



City of Toronto

# 2019 Consumption-Based Emissions Infographics Report

July 2023



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## How To Use This Document

This Infographics Report provides a high-level summary overview of the content from three recent City of Toronto reports: the *2019 Community-Wide Consumption-Based Emissions Inventory Report*, the *2019 Corporate Consumption-Based Emissions Inventory Report*, and the *2019 Buildings and Linear Infrastructure Emissions Analysis*. The purpose of this Infographic Report is to simplify and capture key information from these other reports; readers should review these other reports for additional information and more details.

This report is intended to answer questions about:

1. What is a consumption-based emissions inventory (CBEI)? What’s included?
2. How does a CBEI differ from Toronto’s existing sector-based emissions inventory (SBEI)? How was the CBEI prepared?
3. What are the key findings from the CBEIs? What is the City of Toronto doing to support a reduction of these emissions?

*Cover image created by EcoDataLab. “Artistic watercolor painting of the Toronto city skyline”, Midjourney, version 5.2, June 2023. [www.midjourney.com](http://www.midjourney.com).*

## Introduction

In 2019, Toronto City Council declared a Climate Emergency and pledged to accelerate the City's climate action plan, including the development of a plan to measure, monitor, and reduce consumption-based (lifecycle) emissions<sup>1</sup>. In 2021, the City adopted<sup>2</sup> the TransformTO Net Zero Strategy (NZS)<sup>3</sup>, and an associated TransformTO Net Zero Strategy Short-Term Implementation Plan 2022-2025<sup>4</sup>. The NZS Short-Term Implementation Plan, item 15B commits the City to conducting a consumption-based emissions inventory and identifying targets that would meaningfully reduce consumption-based emissions.

## What is a consumption-based emissions inventory?

A consumption-based emissions inventory (CBEI) is a type of a greenhouse gas (GHG) inventory that captures all GHG emissions associated with the production, transport, sale, and use of everything consumed by either households or governments. The City of Toronto has prepared two CBEIs: a community-wide CBEI, looking at household consumption by Toronto residents; and a corporate CBEI, looking at consumption by the City of Toronto's government operations. The City has also prepared a separate analysis of emissions from building and linear infrastructure construction.

A community-wide CBEI is similar to a personal household carbon footprint estimate, except it is calculated for all households in Toronto. Household consumption is organized into five categories: transportation, housing, food, goods, and services. The CBEI accounts for all emissions associated with producing, transporting, selling, and using everything households consume in these categories.

Consumption-based emissions can occur anywhere in the world. See **Figure 1** for an overview of what's included in a community-wide CBEI.



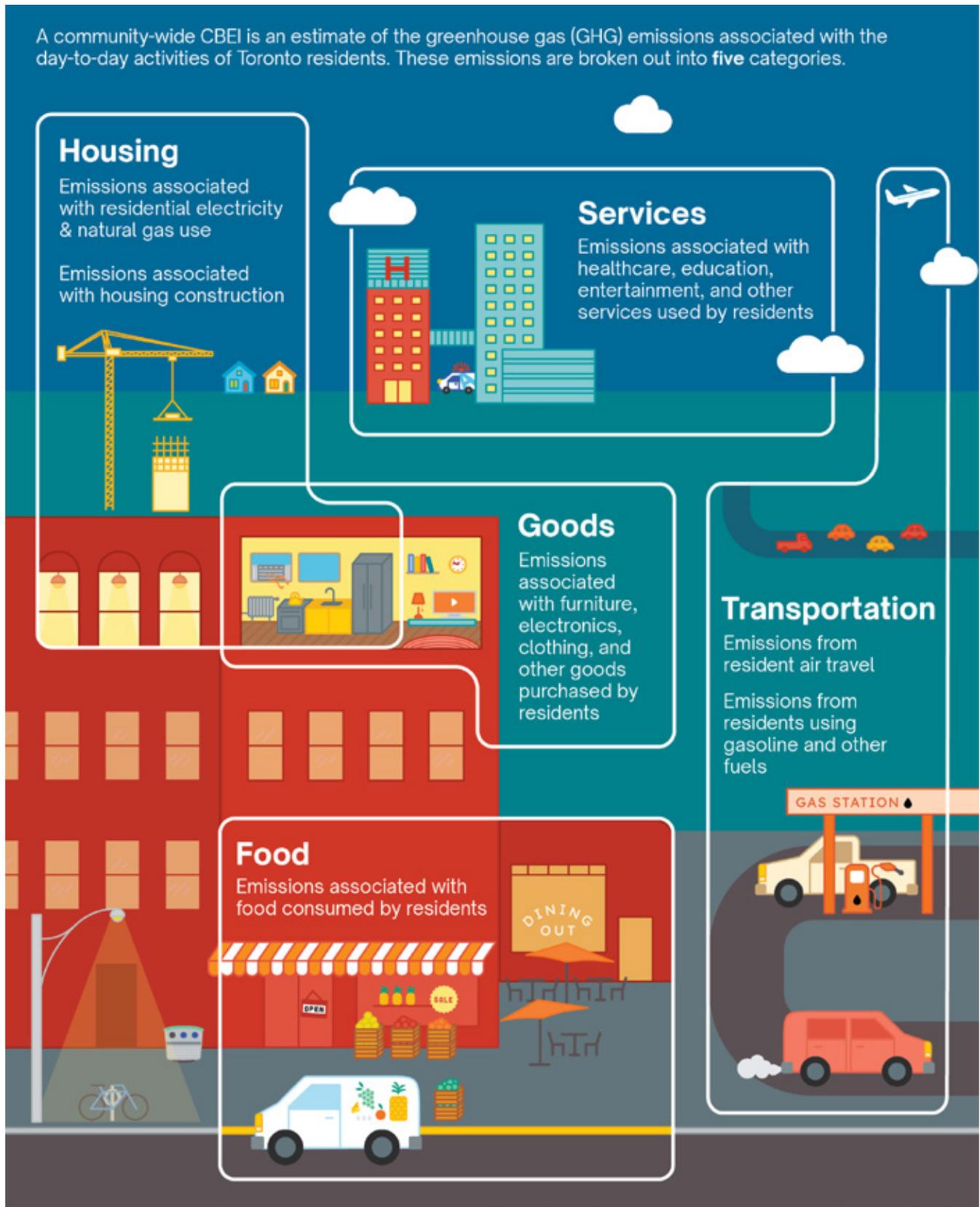
1 Item 6f: <https://secure.toronto.ca/council/agenda-item.do?item=2019.MM10.3>

2 <https://secure.toronto.ca/council/agenda-item.do?item=2021.IE26.16>

3 <https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-173758.pdf>

4 <https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-173757.pdf>

**Figure 1. What's included in a community-wide CBEI?**



GHG emissions can also be broken down by “scope.”

- “Scope 1” emissions occur from sources that are controlled or owned by households (e.g., fuel combustion in boilers, furnaces, vehicles).
- “Scope 2” emissions are associated with the purchase of electricity<sup>5</sup>.
- “Scope 3” emissions, in the context of a community-wide CBEI, are the result of activities involved in producing everything else consumed by households.

The vast majority of emissions in the CBEI are Scope 3 emissions, as shown in **Figure 2** below.

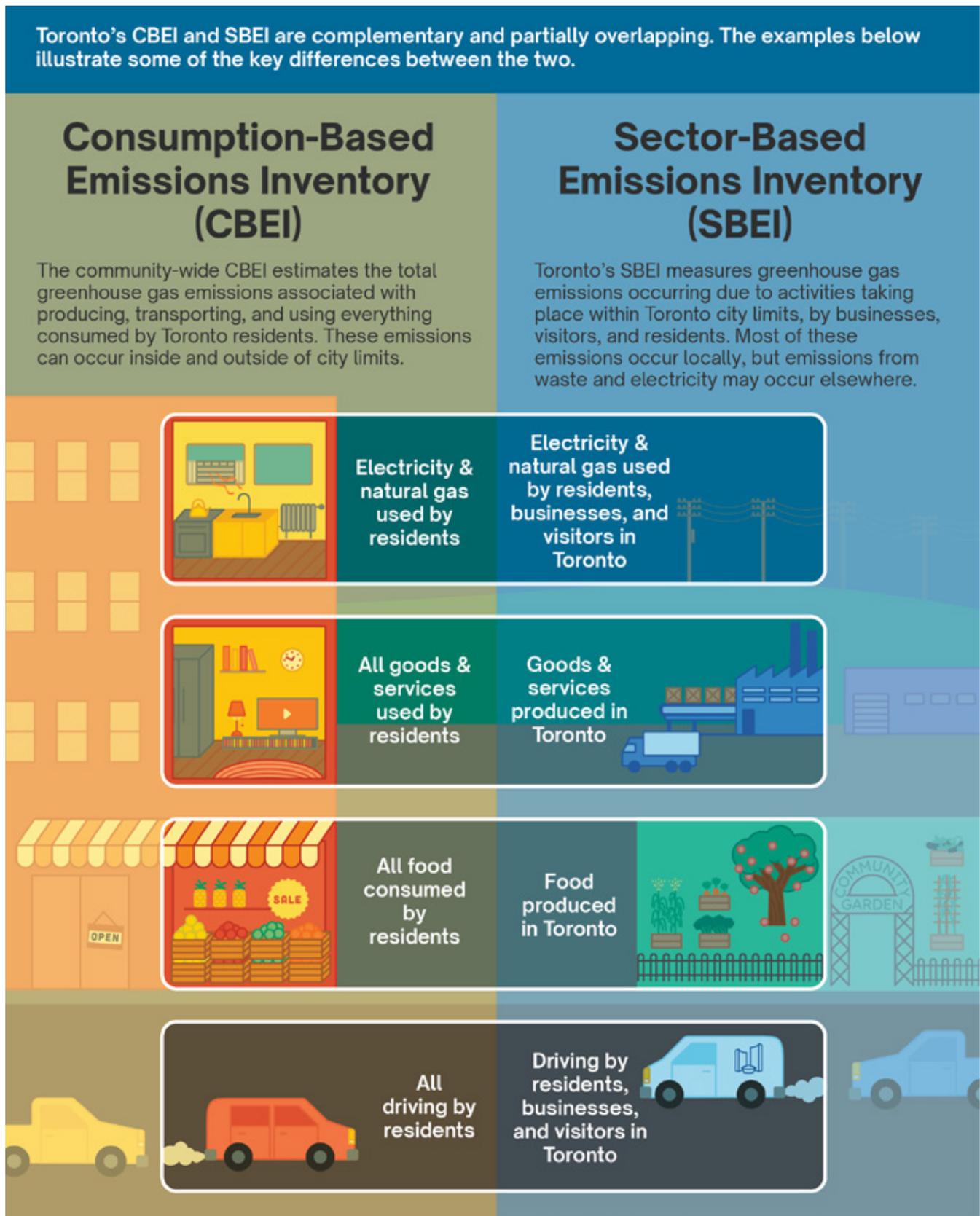
**Figure 2. Community-wide consumption-based emissions by scope**



A CBEI provides a new perspective on local GHG emissions, and for many cities captures a broader range of emissions than a sector-based emissions inventory (SBEI). Toronto’s SBEI measures only GHGs attributable to emissions-generating activities taking place within the geographic boundary of the city, as well as some indirect emissions from waste produced in the city, and transmission of electricity into the city boundary in a given year. Some of these key differences are highlighted in **Figure 3** on the next page.

<sup>5</sup> U.S. Environmental Protection Agency, “Scope 1 and Scope 2 Inventory Guidance” <https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance>

**Figure 3. CBEI vs SBEI: What's The Difference?**





## How is the CBEI prepared?

The CBEI is developed using a wide range of data from local, national, and international sources. These data inform computer models that are used to predict consumer behavior across the wide diversity of Toronto residents. They also help estimate the impacts of consumption. Due to limited data availability, some data sources and models were used based upon U.S. data; in future CBEI work, the City hopes to have more local and Canadian-specific datasets available.

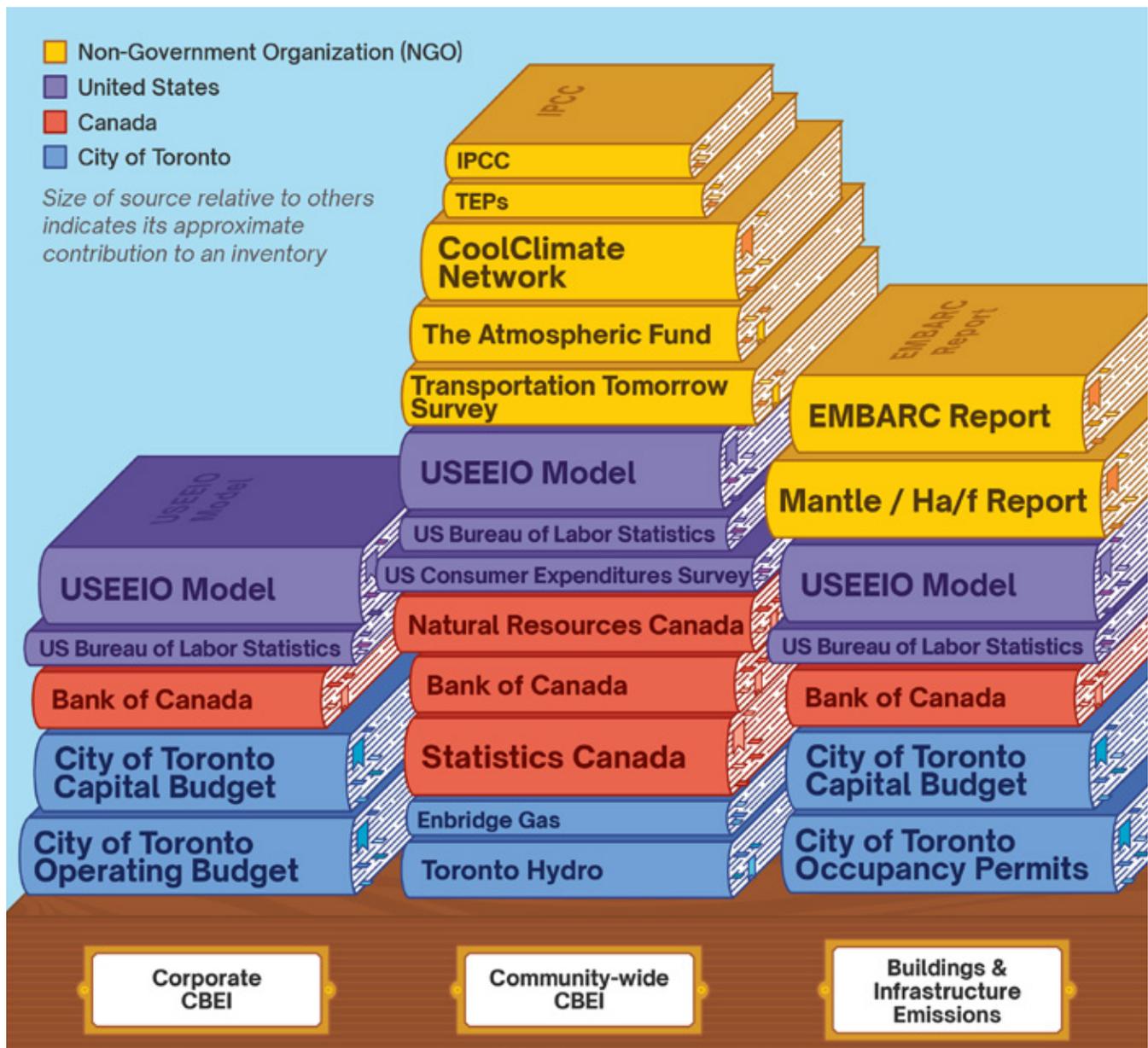
Some of the data used in these inventories include:

- **U.S. Bureau of Labor Statistics and Consumer Expenditures Survey:** Datasets prepared by the U.S. federal government that track consumer expenditures in different categories. These are used by CoolClimate Network to build computer models (mathematical formulas) that predict household expenditures based upon different household characteristics.
- **Statistics Canada:** Canadian census on household characteristics for Toronto, used to predict household expenditures.
- **U.S. Environmentally-Extended Input-Output (USEEIO) Model:** a dataset prepared by the U.S. Environmental Protection Agency that links expenditures to greenhouse gas emissions by industry sector.
- **Enbridge Gas and Toronto Hydro:** Real-world household energy use data.
- **Emissions from Materials Benchmark Assessment for Residential Construction (EMBARC) Report and Mantle Developments:** Local Toronto-area and Ontario studies on the GHG emissions associated with building construction.
- **Traffic Emissions Prediction scheme (TEPs) and Transportation Tomorrow Survey:** Local Toronto-area studies on transportation emissions and vehicle ownership.

- **Intergovernmental Panel on Climate Change (IPCC):** a United Nations agency that studies climate change, and estimates the relative impact of different greenhouse gases. This allows for the conversion of all GHG emissions into units of “carbon dioxide equivalent”, or CO<sub>2</sub>e.
- **City of Toronto Capital & Operating Budgets and Occupancy Permits:** City data on local government expenditures and building construction activity.

Figure 4 shows the relative contributions of these and other data sources to the CBEI reports.

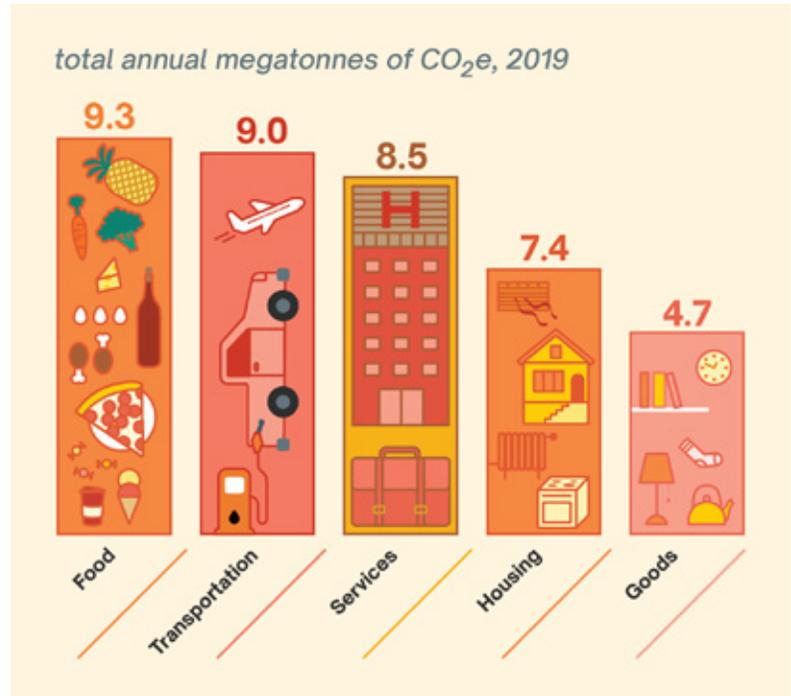
Figure 4. What data sources were used for Toronto’s CBEI?



## What are the findings from the community-wide CBEI?

Toronto's community-wide CBEI totaled 38.9 megatonnes (MT) of CO<sub>2</sub>e in 2019, with 9.3 MTCO<sub>2</sub>e from food, 9.0 MTCO<sub>2</sub>e from transportation, 8.5 MTCO<sub>2</sub>e from services, 7.4 MTCO<sub>2</sub>e from housing, and 4.7 MTCO<sub>2</sub>e from goods, as shown in **Figure 5**.

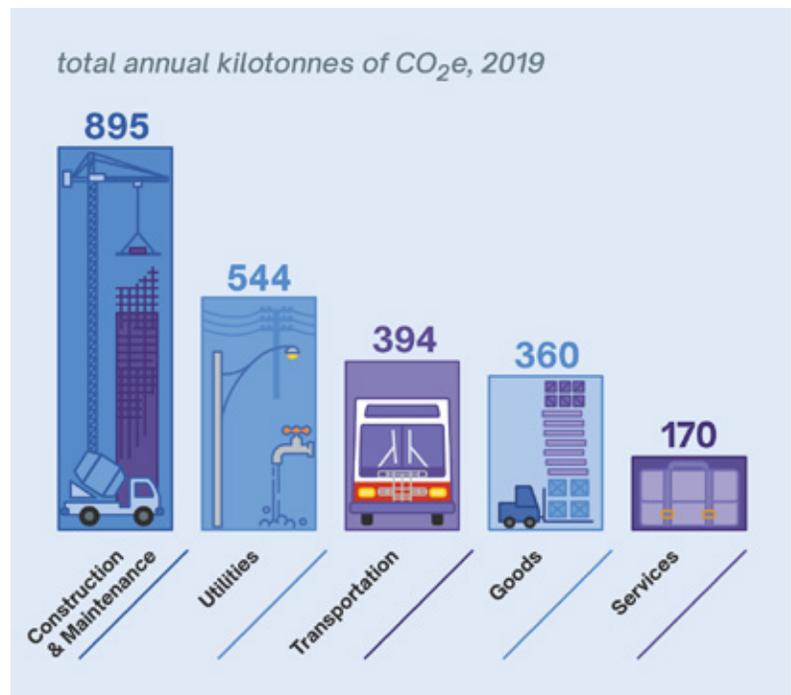
Figure 5. Toronto's community-wide CBEI results



## What are the findings from the corporate CBEI?

Toronto's corporate CBEI totaled 2,363 kilotonnes (kt) of CO<sub>2</sub>e in 2019, with 895 ktCO<sub>2</sub>e from construction and maintenance, 544 ktCO<sub>2</sub>e from utilities, 394 ktCO<sub>2</sub>e from transportation, 360 ktCO<sub>2</sub>e from goods, and 170 ktCO<sub>2</sub>e from services, as shown in **Figure 6**.

Figure 6. Toronto's corporate CBEI results



## How is the City of Toronto supporting a reduction in consumption-based emissions?

In Toronto's community-wide CBEI, gasoline and natural gas usage are two of the largest sources of emissions. Fortunately, the the Council-adopted TransformTO Net Zero Strategy<sup>6</sup> (NZS), Net Zero Existing Buildings Strategy<sup>7</sup> (ExB), and Electric Vehicle Strategy<sup>8</sup> are already working to address these sources of emissions.

The NZS sets an explicit goal of eliminating fossil fuels by 2040. In addition, it outlines critical strategies for ensuring near zero emissions for all new buildings, expanding non-automotive alternatives, and supporting both the ExB and Electric Vehicle Strategies. The ExB specifies further actions to support transitioning existing buildings to all-electric, while the Electric Vehicle Strategy will help the city meet EV uptake targets. Lastly, Toronto's Official Plan<sup>9</sup>, and the province-led Transit-Oriented Communities program<sup>10</sup>, are both supporting the creation of new housing and infrastructure that will reduce the need for automobiles overall.

Toronto has also identified a need to reduce emissions from building construction and food. The City's new Toronto Green Standard<sup>11</sup> sets limits on emissions associated with new buildings, and the City has signed on to the Cool Food Pledge and the C40 Good Food Cities Declaration, committing to reduce emissions associated with the food the City procures, as well as supporting an overall increase in community-wide plant-based food consumption.

**Figure 7**, on the next page, highlights these strategies.



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6 <https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/>

7 <https://www.toronto.ca/services-payments/water-environment/net-zero-homes-buildings/>

8 <https://www.toronto.ca/wp-content/uploads/2020/02/8c46-City-of-Toronto-Electric-Vehicle-Strategy.pdf>

9 <https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/official-plan/>

10 <https://www.toronto.ca/services-payments/streets-parking-transportation/transit-in-toronto/transit-oriented-communities/>

11 <https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/>

**Figure 7. City of Toronto efforts to support a reduction in consumption-based emissions**

