DEPARTMENT OF
ECOLOGY
State of Washington

Preliminary Cost-Benefit and Least Burdensome Alternative Analysis

Chapter 173-441 WAC
Reporting of Emission of Greenhouse Gases

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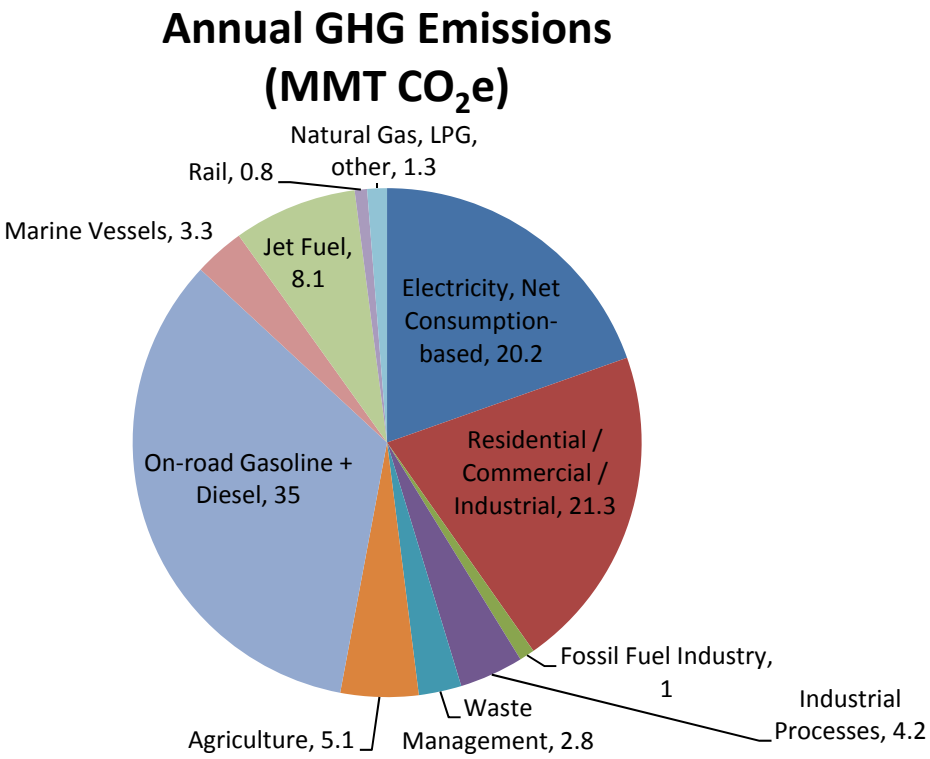
Executive Summary

The Washington State Department of Ecology (Ecology) is proposing a rule (Chapter 173-441 WAC) to require reporting of greenhouse gas (GHG) emissions from sources in the state. Ecology estimated that in 2010, Washington state GHG emissions will be 103 million metric tons (MT CO_2e; carbon dioxide-equivalent), based on energy and fuel use.[1] The chart below summarizes the expected contributions of emissions sources in 2010.



Ecology's proposed rule requires reporting of emissions from:

- Sites and fleets of aircraft, marine vessels, and rail equipment, emitting over 10,000 metric tons of greenhouse gas emissions per year.
- Fleets of on-road motor vehicles emitting over 2,500 metric tons of greenhouse gas emissions per year.

Ecology's proposed rule does not cover emissions from personal vehicles, which are a large part of on-road gasoline and diesel emissions.

Ecology has analyzed the ranges of quantifiable cost and benefit impacts, as well as likely qualitative impacts. Based on its analysis, Ecology has determined the likely benefits of Ecology's proposed rule exceed the likely costs, accounting for both quantified and qualitative impacts.

[1] Washington State Department of Ecology and Washington State Department of Community, Trade and Economic Development (2008). Leading the Way on Climate Change: A Challenge of Our Time, Interim Report. Chapter 2, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State." Table 1.

Ecology compared Ecology's proposed rule to two baselines of no-reporting and the proposed federal GHG reporting rule.

Quantifiable Costs and Benefits of Ecology's Proposed Rule				
	Compared to Proposed Federal Rule*		**Compared to No Reporting**	
Emissions Source	**Annualized Costs** millions of $/year	**Benefits** GHG direct emissions reported; millions of MT CO_2e/year**	**Annualized Costs** millions of $/year	**Benefits** GHG direct emissions reported; millions of MT CO_2e/year**
Sites and Fleets of Nonroad Mobile Sources	$2.0 – $4.5	7.9	$2.5 – $6.4	40.5
Fleets of On-Road Motor Vehicles	$0.6 – $0.8	3.5 – 5.0	$0.6 – $0.8	3.5 – 5.0
Reporting Fees	$0.3		$0.3	
TOTALS	$2.9 – $5.6	11.4 – 12.9	$3.4 – $7.5	44.0 – 45.5

* Ecology expects the proposed federal GHG reporting rule to cost $0.5 – 0.9 million annually, and result in reporting of approximately 32.6 million metric tons of emissions annually.
** Emissions totals do not include indirect emissions, which would be reported under Washington's rule but neither of the baselines. Emissions estimates are based on site or fleet level reporting, not on organization level reporting that starts in 2012.

Compared to the proposed federal rule, Ecology expects Ecology's proposed rule to result in annual quantifiable costs of:

- Annualized costs to operators of sites, fleets of aircraft, marine vessels, and rail equipment of **$2.0 million – $4.5 million**, including reporters and non-reporters.
- Annualized costs to operators of on-road motor vehicle fleets of **$0.6 million – $0.8 million**, including reporters and non-reporters.
- Preliminary estimated reporter fees of **$335 thousand**, funding Ecology's reporting program.

Ecology calculated these costs based on the combined impacts of Ecology's proposed rule, in excess of the proposed federal rule:

- Applicability to more emitters
- Inclusion of more emissions types (indirect, biomass)
- Earlier applicability for some reporters
- Minor inclusion of some on-site vehicle emissions
- Applicability to fleets of on-road motor vehicles
- Applicability to fleets of aircraft, marine vessels, rail equipment

Compared to the proposed federal rule, Ecology expects its proposed rule to result in annual quantifiable benefits, including reporting of:

- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule (emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions).
- Over 2.1 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass from reporters only under Ecology's proposed rule (over 25,000 metric tons of CO_2e GHG emissions).
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered by The Climate Registry calculations used in Ecology's proposed rule, but not reflected in the proposed federal rule. Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported under the proposed federal rule. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of on-road motor vehicles.
- Unquantifiable indirect emissions from nearly 260 sites and fleets of nonroad mobile sources that do not report under the proposed federal rule.
- Unquantifiable indirect emissions from 78 large reporters also reporting under the proposed federal rule.

The sum of the quantifiable increase in emissions reported is at least 11.4 million metric tons.

This is a 35 percent increase over total emissions reporting Ecology expects in the state under the proposed federal rule (32.6 million metric tons). It is approximately 12 percent of the estimated total emissions in Washington State from all sources in 2005, and 11 percent of the estimated emissions from all sources in the state in 2010.

Ecology has reported benefits in metric tons of carbon-dioxide equivalent emissions (instead of estimating dollar-based benefits) because of the uncertainty associated with the estimation of dollar-valued endpoints. While Ecology believes this additional knowledge will contribute significantly to future policymaking and greenhouse gas emissions reductions mandated by law, Ecology could not develop sufficiently likely dollar-values related to units of reported emissions to estimate the benefits of Ecology's proposed rule in dollars.

These are related to the **qualitative benefits** Ecology expects over the proposed federal rule, including:

- Creation of a comprehensive emissions database.
- Broader coverage of 260 more emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 fleets of on-road mobile emissions sources.
- Reporting of more emissions types, including: indirect emissions, rail equipment, aircraft, marine vessel, and on-road motor vehicle emissions as well as extended biomass, process, and fugitive emissions reporting.
- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.
- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

Compared to no reporting, Ecology expects Ecology's proposed rule to result in annual quantifiable costs of:

- Annualized costs to operators of sites, fleets of aircraft, marine vessels, and rail equipment of **$2.5 million – $6.4 million**, including reporters and non-reporters.
- Annualized costs to operators of on-road motor vehicle fleets of **$0.6 million – $0.8 million**, including reporters and non-reporters.
- Preliminary estimated reporter fees of **$335 thousand**, funding the reporting program.

Ecology calculated these costs based on the combined impacts of Ecology's proposed rule, compared to no reporting:

- Broad applicability
- Inclusion of multiple emissions types (indirect, biomass)
- Applicability beginning in 2010 for 2009 emissions, for some reporters
- Minor inclusion of some on-site vehicle emissions
- Applicability to fleets of on-road motor vehicles
- Applicability to fleets of aircraft, marine vessels, rail equipment

Compared to no reporting, Ecology expects Ecology's proposed rule to result in annual quantifiable benefits, including reporting of:

- Approximate emissions totaling 32.6 million metric tons CO_2e of direct emissions from reporters emitting over 25,000 metric tons of CO_2e emissions.

- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions.
- Over 2.1 million metric tons CO_2e of direct emissions from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass over 25,000 metric tons of CO_2e GHG emissions.
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered in particular by The Climate Registry calculations used in Ecology's proposed rule Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported by 78 large reporters. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from fleets of on-road motor vehicles.
- Unquantifiable indirect emissions from nearly 340 sites and fleets of nonroad mobile sources.

The sum of the quantifiable emissions reported is at least 44 million metric tons.

This is approximately 46 percent of the estimated total emissions in Washington State from all sources in 2005, and 43 percent of the estimated emissions from all sources in the state in 2010.

Ecology has reported benefits in metric tons of carbon-dioxide equivalent emissions (instead of estimating dollar-based benefits) because of the uncertainty associated with the estimation of emissions-related dollar-valued endpoints. While Ecology believes this additional knowledge will contribute significantly to future policymaking and greenhouse gas emissions reductions mandated by law, Ecology could not develop sufficiently likely dollar-values related to units of reported emissions to estimate the benefits of Ecology's proposed rule in dollars.

<u>These are related to the **qualitative benefits** Ecology expects relative to no reporting, including:</u>

- Creation of a comprehensive emissions database.
- Coverage of nearly 340 emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 on-road mobile fleet emissions sources.
- Reporting of multiple emissions types, including rail equipment, aircraft, and marine vessel emissions, as well as on-road motor vehicles.
- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.

- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

Chapter 1: Background and Scope

The Washington State Department of Ecology (Ecology) is proposing a rule to require reporting of greenhouse gas emissions from certain sources in the state.

The Administrative Procedure Act (Chapter 34.05 RCW) requires that, before adopting a significant legislative rule, Ecology must, "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." [RCW 34.05.328(1)(c)]

For Ecology's proposed rule regarding Reporting of Emissions of Greenhouse Gases (new Chapter 173-441 WAC), this means Ecology must estimate the impacts of Ecology's proposed rule on individuals, businesses and the public. Impacts are determined by comparing the expected regulatory environment in the absence of Ecology's proposed rule to the way greenhouse gas (GHG) emissions reporting will occur under Ecology's proposed rule. Due to uncertainty about the likely baseline, Ecology performed this analysis in comparison to two baselines: the proposed federal rule as the baseline, and no reporting as the baseline.

This document provides the public with an overview of the methods Ecology used to perform this analysis, and the likely impacts found. This is a preliminary analysis of Ecology's proposed rule, and is based on the best and most appropriate information available at the time of publication. Ecology welcomes comments on the analysis and data that may improve the quality and accuracy of the results.

Background

Washington State has taken several steps to begin responding to climate change. Executive Order 07-02, issued by Governor Chris Gregoire in February 2007, set goals for the statewide reduction of GHG emissions within Washington over the next several decades, as one of the methods for addressing climate change.[2] The 2007 state Legislature passed Chapter 80.80 RCW setting statutory requirements for statewide reductions in GHG emissions and setting a GHG emissions performance standard for baseload electric power generation.

Engrossed Second Substitute House Bill (ESSHB) 2815 (codified mostly in chapters 70.235 RCW and 70.94 RCW), passed by the 2008 Legislature as part of the Governor's Climate Change Framework, included more actions to reduce GHG emissions, and to build a clean energy economy. One element of this legislation is a requirement for large vehicle fleet operators and large stationary sources of GHG emissions to begin reporting emissions in 2010. The legislation directs Ecology to adopt rules to develop and implement a reporting system for those emitters required to report. It also requires Ecology to participate in the design of a market-based emissions trading system, in cooperation with the Western Climate Initiative.

[2] State of Washington, Office of the Governor (2007). Executive Order 07-02, Washington Climate Change Challenge.

Ecology's Proposed Rule

As directed by statute, Ecology developed a proposed rule to require reporting of GHG emissions from certain sites, mobile sources, and combinations of sources in the state. Ecology's proposed rule:

- Applies to all sources of GHG emissions in Washington State including: sites, and fleets of aircraft, rail equipment, marine vessels, and on-road motor vehicles.
- Requires emissions reporting for sources and combinations of sources with direct emissions greater than or equal to a threshold of 10,000 metric tons (phased-in from 25,000 metric tons in 2009) of CO_2e GHG emissions per year, from sites and fleets of nonroad mobile sources. The applicability and threshold were set by the authorizing statute.
- Requires emissions reporting greater than or equal to a threshold of 2,500 metric tons of CO_2e GHG emissions per year, from fleets of on-road motor vehicles. The applicability and threshold were set by the authorizing statute.
- Requires reporting of indirect emissions after the threshold is met as required by the authorizing statute.
- Allows multiple tiers of emissions calculation, depending on the data available to reporters. These calculations are sourced from protocols used by groups such as The Climate Registry.
- Allows reporters to use simplified estimation methods and two forms of exclusion de minimis for some emissions.
- Sets a report submission deadline of October 31 of each year, for emissions in the previous year. This is the latest date allowed by statute.
- Sets reporter fees based on their share of the operating costs of the GHG emissions regulatory program.
- Requires retention of supporting records for 5 years.
- Requires reporting of in-state aircraft emissions above a threshold of 10,000 metric tons, beginning with 2012 emissions.
- Requires reporting of marine vessel emissions above a threshold of 10,000 metric tons (phased-in from 25,000 metric tons for 2009 emissions).
- Requires reporting of rail emissions above a threshold of 10,000 metric tons of GHG emissions (phased-in from 25,000 metric tons for 2009 emissions).
- Allows agency review of emissions reports.
- Allows reporters to petition Ecology to use a different quantification methodology.

Ecology developed this rule based on statutory requirements, internal expertise, and the input of stakeholders.

Proposed Federal Reporting Rule

In 2008, the Environmental Protection Agency (EPA) proposed a federal GHG reporting rule.[3] While the rule is not final, and therefore not part of existing regulation, Ecology believes Ecology's proposed rule, or a similar regulation, will be put in place at the federal level. As such, Ecology analyzed the proposed state-level rule in both possible contexts – no existing reporting regulation, and the proposed federal rule.

The proposed federal GHG reporting rule:

- Applies only to a specific list of industries and suppliers, as well as all stationary combustion sources that have a total maximum rated heat input capacity of the stationary fuel combustion units at the facility of at least 30 mmBtu/hr.
- Applies only to stationary operations emissions, vehicle manufacturers, and fuel or process gas suppliers; excludes fleet level mobile source emissions and indirect emissions.
- Has a reporting threshold of 25,000 metric tons of carbon dioxide equivalent emissions.
- Requires report submission by March 31 of each year starting in 2011.
- Emissions reporting starting with 2010 emissions, or the first year of facility operation.
- Includes some phasing-in of requirements until 2011 emissions.
- Allows EPA review of emissions reports.
- Requires records retention for five years.
- Incorporates more-strictly tiered industry-specific emissions calculation methods, largely based on reporting protocols from federal, state, regional, nongovernmental, international, and industry groups.
- Has a significantly larger listing of chemicals to be reported as GHGs than state proposal or UN- IPCC

Analytical Format and Scope

Ecology analyzed the impacts of Ecology's proposed rule in the following sections:

- Chapter 2: The Two Baselines and Changes. This chapter explains the baseline concepts to which Ecology's proposed rule was compared in Ecology's analysis, as well as how rule impacts were analyzed.

[3] Federal Register Docket ID No. EPA-HQ-OAR-2008-0508

- Chapter 3: Costs of Proposed Reporting by Sites and Fleets of Aircraft, Marine Vessels, and Rail Equipment, Relative to the Proposed Federal Rule. Ecology analyzed costs of Ecology's proposed rule's reporting requirements for sites, aircraft, marine vessels, and rail equipment that generate costs relative to the proposed federal GHG reporting rule.
- Chapter 4: Benefits of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment, Relative to the Proposed Federal Rule. Ecology analyzed benefits of Ecology's proposed rule's reporting requirements for sites, fleets of aircraft, marine vessels, and rail equipment that generate benefits relative to the proposed federal GHG reporting rule.
- Chapter 5: Costs of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment, Relative to No Reporting. Ecology analyzed costs of Ecology's proposed rule's reporting requirements for sites, fleets of aircraft, marine vessels, and rail equipment that generate costs relative to no reporting required. This is the regulatory context of Ecology's proposed rule at the time of this analysis, until a federal rule is adopted, but not the long-run expected context.
- Chapter 6: Benefits of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment, Relative to No Reporting. Ecology analyzed benefits of Ecology's proposed rule's reporting requirements for sites, fleets of aircraft, marine vessels, and rail equipment that generate benefits relative to no reporting required. This is the regulatory context of Ecology's proposed rule at the time of this analysis, until a federal rule is adopted, but not the long-run expected context.
- Chapter 7: Costs and Benefits of On-Road Motor Vehicle Fleet Reporting, Relative to the Proposed Federal Rule and to No Reporting. Ecology analyzed the costs and benefits of Ecology's proposed rule's reporting requirements for fleets of on-road motor vehicles. The costs and benefits of reporting requirements for fleets of on-road motor vehicles are not affected by the choice of baseline.
- Chapter 8: Conclusions. Ecology summarized its results and included comments on the analysis.
- Chapter 9: Least Burdensome Alternative Analysis. Ecology determined Ecology's proposed rule places the least burden possible on those required to comply with it, while fulfilling the goals and objectives of the authorizing legislation.

Chapter 2: The Two Baselines and Changes

Ecology analyzed the impacts of Ecology's proposed rule relative to two baseline regulatory scenarios: the proposed federal GHG reporting rule, and no reporting required. This chapter describes the baseline contexts, and complexities that arose for this rule in particular, as well as what changes were analyzed for each baseline, and how they are included in this preliminary analysis.

Baseline

The baseline for Ecology's analysis of proposed rules is the regulatory context in the absence of a proposed rule. This includes relevant federal and other jurisdictional rules that would govern the behavior of regulated emitters if Ecology does not adopt Ecology's proposed rule.

Proposed Federal Rule Baseline

In the case of this proposed GHG reporting rule, Ecology determined the most likely baseline for future behavior was the proposed federal GHG reporting rule. Ecology expects the EPA to adopt a final rule in the upcoming year, and state law requires Ecology to adjust its requirements to minimize duplicative reporting requirements if Ecology finds the federal program will satisfy state needs. The adopted federal reporting rule will not necessarily be identical to the proposed federal reporting rule, but the proposed version is the nearest approximation currently available of the final rule content. The costs and benefits of Ecology's proposed rule relative to this baseline are presented in Chapter 3 and Chapter 4, respectively.

No-Reporting Baseline

Ecology analyzed the impacts of Ecology's proposed rule relative to a baseline of no reporting regulation. From a regulatory standpoint, there is no current finalized regulation requiring reporting of GHG emissions – if a federal rule is not adopted in future, no-reporting will be the regulatory context of Ecology's proposed rule. Ecology analyzed Ecology's proposed rule relative to this baseline to reflect the impacts of the rule under the regulatory environment at the time of this publication. The costs and benefits of Ecology's proposed rule relative to this baseline are presented in Chapter 5 and Chapter 6, respectively.

Changes under Ecology's Proposed Rule – Proposed Federal Rule Baseline

The GHG reporting rule Ecology is proposing differs from the proposed federal reporting rule in the following ways, many of which are explicitly dictated by statute.

- Applicability to additional sources. Some emissions sources will need to report, while others will only need to determine whether they are required to report.

- Federal proposal limited to individual sources of emissions, while the proposed state rule applies more broadly to sources or combinations of sources.
- Lower thresholds after phasing-in: 25,000 MT (metric tons of CO_2e emissions) per year, phasing in to 10,000 MT for site, aircraft, marine vessel, and rail equipment sources; 2,500 for fleets of on-road motor vehicles. This requirement is explicitly dictated by statute.
- Later submission deadline of October 31 of each year. This is the latest allowed by the authorizing statute.
- Earlier applicability for some reporters of 2009 emissions. This requirement is explicitly dictated by statute.
- Program fees to support the administrative cost of the program.
- Includes indirect emissions, biomass, and some on-site vehicles in reports of site emissions. This requirement is explicitly dictated by statute.
- Includes fleets of aircraft, marine vessel, and rail emissions. This requirement is explicitly dictated by statute.
- Includes fleets of on-road motor vehicles. This requirement is explicitly dictated by statute.
- Does not include upstream reporting by suppliers of fuels or greenhouse gases, or engine manufacturers.
- Proposed state rule includes only the six classes of GHGs in the Kyoto treaty, while the proposed federal rule uses a larger listing of GHGs.

Changes under Ecology's Proposed Rule – No-Reporting Baseline

The GHG reporting rule Ecology is proposing differs from a no-reporting baseline *in its entirety*. Many of the elements of Ecology's proposed rule are explicitly dictated by statute.

Analytic Approach

Many of the individual requirements of Ecology's proposed rule work together to generate behavioral changes, resulting in costs and benefits. Ecology qualitatively described the costs and benefits of each aspect of Ecology's proposed rule, relative to the each of the two baselines. In addition, where reliable and confident quantitative estimation was possible, Ecology quantified cost and benefit impacts to the extent practicable. In cases for which estimated cost or valuation data was available, Ecology estimated the dollar value of costs and benefits.

Analytic Exemptions and Inclusion

When Ecology analyzes the impacts of proposed rules, Ecology is exempt from analyzing aspects of a rule directly imposed by the authorizing statute, or other existing rule. In the case

of this proposed rule, Ecology encountered the following difficulties in separating out requirements exempt from analysis.

- The statute dictates reporting from sources or combinations of sources emitting at least 10,000 metric tons yearly. This requirement works in conjunction with the elements of Ecology's proposed rule set by Ecology – including calculation methods, reporting protocols, timing, deferred reporting, and interpretation of sources and combinations of sources – to change the behavior of the regulated community and the public.
- The requirement to report GHG emissions from fleets of on-road vehicles, the year of first reporting, and the 2,500 metric ton emissions threshold, are specifically dictated by statute. These requirements work in conjunction with the elements of Ecology's proposed rule set by Ecology, including calculation methods, reporting protocols, and timing – to change the behavior of the regulated community and public.

Ecology could not perform its analysis without including the broad requirements set by statute, and so the results of this analysis overestimate the impacts of Ecology's proposed rule requirements determined only by Ecology. To maintain conservative[4] estimates of net benefits, Ecology analyzed the rule as a whole, as including the statutory determination of the applicability and thresholds of reporting.

[4] In Ecology analyses, "conservative" has specific meanings that may differ from common usage. Ecology deals with uncertainty in its analysis by making assumptions that will generate a "conservative" range of net benefits (the smallest range of benefits minus costs), to show that benefits are likely to exceed costs. This interpretation of "conservative" extends to individual discussion of benefits and costs: "conservative benefits" are likely underestimated; "conservative costs" are likely overestimated.

Chapter 3: Costs of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment – Relative to the Proposed Federal Baseline

Ecology analyzed the costs of Ecology's proposed rule relative to the proposed federal GHG reporting rule, proposed by the EPA. This chapter describes qualitative and quantified measures of estimated costs. As the impacts of each requirement under the rule may overlap in terms of quantifiable changes in behavior, this chapter first describes costs of rule requirements qualitatively, and then discusses estimated overall quantifiable impacts.

Ecology is not required to analyze those aspects of Ecology's proposed rule that are dictated by statute. Some elements of Ecology's proposed rule, however, although dictated broadly by statute, were not separable from other aspects of the rule over which Ecology had discretion, such as emissions quantification methods and options, reporting protocols, deferred reporting, and timing. In such cases, the statutory language was included in the analysis. In this chapter, Ecology includes in its analysis the statutory requirement that emitters of at least 10,000 metric tons of CO_2e emissions of GHG must report.

Costs of Broader Applicability

Ecology's proposed rule applies to a broader set of sites than the federal reporting rule, and applies to some fleets of aircraft, marine vessels, and rail equipment. Ecology based this broader scope for Ecology's proposed rule on the requirements of the laws (Chapters 70.94 and 70.235 RCW) and the understanding of the comprehensive level of GHG emissions reporting deemed necessary by the Legislature. Ecology expects that broader applicability will increase the number of sites and fleets of nonroad mobile sources that incur compliance costs, compared to the proposed federal rule.

Ecology presents its estimation of the combined effects of broader coverage and broader applicability, and the lower reporting threshold later in this chapter.

Costs of Broader Coverage

Ecology expects Ecology's proposed rule's broader coverage (to all emitters emitting greenhouse gases, and to additional types of process emissions) to capture a greater portion of Washington State's GHG emissions in an inventory. This will generate compliance costs for reporters by including additional emissions source types. This will increase estimated emissions from some sites and fleets of nonroad mobile sources. This will also generate compliance costs for non-reporters, by including additional emissions sources that contribute to the decision of whether to report.

Costs of 2009 Applicability – Costs to Non-Phased-In Reporters

Ecology's proposed rule requires reporting for some sources (those emissions for which thresholds or reporting are not phased-in or delayed to the maximum extent allowed by statute) beginning for 2009 GHG emissions. This is a year earlier than these sources would report under the proposed federal rule.

Ecology estimated annualized compliance costs and fees for the regulated community, under full phasing-in of its proposed rule. Earlier applicability of the rule for some reporters means they will pay equivalent annualized costs one year earlier than under the proposed federal rule. Since Ecology estimated the most conservative annualized costs without phasing-in, Ecology's proposed rule's earlier applicability generates one extra year of costs for some reporters.

Costs of Including Indirect Emissions, Separate Biomass Emissions, and Some On-Site Vehicles

Ecology's proposed rule requires sites and fleets of nonroad mobile sources to report indirect GHG emissions, separate biomass emissions, and emissions associated with a small number of on-site vehicles that transport people or cargo. This aspect of Ecology's proposed rule will work with broader applicability, relative to the baseline, to generate costs for the regulated community.

Costs of Including Air, Marine, Rail

Ecology's proposed rule requires reporting of some fleets of aircraft, marine vessel, and rail equipment emissions from fleets in Washington State. These sources are not included in the same way in the proposed federal rule, which uses upstream reporting to address some of these emissions. Ecology believes inclusion of these sources will generate compliance costs for some additional emitters operating fleets of aircraft, marine vessels, or rail equipment. In addition, Ecology expects a larger number of non-reporters to need to determine their reporting status. These costs, over the baseline, are reflected in Ecology's quantitative analysis, further in this chapter.

Quantified Costs of Ecology's Proposed Rule

Ecology estimated the quantifiable costs of Ecology's proposed rule by determining expected reporters, and estimating the range of compliance costs for each industry.

Proposed Federal Reporting Rule Coverage

Ecology expects the proposed federal reporting rule to capture emissions from the largest industrial emitters. The EPA's Regulatory Impact Analysis for the federal reporting rule expects 30 thousand facilities in the United States will need to assess whether they must report, and about 13 thousand of these will likely meet the threshold to report.

Ecology developed an estimate of the number of Washington State emitters impacted by the federal reporting rule, based on reported fuel consumption and business output. Ecology developed a list of 78 sites that likely emit over the federal threshold of 25,000 metric tons per year, from industrial processes covered by the proposed federal rule. Based on the relative proportions of likely reporters to non-reporters at the national level,[5] Ecology assumed 100 businesses in Washington would only need to determine whether they are reporters. This number is highly conservative and likely an overestimate, based on Ecology's knowledge of the industries reporting under the proposed federal rule, and those industries in Washington State. However, Ecology chose this estimate based on the proportion of reporters to non-reporters in the United States as a whole, as reported by the EPA.

Coverage under Ecology's Proposed Rule

Ecology expects coverage under Ecology's proposed rule to include several manufacturing, commercial, and utility operations, including those reporting under the federal reporting rule. In addition, Ecology expects Ecology's proposed rule to cover significant mobile sources of aircraft, marine vessel, and rail equipment emissions. Ecology's proposed rule's lower reporting threshold and broader base of covered emitters is expected to include more reporters, largely because of the lower threshold itself, but also to an additional extent because of broader inclusion of indirect, biomass, and some on-site vehicle emissions that will add to basic industrial process emissions.

Ecology's proposed rule requires reporting of indirect emissions as well, but only once the reporting threshold is exceeded. Therefore, indirect emissions reporting is not expected to affect the number of reporters or the number of assessments of whether to report, but increases what is required of reporters, and how much is reported.

Based on the energy intensity of different production activities, and employment size of firms as a proxy for operation size, Ecology estimated that about 260 sites and fleets of nonroad mobile sources in the state are likely to be required to report under Ecology's proposed rule.[6] Ecology expects that some remaining businesses in the state, in manufacturing, utility, and commerce fields will need to determine their reporting status, but will not need to report. Ecology estimated there are about 3 thousand remaining manufacturing, commercial, and utility sites and fleets of nonroad mobile sources in the state, in industries relevant to Ecology's proposed rule.[7]

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[5] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

[6] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.

[7] Washington State Employment Security Department, Workforce Explorer. http://www.workforceexplorer.com/

Among the 260 estimated site and nonroad mobile source reporters, Ecology determined that 36 businesses were likely to report mobile emissions from marine vessels, while another 22 were possible, though less likely to become reporters. For rail emissions, Ecology determined that eight businesses were likely reporters under Ecology's proposed rule, while another six were possible reporters. For aircraft emissions, Ecology determined that five businesses were likely reporters, while another 10 were possible reporters. For fleets of aircraft, marine vessel, and rail equipment emissions sources, Ecology assumed the number of "possible" reporters discussed above was a conservative estimate of potential non-reporters, totaling 38.

Also among the 260 estimated reporters are 13 sites required to report biomass separately under Ecology's proposed rule, above the threshold.

Difference in Coverage

Overall, based on the additional sectors described above, Ecology expects Ecology's proposed rule to cover about 260 sites and fleets of nonroad mobile sources, including among them:

- 193 sites under 25,000 MT CO_2e expected to report only under Ecology's proposed rule.
- Five aircraft emitters expected to report only under Ecology's proposed rule.
- Eight rail equipment emitters expected to report only under Ecology's proposed rule.
- 36 marine vessel emitters expected to report only under Ecology's proposed rule.
- 13 biomass emitters expected to report only under Ecology's proposed rule.
- 4 emitters in sectors not covered by the proposed federal rule, expected to report only under Ecology's proposed rule.
- 78 sites expected to report under both Ecology's proposed rule, and under the proposed federal reporting rule.

Cost Estimation – Reporters

Ecology developed a list of likely reporters under Ecology's proposed rule. For each of these operations, Ecology developed an estimated facility compliance cost by industry, indirect emissions, biomass, and on-site vehicle compliance cost, and/or aircraft, rail equipment, and marine vessel compliance cost, if applicable. Ecology estimated a range of compliance costs, tied to labor and capital cost assumptions developed by the EPA for its Regulatory Impact Analysis for the proposed federal rule.[8]

[8] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

The upper end of the costs range was based on the highly-conservative (likely overestimated) scenario that reporters would need extensive monitoring and sampling to determine reported emissions. This scenario is highly unlikely, as Ecology provides reporters with more choice and flexibility in emissions calculation and reporting. While the high-cost estimate is provided for cases in which other compliance options are not available, Ecology believes reporters will use the flexibility in Ecology's proposed rule to minimize compliance costs.

The low end of the costs range was based on the scenario that only labor costs were necessary for compliance, and emissions could be estimated based on existing or easily accessed records. Ecology's proposed rule allows for various emissions calculations, and Ecology expects actual compliance costs to be near the low end of the range, as businesses are likely to minimize costs where possible.

Reporter costs used by Ecology were industry-specific where available, and tied to the EPA's cost estimation assumptions, in the EPA's analysis of the proposed federal rule. Utilities expected to report under Ecology's proposed rule were assigned estimated costs of stationary combustion from this same analysis. Ecology assumed aircraft, marine vessel, and rail equipment reporters would primarily use a fuel-consumption-based or simplified industry approach to emissions calculation, and so assigned these fleets the average planning, analytic, and administrative costs across other industries. Commercial reporters (typically port authorities and other transportation or couriers with possible multiple nonroad mobile source transportation types) or military facilities, were assigned combined (additive) costs of reporting for each aspect of operations. See Appendix A for a break-down of compliance costs.

For those sites and fleets of nonroad mobile sources expected to report emissions under the proposed federal rule as well, Ecology included cost estimates for only additional reporting of indirect, separate biomass, and some on-site vehicle emissions. Ecology assumed this cost would entail the average planning, analytic, and administrative costs across all industries. Ecology also calculated the costs of reporting emissions from electricity purchases based on the EPA's assumptions in its analysis of the proposed federal rule, at the industry level.

Based on its analysis of operation-level compliance costs, Ecology estimated that about 260 sites and fleets of nonroad mobile sources are expected to incur total annualized reporting costs of $2.0 million – $4.4 million. This is the overall range of possible annualized compliance costs, looking at extreme high and low costs across all fleets, and all possible compliance options including unlikely high-cost options.

Cost Estimation – Non-Reporters

Based on the industries impacted in Ecology's cost analysis for reporters, Ecology assumed a remaining 3,000 facilities in the state[9] would need to determine what action to take in compliance with the rule, but would not need to report. These are sites involved in the same set of industries likely impacted by Ecology's proposed rule. In addition, Ecology assumed the 38 marine vessel, aircraft, and rail equipment fleets it identified as "possible" (but not probable) reporters would also need to determine whether to report. Ecology assumed the costs of determining whether to report for fleets of aircraft, rail equipment, and marine vessel emitters with operations classified as "possibly" reporting or unlikely to report will be one-time.

Ecology followed the EPA's assumptions on the labor required to determine whether to report. [10] Results based on these EPA estimates were used as the high end of the cost range, as they assume the most conservative (i.e., high) cost scenario possible. Ecology also calculated this cost based on only the subset of labor required to determine reporting status based on existing fuel and input records. The range of costs for non-reporters was determined to be $150 to $500 per non-reporter.

Ecology assumed the determination of whether to report would be one-time, unless significant changes to existing processes were made. Ecology annualized this range of non-reporter costs to be $13 to $44 dollars per year. Summed across all non-reporting sites and fleets of nonroad mobile sources determining whether to report, this is an annualized compliance cost of $39 thousand – $132 thousand.

See the Appendix A for a break-down of compliance costs.

Ecology also noted that some likely non-reporters would be able to determine whether to report during a brief phone call with a member of Ecology staff, so the quantified range of annualized costs presented above may be an overestimate.

Reporting Fees

The authorizing statute allows Ecology to charge appropriate fees to reporters, based on the expected costs of the program. Ecology estimated the future workload of the reporting program, based on Ecology's proposed rule. Based on its analysis of expected reporters, Ecology estimated future program costs based on 400 on-road motor vehicle fleet reporters, 195 small sites and fleets of nonroad mobile sources (emitting between 10,000

[9] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.

[10] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

and 25,000 metric tons per year), and 73 large sites and fleets of nonroad mobile sources (emitting over 25,000 metric tons per year).

Ecology determined which tasks it expects to perform under Ecology's proposed rule, and the workload associated with those tasks. The tasks include:

- Rule updates, program administration, program tracking, and fiscal operations.
- Data management and The Climate Registry interface.
- Technical support for reporters, tracking, and Western Climate Initiative.
- Compliance and enforcement.
- Management and oversight.
- Data verification.
- Administrative support in billing and correspondence.

Ecology estimated the workload associated with each task, and the total compensation estimate for each position involved. Total compensation included salaries, benefits, goods, travel, and indirect costs. Ecology estimated that overall program costs will be approximately $335 thousand per year for administering the reporting rule for both sites and fleets of nonroad mobile sources, and for fleets of on-road motor vehicles. This cost represents Ecology's current best estimate, and could change depending on the actual workload associated with running the GHG emissions reporting program.

To allocate reporter fees across on-road motor vehicle fleets, small emitters, and large emitters, Ecology followed the language in Ecology's proposed rule. Ecology broke the budget down into a flat fee (20 percent of the estimated total program cost), and an additional fee paid only by reporters for sites and fleets of nonroad mobile sources. In turn, the 80 percent of the fee was broken down into 50 percent paid by large emitters, and 30 percent paid by small emitters. Ecology then divided the total fees to be paid by reporters to estimate that:

- On-road fleet reporters will pay only the flat fee of $105 per year.
- Small sources or combinations of sources will pay a flat fee, plus a variable fee, totaling $643 per year.
- Large sources or combinations of sources will pay a flat fee plus a variable fee, totaling $2,500 per year.

These are estimated values, based on the expected annual costs of the program at the time of this publication. If the realized composition of reporters and non-reporters differs from Ecology's assumptions, actual fees may differ.

Based on these estimated fees, Ecology expects the overall shares of reporting fees to be:

- 12 percent paid by fleets of on-road vehicles = $40,000 per year.

- 36 percent paid by small site and nonroad mobile fleet emitters = $121,000 per year.
- 52 percent paid by large site and nonroad mobile fleet emitters = $174,000 per year.

Ecology summed the estimated reporting fees for small and large sites and fleets of nonroad mobile sources, to determine total expected annual reporting costs to sites, fleets of aircraft, marine vessel, and rail equipment reporters of $295 thousand. See the Appendix A for a further break-down of compliance costs.

Summary

Ecology determined Ecology's proposed rule has quantifiable and qualitative costs. These costs amass to businesses required to comply with Ecology's proposed rule. These are costs estimated relative to a baseline of the proposed federal reporting rule. (They are costs in addition to costs created by the proposed federal rule if it is adopted.) See Chapter 5 for analysis of the costs created by Ecology's proposed rule relative to no reporting.

See Chapter 7 for additional costs and benefits of Ecology's proposed rule's requirement for fleets of on-road motor vehicles.

Ecology expects Ecology's proposed rule to result in compliance costs of:

- Annualized costs to sites and fleets of nonroad mobile sources reporting under Ecology's proposed rule of $2.0 million – $4.4 million.
- Annualized costs to sites and fleets of nonroad mobile sources not reporting under Ecology's proposed rule of $39 thousand – $132 thousand.
- Reporter fees of $295 thousand funding the site and fleet of nonroad mobile sources component of the reporting program. These are the fees collected from site, aircraft, marine vessel, and rail equipment reporters.

Ecology calculated these costs based on the combined impacts, relative to the proposed federal reporting rule, of:

- Costs of broader applicability.
- Costs of broader coverage
- Costs of 2009 applicability
- Costs to reporters that do not have phased-in requirements
- Costs of including indirect emissions, biomass emissions, and emissions from some on-site mobile vehicles.
- Costs of including fleets of aircraft, marine vessels, and rail equipment.

Chapter 4: Benefits of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment – Relative to the Proposed Federal Baseline

In this chapter, Ecology analyzed the benefits of Ecology's proposed rule's reporting requirements for sites, fleets of aircraft, marine vessels, and rail equipment, relative to the proposed federal reporting rule at the time of this publication. This chapter describes qualitative and quantified measures of estimated benefits. As the impacts of each requirement under the rule may overlap in terms of quantifiable changes in behavior, this chapter first describes benefits of rule requirements qualitatively, and then discusses estimated quantifiable impacts of the rule as a whole.

See Chapter 7 for Ecology's analysis of Ecology's proposed rule's regulation of fleets of on-road motor vehicles.

Compliance With Legislative Mandate

Ecology is required to establish a GHG reporting protocol by the state Legislature. While Engrossed Second Substitute House Bill 2815[11] creates the program, Ecology has discretion on the scope and content of program requirements. It is not possible to separate the costs and benefits of Ecology's proposed rule from the creation of the program, and the inherent costs and benefits associated with any such program.

In its analysis of the costs of Ecology's proposed rule, relative to the proposed federal rule, Ecology did not attempt to separate out the costs of the created GHG reporting program from the costs of those elements of Ecology's proposed rule over which Ecology had discretion. Similarly, in discussion of benefits, Ecology did not differentiate between the benefits of such a program existing and the benefits of each component of Ecology's proposed rule.

Mandatory Reporting at the State Level -- Public

Ecology expects mandatory reporting at the state level to generate benefits to the public, in addition to those created by the baseline federal reporting rule. In particular, these benefits are associated with other long-term requirements and goals put forward by the Governor and Legislature. In Executive Order 07-02, the Governor put forth goals for emissions reductions. In Engrossed Second Substitute House Bill 2815, the Legislature set these as requirements for GHG emissions reductions at the state level, and for tracking of progress toward those goals. Within the context of these specific Washington State-oriented goals, Ecology expects several benefits to arise from reporting of Washington State emissions, in addition to information expected to be reported at the national level.

[11] Engrossed Second Substitute House Bill 2815. Adopted 2008 Legislative Session, and codified primarily in chapters 70.235 RCW and 70.94 RCW.

In addition, Ecology expects the information gathered under Ecology's proposed rule to benefit the public, as it can be used to understand business and government actions and consumer behavior. Ecology believes these information-based benefits to apply to information both on reporters and non-reporters. While Ecology's proposed rule will directly gather emissions information on reporters exceeding GHG emissions thresholds, the status of a non-reporter also provides the public and the non-reporter with information about the maximum level of emissions it generates.

Creation of a comprehensive database

Ecology's proposed rule requires reporting of types of GHG emissions including those required under the federal rule. This more-comprehensive collection of data addresses sources particularly important in Washington State, including site, marine vessel, aircraft, and rail equipment sources. Washington's emissions composition differs significantly from the nation as a whole, and Ecology believes Ecology's proposed rule will benefit businesses and the public through planning and policy that is more appropriate for the state's economy and emissions composition.

Transportation is a large part of Washington State's GHG emissions. While Ecology's proposed rule will not capture all of these emissions, it is likely to capture significant nonroad mobile source fleet components of transportation emissions.

In 2005, marine vessel GHG emissions in the state were estimated to be 3.2 percent of total state emissions, and accounted for about 3 million metric tons of CO_2e emissions, based on fuel use.[12] That year, transportation as a whole accounted for 46.9 percent of total emissions, with 8.2 percent (7.8 million metric tons) stemming from aviation, and 0.8 percent (800 thousand metric tons) from rail.

Ecology believes that inclusion of these emissions, as well as those required under the federal reporting rule provides significant additional information for planning and implementation of future emissions reduction goals. By gaining a better understanding of Washington-specific emissions, reductions in emissions can be achieved more efficiently and with a greater degree of equity across the local economy than would occur based solely on information collected by the federal reporting scheme. Ecology believes this additional information will contribute to better policy decisions implementing the required GHG emissions reductions under law.

Trading Scheme Participation

In the future, Washington State GHG emitters may participate in an emissions credit trading scheme. Inclusion of those emitters covered by Ecology's proposed rule, in excess of the scope of federal reporting requirements, will likely allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

[12] Washington State Department of Ecology and Washington State Department of Community, Trade and Economic Development (2008). Leading the Way on Climate Change: A Challenge of Our Time, Interim Report. Chapter 2, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State." Table 1.

Focus on Washington Emissions Composition

Ecology expects the public to benefit from an understanding of Washington-specific emissions, and their sources, with special focus on those industries and types of emitters that are more prevalent in the state. This can reflect in consumer decision making, and more informed purchasing and planning.

Public Confidence and Government Transparency

With a comprehensive, state-level reporting rule in place, emissions estimates for Washington State are likely to hold more public confidence. This is probable not only for the emissions numbers themselves, but for any future regulatory actions taken to reduce GHG emissions. Increased public confidence in the quality and the scope of reported numbers increases the likelihood the public will more fully understand the specific emissions reduction actions, why they are taken, and how they affect the local economy.

Credibility, Consumer Behavior, and Investment

While GHG emissions reporting may not produce a complete mapping of all emissions involved in consumer products, Ecology expects the incremental information it provides to consumers about the emissions associated with intermediate or final goods and services to benefit consumers by allowing them to make more efficient consumption choices relative to their preferences, including preferences for carbon impact.

As well as providing emissions information to consumers – as a voluntary program also would – a mandatory reporting scheme for Washington gives more credibility to local emissions estimates. This reduces uncertainty for consumers that include emissions information in their purchasing decisions. The combination of increased knowledge about GHG emissions from reporters operating in the local economy, and increased confidence in the scope and accuracy of that information will benefit consumers' ability to behave in line with their full set of preferences.

The GHG emissions information may also benefit investors' ability to make financial decisions based on expected benefits and risks to GHG emitters, depending on emissions levels and other firm attributes.

Mandatory Reporting at the State Level – Industry and Investors

While Ecology expects Ecology's proposed rule to generate compliance costs for the regulated community, Ecology also believes Ecology's proposed rule will allow covered GHG emitters to benefit from the additional information generated by a mandatory state-level reporting requirement, and the broad scope of emissions sources reported under Ecology's proposed rule.

Emissions Reductions

Ecology expects the broader scope of Ecology's proposed rule – relative to federal reporting requirements – may benefit some members of the regulated community, in the event of future mandatory reductions in GHG emissions. In particular, those reporters required to report under the proposed federal and proposed state rules may have their costs mitigated under Ecology's proposed rule. This is because mandatory in-state emissions reductions could be spread across a wider set of reporters, than would be possible with the more limited emissions information gathered by the federal program.

In addition, the broader scope of Ecology's proposed rule – in terms of including indirect emissions, biomass emissions, and emissions from some on-site vehicles, aircraft, rail equipment, and marine vessel sources – may allow reporters more flexibility in future emissions reductions, if reductions become mandatory. Given only the emissions officially reported under the proposed federal reporting rule, reporters would likely be limited to reducing those emissions they have reported. For many reporters, this could involve costly technology or alterations to industrial processes. Under Ecology's proposed rule, the broader scope of types of emissions reported will allow some reporters more flexibility in reducing emissions, based on their business practices and cost structure.

Trading Scheme Participation

In the future, Washington State GHG emitters or reporters may participate in an emissions credit trading scheme. Inclusion of those emitters covered by Ecology's proposed rule, in excess of the scope of federal reporting requirements, will likely allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

Public Relations

Credible and comprehensive emissions reports under Ecology's proposed rule may improve a reporter's public relations, much as the status of non-reporter can. While this is, to some extent, possible under the federal reporting rule, the degree of comprehensiveness and broad scope of Ecology's proposed rule may generate more public relations impacts, and through perceived reliability of reports, increase the size of those impacts. Ecology expects estimates of GHG emissions to be available for marketing purposes promoting a "green" image, and for adding credibility to emissions reductions. The transparency itself afforded by the comprehensive reporting required under Ecology's proposed rule may allow some businesses to improve public relations, by supporting other environmentally friendly or marketing claims while confirming to the public that large quantities of GHG emissions are not "behind the scenes" in indirect emissions, biomass emissions, emissions from some on-site mobile equipment, or marine vessel, rail equipment, or aircraft.

Similarly, GHG emissions information – either through public perception or directly – may benefit investors in their information set used to make decisions. Ecology expects

some firms to benefit from improved investment prospects based on their GHG emissions reports or the credibility and broader informational basis of future emissions reduction actions.

Potential Cost Savings

Members of the regulated community – just reporters, and emitters as a whole – may discover potential cost savings in their operations by performing GHG emissions calculations on aspects of non-process emissions.

In addition to the analysis of industrial operations and emissions required by the proposed federal reporting rule, regulated emitters may discover efficiencies to be gained in how their business is performed, fueled, transported, or designed, as they examine GHG emissions coming from multiple aspects of production or service provision.

Ecology also expects businesses to benefit in this fashion either by reducing costs by changing their practices, or to benefit through public relations or investment from review and verification that current practices are highly efficient.

Benefits to Non-Reporters

Those businesses regulated by Ecology's proposed rule not only deal with the public through interrelated markets – they deal with many other businesses. These businesses may have dealings with raw inputs, intermediate goods, wholesale or retail intermediary work, and service provisions or demand. These businesses may benefit from a comprehensive state-level GHG emissions inventory – in excess of the basic industry-specific measures covered by the proposed federal rule – in determining their own best business practices and connections.

Ecology expects some businesses dealing with sites and fleets of nonroad mobile sources covered by Ecology's proposed rule to benefit from information about GHG emitters in Washington State that allows them to improve their own efficiency in dealing with covered business partners. This may include adjusting pricing and availability of goods or services to maximize profits, to making new business connections for purposes of reducing GHG emissions, or the public relations benefit of dealing with "green" businesses or improving efficiency.

Credibility in emissions reductions

Another aspect of each of the expected benefits of Ecology's proposed rule described above is the reduction in uncertainty provided by credible emissions estimates, in terms of official agency review and the broader scope of emissions covered by Ecology's proposed rule. Whether estimated GHG emissions reported by firms are used in emissions reductions planning, trading scheme participation, public relations, or cost-saving operations adjustments, or used by outside non-covered businesses to provide better service, increase profitability, or improve control technology, added credibility increases the certainty with which businesses can make decisions and use information. Ecology expects Ecology's proposed rule to reduce uncertainty regarding actual

emissions by estimating a broader scope of emissions, and being inclusive of reporters not covered by the proposed federal reporting rule.

Benefits of Broader Applicability

Ecology's proposed rule applies to a broader set of reporters and non-reporters than the proposed federal reporting rule. Ecology based this broader scope for Ecology's proposed rule on its understanding of the comprehensive level of GHG emissions reporting deemed necessary by the Legislature, and Ecology acknowledges that broader applicability will increase the number of sites and fleets of nonroad mobile sources that incur compliance costs. However, Ecology believes there are also benefits associated with expanding the types of reporters, and the types of emissions covered by Ecology's proposed rule.

Future Reductions Spread Over Larger Population of Reporters

In the future, Washington State GHG emitters may participate in an emissions credit trading scheme. In Engrossed Second Substitute House Bill 2815, the Legislature directs Ecology to participate in the design of a market-based emissions trading system, in coordination with the Western Climate Initiative. Inclusion of those emitters covered by Ecology's proposed rule, in excess of the scope of federal reporting requirements, may allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

Greater understanding of distribution and structure of GHG emissions in WA

Ecology expects the public, regulatory agencies, and business to benefit from a greater knowledge specifically of the local economy and its relationship to GHG emissions. For all three points of view – public, policy, and business – Ecology's proposed rule offers opportunity for Washington-specific improvements and efficiencies in emissions reductions and trading, policy planning and creation, or public relations and consumer purchasing and investment behavior. Ecology expects Ecology's proposed rule to increase transparent, credible information in all of these interactions between the public, policy, and businesses – opening the possibility for benefits accruing to one or more of these groups, and benefiting Washington as a whole.

Benefits of Broader Coverage

Ecology expects Ecology's proposed rule's broader coverage (to all sites and fleets of nonroad mobile sources emitting greenhouse gases, and to additional types of site emissions) to capture a greater portion of Washington State's GHG emissions in an inventory. It is difficult to separate the broadened impact of Ecology's proposed rule's lower threshold (set by the Legislature), from the impact of including multiple types of emissions.

Ecology believes the public and policy development will benefit from Ecology's proposed rule, relative to the proposed federal rule, through an emissions inventory that better represents actual emissions from all of these sectors, and from a broader range of business sizes. This is expected to benefit the public and policy not only as discussed in general, above, but by providing a better basis for – and understanding of the impacts of – future GHG emissions reduction policies.

Proposed Federal Reporting Rule Coverage

Ecology expects the proposed federal reporting rule to capture emissions from the largest industrial emitters. The EPA's Regulatory Impact Analysis for the federal reporting rule expects 30 thousand facilities in the United States will need to assess whether they must report, and about 13 thousand of these will likely meet the threshold to report.

Ecology developed an estimate of the number of Washington State reporters impacted by the federal reporting rule, based on reported fuel consumption and business output. Ecology developed a list of 78 sites that likely emit over the federal threshold of 25,000 metric tons per year, from industrial processes covered by the proposed federal rule.[13] Based on the relative proportions of likely reporters to non-reporters at the national level,[14] Ecology assumed 100 businesses in Washington would need to determine whether they are reporters. This number is highly conservative and likely an overestimate, based on Ecology's knowledge of the industries reporting under the proposed federal rule, and those industries in Washington State. However, Ecology chose this estimate based on the proportion of reporters to non-reporters in the United States as a whole, as reported by the EPA.

Coverage under Ecology's Proposed Rule

Ecology expects coverage under Ecology's proposed rule to include several manufacturing, commercial, and utility operations, including those reporting under the federal reporting rule. In addition, Ecology expects Ecology's proposed rule to cover significant mobile sources of aircraft, marine vessel, and rail equipment emissions. Ecology's proposed rule's lower reporting threshold and broader base of covered sites and fleets of nonroad mobile sources is expected to include more reporters, largely because of the lower threshold itself, but also to an additional extent because of broader inclusion of indirect, biomass, and some on-site vehicle emissions that will add to basic industrial process emissions.

Ecology's proposed rule requires reporting of indirect emissions as well, but only once the reporting threshold is exceeded. Therefore, indirect emissions reporting is not expected to affect the number of reporters or the number of assessments of whether to report, but increases what is required of reporters, and how much is reported.

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[13] Washington State Department of Ecology (2009). Significant Sources of Greenhouse Gas Emissions in Washington. http://www.ecy.wa.gov/climatechange/docs/20090520_GHGsources.pdf

[14] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

Based on the energy intensity of different production activities, and employment size of firms as a proxy for operation size, Ecology estimated that about 260 sites and fleets of nonroad mobile sources in the state are likely to be required to report under Ecology's proposed rule.[15] Ecology expects that some remaining businesses in the state, in manufacturing, utility, and commerce fields will need to determine their reporting status, but will not need to report. Ecology estimated there are about 3 thousand remaining manufacturing, commercial, and utility sites and fleets of nonroad mobile sources in the state, in industries relevant to Ecology's proposed rule.[16]

Among the 260 estimated site and nonroad mobile source reporters, Ecology determined that 36 reporters were likely to report mobile emissions from marine vessels, while another 22 marine vessel operators were possible, though less likely to become reporters. For rail equipment emissions, Ecology determined that eight rail equipment operators were likely reporters under Ecology's proposed rule, while another six were possible reporters. For aircraft emissions, Ecology determined that five aircraft operators were likely reporters, while another 10 were possible reporters. For aircraft, marine vessel, and rail equipment emissions sources, Ecology assumed the number of "possible" reporters discussed above was a conservative estimate of potential non-reporters, totaling 38.

Also among the 260 estimated reporters are 13 sites required to report biomass separately under Ecology's proposed rule, above the federal threshold.

Difference in Coverage

Overall, based on the additional sectors described above, Ecology expects Ecology's proposed rule to cover about 260 sites and fleets of nonroad mobile sources, including among them:

- 193 sites under 25,000 MT CO_2e expected to report only under Ecology's proposed rule.
- Five aircraft emitters expected to report only under Ecology's proposed rule.
- Eight rail equipment emitters expected to report only under Ecology's proposed rule.
- 36 marine vessel emitters expected to report only under Ecology's proposed rule.
- 13 biomass emitters expected to report only under Ecology's proposed rule.
- 4 emitters in sectors not covered by the proposed federal rule, expected to report only under Ecology's proposed rule.

[15] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.
[16] Washington State Employment Security Department, Workforce Explorer. http://www.workforceexplorer.com/

- 78 sites expected to report under both Ecology's proposed rule, and the proposed federal reporting rule.

Benefits of Later Reporting Deadline

Ecology's proposed rule contains a later submission deadline than the federal reporting rule. The federal rule requires reporting by March 31 of each year, for the previous year's emissions. Ecology's proposed rule requires reporting by October 31 of each year, for the previous year's emissions. Ecology believes the later reporting deadline will create benefits for both reporters and non-reporters.

General Increase in Data Collection and Calculation Time

Ecology expects Ecology's proposed rule to allow all owners of sources and collections of sources, and mobile reporters, over 30 more weeks to comply to the appropriate degree for each reporter. For non-reporters, this is extra time to compile the necessary data, and perform the calculations to determine whether or not to report. For reporters, this is additional time to gather necessary data, determine reporting status, and to create and submit the necessary report.

During the rule-development process, some stakeholders suggested that reporters could have trouble complying with the proposed federal rule's reporting deadline. This could be because information required for reporting from third-party suppliers and contractors would not yet be available. Under a later reporting deadline, reporters have more time to receive this information, especially as pertains to reporting of indirect emissions.

Benefit to State and Federal Reporters

For those reporters required to report under both the federal reporting rule and the proposed state rule, Ecology expects the difference in the reporting deadline to allow reporters an additional 30 weeks to compile data, make calculations, and complete reports on the additional emissions types required under state-level reporting, but excluded from federal reporting. This includes emissions from on-site vehicles, electricity use, marine vessels, rail, and aircraft and indirect emissions that a business may need to report emissions for under Ecology's proposed rule, which are not covered by the federal reporting rule.

Benefits of 2009 Applicability

Benefits to Non-Phased-In Reporters

Ecology's proposed rule requires reporting for some sites and fleets of nonroad mobile sources (those emissions for which thresholds or reporting are not phased-in or delayed to the maximum extent allowed by statute) beginning for 2009 GHG emissions. Ecology believes these may benefit from Ecology's proposed rule, relative to the 2010 earliest applicability of the federal reporting rule, in two ways: First, Ecology believes one to

three more years of reporting some emissions will allow businesses to become more familiar with the workings of Ecology's proposed rule, and facilitate more efficient compliance with more reporting as it phases in. Second, Ecology believes a longer record of past emissions can benefit businesses in providing them with more emissions data to inform business planning and public relations. Moreover, businesses may benefit in a future trading scheme through earlier reductions in emissions than other businesses.

Benefits to the Public and Planning

Earlier applicability of reporting requirements for some emissions may also benefit the public and regulatory decisions. Under Ecology's proposed rule, the public will gain GHG emissions information for some businesses, allowing them increased ability to make more-informed and efficient choices in consumption and investment. Additional information will be available in the inventory for public policy planning. See Mandatory Reporting at the State Level – Public for more detail on these benefits.

Benefits of Phasing-In Reporting

Ecology's proposed rule phases in reporting as a whole, and phases in the threshold level, for some reporters. This means that some reporters will not be required to report, or will have a different degree of reporting under Ecology's proposed rule than under the baseline, in the early years of the program. In Chapter 3, Ecology estimated quantifiable costs based on full implementation of the rule (i.e., final reporting and threshold requirements, beginning for 2012 emissions reported in 2013, at the latest). The baseline also does not require reporting until 2011 (for 2010 emissions). These combined factors mean that phasing-in certain requirements of Ecology's proposed rule mitigates the quantifiable costs of Ecology's proposed rule presented in Chapter 3, through eliminating compliance costs in some years, for some reporters

Benefits of Including Indirect Emissions, Biomass, and On-Site Vehicles

Ecology's proposed rule requires emissions operations to report indirect GHG emissions, biomass emissions, and emissions associated with some on-site vehicles that transport people or cargo. Ecology believes this will capture a greater proportion of actual emissions, relative to the proposed federal reporting rule. Ecology determined that about 260 operations are likely to report under the proposed state rule, of which 78 would already be reporting facility-based emissions under the proposed federal rule.

Ecology could not confidently estimate the degree of indirect emissions or emissions from a limited number of on-site vehicles at these sites. Current information is insufficient to determine accurate quantitative estimates based on hard data. The inclusion of this type of emissions, however, expected to increase the quantity of emissions from some reporters.

Benefits of Including Fleets of Aircraft, Marine Vessel, and Rail Equipment Emissions

Ecology's proposed rule requires reporting of some fleets of aircraft, marine vessel, and rail equipment emissions in Washington State. These sources are required to report emissions by the authorizing statute, but since Ecology could not confidently separate the impacts of the overall requirement from the impacts of components of the rule Ecology chose to include (deferring some emissions, calculation methodologies, reporting protocols). Ecology chose to conservatively analyze the impacts of the entire requirement.

These sources are not included directly if at all in reporting for the proposed federal rule. Ecology believes inclusion of these sources will contribute to the overall emissions inventory and understanding of emissions structure in the state.

Overall, a high proportion of emissions in Washington State are transportation related. 46.9 percent of emissions in 2005 were estimated to be from transportation-related sources. Ecology acknowledges that a large portion of these emissions are emitted by private on-road vehicles, and would therefore not be reported under Ecology's proposed rule. However, marine vessel, rail equipment, and aircraft emissions will be captured to some extent. In 2005, Ecology estimated that 8.2 percent of total GHG emissions in the state came from aircraft, and 0.8 percent came from rail.[17]

Relative to the United States as a whole, emissions in Washington State include a high proportion of marine vessel emissions. In 2005, 3.2 percent of estimated state emissions came from marine vessel sources, based on fuel use. Ecology identified 437 businesses in the state involved to some degree in marine commerce, recreation, or other type of industry (excluding machinery rental).[18] Across the 75 port districts in the state, arriving or departing cargo was valued at $150 billion in 2006. In 2007, Washington's port throughput equaled 112.5 million metric tons.[19]

Ecology believes Ecology's proposed rule will capture a small part of aircraft emissions, because of the limited scope of the rule in covering emissions only from flights that both take off and land in the state. Ecology's proposed rule, however, is expected to capture a larger part of marine vessel and rail equipment emissions, because of rule content and market structure.

[17] Washington State Department of Ecology and Washington State Department of Community, Trade and Economic Development (2008). Leading the Way on Climate Change: A Challenge of Our Time, Interim Report. Chapter 2, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State." Table 1.
[18] Washington State Employment Security Department. Workforce Explorer.
[19] Washington Public Ports Association and Washington State Department of Transportation (2009). 2009 Marine Cargo Forecast: Technical Report. Prepared by BST Associates in conjunction with IHS Global Insight and Mainline Management, Inc. http://www.washingtonports.org/downloads/MCF%202009%20Final%20Report%203-23-2009.pdf

Overall Increase in Emissions Reported

Ecology estimated the additional emissions reported under Ecology's proposed rule, relative to the proposed federal rule. This involved determining new reporters, changes in types of reporting, and estimates of emissions likely to be reported for some of these likely reporters. Ecology combined the regulatory impacts of each of the subsections above, and determined overall changes in reporting behavior for each reporter, relative to proposed federal reporting requirements.

Ecology first determined which sites and fleets of nonroad mobile sources would likely be reporting under the proposed state rule. This included reporters only under Ecology's proposed rule, reporters under both state and federal proposed rules, aircraft reporters, marine vessel reporters, and rail equipment reporters.

For these reporters, Ecology determined the approximate degree of reporting under Ecology's proposed rule – whether due to specific inclusion in Ecology's proposed rule, the lower reporting threshold, or addition of emissions sources. For those reporters under the proposed state and proposed federal rules, Ecology subtracted the emissions that would be reported under both scenarios, leaving primarily indirect, biomass, and possible on-site vehicle emissions, which Ecology could not directly quantify all of, but developed assumptions about the additional percentage of emissions from these reporters.

Ecology estimated Ecology's proposed rule will result in the additional reporting of:

- Reporters only under Ecology's proposed rule (emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions) approximate emissions totaling over 4.7 million metric tons:
    - Site reporters emitting a total of 2.6 million metric tons.
    - Aircraft reporters emitting a total of 225 thousand metric tons.
    - Rail equipment reporters emitting a total of 900 thousand metric tons.
    - Marine vessel reporters emitting a total of 1.0 million metric tons.
    - Unquantifiable indirect emissions from approximately 242 sites and fleets of nonroad mobile sources.
- Reporters only under Ecology's proposed rule due to biomass (over 25,000 metric tons of CO_2e GHG emissions) approximate emissions totaling over 2 million metric tons:
    - 2 million metric tons, in sectors covered otherwise by the proposed federal rule.
    - Unquantifiable indirect emissions from these 13 biomass reporters.
- Reporters only under Ecology's proposed rule over 25,000 MT CO_2e in sectors not covered by the proposed federal rule.
    - 240 thousand metric tons in sectors not otherwise covered by the proposed federal rule.

- Reporters under the proposed federal rule AND the proposed state rule approximate emissions totaling approximately 950 thousand metric tons, on average:
    - Unquantifiable indirect emissions from 78 large reporters also reporting under the proposed federal rule.
    - On-site mobile emissions of less than 25 thousand metric tons statewide.
    - Direct emissions covered by The Climate Registry calculations used in Ecology's proposed rule, but not reflected in the proposed federal rule. Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported under the proposed federal rule. This is between 300 thousand and 1.6 million metric tons.

Summary of Benefits Relative to the Proposed Federal Rule

Ecology expects Ecology's proposed rule to have the following benefits, compared to the proposed federal reporting rule. See Chapter 6 for benefits of Ecology's proposed rule relative to no reporting currently under law.

See Chapter 7 for added costs and benefits of Ecology's proposed rule's requirement for fleets of on-road vehicles.

Benefits in additional metric tons of emissions reported above what is reported under the proposed federal rule, gained each year, include:

- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule (emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions).
- Over 2.1 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass from reporters only under Ecology's proposed rule (over 25,000 metric tons of CO_2e GHG emissions).
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered by The Climate Registry calculations used in Ecology's proposed rule, but not reflected in the proposed federal rule. Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported under the proposed federal rule. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of on-road motor vehicles .

- Unquantifiable indirect emissions from nearly 260 sites and fleets of nonroad mobile sources that do not report under the proposed federal rule.
- Unquantifiable indirect emissions from 78 large reporters also reporting under the proposed federal rule.

The sum of the quantifiable increase in emissions reported is at least 7.9 million metric tons. This is nearly a 25 percent increase over emissions reporting Ecology expects in the state under the proposed federal rule.[20]

These increases in emissions reported are related to several qualitative benefits Ecology expects Ecology's proposed rule to generate, including:

- Creation of a comprehensive emissions database.
- Broader coverage of 260 more emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 fleets of on-road mobile emissions sources.
- Reporting of more emissions types, including: indirect emissions, rail equipment, aircraft, marine vessel, and on-road motor vehicle emissions as well as extended biomass, process, and fugitive emissions reporting.
- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.
- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

[20] Ecology developed a list of potential and likely reporters under Ecology's proposed rule, which included large industrial reporters likely covered by the proposed federal rule. Ecology identified 78 sites in Washington State that would likely report under the proposed federal rule, emitting a total of 32.6 million metric tons of CO2e GHG emissions.

Chapter 5: Costs of Proposed Reporting by Sites, Fleets of Aircraft, marine Vessels, and Rail Equipment – Relative to No Reporting

Ecology estimated the costs of Ecology's proposed rule compared to the current regulatory framework of no reporting. While Ecology does not believe this will be the long-run regulatory context, it is the existing regulation at the time of this publication. Comparison to a no-reporting baseline means that the impacts of Ecology's proposed rule have full impact, without any existing GHG reporting behavior exempt from analysis.

This chapter describes qualitative and quantified measures of estimated costs. As the impacts of each requirement under the rule may overlap, or work together, to impact behavior, this chapter first describes costs of rule requirements qualitatively, and then discusses estimated overall quantifiable impacts.

Ecology is not required to analyze those aspects of Ecology's proposed rule that are dictated by statute. Some elements of Ecology's proposed rule, however, although dictated broadly by statute, were not separable from other aspects of the rule over which Ecology had discretion, such as emissions quantification methods and options, reporting protocols, deferred reporting, and timing. In such cases, the statutory language was included in the analysis. In this chapter, Ecology includes in its analysis the statutory requirement that emitters of at least 10,000 metric tons of CO_2e emissions of GHG must report.

Costs of Applicability

Ecology's proposed rule applies to a broad set of sites, and applies to some aircraft, marine vessels, and rail equipment. Ecology based this broad scope for Ecology's proposed rule on the requirements of the laws (Chapters 70.94 and 70.235 RCW) and the understanding of the comprehensive level of GHG emissions reporting deemed necessary by the Legislature.

Ecology presents its estimation of the combined effects of broad coverage and broad applicability later in this chapter.

Costs of Coverage

Ecology expects Ecology's proposed rule's broad coverage (to all emitters of greenhouse gases, and to multiple types of process emissions) to capture a significant portion of Washington State's GHG emissions in an inventory. This will generate compliance costs for reporters by including multiple emissions source types. This will increase estimated emissions from some sites and fleets of nonroad mobile sources with multiple emissions types, compared to sources without those emissions. This will also generate compliance costs for non-reporters, by including multiple emissions sources to evaluate, that contribute to the decision of whether to report.

Costs of 2009 Applicability – Costs to Non-Phased-In Reporters

Ecology's proposed rule requires reporting for some sources (those emissions for which thresholds or reporting are not phased-in or delayed to the maximum extent allowed by statute) beginning for 2009 GHG emissions. This means some sources would incur costs earlier than others.

Ecology estimated annualized compliance costs and fees for the regulated community, under full phasing-in of its proposed rule. Earlier applicability of the rule for some reporters means they will pay equivalent annualized costs one year earlier than under the proposed federal rule. Since Ecology estimated the most conservative annualized costs without phasing-in, Ecology's proposed rule's earlier applicability generates one extra year of costs for some reporters.

Costs of Including Indirect Emissions, Separate Biomass Emissions, and Some On-Site Vehicles

Ecology's proposed rule requires sites and fleets of nonroad mobile sources to report indirect GHG emissions, separate biomass emissions, and emissions associated with a small number of on-site vehicles that transport people or cargo. This aspect of Ecology's proposed rule will generate costs for the regulated community, through reporting of multiple types of emissions sources.

Costs of Including Air, Marine, Rail

Ecology's proposed rule requires reporting of some aircraft, marine vessel, and rail equipment emissions from fleets in Washington State. Ecology believes inclusion of these sources will generate compliance costs for some emitters operating fleets of aircraft, marine vessels, or rail equipment. In addition, Ecology expects a number of non-reporters to need to determine whether to report. These costs are reflected in Ecology's quantitative analysis, further in this chapter.

Quantified Costs of Ecology's Proposed Rule

Ecology estimated the quantifiable costs of Ecology's proposed rule by determining expected reporters, and estimating the range of compliance costs for each industry.

Coverage under Ecology's Proposed Rule

Ecology expects coverage under Ecology's proposed rule to include several manufacturing, commercial, and utility operations. In addition, Ecology expects Ecology's proposed rule to cover significant mobile sources of aircraft, marine vessel, and rail equipment emissions.

Ecology's proposed rule requires reporting of indirect emissions, but only once the reporting threshold is exceeded. Therefore, indirect emissions reporting is not expected to affect the number of reporters or the number of assessments of whether to report, but increases what is required of reporters, and how much is reported, increasing reporting costs.

Based on the energy intensity of different production activities, and employment size of firms as a proxy for operation size, Ecology estimated that about 340 sites and fleets of nonroad mobile sources in the state are likely to be required to report under Ecology's proposed rule.[21] Ecology expects that some remaining businesses in the state, in manufacturing, utility, and commerce fields will need to determine their reporting status, but will not need to report. Ecology estimated there are about 3 thousand remaining manufacturing, commercial, and utility sites and fleets of nonroad mobile sources in the state, in industries relevant to Ecology's proposed rule.[22]

Among the 340 estimated site and nonroad mobile source reporters, Ecology determined that 36 businesses were likely to report mobile emissions from marine vessels, while another 22 were possible, though less likely to become reporters. For rail emissions, Ecology determined that eight businesses were likely reporters under Ecology's proposed rule, while another six were possible reporters. For aircraft emissions, Ecology determined that five businesses were likely reporters, while another 10 were possible reporters. For mobile aircraft, marine vessel, and rail equipment emissions sources, Ecology assumed the number of "possible" reporters discussed above was a conservative estimate of potential non-reporters, totaling 38.

Also among the 340 estimated reporters are 13 sites required to report biomass separately under Ecology's proposed rule, above the threshold.

Breakdown of Coverage

Overall, based on the sectors described above, Ecology expects Ecology's proposed rule to cover about 340 sites and fleets of nonroad mobile sources, including among them:

- 288 site GHG emitters.
- Five aircraft GHG emitters.
- Eight rail equipment GHG emitters.
- 36 marine vessel GHG emitters.

[21] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.
[22] Washington State Employment Security Department, Workforce Explorer. http://www.workforceexplorer.com/

Cost Estimation – Reporters

Ecology developed a list of likely reporters under Ecology's proposed rule. For each of these operations, Ecology developed an estimated facility compliance cost by industry, indirect emissions, biomass, and on-site vehicle compliance cost, and/or aircraft, rail equipment, and marine vessel compliance cost, if applicable. Ecology estimated a range of compliance costs, tied to labor and capital cost assumptions developed by the EPA for its Regulatory Impact Analysis for the proposed federal rule.[23]

The upper end of the costs range was based on the highly-conservative (likely overestimated) scenario that reporters would need extensive monitoring and sampling to determine reported emissions. This scenario is highly unlikely, as Ecology provides reporters with more choice and flexibility in emissions calculation and reporting. While the high-cost estimate is provided for cases in which other compliance options are not available, Ecology believes reporters will use the flexibility in Ecology's proposed rule to minimize compliance costs.

The low end of the costs range was based on the scenario that only labor costs were necessary for compliance, and emissions could be estimated based on existing or easily accessed records. Ecology's proposed rule allows for various emissions calculations, and Ecology expects actual compliance costs to be near the low end of the range, as reporters and non-reporters are both likely to minimize costs where possible.

Reporter costs used by Ecology were industry-specific where available, and tied to the EPA's cost estimation assumptions, in the EPA's analysis of the proposed federal rule. Utilities expected to report under Ecology's proposed rule were assigned estimated costs of stationary combustion from this same analysis. Ecology assumed aircraft, marine vessel, and rail equipment reporters would primarily use a fuel-consumption-based, or simplified industry approach to emissions calculation, and so assigned these fleets the average planning, analytic, and administrative costs across other industries. Commercial reporters (typically port authorities and other transportation or couriers with possible multiple nonroad mobile source transportation types) or military facilities, were assigned combined (additive) costs of reporting for each aspect of operations. Ecology also calculated the costs of reporting emissions from electricity purchases based on the EPA's assumptions in its analysis of the proposed federal rule, at the industry level.

See the Appendix A for a break-down of compliance costs.

Based on its analysis of operation-level compliance costs, Ecology estimated that about 340 sites and fleets of nonroad mobile sources are expected to incur total annualized reporting costs of $2.5 million – $6.3 million. This is the overall range of possible annualized compliance costs, looking at extreme high and low costs across all fleets, and all possible compliance options including unlikely high-cost options.

[23] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

Cost Estimation – Non-Reporters

Based on the industries impacted in Ecology's cost analysis for reporters, Ecology assumed a remaining 3,000 facilities in the state[24] would need to determine what action to take in compliance with the rule, but would not need to report. These are sites involved in the same set of industries likely impacted by Ecology's proposed rule. In addition, Ecology assumed the 38 marine vessel, aircraft, and rail equipment fleets it identified as "possible" (but not probable) reporters would also need to determine whether to report. Ecology assumed the costs of determining whether to report for fleets of aircraft, rail equipment, and marine vessel emitters with operations classified as "possibly" reporting or unlikely to report will be one-time.

Ecology followed the EPA's assumptions on the labor required to determine whether to report. [25] Results based on these EPA estimates were used as the high end of the cost range, as they assume the most conservative (i.e., high) cost scenario possible. Ecology also calculated this cost based on only the subset of labor required to determine reporting status based on existing fuel and input records. The range of costs for non-reporters was determined to be $150 to $500 per non-reporter.

Ecology assumed the determination of whether to report would be one-time, unless significant changes to existing processes were made. Ecology annualized this range of non-reporter costs to be $13 to $44 dollars per year. Summed across all non-reporting sites and fleets of nonroad mobile sources determining whether to report, this is an annualized compliance cost of $39 thousand – $132 thousand.

See the Appendix A for a break-down of compliance costs.

Ecology also noted that some likely non-reporters would be able to determine whether to report during a brief phone call with a member of Ecology staff, so the quantified range of annualized costs presented above may be an overestimate.

Reporting Fees

The authorizing statute allows Ecology to charge appropriate fees to reporters, based on the expected costs of the program. Ecology estimated the future workload of the reporting program, based on Ecology's proposed rule. Based on its analysis of expected reporters, Ecology estimated future program costs based on 400 on-road motor vehicle fleet reporters, 195 small sites and fleets of nonroad mobile sources (emitting between 10,000

[24] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.

[25] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

and 25,000 metric tons per year), and 73 large sites and fleets of nonroad mobile sources (emitting over 25,000 metric tons per year).

Ecology determined which tasks it expects to perform under Ecology's proposed rule, and the workload associated with those tasks. The tasks include:

- Rule updates, program administration, program tracking, and fiscal operations.
- Data management and The Climate Registry interface.
- Technical support for reporters, tracking, and Western Climate Initiative.
- Compliance and enforcement.
- Management and oversight.
- Data verification.
- Administrative support in billing and correspondence.

Ecology estimated the workload associated with each task, and the total compensation estimate for each position involved. Total compensation included salaries, benefits, goods, travel, and indirect costs. Ecology estimated that overall program costs will be approximately $335 thousand per year for administering the reporting rule for both sites and fleets of nonroad mobile sources, and for fleets of on-road motor vehicles. This cost represents Ecology's current best estimate, and could change depending on the actual workload associated with running the GHG emissions reporting program.

To allocate reporter fees across on-road motor vehicle fleets, small emitters, and large emitters, Ecology followed the language in Ecology's proposed rule. Ecology broke the budget down into a flat fee (20 percent of the estimated total program cost), and an additional fee paid only sites and fleets of nonroad mobile sources. In turn, the 80 percent of the fee was broken down into 50 percent paid by large emitters, and 30 percent paid by small emitters. Ecology then divided the total fees to be paid by reporters to estimate that:

- On-road fleet reporters will pay only the flat fee of $105 per year.
- Small sources or combinations of sources will pay a flat fee, plus a variable fee, totaling $643 per year.
- Large sources or combinations of sources will pay a flat fee plus a variable fee, totaling $2,500 per year.

These are estimated values, based on the expected annual costs of the program at the time of this publication. If the realized composition of reporters and non-reporters differs from Ecology's assumptions, actual fees may differ.

Based on these estimated fees, Ecology expects the overall shares of reporting fees to be:

- 12 percent paid by fleets of on-road vehicles = $40,000 per year.

- 36 percent paid by small site and nonroad mobile fleet emitters = $121,000 per year.
- 52 percent paid by large site and nonroad mobile fleet emitters = $174,000 per year.

Ecology summed the estimated reporting fees for small and large sites and fleets of nonroad mobile sources, to determine total expected annual reporting costs to sites, aircraft, marine vessel, and rail equipment reporters of $295 thousand. See the Appendix A for a further break-down of compliance costs.

Summary

Ecology determined Ecology's proposed rule has quantifiable and qualitative costs. These costs amass to emitters required to comply with Ecology's proposed rule. These are full costs of Ecology's proposed rule, estimated relative to a baseline of no reporting. See Chapter 3 for analysis of the costs created by Ecology's proposed rule relative to the proposed federal rule.

See Chapter 7 for additional costs and benefits of Ecology's proposed rule's requirement for fleets of on-road motor vehicles.

Ecology expects Ecology's proposed rule to result in compliance costs of:

- Annualized costs to sites and fleets of nonroad mobile sources reporting under Ecology's proposed rule of $2.5 million – $6.3 million.
- Annualized costs to sites and fleets of nonroad mobile sources not reporting under Ecology's proposed rule of $39 thousand – $132 thousand.
- Reporter fees of $295 thousand funding the site and fleet of nonroad mobile sources component of the reporting program. These are the fees collected from site, fleets of aircraft, marine vessel, and rail equipment reporters.

Ecology calculated these costs based on the combined impacts, relative to no reporting, of:

- Costs of broad applicability.
- Costs of broad coverage
- Costs of 2009 applicability
- Costs to reporters that do not have phased-in requirements
- Costs of including indirect emissions, biomass emissions, and emissions from some on-site mobile vehicles.
- Costs of including fleets of aircraft, marine vessels, and rail equipment.

Chapter 6: Benefits of Proposed Reporting by Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment – Relative to No Reporting

In this chapter, Ecology analyzed the benefits of Ecology's proposed rule's reporting requirements for sites, fleets of aircraft, marine vessels, and rail equipment, relative to the current regulatory context of no reporting required. While Ecology does not believe this will be the long-run context, it is the current regulatory context at the time of this publication. This chapter describes qualitative and quantified measures of estimated benefits. As the impacts of each requirement under the rule may overlap in terms of quantifiable changes in behavior, this chapter first describes benefits of rule requirements qualitatively, and then discusses estimated quantifiable impacts of the rule as a whole.

See Chapter 7 for Ecology's analysis of Ecology's proposed rule's regulation of fleets of on-road motor vehicles.

Compliance with Legislative Mandate

Ecology is required to establish a GHG reporting protocol by the state Legislature. While Engrossed Second Substitute House Bill 2815[26] creates the program, Ecology has discretion on the scope and content of program requirements. It is not possible to separate the costs and benefits of Ecology's proposed rule from the creation of the program, and the inherent costs and benefits associated with any such program.

In its analysis of the costs of Ecology's proposed rule, relative to the proposed federal rule, Ecology did not attempt to separate out the costs of the created GHG reporting program from the costs of those elements of Ecology's proposed rule over which Ecology had discretion. Similarly, in discussion of benefits, Ecology did not differentiate between the benefits of such a program existing and the benefits of each component of Ecology's proposed rule.

Mandatory Reporting at the State Level -- Public

Ecology expects mandatory reporting at the state level to generate benefits to the public.. In particular, these benefits are associated with other long-term requirements and goals put forward by the Governor and Legislature. In Executive Order 07-02, the Governor put forth goals for emissions reductions. In Engrossed Second Substitute House Bill 2815, the Legislature set these as requirements for GHG emissions reductions at the state level, and for tracking of progress toward those goals. Within the context of these specific Washington State-oriented goals, Ecology expects several benefits to arise from reporting of Washington State emissions.

[26] Engrossed Second Substitute House Bill 2815. Adopted 2008 Legislative Session, and codified primarily in chapters 70.235 RCW and 70.94 RCW.

In addition, Ecology expects the information gathered under Ecology's proposed rule to benefit the public, as it can be used to understand business and government actions and consumer behavior. Ecology believes these information-based benefits to apply to information both on reporters and non-reporters. While Ecology's proposed rule will directly gather emissions information on reporters exceeding GHG emissions thresholds, the status of a non-reporter also provides the public and the non-reporter with information about the maximum level of emissions it generates.

Creation of a comprehensive database

Ecology's proposed rule requires reporting of multiple types of GHG emissions. This comprehensive collection of data addresses sources particularly important in Washington State, including site, marine vessel, aircraft, and rail equipment sources, as well as biomass emissions. Washington's emissions composition differs significantly from the nation as a whole, and Ecology believes Ecology's proposed rule will benefit businesses and the public through planning and policy that is more appropriate for the state's economy and emissions composition.

Transportation is a large part of Washington State's GHG emissions. While Ecology's proposed rule will not capture all of these emissions, it is likely to capture significant nonroad mobile source fleet components of transportation emissions.

In 2005, marine vessel GHG emissions in the state were estimated to be 3.2 percent of total state emissions, and accounted for about 3 million metric tons of CO_2e emissions, based on fuel use.[27] That year, transportation as a whole accounted for 46.9 percent of total emissions, with 8.2 percent (7.8 million metric tons) stemming from aviation, and 0.8 percent (800 thousand metric tons) from rail.

Ecology believes that inclusion of these emissions, as well as those required under the federal reporting rule provides significant information for planning and implementation of future emissions reduction goals. By gaining a better understanding of Washington-specific emissions, reductions in emissions can be achieved efficiently and with a greater degree of equity across the local economy. Ecology believes this information will contribute to better policy decisions implementing the required GHG emissions reductions under law.

Trading Scheme Participation

In the future, Washington State GHG emitters may participate in an emissions credit trading scheme. Inclusion of those emitters covered by Ecology's proposed rule, in excess of the scope of federal reporting requirements, will likely allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

[27] Washington State Department of Ecology and Washington State Department of Community, Trade and Economic Development (2008). Leading the Way on Climate Change: A Challenge of Our Time, Interim Report. Chapter 2, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State." Table 1.

Focus on Washington Emissions Composition

Ecology expects the public to benefit from an understanding of Washington-specific emissions, and their sources, with special focus on those industries and types of emitters that are more prevalent in the state. This can reflect in consumer decision making, and more informed purchasing and planning.

Public Confidence and Government Transparency

With a comprehensive, state-level reporting rule in place, emissions estimates for Washington State are likely to hold more public confidence. This is probable not only for the emissions numbers themselves, but for any future regulatory actions taken to reduce GHG emissions. Increased public confidence in the quality and the scope of reported numbers increases the likelihood the public will more fully understand the specific emissions reduction actions, why they are taken, and how they affect the local economy.

Credibility, Consumer Behavior, and Investment

While GHG emissions reporting may not produce a complete mapping of all emissions involved in consumer products, Ecology expects the incremental information it provides to consumers about the emissions associated with intermediate or final goods and services to benefit consumers by allowing them to make more efficient consumption choices relative to their preferences, including preferences for carbon impact.

As well as providing emissions information to consumers – as a voluntary program also would – a mandatory reporting scheme for Washington gives more credibility to local emissions estimates. This reduces uncertainty for consumers that include emissions information in their purchasing decisions. The combination of increased knowledge about GHG emissions from reporters operating in the local economy, and increased confidence in the scope and accuracy of that information will benefit consumers' ability to behave in line with their full set of preferences.

The GHG emissions information may also benefit investors' ability to make financial decisions based on expected benefits and risks to GHG emitters, depending on emissions levels and other firm attributes.

Mandatory Reporting at the State Level – Industry and Investors

While Ecology expects Ecology's proposed rule to generate compliance costs for the regulated community, Ecology also believes Ecology's proposed rule will allow covered GHG emitters to benefit from the information generated by a mandatory state-level reporting requirement, and the broad scope of emissions sources reported under Ecology's proposed rule.

Emissions Reductions

Ecology expects the broad scope of Ecology's proposed rule may benefit some members of the regulated community, in the event of future mandatory reductions in GHG

emissions. In particular, reporters under the proposed state rule may have their costs mitigated under Ecology's proposed rule. This is because mandatory in-state emissions reductions could be spread across a wide set of reporters.

In addition, the broad scope of Ecology's proposed rule may allow reporters more flexibility in future emissions reductions, if reductions become mandatory. Under Ecology's proposed rule, the broad scope of types of emissions reported will allow some reporters more flexibility in reducing emissions, based on their business practices and cost structure.

Trading Scheme Participation

In the future, Washington State GHG emitters or reporters may participate in an emissions credit trading scheme. Inclusion of those emitters covered by Ecology's proposed rule, in excess of the scope of federal reporting requirements, will likely allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

Public Relations

Credible and comprehensive emissions reports under Ecology's proposed rule may improve a reporter's public relations, much as the status of non-reporter can. The degree of comprehensiveness and broad scope of Ecology's proposed rule may generate more public relations impacts, and through perceived reliability of reports, increase the size of those impacts. Ecology expects estimates of GHG emissions to be available for marketing purposes promoting a "green" image, and for adding credibility to emissions reductions. The transparency itself afforded by the comprehensive reporting required under Ecology's proposed rule may allow some businesses to improve public relations, by supporting other environmentally friendly or marketing claims while confirming to the public that large quantities of GHG emissions are not "behind the scenes" in indirect emissions, biomass emissions, emissions from some on-site mobile equipment, or marine vessel, rail equipment, or aircraft.

Similarly, GHG emissions information – either through public perception or directly – may benefit investors in their information set used to make decisions. Ecology expects some firms to benefit from improved investment prospects based on their GHG emissions reports or the credibility and broader informational basis of future emissions reduction actions.

Potential Cost Savings

Members of the regulated community – just reporters, and emitters as a whole – may discover potential cost savings in their operations by performing GHG emissions calculations. Regulated businesses may discover efficiencies to be gained in how their business is performed, fueled, transported, or designed, as they examine GHG emissions coming from multiple aspects of production or service provision.

Ecology also expects businesses to benefit in this fashion either by reducing costs by changing their practices, or to benefit through public relations or investment from review and verification that current practices are highly efficient.

Benefits to Non-Reporters

Those businesses regulated by Ecology's proposed rule not only deal with the public through interrelated markets – they deal with many other businesses. These businesses may have dealings with raw inputs, intermediate goods, wholesale or retail intermediary work, and service provisions or demand. These businesses may benefit from a comprehensive state-level GHG emissions inventory in determining their own best business practices and connections.

Ecology expects some businesses dealing with reporters covered by Ecology's proposed rule to benefit from information about GHG emitters in Washington State that allows them to improve their own efficiency in dealing with covered business partners. This may include adjusting pricing and availability of goods or services to maximize profits, to making new business connections for purposes of reducing GHG emissions, or the public relations benefit of dealing with "green" businesses or improving efficiency.

Credibility in Emissions Reductions

Another aspect of each of the expected benefits of Ecology's proposed rule described above is the reduction in uncertainty provided by credible emissions estimates, in terms of official agency review and the broader scope of emissions covered by Ecology's proposed rule. Whether estimated GHG emissions reported by firms are used in emissions reductions planning, trading scheme participation, public relations, or cost-saving operations adjustments, or used by outside non-covered businesses to provide better service, increase profitability, or improve control technology, added credibility increases the certainty with which businesses can make decisions and use information. Ecology expects Ecology's proposed rule to reduce uncertainty regarding actual emissions by estimating a broader scope of emissions.

Benefits of Broad Applicability

Ecology's proposed rule applies to a broad set of emitters. Ecology based this broad scope for Ecology's proposed rule on its understanding of the comprehensive level of GHG emissions reporting deemed necessary by the Legislature, and Ecology acknowledges that broad applicability requires the inclusion of a large number of emitters that will incur compliance costs. However, Ecology believes there are also benefits associated with the broad array of types of emitters required to report, and the types of emissions covered by Ecology's proposed rule.

Future Reductions Spread Over Large Population of Reporters

In the future, Washington State GHG emitters may participate in an emissions credit trading scheme. In Engrossed Second Substitute House Bill 2815, the Legislature directs

Ecology to participate in the design of a market-based emissions trading system, in coordination with the Western Climate Initiative. Inclusion of the broad array of emitters covered by Ecology's proposed rule may allow businesses more flexibility in emissions market participation. Businesses with documented early emissions reductions may be able to use them as offsets to market GHG emissions allocations.

Greater Understanding of Distribution and Structure of GHG Emissions in WA

Ecology expects the public, regulatory agencies, and business to benefit from knowledge specifically of the local economy and its relationship to GHG emissions. For all three points of view – public, policy, and business – Ecology's proposed rule offers opportunity for Washington-specific improvements and efficiencies in emissions reductions and trading, policy planning and creation, or public relations and consumer purchasing and investment behavior. Ecology expects Ecology's proposed rule to increase transparent, credible information in all of these interactions between the public, policy, and businesses – opening the possibility for benefits accruing to one or more of these groups, and benefiting Washington as a whole.

Benefits of Broad Coverage

Ecology expects Ecology's proposed rule's broad coverage (to all emitters emitting greenhouse gases, and to additional types of site emissions) to capture a large portion of Washington State's GHG emissions in an inventory, from both the low threshold (set by the Legislature), and the impact of including multiple types of emissions.

Ecology believes the public and policy development will benefit from Ecology's proposed rule, through an emissions inventory that represents actual emissions from multiple sectors, and from a broad range of business sizes. This is expected to benefit the public and policy not only as discussed in general, above, but by providing a better basis for – and understanding of the impacts of – future GHG emissions reduction policies.

Coverage Under Ecology's Proposed Rule

Ecology expects coverage under Ecology's proposed rule to include many manufacturing, commercial, and utility operations. In addition, Ecology expects Ecology's proposed rule to cover significant mobile sources of aircraft, marine vessel, and rail equipment emissions. Ecology's proposed rule's reporting threshold and broad base of covered emitters also includes indirect, biomass, and some on-site vehicle emissions that will add to basic industrial process emissions.

Ecology's proposed rule requires reporting of indirect emissions, but only once the reporting threshold is exceeded. Therefore, indirect emissions reporting is not expected to affect the number of reporters or the number of assessments of whether to report, but increases what is required of reporters, and how much is reported.

Based on the energy intensity of different production activities, and employment size of firms as a proxy for operation size, Ecology estimated that about 340 sites and fleets of nonroad mobile sources in the state are likely to be required to report under Ecology's proposed rule.[28] Ecology expects that about 3,000 additional businesses in the state, in manufacturing, utility, and commerce fields will need to determine their reporting status, but will not need to report..[29]

Among the 340 estimated site and nonroad mobile source reporters, Ecology determined that 36 businesses were likely to report mobile emissions from marine vessels, while another 22 were possible, though less likely to become reporters. For rail emissions, Ecology determined that eight businesses were likely reporters under Ecology's proposed rule, while another six were possible reporters. For aircraft emissions, Ecology determined that five businesses were likely reporters, while another 10 were possible reporters. For aircraft, marine vessel, and rail equipment emissions sources, Ecology assumed the number of "probable" reporters is 49, while the number of "possible" reporters, a conservative estimate of potential non-reporters, is 38.

Also among the 340 estimated reporters are 13 sites required to report biomass separately under Ecology's proposed rule, above the threshold.

Overall, based on the sectors described above, Ecology expects Ecology's proposed rule to cover about 340 sites and fleets of nonroad mobile sources, including among them:

- 288 site GHG emitters.
- Five aircraft GHG emitters.
- Eight rail equipment GHG emitters.
- 36 marine vessel GHG emitters.

Benefits of Including Indirect Emissions, Biomass, and On-Site Vehicles

Ecology's proposed rule requires emissions operations to report indirect GHG emissions, biomass emissions, and emissions associated with some on-site vehicles that transport people or cargo. This will capture a greater proportion of actual emissions than reporting of only process emissions. Ecology determined that about 340 operations are likely to report under the proposed state rule.

Ecology could not confidently estimate the degree of indirect emissions, or emissions from a limited number of on-site vehicles at these sites. Current information is insufficient to

[28] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.
[29] Washington State Employment Security Department, Workforce Explorer. http://www.workforceexplorer.com/

determine accurate quantitative estimates based on hard data. The inclusion of this type of emissions, however, is expected to increase the quantity of emissions from some reporters. Ecology quantified some biomass emissions that would trigger reporting under Ecology's proposed rule, as discussed below.

Benefits of Including Fleets of Aircraft, Marine Vessel, and Rail Equipment Emissions

Ecology's proposed rule requires reporting of some aircraft, marine vessel, and rail equipment emissions in Washington State. These sources are required to report emissions by the authorizing statute, but since Ecology could not confidently separate the impacts of the overall requirement from the impacts of components of the rule, Ecology chose to include (deferring some emissions, calculation methodologies, reporting protocols). Ecology chose to conservatively analyze the impacts of the entire requirement. Ecology believes inclusion of these sources will contribute to the overall emissions inventory and understanding of emissions structure in the state.

Overall, a high proportion of emissions in Washington State are transportation related. 46.9 percent of emissions in 2005 were estimated to be from transportation-related sources. Ecology acknowledges that a large portion of these emissions are emitted by private on-road vehicles, and would therefore not be reported under Ecology's proposed rule. However, marine vessel, rail equipment, and aircraft emissions will be captured to some extent. In 2005, Ecology estimated that 8.2 percent of total GHG emissions in the state came from aircraft, and 0.8 percent came from rail.[30]

Relative to the United States as a whole, emissions in Washington State include a high proportion of marine vessel emissions. In 2005, 3.2 percent of estimated state emissions came from marine vessel sources, based on fuel use. Ecology identified 437 businesses in the state involved to some degree in marine commerce, recreation, or other type of industry (excluding machinery rental).[31] Across the 75 port districts in the state, arriving or departing cargo was valued at $150 billion in 2006. In 2007, Washington's port throughput equaled 112.5 million metric tons.[32]

Ecology believes Ecology's proposed rule will capture a small part of aircraft emissions, because of the limited scope of the rule in covering emissions only from flights that both take off and land in the state. Ecology's proposed rule, however, is expected to capture a larger part of marine vessel and rail equipment emissions, because of rule content and market structure.

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[30] Washington State Department of Ecology and Washington State Department of Community, Trade and Economic Development (2008). Leading the Way on Climate Change: A Challenge of Our Time, Interim Report. Chapter 2, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State." Table 1.
[31] Washington State Employment Security Department. Workforce Explorer.
[32] Washington Public Ports Association and Washington State Department of Transportation (2009). 2009 Marine Cargo Forecast: Technical Report. Prepared by BST Associates in conjunction with IHS Global Insight and Mainline Management, Inc. http://www.washingtonports.org/downloads/MCF%202009%20Final%20Report%203-23-2009.pdf

Overall Emissions Reported

Ecology estimated the emissions reported under Ecology's proposed rule. This involved determining reporters, changes in types of reporting, and estimates of emissions likely to be reported for some of these likely reporters. Ecology combined the regulatory impacts of each of the subsections above, and determined overall changes in reporting behavior for each reporter, relative to the baseline of no reporting.

Ecology first determined which sites and fleets of nonroad mobile sources would likely be reporting under Ecology's proposed rule. For these sites and fleets of nonroad mobile sources, Ecology determined the approximate degree of reporting under Ecology's proposed rule. Ecology could not confidently quantify reported indirect and some on-site emissions, but developed assumptions about the additional percentage of emissions from these reporters reflecting the broad scope of Ecology's proposed rule.

Ecology estimated Ecology's proposed rule will result in the reporting of:

- Approximate emissions totaling 32.6 million metric tons CO_2e of direct emissions from reporters emitting over 25,000 metric tons of CO_2e emissions.
- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions.
- Over 2.1 million metric tons CO_2e of direct emissions from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass over 25,000 metric tons of CO_2e GHG emissions.
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered in particular by The Climate Registry calculations used in Ecology's proposed rule Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported by 78 large reporters. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from fleets of on-road motor vehicles .
- Unquantifiable indirect emissions from nearly 340 sites and fleets of nonroad mobile sources.

Summary of Benefits Relative to the No Reporting

Ecology expects Ecology's proposed rule to have the following benefits, compared to no reporting required. See Chapter 4 for benefits of Ecology's proposed rule relative to the proposed federal reporting rule.

See Chapter 7 for added costs and benefits of Ecology's proposed rule's requirement for fleets of on-road vehicles.

Benefits in metric tons of emissions reported each year, include:

- Approximate emissions totaling 32.6 million metric tons CO_2e of direct emissions from reporters emitting over 25,000 metric tons of CO_2e emissions.
- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions.
- Over 2.1 million metric tons CO_2e of direct emissions from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass over 25,000 metric tons of CO_2e GHG emissions.
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered in particular by The Climate Registry calculations used in Ecology's proposed rule Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported by 78 large reporters. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from fleets of on-road motor vehicles .
- Unquantifiable indirect emissions from nearly 340 sites and fleets of nonroad mobile sources.

The sum of the quantifiable emissions reported is at least 44 million metric tons.

These emissions reported are related to several qualitative benefits Ecology expects Ecology's proposed rule to generate, including:

- Creation of a comprehensive emissions database.
- Coverage of nearly 340 emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 on-road mobile fleet emissions sources.
- Reporting of multiple emissions types, including rail equipment, aircraft, and marine vessel emissions, as well as on-road motor vehicles.

- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.
- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

Chapter 7: Costs and Benefits of On-Road Motor Vehicle Fleet Reporting – Compared to the Proposed Federal Rule or to No Reporting

Ecology separately analyzed the costs and benefits of Ecology's proposed rule's reporting requirement for fleets of on-road vehicles emitting over 2,500 metric tons per year. This is because:

- The statutory requirement establishing the scope and threshold were not separable from implementation requirements created by Ecology. This means, the threshold and coverage set by statute were not analytically separable from the additional calculations, reporting protocols, and deferrals set by Ecology.
- The costs and benefits are the same relative to either baseline: the proposed federal reporting rule, or no-reporting.

For clarity, Ecology analyzed this requirement in a separate section of the document.

Costs of the On-Road Fleet Requirement

A large part of the on-road motor vehicle fleet portion of Ecology's proposed rule is set by statute. In particular, Ecology's choices included:

- Not deferring interstate emissions.
- Choice of calculation methods and simplified calculation.
- Efforts to provide each operation with simple reporting protocols suited to their data and abilities.

However, since these elements were not separable from the language creating and outlining the on-road motor vehicle fleet reporting requirements, Ecology analyzed Ecology's proposed rule as a whole. Ecology emphasizes that it is responsible for a portion of the costs and benefits of Ecology's proposed rule estimated in this document, and impacts discussed here are likely conservatively large.

Ecology determined which fleets in the state were likely fleet reporters under Ecology's proposed rule. This determination was based on the best information available on the number of vehicles in a fleet, and for some, the types of vehicles in the fleet.[33] For some fleets, only the number of vehicles was available, so Ecology used information on other fleet compositions to determine which of these were likely reporters. Ecology assumed that fleets with fewer than 200 vehicles may not need to report, while fleets with more than 200 vehicles may be required to report.

Based on its analysis of fleet size and composition, Ecology determined that about 400 fleets would likely be required to report emissions under Ecology's proposed rule. The remaining

[33] Washington State Department of Licensing Vehicle Fleet Database Query – December 2008

nearly 600 identified fleets in the state are expected to incur only the costs of determining whether to report, but not actual reporting costs.

Compliance Costs

For reporting fleets, Ecology estimated costs based on EPAs assumptions in estimating reporting burden for the SmartWay Transport Partnership.[34] The SmartWay program is a voluntary program that requires many of the same reporting information and data as Ecology's proposed rule, as well as using a similar calculation and reporting format.

See Appendix B for a break-down of costs used in this analysis.

The base cost used by Ecology for reporting emissions from a simple fleet (one type of vehicle) is the reporting cost based on the SmartWay analysis. To reflect the increasing complexity of reporting emissions from multiple vehicle sizes, types, fuels, and uses, Ecology assumed there were no economies of scale, and that the reporting cost would be incurred additively for each type of vehicle reported. This is a highly conservative estimate, since Ecology expects large economies of scale in understanding regulation, data gathering, calculations, and reporting. Ecology did not quantify a more likely estimate in this case, because it was not possible to confidently quantify the degree to which economies of scale will take place.

For those expected reporters that did not have data available on vehicle types, Ecology assumed the cost distribution was the same as the distribution across other reporters, and assigned costs accordingly. Across all reporters (those with known vehicle types and those without vehicle type data), annualized costs ranged from $292 to $1,754. Ecology has also made efforts to develop calculation methodologies and reporting protocols that are specific to types of fleets and reporters, and so expects actual compliance costs to be toward the low end of this range, if not below it.

For non-reporters, Ecology assumed only basic planning and calculation tasks were necessary for determining reporting status. To maintain consistency with other mobile emissions reporters (fleets of aircraft, marine vessels, and rail equipment emitters) Ecology assumed that on-road motor vehicle fleet non-reporters would incur the same costs as other non-reporters.[35] Ecology calculated annual costs for non-reporters between $150 and $500. Ecology assumed the determination of whether to report would be one-time, unless significant changes to existing processes were made. Ecology annualized this range of non-reporter costs to be $13 to $44 dollars per year.

Ecology also stresses that a likely majority of non-reporters could determine compliance requirements during at 10-minute phone call with Ecology staff. It is therefore likely that

[34] Environmental Protection Agency (2009). Supporting Statement for EPA Information Collection Request Number 2265.01 "Information Collection Activities Associated with the SmartWay Transport Partnership". Exhibit 1.
[35] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

actual costs will be below this range, or insignificant. To remain conservative in cost estimation, however, Ecology chose to use the annualized cost range in its calculations.

Summing across all reporters and non-reporters of on-road vehicle fleet emissions, Ecology estimated Ecology's proposed rule will have a direct compliance cost of $596 thousand – $793 thousand, per year. As with other non-reporters, this is likely to be a one-time cost, unless operations change significantly from year to year, or a non-reporter is near the reporting threshold.

Reporting Fees

The authorizing statute allows Ecology to charge appropriate fees to reporters, based on the expected costs of the program. Ecology estimated the future workload of the reporting program, based on Ecology's proposed rule. This analysis is described in detail in Chapter 3.

Ecology estimated that total program costs will be $335 thousand per year. This was based on expected workload and staff demands, by position, as well as expected costs of state employment.

To allocate reporter fees across fleets, small emitters, and large emitters, Ecology followed the language in Ecology's proposed rule. Ecology broke the budget down into a flat fee (20 percent of the estimated total program cost), and additional fee paid only by stationary and combined source (not fleet) reporters pay. On-road fleet reporters are required to pay only the flat fee under Ecology's proposed rule. Ecology then divided the total on-road fleet fees to be paid by reporters to estimate that on-road fleet reporters will pay a flat fee of $105 per year. Multiplied by approximately 400 on-road fleet reporters, this is $40 thousand per year.

Benefits of the On-Road Fleet Requirement

Based on the expected fleet reporters and non-reporters used in cost calculations, Ecology estimated the benefits of GHG emissions reporting from fleets of on-road motor vehicles. Ecology estimated reported emissions based on fleet size and vehicle types. This was based on the best information available to Ecology.

Ecology developed a list of approximately 400 likely on-road vehicle fleet reporters, and estimated reported emissions from those fleets. Ecology estimated a total of 3.5 million to 5 million metric tons of CO_2e GHG emissions reported.

These additional reported emissions contribute to an inventory and understanding of Washington-specific emissions, their structure and sources, and their place in the economy. Qualitative discussion of the benefits of a comprehensive and broad-based GHG emissions inventory is in Chapter 4 of this document.

Summary

Ecology expects Ecology's proposed rule's reporting requirement for fleets to generate:

- $0.6 million– $0.8 million in annualized compliance costs for on-road vehicle fleet reporters and non-reporters.
- $40 thousand in annual on-road motor vehicle fleet reporting fees.
- Benefits associated with additional reporting of 3.5 million to 5 million metric tons of GHG emissions from on-road vehicle fleets, per year.

These benefits are identical whether compared to the conservative baseline of the proposed federal reporting rule, or the current statutory baseline of no-reporting.

Chapter 8: Conclusion and Comments

The Washington State Department of Ecology is proposing a rule to require reporting of greenhouse gas emissions from certain sources in the state.

The Administrative Procedure Act (Chapter 34.05 RCW) requires that, before adopting a significant legislative rule, Ecology must, "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." [RCW 34.05.328(1)(c)]

For Ecology's proposed rule regarding Reporting of Emission of Greenhouse Gases, (new Chapter 173-441 WAC), this means Ecology must estimate the impacts of Ecology's proposed rule on individuals, businesses and the public. Impacts are determined by comparing the expected regulatory environment in the absence of Ecology's proposed rule, to the way greenhouse gas emissions reporting will occur under Ecology's proposed rule.

The regulatory context of Ecology's proposed rule is unique, so Ecology analyzed the impacts of Ecology's proposed rule relative to two possible baselines:

- The proposed federal GHG reporting rule. This is the best assumption, at the time of this publication, of what a federal reporting rule will contain. Ecology expects the EPA to adopt a federal reporting rule in the next year.
- No reporting, as reflected by current regulation. This is the existing regulatory context at the time of this publication, but Ecology does not expect it to be the long-run level of regulation at the baseline.

Ecology has analyzed the ranges of quantifiable cost and benefit impacts, as well as numerous likely qualitative impacts, relative to both baseline options. Based on its analysis, Ecology has determined the likely benefits of Ecology's proposed rule exceed the likely costs, accounting for both quantified and qualitative impacts, and relative to both possible baselines.

Quantifiable Costs and Benefits of Ecology's Proposed Rule				
	Compared to Proposed Federal Rule*		**Compared to No Reporting**	
Emissions Source	**Annualized Costs** millions of $/year	**Benefits** GHG emissions reported; millions MT/year**	**Annualized Costs** millions of $/year	**Benefits** GHG emissions reported; millions MT/year**
Sites and Fleets of Non-Road Mobile Sources	$2.0 – $4.5	7.9	$2.5 – $6.4	40.5
On-Road Fleets of Motor Vehicles	$0.6 – $0.8	3.5 – 5.0	$0.6 – $0.8	3.5 – 5
Reporting Fees	$0.3		$0.3	
TOTALS	$2.9 – $5.6	11.4 – 12.9	$3.4 – $7.5	44.0 – 45.5

* Ecology expects the proposed federal GHG reporting rule to cost $0.5 – 0.9 million annually, and result in reporting of approximately 32.6 million metric tons of emissions annually.
** Emissions totals do not include indirect emissions, which would be reported under Washington's rule but neither of the baselines. Emissions estimates are based on site or fleet level reporting, not on organization level reporting that starts in 2012.

Costs of Ecology's Proposed Rule Relative to the Proposed Federal Rule

Ecology determined Ecology's proposed rule has quantifiable and qualitative costs. These costs amass to businesses required to comply with Ecology's proposed rule. These are costs estimated relative to a baseline of the proposed federal reporting rule. (They are costs in addition to costs created by the proposed federal rule if it is adopted.)

Ecology expects Ecology's proposed rule to result in compliance costs of:

- Annualized costs to site and nonroad mobile source reporters under Ecology's proposed rule of $2.0 million – $4.4 million.
- Annualized costs to site and nonroad mobile source non-reporters under Ecology's proposed rule of $39 thousand – $132 thousand.
- Annualized costs to fleets of on-road motor vehicles of $0.6 million – $0.8 million.
- Preliminary estimated reporter fees of $335 thousand.

Ecology calculated these costs based on the combined impacts, relative to the proposed federal reporting rule, of:

- Costs of broader applicability.
- Costs of broader coverage
- Costs of 2009 applicability
- Costs to reporters that do not have phased-in requirements
- Costs of including indirect emissions, biomass emissions, and emissions from some on-site mobile vehicles.
- Costs of including fleets of aircraft, marine vessels, and rail equipment.
- Costs of including on-road motor vehicle fleets.

Benefits of Ecology's Proposed Rule Relative to the Proposed Federal Rule

Ecology expects Ecology's proposed rule to have the following benefits, compared to the proposed federal reporting rule.

Benefits in additional metric tons of emissions reported above what is reported under the proposed federal rule, gained each year, include:

- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule (emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions).
- Over 2.1 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass from reporters only under Ecology's proposed rule (over 25,000 metric tons of CO_2e GHG emissions).
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered by The Climate Registry calculations used in Ecology's proposed rule, but not reflected in the proposed federal rule. Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported under the proposed federal rule. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from reporters reporting only under Ecology's proposed rule from fleets of on-road motor vehicles .
- Unquantifiable indirect emissions from nearly 260 sites and fleets of nonroad mobile sources that do not report under the proposed federal rule.
- Unquantifiable indirect emissions from 78 large reporters also reporting under the proposed federal rule.

The sum of the quantifiable increase in emissions reported is at least 11.4 million metric tons. This is 35 percent increase over total emissions reporting Ecology expects in the state under the proposed federal rule.[36]

These increases in emissions reported are related to several qualitative benefits Ecology expects Ecology's proposed rule to generate, including:

- Creation of a comprehensive emissions database.
- Broader coverage of 260 more emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 fleets of on-road mobile emissions sources.

[36] Ecology developed a list of potential and likely reporters under Ecology's proposed rule, which included large industrial reporters likely covered by the proposed federal rule. Ecology identified 78 sites in Washington State that would likely report under the proposed federal rule, emitting a total of 32.6 million metric tons of CO2e GHG emissions.

- Reporting of more emissions types, including: indirect emissions, rail equipment, aircraft, marine vessel, and on-road motor vehicle emissions as well as extended biomass, process, and fugitive emissions reporting.
- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.
- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

Costs of Ecology's Proposed Rule Relative to No Reporting

Ecology determined Ecology's proposed rule has quantifiable and qualitative costs. These costs amass to businesses required to comply with Ecology's proposed rule. These are full costs of Ecology's proposed rule, estimated relative to a baseline of no reporting.

Ecology expects Ecology's proposed rule to result in compliance costs of:

- Annualized costs to sites and fleets of nonroad mobile sources reporting under Ecology's proposed rule of $2.5 million – $6.3 million.
- Annualized costs to sites and fleets of nonroad mobile sources not reporting under Ecology's proposed rule of $39 thousand – $132 thousand.
- Annualized costs to on-road fleets of motor vehicles of $0.6 million – $0.8 million.
- Preliminary estimated reporter fees of $335 thousand.

Ecology calculated these costs based on the combined impacts, relative to no reporting, of:

- Costs of broad applicability.
- Costs of broad coverage
- Costs of 2009 applicability
- Costs of including indirect emissions, biomass emissions, and emissions from some on-site mobile vehicles.
- Costs of including fleets of aircraft, marine vessels, and rail equipment.
- Costs of including on-road motor vehicle fleets.

Benefits of Ecology's Proposed Rule Relative to No Reporting

Ecology expects Ecology's proposed rule to have the following benefits, compared to no reporting required.

Benefits in metric tons of emissions reported each year include:

- Approximate emissions totaling 32.6 million metric tons CO_2e of direct emissions from reporters emitting over 25,000 metric tons of CO_2e emissions.
- Approximate emissions totaling 2.6 million metric tons CO_2e of direct emissions from reporters emitting 10,000 to 25,000 metric tons of CO_2e GHG emissions.
- Over 2.1 million metric tons CO_2e of direct emissions from fleets of nonroad mobile sources.
- Over 2.2 million metric tons CO_2e of direct emissions due to biomass over 25,000 metric tons of CO_2e GHG emissions .
- Estimated emissions of less than 25,000 metric tons CO_2e of direct emissions from on-site mobile sources.
- Direct emissions covered in particular by The Climate Registry calculations used in Ecology's proposed rule Ecology did not have sufficient data to estimate the size of these emissions directly, but conservatively assumed 1 percent to 5 percent additional emissions reported, above what is reported by 78 large reporters. This is between 300 thousand and 1.6 million metric tons, or an average of 950 thousand metric tons CO_2e of direct emissions.
- 3.5 million to 5 million metric tons CO_2e of direct emissions from fleets of on-road motor vehicles .
- Unquantifiable indirect emissions from nearly 340 sites and fleets of nonroad mobile sources.

The sum of the quantifiable emissions reported is at least 44 million metric tons.

These emissions reported are related to several qualitative benefits Ecology expects Ecology's proposed rule to generate, including:

- Creation of a comprehensive emissions database.
- Coverage of nearly 340 emissions sources, including 36 marine vessel reporters, eight rail equipment reporters, and five aircraft reporters.
- Coverage of nearly 400 on-road mobile fleet emissions sources.
- Reporting of multiple emissions types, including rail equipment, aircraft, and marine vessel emissions, as well as on-road motor vehicles.
- Improved information for regulatory and industry planning.
- Improved information for prospective participation in emissions trading.

- Focus on a Washington-specific emissions composition.
- Public confidence in business and government transparency.
- Improved information for efficient consumer purchasing and investment.
- Business public relations and credibility in emissions.
- Broader scope for mandated future emissions reductions.
- Operations information for possible cost savings and efficiency.

Comment: Phasing-In and Effective Date

Ecology has reported annualized impacts of Ecology's proposed rule in this analysis. In annualizing, Ecology made the conservative assumption that costs would be incurred by all reporters and non-reporters beginning with 2009 emissions reported in 2010. Ecology expects actual costs to be lower for many reporters and non-reporters regulated by sections of Ecology's proposed rule that phase in (as late as 2012), but benefits associated with reporting from these emitters will also be delayed. Similarly, for some emitters, Ecology's proposed rule is effective for 2009 emissions, which creates an additional year or more of costs for those emitters, but it also creates an additional year or more of benefits from the information reported by those emitters. Ecology's conservative estimate encompasses the most conservative cost scenario.

Chapter 9: Least Burdensome Alternative Analysis

Introduction

RCW 34.05.328(1)(e) requires Ecology to "determine, 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."

Determination

Based on research and analysis required by RCW 34.05.328(1)(e) the Department of Ecology determines:

> *There is sufficient evidence the rule is the least burdensome version of the rule for those who are required to comply, given the goals and objectives of the law, for Ecology to propose the rule.*

This rulemaking was required by Chapter 14, Laws of 2008 – Engrossed Second Substitute House Bill 2815, Adopted 2008 Legislative Session, and codified primarily in chapters 70.235 RCW and 70.94 RCW. These authorizing statutes require Ecology to adopt rules under RCW 70.94.151 to establish monitoring and reporting of greenhouse gases. Ecology's understanding of the requirements and intent of House Bill 2815 constrained Ecology's range of choices in determining the content of the rule.

During the development of this rule, Ecology considered alternative versions of the rule, whenever possible, to ensure Ecology's proposed rule is the least burdensome alternative to achieve the general goals and specific objectives of the statute. Alternative rule language that did not meet the general goals and specific objectives of the statute being implemented – whether less burdensome than Ecology's proposed rule content, or not – could not be included in Ecology's proposed rule.

General Goals and Specific Objectives of the Authorizing Statutes

RCW 70.235.005 states:

> … (2) The legislature further finds that Washington should continue its leadership on climate change policy by creating accountability for achieving the emission reductions established in RCW 70.235.020, participating in the design of a regional multi-sector market-based system to help achieve those emission reductions, assessing other market strategies to reduce emissions of greenhouse gases, and ensuring the state has a well trained workforce to grow the clean energy sector and reduce the state's expenditures on imported fuels.
>
> (3) It is the intent of the legislature that the state will: (a) Limit and reduce the emissions of greenhouse gas consistent with the emission reductions established in RCW 70.235.020

…

(4) In the event the state elects to participate in a regional multi-sector market-based system, it is the intent of the legislature that the system will become effective by January 1, 2012, after authority is provided to the department for its implementation. By acting now, Washington businesses and citizens will have adequate time and opportunities to be well positioned to take advantage of the low-carbon economy and to make necessary investments in low-carbon technology.

RCW 70.235.020 states:

(1)(a) The state shall limit emissions of greenhouse gases to achieve the following emission reductions for Washington State:
(i) By 2020, reduce overall emissions of greenhouse gases in the state to 1990 levels;
(ii) By 2035, reduce overall emissions of greenhouse gases in the state to twenty-five percent below 1990 levels;
(iii) By 2050, the state will do its part to reach global climate stabilization levels by reducing overall emissions to fifty percent below 1990 levels, or seventy percent below the state's expected emissions that year.

…

Consistent with this directive, the department shall take the following actions:
(i) Develop and implement a system for monitoring and reporting emissions of greenhouse gases as required under RCW 70.94.151; and
(ii) Track progress toward meeting the emission reductions established in this subsection, including the results from policies currently in effect that have been previously adopted by the state and policies adopted in the future, and report on that progress.

These sections delineate the broad intent and usefulness of the proposed GHG reporting rule, which is created specifically under RCW 70.94.151. That statute states in subsection (5):

(a) The department shall adopt rules requiring the reporting of emissions of greenhouse gases as defined in RCW 70.235.010. The rules must include a de minimis amount of emissions below which reporting will not be required for both indirect and direct emissions. The rules must require that emissions of greenhouse gases resulting from the burning of fossil fuels be reported separately from emissions of greenhouse gases resulting from the burning of biomass. Except as provided in (b) of this subsection, the department shall, under the authority granted in subsection (1) of this section, adopt rules requiring any owner or operator: (i) Of a fleet of on-road motor vehicles that as a fleet emit at least

twenty-five hundred metric tons of greenhouse gas annually in the state to report the emissions of greenhouse gases generated from or emitted by that fleet; or (ii) of a source or combination of sources that emit at least ten thousand metric tons of greenhouse gas annually in the state to report their total annual emissions of greenhouse gases. In calculating emissions of greenhouse gases for purposes of determining whether or not reporting is required, only direct emissions shall be included. For purposes of reporting emissions of greenhouse gases in chapter 14, Laws of 2008, "source" means any stationary source as defined in RCW 70.94.030, or mobile source used for transportation of people or cargo. The emissions of greenhouse gases must be reported as carbon dioxide equivalents. The rules must require that persons report 2009 emissions starting in 2010. The rules must establish an annual reporting schedule that takes into account the time needed to allow the owner or operator reporting emissions of greenhouse gases to gather the information needed and to verify the emissions being reported. However, in no event may reports be submitted later than October 31st of the year in which the report is due. The department may phase in the reporting requirements for sources or combinations of sources under (a)(ii) of this subsection until the reporting threshold is met, which must be met by January 1, 2012. The department may from time to time amend the rules to include other persons that emit less than the annual greenhouse gas emissions levels set out in this subsection if necessary to comply with any federal reporting requirements for emissions of greenhouse gases.

(b) In its rules, the department may defer the reporting requirement under (a) of this subsection for emissions associated with interstate and international commercial aircraft, rail, truck, or marine vessels until (i) there is a federal requirement to report these emissions; or (ii) the department finds that there is a generally accepted reporting protocol for determining interstate emissions from these sources.

(c) The department shall share any reporting information reported to it with the local air authority in which the owner or operator reporting under the rules adopted by the department operates.

(d) The fee provisions in subsection (2) of this section apply to reporting of emissions of greenhouse gases. Owners and operators required to report under (a) of this subsection who fail to report or pay the fee required in subsection (2) of this section are subject to enforcement penalties under this chapter. The department shall enforce the reporting rule requirements unless it approves a local air authority's request to enforce the requirements for sources operating within the authority's jurisdiction.

(e) The energy facility site evaluation council shall, simultaneously with the department, adopt rules that impose greenhouse gas reporting requirements in site certifications on owners or operators of a facility permitted by the energy facility site evaluation council. The greenhouse gas reporting requirements imposed by

the energy facility site evaluation council must be the same as the greenhouse gas reporting requirements imposed by the department. The department shall share any information reported to it from facilities permitted by the energy facility site evaluation council with the council, including notice of a facility that has failed to report as required. The energy facility site evaluation council shall contract with the department to monitor the reporting requirements adopted under this section.

(f) In developing its rules, the department shall, with the assistance of the department of transportation, identify a mechanism to report an aggregate estimate of the annual emissions of greenhouse gases generated from or emitted by otherwise unreported on-road motor vehicles.

(g) The inclusion or failure to include any person, source, classes of persons or sources, or types of emissions of greenhouse gases into the department's rules for reporting under this section does not indicate whether such a person, source, or category is appropriate for inclusion in the multi-sector market-based system designed under RCW 70.235.020.

(h) Should the federal government adopt rules sufficient to track progress toward the emissions reductions required by chapter 14, Laws of 2008 governing the reporting of greenhouse gases, the department shall amend its rules, as necessary, to seek consistency with the federal rules to ensure duplicate reporting is not required. Nothing in this section requires the department to increase the reporting threshold established in (a) of this subsection or otherwise require the department's rules be identical to the federal rules in scope.

(i) The definitions in RCW 70.235.010 apply throughout this subsection (5) unless the context clearly requires otherwise.

This section describes the specific objectives of this rulemaking, in designing Ecology's proposed rule. Ecology could not include elements in Ecology's proposed rule that do not, at a minimum, meet the standards of this statute.

Further, Ecology understands the legislative intent of Engrossed Second Substitute House Bill 2815 to be to establish a comprehensive program to reduce greenhouse gas emissions in Washington. The legislature also found that "Washington should continue its leadership on climate change policy by creating accountability for achieving the emission reductions established in section 3 of this act…." In order to reduce greenhouse gas emissions, they must first be accurately accounted for and measured. To accomplish this, the legislature envisioned a greenhouse gas reporting program that is sufficiently broad in scope and coverage to account for greenhouse gas emissions from major emitting sectors. This rulemaking meets the legislative intent by establishing a reporting program that will accurately and consistently measure greenhouse gas emissions from covered sources.

Alternative Rule Content Considered

This section discusses alternative rule content that Ecology considered during rulemaking, and why it was not included in Ecology's proposed rule language. Each subsection also includes the rule language that was included in Ecology's proposed rule – *shown in italics*.

Third-party Verification

Ecology considered including third-party verification of greenhouse gas emissions reports in Ecology's proposed rule. Third-party verification is an accepted method for ensuring accuracy of reported emissions and is required by voluntary (The Climate Registry) as well as mandatory (California Air Resources Board) greenhouse gas reporting programs. Verification of reported emissions by an independent third-party can ensure the data reported for individual reporters is accurate and consistent over time and across industry sectors and complies with the requirements of the reporting rule. While accuracy, consistency, and compliance are important for any reporting program, it becomes critical when the data is used to support a cap and trade program. The authorizing statute states the rule must establish a reporting schedule that allows a reporter to gather the information needed and to verify the emissions being reported. The statute does not specify the level of verification that the rule should or should not require.

Alternative rule language considered:

- Third-party verification becomes effective in 2010 for reporters with > 25,000 metric tons (MT) of emissions.
- Third-party verification becomes effective when Washington participates in a regional or national cap and trade program.
- *Third-party verification is not required in the draft rule. Ecology may review the emissions report and conduct audits or site inspections to verity the reported emissions.*

Ecology considered several alternatives for implementing third-party verification within the reporting rule. Third-party verification could either begin on a specific date (i.e., year 2010), or be required of particular reporters (i.e., those emitting at least 25,000 metric tons of greenhouse gases), or both. Ecology supported the requirement for third-party verification beginning in 2010 when it appeared that Washington might pass cap and trade legislation during the 2009 legislative session. When the legislation did not pass, Ecology considered rule language to require third-party verification when Washington began participating in a regional or national cap and trade program.

To create a viable and comprehensive GHG emissions inventory, Ecology determined that it was unduly burdensome to require the expense of third-party verification in the absence of a trading scheme such as a regional or national cap and trade program. Similarly, Ecology determined that it could create excess burden for greenhouse gas reporters to undergo third-party verification when Washington began participating in a cap and trade program, if Washington's verification requirements differed significantly from the verification requirements of such a program.

Since no cap and trade program currently exists, Ecology did not include third-party verification in Ecology's proposed rule. Excluding third-party verification from the reporting rule avoids the possibility of creating undue burden for greenhouse gas emissions reporters, while there is no cap and trade program within Washington State. To ensure Completeness and accuracy of reported emissions, and to achieve the goals and objectives of the statute, Ecology may conduct reviews of emissions reports and perform audits and site inspections of selected emissions sources. This means, however, that Ecology may need to revise reporting requirements in the future to reflect the verification needs of a cap and trade program if Washington becomes a participant in such a program.

Phasing in Reporting Requirements

The authorizing statute requires Ecology to establish reporting of greenhouse gas emissions by owners or operators of "a source or combination of sources" of emissions. The authorizing statute also allows Ecology to phase in reporting requirements for a source or combination of sources until January 1, 2012. The statute does not allow Ecology to phase in any of the reporting requirements for fleets of on-road motor vehicles. Ecology interprets this statutory language to mean that Ecology has the discretion to phase in certain elements of the reporting requirements until 2012. However, all other reporting requirements must be met by January 1, 2012. The following sections discuss the various reporting requirements where Ecology considered phasing options, the options that were considered, and why an option was chosen.

Phasing in Entity/Organization Level Reporting

The authorizing statute requires any owner or operator of a source or combination of sources that emit at least 10,000 MT CO_2e to report emissions from those sources of emissions. Ecology interprets this to mean that an owner or operator must report emissions at the entity or organization level. To reduce the burden to reporters in the early years of reporting, Ecology considered phasing in this reporting requirement by allowing reporting of emissions for only those operations that individually meet the reporting threshold. Operation-level reporting is consistent with the requirements of the EPA proposed rule and with the California Air Resources Board (CARB) mandatory reporting rule.

Alternative rule language considered:

- Entity or organizational level reporting beginning with 2009 emissions reported in 2010, as required in the authorizing statute.
- Operation-level reporting in 2009 and 2010. Entity level reporting beginning in 2011.
- *Site- level reporting in 2009, 2010, and 2011. Entity level reporting beginning with 2012 emissions reported in 2013. This is the maximum phasing allowed by statute.*

Ecology considered a no-phasing option that would require entity level reporting beginning with 2009 emissions, but determined that a no-phasing option would place undue burden on reporters in the initial years of the reporting program. Ecology also considered phasing in entity level reporting by requiring reporting of emissions for each individual operation that meets the reporting threshold for 2009 and 2010 emissions.

Ecology determined the least burdensome option for proposed rule language would allow operation-level reporting through 2011, for the maximum timeframe allowed by statute. This option – requiring reporting at the entity level beginning with 2012 emissions reported in 2013– complies with the minimum requirements of the statute, without creating an added burden for reporters that own or operate multiple operations under one business, while achieving the general goals and specific objectives of the statute.

Phasing in reporting threshold

The authorizing statute establishes a reporting threshold of 10,000 MT CO_2e of greenhouse gases for a source or combination of sources of emissions, defined as a stationary source (as defined in RCW 70.94.030) or mobile source used for transportation of people or cargo. Ecology is allowed by the authorizing statute to phase in this reporting threshold. To reduce the burden to reporters, Ecology considered phasing in this reporting threshold.

Alternative rule language considered:

- All reporters with $\geq$ 10,000 MT emissions begin reporting in 2009.
- *10,000 MT reporting threshold phased in. Threshold for 2009 emissions to be reported in 2010 is set at 25,000 MT. 10,000 MT threshold begins for 2010 emissions to be reported in 2011.*

The greenhouse gas reporting rule will not be adopted until late 2009 even though the statute requires reporting of 2009 emissions. Ecology recognizes that this timing may create an undue burden on some reporters, particularly smaller reporters who may not be as familiar with calculating and reporting emissions. While it would also comply with the statute, Ecology determined that a 10,000 metric ton threshold for reporters beginning with 2009 emissions would place an added burden on smaller reporters. Setting the reporting threshold at 25,000 MT for 2009 emissions will capture most of the emissions reported and establish a usable base of reported emissions for 2009. Providing an extra year for smaller reporters to comply with the reporting rule removes the burden for these reporters while still achieving the general goals and specific objectives of the statute.

The phasing of the reporting threshold was not extended until 2012, the latest date allowed under statute, because Ecology believes it is important to begin collecting emissions data from all reporters before 2012. Providing an added year for the smaller reporters to comply with the reporting rule will provide enough time for those

reporters to become familiar with the rule and develop a system for collecting and reporting their emissions data. This is balanced against the need to begin collecting data from all reporters in order to establish an inventory of emissions sources within Washington. This inventory will provide data needed to develop policies to limit and reduce the emissions of greenhouse gases consistent with the emission reductions established in RCW 70.235.020. Based on this, Ecology chose a phasing option that imposes the 10,000 metric ton threshold beginning with 2010 emissions reported in 2011.

Phasing-In Report Consistency

The authorizing statute requires Ecology to develop and implement a system for monitoring and reporting emissions of GHGs that tracks progress towards meeting the emission reductions established in the statute. Since the data will be used to compare emissions over time, the data must be collected as consistently as possible to reduce process variables and get an accurate representation in the change in emissions for a given reporter. The consistency requirement is designed to minimize the frequency of a reporter changing reporting methods. If methods are changed, then the reporter is required to adjust prior emission reports to match the new method, but only if the necessary data are available and only for the years still covered by the document retention period.

Alternative rule language considered:

- Consistency of reported emissions is required "throughout the organization" in addition to "over time".
- The requirement to adjust data from previous reports is triggered by a five-percent change in emissions because of the method change. This threshold is based on the individual method change, not total emissions. There is no limit to the number of years an organization has to adjust prior emissions.
- Reporters must consistently report emissions over time, beginning with 2009 emissions reported in 2010. A reporter may switch to a higher tiered method if the reporter continues to use the new method in future years. A reporter cannot switch to a lower tiered method unless the data required for the previous higher tiered method is no longer available or the organization changes. If possible, a reporter must adjust prior reports if a change in methods alters total direct or indirect emissions by more than five percent. This requirement is limited to the time period covered in the document retention section.
- *Report consistency described in the third bullet above is phased in and does not begin until 2011 emissions reported in 2012.*

Ecology considered many alternatives in creating the requirement that reporting be consistent over time, and that past reports must be updated with the current method to

maintain consistency. Originally, the consistency requirements applied to different operations and units in Washington as well as changes over time. This requirement was removed to reduce the burden on organizations that might have similar, but not identical sources across the state.

The requirement to update past reports was originally triggered by a five-percent difference in emissions between the units or processes calculated using the new method compared to the emissions from the same units or processes using the old method. Ecology chose to change the five percent threshold to being based on the reporter's total direct or indirect emissions to reduce the frequency of having to adjust prior reports and be more consistent with other GHG reporting protocols. Ecology further mitigated the requirement by limiting it to the time that reporters are required to retain documentation.

Ecology then chose to reduce the burden imposed by phasing in the report consistency requirement. This likely reduced the burden for reporters adjusting calculation methods in the first years of the program and provides reporters an opportunity in the early years of the program to find a method that works for them.

Enforcement

The authorizing statute allows Ecology to impose enforcement penalties against reporters who fail to report emissions or pay the reporting fee. SSB 5042, adopted during the 2009 legislative session under Chapter 359 Laws of 2009, provides for the waiver of penalties for first-time paperwork violations by small businesses.

Alternative rule language considered:

- The department may take any of the regulatory actions for enforcement to meet the provisions of RCW 43.21B.300, including civil and criminal penalties.
- *In addition to the bullet point above, rule language was added to allow enforcement of first time violators modeled after SSB 5042, "Providing a waiver of penalties for first-time paperwork violations by small businesses". The language in the reporting rule extends the waiver of penalties for first time paperwork violations to all reporters, not just small businesses and allows Ecology to waive fines or civil penalties for first time reporting violations.*

Ecology considered implementing the enforcement provisions, as allowed by statute, but determined that this would place undue burden on first time reporters. To address this concern, Ecology included language in Ecology's proposed rule, modeled after SSB 5042, which allows for the waiver of fines and penalties for first-time reporting rule violations by any reporter, not just small businesses. Inclusion of this language allows Ecology to reduce the prospective burden on reporters throughout the reporting program and maintain an enforcement standard while achieving the general goals and specific objectives of the statute. This reduces the possible burden arising from not only errors in calculation, but from errors in, or lack of, supporting paperwork.

Exclusion De Minimis and Simplified Estimation Methods

The authorizing statute requires the rules include a de minimis amount of emissions below which reporting will not be required for both direct and indirect emissions. Ecology included two forms of exclusion de minimis and simplified estimation methods to meet this requirement and minimize the burden of reporting.

Alternative rule language considered:

- Operation-level exclusion de minimis of an unlimited number of sites, as long as the site's total emissions are < 5 MT. The 5 MT limit is applied separately to direct and indirect emissions.
- In addition to operation-level exclusion de minimis, unit level exclusion de minimis of an unlimited number of certain unit types. This applies to stationary stand alone refrigeration units with a combined refrigerator and freezer capacity less than or equal to sixty cubic feet and stationary stand alone air conditioning units with a cooling capacity of 10,000 BTU's per hour or less. In addition to exclusion de minimis, simplified estimation methods up to 3% of total direct emissions (CA percentage, EU uses 2%) with a cap of 10,000 MT.
- In addition to the above bullet points, identical simplified estimation methods for indirect emissions, which are kept separate from direct emissions.
- In addition to the above bullet points, increasing the simplified estimation method allotment to 5% of total direct or indirect emissions. (Corresponds to the percentage used by The Climate Registry.)
- *In addition to the above bullet points, Ecology explicitly limited reporting for mobile sources to the sources specifically referenced in the authorizing statute.*

The concept of exclusion de minimis has been replaced in most reporting protocols (including TCR, CARB, and WCI) by simplified estimation methods or eliminated altogether (EPA). The major reporting scope difference influencing small emission sources between Washington's statute and most other protocols is Washington's requirement for entity / organization level reporting. Ecology thus interpreted exclusion de minimis to ease the burden for small operations by exempting operations that emit five metric tons or less of direct or indirect emissions from reporting.

Ecology later expanded exclusion de minimis by also exempting certain small air conditioning and refrigeration units from reporting. This reduces the burden of tracking small emission sources. Refrigeration and air conditioning units were chosen due to stakeholder input indicating that small units were not currently tracked.

Simplified estimation methods were also included to reduce the burden of reporting small sources, provide flexibility, and be consistent with other reporting protocols. Ecology chose to allow five percent of total emissions (applied to direct and indirect emissions separately) to be calculated using simplified estimation methods. This percentage is the

maximum found in other protocols. A cap of ten thousand metric tons was applied to maintain the integrity of Washington's reporting threshold while minimizing the burden on smaller reporters.

Ecology also limited reporting for mobile sources to the sources specifically mentioned in the authorizing statute (on-road motor vehicles, fleets of aircraft, marine vessels, and rail equipment). While not specifically de minimis, this interpretation excludes all other land-based mobile sources from reporting, including: forklifts, front-end loaders, mobile cranes, and most mining, forestry, construction, and agricultural equipment.

Unit-Level Reporting for Emissions Sources

Many, but not all quantification methods require calculations on the unit level. This information is often necessary for an agency or verifier to perform an emissions audit. The proposed EPA rule requires unit level reporting for many emissions sources.

Alternative rule language considered:

- Require unit-level reporting of emissions.
- *Remove requirement for most emissions sources to report unit-level information.*

Ecology considered requiring reporters to include emissions estimation at the unit level, in emissions reports. Reporters had concerns with increased data entry and confidentiality of unit level information. Ecology determined the requirement created undue burden for reporters, and removed the requirement from Ecology's proposed rule language. Unit-level reporting remains for some sources, where Ecology adopted EPA protocols to maintain consistency with the federal rules. Reporters are required to retain any unit level information needed to replicate emissions calculations and provide the data to Ecology upon request.

Requirement for a Greenhouse Gas (GHG) Inventory Management Plan

The purpose of a greenhouse gas inventory management plan is to ensure that emissions calculations and other information that is required to be reported under the rule are transparent, accurate, and independently verifiable. The management plan would include systems of internal audit, quality assurance, and quality control for the reporting program and the data reported. If Ecology's proposed rule were to require an inventory management plan, the reporter would have to provide the plan upon request by Ecology. Similarly, as part of its record keeping requirements the EPA proposed rule requires a reporter to provide, upon request, a written quality assurance performance plan.

Alternative rule language considered:

- Require reporters to prepare and maintain a GHG inventory management plan that ensures that emissions calculations and other information that is required to be reported under this rule are transparent, accurate, and independently verifiable.
- *Remove requirements for a GHG inventory management plan.*

Ecology considered requiring reporters to prepare and maintain a GHG inventory management plan. After further review of reporting and record keeping requirements, Ecology determined that the requirement to prepare and maintain an inventory management plan created undue burden for reporters and removed this requirement from Ecology's proposed rule language. The document retention and record keeping requirements within Ecology's proposed rule require the reporter to maintain sufficient records to allow Ecology to review and verify reported emissions without the requirement for the reporter to prepare a separate inventory management plan. Removal of this requirement allows Ecology to reduce the prospective burden on reporters while achieving the general goals and specific objectives of the statute.

Reporting Fees

The authorizing statute directs Ecology to establish and collect reporting fees to compensate for the costs of administering the reporting program. Similar to fee schedules for other Air Quality Program rules, Ecology considered methods for allocating the fees among reporters in the most fair manner.

Alternative rule language considered:

- Allocate fees evenly among all reporters
- *Base the fees on a workload analysis that projects the resource requirements for administering the reporting program. Prepare a budget for administering the reporting program based on the workload analysis.*
- *Allocate fees among reporters based on amount of reported emissions and complexity of reported emissions by establishing a flat component and an emissions component of the reporting fee. The components are allocated as follows:*
    - *The flat component is weighted at 20 percent of the budget amount and is allocated among all reporters.*
    - *Acknowledgement that reporters of fleets of on-road motor vehicles are the least complex reporters by only applying the flat component of the fee to them.*
    - *The emissions component applies to reporters of emissions from all sources other than fleets of on-road motor vehicles. Reporters with emissions < 25,000 MT are weighted at 30 percent of the budget amount, and that is allocated among all reporters in this category. Reporters with emissions $\geq$ 25,000 MT are weighted at 50 percent of the budget amount, and that is allocated among all reporters in this category.*

In determining fee distribution across reporters, Ecology considered allocating fees evenly across all reporters, dividing program costs by the number of reporters. While this method is simpler, Ecology found that it may place uneven burden on smaller reporters that require less expenditure of program time and funds, as they are less likely to require

complicated verification of reported emissions by agency staff. Instead, Ecology chose to allocate fees based on emissions and the complexity of the reporting and associated agency verification.

On-road fleet reporters only pay the flat component of the fee (20 percent of the budget, divided by the total number of reporters) under Ecology's proposed rule, as Ecology expects their reports to be the most straightforward. All other reporters pay the flat component plus an emissions component based on whether their emissions are above or below 25,000 MT. Complicated multiple-source reporters (for example, those with operation emissions, on-site vehicles, and fleets) are expected to require larger amounts of time and resources from Ecology to review and verify reported emissions.

To acknowledge the anticipated difference in workload based on the complexity and quantity of emissions, the emissions component allocates 50 percent of the budget to reporters with emissions equal to or greater than 25,000 MT and 30 percent of the budget to reporters with emissions less than 25,000 MT. Ecology believes that this approach to allocating fees will reduce the prospective burden on smaller and less complex reporters while achieving the general goals and specific objectives of the statute.

Providing Documents to Ecology

To be able to review and verify the reported emissions, Ecology must have access to the data and documents the reporter used to develop its inventory of emissions. Ecology's proposed rule requires the reporter provide documents and data to Ecology, upon request. Ecology considered various timelines for a reporter to respond to a request for documents and data.

Alternative rule language considered:

- Reporter must provide documents to Ecology within 10 business days of the request.
- Reporter must provide documents to Ecology within 15 business days of the request.
- *Reporter must provide documents to Ecology within 30 calendar days of the request.*

Ecology's proposed rule requires reporters to retain all documents regarding the design, development, and maintenance of the greenhouse gas inventory. The documents and data retained by the reporter must be made available to Ecology, upon request. Ecology considered the more burdensome option of giving reporters ten business days or fifteen business days to comply with a request for the documents or data. After considering comments from stakeholders, Ecology instead chose a longer compliance period of 30 calendar days for document submittal.

Record Retention

To be able to review and verify the reported emissions, Ecology must have access to the data and documents the reporter used to develop its inventory of emissions. Ecology's proposed rule requires that the reporter retain all documents and data regarding the design, development and maintenance of the GHG inventory. The retained documents must be sufficient to allow Ecology to review an emissions report. Ecology considered various timelines for a reporter to retain documents.

Alternative rule language considered:

- Reporter must retain documents and data for seven years.
- *Reporter must retain documents and data for five years.*

Ecology's proposed rule requires reporters to retain all documents regarding the design, development, and maintenance of the greenhouse gas inventory. The documents and data retained by the reporter must be made available to Ecology, upon request. Ecology considered the more burdensome option of requiring documents to be retained for seven years. The seven year requirement was the same as WCI's Essential Requirements of Mandatory Reporting. The seven year record retention requirement also better supported other requirements under third-party verification, such as the limitation on the number of years a reporter could contract with a specific verification body. Other reporting systems, such as Oregon's reporting rule and the EPA proposed rule, require documents to be retained for five years. After third-party verification was removed from Ecology's proposed rule, the decision was made to change the document retention period to five years to reduce the burden on reporters and to be more consistent with other reporting programs.

Quantification Methods

The authorizing statute requires reporting from a source or combination of sources that emit at least ten thousand metric tons of direct GHG's each year. Once the threshold is triggered, direct and indirect emissions must be reported for stationary sources as well as interstate and international fleets of aircraft, rail equipment, and marine vessels. Standardized protocols are necessary to provide a framework for reporters, consistency throughout the program, and ensure that reported emissions are comparable from reporter to reporter and over time.

Alternative rule language considered:

- Reporters must use methods contained in The Climate Registry's General Reporting Protocol.
- Reporters have significant freedom to choose methods among those in The Climate Registry. Reporters are only limited in method choice to methods requiring already available data.
- First two bullet points, plus methods from EPA proposed rule and CARB Mandatory Reporting Rule for specific sectors in Ecology's rule.

- First three bullet points, plus a protocol for indirect emissions of electricity to use a utility specific emissions factor to be calculated by Washington Department of Commerce (Commerce).
- *First four bullet points, plus a provision to allow reporters to petition Ecology to use a protocol not contained in the rule if that protocol is well recognized and widely accepted.*

Ecology began with a relatively restrictive approach to quantification methods required under Ecology's proposed rule – only those methods in The Climate Registry's General Reporting Protocol. Instead of dictating which TCR method a reporter must use, Ecology allowed reporters to choose from the TCR methods. They were only confined to methods the reporter already had existing data for. This reduced the burden of reporting by only requiring new data, equipment, or accounting procedures if a reporter did not meet any of TCR's tiers or qualify for simplified estimation methods. At the request of stakeholders, Ecology added methods from the EPA's proposed national GHG reporting rule as applied to specific sectors, and a protocol for indirect emissions from electricity using emissions factors from Commerce. This inclusion increases consistency with the proposed federal rule and minimizes duplicative regulatory requirements on reporters. Finally, Ecology included a provision to allow nationally accepted methods other than those already specified, when approved by Ecology, and included language confirming that Ecology will accept protocols included in EPA's proposed rule.

Each of these developments served to reduce burden on the regulated community, while retaining the goal of accurate emissions quantification and consistency indicated by the authorizing statute. That is, more burdensome options for emissions quantification were rejected as the sole required method, but collectively created the least burdensome regulatory option possible.

Fleets of on-road motor vehicles

The authorizing statute requires reporting from fleets of on-road motor vehicles that emit at least two thousand five hundred metric tons of direct GHG's each year. Standardized protocols are necessary to provide a framework for reporters, consistency throughout the program, and ensure that reported emissions are comparable from reporter to reporter and over time. Ecology based on-road motor vehicle reporting on TCR methods as most other protocols do not require mobile sources to report. Reporting is on a statewide fleet basis from the beginning since on-road motor vehicles are mobile by nature and can be difficult to associate with a specific operation.

Alternative rule language considered:

- Reporters must use The Climate Registry's General Reporting Protocol to calculate on-road motor vehicle emissions. This requires fuel tracking or detailed mpg and mileage for CO_2. Mileage (or fuel use and detailed mpg data) and detailed vehicle information are needed for CH_4 and N_2O. Quantity of refrigerant systems is required for HFC emissions.

- *Because of stakeholder input, Ecology developed a simplified method that only requires total fuel use by type for CO_2, CH_4, and N_2O. For most reporters, this removes the need to track mileage, mpg, and detailed vehicle specific information.*
    - *The screening method is considered a tiered method for on-road motor vehicle AC/refrigeration and does not count towards the 5% simplified estimation methods quota.*
    - *Fuels that are < 50 percent biomass may be reported as pure fossil fuel.*
- *Ecology developed a method specifically for the needs of trucking companies for determining what emissions occur in Washington.*
- *Ecology developed a method specifically for the needs of rental companies for determining what emissions occur in Washington.*
- *Freedom to choose among methods for determining what emissions occur in Washington for each type of vehicle.*

Similar to developing the least burdensome option for quantification methods, Ecology began with a more burdensome requirement for reporting on-road fleet emissions and added less complex alternatives that provide reporters with flexibility and reduced data handling requirements. The quantification methods are based on TCR methods. Ecology developed and incorporated a simplified estimation method that allows CH_4 and N_2O emissions to be calculated with only fuel use data. This significantly reduces the reporting burden for most reporters by not requiring the tracking and reporting of vehicle specific information, mileage, or fuel efficiency. Ecology designated TCR's screening method for refrigeration and air-conditioning emissions as a tiered method for on-road motor vehicles, allowing the use of the method without using part of the fleet's five percent simplified estimation methods quota. Ecology also allowed reporters the option of choosing to report fuel of less than fifty percent biomass origin to be reported as their fossil fuel equivalents. This allows reporters to choose if they prefer credit for biomass emissions or streamline reporting by not having to track the variable biogenic content of low biomass fuels often available at public pumps.

When developing methods to determine if emissions occur in Washington state, specific methods were developed for rental fleets and interstate trucking. The method for rental fleets eliminates the need to track data they do not have or install new equipment, rental clauses, and/or procedures. The method for interstate trucking follows the requirements of tax programs and significantly reduces the amount of new data to be collected. Ecology also included the freedom to choose among methods for determining what emissions occur in Washington for each type of vehicle.

Ecology also created a calculator that incorporates the new less complicated methods for the regulated community to reduce compliance burden associated with precise understanding of the rule context and quantification methods. Fleet managers can go to Ecology's website, download the calculator, enter a minimum amount of data, and determine their on-road fleet emissions in five to ten minutes without having to research the protocols or perform calculations.

Mobile Sources

The authorizing statute requires reporting of emissions from mobile sources used for the transportation of people or cargo. The statute allows for the deferment of reporting emissions from interstate or international mobile sources, but Ecology interprets the legislative intent for those emissions to be reported if technically feasible. Ecology based mobile source reporting on TCR methods. Reporting is on a statewide fleet basis from the beginning since emissions are mobile by nature and can be difficult to associate with a specific operation.

Fleets of Aircraft

Alternative rule language considered:

- *Reporters must use The Climate Registry's General Reporting Protocol to calculate emissions. This requires fuel tracking and refrigerant information but not mileage, fuel efficiency, or detailed vehicle specific information.*
- *The instate emissions determination is restricted to flights with takeoffs and landings in Washington state.*
- *Phasing reporting of intrastate emissions from aircraft until 2012, the maximum amount of time allowed by statute.*
- *Deferring interstate and international reporting indefinitely, as allowed by statute.*

Ecology did not consider alternatives to TCR quantification methods for aircraft emissions as most other protocols do not require aircraft to report. To reduce burden, Ecology chose to phase in reporting of intrastate emissions beginning reporting with 2012 emissions reported in 2013, and to use the deferment option to indefinitely limit reporting to aircraft traveling within Washington State. The instate emissions determination is restricted to flights with takeoffs and landings in Washington state. This was done to reduce data tracking requirements and increase simplicity.

Fleets of Marine Vessels

Alternative rule language considered:

- *Reporters must use The Climate Registry's General Reporting Protocol to calculate emissions. This requires fuel tracking and refrigerant information but not mileage, fuel efficiency, or detailed vehicle specific information.*
- *Ecology structured the rule to avoid requiring reporting from marine vessels transiting Washington waters on the way to Canada with no stops in Washington.*
- *Ecology only requires half of emissions occurring on stretches of rivers with a shared border as the other half are considered to occur in the other state.*

Ecology did not consider alternatives to TCR quantification methods for marine vessel emissions as most other protocols do not require marine vessels to report. Ecology did not choose to phase in reporting of intrastate emissions or to use the deferment option to limit reporting to marine vessels traveling exclusively within Washington State to minimize competitive differences compared to other mobile sources such as rail and trucking and because the necessary data is already reasonable available to reporters. Most marine vessels are currently required to track and broadcast exact position, heading, destination, and speed information in real time.

For marine vessel emissions reporting, Ecology excluded reporting requirements for vessels that pass through Washington waters, but continue to Canada without stopping. Ecology also only requires half of emissions occurring on stretches of rivers with a shared border as the other half are considered to occur in the other state.

Fleets of Rail Equipment

Alternative rule language considered:

- *Reporters must use The Climate Registry's General Reporting Protocol to calculate emissions. This requires fuel tracking and refrigerant information but not mileage, fuel efficiency, or detailed vehicle specific information.*
- *At the request of a stakeholder, we added a method for determining what emissions occur in WA.*
- *Reporters have freedom to choose among methods for determining what emissions occur in WA for each type of rail equipment.*

Ecology did not consider alternatives to TCR quantification methods for rail equipment emissions as most other protocols do not require rail equipment to report. Ecology did not choose to phase in reporting of intrastate emissions or to use the deferment option to limit reporting to rail equipment traveling exclusively within Washington State to minimize competitive differences compared to other mobile sources such as marine vessels and trucking and because the necessary data is already reasonable available to reporters. Many rail operators currently use sophisticated real time position tracking and equipment inventory systems. A limited number of track border crossings make instate determinations even more straightforward.

For rail emissions reporting, Ecology developed a method to determine Washington-specific emissions. This choice reduced the burden for rail emissions reporters, by simplifying the estimation required to isolate GHG emissions only in Washington State. Ecology believes this is the most feasible method, given available data on the rail industry. In addition, Ecology expanded the options for the rail industry to determine Washington-specific emissions for each type of rail equipment. Ecology believes this flexibility creates the least burden for rail emissions reporters, while maintaining reliable GHG emissions estimates.

Other Land-Based Mobile Sources

Alternative rule language considered:

- Reporters must use The Climate Registry's General Reporting Protocol to calculate emissions. This requires fuel tracking and refrigerant information but not mileage, fuel efficiency, or detailed vehicle specific information. TCR protocols include all combustion units (aka lawnmowers).
- Ecology used the statutory language "for the transport of people or cargo" to eliminate reporting for many units.
- Ecology included a provision that allows reporters the choice to just track total fuel use, without the need to separate emissions by vehicle type or even subtract out non-reportable emissions if they decide that is easier (common fueling tank method).
- Phased reporting for the maximum amount (2012).
- *Specifically defined mobile sources to exclude reporting for other land based mobile sources.*

While writing Ecology's proposed rule language, Ecology considered The Climate Registry's protocols for other land based mobile sources. Ecology further emphasized the statute's condition for mobile sources as transporting people or cargo to eliminate reporting of GHG emissions from some combustion units to create a smaller burden of compliance on reporters. Ecology also provided an option of reporting emissions based on total fuel use (that may or may not include fuel for sources that do not transport people or cargo) to further increase options and reduce the reporting burden. Ecology also considered requiring GHG emissions reporting from other land-based mobile sources beginning in the first year of reporting. As allowed by statute, however, Ecology chose the latest effective date for reporting these emissions, beginning with 2012 emissions reported in 2013. This option creates less burden for reporters, not only by delaying these reporting costs, but by allowing three reporting years for reporters to plan and prepare for full compliance.

Eventually Ecology explicitly altered the definition of mobile source to only include on-road motor vehicles, aircraft, marine vessels, and rail equipment. This effectively excludes all other land based mobile sources from reporting including: forklifts, front-end loaders, mobile cranes, and most mining equipment, forestry equipment, construction equipment, and agricultural equipment.

Report Deadline

The authorizing statute requires that Ecology establish an annual reporting schedule that considers the time needed for a reporter to gather the information needed and to verify the emissions being reported, with reports being submitted by October 31 of each year. However, the authorizing statute does not prevent Ecology from establishing an earlier reporting deadline for some or all reporters.

Alternative rule language considered:

- Reporting deadline of April 1 of each year for reporters subject to 3rd party verification, as third-party verification would require early completion of calculations so the verifier could complete the process within the timeline provided. A reporting deadline of October 31 of each year for reporters not subject to third-party verification.
- *Reporting deadline of October 31 for all reporters. This is the latest reporting date allowed by statute.*

Ecology considered a reporting deadline to correspond to other proposed or existing GHG reporting deadlines. EPA's proposed rule has a March 31 reporting deadline; WCI's Essential Requirements of Mandatory Reporting has a reporting deadline of April 1. The Climate Registry's voluntary reporting program has a report deadline of June 30. When Ecology was considering requiring third-party verification for some reporters, there was a need to establish an earlier reporting deadline that would provide enough time for the verifier to complete the verification process and meet the deadline for verification established within Ecology's proposed rule. After Ecology determined that third-party verification would not be required as part of this rule making, it was decided that one reporting deadline should be established for all reporters. To reduce burden imposed on reporters by time constraints, data availability, and multiple reporting schemes, Ecology extended the reporting deadline to October 31, the latest date allowable by statute. This allows reporters maximum flexibility in determining the timeline for constructing reports while achieving the general goals and specific objectives of the statute.

Requirement to report after emissions fall below the reporting threshold

The authorizing statute directs Ecology to develop and implement a system for monitoring and reporting emissions of greenhouse gases as required under RCW 70.94.151 and to track the progress toward meeting the emission reductions established in RCW 70.235.020. Ecology believes it is essential to have consistent reporting from year to year from reporters meeting the applicable reporting threshold(s) in order to develop an accurate and reliable emissions inventory over time. A provision in Ecology's proposed rule to require reporters to continue to report emissions when those emissions vary above and below the reporting threshold regularly ensures the development of a reliable and accurate record of emissions over time. This approach avoids having a reporter fall in and out of the reporting program from year to year.

Alternative rule language considered:

- If a reporter's emissions change such that they fall below the reporting threshold, the reporter must continue to report until the emissions are below the reporting threshold for a minimum of three consecutive years.
- *In addition to the first bullet, added the ability for a reporter to petition Ecology to end reporting requirements when there is a change in operations resulting in the permanent reduction of direct emissions below the reporting threshold or when the emissions source permanently stops operations.*

Ecology determined that consistency in reporting over time, and reporting requirements that compensate for temporary reductions in emissions that drop emissions levels below reporting thresholds were necessary in Ecology's proposed rule to maintain a consistently accurate emissions inventory from regulated sources. To address this, Ecology considered requiring reporters to continue to report emissions for a minimum of three consecutive years when those emissions change such that they fall below the reporting threshold. If the reported emissions have remained below the reporting threshold for three consecutive years, the reporter does not need to report again until emissions meet the reporting threshold again. However, the intent of this restriction is not to extend reporting when a source changes operations and can predictably expect a permanent reduction in GHG emissions. Ecology recognizes that this may place an undue burden on reporters that have permanently reduced emissions due to a change in operations or when the emissions source permanently ceases operations. To address this concern, Ecology added an option to Ecology's proposed rule language that would allow a reporter to petition Ecology to end reporting requirements before the three year timeline if the reporter can demonstrate that emissions reductions are permanent.

Alternate Federal and State GHG Reporting Schemes

Before, and overlapping with, the development of Ecology's proposed GHG reporting rule, other states and the EPA proposed or adopted reporting rules for emissions of greenhouse gases. Ecology considered these as alternatives to Ecology's proposed rule as a whole, as well as particular elements of these schemes for inclusion in Ecology's proposed rule. This section describes why Ecology did not propose a rule identical, or more similar to, rules in other jurisdictions. In some cases, Ecology's proposed rule or its elements are less burdensome than the alternative rules. While in other cases Ecology did not believe that particular elements within the alternative federal and state rules sufficiently met the goals and objectives of the authorizing statutes. In no instances do any of the alternative federal and state reporting rules, as a whole, meet the statutory requirements of HB 2815. Therefore, Ecology could not propose a rule that was identical to any of these alternative reporting rules.

Federal (EPA) Proposed Rule

The federal GHG reporting rule proposed by the EPA (Federal Register Docket ID No. EPA-HQ-OAR-2008-0508) differs from Ecology's proposed rule in several areas. The EPA proposed rule:

- Is based on sector specific protocols and thresholds. Therefore, it only applies to a specific list of industries and suppliers, as well as stationary combustion sources that have a total maximum rated heat input capacity of the stationary fuel combustion units at the facility of at least 30 mmBtu/hr.

  Ecology does not believe that further limiting the applicability of Ecology's proposed rule sufficiently meets the standards outlined in the statute authorizing the development of a GHG emissions inventory for the state, but

acknowledges that this option would be less burdensome for those categories not included in the EPA rule. Including a general reporting protocol such as TCR's GRP gives Washington a more thorough emissions assessment including all sectors and all six GHG's specified in statute, is more in line with an emissions threshold based system, makes the threshold determination more straightforward, and adds consistency to the program. For mobile sources, the EPA rule regulates GHG emissions from fuel suppliers and engine manufacturers, rather than fleet owners, which shifts burden on a national scale, but is not viable at the state level, and with most mobile source manufacturing occurring outside the state.

- Has a reporting threshold of 25,000 metric tons of carbon dioxide equivalent emissions.

  Similarly, including only very large reporters would likely reduce or eliminate the burden on smaller reporters, but Ecology does not believe the agency would sufficiently comply with the reporting thresholds established in the authorizing statute and legislative intent by including only the largest reporters with emissions of 25,000 MT or greater in the regulated community. Ecology attempted to reduce disproportionate burden on small businesses, within the bounds of the statutes, however. This effort is described in the associated Small Business Economic Impact Statement (Ecology publication number 09-02-018).

- Requires report submission by March 31 of each year.

  The submission deadline of October 31under Ecology's proposed rule is later than the proposed EPA deadline of March 31. The October 31 deadline is the latest reporting date allowed under the authorizing statute. This reduces burden on the reporter by extending the timeline for emissions calculations, and allowing greater flexibility for coordinating compliance with federal and state level requirements.

- Becomes effective for 2010 emissions, or the first year of facility operation.

  Washington's authorizing statute requires reporting to begin with 2009 emissions. The statute allows Ecology to phase in some reporting requirements. However, phasing is not allowed for owners or operators of a fleet of on-road motor vehicles that meets the 2,500 MT reporting threshold established in statute. Therefore, these reporters must report 2009 emissions in 2010. As discussed in Section 4 of this document, Ecology proposes to phase in certain reporting requirements for emissions sources required to report under the 10,000 MT threshold.

- Includes some phasing-in of requirements until 2011 emissions.

Ecology's proposed rule takes advantage of the statutory ability to phase in Ecology's proposed rule requirements between one and three years, until 2012, the latest year allowed by statute. This is at least as long a phasing-in period as that under EPA's proposed rule. To reduce the burden during the first year of reporting, Ecology is phasing in entity level reporting, the reporting threshold for a source or combination of sources, and the report consistency requirements. See Section 4 of this document for details on the reporting elements that are being phased in under Ecology's proposed rule.

- Allows agency review of emissions reports.

  Under Ecology's proposed rule, Ecology will verify emissions reports at the agency level, and include administrative costs of verification in the program's workload analysis and budget. This budget will be funded by fees collected from reporters. See Third-party Verification of this report for additional discussion of verification.

- Requires records retention for five years.

  Ecology's proposed rule also has a five-year required records retention period

- Incorporates tiered industry-specific emissions calculation methods that differ from TCR methods.

  Ecology has incorporated quantification methods for specific sectors from EPA's proposed rule into Ecology's proposed rule. Ecology has also included language to allow a reporter to petition Ecology to use an EPA (or other approved quantification method). This allows reporters to use EPA's methods to minimize duplicative reporting requirements as much as possible while complying with Washington's statutory requirements. Statutory limitations and the fact that EPA's rule is still in development prevent Ecology from adopting EPA's methods uniformly and call for the inclusion of TCR methods.

- Does not include emissions from fleets of mobile sources. Reporting of emissions from mobile sources is only covered upstream by fuel suppliers and engine manufacturers.

  The proposed EPA rule does not require reporting of emissions from fleets of on-road motor vehicles or mobile sources for transporting people or cargo, while Washington's statute requires operator reporting from these sources. While Ecology recognizes that this requirement creates an added burden for some reporters, Ecology does not believe exclusion of these mobile sources would fulfill the requirements for a comprehensive and useful program set out by the legislature and the authorizing statute. Upstream reporting is more

feasible for a federal program, with fewer boundary leakage issues and an established engine manufacturer emissions testing program.

Oregon State Rule

At the request of stakeholders, this section compares the requirements in the GHG reporting rule developed in Oregon State, to Ecology's proposed rule. The Oregon rule:

- Applies to permitted Title V facilities that emit at least 2,500 metric tons of carbon dioxide equivalent greenhouse gases, plus facilities holding Air Contaminant Discharge Permits (ACDP) in specified industries, similar to those listed by EPA.

  Washington's authorizing statute clearly mandates reporting thresholds for a source or combination of sources that emit ten thousand metric tons of GHG each year or a fleet of on-road motor vehicles that emit two thousand five hundred metric tons of GHG each year. Oregon's applicability standards are not statutorily compatible with Washington's program. The Oregon Department of Environmental Quality expects their rule to affect about 150-200 facilities in their state. Ecology does not believe that such a small regulated population would comprehensively represent significant emissions in Washington State, or create a GHG emissions inventory that would be useful in planning and gauging emissions reductions over time.

- Exempts landfills and wastewater treatment plants with a Title V or ACDP permit for one year, beginning with 2010 emissions.

  Like the Oregon rule phases in its requirements for landfills and wastewater treatment, Ecology's proposed rule phases in most requirements, including for landfills and wastewater. Some of these requirements are delayed until as late as 2012 emissions. This is the latest allowed by statute.

- Requires records retention for five years.

  Ecology's proposed rule also has a five-year required records retention period.

- Uses quantification methods used by the Western Climate Initiative, where possible. Is considering comment proposals of alternate quantification methods derived from a set of existing nongovernmental, state, and federal programs. May include industry-specific quantification methods.

  WCI calculation methods were not finalized during Ecology's rulemaking process. Ecology felt that it was important for reporters to have finalized protocols available during the rulemaking process so they could thoroughly evaluate the methods and get started collecting the data necessary to report.

The WCI methods are mostly based on California methods, which our stakeholders have expressed that they have concerns with.

Ecology chose a reporting method framework that maintains the goal of accurate emissions calculation, while allowing flexibility in data and quantification methods to reduce compliance burden. Ecology's emissions quantification methods allow at least as much flexibility as Oregon's rule, as it is currently less prescriptive than the WCI methods used in the Oregon rule. The Oregon rule may ultimately, however, include more quantification methods, as it has encouraged public comment regarding them.

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Appendix A: Compliance Cost Calculations for Sites, Fleets of Aircraft, Marine Vessels, and Rail Equipment

Ecology estimated compliance costs under Ecology's proposed rule, for stationary, air, marine, and rail emitters based on several inputs:

- Labor and capital requirements consistent with assumptions in EPA's Regulatory Impact Analysis of the proposed federal reporting rule, under both highly conservative and mostly likely behavior scenarios.[37]
- Updated estimates of the cost of employment from the US Bureau of Labor Statistics.[38]
- 7 percent discount rate consistent with EPA standards, as well as industry-specific discount rates where available.[39]
- 20-year analytical time frame for annualizing costs.
- High-end estimates based on unlikely monitoring and technological emissions estimation.
- Low-end estimates based on calculations using existing or easily-acquired business data.
- Non-reporter costs based on calculations using existing or easily-acquired business data, as consistent with EPA analysis of the proposed federal reporting rule.[40]
- Assumption of no economies of scale in reporting across size, emissions, or multiple reporting activities.

Ecology's method for reporters and non-reporters of emissions from sites, fleets of aircraft, marine vessels, and rail equipment is summarized in this appendix. For summary of Ecology's method in estimating costs to on-road vehicle fleet operators, see Appendix B.

Reporter Costs

For industry-specific estimates of the labor and capital required to report GHG emissions, at the conservative technology-based and monitoring-based level, Ecology used estimated labor hours and capital costs as assumed in EPA's Regulatory Impact Analysis of the currently proposed federal GHG reporting rule. Ecology calculated estimates based on both the most highly conservative, but also highly unlikely scenario of reporting costs, and based on the more likely lower-cost scenario allowed for in Ecology's proposed rule, as Ecology's

[37] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

[38] US Bureau of Labor Statistics (2008). May 2008 National Occupational Employment and Wage Estimates: United States, and US Bureau of Labor Statistics. Wages and salaries as percentage of total compensation., database query. 2004 – 2009.

[39] Hoovers business database query for returns to invested capital by industry category. www.hoovers.com

[40] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

proposed rule allows for more freedom in the tier selection process that allows entities to choose the most cost-effective estimation method given their resources.

The most likely scenario costs for industry-based emissions from sites and fleets of nonroad mobile sources were based on only managerial, some technical, clerical, and legal labor, with minor capital costs, if any. Ecology believes that covered entities will seek to minimize costs efficiently, and so considers these low-end estimates to be possible for some reporters. Ecology used this most likely scenario as one end of the costs range. Ecology estimated the extreme upper end of compliance costs using the highly unlikely compliance scenario requiring monitoring and capital equipment. This upper-end cost, while extremely conservative, is also unlikely, as reporters will use flexibility in Ecology's proposed rule to minimize costs, and will resort to the highest cost scenario only if none of the multiple options in Ecology's proposed rule are viable.

Ecology used occupational wage estimates, and percentages of total compensation and costs of employment from the US Bureau of Labor Statistics, to calculate per-hour costs for various legal, technical, clerical, and managerial positions. Ecology multiplied these hourly costs by their respective labor time costs to develop total labor costs for reporters by industry.

Table A-1 summarizes the cost of employment estimates by job category.

Table A-1: Employment Costs

Term used in analysis	Median Hourly	Mean Hourly	Expected Cost of Employment / hour)
Administrative	$15.71	$16.66	$23.72
Clerical	$15.71	$16.66	$23.72
eng/tech	$35.57	$36.74	$50.32
environmental engineer	$38.33	$38.59	$52.86
environmental manager	$58.50	$61.90	$92.55
industrial eng/tech	$38.00	$38.24	$52.38
industrial manager	$45.45	$50.06	$74.85
Lawyer	$46.56	$52.44	$71.83
Legal	$46.56	$52.44	$71.83
legal counsel	$46.56	$52.44	$71.83
Managerial	$48.38	$53.40	$79.84
refinery eng/tech	$44.51	$43.45	$59.51
refinery manager	$57.15	$58.77	$87.87
senior manager	$55.72	$63.69	$95.23
technical (technician and engineering occupations)	Average of multiple technical occupations, below.	$29.52	$40.43
	$23.80	$25.71	
	$28.08	$28.37	
	$27.32	$27.14	
	$32.63	$31.55	

Table A-2 summarizes the annualized GHG reporting costs estimated for twelve industries.

Table A-2: Annualized Site GHG Reporting Costs, per Operation			
NAICS Group	**Industry group or Sub-industry**	**Low**	**High**
221	Wastewater Treatment	$4,591	$4,970
221	Utilities	$2,500	$56,040
562	Landfills	$3,107	$3,790
311	Food Manufacturing/Processing	$10,413	$11,476
321	Wood Product Manufacturing	$375	$637
322	Paper Manufacturing	$5,813	$9,866
324	Petroleum and Coal Products Manufacturing	$3,579	$3,759
325	Chemical Manufacturing	$5,969	$21,093
327	Nonmetallic Mineral Product Manufacturing	$4,835	$33,182
331	Primary Metals Manufacturing	$25,520	$31,501
334	Computer and Electronics Manufacturing	$30,943	$30,943
336	Transportation Equipment Manufacturing	$20,663	$21,320

For entities not covered by a comparable set of assumptions in the industries listed in Table A-2, Ecology developed conservative estimates of cost based on existing data. Entities that Ecology determined were likely site or fleet of nonroad mobile source reporters, but were not listed in Table A-2, included commercial operations, military, and corrections facilities. Ecology assumed that these facilities could incur the compliance costs associated with reporting emissions for multiple sets of air, marine, and/or rail emissions.

Due to deficiencies in data, aircraft, marine vessel, and rail equipment emissions reporting was assumed to be the average of the estimated industry-based compliance costs, excluding technological monitoring and associated operations and maintenance costs. All of these entities were also assumed to report some form of indirect emissions, electricity purchases, biomass, and limited on-site vehicle emissions if applicable, assumed to have equal cost to reporting other mobile nonroad fleet emissions.

Ecology calculated present-value total costs, based on flows of costs over a 20-year timeframe. It then annualized them using both a 7 percent discount rate (consistent with EPA, and the nearest to current historical risk-free investment rates), and industry-specific returns to capital. Overall, there was no significant difference between annualized costs across the two discount rates. Ecology used the 7 percent rate in its final analysis, as industry-specific rates were not available or appropriate for all types of entities in the full Cost-Benefit Analysis.

Table A-3 summarizes the annualized total GHG reporting costs for all expected reporters under Ecology's proposed rule.

Table A-3: Annualized Total GHG Reporting Cost, per Operation		
Industry group or Sub-industry	**Low**	**High**
Chemical Manufacturing	$7,626	$22,750

Commercial	$6,627	$6,627
Computer and Electronics Manufacturing	$32,599	$32,599
Food Manufacturing/Processing	$12,070	$13,132
Marine vessel, Aircraft, or Rail equipment	$1,657	$1,657
Nonmetallic Mineral Product Manufacturing	$6,492	$34,838
Paper Manufacturing	$7,470	$7,470
Petroleum and Coal Products Manufacturing	$5,236	$5,416
Primary Metals Manufacturing	$27,177	$33,157
Transportation Equipment Manufacturing	$22,320	$22,977
Utilities	$4,157	$57,697
Wood Product Manufacturing	$2,032	$2,293

Ecology expects Ecology's proposed rule to cover about 340 site and fleet of nonroad mobile sources, including:

- 193 sites under 25,000 MT CO_2e expected to report only under Ecology's proposed rule.
- Five aircraft emitters expected to report only under Ecology's proposed rule.
- Eight rail equipment emitters expected to report only under Ecology's proposed rule.
- 36 marine vessel emitters expected to report only under Ecology's proposed rule.
- 13 biomass emitters expected to report only under Ecology's proposed rule.
- 4 emitters in sectors not covered by the proposed federal rule, expected to report only under Ecology's proposed rule.
- 78 sites expected to report under both Ecology's proposed rule, and the proposed federal reporting rule.

Based on the energy intensity of different production activities, and employment size of firms as a proxy for operation size, Ecology estimated that about 340 sites and fleets of nonroad mobile sources in the state are likely to be required to report under Ecology's proposed rule.[41] Ecology summed the expected costs applied to each expected reporter to develop the costs used in this analysis.

Non-Reporter Costs

Ecology followed otherwise identical methods for non-reporters of site, marine, aircraft, and rail equipment emissions, as it did for expected reporters. Compliance costs of investigating whether to report, however, differed for non-reporters. Ecology used labor and capital use

[41] Washington State Employment Security Department. Workforce Explorer. http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94&SUBID=149, Nicholas Institute for Environmental Policy Solutions (2007). Size Thresholds for GHG Regulation: Who Would be Affected by a 10,000 ton CO2 Emission Rule, and Energy Information Administration (2002). Manufacturing Energy Consumption Survey. Table 6.4 Manufacturing fuel consumption by Manufacturing Industry and Employment Size.

estimates consistent with assumptions in EPA's analysis of the proposed federal reporting rule.

As with reporters, Ecology used the EPA's estimates of labor time and capital required to determine non-reporting status as the high end of the cost range. As Ecology has allowed in Ecology's proposed rule for non-reporters to use simplified emissions estimation methods that allow entities to calculate emissions based on existing or easily acquired business data. Based on this, Ecology estimated a low-end cost based on EPA's method using labor time and capital required,[42] but limited calculation only to added labor time, without data acquisition. This generated an estimated non-reporter cost of $150 – $500, or annualized costs of $13 to $44 per year.

[42] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

Appendix B: Compliance Cost Calculations for On-Road Motor Vehicle Fleet Reporters

Ecology estimated compliance costs under Ecology's proposed rule, for fleets of on-road vehicles, based on several inputs:

- Labor and capital requirements consistent with assumptions in EPA's analysis of reporting burden arising from the voluntary SmartWay Transport Partnership.[43]
- Updated estimates of the cost of employment from the US Bureau of Labor Statistics.[44]
- 7 percent discount rate consistent with EPA standards, as well as industry-specific discount rates.[45]
- 20-year analytical timeframe for annualizing costs.
- Non-reporter costs based on calculations using existing or easily-acquired business data, as consistent with EPA analysis of the proposed federal reporting rule.[46]
- Assumption of no economies of scale in reporting across size, emissions, or multiple reporting activities.

Ecology's method for on-road motor vehicle fleet reporters and non-reporters is summarized in this appendix.

Reporter Costs

For industry-specific estimates of the labor inputs required to report GHG emissions, Ecology used estimated labor hours as assumed in EPA's analysis of the reporting burden of the voluntary SmartWay Transport program. The reported information, calculation models, and required data under that program are similar to the compliance burden of on-road motor vehicle fleet reporters under Ecology's proposed rule.

The basic compliance cost for a reporter was estimated to be based on:

[43] Environmental Protection Agency (2009). Supporting Statement for EPA Information Collection Request Number 2265.01 "Information Collection Activities Associated with the SmartWay Transport Partnership". Exhibit 1.
[44] US Bureau of Labor Statistics (2008). May 2008 National Occupational Employment and Wage Estimates: United States, and US Bureau of Labor Statistics. Wages and salaries as percentage of total compensation., database query. 2004 – 2009.
[45] Hoovers business database query for returns to invested capital by industry category. www.hoovers.com
[46] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf

- 2 first-year manager hours
- 6.16 first-year technical hours
- 1 first-year clerical hour
- 1 subsequent-year manager hour
- 3.66 subsequent year technical hours
- 1 subsequent year clerical hour

Table B-1 summarizes the cost of employment estimates by job category.

Table B-1: Employment Costs			
Term used in analysis	**Median Hourly**	**Mean Hourly**	**Expected Cost of Employment / hour)**
Administrative	$15.71	$16.66	$23.72
Clerical	$15.71	$16.66	$23.72
eng/tech	$35.57	$36.74	$50.32
environmental engineer	$38.33	$38.59	$52.86
environmental manager	$58.50	$61.90	$92.55
industrial eng/tech	$38.00	$38.24	$52.38
industrial manager	$45.45	$50.06	$74.85
Lawyer	$46.56	$52.44	$71.83
Legal	$46.56	$52.44	$71.83
legal counsel	$46.56	$52.44	$71.83
Managerial	$48.38	$53.40	$79.84
refinery eng/tech	$44.51	$43.45	$59.51
refinery manager	$57.15	$58.77	$87.87
senior manager	$55.72	$63.69	$95.23
technical (technician and engineering occupations)	Average of multiple technical occupations, below.	$29.52	$40.43
	$23.80	$25.71	
	$28.08	$28.37	
	$27.32	$27.14	
	$32.63	$31.55	

Ecology used occupational wage estimates, and percentages of total compensation and costs of employment from the US Bureau of Labor Statistics, to calculate per-hour costs for various legal, technical, clerical, and managerial positions. Ecology multiplied these hourly costs by their respective labor time costs to develop total labor costs for reporters by industry.

Ecology estimated the basic compliance cost to be $292 per year.

Ecology observed, however, a broad range in fleet composition. Ecology used data on fleet composition – size of vehicle and fuel type – to develop an index (numbered 1-6; representing number of vehicle types in the fleet) of fleet composition complexity. In this way, Ecology estimated the impact of reporting for a complex fleet using not only many vehicles, but multiple types of vehicles and fuels. Ecology assumed no economies of scale in increasing fleet complexity, and so estimated on-road motor vehicle fleet reporting cost as the index number multiplied by the basic compliance cost.

For those on-road motor vehicle fleet operators that Ecology did not have vehicle type or fuel data for, Ecology assumed the distribution of costs was similar to that of all other fleet reporters. Ecology assigned costs to these reporters proportionally, based on the percentages of other on-road motor vehicle fleet reporters in each complexity category.

Table B-2 summarizes on-road vehicle fleet reporter annual costs.

Table B-2: Total Annualized Reporting Costs and Proportions, per On-Road Vehicle Fleet

Fleet Complexity (number of vehicle types in fleet)	Reporters	Percentage of Total	Annualized Reporting Cost
1	45	10.9%	$292
2	66	16.2%	$585
3	41	10.0%	$877
4	50	12.1%	$1,169
5	45	10.9%	$1,462
6	163	39.9%	$1,754

Non-Reporter Costs

Ecology followed identical methods for non-reporters of on-road vehicle fleet emissions, as it did for expected non-reporters of other emissions. Ecology used labor and capital use estimates consistent with EPA's analysis of the proposed federal reporting rule.

As Ecology has allowed in Ecology's proposed rule for non-reporters to use simplified emissions estimation methods that allow entities to calculate emissions based on existing or easily acquired business data. Based on this, Ecology estimated a low-end cost based on EPA's method using labor time and capital required,[47] but limited calculation only to additional labor time, without data acquisition. This generated an estimated non-reporter cost of $150 – $500, or annualized costs of $13 to $44 per year.

[47] Environmental Protection Agency (2009). Regulatory Impact Analysis for the Mandatory Reporting of Greenhouse Gas Emissions Proposed Rule (GHG Reporting), Final Report. http://www.epa.gov/climatechange/emissions/downloads/GHG_RIA.pdf