Guidance for Ecology
Including Greenhouse Gas Emissions in SEPA Reviews

The purpose of this document is to assist Ecology staff in determining which projects should be evaluated for greenhouse gas emissions and how to evaluate those emissions under SEPA when Ecology is the lead agency. This document does not attempt to provide a comprehensive overview of SEPA - see the SEPA Handbook and Ecology's SEPA Intranet page for more general information about SEPA. This internal guidance is intended to answer specific questions about including greenhouse gases in a SEPA analysis. It is not an adopted rule and SEPA decisions on whether a project has significant impacts must still be made on a case-by-case basis. It also is not intended to take the place of the procedure for considering greenhouse gas emissions already being used by the Nuclear Waste Program for projects at the Hanford site.

This document will be revised as agency staff recommend improvements and to reflect any relevant decisions by the Shorelines Hearing Board or other tribunals. Questions and suggested improvements should be sent to both Janice Adair at jada461@ecy.wa.gov **and** Brenden McFarland at bmcf461@ecy.wa.gov. Gail Sandlin in the Air Quality Program (gasa461@ecy.wa.gov) is available to assist with the SEPA GHG reviews.

A. SEPA and climate change

SEPA requires state and local agencies to identify, disclose, and consider the probable environmental impacts that may result from their decisions. Greenhouse gas (GHG) emissions adversely affect the environment by contributing to global climate change. In turn, global climate change results in environmental impacts in Washington such as rising sea levels and changes in water supply. These changes can impact the built environment, and SEPA requires these types of impacts to be disclosed, too.

Thus, two different climate change impacts of a proposal should be considered.

1. New GHG emissions caused by the proposal
2. The effects of a changing climate on the proposal's new infrastructure as a result of:
    a. Increased sea levels
    b. Reduced snowpack
    c. Changes in water availability
    d. Changes in stream flow timing
    e. Increased forest fires
    f. More extreme precipitation events and flooding

B. Ecology's role in SEPA reviews

Ecology plays one of three roles in reviewing a SEPA analysis.

1. Lead agency
2. Agency with jurisdiction (where another governmental entity is the lead agency, but Ecology will be issuing permits for the project)

3. Other - no agency action on proposal (we are an agency with expertise, a commenting agency, or no review or comment)

This document is to be used when Ecology is either the lead agency or an agency with jurisdiction. It is not expected that Ecology will review SEPA analyses solely for GHG emissions.

C. Greenhouse gases in brief

Greenhouse gases include carbon dioxide (CO_2), methane (CH_4), Nitrous oxide (N_2O), nitrogen trifluoride (NF_3), hydrofluorcarbons (HFCs), perflurocarbons (PFCs), and sulfur hexafluoride (SF_6).

In a very simple sense, GHG emissions are air pollutants. However, there are distinctive features about these emissions that make them different from other air pollutants.

GHGs, and in particular carbon dioxide, are emitted by a vast number of sources, both natural and anthropogenic, in amounts ranging from trivial to massive. These emissions mix rapidly and uniformly in the atmosphere. They contribute equally to global concentrations no matter where they are emitted. A ton of CO_2 emitted from Seattle has the same effect on global concentrations as a ton emitted in Clarkston. Unlike many conventional air pollutants, local concentrations of GHGs are not greater near large sources than they are in areas far away.

Carbon dioxide equivalent (CO_2e) is the preferred measure for determining GHG emissions rates for any combination of these GHGs. Emissions of greenhouse gases are typically expressed in a common metric, so that their impacts can be directly compared, as some gases have a higher global warming potential (GWP) than others.

How will I know if a particular project will result in GHG emissions?

GHG emissions come from multiple sources in widely varying levels. The majority of GHG emissions are produced by the burning of fossil fuels. The most common sources are:

- Energy production and use, including transportation (e.g. vehicles)
- Industrial manufacturing processes, including[1]:
    - Cement
    - Glass
    - Steel
    - Aluminum
    - Lime
    - Pulp and Paper
    - Oil and gas refining
    - Silicon production

[1] These industrial facilities are typically energy intensive and will include a number of boilers. The manufacturing process itself will also create greenhouse gas emissions.

- Waste disposal and wastewater treatment
- Electricity or natural gas distribution
- Permanent deforestation
- Cattle manure management

While nearly every project will have some level of GHG emissions, not every project will produce emissions to a level that warrants disclosure.

It is important to note that under current state law (RCW 70.235.020(3)), emissions of carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals are not considered a greenhouse gas.

D. Which emissions need to be disclosed?

"New" emissions that are expected to average 10,000 metric tons or more of carbon dioxide equivalent (CO_2e) per year and that are "proximately caused" by the proposal should be disclosed. We expect the majority of projects to be below this level of emissions.

10,000 metric tons is the equivalent of the emissions produced by 2,092 passenger cars in one year. Attachment 1 is a screening table that can be used by staff to determine if a proposal is likely to emit greater than 10,000 metric tons per year.

"New" emissions are any emissions that will result from the project that are additional ("above and beyond" current emission levels). For example, replacing an existing boiler with a more efficient boiler might result in no "new" emissions if the new boiler decreases emissions whereas an industrial development on land currently used for agriculture would likely result in some quantity of "new" emissions. A proposal that will improve or replace infrastructure but not add any new business or throughput would not be expected to result in "new" operational or transportation emissions. Relocating an operation could result in additional emissions, or might reduce emissions depending on the specifics of the relocation. Relocating a supply route from one location to another, such as between ports or distribution centers, may not result in new emissions.

"Proximate cause" means a "reasonably close causal relationship between the environmental effect and the alleged cause." It is the standard that the United States Supreme Court adopted under NEPA.[2] Although Washington courts have not ruled on this issue as it relates to SEPA, we have used the same standard in the state because it presents a reasonable approach to defining the scope of impacts that need to be considered. Proximate cause requires a showing that the proposal is the cause of the emissions in a direct sequence, unbroken by any superseding cause. The courts have further defined proximate cause as whether the action and the impacts (emissions) are "two links of [the same] chain." If the environmental impact is linked to the action, then it should be considered under SEPA.

[2] *Dept. of Transp. v. Public Citizen*, 541 U.S. 752, 754 (2004)

Generally, Ecology believes that only larger development projects such as new industrial facilities and electricity generation units will have emissions to a level that will necessitate their specific disclosure. For example, a proposal to redevelop a site into an industrial park would likely have emissions that would require disclosure. On the other hand, a building permit for a small business enterprise would not be expected to have emissions that necessitate disclosure even though the completed project will use energy and there may be traffic associated with the business.

E. How should GHG emissions be quantified?

When quantifying new emissions that are caused by the project, proponents should use accepted protocols and emissions factors such as those outlined in Attachment 2. We have also developed a simple tool that will be helpful in quickly estimating emissions from specific projects. It is available online: SEPA GHG Calculation Tool.

F. What are the boundaries of the project for which emissions must be disclosed?

For all impacts, WAC 197-11-060(4)(b) states that "In assessing the significance of an impact, a lead agency shall not limit its consideration of a proposal's impacts only to those aspects within its jurisdiction, including local or state boundaries." If the emissions are proximately caused by the project, they should be disclosed regardless of their location.

The project proponent should carefully consider any transportation emissions associated with movement of products related to the operation of the project. At a minimum, the analysis should include the emissions that occur within Washington state, including the nautical three mile boundary if transporting products by ship. For projects with ongoing operations that include transporting products from outside the state, such as a port, a more thorough and perhaps more defensible analysis would include the transportation emissions from the source location outside of Washington to the final destination *if either is known and the extent to which either is known*. Whether or not SEPA requires the transportation analysis to include these out-of-state transportation emissions is an unsettled question under SEPA case law.

Remember that this document does not supersede or otherwise replace the current SEPA handbook and provisions prohibiting piecemealing and other requirements on defining the scope of the project still apply.

G. What level of detail is needed for emissions disclosure?

For projects that are expected to annually produce an average estimate of at least 10,000 but less than 25,000 metric tons CO_2e, proponents should at least *qualitatively* disclose the GHG emissions caused by the project. A qualitative disclosure should include a general description of the project's expected source(s) of the emissions, as well as any proposed GHG mitigation measures incorporated or designed into the project.

Proponents of projects that are expected to produce an average of 25,000 or more metric tons CO_2e each year should include a *quantitative* disclosure of GHG emissions. The screening table included as Attachment 1 can be used by staff to estimate if a proposal is likely to require this quantitative analysis. The quantitative analysis should include GHG emissions from all phases of the project. Emissions from the operation of the completed

project should be disclosed separately from emissions associated with the project construction including site preparation and any demolition. This will allow the agency to better understand the difference between short term and long term emissions. In addition, the proponent should average the annual estimated operational emissions over the lifespan of the project. Remember that the SEPA rules require the official to consider mitigation measures which the proponent proposes to implement as part of the proposal, including any mitigation measures required by other existing environmental rules or laws.

The GHG analysis should include emissions in the following categories.[3,4]

Scope 1 Emissions

- Direct stationary combustion of fossil fuels once the project is complete.
- Vehicle fleet emissions once the project is complete.
- Loss of carbon storage from the permanent conversion of forested lands.
- Methane emissions from new landfills, wastewater treatment plants, or manure management systems.

Scope 2 Emissions

- Purchased electricity or steam consumed by the project.

Scope 3 Emissions

- Heavy-machinery emissions during site preparation, construction, or clean-up activities.
- New on-going product transportation emissions that are caused by the project; as noted above in F, this will at a minimum include emissions that occur within Washington state and its three mile nautical boundary.
- Vehicle trips generated by the project during construction and operation, including those of employees, customers, vendors, or residents.

H. How can the current SEPA checklist be used to disclose emissions and effects on the built environment?

The current SEPA environmental checklist (WAC 197-11-960) can be used to identify and disclose sources of GHG emissions as well as the impacts on the built environment expected as a result of global climate change.

Section B2 of the checklist requires the proponent to identify air emissions associated with the project during construction and when the project is completed, as well as any measures proposed to avoid, minimize, or mitigate those emissions. These questions can be used to help disclose GHG emissions.

The checklist includes other questions that may be useful in identifying other potential GHG emissions, such as the number of people residing or working in the completed project (under "Land and Shoreline Use"), vehicle

[3] 25,000 metric tons is the greenhouse gas reporting threshold for the US Environmental Protection Agency. It is the equivalent of 4,545 average passenger cars or 60,749,347 kilowatt hours of electricity.

[4] GHG measurement tools group emissions into three categories. Scope 1 may also be referred to as direct emissions and Scopes 2 and 3 as indirect emissions. However, since "direct" and "indirect" are also used in SEPA and mean something different, we recommend refraining from using those terms to refer to emissions.

trips per day and other demands on transportation (under "Transportation"), and energy use (under "Energy and Natural Resources").

Projects with a long lifespan should consider their vulnerability to a changing climate. This is especially true for buildings and infrastructure along coastlines and in floodplains, as well as large water users. By 2050 sea level in Washington is projected to increase between 1 and 22 inches, depending on location and future emissions. Major storms and floods are also projected to increase in the future, increasing the flooding danger to projects located within existing flood plains. Climate change will also affect future water availability and should be considered for projects that will be large water users.

Section B.3 of the checklist concerning surface water could be used to disclose a project's vulnerability to climate change. Additional information of the effects of climate change can be found on Ecology's climate adaptation website.

J. When are emissions considered "significant"?

The SEPA rules include a process for determining when impacts are considered significant (WAC 197-11-330). Under this rule, the responsible official is tasked with taking into account whether or not the proposal conflicts with local, state or federal rules or laws. The official is also directed to consider mitigation measures which the proponent proposes to implement as part of the proposal, including any mitigation measures required by other existing environmental rules or laws.

The SEPA rules also state, in defining significance, that it involves context and intensity and does not lend itself to a formula or quantifiable test (WAC 197-11-794). However, we believe that we can identify what level of greenhouse gas emissions would not be significant, especially taking into account the state's greenhouse gas reduction targets and other legal requirements to reduce or mitigate emissions.

RCW 70.235.020 establishes greenhouse gas reduction targets for Washington. By 2020, we are to return to 1990 levels. While there are also reduction targets for 2035 and 2050, at this point we are concentrating on meeting the 2020 targets. Based on Ecology's most recent Comprehensive Plan to meet those targets, the state must reduce its emissions by 11%[5] in order to return to 1990 levels by 2020[6].

There are also some legal requirements to reduce or mitigate GHG emissions. These include:

- Facilities subject to Prevention of Significant Deterioration (PSD) requirements under the Clean Air Act that have been determined to meet "Best Available Control Technology" for GHGs.
- New fossil-fueled thermal electric generating facilities required to offset a portion of their CO_2 emissions under RCW 80.70.
- Baseload power generation facilities subject to the state Emissions Performance Standard (RCW 80.80).

[5] The agency is required to update the emissions inventory every even-numbered year, and the percentage reduction needed to reach the statutory targets will be updated accordingly.

[6] Ecology is still considering how and when to use the percentage reduction required to meet the 2035 statutory target.

A proposal will be presumed to be not significant for greenhouse gas emissions and thus no further mitigation for greenhouse gas emissions will be necessary if it is:

- expected to result in fewer than 25,000 metric tons a year;
- subject to a legal requirement to reduce or mitigate GHG emissions; or
- expected to result in emissions of 25,000 metric tons or more a year and has incorporated mitigation measures to reduce its emissions by approximately 11% below what its emissions would have been without those mitigation measures.

These proposals should still disclose their emissions as outlined in Section D of this document and at the appropriate level of detail as outlined in Section G.

For projects that have incorporated mitigation measures to reduce emissions by 11%, the project proponent should use a reasonable amount of effort to demonstrate that those measures will get as close to the 11% reduction as possible, however it is not necessary to mitigate emissions by exactly 11%.

By identifying the level of emissions that would be presumed to be not significant, the agency is not taking the position that emissions exceeding those levels would be presumed to be significant. It is unlikely that a proposal would be considered significant based solely on its greenhouse gas emissions. We would expect a project with high GHG emissions to also have other environmental impacts.[7]

It is important to remember that a project may still be found to be significant because of other impacts even if the greenhouse gas emissions are not significant.

K. How can a project proponent mitigate emissions?

For proponents who wish to mitigate emissions, there are many options. A number of these are outlined in Attachment 2.

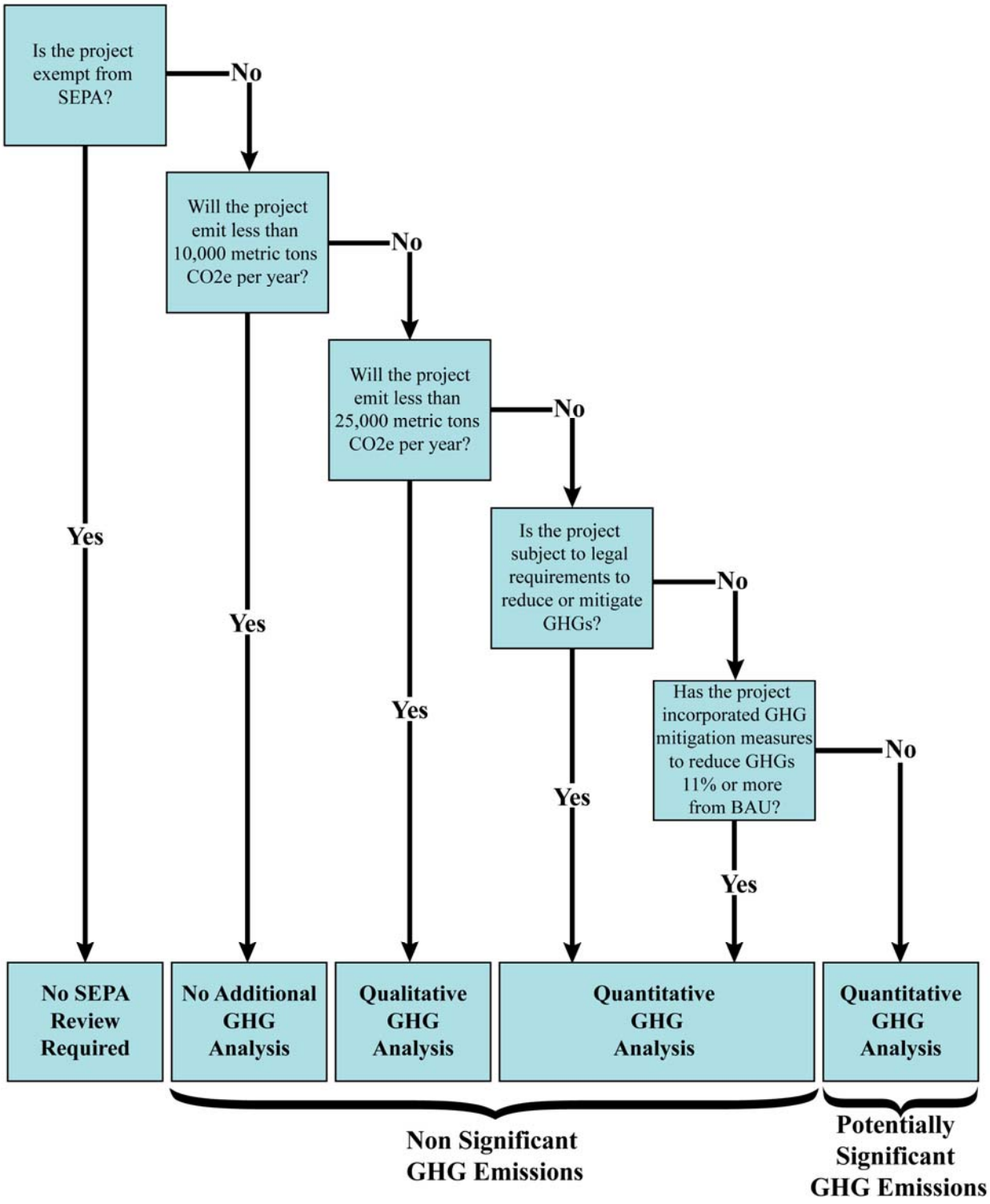
If a proponent chooses to mitigate GHG emissions by including energy efficiency or other design features that will reduce GHG emissions, the proponent should quantify and disclose the expected emissions from the project both with and without those design features.

Mitigation may occur at a different location or at a different source than the emissions associated with the project. Greenhouse gases mix rapidly in the atmosphere and persist for a number of years, therefore a reduction in any location will reduce the overall atmospheric burden. Some ideas for off-site mitigation that have been suggested include energy efficiency improvements in schools, low income housing, or other public or community buildings, as well as projects that will capture methane from landfills or manure management systems. These are just examples.

[7] Some electronic manufacturing, such as photovoltaic solar cell and film silicon modules, may use fluorinated gases with a very high global warming effect. These projects could have extremely high levels of GHG emissions without other environmental impacts.

If a project proponent proposes to mitigate emissions by purchasing a GHG offset project from a third party, you should contact Ecology's Climate Policy Group for assistance. These types of projects can be controversial and it is important to ascertain that the offset project meets the necessary criteria.

Ecology SEPA and Greenhouse Gas Emissions Significance Flow Chart



Attachment 1: GHG Screening Table

The following table can be used to screen projects in order to determine the level of additional greenhouse gas emissions analysis that should be done by the project proponent. For each category the table estimates the size of a project that would be expected to produce emissions at annual levels of 10,000 and 25,000 metric tons during operation. Projects that are near the threshold may require additional project-specific analysis to determine if emissions may trigger GHG analysis.

For development projects, emissions are included from direct combustion and induced transportation emissions. For development projects the table uses national and regional estimate of energy use compiled by the U.S. Energy Information Administration. Estimated emissions from development projects also include induced transportation emissions based on the Fehr and Peers VMT spreadsheet with default values for Puget Sound.

	10,000 MT CO_2e Per Year	25,000 MT CO_2e Per Year	Data Unit
Energy Usage			
Gasoline	1,136,708	2,841,769	Gallons
Diesel	983,367	2,458,418	Gallons
Natural Gas	1,881,255	4,703,138	Therms
Electricity Consumption	24,300	60,749	MWh
Commercial or Industrial Boilers			
Natural Gas Fired	22	54	Heat Input (MMBtu/hr)
Fuel Oil Fired	15	38	Heat Input (MMBtu/hr)
Coal Fired	12	30	Heat Input (MMBtu/hr)
Biomass Fired (carbon neutral CO_2)	578	1,446	Heat Input (MMBtu/hr)
Residential Development (Includes Transportation and Operation)			
Single Family	409	1,023	Dwelling Units
Multi-Family	575	1,438	Dwelling Units
High-Rise Condo	854	2,135	Dwelling Units
Commercial Development (Includes Transportation and Operation)			
General Retail	185	463	Thousand Square Feet
Supermarket	75	187	Thousand Square Feet
Fast-Food Restaurant	18	45	Thousand Square Feet
Office Space	399	998	Thousand Square Feet
Medical Office	160	399	Thousand Square Feet
Hotel	565	1,411	Hotel Rooms
Movie Theatre	30	75	Movie Screens
Educational Facility Development			
Grade School	5,050	12,624	Number of Students
High School	3,662	9,154	Number of Students
College	2,644	6,610	Number of Students
Industrial Development			
Warehouse/Distribution Center	119	298	Thousand Square Feet
Conversion of Forested Lands			
Deforestation (Western WA)	83	207	Acres
Deforestation (Eastern WA)	213	532	Acres
Waste and Wastewater Treatment			
Landfill	74,830	187,075	Tons MSW Disposed per Year
Domestic Wastewater Treatment Plant	26	65	1000 People Served
Dairy Cattle Manure Management (Open Lagoon)	2,046	5,115	Head Cattle
Beef Cattle Manure Management (Open Lagoon)	6,063	15,158	Head Cattle

Attachment 2: Sources of GHG Emissions Mitigation Options

The following table lists various sources of GHG emissions as well as potential quantification methodologies and mitigation options for each source. These emissions sources can be evaluated quantitatively or qualitatively to address greenhouse gas reduction strategies. Not all categories must be quantified or mitigated.

GHG Emission Sources	Definition and Examples	Emissions Scope	Quantification Methodologies, Tools, and Emission Factors* (see last page for links to all of these tools)	Potential Mitigation Options†
On-Road Mobile Sources	Mobile sources owned by the project proponent operating both within the proponent's facility and off-site.	Scope 1	• TCR • WRI/WBCSD • Seattle Climate Partnership • Ecology • *EIA* • *URBEMIS* • *CalEEMod*	• Highly efficient vehicles • Alternative fuel vehicles • Site location • Video conferencing • Anti-idling technology
Non-Road Mobile Sources	Non-road mobile sources owned by the project proponent used for construction, maintenance, and facility operation (e.g. heavy machinery, maintenance equipment, trains, and boats)	Scope 1	• TCR • WRI/WBCSD • Seattle Climate Partnership • Ecology • *URBEMIS* • *CalEEMod*	• Highly efficient vehicles • Alternative fuel vehicles • Site location • Anti-idling technology
Stationary Combustion	On-site combustion of fossil fuels	Scope 1	• TCR • WRI/WBCSD • EPA Reporting Rule • *EIA* • *URBEMIS*	• Building design and operation • Energy efficiencies

GHG Emission Sources	Definition and Examples	Emissions Scope	Quantification Methodologies, Tools, and Emission Factors* (see last page for links to all of these tools)	Potential Mitigation Options†
Industrial Processes	Non-combustion emissions resulting from certain industrial processes such as oil refining, cement production, aluminum production, and steel manufacturing	Scope 1	• TCR • EPA Reporting Rule • WRI/WBCSD • IPCC	• Facility operation • Methane capture and use or destruction • High-global warming potential gas destruction
Fugitive Emissions	Non-combustion emissions from owned resources (e.g. landfills , natural gas transmission, electricity transmission, and wastewater treatment plants)	Scope 1	• TCR • EPA Reporting Rule • WRI/WBCSD • IPCC • CCME	• Facility operation • Methane capture and use or destruction • High-global warming potential gas destruction
Agricultural Emissions	Non-combustion emissions from agriculture (e.g. manure management, fertilizer application, enteric fermentation, and soil preparation)	Scope 1	• WRI/WBCSD • IPCC • DOE 1605b • CAR • CCME	• Methane capture and use or destruction • Waste reduction • Organic or low input agriculture
Land Use Change	Emissions from lost carbon storage from the permanent conversion of forested land to other uses	Scope 1	• DOE 1605b • U.S Forest Service • WRI/WBCSD • IPCC • CAR	• Site design and location • Low impact development

GHG Emission Sources	Definition and Examples	Emissions Scope	Quantification Methodologies, Tools, and Emission Factors* (see last page for links to all of these tools)	Potential Mitigation Options†
Purchased Electricity and Steam	Off-site emissions produced to generate purchased electricity or steam	Scope 2	• TCR • EPA eGRID • Seattle Climate Partnership • *EIA* • *URBEMIS* • *CalEEMod*	• Building design and operation • Energy efficiencies
Road and Non-Road Mobile Sources	Combustion emissions from leased or contractor on-road and non-road mobile sources used as part of construction , maintenance, and facility operation (e.g. heavy machinery, maintenance equipment, trains, and boats)	Scope 3	• TCR • WRI/WBCSD • Ecology • *URBEMIS* • *CalEEMod*	• Highly efficient vehicles • Alternative fuel vehicles • Site Location • Anti-idling technology
Generated Vehicle Trips	Combustion emissions from vehicle trips generated by the project during construction and operation including those of employees, customers, vendors, and residents.	Scope 3	• TCR • CTR • Seattle Climate Partnership • *URBEMIS* • *Fehr & Peers* • *CalEEMod*	• Highly energy efficient or alternative fueled vehicles and infrastructure • Site location • Public transit infrastructure and incentives • Bike/ped accessibility • Anti-idling technology

GHG Emission Sources	Definition and Examples	Emissions Scope	Quantification Methodologies, Tools, and Emission Factors* (see last page for links to all of these tools)	Potential Mitigation Options†
Water Use and Wastewater Disposal	Combustion and fugitive emissions created to provide water and dispose of wastewater (e.g. pumping energy and POTW fugitive methane)	Scope 3	• TCR • WRI/WBCSD • IPCC	• Low impact development • Site location • Methane capture and use or destruction • Water conservation/efficiencies (fixtures, appliances) • Water reuse
Supply Chain Transportation Emissions	Supply chain transportation emissions generated to transport feedstocks to the completed project, finished products away from the project, and any additional new shipping emissions that are caused by the project.	Scope 3	• TCR • WRI/WBCSD • *URBEMIS* • *CalEEMod*	• Highly efficient or alternative fueled vehicles and infrastructure • Site location • Anti-idling technology

*The following list is illustrative showing some good sources for quantification tools, protocols, and emissions factors that can be used to quantitatively assess emissions from each of these sources. It is not meant to be exhaustive. We are not advocating the use of these methodologies for determining acceptable error rates for assessing emissions. Tools in italics are simple models that can be used to estimate the magnitude of future emissions.

†These are general examples of mitigation options for various emissions sources. This list is not meant to be comprehensive.

Quantification Methodologies, Tools, and Emissions Factors

- Athena Institute EcoCalculator (Athena) - http://www.athenasmi.org/index.html
- CalEEMod - http://www.caleemod.com/
- CCME - http://www.ccme.ca/ourwork/waste.html?categoryid=137
- Department of Commerce GHG Emissions Planning Tools (Commerce) - http://www.commerce.wa.gov/site/1277/default.aspx
- Ecology Mobile Source Tool (Ecology) - http://www.ecy.wa.gov/programs/air/pdfs/ghgfleetcalculator.xls
- Energy Information Agency End Use Consumption Data (EIA) - http://www.eia.doe.gov/emeu/consumption/index.html
- EPA Reporting Rule - http://www.epa.gov/climatechange/emissions/ghgrulemaking.html
- EPA WARM Model - http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html
- Fehr & Peers VMT spreadsheets - http://coolconnections.org/solutions/
- IPCC Emissions Factor Database (IPCC) - http://www.ipcc-nggip.iges.or.jp/EFDB/main.php
- National Renewable Energy Laboratory (NREL) Life-cycle Inventory Database - http://www.nrel.gov/lci/
- Seattle Climate Partnership - http://seattleclimatepartnership.org/tools/index.html#tool
- The Climate Action Reserve (CAR) - http://www.climateactionreserve.org
- The Climate Registry (TCR) - http://www.theclimateregistry.org/
- U.S Department of Energy 1605b (DOE 1605b) - http://www.eia.doe.gov/oiaf/1605/reporting_tools.html
- U.S Forest Service Carbon Lookup Tables (U.S Forest Service) - http://nrs.fs.fed.us/pubs/8192
- URBEMIS - http://www.urbemis.com/
- World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) - http://www.ghgprotocol.org/
- WSDOT Commute Trip Reduction Program (CTR) - http://www.wsdot.wa.gov/TDM/CTR