

Climate Budget – Greenhouse Gas Implications of Capital Projects

ISSUE

As directed by City Council, Administration is in the process of developing a climate budget and integrating it into its Multi-Year Business Plan and Budget. As part of that process, City Council also instructed the Administration to estimate carbon impacts, or Greenhouse Gas (GHG) additions, resulting from capital projects. Estimating GHG emissions for municipal capital projects is subject to a high degree of uncertainty; therefore, establishing the scope and criteria early in the process is important for transparency purposes. As a result, what criteria should be considered for this process?

RECOMMENDATION

That the Standing Policy Committee on Environment, Utilities, and Corporate Services recommend to City Council the adoption of the criteria outlined in this report to guide the identification and estimation of GHG additions for capital projects to be included in the 2024/2025 Multi-year Business Plan and Budget.

BACKGROUND

At its meeting held on January 25, 2023, City Council approved the following recommendations from Administration:

1. That a climate budget approach, as outlined in the report of the General Manager, Utilities and Environment dated January 10, 2023, be approved in principle for implementation during the 2024/2025 budget planning cycle;
2. That Administration be directed to draft and present to the Governance and Priorities Committee for approval, a policy amendment to the Multi-year Business Plan and Budget Policy to reflect the goals, principles, and process for a climate budget as outlined in Appendix 4; and
3. That the budget includes carbon impacts for proposed capital projects with specific attention to impacts to the business as planned projection.

DISCUSSION/ANALYSIS

Status of GHG Emission Tracking

The City of Saskatoon (City) tracks progress on its GHG emission reduction targets and related actions through regular progress reports, including the [Climate Action Plan: Progress Report 2021](#). The biennial reports include updated GHG emission inventories, and report cards on the City's climate mitigation and adaptation strategies. The next climate action progress report is scheduled for 2024.

A couple of important limitations of our current approach are that:

- (a) the reports are backward-looking or provide an ex-post analysis of the City's GHG emissions; and
- (b) the reports are delinked from the City's financial analysis or project selection process. In other words, the City does not forecast emissions that may emerge from the various bundles of capital projects that are approved in the budget cycle.

A Request for Proposals for a GHG Management Platform was issued on February 3, 2023. This is a two-year pilot with the intent of identifying a software solution to improve tracking and reporting of progress towards the City's GHG emission reduction targets and *Low Emissions Community Plan* (LEC Plan) actions. It is unknown at this point if the platform will also be capable of estimating emissions at the project level for climate budget purposes, although this function was included in the Request for Proposals.

Climate-Related Guidance for City Staff

The significance of environmental performance is embedded in the City's strategic plan and other core strategies, policy documents, or processes such as the LEC Plan, Triple Bottom Line Policy and Framework, Contractor Environmental Guidelines, and the internal support of the Sustainability Department. More specifically, the City's High Performance Civic Building Policy (C08-002) is an example of an administrative tool that specifically addresses the asset and financial sustainability of new civic buildings, major renovations, and additions.

In addition, the prioritization process for the 2020/2021 Business Plan Options and the 2022/2023 10-year Capital Plan included questions regarding the GHG implications of projects; however, GHG quantification was not a requirement. Together, these resources help City staff understand, identify, and where possible estimate, the environmental implications of their activities, products, and services.

There are also various external requirements that the City may be subject to when proposing projects for funding consideration. For example, Infrastructure Canada's Climate Lens assessment for GHG mitigation and climate change resilience assessments, which is a requirement for funding through the Federal Government's Investing in Canada Infrastructure Program (ICIP), Disaster Mitigation and Adaptation Fund, and Smart Cities Challenge.

Recent examples of City initiatives that have incorporated environmental reporting components into early stages of project development include the Bus Rapid Transit (BRT) and Downtown Event and Entertainment District (DEED) projects. The BRT project completed a Climate Lens assessment as a condition of ICIP funding; a Multiple Account Evaluation was also completed to compare the cost of the investment against the benefit it will provide over the life of the investment, which in this case included a net reduction in GHG emissions. The DEED project incorporated environmental criteria into the deliverables of the Technical Advisor RFP, including the provision of preliminary estimates of GHG emissions for the proposed conceptual design recommendations.

Business-as-Planned Emission Scenario

A Business-as-Planned (BAP) scenario was modelled for the LEC Plan which serves as a line to work from in determining the scope, scale, and timing for GHG mitigation

measures required to meet Saskatoon’s 80% reduction target by 2050. The BAP projection is important because it provides a point for each year from which GHG reductions and possible additions relating to specific initiatives can be understood relative to the overall emission reduction target.

The LEC Plan models Saskatoon’s BAP projection, which assumes that no additional policies, actions, or strategies will be implemented by 2050 beyond those that were underway during the development of the LEC Plan in 2019. Modelling assumptions account for economic and demographic trends and forecasts and use energy and GHG emissions-related information from local, provincial, and federal governments to inform modelling assumptions.

If resourced, the 2025 LEC Plan refresh would assess and revise the actions, assumptions, and related GHG implications from the 2019 Plan.

GHG Estimation Tools

A jurisdictional scan identified that municipalities use a variety of tools to assist in GHG quantifications. For example, Edmonton has an Integrated Carbon Accounting & Budget Model that is specifically aligned with the quantification methodologies in their GHG inventory and emissions forecasts. Calgary, Durham, and Ottawa jointly funded the development of a spreadsheet-based tool specific to carbon budgeting. The tool is currently in the beta stage of development, and publicly accessible for testing. In general, municipalities use in-house resources and/or consultants to estimate emissions and emission projections. However, there does not seem to be a ‘go-to’ GHG accounting tool that municipalities are using for climate budget-specific purposes.

Minimum Requirements to Estimate GHG Emissions

GHG emissions are generally quantified using an activity level (e.g., litres of fuel, kilowatt-hours of electricity, cubic metres of natural gas, etc.) multiplied by an emission factor. The emission factor, also referred to as emission intensity, carbon intensity, or conversion factor, is a coefficient that describes the rate at which the activity releases GHGs into the atmosphere. To quantify the emissions associated with a capital project, the energy inputs of that project must be estimated.

An example is the use of 200 m³ of natural gas to heat a building on a construction site. SaskEnergy’s 2021 emission factor for natural gas is 1,946 grams CO_{2e}¹ / m³. Multiplying the activity level (200 m³) by the emission factor (1,946 grams CO_{2e} / m³) results in an emissions value of 389,200 grams CO_{2e} or 0.389 tonnes CO_{2e}.

$200 \text{ m}^3 \times 1,946 \text{ grams CO}_2\text{e/m}^3 = 389,200 \text{ grams CO}_2\text{e} \text{ (0.389 tonnes CO}_2\text{e)}$
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GHG Estimation Reporting Criteria

The City’s GHG inventories include emissions primarily from sources located within the city boundary (Scope 1) and emissions occurring as a consequence of the use of grid-

¹ CO_{2e} or carbon dioxide equivalent is the standard unit of measure used to compare greenhouse gases on the basis of their global warming potential.

supplied electricity (Scope 2). There are also a limited number of emissions that occur outside the city boundary as a result of activities taking place within the city boundary (Scope 3²). To be consistent with the City’s current GHG accounting methodologies, GHG estimates reported in the climate budget will include Scope 1 and Scope 2 emissions only.

The ability to estimate GHG emissions for a capital project – be it GHG impacts from its implementation activity or operations – is often dependent on the phase, scale, or type of project. Most significant capital projects will undergo cost estimating at different stages of project completion for budgeting and project analysis purposes. Furthermore, operational costs / impacts are also estimated and required to be included for capital budgeting. For the purposes of climate budgeting, GHG additions and reductions can be considered through a similar estimating lens and potentially in alignment with cost estimating processes and phases; understanding that, like a cost estimate, early estimates have a greater degree of uncertainty.

Typically, projects first require some degree of scoping, feasibility, or pre-design work to determine a preliminary budget and parameters for a project. GHG additions should be considered first at this stage, but some project leaders may choose to re-estimate their GHG additions as the project advances or if significant changes occur. Capital funding requests to complete preliminary feasibility or scoping work would not be able to include GHG estimates as this would be completed as part of the proposed work scope.

The identification and estimation of GHG emissions (additions and/or reductions) will be required for the capital projects meeting the criteria outlined in Table 1. A process map outlining the types of initiatives and corresponding assessment criteria is provided in Appendix 1.

Table 1: Capital Project Criteria for GHG Data in Budget

INCLUDE projects which are/have:
<p>Measurable GHG reductions¹ All capital projects that have measurable reductions in energy use, related directly to actions identified in the LEC Plan.</p>
<p>Measurable GHG additions resulting from implementation² Capital projects that include activities that use energy. and: Budget of \$2M or greater Combined value during the 2024/2025 budget cycle.</p>
EXCLUDE projects which are/have:
<p>Strategies with no direct GHGs to estimate</p>

² Scope 3 emissions included in the City’s inventory are: transmission and distribution losses associated with grid-supplied electricity, waste disposal and treatment outside the city boundary, and transboundary transportation. Scope 3 emissions not included in the City’s inventory are: emissions embodied in fuels, water, food, and construction materials.

Capital projects that are requesting funding for strategy development.
Undefined and/or still in early scoping³ Materials and/or methods have yet to be considered, even in a preliminary manner.
Very few emissions⁴ Capital projects expected to have very little GHG impact.
Unplanned Weather or major disaster event response.
Led by City Boards or Corporations

Notes

1. Consistent with the approach to Climate Budget reductions previously presented to Committee.
2. Such as direct emissions from use of non-renewables such as diesel and natural gas (i.e., construction); does not include Scope 3 emissions relating to embodied energy.
3. Such as projects at pre-design stage, or projects that will be informed by public engagement, etc.
4. Such as projects not associated with significant energy inputs/emission outputs (e.g., community programming and REDI initiatives).

Examples of Projects Required to Identify GHG Additions

For reference, these are examples of capital project funding requests from the 2022/2023 Multi-Year Budget, by Business Line, that would require GHG quantification based on the inclusion and exclusion criteria outlined above:

- Environmental Health – landfill optimization, solar/renewable energy installations;
- Land Development – roadway construction, park development;
- Recreation and Culture – park upgrades, new recreation facilities;
- Saskatoon Fire – new (additional) vehicles/equipment, new fire halls;
- Transportation – bridge rehabilitation, snow management facility construction; and
- Utilities – water and wastewater treatment plant upgrades, electrical system distribution upgrades.

FINANCIAL IMPLICATIONS

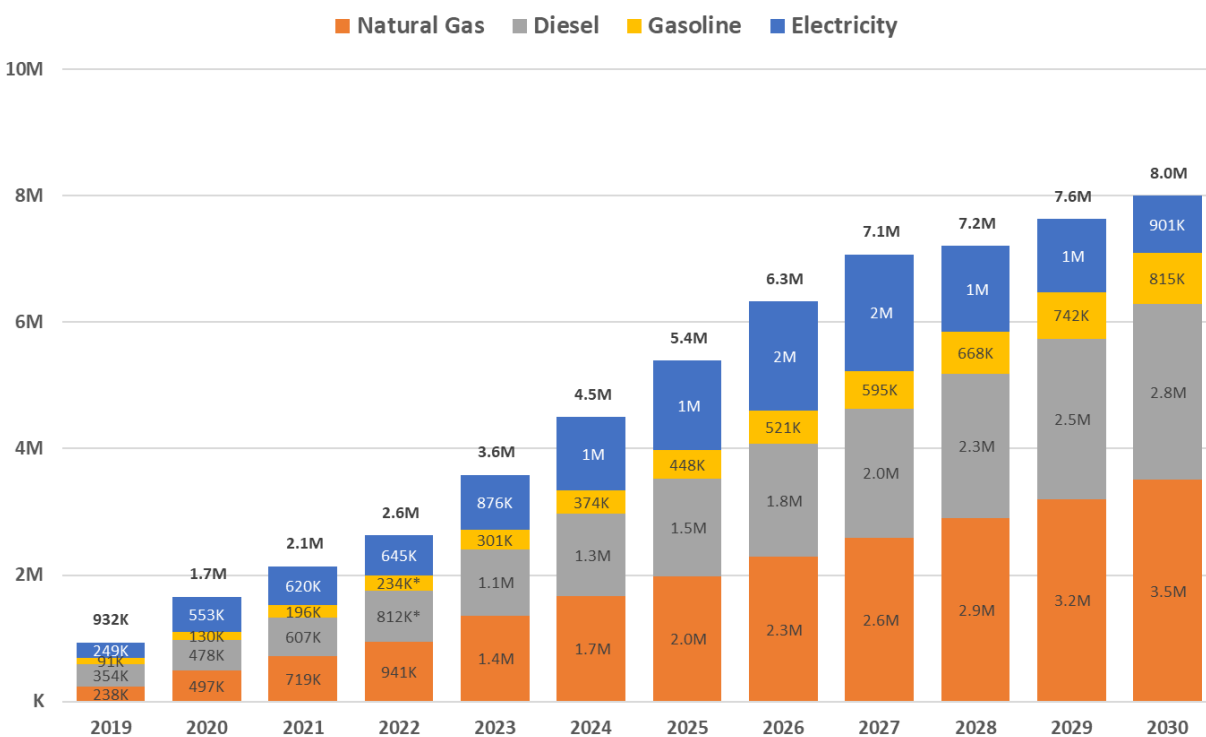
The initial development of the climate budget will be supported using existing operating staff from Sustainability. This resource will collaborate with the Finance Division on integrating the climate budget into the 2024/2025 budget documents, and work with Finance and the City Solicitor to update the *Multi-Year Business Plan* and *Budget Policy (C03-036)* as required.

Internal support and tools will be available for Project Managers with GHG quantification inquiries. Alternately, Project Managers may obtain GHG emissions data as part of feasibility-, functional-, or detailed-design stage analysis prepared by internal staff, or external consultants. There are currently no additional funds available for the preparation of this information; costs associated with preparing GHG impacts will be tracked for reporting and assessment after the 2024 pilot is complete. Projects that have not yet completed a feasibility study or preliminary scoping are not required to provide GHG addition information.

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The LEC Plan models actions for investment and implementation now and over time and demonstrates there are costs to doing nothing and benefits to timely implementation of measures. The incremental expenditures in buildings, vehicles, and other energy-related equipment and infrastructure increase costs in the short-term, but improve financial resiliency to future risks, especially costs associated with use of natural gas, diesel, gasoline, and electricity. For example, in 2022, the City paid \$2.6M in carbon charges stemming from the \$50/tonne charge levelled at electricity, natural gas, diesel, and gasoline use. By 2030, the total amount of carbon charges is estimated to be \$8M, all things equal, with charges for natural gas, diesel, and gasoline increasing over three times their 2022 costs, assuming a business-as-planned energy consumption scenario.

Figure 1: Carbon Charge Actuals (2019-2022) and Projections (2023-2030)



ADDITIONAL IMPLICATIONS/CONSIDERATIONS

A Triple Bottom Line review has not been completed at this stage of climate budget development. Projects funded through the budget process will be required to complete a review as per Triple Bottom Line Policy (C08-001), and this process will help identify projects that require GHG quantification.

A LEC Plan update is expected to commence in 2024, for completion in 2025 (if approved and funded through the 2024/2025 budget), which will inform the refinement of future climate budgets.

The development of a climate budget is complex. As such, there are potential risks associated with implementing the climate budget too soon, including:

- Lack of resources to support the Corporation at the required level (e.g., internal knowledge, project management capacity, quantification tools, etc.);
- Lack of readiness by the Corporation for this change management initiative; and
- Outdated GHG emission data to accurately assess the impacts of proposed measures on the City’s GHG target (i.e., outdated Business-as-Planned emission scenario).

NEXT STEPS

The ongoing development of the climate budget will require the following next steps:

- Amendments to the Multi-year Business Plan and Budget Policy (C03-036) will be brought to the April 2023 meeting of the Governance and Priorities Committee for approval;
- With support, departments responsible for capital projects identified in the LEC Plan being proposed through the 2024/2025 budget, will develop budget requests including cost and GHG estimates to include in the 2024/2025 budget;
- With support, departments responsible for other capital projects being proposed through the 2024/2025 budget and if required by the criteria outlined in this report, will develop budget requests including cost and GHG estimates to include in the 2024/2025 budget;
- The 2024/2025 climate budget will be developed and integrated into the financial budget book;
- Ongoing development of tools for climate budget awareness; and
- Ongoing development of tools for project-level GHG quantification.

APPENDICES

1. Climate Budget Process Map

Report Approval

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