MINNESOTA
ENVIRONMENTAL QUALITY BOARD

Memo

Date: September 6, 2024

To: ERIS Members

From: Stephanie Aho

RE: Climate Calculator – Scoping Update and Data Sources

The quantification of greenhouse gas (GHG) emissions was added to the Environmental Assessment Worksheet (EAW) in December 2022. Question 18 requires the quantification and discussion of a project's GHG emissions; it also asks for emissions mitigation considerations and an explanation of decisions related to the GHG calculations provided. The motivation for asking for this information in the form is to assess the potential GHG emission impacts from a project and compare it to other similar projects to gain insight about mitigation and adaptation approaches.

However, climate pollution estimation is complicated. There is a strong need to make the process of answering the EAW climate questions more efficient, effective, and consistent. The purpose of the Climate Calculator Tool is to help project developers estimate greenhouse gas emissions that will directly or indirectly result from the implementation of a project over its lifetime.

Project Goals

The climate calculator tool aims to improve upon the current method of filling out the EAW climate questions by providing a standardized approach to answering question 18 on the EAW form for many key mandatory categories. The intent is for the calculator to take simple inputs from the user to quantify greenhouse gas emissions. The user would not have to make outside calculations or use multiple tools, decreasing both the time and cost of filling out the form. The tool also aims to make the calculation more complete and more defensible through increased standardization and accuracy of GHG accounting across project types and emission sources.

Methodology / Defining Lifecycle Assessment

The climate calculator tool will be constructed to estimate GHG emissions using a lifecycle assessment (LCA) approach. Life cycle assessment is the prevailing methodology to quantify environmental impacts associated with all the stages of a product or project lifespan − from raw material extraction through materials processing, manufacture, distribution, use, repair, maintenance, and disposal or recycling. This technique is used to identify where impacts occur, to measure the magnitude of these impacts, and to evaluate alternatives.

The goal of LCA is to compare the full range of environmental effects assignable to products, projects, and services by quantifying all inputs and outputs of material flows and assessing how these material flows affect the environment. This information is used to improve processes, support policy, and provide a sound basis for informed decisions that reduce the environmental impacts of the products, projects, and services.

The climate calculator tool will encompass as much of the entire lifespan of projects that occur within the mandatory categories as is reasonable to include. The resulting output – a robust estimate of the project's climate pollution – will consider all project phases (construction, operation, and decommissioning) and include upstream and downstream emissions where there is data to do so. This approach aligns with the scope 1, 2, and 3 greenhouse gas emissions that EQB's current guidance on climate assessments asks users to complete. EQB's guidance will be updated when the calculator becomes available.

This LCA tool is **not** using an ISO LCA. ISO, or the International Organization for Standardization, develops consensus-based standards for processes using expertise from global experts. These standards can be applied to a wide variety of products or processes. ISO has developed a standard that describes the principles and framework for completing life cycle assessment for studies and inventories. The climate calculator tool is not using the formal ISO standards. A tool does not fit into the ISO standard the way an individual product or process would. However, the consultant that is working on the tool will be transparent in reporting the limitations of the calculator, detailing which phases are included in the calculator, and how it should be used.

This tool is also **not** a greenhouse gas inventory, or to develop components of an inventory. A greenhouse gas inventory quantifies the greenhouse gas emissions generated within a boundary (such as the whole state of Minnesota) from identified sectors; typically, the goal is to see a downward trend in generation from those sectors over time. The EQB tool, in contrast with an inventory, will quantify the greenhouse gas emissions from a project over its lifespan (or life cycle). The calculator tool assesses emissions that will be generated outside the boundaries of Minnesota. For example, emissions generated from steel manufactured outside of Minnesota that is required for a building project undergoing environmental review will be counted even though they were not generated within the state.

Scoping Approach

Due to time, resources, and available data, a tool that can perfectly estimate the greenhouse gas emissions from every type of project that might go through environmental review is not feasible. Therefore, developing the tool first requires establishing the scope of the calculator, or the parameters of what emissions can be included. The scoping process began earlier this year, and has been a collaborative approach involving EQB staff, the contractor (ICF), and a technical advisory team (TAT).

The remainder of this memo describes the scoping approach used and the current draft scope envisioned for the calculator. Attachment 1 to this memo provides detailed technical information on the scoping process.

Scoping: Step 1

The first step in defining the emission sources and project types the calculator will include (known collectively as the quantification boundaries) is to examine the distribution of historical EAWs. This provides an understanding of the project categories that are most often used and will likely be most important to cover with this tool. Expecting future needs to align with past EAW frequency is not a perfect assumption. The look back at the last five years of projects included the anomalous COVID-19 years. There are also emerging project categories that have not been historically utilized but will have higher representation in future projects. Despite these limitations, this approach is a useful exercise to determine focus areas for emission calculation. The top 10 (non-energy) categories are shown below. Energy projects are already known to be high frequency and highly important for inclusion in this tool despite not being included in this look-back.

Scoping: Step 2

The second step to accurately assessing the appropriate quantification boundaries is examination of the mandatory categories to find commonalities in emission sources leading to economies in tool construction. Emission sources that are necessary for many mandatory categories are more economical to include than those incorporated into fewer categories. Common emission sources can also simplify the calculator's construction and make the tool most useful to the widest audience possible with our finite resources. In general, work done on the tool that can apply to many different project types will give us more "bang for our buck."

When this exercise was completed, ten groupings emerged containing projects with similar emission quantification needs. From this analysis we can anticipate that including emission sources related to, for example, residential and commercial buildings (with eight mandatory categories sharing common emission sources) is likely more economical than including emission sources related to communication towers (with one unique mandatory category). As highlighted above, commonalities in implementation lead to economy of construction.

The groups are shown below, along with the number of mandatory categories that fit into each group.

Group	Mand. Cat. In Group
Residential & Commercial	8
Energy Industries	6
Industrial	5
Natural Resources	5
Transportation Infrastructure	4
Storage	3
Waste	3
Low Emissive Impact	3
Communication Towers	1
Animal Feedlots	1

Scoping: Step 3

The final step in determining the quantification boundaries is examining the available data. To do this, an assessment was done on a wide range of GHG emission data sources to determine the age, availability, and applicability of the data. Emission sources where data is unavailable or hard to obtain, where the data is not appropriate for this tool, or where data is too old are not able to be included within the scope of the climate calculator tool.

Important data sources identified include MICE, CalEEMod, EPA's GHG Emissions Factor Hub, EPA's SIT, EC3, DEFRA, GREET, USAID's CLEER Tool, COMET, WARM, and eGRID. Data source review will be a continuous process throughout calculator construction as additional challenges and needs arise.

Preliminary Scoping Conclusions

Using the above strategy, the project team (ICF, working with EQB and the tech advisory group) has determined the most effective emission sources to include in the climate calculator project.

The following stoplight charts illustrate these decisions into three categories: high priority for the calculator (to be included now); low priority for the calculator (to be included now if resources allow); and emission sources to be included in a future phase of the project after June 2025, if resources are available.

In general, the scope of the calculator tool prioritizes emissions from project construction and the highest emitting components of project operations. While decommissioning is an important stage of life cycle assessment, emissions from decommissioning are not envisioned to be able to be included in the climate calculator tool at this time.

Construction: All sources are included in the current project scope

Source	Description	Priority
Materials	Emissions Associated with Construction Materials	High
Stationary Energy	Onsite Electricity and Fuel	Low
Transportation	Transportation of Materials to Site; Construction Equipment; Transportation of Waste for Disposal;	High
	Employee Commuting to Site	Low
Land Use	Change in Carbon Storage from Land Use Change	High
Waste	Disposal of Waste Generated	High

Operation: Most emission sources are included

Source	Description	Priority
Materials	Emissions Associated with Routine Maintenance	Future
Stationary Energy	Onsite Electricity and Fuel	High
Fugitive Emissions	Mining, Processing, Storage, Transportation of Coal; Natural Gas and Petroleum Systems	High
	SF6 from Transmission and Distribution Equipment; HFCs leakage from cooling equipment	Low
Industrial Processes	Production of Metals and Other Industrial Processes	High
Land Use	Change in Carbon Storage from Land Use Change	High
Transportation	Transportation of Waste to Disposal Site	Low
	Transportation of Materials to Site	Low
	Routing Maintenance; Employee Commuting to Site; Change in Vehicle/Aircraft/Watercraft Operation	Future*
Wastewater	On-site Treatment	High
Waste	Disposal of Waste Generated; On-site Treatment	High
Agriculture	Enteric Fermentation; Manure Management	High
Use of Sold Products	Consumption of Products Generated	Future*

**High Priority for some mandatory categories*

Decommissioning: All sources outside the current scope

Source	Description	Priority
Stationary Energy	Onsite Electricity and Fuel	Future
Transportation	Employee Commuting to Site; Demolition Equipment; Transportation of Waste for Disposal;	Future
Land Use	Change in Carbon Storage from Land Use Change	Future
Waste	Disposal of Waste Generated	Future

Some operation emission sources shown will be applied only to those projects where the emission source represents a large portion of the expected GHG emissions (marked above as “High Priority for some mandatory categories” on the “Operation” table).

The attached memo from ICF goes more in depth into the intricacies of the scoping decisions being made. These include decisions about user inputs to the tool, imbedded assumptions, GHG data sources being utilized, and which emission sources apply to which mandatory categories.

Review of Scope and Next Steps

The scoping memo is outlined as a deliverable within our contract with ICF, targeted for completion in early October 2024; it is attached and provided as information for ERIS, the Board, and the public about the likely scope of the final calculator tool. The scope set forth in the final memo will be a blueprint for tool construction, but the final calculator tool may have a slightly different scope. Likely, these future scope changes will result in slightly fewer emissions being able to be included, due to data challenges or similar issues, rather than more.

The draft scoping memo from ICF is currently being reviewed by subgroups of the Technical Advisory Team for data source completeness and validity of the scope proposed. It has received constructive comments and positive reviews from those subgroups already convened. These TAT subgroup meetings will continue through September 12, 2024. Additional information and comments from those subgroups will be provided in the September 2024 ERIS presentation.

Feedback on the scoping memo is welcomed from the public, Tech Reps, and the ERIS board at any time. To be considered for incorporation into the final scoping memo, comments must be received by September 30, 2024. After this time, feedback is still welcomed, but it will be used to inform smaller decisions about how the tool is constructed based on the quantification boundaries already established.