Variability across sites or site-specific attributes of modifications.

We estimated the following costs associated with the proposed requirements for third-party verification.

- Pathway applications and reports:
    - Based on pathways reflected in Ecology's Clean Fuels reporting database, we assumed 15 applications would be received per year. This is the difference between 49 identified facilities in 2023, to 64 identified facilities in 2024. The resulting annual costs of $225,000 to $1.1 million have an equivalent 20-year present value of between $4.1 million and $18.9 million. We note that this cost may be somewhat underestimated, as existing facilities also submit pathway applications after improvements (to reduce carbon intensity), but we could not confidently predict how often such changes will occur.
    - We identified 59 producers in Ecology's database in 2024. Assuming each producer incurs third-party verification costs of annual reports, the annual cost would be between $885,000 and $4.5 million. The equivalent 20-year present value of this cost is between $16.0 million and $80.8 million.
- Quarterly and annual reports:
    - We identified up to 165 individual regulated parties potentially incurring third-party verification costs. It is difficult to predict whether and when reporters would trigger annual third-party verification, versus be able to defer for up to two years because they are eligible for "less intensive verification" by not exceeding the threshold of 6,000 credits or deficits. We chose to make additional assumptions to develop a realistic range of present values. We assumed at least 13 parties would incur these costs each year because they already exceed the threshold.
        - For our low estimate, we assumed the others would only incur these costs every third year.
        - For our high estimate, we assumed the others' credit or deficit generation would increase at a rate that resulted in a linear increase in third-party verification over our 20-year timeframe, until they were all incurring these costs.
    - The above assumptions resulted in total 20-year present value costs for quarterly reports of between $63.4 million and $141.1 million.
    - The above assumptions resulted in total 20-year present value costs for annual reports of between $15.9 million and $91.9 million.
- Crude oil volume quarterly and annual reports:
    - We identified five entities submitting crude volume reports. The resulting costs of annual reporting ranged between $75,000 and $350,000. For quarterly reporting, this range was between $300,000 and $1.4 million.

- The corresponding 20-year present value costs are between $1.4 million and $6.3 million for annual report verification. For quarterly report verification, this range is $5.4 million to $25.3 million.

- Sequestration project annual reports:
  - Washington does not currently have any sequestration projects participating in the Clean Fuels Program. Based on observations of these developing sectors in California and Oregon, we assumed up to five projects would develop over 20 years. Each would incur an annual cost of between $15,000 and $70,000 once in operation and participating.
  - The 20-year present value costs of third-party verification would be between $520,000 and $2.4 million.

- Verifier certification costs:
  - It is important to note that verifiers would only participate in the program if they expected a net benefit (profit) from participation. This means for participating verifiers the costs estimated below are outweighed by revenues from the verification activities above (revenues from verification services for pathway applications and reports, and for various quarterly and annual reports).
  - We expect the costs below to be passed along, and distributed across parties engaging third-party verifier services, as part of verifiers' rates. As such, they are likely to be distributed via the verification costs estimated above.
  - These costs would underlie verifiers' decisions to offer their services for Washington and would therefore affect the number of available verifiers and the competitiveness of their rates. To better understand the degree of administrative burden the proposed rule amendments pose for verifiers, we estimated these costs separately as well. Based on the size of the Washington Clean Fuels Program, we assumed Washington would eventually certify approximately the same total number of verifiers as the Oregon clean fuels program: 109.[33] Assuming the time it takes a verifier to complete documentation and attend relevant trainings would be similar to that of third-party verifiers for the state's Climate Commitment Act, we estimated the costs of 40 hours of time for an engineer, at a median wage rate of $66.22.[34] This resulted in a one-time

[33] OR Department of Environmental Quality, 2025. List of Approved Third Party Verifiers for Oregon Clean Fuels Program. January 31, 2025.

[34] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U). While the staff completing verifier certification are likely to vary according to specific expertise, we chose to use the highest wage rate available among potential engineering professions and specialties – that of "Petroleum Engineers". Verifier time costs may be lower than estimated here. For example, median wages identified were approximately $2 les for "Electrical engineers", or $8 less for "Engineers, all other".

cost estimate of approximately $238,000. We also note that documentation and training costs are likely also similar across jurisdictions, and do not expect this cost to hinder verifier participation in Washington.

- We conservatively assume this cost would be incurred immediately, with a corresponding present value of approximately $860,000. We note, however, that verifier participation is likely to begin with fewer verifiers and increase over time, so this is likely an overestimate of the present value cost. We reiterate that this cost is also likely to be passed along to some degree to entities engaging verification services, and should not necessarily be added to other costs estimated in this section.

3.2.9 Environmental justice costs[35]

We do not expect the proposed rule amendments to result in significant environmental justice costs as compared to the baseline. We note, however, that we considered multiple alternative changes to the rule during development of the proposed amendments, regarding avoided methane crediting and book-and-claim biomethane. These varied in how they could impact different communities. We discuss these considerations and relative distribution of impacts below, as well as in Chapter 6, where we discuss the compliance burdens of alternatives considered and how they meet the goals and objectives of the authorizing statute.

Fuel production facilities

Emissions reduction or fuel production projects that could be incentivized by the proposed rule amendments would need to undergo any relevant processes to assess and mitigate their impacts (e.g., SEPA, NEPA, county and local ordinances). We therefore do not expect environmental justice costs to result directly from incentives to develop projects or facilities under the proposed rule amendments.

We note that alternative rule requirements were considered during development of the proposed rule, for which communities raised environmental justice concerns. For example, rural communities expressed concerns that avoided methane crediting would increase the size or presence of concentrated animal feeding operations (sometimes called feedlots) that could cause rural communities to experience air quality and water quality harms, or incentivize larger operations with higher overall environmental footprint and greenhouse gas emissions simply for the purpose of generating credits during the allowed crediting period.[36] Analysis of California's dairy sector has shown little evidence of avoided methane credits causing an

[35] Input received from likely impacted communities helped to inform the proposed rule amendments and our analysis of costs and benefits. See Chapter 6 for discussion of alternative rule content suggested during rule development, that was not included in the proposed rule. Community engagement and input are documented in the Environmental Justice Assessment for this rulemaking, and included in the rule file when a final rule is adopted.
[36] For discussion of the environmental justice impacts of climate change resulting from greenhouse gas emissions, see Section 4.2.9.

increase in herd sizes. The average herd growth rate of dairies with digesters and without digesters is almost identical, suggesting that factors other than biomethane production incentives are driving growth and industry consolidation.[37] Washington dairies also are not as efficient on average as California dairies at producing biomethane due to climate differences and other factors, further demonstrating that it is unlikely that credit incentives will lead to a large increase in dairy herd sizes. Nevertheless, the final content of the proposed rule amendments reflects countermeasures to prevent such impacts.

Alternative jet fuel

While book-and-claim biomethane used in production of other fuels would be required to meet sourcing requirements beginning in 2030 (including production in Washington, injection into a specified interstate pipeline, or injection into a specified international pipeline), comparable requirements would not take effect until 2045 for alternative jet fuel projects that broke ground in or after 2030. This difference across the proposed rule requirements could delay guarantees that additional methane emissions reductions are occurring in Washington, or reduce the likelihood that in-state or regionally-produced biomethane (as opposed to biomethane from other parts of North America) is used as a feedstock for alternative jet fuel production in the state, compared to an alternative requirement that set the same compliance timelines for all book-and-claim biomethane. We believe the different timelines are necessary to balance the needs of current aviation technology, the developing nature of the alternative jet fuels industry, and potential price impacts for both fuels and associated credits. While these are potential impacts compared to alternative rule requirements considered during this rulemaking, compared to the baseline the proposed rule amendments would nonetheless help to guarantee that emissions reductions from these fuels are happening in Washington over time.

[37] Dairy Sector Workshop Presentation

Chapter 4: Likely Benefits of the Proposed Rule Amendments

4.1 Introduction

We analyzed the likely benefits associated with the proposed rule amendments, as compared to the baseline. The proposed rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

This rulemaking includes multiple separate amendments as well as larger program additions or reorganizations with multiple elements themselves. We have therefore organized this analysis and document:

- Largely in terms of the types of costs or benefits expected (e.g., labor effort, capital costs, credits/deficits, program participation, etc.).
- Separately grouping the likely impacts of the following proposed amendments in their own sections, as they involve either new concepts or multiple amendments and reorganization.
    - ZEV capacity crediting.
    - Third-party verification.

4.2 Benefits analysis

The proposed rule amendments would:

- Add flexibility or clarity.
- Make adjustments to reporting and documentation efforts.
- Redistribute potential credit generation.
- Require metering of forklift charging.
- Shift potential program participation (including amendments to indirect accounting and avoided methane crediting).
- Adjust crediting and deficit calculations.
- Modify ZEV capacity crediting.
- Add third-party verification.

See Section 2.3 for the full lists of specific changes under each bullet above.

4.2.1 Adding flexibility or clarity

4.2.1.1 Definitions and benchmarks

These proposed amendments do not have impacts in and of themselves, beyond clarity and beneficial alignment with the California and Oregon clean fuel programs, or facilitation of covered entities' use of the WFRS. Impacts occur based on where and how these terms and fuels are used throughout the rule. Where each is relevant in the sections below, and in subsequent analysis of costs and benefits, we also account for these definition and benchmark amendments.

4.2.1.2 Mass balance reporting flexibility

Given baseline requirements to track the carbon intensity of all physical gallons of liquid fuel, and the lack of clarity on allowable methods of tracking carbon intensity for comingled fuels, we expect this proposed rule amendment to add clarity and flexibility for reporters with fuels that are commingled in storage, production, or transport tanks. Adding flexibility to choose mass balance reporting would be a potential cost savings and would be chosen by reporters who have previously defaulted to substitute fuel pathway codes or the fossil baseline carbon intensity when the actual carbon intensity of the fuel has not been able to be determined due to comingled storage. For entities who have already requested Ecology approval to use mass balancing, there would be no change.

We were unable to quantify the degree to which these proposed amendments would lead to cost savings for reporters who would otherwise continue to default to substitute fuel pathway codes of baseline carbon intensity. Their baseline approach could be due to a lack of clarity in the baseline rule, but a change from this could also be driven by potential benefits of mass balance reporting in terms of a more beneficial final determined carbon intensity of their fuels.

4.2.1.3 Aligning specified feedstocks with California and Oregon

The proposed amendments would align the Clean Fuels Program with the California and Oregon clean fuel programs. This would improve regulatory consistency across jurisdictions, as well as expanding potential pathways available for generating credits. As entities would only be likely to voluntarily participate if they expected a net private benefit, we only expect additional benefits where additional participation occurs. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.1.4 Pathway application flexibility

We expect these proposed amendments to result in potential cost-savings of effort on the joint EER applicant's part, if it is easier to obtain a letter from the owner than from the manufacturer. Ecology has received very few joint EER applications, so we expect that this benefit will be minor.

We also expect the provision of a specific process for revising Ecology's utility-specific carbon intensities to result in added clarity for program participants, as well as improved accuracy of utility-specific carbon intensity values. While the proposed revision process includes a deadline for disagreement documentation, it is overall more flexible and transparent than the baseline rule language that only sets the deadline for Ecology to post final values. Added transparency and clearer expectations support a well-functioning program with reduced likelihood of inaccurate representation of actual utility-specific carbon intensities.

4.2.1.5 Clarifying without material impact

As these proposed amendments do not change the meanings or requirements in the rule, they would not result in benefits beyond the benefit of clarity and consistency. This would serve to streamline compliance by covered and opt-in entities, potentially reducing the need for technical assistance or resulting in fewer delays. This would especially be the case for new program entrants, by reducing the time it takes to learn and understand the complexities of the program.

4.2.2 Making adjustments to reporting and documentation efforts

4.2.2.1 Exempt use transactions

In cases where the person asserting the exemption is not the fuel end user, this proposed rule amendment may result in acquiring and retaining additional records held by end users. Where this occurs, this amendment would result in the benefit of clarity in who is responsible for both accuracy and records. As the exchange of this information is likely already part of the business relationships involved in fuel sales for purposes of tracking and accounting, we do not expect this change to result in significant benefits over the baseline beyond availability of these records to resolve issues or disputes that may arise.

4.2.2.2 Aggregator notifications

This proposed amendment may result in aggregators needing to notify Ecology earlier than they would under the baseline. This would mean making the same effort earlier, with a benefit of their customers being excluded from the annual fee.

The potential avoided fee per entity under the proposed rule is at least $274[38] in 2024.[39] The fee varies year-to-year: Ecology estimates the cost of administering the program for the upcoming year and sets the fee for that year based on the estimated budget and the number of participants registered. To retain conservative estimates of benefits, we chose to assume this fee would remain constant in real terms (updating the value for inflation over time, but not in terms of purchasing power), rather than make additional assumptions about the overall size, cost, and composition of the program and its participation or coverage over time.

In chapter 3, we assumed aggregators would submit 10 additional notifications per year, earlier, under the proposed rule amendments. This would result in their customers avoiding the participation fee, with a potential total annual benefit of approximately $3,000. Ecology reports

[38] This is the program participation fee for 2024. Other fees may be relevant, but we have not included them to avoid underestimating likely benefits.
[39] Chapter 173-455 WAC.

streams of costs and benefits in terms of present value over 20 years.[40] The 20-year present value of this annual benefit would be approximately $50,000.[41]

4.2.2.3 Designation of electric credit generators

These proposed rule amendments are likely to result in benefits of:

- Clarity in roles and responsibilities, facilitating smooth compliance with reduced risk of delays or missing data or documentation.
- Transparency to market participants in revenue generated from their FSE.

The associated benefit of these amendments is supporting a program in which all parties have clear responsibilities and understand the private benefits they receive from how they participate. Market participants having clear knowledge of the revenue generated from their FSE particularly supports them in making well-informed business decisions, minimizing costs, and maximizing benefits of whether to use an aggregator.

4.2.2.4 Electric utility notifications

Depending on how utilities interpret the baseline language, this proposed amendment may result in benefits of improved program tracking of utility participation, confidence, and administration. Additional assurances and clear statement of responsibilities and intent support Ecology's understanding of how utilities choose to participate in the program over time.

4.2.2.5 Changes in ownership or control

This proposed amendment is likely to result in clarity in the responsibilities of regulated parties, potentially reducing errors and delays in compliance. Lack of clear communication between Ecology and both the previous and new owners, or limited new owner understanding of the responsibilities they are taking on and documentation they will need, could result in compliance errors and difficulties in resolving them.

4.2.2.6 Inactive registrations

In cases where an account is inactive for four quarters, this proposed amendment would result in benefits of a well-functioning, streamlined program with up-to-date information and in which residual credits are not abandoned. This amendment would also make Washington's program consistent with the California and Oregon clean fuel programs, resulting in regulatory consistency for registered parties across jurisdictions.

---

[40] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

[41] We note that some aggregators may send multiple such notifications (for multiple customers) in a given year, so these benefits would be distributed similarly across the relevant aggregators.

Inactive registrations impair efficient functioning of the program, including reduced confidence that all entities that must or choose to participate are able to comply effectively. Depending on the scale of total credits that would be abandoned, the rule amendments also reduce the risk of credit market disruptions resulting from differences between expected and actual credit availability.

As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

Finally, these proposed amendments would potentially result in otherwise abandoned credits being transferred to the backstop aggregator, which has the purpose of further decarbonization. The backstop aggregator is a nonprofit organization appointed to:

- Collect unclaimed credits from electric charging.
- Sell those credits.
- Reinvest the revenue into transportation electrification in communities with the most air pollution.

4.2.2.7 Registration of fueling supply equipment

This proposed amendment is likely to result in benefits of clearly meeting program goals through registering only equipment that is capable of being used for fueling or charging purposes. This amendment would not only improve awareness and attention to which FSE are eligible or not, it would reduce risks of program errors or inefficiencies when both types of FSE are connected to the same power source.

When eligible and ineligible equipment are on the same power source, there is a risk of overrepresenting the fueling and credit generation coming from just eligible FSE. By clearly delineating eligible and ineligible FSE, this proposed amendment supports efficient and accurate program function. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.2.8 Registration of electric transport refrigeration units

The proposed rule is likely to result in cost-savings of avoiding the costs of needing to repeatedly re-register these FSE under the baseline. In Chapter 3, we assumed four eTRU aggregators would undertake the more permanent registration available under the proposed rule amendments (see associated cost estimate in Section 3.2.2.8). This would result in them no longer having to repeatedly register FSE in the temporary fashion under the baseline.

We conservatively assumed that each repeated re-registration would take a quarter of the time needed for initial registration (assumed to be 40 hours for aggregators with large numbers of FSE in chapter 3) of manager time. For these resulting 10 hours, we used the BLS wage for

"Managers, all other" of $80.70.[42] Across the aggregators, this would be an annual avoided cost of approximately $3,000 per year. Ecology reports streams of costs and benefits in terms of present value over 20 years.[43] The 20-year present value of this annual benefit would be approximately $58,000

4.2.2.9 Follow-up information requests

This amendment may result in benefits of a well-functioning, streamlined program with up-to-date and comprehensive information. We expect that the deadline that Ecology sets would take into account the scope of the information request. However, in cases that would take a longer time under the baseline, this proposed amendment would result in earlier resolution of questions or issues related to registration. This would ultimately serve to reduce registration delays that could otherwise impair effective program participation, while improving the quality of registration information.

4.2.2.10 Fuel transfers

The actual change resulting from these proposed amendments, as compared to the baseline, is the requirement to include specific language in the fuel transfer document in cases where the transferor retains credit or deficit generation obligations. In such cases, the amendments would result in benefits of transparent obligations and responsibilities, as well as reiteration of requirements for entities that then export the fuel out of state.

Confusion regarding the responsibilities and roles that are required for fuel transfer may result in compliance errors that are difficult to resolve. This could lead to misunderstanding of credit ownership or deficit obligation, leading to noncompliance or disputes. Moreover, the baseline rule already sets requirements for fuel exporters, and without explicit notification in the fuel transfer document, an exporter receiving fuel may be unaware that they are subject to Clean Fuels Program requirements despite not taking on credit or deficit generation obligations. Where limited information or misunderstanding could lead to noncompliance or disputes under the baseline, the proposed rule would support efficient program function.

As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.2.11 Exported fuel sales

---

[42] US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm; US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

[43] A present value reflects future streams of costs and benefits in terms of current dollar values. It accounts for both inflation and the opportunity cost of having money later rather than earlier (e.g., a person with money sooner could invest it to make more money over time, which a person getting the same money later misses out on). The present value calculation uses the same discount rate as our other opportunity cost calculations. Ecology uses a discount rate based on an estimated Social Rate of Time Preference, based on the past 20 year average real return on US Treasury Department I Bonds. I Bonds are inflation-adjusted, broadly accessible, and relatively risk-free. US Treasury Department, 2024. I bonds interest rates. Historic data collected twice-yearly by Ecology since September 1998. The current average 20-year annual real discount rate is about 1%.

This proposed amendment could expand the number of recipients identified by registered parties that are position holders that sell fuel below the rack for export. Correspondingly, this would result in better program knowledge of exported fuel recipients to the extent Ecology is not currently aware of them. Knowledge of these recipients of fuel sold below the rack for export would ensure they are aware of the requirements they must meet under the baseline, including registration, which would support comprehensive implementation of the program and meeting its goals.

Benefits arise from a combination of Ecology becoming aware of unregistered exporters that have purchased fuel below the rack, and improved awareness of exporters about the requirements they are subject to. We discuss the benefits associated with registration of currently unregistered exporters in Section 4.2.3.1.

4.2.2.12 Updated report corrections

These proposed amendments are largely clarifications, but would potentially result in a need for entities to resubmit their correction requests, if they take longer than two days to submit corrections. This would result in a corresponding benefit of an efficient process during which information is up-to-date and potential corrections are completed in a timely fashion. We do not expect this impact to occur frequently, as additional corrections are likely to be identified and specified within a short time of identifying initial corrections. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.2.13 Reporting forklift charging

As other proposed amendments would require metering of forklift charging, and the baseline language includes the default (without request for an alternative approach) requirement that quantity of electricity measured per FSE must be reported, we do not expect this change to result in costs or benefits. See Section 4.2.4 for discussion of the benefits of requiring metering for forklift charging.

4.2.2.14 Credit transfers

The proposed definition of Type 1 and Type 2 credit transfers would support improved Clean Fuels Program planning. Planning in the program entails understanding of both the generation and flows of credits across entities and over time, including market monitoring and auditing. Differentiating between these types of credits would allow Ecology to better link the reported price for the transfer with agreement timing and delivery timing. We note that while this is a rule change, it would put the rule language in line with current practice that already supports these benefits.

Shortening the time during which seller and buyer requirements must be met would align rule requirements with the existing functions of the WFRS. While this is a change in rule language, taking longer than 10 days without a transaction voiding is not possible under the baseline. We therefore do not expect a benefit from this proposed amendment beyond clarity.

4.2.2.15 Specified source pathway attestation

This proposed amendment would benefit the program by ensuring the integrity of specified source feedstocks, and would align the program with the California and Oregon clean fuel programs. Clear attestation by authorized representatives would result in improved accountability for meeting baseline requirements and the statutory objectives of the program to efficiently reduce the carbon intensity of fuels used in the state (and to do so accurately).

4.2.2.16 Pathways approved by California or Oregon programs

This proposed rule amendment would provide additional clarity and assurances that the carbon intensities being sought based on approval in the California or Oregon clean fuel programs are accurate and appropriately verified. Consistent with the benefits of third-party verification (discussed in section 4.2.9), this clarity would support efficient and effective program function by reducing the risk that credits or deficits are inaccurately generated. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.2.17 Use of carbon intensity calculators

The additional requirement to provide the equivalent nameplate production capacity for non-liquid fuels could result in consistent information about facility capacity for all types of fuels seeking a carbon intensity. We note, however, that this interpretation of the unclear baseline rule language is the current interpretation used when calculating carbon intensity. We therefore do not expect a significant benefit beyond clarity.

The specified process for initial approval of Tier 2 methodology before submitting additional application materials may result in reduced repeated work effort for applicants. Under the baseline, Ecology does not approve applications with inadequate methodology, and the proposed amendment could reduce the need to compile and submit additional information again when reapplying if it would otherwise be submitted with an application that would be denied. Because applications and methodologies are highly case-specific, we could not confidently estimate this benefit.

4.2.2.18 Use of renewable electricity products and power purchase agreements

These amendments would result in benefits of consistent and comprehensive reporting that accounts for necessary timing of verification requirements. This would serve to support confidence and transparency in the program. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.3 Redistributing potential credit generation

4.2.3.1 Amending designation of fuel exporters

This proposed amendment would resolve contradicting language in the baseline rule, resulting in benefits of clarity. While the rule language itself would change, we do not expect it to result in other impacts, as this is already how exporters interpret the baseline language in their compliance behavior.

4.2.3.2 Encouraging use of Pacific Northwest renewable electricity

Starting in 2026, these proposed amendments would result in entities seeking to lower carbon intensity based on retired RECs only being able to use RECs generated from facilities in Washington, Oregon, or Idaho. Benefits would include alignment with statewide emissions reduction targets and renewable electricity goals.

It is difficult to quantify the degree to which RECs, including the shift to Pacific Northwest RECs, would be used over time under future supply and demand scenarios, especially as the proposed rule may incentivize additional local development. Their use will also vary across entities, depending on their needs and requirements under the baseline (e.g., CETA).

We examined the potential costs and benefits of this proposed amendment by considering an illustrative scenario in which 312,102 RECs are affected each year, based on current trends in REC use in the program. We estimated the proposed rule amendments would result in additional demand for Pacific Northwest RECs, raising their price, and resulting in illustrative additional payments of $1.6 million for RECs ($28.2 million in 20-year present value).

Payments for RECs (the total cost of RECs, including the increased cost above as well as the baseline cost that would shift from other states to Washington) would go to REC developers in Washington, Oregon, and Idaho, who would not have received this additional premium under the baseline. While not considered as part of the direct effects of the proposed rule amendments, we note that this incentive to shift to local development of RECs would also shift associated employment and other expenditures to the Washington economy.

Using the above example of our cost calculations from Chapter 3, for the proposed requirement to use RECs generated in Washington, we used the REMI E3+ model to illustrate the jobs and output that this local spending could create in the Washington economy. (See Chapter 7 for discussion of how the REMI model works. Note that the model is specific to Washington, and the results below reflect this limitation; it was not possible for us to instead model impacts to Oregon and Idaho, or resulting economic impacts to Washington from interstate trade.) Using the same in-state REC prices used in our cost calculations, we looked at the impacts of total spending on Washington-generated RECs of $4.7 million. Recall from Chapter 3 that the costs of the rule would be 1/3 of this amount, because the other 2/3 would be spent on lower-cost RECs under the baseline, but this total amount would be what is actually spent on RECs in Washington, supporting local economic activity.

The jobs and output associated with new $4.7 million annual spending on in-state RECs depends on the projects generating RECs. We modeled the impacts (total across all sectors in the state economy) for the following examples:

- Spending on solar power construction supports about 70 local jobs and $8 million in output.
- Spending on onshore wind construction supports about 7 local jobs and $4 million in output.

- Spending on solar generation operations and maintenance supports about 80 jobs and $18 million in output.
- Spending on onshore wind generation operation and maintenance supports about 160 jobs and $30 million in output.

The above modeled results are based on current trends in Washington's economy and the rest of the world, including existing capacity for local production of inputs to renewable energy construction and operations (e.g., wind turbines, solar panels), as well as local industry, household, and government spending trends. These values might change if in reality there is more in-state manufacturing of the inputs to solar and wind generation facilities, or if Washington wages or spending patterns change more than the model expects compared to the rest of the world.

The proposed amendments related to registration and retirement of RECs would reinforce Ecology guidance and interpretation of baseline needs, ensuring RECs meet program requirements and avoiding program inefficiencies that would result from double counting. This added clarity would also reduce the likelihood that entities fail to demonstrate that RECs meet program requirements and risk invalidation of credits.

4.2.3.3 Reporting electric fueling of eTRU

As the FSE owner may have better access to relevant data and information, this amendment could result in an aggregate reporting cost savings. These cost savings could come in the form of reduced work effort in collecting data and information necessary for reporting, or reduced delays in requesting and receiving additional information. This benefit depends on the relevant scope of reporting, including number and locations of owned FSE and the fleets that charge there, and so is difficult to quantify.

Additionally, since the FSE owner would be more likely to be making decisions about additional investments in FSE capacity, this amendment could create more incentive for FSE owners to enter the market or make additional investments. This would be supported by first-hand collection of reporting data across owned FSE, to the extent it is not already assessed, providing aggregated insight into demand for services and use trends for their collective FSE.

4.2.4 Requiring metering of forklift charging

This proposed amendment would result in some facilities needing to install metering for charging of electric forklifts, if they would not under the baseline. We note that Ecology guidance implementing the baseline rule has specified a phase-out of the use of alternative measurement or estimation methods after 4 quarters per facility, so facilities may already be planning for this change.

Benefits would include accurate measurement of electricity used for forklift charging, consistent with measurement requirements for other vehicle fueling. This would reduce the risk of the program either over-providing or under-providing associated credits, facilitating an efficient program and associated efficient pricing to meet program carbon intensity goals. As

multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.5 Shifting potential program participation

4.2.5.1 Alternative jet fuels and alternative marine fuels

This proposed amendment would add circumstances in which a utility-specific carbon intensity for electrolytic hydrogen used as process energy can be reported in the Clean Fuels Program. We note that these fuels are eligible under the baseline, and the proposed amendment would adjust the carbon intensity options available to their producers. While costs of meeting the new requirements related to approval and documentation would result from these amendments, we do not expect any net costs of this amendment. This is because entities would only choose to participate and use this utility-specific carbon intensity option if they expected a net benefit.

The proposed amendments are designed to provide incentives specifically to reduce carbon intensities sooner in these difficult-to-decarbonize sectors. Aviation is difficult to decarbonize due to factors like traveling long ranges, consideration of the weight of fuel or new technologies, and high capital costs of changing durable equipment in which they have already invested (e.g., airplanes themselves or fueling infrastructure). The marine sector is difficult to decarbonize for similar reasons. Both sectors are also simultaneously limited by the scale of lower carbon intensity fuel production, and associated fuel costs. These proposed amendments would create additional early incentives for production of alternative jet fuel and alternative marine fuel, to help address fuel supply and pricing limitations on these sectors.

Added incentives for earlier credit production would also help to mitigate upward pressure on credit prices. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

The proposed amendments related to registration and retirement of RECs would reinforce Ecology guidance and interpretation of baseline needs, ensuring RECs meet program requirements and avoiding program inefficiencies that would result from double counting. This added clarity would also reduce the likelihood that entities fail to demonstrate that RECs meet program requirements and risk invalidation of credits.

4.2.5.2 Book-and-claim pipeline-injected biomethane

Book-and-claim accounting allows fuel producers to claim credit incentives for purchasing the renewable attributes of biomethane that is injected into a common carrier pipeline, without regards to physical traceability (i.e., verification that the biomethane is produced, delivered, or used in Washington), under certain conditions specified in rule. This system is intended to incentivize new methane capture and alternative fuel production opportunities while acknowledging the physical constraints of the natural gas pipeline network, where biomethane becomes untraceable once injected and commingled with fossil natural gas. Ecology's proposed rule amendments would require a phased-in transition towards book-and-claim biomethane being produced in Washington or injected into pipelines serving Washington. The intention of

these amendments is to balance the physical constraints of the pipeline system and fuel producers' need for sufficient feedstocks with the CFS program's goal of encouraging environmental and economic benefits in Washington.

The proposed requirements for biomethane used as a feedstock for alternative jet fuel align with standards in California, where the sourcing requirement becomes effective in 2046. Consistency across jurisdictions would help to ensure a level regulatory landscape and reduce the risk of disincentivizing alternative jet fuel production in Washington or creating regional price disparities. The delayed compliance timeline for this biomethane would also serve to support decarbonization in the aviation sector. This sector is currently difficult to decarbonize, due to a lack of viable low- or zero-emissions alternatives to current jet technologies, requiring the use of lower-carbon drop-in fuels to decrease greenhouse gas emissions. Current alternative jet fuel production is a developing industry, and fuels are produced in small quantities compared to other biomethane-derived fuels. The longer compliance timetable would allow for technology development and adoption.

Benefits would also include ensuring as many emissions reductions as feasible are happening in Washington, in support of program efficacy and the long-term objective of helping the state meet its statutory greenhouse gas emission limits. When biomethane is captured outside of the state and injected into a pipeline that does not flow towards Washington, that does not create a statewide methane reduction benefit by incentivizing in-state methane capture or reduce the need for fossil natural gas within the regional gas network serving Washington. When this happens, Washingtonians do not see that benefit in reduced emissions in the state, though they pay any resulting incremental costs.

By establishing phased-in regionality requirements, the proposed rule amendments better ensure that biomethane reported through book-and-claim accounting creates environmental benefits in Washington and the Pacific Northwest. This helps the program achieve statutory goals for greenhouse gas emissions reductions in Washington, without placing severe restrictions on sourcing biomethane from out-of-state sources by allowing injection into regional and international pipelines that flow into Washington or directly connect to Washington pipelines.

The proposed amendments would also support long-run viability of biomethane supply to the region served by specified pipelines in or into the state. Added crediting opportunities over time would provide financial incentive for local production and infrastructure development. This local production would also face less competition from other regions that would otherwise deliver to Washington under the baseline, though it would still face competition within the region. This would support the competitiveness of these in-state and within-region industries. While this analysis focuses on direct impacts of the rulemaking, we note that this would indirectly support local employment and expenditures on facilities and infrastructure.

Increased assurances and viability are two of the determinants of a well-functioning market and program. As multiple proposed amendments work to support this, we discuss the benefits of an efficient and well-functioning market in Section 4.3.

4.2.5.3 Avoided methane from livestock and organic waste

These amendments would incentivize new and additional methane capture and RNG production from dairy and swine manure, and from organic waste diverted from landfills. Methane capture that otherwise would not have occurred in the absence of the CFS program would receive the most generous incentives from avoided methane crediting. This additionality benefit is supported by:

- Establishing the baseline for each new facility built after Jan. 1, 2023, as its operational date for a period up to 15 years. Facilities operational before the start date would receive gradually decreasing avoided methane credits for a maximum of 14 years, depending on the start date, with more recent projects receiving a longer crediting period.
- Applicants using dairy and swine manure as a feedstock would be required to demonstrate their manure management system prior to their participation in the program to determine that their methane capture is new and additional.

Extension of crediting to organic material that would have otherwise been disposed of at a landfill would better incentivize the reduction in landfill methane emissions as well as dairy and swine.

While there would be costs associated with program participation using these pathways, we expect that entities will only choose to participate if they expect a net benefit, accounting for costs of participation and expected credit generation. Additional credit generation opportunities would also benefit the public and environment through incentivizing greenhouse gas emissions reductions. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.6 Adjusting crediting and deficit calculations

4.2.6.1 Switching to continuous review of carbon intensities

This amendment would allow Ecology greater flexibility in ensuring that carbon intensities reflect the most up-to-date science and lifecycle analysis models. While this could mean that the carbon intensities that underlie calculation of credits or deficits change more frequently, it could also result in reduced risk of going longer periods allowing over-generation or under-generation of credits or deficits relative to the actual lifecycle emissions associated with fuels and pathways.

As future science and technologies are unknown, it is difficult to quantify how any given carbon intensity would change in the future, or how much sooner Ecology would update it. To examine potential impacts of this proposed amendment, we considered an illustrative scenario that could result in benefits. (See Chapter 3 for discussion of a scenario resulting in costs.)

For this illustrative scenario, we assumed future carbon intensities decreased across the board by one percent. In terms of cost of deficits or value of credits, this would be equivalent to a one percent decrease in total obligation costs, or a one percent increase in the total value of credits.

Assuming a $10 future credit price, this would be like each credit becoming worth ten cents more.

Since these new carbon intensities would eventually be adopted under the baseline, at latest every three years, we also assumed in our scenario that the one-percent change in deficits or credits would occur at most three years earlier. A ten-cent increase in the value of credits generated, or a ten-cent reduction in the costs of deficits generated, occurring three years earlier would result in a benefit (avoided opportunity costs) of 1/3 of a cent per credit or deficit.

This benefit would scale up or down by the actual degree of:

- How much adopted carbon intensities increase.
- Future credit prices.

It would, however, remain the benefit of needing to comply with the new carbon intensities sooner, rather than the total cost of complying with the new carbon intensities, as these would eventually be adopted under the baseline.

We note also that evaluating carbon intensities continuously does not necessarily mean that they will decrease. Where they decrease sooner as a result of the proposed rule amendments, entities would incur an opportunity cost of needing to comply with them sooner.

4.2.6.2 Adjustments to pathway carbon intensity calculator tiers

These proposed amendments would reduce costs associated with use of the carbon intensity calculators for the for fuel type pathways moved or added to Tier 1. Resulting carbon intensities may be unimpacted, or would be updated to reflect appropriate and up-to-date science.

To illustrate the potential size of this benefit, we considered a conservative illustrative scenario in which one pathway application would be submitted for the affected fuel types each year. As use of the Tier 1 calculator is considerably less complex than for Tier 2, we assumed it would take 40 hours less manager time to go through the process. We used an updated BLS wage of $80.70 for “Managers, all other” as a simplifying assumption, as various positions would be involved throughout the process. In this scenario, the proposed rule amendments would result in a cost-savings of approximately $3,000 per year. Over 20 years, the equivalent present value would be a benefit of approximately $58,000.

4.2.6.3 Adjustments in cases where operating and certified carbon intensities differ

Generally, we must analyze the impacts of proposed rules by assuming accurate compliance with requirements. That makes it difficult to assess the impacts of this proposed amendment in a way that is comparable to other impacts, as it is inherently based on deviation from pathways having their certified carbon intensity. Holding this assumption consistent across this analysis, this proposed amendment would have only the benefits of creating disincentive for deviation from certified carbon intensities, and correcting for such inconsistencies in truing up credits and deficits to bring the program back into balance with actual carbon intensities associated with fuel pathways.

This would serve to meet statutory goals related to a program that efficiently reduces aggregate carbon intensities at lower cost. Disincentive to have significant and long-lasting

discrepancies would also reduce likelihood of significant program and credit market distortions. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.6.4 Adjustment for geothermal pathway carbon intensity

This proposed amendment would generate benefits of ensuring carbon intensities associated with geothermal electricity pathways accurately reflect their actual emissions. We could not confidently quantify the degree to which (if any) future geothermal project would be affected by this amendment. In cases where the actual carbon intensity of a geothermal pathway is zero (accounting, e.g., for process emissions), this proposed amendment would not have any impact. In cases in which actual pathway carbon intensity is nonzero, this amendment would avoid overgeneration of credits. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.7 Modifying ZEV capacity crediting

For HD-HRI, we expect the proposed amendments to result in benefits of:

- Consistent tracking of applications and up-to-date information: Providing application information within the quarter rather than in the longer 180 days would reduce risk that applications would be overlooked or that application information provided over the course of the period would become outdated.
- Reduced costs (benefits) of reduced reporting frequency for costs borne and revenues received per station: The proposed amendments would shift reporting from quarterly to annual. As the overall amount of data for the year would be the same, we assumed cost-savings would mostly come in the form of reduced administrative and submittal costs – changing from 4 hours per quarterly report to 8 hours for one annual report. This would result in an annual cost-savings of approximately $650 per affected applicant. As we do not currently have any HD-HRI projects, it is difficult to say how frequently this cost savings would occur.
- Potential increased participation through shared refueling stations: As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.
- Potential increased participation due to increased capacity eligibility: As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits. As

multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

For LMD-FCI, we expect the proposed amendments to result in benefits of:

- Consistent tracking of applications and up-to-date information. Providing application information within the quarter rather than in the longer 180 days would reduce risk that applications would be overlooked or that application information provided over the course of the period would become outdated.
- Accurate understanding of FSE drawing from the same power source whether they are eligible to generate credits or not: When eligible and ineligible equipment are on the same power source, there is a risk of overrepresenting the fueling and credit generation coming from just eligible FSE. By clearly delineating eligible and ineligible FSE, this proposed amendment supports efficient and accurate program function. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.
- Reduced costs of reduced reporting frequency for costs borne and revenues received per station: The proposed amendments would shift reporting from quarterly to annual. As the overall amount of data for the year would be the same, we assumed cost-savings would mostly come in the form of reduced administrative and submittal costs – changing from 4 hours per quarterly report to 8 hours for one annual report. This would result in an annual cost-savings of approximately $650 per affected applicant. In the past year, we have 50 applications for LMD-FCI. As the proposed amendments incentivize additional capacity, we assumed a larger number of 75 applications. This would result in an annual cost-savings of approximately $48,000, or about $874,000 in 20-year present value.
- Increased diversity and distribution of charging sites across more applicants due to the credit cap per applicant: Increased diversity could benefit the charging population by increasing competition and potentially the geographic distribution of sites.
- Minor avoided opportunity costs for the first quarter and incurred opportunity costs for the last quarter of the shifting 5-year capacity crediting timeframe. This may result in net benefits or at least earlier available credit generation to recoup investments. Potential to generate credits earlier could increase program participation or capacity.
- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. In this chapter, we discuss situations in which this could be a net benefit. This also allows for greater transparency up front for credit generators to set expectations for capacity credit generation over time.

A net benefit would occur in cases where increased initial credit generation outweighs fewer credits received later. This would result in a net gain of value if the total baseline value of future credits was less than the total baseline value of initial credits. In turn, that would only happen if:

- Assuming constant prices, the total initial credits exceed total future credits.
- Initial credit prices are significantly lower than future credit prices.

If entities expect the above scenario to be true, based on their planned expenditures, facility attributes, and credit price expectations, this proposed amendment could result in greater incentives for program participation for entities with these expectations and plans. We note that some entities increasing participation does not necessarily mean that in the aggregate more credits would be generated. Rather, they could be reallocated across other entities with different financing, facility, and credit price expectations.

For HD-FCI, we expect the proposed amendments to result in benefits of:

- Consistent tracking of applications and up-to-date information. Providing application information within the quarter rather than in the longer 180 days would reduce risk that applications would be overlooked or that application information provided over the course of the period would become outdated.
- More flexibility for applicants due to removal of the limit on effective simultaneous power rating. We expect that most sites will be shared fleet vehicle stations where the site is making regular decisions about how to allocate power while fleets are charging. HD-FCI has a limit of 10 MW cumulative power rating, and under the proposed amendments a site would be able to choose the power rating they apply for each charger. This would allow them the opportunity to allocate their 10 MW across more chargers, but receive fewer credits per charger, according to their site-specific needs.[44]
- Potential increased participation through shared refueling stations: As this participation is voluntary, we expect entities to choose to participate only if their expected benefits from credit generation exceed costs of compliance. The public and environment would also benefit from increased incentives to generate credits. As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.
- Minor avoided opportunity costs for the first quarter and incurred opportunity costs for the last quarter of the shifting 5-year capacity crediting timeframe. This may result in net benefits or at least earlier available credit generation to recoup investments. Potential to generate credits earlier could increase program participation or capacity.

[44] For example, a site that registered one hundred 100-kW chargers at 100 kW capacity under the baseline, could instead choose to register two hundred 100-kW chargers at 50 kW capacity.

- Due to proposed changes to the cumulative credit generation value based on capital expenditures, increased initial opportunity for credit generation, counterbalanced by potential to receive fewer credits later because that limit does not change over time with changes in capital expenditures. In this chapter, we discuss situations in which this could be a net benefit. This also allows for greater transparency up front for credit generators to set expectations for capacity credit generation over time.

  A net benefit would occur in cases where increased initial credit generation outweighs fewer credits received later. This would result in a net gain of value if the total baseline value of future credits was less than the total baseline value of initial credits. In turn, that would only happen if:

  - Assuming constant prices, the total initial credits exceed total future credits.
  - Initial credit prices are significantly lower than future credit prices.

  If entities expect the above scenario to be true, based on their planned expenditures, facility attributes, and credit price expectations, this proposed amendment could result in greater incentives for program participation for entities with these expectations and plans. We note that some entities increasing participation does not necessarily mean that in the aggregate more credits would be generated. Rather, they could be reallocated across other entities with different financing, facility, and credit price expectations.

- Increased relative incentive for higher power rating chargers, due to the modified capacity calculation. While this would not affect the total credits available, it would potentially shift more credits for higher-powered chargers to be received sooner (making them more likely to recoup investment). This could, in turn, incentivize participation by entities that would otherwise not choose to apply due to economic timing factors.

4.2.8 Adding third-party verification

These proposed rule amendments are likely to collectively result in benefits of assurance that the data and reports receiving third-party verification are accurate and complete. This benefits the program and public by ensuring the program is accurately assigning deficits and credits to program participants, and no entity is gaining advantage in the program based on inaccurate information or reporting. This, in turn, benefits the public and environment by ensuring the program is meeting the goals and objectives of the statute to reduce the aggregate carbon intensity of transportation fuels used in Washington.

Assuring that Clean Fuels Program credits and deficit allocations match actual emissions reductions supports the program's function in reducing contributions to climate change and local health impacts from fuel combustion. In 2022, BRG modeled the potential impacts of the Clean Fuels Program on emissions of fine particulates (PM2.5), and found that the program would reduce mortality risk valued at between approximately $2 billion and $4 billion. BMG also calculated the avoided social cost of carbon emissions (the costs resulting from greenhouse

gas contributions to climate change) at a value of $1.4 billion using the social cost of carbon available at that time.[45] If even 5 percent of emissions reductions across all fuels in the program were underestimated, the assurance and resulting corrections provided by third-party verification would support benefits of between $75 million and $160 million in mortality resulting from PM2.5 and $70 million in social costs of carbon. If 5 percent were overestimated, it would result in the overgeneration of over 26 million credits over 20 years (assuming BRG's average credit growth rate for years beyond that analysis). At an assumed $10 per credit, this would be valued at $260 million in credit value without a corresponding change in emissions.

Moreover, the understanding and quantification of the social cost of carbon continues to evolve. Updating to more recently developed social cost of carbon values that capture more impacts and better align with discount rates Ecology uses to reflect streams of costs or benefits[46] these values become $75 million to $160 million in mortality resulting from PM2.5 and $239 million in avoided social costs of carbon.[47]

As multiple proposed rule amendments would result in efficient market function and achieving statutory programmatic goals, see Section 4.3 for discussion of the benefits of efficient program function.

4.2.9 Environmental justice benefits[48]

The proposed rule amendments serve to improve Clean Fuels Program effectiveness in meeting its goals by:

- Creating incentives for additional credit generation.
- Improving confidence and transparency of the program.
- Ensuring that credit generation from alternative fuels, including electricity and biomethane, is aligned with verified greenhouse gas emission reductions and local and regional environmental benefits.

These, in turn, support ongoing reductions in the carbon intensity of fuels while doing so at lower cost that might arise from limited credits as program requirements for carbon intensities

[45] BRG, 2022. Washington Department of Ecology: Clean Fuel Standard Cost Benefit Analysis Report. May 12, 2022.
[46] US Environmental Protection Agency, 2023. Supplementary material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review. Docket ID No. EPA-HQ-OAR-2021-0317. November 2023.
[47] The BRG analysis only provided modeled results through 2038. To extend to 2045, we used the average annual percentage change across modeled years to estimate subsequent annual emissions reductions. For individual years' modeled emissions reductions, see WA Department of Ecology, 2022. Final Regulatory analyses for Chapter 173-424 WAC, Clean Fuels Program Rule and Chapter 173-455 WAC, Air Quality Fee Rule. Publication no. 22-02-058.
[48] See Chapter 6 for discussion of alternative rule content suggested during rule development, that was not included in the proposed rule. Input received is documented in the Environmental Justice Assessment for this rulemaking, and included in the rule file.

become more stringent. Reduction of carbon intensity reduces the greenhouse gas emissions associated with transportation (either when fuels are used in vehicles or upstream in their supply chain), reducing contributions to climate change.

Climate change

Climate change is expected to result in larger and more frequent events such as:

- Wildfires.
- Extreme-heat days.
- Flooding.

Climate change disproportionately affects some Washingtonians more heavily than others. This can happen because they are more exposed to climate hazards, have higher existing health burdens, or are less able to afford resources. While these events affect people across the state, communities and individuals may be more impacted through:

- Health impacts, due to factors such as higher existing health burden and risk.
- Difficulty developing prevention or mitigation measures, due to factors such as lower access to income and resources.
- Exposure, due to factors such as lower access to cooling and air filtration, or greater heat retention in areas with less tree canopy and more paved surfaces.
- Gaps in resiliency when impacts happen, due to factors such as less access to response and recovery funds, as well as more difficulty affording interim housing and sufficient transportation to meet their emergency needs.

Disproportionately affected populations include people who:

- Have lower incomes.
- Live or work in locations with limited air filtration or cooling.
- Live in areas that absorb and retain more heat.
- Are unsheltered or have inadequate housing.
- Have a higher existing health burden.

Economic disparities

By creating additional incentives to develop projects that generate credits, the proposed amendments also support the affordability aspects of the Clean Fuels statute. Added credits reduce upward pressure on credit prices over time, and reduce the risk that the costs of reducing the carbon intensity of fuels will be passed on to consumers. Consumers with lower disposable incomes bear cost increases as a higher share of their resources.

Other pollutant emissions

Changing the types of fuels used in vehicles can also reduce emissions of non-greenhouse gases and other combustion byproducts that affect nearby communities. In 2022, BRG modeled the

potential impacts of the Clean Fuels Program on emissions of fine particulates (PM2.5), and found that the program would reduce mortality risk valued at between approximately $2 billion and $4 billion.[49]

Overburdened communities tend to be located in areas that expose them to higher historic or current pollutants. Whether in their homes, outdoors, at school, or at work, overburdened populations are more likely to interact with air emissions from vehicles or heavy-duty vehicles, contaminated non-potable and even potable waters, or soils and shorelines contaminated by historical activities or land uses.

By supporting an efficient program with additional credit generation incentives, the proposed rule amendments also support more-affordable reductions in other combustion emissions. The Washington State Department of Transportation notes:[50]

- In Washington about 1 in 7 (900,000) people live within 1/4 mile of heavy traffic roadways. These people breathe more air pollution from diesel and gasoline exhaust.
- People with an underlying health condition like asthma or heart disease may be especially sensitive to traffic-related air pollution, as are children and adults aged 65 and older.
- Traffic air pollution is linked to adverse birth outcomes such as low birth weight and premature births.

By creating additional incentives for the production and use of alternative jet fuels, the proposed rule amendment would also benefit populations living in neighborhoods with greater air traffic, such as people living near airports and flight paths.

Mitigating potential negative impacts of fuel production

During development of the proposed rule amendments, Ecology received comments expressing concern that allowing "avoided methane credits" for biomethane would increase industrial livestock activities, particularly in overburdened communities, and that these actions would negatively impact air quality, water quality, and associated community and environmental health. Analysis of California's dairy sector has shown little evidence of avoided methane credits causing an increase in herd sizes. The average herd growth rate of dairies with digesters and without digesters is almost identical, suggesting that factors other than biomethane production incentives are driving growth and industry consolidation.[51] Washington dairies also are not as productive on average as California dairies at producing biomethane due to climate differences and other factors, further demonstrating that it is unlikely that credit incentives will lead to a large increase in dairy herd sizes.

Nevertheless, based on these comments, Ecology worked to include specifications in the proposed amendments to limit the timing and scope of credit generation opportunities and

[49] BRG, 2022. Washington Department of Ecology: Clean Fuel Standard Cost Benefit Analysis Report. May 12, 2022.
[50] WA Department of Health, 2022. Traffic Air Pollution Data. https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn/traffic-air-pollution
[51] Dairy Sector Workshop Presentation

incentives. The highest level of avoided methane credits will be limited to new methane capture projects that create an additional environmental benefit for Washington, and credits will be calculated against any legal or regulatory requirements for the destruction of biomethane. These specifications also serve to maintain balance across fuel types generating credits.

4.3 Benefits of increased program participation and efficiency

The Clean Fuels Program relies on a well-functioning credit market that supports cost-effective reduction of the carbon intensity of transportation fuels used in Washington. This includes:

- Credit prices high enough to sufficiently incentivize the production and distribution of low carbon fuels.
- Credit prices low enough to keep compliance affordable for parties that generate deficits.
- Adequate supply of credits to meet the goals above.
- Confidence that greenhouse gas emissions reductions in Washington are being achieved.
- Transparent information for market participants, including those that participate via a third-party like an aggregator.
- Confidence that the numbers of credits and deficits being generated (including for other market participants) correctly reflect the carbon intensities and volumes of fuels being used. This provides the program and participants assurance that no party will unfairly dominate the market or create unexpected changes like price shocks.
- Broad inclusion of sectors, including those that are difficult to decarbonize, to allow parties more flexibility and affordability in their choices to purchase credits or reduce the carbon intensities of their fuels.

Benefits of a transparent, accurate, and well-functioning market

Price balance

Credit prices are one factor that goes into the decisions entities make related to the fuels they produce, and in the case of opt-in entities, whether to participate in the program. Prices that are too low (or are expected to be too low later) could reduce incentives for entities to participate in the program by producing low carbon intensity fuels – the benefit of selling credits might not be enough to make up the costs they incur. Prices that are too high (or are expected to get too high later) could make it very costly for covered entities that generate deficits to comply with the program – excess costs could affect their volumes or types of fuels, and could be passed along to consumers at greater rates. This is why the Clean Fuels Program seeks to balance upward and downward pressure on prices.

Accuracy and efficacy

The above incentives and costs do not only depend on current credit prices, but on expectations about what the prices will be in the future. This makes transparency and confidence in the market particularly important, since price expectations rely on it. The expected future supply of cleaner fuels and credits affects choices now and over time. Confidence that the market is accurately reflecting actual carbon intensities, fuel volumes, and market exchanges reduces risk for covered entities, by reducing the likelihood that there will be an unexpected shock to the market that affects prices. Confidence in data accuracy also provides assurance to the public that the greenhouse gas emissions reductions attributed to the program are real and verifiable.

The authorizing statute also supports ensuring that alternative fuels used in Washington create local and verifiable environmental benefits. By adding provisions for regional and in-state generation of biomethane and RECs the proposed rule amendments help us to more effectively achieve this goal. Absent proposed amendments that would provide more assurance that book-and-claim biomethane injected into pipelines results in actual emissions reductions and deliverability of biomethane into WA, we could not be sure this goal is being achieved. As Washingtonians are likely to incur costs associated with the program, it is also important and consistent with the statute that they receive the benefits as well. Associated indirect benefits of added in-state expenditures and job creation related to new in-state projects also support statutory objectives of creating jobs and spurring economic development in the state (see Section 4.2.3.2).

Potential benefit scope

While it is difficult to confidently quantify the degree to which a well-functioning market and program reduce risk and costs, we may consider that investments in fuel production and infrastructure are in the millions of dollars, and they expect to recoup at least that amount. The volume of fuels used in the state is also in the millions of gallons, and the credit volumes transacted in the credit market are in the hundreds-of-thousands of metric tons. A market disruption that causes even a relatively minor price drop can significantly impact the revenues of credit generators, much as a price spike can significantly impact the compliance costs of deficit generators.

Time and expectations are also crucial factors in the scope of these benefits, as discussed above. If entities expect prices to be low, they may choose not to undertake new development or expansion of fuel production. Providing a clear signal for cases in which credits will be available or limited due to factors like requirements for local emissions reductions or focus on sectors that are difficult to decarbonize, supports clear expectations in long-run decision making.

As discussed in multiple sections of this chapter, the proposed rule amendments would support efficient credit market and Clean Fuels Program function by:

- Reducing inactive registrations.
- Preventing registration of FSEs that are not capable of being used.
- Clearly delineating responsibilities and roles during fuel transfers.

- Improving efficiency of report corrections.
- Ensuring verification of California and Oregon fuel pathways.
- Improving consistency and coverage in reporting renewable energy products.
- Ensuring emissions reductions from biomethane and RECs are happening in WA.
- Requiring metering for forklift charging.
- Further discouraging exceedance of certified carbon intensities.
- Reflecting actual geothermal carbon intensity.
- Reducing risks associated with ineligible ZEV-charging FSE sharing a power source with eligible FSE.
- Adding third-party verification.

Benefits of adequate credit supply

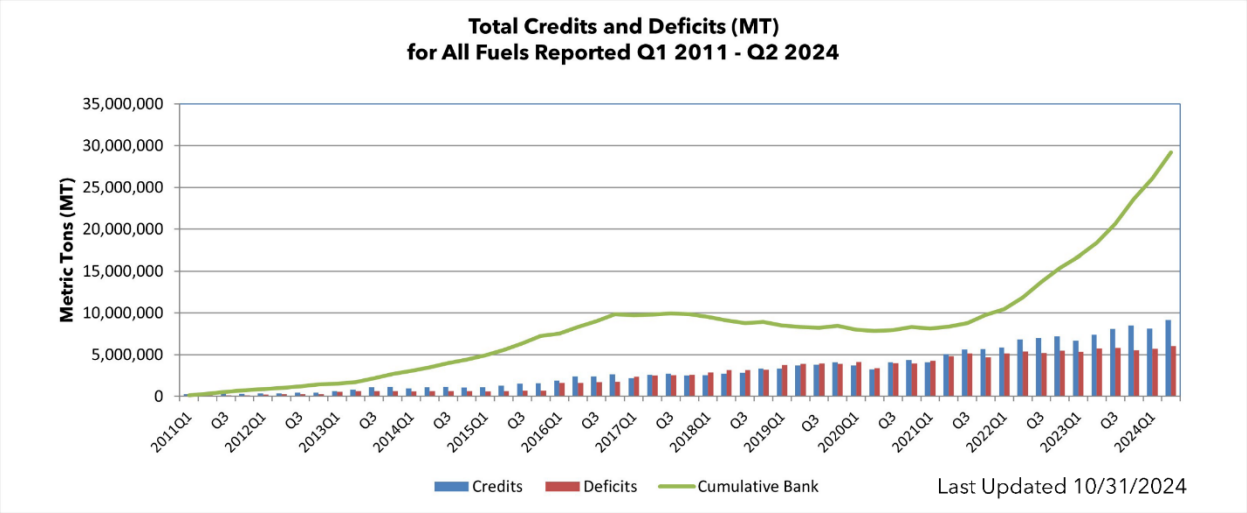
Credit prices are determined by the underlying supply of, and demand for, credits. The higher the ratio between demand and supply, the more that credit prices get bid up. Generation of additional credits (e.g., though expansion of potential credit-generating opportunities) mitigates this upward pressure while also making alternative fuel types more affordable by increasing their supply as well. By design, the program also sets limits on credit generation (in terms of amounts or timing) to prevent downward pressure from new credit generation from pushing prices so low that producers of clean fuels do not see a net benefit to participating in the program. This also reduces the likelihood of large price swings over time.

It is difficult to assess the degree to which added credit generation opportunities provided by the proposed rule amendments would increase credit supply, or to what degree prices would change. This is largely due to many of the proposed amendments making smaller changes to existing requirements. Many fuel pathways also have limited data or program participation at this point, and we lack information about potential volumes or use cases. Moreover, given we are limited in our understanding of how much the supply of clean fuels and associated credit supply, we are not able to quantify the resulting impact on credit prices or fuel use.

We may look to experiences in the California Low Carbon Fuel Standard for information on the relationship between deficits, credits, and prices. The figure below represents the quantities of credits and deficits in the California program over time, as well as the overall number of banked credits.[52] One observation about this figure is that to varying degrees in about 2014-2016, and to a greater and increasing degree starting in 2021, credits generated more significantly exceed deficits generated in each quarter.

Figure 3. Total credits and deficits, California Low Carbon Fuel Standard

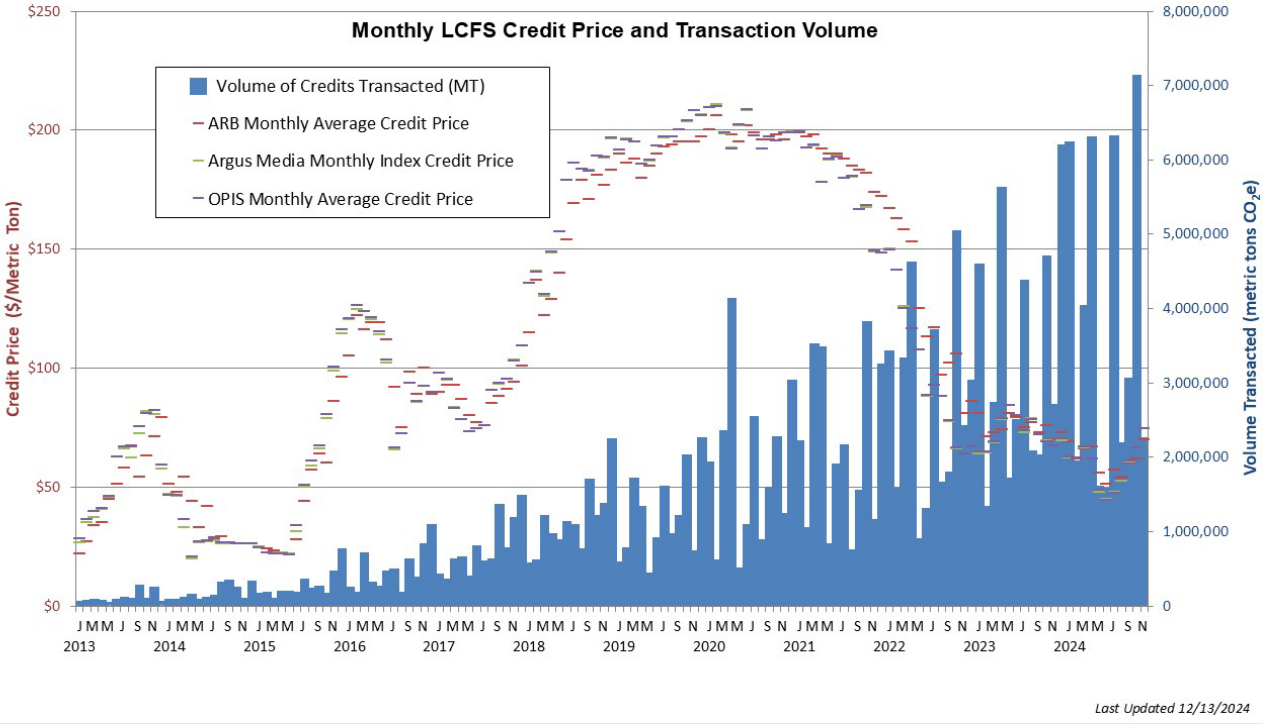
[52] California Air Resources Board, 2025. LCFS Data Dashboard. https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard



The figure below represents the total volumes transacted and credit prices in the California Low Carbon fuel Standard.[53] We may observe that during the periods described in the previous paragraph above, prices have experienced significant falls. Note that other factors may also have affected credit prices during these periods, such as uncertainty due to potential revisions to program requirements affecting expectations, or shifts in the types of fuel available. That said, added supply relative to demand for credits likely contributed to downward pressure on credit prices.

Figure 4. Monthly California Low Carbon Fuel Standard credit prices and volumes

[53] Ibid.



As discussed in multiple sections of this chapter, the proposed rule amendments would support added opportunities for credit generation by:

- Aligning specified feedstocks with California and Oregon clean fuel programs.
- Incentivizing production of alternative jet fuels and alternative marine fuels.
- Incentivizing avoided methane from livestock and organic waste.
- Incentivizing HD-HRI though expanded eligibility of shared refueling stations and increased capacity eligibility.
- Incentivizing LMD-FCI through expanded eligibility of shared refueling stations

Benefits of limiting credit generation

While there are benefits to ensuring the supply of credits is sufficient to keep compliance costs low for the Clean Fuels Program, and for keeping cleaner fuels flowing to Washington, there are also benefits to balancing this with requirements that limit supply. When prices get too low, there is less incentive for credit generation, and less cleaner fuel coming to the state.

On the compliance side, when prices are low, entities with deficit obligations might instead choose lower-cost options like purchasing RECs (if their prices are lower at the time). This could impair the program's ability to meet goals and objectives. This means not only fewer reductions in greenhouse gas emissions, but also fewer reductions in other pollutants such as fine particulate matter affecting communities.

While, again, multiple factors are involved, and it is difficult to confidently estimate the size of this benefit that results specifically from the proposed rule amendments, we might again look

to the California example figures above. This is a corollary to our observations above, that as credit generation grows, prices fall. When credit prices rise, they create incentive for more entities producing cleaner fuels to opt into the program. And if they rise enough relative to deficits, they mitigate upward pressures on prices, and ultimately may reduce prices.

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of costs and benefits of the proposed rule amendments

We identified multiple likely quantitative and qualitative costs and benefits of the proposed rule amendments. Recall that the APA requires us to determine whether "the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented."

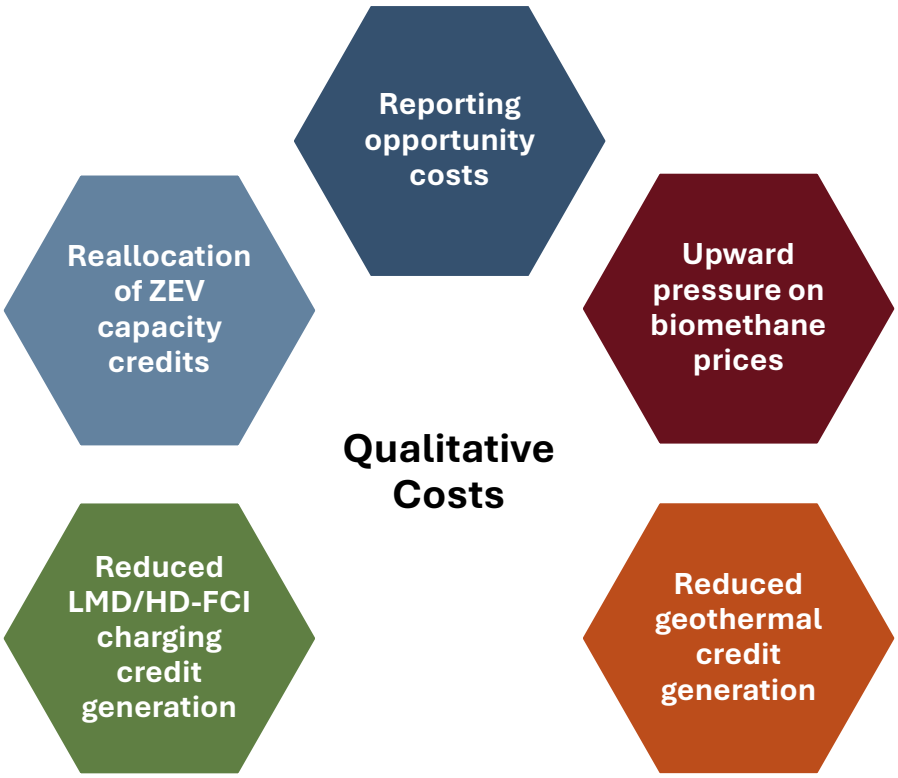
The tables of quantifiable impacts and lists of qualitative impacts below include only those amendments for which we identified a likely non-zero cost or non-zero benefit. Some rule amendments are likely to result in only benefits. We have briefly summarized relevant qualitatively discussed or illustrative impacts, in addition to those that are monetized. For detailed discussion of the rule amendments as compared to the baseline, see Chapter 2. For more information about the associated costs and benefits, see chapters 3 and 4, respectively.

Costs

Table 3. Estimated quantifiable costs of the proposed amendments (millions of 2024$; 20-year present value compared to baseline)

Proposed amendments (Discussion section)	**Cost Low; millions of $**	**Cost High; millions of $**
Designation of electric credit generators (3.2.2.3)	$0.021	$0.021
Change in ownership (3.2.2.5)	$0.009	$0.009
Inactive registrations (3.2.2.6)	$0.155	$0.155
Registration of eTRU (3.2.2.8)	$0.013	$0.013
Fuel transfers (3.2.2.10)	$0.012	$0.012
Pathway attestation (3.2.2.15)	$0.058	$0.058
Encourage use of PNW renewable electricity (3.2.3.2)	$28	$28
Requiring metering of forklift charging (3.2.4)	$0.487	$18
Modifying ZEV capacity crediting (3.2.7)	$0.303	$0.303
Adding third-party verification (3.2.8)	$107	$367
Total quantified cost (millions):	**$136**	**$414**

Figure 5. Overview of qualitatively described costs of the proposed rule amendments



Qualitatively described costs include:

- Use of renewable electricity products (3.2.2.18): **Opportunity cost** of up to 1% of fuel pathway reporting cost.
- Book-and-claim pipeline-injected biomethane (3.2.5.2): **Potential upward pressure on biomethane prices and reduction in supplied volume** if production in the region is higher cost than under the baseline. These impacts would be delayed or avoided for biomethane used as a feedstock in alternative jet fuel.
- Switching to continuous review of carbon intensities (3.2.6.1): 1/3 of one cent per 1% carbon intensity change, per credit or deficit (illustrative).
- Adjustments for geothermal pathway carbon intensity (3.2.6.4):
    - **Potential reduced credit generation**. No currently known projects in Washington.
    - Impacts depend on degree to which process emissions contribute to overall carbon intensity. **Low-end costs are potentially $0**.
- Modifying ZEV capacity crediting (3.2.7):
    - **Reallocation of credits** across LMD-FCI facilities.

- Some circumstances in which cumulative **credit generation falls** for LMD-FCI and HD-FCI charging.

Benefits

Table 4. Estimated quantifiable benefits of the proposed amendments (millions of 2024$; 20-year present value compared to baseline)

Proposed amendments (Discussion section)	Benefit Low; millions of $	Benefit High; millions of $
Aggregator notifications (4.2.2.2)	$0.049	$0.049
Registration of electric transport refrigeration units (4.2.2.8)	$0.058	$0.058
Encourage use of Pacific Northwest renewable electricity (4.2.3.2)	$84	$84
Adjustments to pathway carbon intensity calculator tiers (4.2.6.2) *Illustrative; see text for detail*	$0.058	$0.058
Modifying ZEV capacity crediting (4.2.7)	$0.874	$0.874
Adding third-party verification (4.2.8)	$314	$399
Total quantified benefit (millions):	**$400**	**$485**

Figure 6. Overview of qualitatively described benefits of the proposed rule amendments

Qualitatively described benefits include:

- Mass balance reporting flexibility (4.2.1.2): Potential **cost-savings** from increased opting to use mass balance reporting.
- Aligning specified feedstocks (4.2.1.3):
    - Improved regulatory **consistency** across jurisdictions.
    - **Expanded pathways** available to generate credits.
- Pathway application flexibility (4.2.1.4):
    - **Improved accuracy** of utility-specific carbon intensity values.
    - **Flexibility** and **transparency**.
- Clarifying without material impact (4.2.1.5): **Clarity**.
- Designation of electric credit generators (4.2.2.3):
    - Clarity in roles and responsibilities, facilitating smooth compliance with **reduced risk of delays or missing data or documentatio**n.
    - **Transparency to market participants** in revenue generated from their FSE.
    - Program **confidence and efficiency**.
- Electric utility notifications (4.2.2.4): Transparent **tracking of utility participation**, confidence, and administration.
- Change in ownership or control (4.2.2.5): Potential **reduction of errors and compliance delays**.
- Inactive registrations (4.2.2.6):
    - Streamlined program with **up-to-date information**.
    - **Regulatory consistency**.
    - **Reduced abandoned credits**.
    - Increased credits and revenues for backstop aggregator, resulting in **further decarbonization in communities with the most air pollution**.
- Registration of fueling supply equipment (4.2.2.7):
    - **Meeting program goals** through registration of only equipment capable of being used for fueling or charging.
    - **Reduced risk** of incorrect credit generation.
- Follow-up information requests (4.2.2.9):
    - Streamlined program with **up-to-date and comprehensive information**.
    - **Earlier resolution** of registration problems.
- Fuel transfers (4.2.2.10): Clear **understanding of obligations and responsibilities**.
- Exported fuel sales (4.2.2.11): Improved fuel exporter **awareness of responsibilities**.
- Updated report corrections (4.2.2.12): None if all corrections are updated within two days under the baseline. Otherwise **process efficiency** and use of up-to-date information.
- Credit transfers (4.2.2.14): **Improved program planning**.
- Specified source pathway attestation (4.2.2.15):
    - Ensured **integrity of specified source feedstocks**.
    - **Consistency** across jurisdictions.
    - Improved and clear **accountability**.

- Pathways approved by California or Oregon programs (4.2.2.16): Assurance that carbon intensities are **accurate and appropriately verified**.
- Use of carbon intensity calculators (4.2.2.17): **Reduced duplicative or repeated work** for applicants.
- Use of renewable electricity products and power purchase agreements (4.2.2.18): **Consistent and comprehensive reporting** that accounts for necessary timing of verification requirements.
- Amending designation of fuel exporters (4.2.3.1): **Resolution of conflicting baseline** rule language.
- Encourage use of Pacific Northwest renewable electricity (4.2.3.2): Transfer and increased spending on **RECs generated in the Pacific Northwest**.
- Reporting electric fueling of eTRU (4.2.3.3): Potential **efficiencies from direct reporter ownership** of FSEs.
- Requiring metering of forklift charging (4.2.4): **Accurate measurement** of electricity used for forklift charging, consistent with requirements for other vehicle fueling.
- Alternative jet fuels and alternative marine fuels (4.2.5.1): Increased **early incentive to reduce** carbon intensities in difficult-to-decarbonize sectors.
- Book-and-claim pipeline-injected biomethane (4.2.5.2):
    - **Ensuring emissions reductions are happening in Washington** rather than elsewhere in the country.
    - **Washingtonians receiving the benefits** for which they pay costs.
- Avoided methane from livestock and organic waste (4.2.5.3):
    - **Increased incentives** for livestock and organic waste use as feedstocks in RNG production.
    - **Reductions in livestock and landfill emissions**.
- Switching to continuous review of carbon intensities (4.2.6.1):
    - **Greater flexibility** in ensuring that carbon intensities reflect up-to-date science and lifecycle analysis models.
    - **Reduced risk** of over- or under-generation of credits and deficits.
- Adjustments in cases where operating and certified carbon intensities differ (4.2.6.3): Added **disincentive for operating carbon intensities to exceed certified carbon intensities**.
- Adjustments for geothermal pathway carbon intensity (4.2.6.4): Ensuring carbon intensities for geothermal pathways **accurately reflect actual emissions**.
- Modifying ZEV capacity crediting (4.2.7):
    - **Consistent tracking** of applications and **up-to-date information**.
    - **Increased participation** through shared refueling stations, **for HD-HRI and HD-FCI**.
    - **Increased participation due to increased capacity eligibility** and cumulative credit generation.
    - **Accurate understanding** of LMD-FCI drawing from the same power source whether eligible or not.

    - Increased **diversity and distribution of charging sites** across more LMD-FCI applicants.
    - More **flexibility for HD-FCI** due to removal of the limit on effective simultaneous power rating.
    - Increased **incentive for higher power rating chargers**, for HD-FCI.
- Adding third-party verification (4.2.8):
    - **Reduced risk** of program failing to achieve public and environmental health benefits while appearing to do so.
    - **Increased assurance** that data and reports receiving third-party verification are accurate and complete.
    - Ensuring the program is **accurately assigning deficits and credits** to program participants.
    - Increased assurance that **no entity gains advantage** in the program based on inaccurate information.

Distributional impacts

We also noted the following distributional impacts related to environmental justice:

- No expected distributional costs, as the proposed rule amendments and baseline regulations likely control for many of the risks associated with low-carbon and clean fuel production siting and scale due to the rule.
- Distributional benefits of:
    - Ensuring effective program function, supporting real and verifiable reductions in contributions to climate change. Climate change disproportionately affects some Washingtonians more heavily than others. This happens because they are more exposed to climate hazards such as smoke and heat, have higher existing health burdens, or do not have enough resources to sufficiently prepare, prevent, or recover from harmful events. Disproportionately affected populations include people who:
        - Have lower incomes.
        - Live or work in locations with limited air filtration or cooling.
        - Live in areas that absorb and retain more heat.
        - Are unsheltered or have inadequate housing.
        - Have a higher existing health burden.
    - Ensuring efficient program function, supporting the achievement of program goals and objectives at the lowest cost possible. Lower-income populations have less flexibility to handle higher costs given household budget limitations.

Sensitivity of results to assumptions

We note that among costs and benefits able to be quantified, a large portion of them is due to costs and benefits of third-party verification. We examined the sensitivity of the monetized

portion of this analysis to the assumption underlying the benefits calculation, regarding how much risk of program inaccuracy and inefficiency is reduced through third-party verification. (See Section 4.2.8 for details.) The table below summarizes total monetized cost and benefit ranges under different percentages of affected crediting.

Table 5. Sensitivity of monetized portion of analysis to assumptions about third-party verification benefits (millions of $)

Percentage of program errors corrected	Total benefits (low)	Total benefits (high)
5%	$400	$485
4%	$337	$405
3%	$274	$325
2%	$211	$245
1%	$148	$165

We observe that as we reduce the beneficial impact of third-party verification, the $136 million to $414 million range of costs and the range of benefits increasingly overlap as the benefits range falls. Under an assumption of four percent, the benefits range sits within the costs range, but toward its upper end. If the assumption falls to one percent, the quantified benefits range is still within the cost range, but is instead at its lower end. This comparison only accounts for those costs and benefits we were able to monetize; overall comparison of costs and benefits includes the lists of quantified impacts above as well.

5.2 Conclusion

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the proposed rule amendments, as compared to the baseline, that the benefits of the proposed rule amendments are greater than the costs.

Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05.328(1)(c) requires Ecology to "…[d]etermine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection." The referenced subsections are:

> (a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements;
>
> (b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule;
>
> (c) Provide notification in the notice of proposed rulemaking under RCW 34.05.320 that a preliminary cost-benefit analysis is available. The preliminary cost-benefit analysis must fulfill the requirements of the cost-benefit analysis under (d) of this subsection. If the agency files a supplemental notice under RCW 34.05.340, the supplemental notice must include notification that a revised preliminary cost-benefit analysis is available. A final cost-benefit analysis must be available when the rule is adopted under RCW 34.05.360;
>
> (d) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.

In other words, to be able to adopt the rule, we must determine that the requirements of the rule are the least burdensome set of requirements that achieve the goals and objectives of the authorizing statute(s).

We assessed alternative proposed rule content, and determined whether they met the goals and objectives of the authorizing statute(s). Of those that would meet the goals and objectives, we determined whether those chosen for inclusion in the proposed rule amendments were the least burdensome to those required to comply with them.

6.2 Goals and objectives of the authorizing statute

The authorizing statute for this rule is Chapter 70A.535 RCW, Transportation Fuel – Clean Fuels Program. Its goals and objectives are:

- To support the deployment of clean transportation fuel technologies through a carefully designed program that reduces the carbon intensity of fuel,
- To reduce levels of conventional air pollutants from diesel and gasoline that are harmful to public health

- To Reduce greenhouse gas emissions associated with transportation fuels; and
- To create jobs and spur economic development based on innovative clean fuel technologies.

6.3 Alternatives considered and why they were excluded

We considered the following alternative rule requirements, and did not include them in the proposed rule amendments. This list includes alternatives that were suggested by the public during development of the rule, with the intent of mitigating negative impacts, including environmental harms on rural populations living near existing or potential biomethane facilities, and equitably distributing benefits. Each section below explains why we did not include these alternatives.

- Use current avoided methane crediting rules, extend timelines, or limit timelines.
- Phase out avoided methane credits.
- Extend timeline for utility-specific carbon intensities.
- Remove the deficit modification.
- Change the timeline for directional flow requirements.
- Use current book-and-claim rules for biomethane.
- Require a percentage of RNG to be Washington-produced.
- Set the same compliance timelines for all book-and-claim biomethane
- Amend third-party verification requirements for electricity reported as transportation fuel.
- Revise the WA-GREET model.
- Exempt biogas-to-electricity facilities from the start date requirement for REC eligibility.
- Exempt crude oil reports from quarterly third-party verification requirements.
- Remove additionality provisions for RECs used to lower the carbon intensity of electricity.
- Remove or amend provisions allowing credit/deficit modifications for illegitimate credits and unclaimed deficits.

6.3.1 Use current avoided methane crediting rules, extend timelines, or limit timelines

We considered not changing the section of this rule that impacts avoided methane crediting, extending the maximum avoided methane crediting period to 20 years for post-2023 projects, limiting the maximum avoided methane crediting period to 15 years for post-2023 projects, and a 14-year maximum for pre-2023 projects. Livestock digester projects have high capital and

operating costs, and sustained avoided methane crediting periods are often cited as one of the key strategies for helping projects become economically feasible. Our intention with this proposal is to establish consistent credit timelines that incentivize methane capture projects while ensuring that the most generous incentives are allocated towards projects creating new, additional climate benefits that would not have occurred in the absence of the CFS program.

Project economics are also highly influenced by credit prices. Establishing guardrails around the use of avoided methane credits will boost the long-term stability of the credit market and reduce the risk of price fluctuations that hinder private market investment in alternative fuel technologies. Avoided methane crediting relies on the principle that, without the incentivization of this policy, the methane would have been emitted into the atmosphere; setting timelines for incentivizing avoided methane emissions acknowledges that eventually the methane capture technology becomes typical and the emissions cannot be considered avoided in perpetuity as compared to the baseline. The 20-year crediting period alternative would therefore not as closely ensure that program incentives are creating new decarbonization benefits that would not have occurred in the CFS program's absence.

6.3.2 Phase out avoided methane credits

We considered phasing out avoided methane credits in 2046, which would align with recent updates to California's Low Carbon Fuel Standard. In addition to CFS incentives for capturing dairy and swine manure for use as transportation fuel or as a feedstock, different manure management practices, changes to livestock feed, grants for the installation and operation of digesters, and legal or regulatory requirements to capture methane could reduce methane emissions from dairy and swine livestock operations. However, in the absence of current regulations on these topics, the installation of a dairy digester to capture biomethane for use as transportation fuel or as a feedstock will reduce methane emissions significantly versus the baseline scenario in which the methane is often directly emitted into the atmosphere.

While the proposed rule does not contain a complete phase-out of avoided methane credit opportunities, we are limiting the timelines of the crediting periods to grant the highest incentives to projects that create new and additional climate benefits. The proposed rule also expands avoided methane crediting opportunities to organic waste that is diverted from landfills. Phasing out avoided methane crediting entirely would be less effective at meeting the goal of reducing greenhouse gas emissions because it would eventually eliminate incentives to provide lower carbon intensity feedstocks, limiting in-state methane reduction opportunities.

6.3.3 Extend timeline for utility-specific carbon intensities

We considered extending the timeline to use utility-specific carbon intensities for producing electrolytic hydrogen as a feedstock for alternative jet fuel or sustainable marine fuel to 2046 or later. We have decided against this provision because it could potentially distort the credit market, especially as additional producers enter the market. Therefore, this alternative would not as effectively meet the goal of reducing greenhouse gas emissions associated with transportation fuels. Only alternative jet fuel and marine fuel are eligible for this option, as it is

intended to provide a temporary boost to innovative fuel production techniques addressing hard-to-decarbonize sectors.

6.3.4 Remove the deficit modification

We considered removing the 4:1 deficit modification from the rule and retaining the status quo of issuing a 1:1 modification if the verified carbon intensity exceeds the operational carbon intensity. However, there is insufficient evidence that this creates an additional burden to covered parties, as there is a mechanism in rule (the "margin of safety") designed to prevent the deficit obligation triggering due to natural variability, weather events and natural disasters, and other issues out of the reporting entity's control. The alternative would not as effectively meet the goal of reducing greenhouse gas emissions associated with transportation fuels.

The rule currently aligns with updates in the CARB LCFS and improves the program by disincentivizing the underreporting of carbon intensities, which can distort the market.

6.3.5 Change the timeline for directional flow requirements

We considered establishing a directional flow requirement for biomethane book-and-claim, similar to the recently adopted rules under the California Low Carbon Fuel Standard. However, this alternative would not as effectively meet the goal of deploying clean transportation fuel technologies that reduce the carbon intensity of fuel due to the specifications of Washington's natural gas pipeline infrastructure. This policy could also potentially prevent RNG users from finding available transportation fuels or feedstocks, as Washington has a limited number of pipelines and flows are sometimes determined by demand in other states and regions.

6.3.6 Use current book-and-claim rules for biomethane

We considered retaining the current rules for book-and-claim accounting and biomethane, which allow the fuel to be sourced from anywhere in North America. This option was not pursued because it does not adequately demonstrate that biomethane claimed in the program actually represents renewable energy investments and emission reductions occurring in or near Washington. Deliverability requirements are needed to ensure that environmental attributes claimed from biomethane usage actually relate to regional and local environmental and economic benefits. The proposed rule contains a phase-in period so as not to affect current or near-term investments that were planned before this rule was enacted.

6.3.7 Require a percentage of biomethane to be Washington-produced

We considered requiring a certain percentage of biomethane reported through book-and-claim to be produced in Washington. The goal of this alternative was to incentivize biomethane production in the state to benefit Washington dairies and other biomethane producers to maximize their biomethane recovery and contribute to statewide greenhouse gas emission reduction efforts. In addition, this alternative was intended to provide fuel producers with an improved local supply of RNG, in addition to providing economic and employment benefits due

to an increase in local industry. This alternative may have also provided statewide air quality benefits by incentivizing digesters for dairies currently using open lagoon manure management.

However, feedback from interested parties suggested that there is not enough potential Washington-based biomethane production to provide adequate feedstocks for state-based fuel production facilities, making this alternative more burdensome for parties required to comply with the rule. Setting a strict requirement for Washington-based production may also limit biomethane capture opportunities in nearby states and provinces that have pipelines flowing towards Washington, thus undermining the broader climate and decarbonization goals of the program.

6.3.8 Set the same compliance timelines for all book-and-claim biomethane

For biomethane production reported through book-and-claim, we considered setting identical compliance timelines across fuel types (alternative jet fuel or otherwise) for requiring the biomethane used as a feedstock to be produced in Washington or injected into regional pipeline networks serving Washington. We ultimately decided to set a longer phase-in period for requiring alternative jet fuel to meet the new sourcing requirements due to the unique decarbonization challenges facing that industry. Unlike other transportation sectors that utilize alternative fuels low- or zero-emission propulsion technologies for aviation are still in development and not yet ready for wide adoption, increasing the need for lower-emission drop-in fuels to decrease greenhouse gas emissions. Current alternative jet fuel production is very limited compared to other alternative fuels utilizing biomethane as a feedstock, such as renewable diesel, and the industry is less developed and has more limited access to infrastructure to transport the fuel to its end users.

For these reasons, we are proposing to extend the compliance timeline for using indirect accounting of biomethane used in the alternative jet fuel sector to 2046 to allow additional flexibility during the industry's early developmental stages. Interested parties have expressed concern that a 2030 target date could limit feedstock availability and delay investment in Washington's alternative jet fuel industry, thus undermining state emissions limits and clean energy sector development. The delayed timeline in the proposed rule balances the need to require biomethane reported in the program to provide local and regional environmental and economic benefits with the time needed for the sector to develop and ensure adequate feedstock availability for fuel production needs. The proposed language also aligns with the goals of Engrossed Substitute Senate Bill 5447 of 2023 (ESSB 5447), which establishes various tax credits and other incentives for the in-state production of low-emission alternative jet fuels, with the goal of making Washington a leader in this developing industry while the Clean Fuels Program incentivizes the production of the lowest carbon intensity alternative jet fuel.

6.3.9 Amend third-party verification requirements for electricity reported as transportation fuel

We considered adopting amended third-party verification requirements for electricity reported as transportation fuel in the program, including allowing remote reviews or creating different standards compared to liquid and gaseous fuels. This alternative was not pursued for multiple reasons, including that it would be out of alignment with California and Oregon's clean fuels program rules and that it would create different verification standards between fuel types. In addition, the proposed rules allow for site visits at central data storage locations in lieu of individual charging stations, which should alleviate financial and logistical concerns regarding EV charging verification.

6.3.10 Revise the WA-GREET model

While it was suggested that Ecology consider amendments to the WA-GREET model to address SAF production from ethanol and other fuels, we stated during the rulemaking announcement (CR-101 form) that changes to the WA-GREET model are not within the scope of this rulemaking.

6.3.11 Exempt biogas-to-electricity facilities from the start date requirement for REC eligibility

We considered exempting biogas-to-electricity sources from the requirement that all RECs come from facilities or efficiency improvements made on or after January 1, 2019. This option was dismissed because there is not sufficient evidence that CFS credit incentives are required for the continued operation of older facilities that have been in-use since before the start date of the CFS program. Such a policy would also be misaligned with rules in other clean fuels jurisdictions.

6.3.12 Exempt crude oil reports from quarterly third-party verification requirements

We considered eliminating quarterly verification of crude oil reports and requiring a single, annual report instead. This option was not pursued because it would diminish the ability to accurately assess the carbon intensity of liquid and gaseous fuels reported in the program. In addition, eliminating quarterly verification for crude oil reports would make Washington out of alignment with verification rules in other clean fuels jurisdictions with active refineries.

6.3.13 Remove additionality provisions for RECs used to lower the carbon intensity of electricity

We considered amending the requirement that RECs claimed in the program be sourced from generation facilities or efficiency improvements made on or after January 1, 2019. This option

was suggested as a means of aligning with the Section 45V tax credit under the federal Inflation Reduction Act and encouraging additional investment in alternative fuel production in Washington, especially for alternative jet fuel and electrolytic hydrogen. Washington-based facilities are exempt from Section 45V's additionality provisions due to the state's Clean Energy Transformation Act requiring 100% clean electric generation by 2045.

This option was not pursued because the CFS has different crediting mechanisms and operational considerations than federal tax credits. For example, fuel producers of alternative jet fuel and electrolytic hydrogen used to produce alternative jet fuel in Washington can claim a utility-specific carbon intensity and generate CFS credits, albeit at a higher carbon intensity, if RECs are too expensive or unavailable. This flexibility contrasts with the 45V regulations, which exempt entities from tax credit eligibility entirely if they are unable to meet the additionality standard.

Furthermore, adopting this carve-out could lead to a further oversupply of credits and delay deployment of renewable energy generation by allowing entities to generate credits from long-established facilities that existed well before the start date of the CFS program and do not create additional grid capacity for Washington.

6.3.14 Remove or amend provisions allowing credit/deficit modifications for illegitimate credits and unclaimed deficits

We considered amending or removing proposed rules that would allow Ecology to issue credit and deficit adjustments for unclaimed deficits and illegitimate credits generated in the program. More severe adjustments would be issued for entities that generated a large number of unclaimed deficits or illegitimate credits and/or have more than one inaccurate report during a 36-month period.

We decided against alternatives because they not be an adequate deterrent to inaccurate reporting, increasing risks of credit market distortion and erroneous greenhouse gas reduction benefits claimed through the program. The proposed rules are also structured to only apply after the conclusion of reporting periods, giving regulated parties numerous opportunities to issue corrections before any modifications take effect. This provision should have the effect of limiting adverse modifications for unintended reporting errors and reserving enforcement only to situations in which entities refuse to take corrective action.

6.4 Conclusion

After considering alternatives, within the context of the goals and objectives of the authorizing statute, we determined that the proposed rule represents the least-burdensome alternative of possible rule requirements meeting the goals and objectives.

Chapter 7: Regulatory Fairness Act Compliance

7.1 Introduction

The Regulatory Fairness Act (RFA; RCW 19.85.070) requires Ecology to perform a set of analyses and make certain determinations regarding the proposed rule amendments. This chapter presents the:

- Analysis of relative compliance cost burden.
- Consideration of lost sales or revenue.
- Cost-mitigating elements of the rule, if required.
- Small business and local government consultation.
- Industries likely impacted by the proposed rule.
- Expected impact on jobs.

A small business is defined by the RFA as having 50 or fewer employees, at the highest ownership and operator level. Estimated compliance costs are determined as compared to the baseline (the regulatory environment in the absence of the proposed rule amendments, limited to existing federal and state requirements). Analyses under the RFA only apply to costs to "businesses in an industry" in Washington State. This means the impacts, for this part of our analyses, are not evaluated for government agencies.

7.2 Analysis of relative compliance cost burden

We calculated the estimated per-business costs to comply with the proposed rule amendments, based on the costs estimated in Chapter 3 of this document. In this section, we estimate compliance costs per employee.

Across the various groups of businesses affected by the proposed rule amendments, the average affected small business likely to be covered employs between about five and 26 people. The largest ten percent of affected businesses employ an average of between 1,855 and 14,997 people. Based on cost estimates in Chapter 3, we estimated the following compliance costs per employee.

Table 6. Compliance costs per employee

Business size category	Low	High
Small businesses	$50.40 cost-savings	$810.85 cost
Largest 10% of businesses	$0.17 cost-savings	$13.97 cost

We conclude that the proposed rule amendments are likely to have disproportionate impacts on small businesses (though in cases where a cost-savings occurs, small businesses would receive a disproportionately larger benefit as well), and therefore Ecology must include

elements in the proposed rule amendments to mitigate this disproportion, as far as is legal and feasible.

7.3 Action taken to reduce small business impacts

The RFA (19.85.030(2) RCW) states that:

> "Based upon the extent of disproportionate impact on small business identified in the statement prepared under RCW 19.85.040, the agency shall, where legal and feasible in meeting the stated objectives of the statutes upon which the rule is based, reduce the costs imposed by the rule on small businesses. The agency must consider, without limitation, each of the following methods of reducing the impact of the proposed rule on small businesses:
>
> a) Reducing, modifying, or eliminating substantive regulatory requirements;
>
> b) Simplifying, reducing, or eliminating recordkeeping and reporting requirements;
>
> c) Reducing the frequency of inspections;
>
> d) Delaying compliance timetables;
>
> e) Reducing or modifying fine schedules for noncompliance; or
>
> f) Any other mitigation techniques including those suggested by small businesses or small business advocates."

We considered all of the above options, and the goals and objectives of the authorizing statutes. We limited compliance cost-reduction methods to those that:

- Are legal and feasible.
- Meet the goals and objectives of the authorizing statute (see Chapter 6).

We addressed the specific options listed in the RFA in the following ways:

a) We could not reduce, modify, or eliminate substantive regulatory requirements, as these are set in statute, where the program created by the statute regulates entities based on their fuel types and volumes.

b) The proposed rule amendments would reduce reporting frequency for ZEV capacity credit generators reporting costs borne and revenues received per station. We identified that the program could still meet the goals and objectives of the statute with less frequent reporting of this information. This was not possible for other proposed amendments, as the contents and frequency of reports was necessary for effective program function and to align the timing of rule requirements with the statute (e.g., the statute structures activities such as deferrals in terms of quarters).

c) The rule does not address inspections. While they are not inspections, site visits are a part of third-party verification. The proposed rule amendments mitigate some of these costs through:

    - Opportunities to defer third-party verification.
    - Opportunities for less-intensive verification.
    - Flexibility in the number of site visits, based on their necessity in each case and the expertise of verification providers.

d) The proposed rule amendments include a phase in time for significant new requirements like third-party verification.

e) As part of this rulemaking, Ecology identified that clarified and more stringent disincentives were necessary to maintain program integrity. See Chapter 6 for discussion of alternatives related to noncompliance.

Finally, we note that the transportation fuels industry and industries that may undertake clean fuel production may have correlation between their production volumes and employment. To the extent small businesses are more likely to incur smaller costs (or, in this case, even up to receiving cost-savings), or large businesses are more likely to incur larger costs, disproportionate impacts may be naturally limited by this correlation.

7.4 Small business and government involvement

We involved small businesses, organizations representing them, and local governments in its development of the proposed rule amendments, using:

- Clean Fuels GovDelivery listerv. Multiple notices sent about the rulemaking throughout late 2023 and 2024.
- One-on-one meetings with:
    - Coalition for Renewable Natural Gas.
    - Twelve Benefit Corporation.
    - SkyRNG.
    - American Biogas Council.
    - Forum Mobility.
    - FirstElement Fuel.
    - POET.
    - RPMG (Renewable Products Marketing Group).
    - Clean Fuels Alliance.
    - Electric Vehicle Charging Association.
    - evReality
    - evGo.

- Informal public workshops, presentations, and listening sessions held on the following dates with various attendees, including from small businesses and local governments:
    - February 22, 2024
    - February 28, 2024
    - May 2, 2024
    - May 8, 2024
    - June 12, 2024
    - September 9, 2024
    - September 12, 2024
    - September 26, 2024
    - December 5, 2024
    - December 11, 2024

7.5 North American Industry Classification System (NAICS) codes of impacted industries

The proposed rule amendments likely impact the following industries, with associated NAICS codes. NAICS definitions and industry hierarchies are discussed at https://www.census.gov/naics/.

- 1121 Dairy cattle and milk production
- 1122, Hog and pig farming
- 2211, Electric Power Generation, Transmission and Distribution
- 2213, Sewage treatment facilities
- 3241, Petroleum and Coal Products Manufacturing (includes jet fuels)
- 3251, Basic Chemical Manufacturing
- 3361, Motor Vehicle Manufacturing (includes electric vehicle manufacturing)
- 4247, Petroleum and Petroleum Products Merchant Wholesalers
- 4251, Wholesale Trade Agents and Brokers
- 4451, Grocery and Convenience Retailers
- 4471, Gasoline Stations
- 4811, Passenger airlines and cargo air transport
- 4883, Marine cargo handling

- 4921, Couriers and Express Delivery Services
- 5419, Other professional, scientific, and technical services (includes credit aggregators)
- 5622, Solid waste landfills
- Electric vehicle charging companies (no current NAICS available specific to this work)
- Electric or hydrogen vehicle fleet owners (various possible NAICS, as multiple types of business may own a fleet)

7.6 Loss of sales or revenue and impacts on jobs

Businesses that would incur costs could experience reduced sales or revenues if the proposed rule amendments significantly affect the prices of the goods they sell. The degree to which this could happen is strongly related to each business's production and pricing model (whether additional lump-sum costs would significantly affect marginal costs), as well as the specific attributes of the markets in which they sell goods, including the degree of influence each firm has on market prices, as well as the relative responsiveness of market demand to price changes. Finally, overall shifts in economic activity in the state, including competition within markets and attributes of the labor market simultaneously adjust in response to changes in compliance costs.

Similarly, employment within directly impacted industries, other industries in Washington, the labor market within and outside of the state, and in the state as a whole will also adjust in response to a change in costs.

We used the REMI E3+ model for Washington State to estimate the impact of the proposed rule amendments on directly affected markets, accounting for dynamic adjustments throughout the economy. The model accounts for variables including but not limited to: inter-industry impacts; price, wage, interstate and international trade, and population or labor market changes; and dynamic adjustment of all economic variables over time.

We modeled costs and benefits based on each type of expenditure and who those funds would be transferred to. Most of these transfers were between additional production labor in affected industries and labor income (in cases where more or less labor time would be spent), while others were purchases of equipment or services such as third-party verification. Additionally, we captured the local impacts of a shift to RECs produced in the Pacific Northwest as spending on solar power plant operations and maintenance (a relatively conservative assumption compared to more labor-intensive renewable sources such as wind), and reflected verification's support of ensuring a portion of the program's intended reductions in greenhouse gas emissions and local emissions of fine particulates as an improvement in the amenities of the state (attracting higher wage labor).

Results

Modeled results indicated a net increase in jobs across the state: initially 346 to 392 jobs (full-time employee equivalents) growing to over a thousand jobs total across all sectors in the state. Most private sector job growth was found to be in construction and real estate, followed by

food and retail trade, as well as engineering services and electric power generation. Some sectors were modeled to experience job losses of between one and nine jobs over time, in sectors such as health and personal care, air transportation, and agriculture.

Similarly, modeled results indicated a net increase in output across the state: initially $64 million to $70 million, growing to over $100 million per year total across all sectors in the state. Most private sector output growth was found to be in the same sectors that would experience employment growth, above. Again similarly to trends modeled for employment, some sectors were modeled to experience output losses of between $1 million and $8 million per year, in sectors such as healthcare, air transportation, and agriculture.

The above impacts are driven by increased economic activity across sectors, driven largely by spending on contracted services such as third-party verification, equipment and installation, and local REC development. These become wages and revenues to sectors providing equipment and services. Additional spending on labor that becomes personal income is also a contributor to increased economic activity. This increase in economic activity across sectors and to the labor force subsequently supports other sectors across the entire state economy.

Inputs to the model reflected annual real costs and benefits for only those variables for which we were able to estimate quantified, monetized impacts. This means the model results do not capture the value of impacts we were not able to monetize in this analysis, including aspects such as growth in regional fuel production from dairy and swine farms, or shifts in participating biomethane producers and production.

While not a requirement of the RFA, we also considered model findings related to price levels over time, by looking at results for consumption commodity prices. The model did not estimate any impact to overall prices (across all consumption commodities) under either low-cost or high-cost assumptions. It did, however, indicate minor impacts of 0.01 percent to 0.02 percent (one one-hundredth to one fiftieth of a percentage point, compared to their levels under the baseline) in price indexes for commodities such as fuels, air and water transportation, and electricity.

References

BRG, 2022. Washington Department of Ecology: Clean Fuel Standard Cost Benefit Analysis Report. May 12, 2022.

California Air Resources Board, 2025. LCFS Data Dashboard. https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

Interagency Electric Vehicle Coordinating Council, 2024. Washington Transportation Electrification Strategy. February 2024.

Moriarti, K, T McCarran, A Bhatt, J Kenny, L Tao, and A Milbrandt, 2022. 2022 Bioenergy Industry Status Report. National Renewable Energy Laboratory. Technical Report NREL/TP-5400-88998.

OR Department of Environmental Quality, 2025. List of Approved Third Party Verifiers for Oregon Clean Fuels Program. January 31, 2025

OR Department of Environmental Quality 2025. Oregon Clean Fuels Program: List of Approved Third Party Verification Bodies. January 31, 2025.

US Bureau of Labor Statistics, 2023. Occupational Employment and Wage Statistics: May 2023 State occupational Employment and Wage Estimates. Washington State. https://www.bls.gov/oes/current/oes_wa.htm

US Bureau of Labor Statistics, 2024. Consumer Price Index for all Urban Consumers (CPI-U).

US Environmental Protection Agency, 2023. Supplementary material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review. Docket ID No. EPA-HQ-OAR-2021-0317. November 2023.

US Treasury Department, 2024. I bonds interest rates.

WA Department of Commerce, 2024. Green Electrolytic Hydrogen and Renewable Fuels: Recommendations for Deployment in Washington. Report to the Legislature. January 5, 2024.

WA Department of Ecology, 2022. Final Regulatory analyses for Chapter 173-424 WAC, Clean Fuels Program Rule and Chapter 173-455 WAC, Air Quality Fee Rule. Publication no. 22-02-058.

WA Department of Health, 2022. Traffic Air Pollution Data. https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn/traffic-air-pollution

Appendix A: Administrative Procedure Act (RCW 34.05.328) Determinations

A. RCW 34.05.328(1)(a) – Clearly state in detail the general goals and specific objectives of the statute that this rule implements.

See Chapter 6.

B. RCW 34.05.328(1)(b) –

1. Determine that the rule is needed to achieve the general goals and specific objectives of the statute.

See chapters 1 and 2.

2. Analyze alternatives to rulemaking and the consequences of not adopting this rule.

Not adopting this rule could harm transportation decarbonization efforts in Washington, inhibit the development of low-carbon alternative fuels that address aviation and other hard-to-decarbonize sectors, and undermine the administration of the program. We did not consider alternatives to rulemaking because the necessary changes could not be effectuated through guidance, interpretive statements, or other strategies.

Please see the Least Burdensome Alternative Analysis, Chapter 6 of this document, for discussion of alternative rule content considered.

C. RCW 34.05.328(1)(c) - A preliminary cost-benefit analysis was made available.

When filing a rule proposal (CR-102) under RCW 34.05.320, Ecology provides notice that a preliminary cost-benefit analysis is available. At adoption (CR-103 filing) under RCW 34.05.360, Ecology provides notice of the availability of the final cost-benefit analysis.

D. RCW 34.05.328(1)(d) – Determine that probable benefits of this rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.

See Chapters 1 – 5.

E. RCW 34.05.328 (1)(e) - Determine, after considering alternative versions of the analysis required under RCW 34.05.328 (b), (c) and (d) that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated in Chapter 6.

Please see Chapter 6.

F. RCW 34.05.328(1)(f) - Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

This rule does not require regulated entities to violate federal or state law.

G. RCW 34.05.328 (1)(g) - Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law.

This rule applies to all entities equally and does not impose different performance requirements other than those required by state or federal law.

H. RCW 34.05.328 (1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter.

No.

- If **yes**, the difference is justified because of the following:

  ☐ (i) A state statute explicitly allows Ecology to differ from federal standards.

  ☐ (ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated in Chapter 6.

I. RCW 34.05.328 (1)(i) – Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same subject matter.

RCW 70A.535.060 requires Ecology to "seek to adopt rules that are harmonized with the regulatory standards, exemptions, reporting obligations, and other clean fuels program compliance requirements and methods for credit generation" of other states that have clean fuels programs or supply significant quantities of transportation fuel to Washington. This rulemaking has proposed numerous changes to align Washington's program with similar rules in California's Low Carbon Fuel Standard (LCFS) and the Oregon's Clean Fuels Program (CFP), and staff from Ecology frequently meet with representatives of the California Air Resources Board and Oregon Department of Environmental Quality to discuss potential rule amendments.