

# Municipal Carbon Budgeting

## Introduction

1. A global carbon budget is the total amount of carbon dioxide emissions that can be emitted in the future while limiting global warming to a given temperature threshold, such as the levels laid out in the Paris Agreement.<sup>1</sup>
2. Municipal carbon budgeting scales international science-based targets down to a community level to show what that community's climate budget is, the scale of action needed to achieve reduction targets and the progress the community is making towards its green house gas (GHG) reduction target. Carbon budgeting within a municipality adds accountability to its Climate Emergency commitments.
3. A city's total carbon budget is broken down into annual caps. Capital and operating expenditures that align with these budgets are approved. The total carbon budget gradually declines annually until the city is operating at a net-zero budget under which most emissions are minimized, and the remaining emissions are offset.
5. Currently, we are a few years short of exhausting our remaining global carbon budget of 440 Gt and exceeding the 1.5° C temperature target set in the Paris Agreement.<sup>2</sup>
6. City carbon budgets provides a critical mechanism to align local-level transport, buildings, land-use and energy policies with larger-scale GHG emissions reduction goals.
7. First developed in Oslo in 2016, the carbon budget responds to the climate crisis like a municipal budget - by setting a total budget for the overall GHGs the city can emit. City of Edmonton pioneered carbon budget creation in Canada by creating a 135 Mt budget between 2020 and 2050.<sup>3</sup>

## Background

4. The concept of carbon budgeting emerged a decade ago, when scientists calculated that global GHG emissions should be limited to 2,900 Gt to keep global warming below 2°C of which, 2460 Gt have already been emitted since the industrial revolution.
8. A carbon budget establishes a direct link between climate science and municipal policies and expenditure patterns, providing a long-term planning perspective as well as an accountability framework for short-and medium-term commitments to mitigate climate change.
9. C40 Cities have developed a "contraction and convergence" model to calculate the remaining carbon budget for the cities. Cities with historically high emissions and high GDP need to reduce emissions immediately whereas cities with historically low emissions and low GDP can increase their emissions until 2030, converge at an agreed emissions rate of 3.2 tonnes/person and reduce their emissions (i.e., contract) together to achieve net-zero by 2050.

10. A single Carbon Budget tool has the potential to be adopted and adapted by other municipalities because the core concepts, objectives and the results are formulaic and transferable.
  11. There are multiple tools and methods to calculate a city's carbon budget. Most used tools are - [Contraction and Convergence approach used by C40 Cities](#), [The Climate Equity Reference Calculator](#) and the upcoming [1000 Cities Carbon Calculator](#), created by SSG and Pathway to Paris.
  12. The consequence of delaying emissions reductions becomes quite evident when a carbon budget is superimposed over a city's projected emissions. A carbon budget is a useful tool for the local governments to act rapidly, as they are often more agile in executing programs than other levels of government.
  13. A Carbon Accounting Framework is critical to the success of Carbon Budgeting as it supports the quantitative tracking and management of GHG emissions throughout the municipality. Periodic emission inventories providing the most accurate information on the progress toward achieving the level of emissions specified in the Carbon Budget for all the city departments must be included in the accounting framework.
  14. Robust data on historical emissions across sectors is essential to chart out future emission reduction targets. Emissions reporting should be conducted periodically, like fiscal reporting and key performance indicators as well as targets for every sector should be determined and highlighted.
  15. Municipalities can implement a carbon budget in a phased manner-with phase one including only corporate emissions. Community emissions can be tracked in phase one and incorporated into the carbon budget in the subsequent phases to inform municipal climate actions.
- ## The Carbon Budgeting Process
16. The City of Edmonton follows a comprehensive process to integrate carbon budget into the city's standard decision-making process.
  17. For each financial cycle, all proposals with capital and operational requirement are first brought to a Carbon Budget office.
  18. The amount of carbon eliminated or added from each project proposal is quantified for the business-as-usual scenario using a carbon accounting tool developed by the City.
  19. All the projected impacts of the proposals are compared to the available carbon budget for that financial cycle and prioritized based on a suite of factors including their financial costs and returns as well as their impact on the carbon budget.
  20. From a GHG perspective, the projects that exceed the carbon budget for a particular period will not be approved for that period. In some exceptional circumstances when a carbon deficit for a particular year or cycle is desired by the need for the project, the city council is made aware, and they would either need to disapprove the proposal or address the deficit.

21. Annual evaluation and reporting on the emissions and carbon budget for each project is critical to check and strengthen the accuracy of the forecasting tool and to ensure that the project stays under its projected GHG emissions limit.

## Municipal Implications

22. A carbon budget puts GHG emissions and climate action at the center of policy and budget discussions. It adds accountability in finances, commitments, builds carbon literacy among different departments and leads to transparent emissions reporting.

23. By charting out carbon budget along the city's projects, the city can be constantly aware of how their decisions are affecting their carbon budget. This information will provide city staff and council with the knowledge they require to ensure they become and remain aligned with the Paris Accord and their own municipal climate emergency declarations.

24. The Clean Air Council (CAC) at CAP is prioritizing the Municipal Carbon Budgeting process and providing regular updates on its progress. The CAC is also exploring the possibility of a joint carbon budgeting effort among its member municipalities.

## Related Webinars and Further Reading

25. Clean Air Partnership [Carbon Budgeting Webinar: Edmonton, Alberta and Oslo, Norway Approaches and Experiences](#)

26. City of Edmonton [Information Brief: Carbon Budget and Accounting](#)

27. City of Edmonton, [Integrated Financial and Carbon Budgeting](#)

28. Sustainability Solutions Group. [The Art and Science of City Carbon Budgets](#)

29. Energy Cities. ["Carbon City budget" or "Climate-proofed municipal budgets"?](#)

30. C40 Cities and Arup. [Deadline 2020. How cities will get the job done](#)

## References and Notes

1. The Paris Agreement's long-term temperature goal is to keep the rise in mean global temperature to well below 2 °C above pre-industrial levels, and preferably limit the increase to 1.5 °C
2. Damon Matthews, H., Tokarska, K.B., Rogelj, J. et al. An integrated approach to quantifying uncertainties in the remaining carbon budget. *Commun Earth Environ* 2, 7 (2021).
3. Revised Community Energy Transition Strategy Final Strategy, Action Plan and Policy. - Executive Committee/CityCouncil | DELEGATION - S. McCabe / J. Chase / M. Brostrom / C. Tomaras April 12, 2021 - Urban Form and Corporate Strategic Development UFCSD00209

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