

Consumption-based Emissions Inventory and Cool Food Pledge Commitments

Date: September 6, 2023

To: Infrastructure and Environment Committee

From: Executive Director, Environment and Climate

Wards: All

SUMMARY

Overview of consumption-based emissions inventory

A consumption-based emissions inventory (CBEI) estimates the total greenhouse gas (GHG) emissions associated with producing, transporting, using and disposing of goods and services consumed by a particular community or entity in a given time frame (e.g., typically one year). Similar to calculations that estimate a household's carbon footprint, consumption-based emissions focus on consumers. The emissions associated from the purchases of goods and services by Toronto residents, such as the food that appears on supermarket shelves, consumer goods purchased at a department store or larger items like personal vehicles are captured by a CBEI. Typically, for these products and services, the majority of GHG emissions are generated outside of Toronto's geographic boundary because many of them are not produced in Toronto.

Complementary to CBEI, a sector-based emissions inventory (SBEI)¹ measures the 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 time period (typically one year). When examining where enhanced impact can be achieved that reduce emissions from both consumption and sector-based inventories, transportation (specifically purchasing vehicles and associated gasoline consumption) and natural gas usage present as the greatest opportunities for residents and businesses to reduce emissions through actions that support non-automobile low carbon transportation modes like walking, cycling and taking transit.

¹ <https://www.toronto.ca/wp-content/uploads/2023/01/8e55-2020-Sector-based-Greenhouse-Gas-Emissions-Inventory.pdf>

Report overview and key findings

This report outlines Toronto's inaugural consumption-based emissions inventory. It provides three different baseline points for the year 2019 - community-wide, corporate and a subcategory of corporate emissions that account for the food that the City procures and serves through three key City Divisions. This report also provides observations from an additional analysis on emissions from embodied carbon found in buildings and linear infrastructure which is an emerging issue and opportunity for local government action.

In summary, the key findings of the baseline year for 2019 are:

- Toronto's community-wide consumption-based emissions were roughly 39 megatonnes (MT) of carbon dioxide equivalent (CO₂e). When compared to Toronto's sector-based emissions inventory, the emissions related to consumption were 2.5 times greater² than sector-based emissions reported in 2019 (15.6MT). With 1,141,709 households in the city, this equates to approximately 34 tonnes of tCO₂e per-household. For reference, the Canadian average for consumption-based emissions was estimated at about 37 tCO₂e per-household.
- There are five main categories that constitute Toronto's consumption-based inventory: food, transportation, services, housing, and goods. Among these categories, food accounts for the majority of consumption-based emissions. The food category includes all food consumed by Toronto residents, broken down by meat, dairy, fruits and vegetables, and other foods consumed at home as well as eating out. Consumption-based emissions from food capture the production, transport, sale, and preparation of food. This includes emissions from fertilizer use, livestock farming, operation of trucks and other equipment, building construction and operation, and fuel used in refrigeration and cooking (for food prepared outside the home, including eating out).
- Toronto's corporate CBEI was 2.4 MTCO₂e and is about six per cent of the total community-wide consumption-based emissions. The largest sources of corporate emissions were from construction and maintenance, utilities, and transportation. Among City Divisions, Agencies, and Corporations (DACs), the Toronto Transit Commission (TTC), Toronto Water (TW), and Transportation Services (TS) were the greatest sources of consumption-based emissions, driven heavily by their significant expenditures on capital projects. Toronto's corporate CBEI captures all emissions associated with the activities of the corporation including goods and services procured for City DACs. The corporate CBEI excludes emissions from non-City entities, such as residents, businesses, or other non-municipal government institutions. In addition, it does not include emissions associated with employee commuting. A corporate CBEI is important because it allows for a more comprehensive review of all GHG emissions that can potentially be reduced by local government.

² Attachment A: 2019 Community-Wide Consumption-Based Emissions Inventory Report provides call-out boxes to highlight and compare specific categories that appear for both Toronto's consumption-based emissions inventory and sector-based emissions inventory.

- The procurement of food for municipally-delivered programs was 46 ktCO₂e which is about two per cent of the total corporate CBEI. Of those emissions, nearly half were from beef and lamb consumption, which comprised only three per cent of total food purchased by weight. Seniors Services and Long-Term Care (SSLTC), Shelter, Support & Housing Administration (SSHA), and Children's Services (CS), procure and serve seven million meals for the year 2019 amounting to approximately 3,000 tonnes of food.
- The complementary 2019 Buildings and Linear Infrastructure Emissions Analysis found that construction and maintenance of buildings and linear infrastructure (such as roads, railways and water infrastructure) in Toronto accounted for 1,513 kilotonnes (kt) of CO₂e. Of this total, buildings comprised 1,065 ktCO₂e, while linear infrastructure comprised 448 ktCO₂e; however, these findings include some overlap with calculations from the community and corporate-wide inventories and therefore should be understood as part of the context of those two other CBEIs.

Future CBEI reporting

CBEIs are 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 and their corresponding impacts from material consumption. However, due to limited data availability, the data sources and models used in Toronto's CBEI were based upon U.S. data.

Because of the current limitations on data availability and evolving CBEI methodology³, it is recommended that Toronto's next CBEI be produced in 2027, following the release of the 2026 national census when data will be comparable to the 2019 CBEI for progress monitoring.

Nevertheless, the findings of Toronto's inaugural CBEI can still be incorporated into policy, program and project activities across the City. The information in the report could be used to consider near term policy- or category-specific targets, or even set targets based upon readily available, actionable data that indicate changes in consumption-based emissions without directly monitoring those emissions ("actionable data indicators" or ADI).

For instance, work has already been initiated specific to food-related emissions as part of the City's commitment to reduce the emissions from the food that it procures. In 2019, the City of Toronto became a signatory of the World Resources Institute (WRI)'s Cool Food Pledge and pledged to decrease emissions from public food procurement by 25 per cent by 2030 relative to 2019 levels. It is therefore recommended that the City continue to calculate and report on an annual basis to the Cool Food Pledge and C40 on progress towards Toronto's food procurement-related commitments and to summarize Toronto's progress on the City's website with identification of the actions

³ In particular, the results calculated from majority of the consumption categories in the report were based on national-level statistical data, including those in the United States. Multiple assumptions were made to estimate local or household-level consumption patterns by Toronto residents.

taken yearly to reach the 2030 goal. This information can be analysed as part of Toronto's 2027 CBEI report.

With respect to building emissions, in 2022, City Planning updated the Toronto Green Standard Version 4 (TGS v4) which applies to new buildings and included revisions in the "Embodied Emissions in Materials" performance measures which apply to the emissions produced by materials used to construct buildings and limit these emissions to 350 kg CO₂e/m² for Tier 2 mid-high rise, non-residential buildings and City-owned facilities and 250 kgCO₂e/m² for Tier 3 mid-high rise and non-residential buildings ([2023.PH3.19](#)). Both E&C and City Planning will continue to refine and adjust actions being taken to address embodied carbon in buildings as further refinement and studies become available.

While methodologies and practices for tracking consumption-based emissions is a nascent field, it shows potential for unique opportunities to support local government in future with developing targets, policies, and programs that can help shift Toronto residents towards more responsible production and consumption of goods and services in order to reduce Toronto's global carbon footprint.

RECOMMENDATIONS

The Executive Director, Environment and Climate, recommends that:

1. City Council direct the Director, Environment and Climate in consultation with Executive Director, Social Development, Finance & Administration, General Manager, Children's Services, General Manager, Shelter, Support & Housing Administration, General Manager, Seniors Services and Long-Term Care, Chief Procurement Officer, Purchasing & Materials Management and Chief Planner & Executive Director, City Planning to report on Toronto's next CBEI in 2027, following the release of the 2026 Canadian Census and recommend methods that consumption-based emissions can be meaningfully measured to assist with future target setting.
2. City Council direct the Director, Environment and Climate to include in future reports progress and actions in meeting Toronto Cool Food Pledge and the C40 Good Food Cities Declaration commitments.

FINANCIAL IMPACT

There is no financial impact to the approved 2023 Operating and Capital budgets for the Environment and Climate (E&C) Division. Any incremental financial impacts will be included in future year Budget submissions for relevant Divisions. E&C has procured a study on cost analysis of shifting food servings to climate-friendly meals across three City Divisions (Seniors Services and Long-Term Care (SSLTC), Shelter, Support & Housing Administration (SSHA); and Children's Services (CS)). Results of the study will be available for Council's consideration in 2024.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

On December 15, 2021, Toronto City Council Council endorsed the TransformTO Net Zero Strategy (NZS) ([2021.IE26.16](#)) and an associated TransformTO NZS Short-term Implementation Plan 2022 – 2025. 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.

In addition, City Council adopted the NZS along with a few related directions, including the Cool Food Pledge initiative ([2021.IE26.16, #17](#)). Specifically, City Council directed the Director, Environment and Energy (now Environment and Climate, E&C), in coordination with Executive Director, Social Development, Finance and Administration (SDFA) and the Chief Procurement Officer, Purchasing and Materials Management Division (PMMD), to identify ways that the City can support the reduction of the GHG emissions associated with food the City of Toronto procures, in alignment with the City's Cool Food Pledge and the C40 Good Food Cities Declaration, and to report back in the second quarter of 2023 on the status of corporate and community food-related emissions and recommended actions for the TransformTO 2026-2030 short-term action plan, including a goal to maximize local, organic and fair trade food procurement.

On July 4, 2017, City Council direct the Chief Corporate Officer to report back on the relevance of consumption-based GHG emissions accounting in the Toronto context as part of the 2019 status update and renewed TransformTO implementation plan ([2017.PE19.4](#)).

On October 2, 2019, 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 ([2019.MM10.3](#)).

COMMENTS

Overview and methodology

Consumption-based emissions inventories (CBEI) estimate the greenhouse gas (GHG) emissions associated with producing, transporting, using, and disposing of goods and services consumed by a particular community or entity in a given time frame (typically one year). Similar to calculations that estimate a household's carbon footprint, consumption-based emissions focus on consumers, in this case, Toronto residents and the emissions associated from their purchases of goods and services such as the food that appears on supermarket shelves or consumed in restaurants, large items purchased at department stores or even larger items like personal vehicles. Typically, for these products and services, the majority of their emissions are generated outside of Toronto's geographic boundary because many of them are not produced in Toronto.

Toronto's first CBEI report serves as a baseline study for the calendar year 2019 using the best currently available data for the city. Three separate baseline points for the year 2019 were generated as part of the study - community-wide, corporate and a subcategory of corporate emissions being emissions from the food that the City procures and serves through three key City Divisions. Observations from an additional analysis regarding emissions from embodied carbon found in "Buildings and Linear Infrastructure Emissions" was also generated to complement the information found in the community and corporate CBEIs. The emissions associated with materials and energy used to build buildings and other infrastructure (roads, etc) presents additional opportunities for local government action.

Quantifying consumption-related emissions is a highly complex exercise, that even if imperfect, can still provide reasonable estimates. According to the Urban Sustainability Director's Network (USDN)⁴, it would take a substantial amount of effort to understand the emissions associated with every consumption decision to create an accurate CBEI — and any precise estimate is likely to become obsolete as production processes and supply chains change over time (sometimes month-to-month or week-to-week).

Consumption-based emissions are modeled based on local variables (e.g., income and vehicle ownership) which are used to estimate, for example, consumer spending and energy usage. These estimates of consumer spending are then linked with corresponding GHG emission factors to estimate consumption-based emissions. A CBEI includes emissions associated with businesses, but only to the extent that those businesses are providing goods or services to residents and thereby captured in household spending.

A CBEI provides a new perspective on local GHG emissions, and for many cities captures a broader range of emissions than a traditional or sector-based emissions inventory (SBEI). Under a CBEI approach, all global GHG emissions are allocated to a final demand (i.e., households and government activities). A CBEI accounts for the full lifecycle emissions of all goods and services consumed by residents or a government entity.

In contrast to the CBEI, an 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 time period (typically one year).

Sector- and consumption-based approaches are complementary tools to track GHG emissions and both are partially overlapping. Both look at residents' local, direct emissions (e.g., from driving or home heating). A sector-based inventory considers the local, direct emissions from businesses and visitors, as well as the indirect emissions associated with electricity used inside the city. However, a sector-based inventory will ignore other emissions occurring from production or consumption outside the city's boundaries that may be for the benefit of residents of the city. Meanwhile, a consumption-based inventory omits the local emissions from business and visitor

4 <https://sustainableconsumption.usdn.org/climate/cbei-guidebook/cbei-basics>

activities that do not serve residents, and instead account for the emissions associated with producing everything that city residents purchase or consume. These consumption-based emissions may occur anywhere in the world.

Figure 1 shows Toronto's total community-wide consumption-based emissions in 2019.

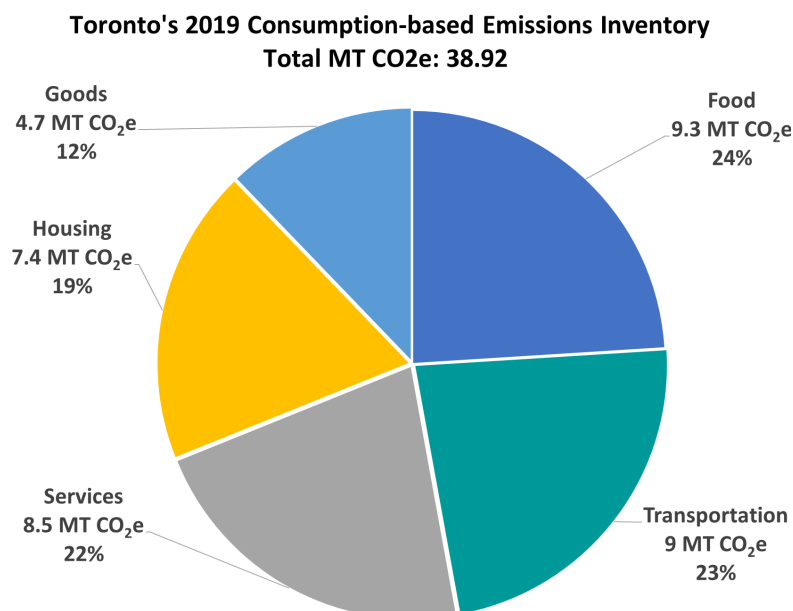


Figure 1 Toronto's community-wide consumption-based emissions (2019)

The City has ambitious targets to reduce sector-based GHG emissions by 45 per cent from 1990 levels by 2025, 65 per cent from 1990 levels by 2030, and to reach net zero by 2040. These targets are based on a sector-based GHG inventory, which is generated on an annual basis to better understand the impact of collective community action in reducing emissions to address the climate crisis. With this initial baseline report for consumption-based emissions, the City can identify actions to reduce Toronto's global carbon footprint.

Results

Key emissions categories of community-wide CBEI

Community-wide CBEI measures GHG emissions attributable to all household consumption, across five categories of food, transportation, services, housing, and goods.

- The **Food** category includes all food consumed by residents of Toronto, broken into meat, dairy, fruits & vegetables, and other foods consumed at home, as well as eating out. Consumption-based emissions from food include emissions associated with the production, transport, sale, and preparation of food. This includes emissions from fertilizer and pesticide use and application, livestock farming, operation of trucks and other equipment, building construction and operation, and fuel used in refrigeration and cooking (for food prepared outside the home, including eating out).

- The **Transportation** category includes household gasoline usage, vehicle purchases and maintenance, and air travel.
- The **Services** category includes all services used by residents, such as healthcare, entertainment, education, personal care services, financial services, and more⁵.
- The **Housing** category consists of emissions associated with household natural gas and electricity use, embodied emissions in home construction and maintenance (shelter), and energy and construction of other lodging (such as hotels and motels).
- The **Goods** category includes all physical items purchased by households (excluding items in other categories, such as food and fuel). The goods category includes items like furniture, personal electronics, clothing, personal care products, toys, and books.

In 2019, the average household in Toronto was responsible for roughly 34 tonnes of CO₂e annually (tCO₂e), or about 14 tCO₂e per-person. With 1,141,709 households in the city, this is a total of roughly 39 MTCO₂e in 2019 attributable to residents of Toronto. Referring to

Figure 2, among all categories, food, transportation, and services are the largest overall consumption categories, accounting for 24 per cent, 23 per cent, and 22 per cent of emissions, respectively. Together, these account for 69 per cent of total emissions. The remaining 31 per cent of emissions was comprised of housing (19 per cent) and goods (12 per cent).

Each of these categories also includes multiple sub-categories. Across all sub-categories, natural gas, gasoline, and healthcare were the top three, accounting for 15 per cent, 15 per cent, and 14 per cent of total emissions, respectively - a combined 44 per cent.

Figure 2 provides the full breakdown of emissions by category and sub-category at the household level.

Attachment A: 2019 Community-Wide Consumption-Based Emissions Inventory Report provides the full breakdown and analysis conducted to quantify the 2019 community-wide consumption-based emissions in Toronto and presents each consumption category and sub-category in greater detail.

⁵ Please refer to *2019 Community-Wide Consumption-Based Emissions Inventory Report Appendix A: Methodology* for more details.

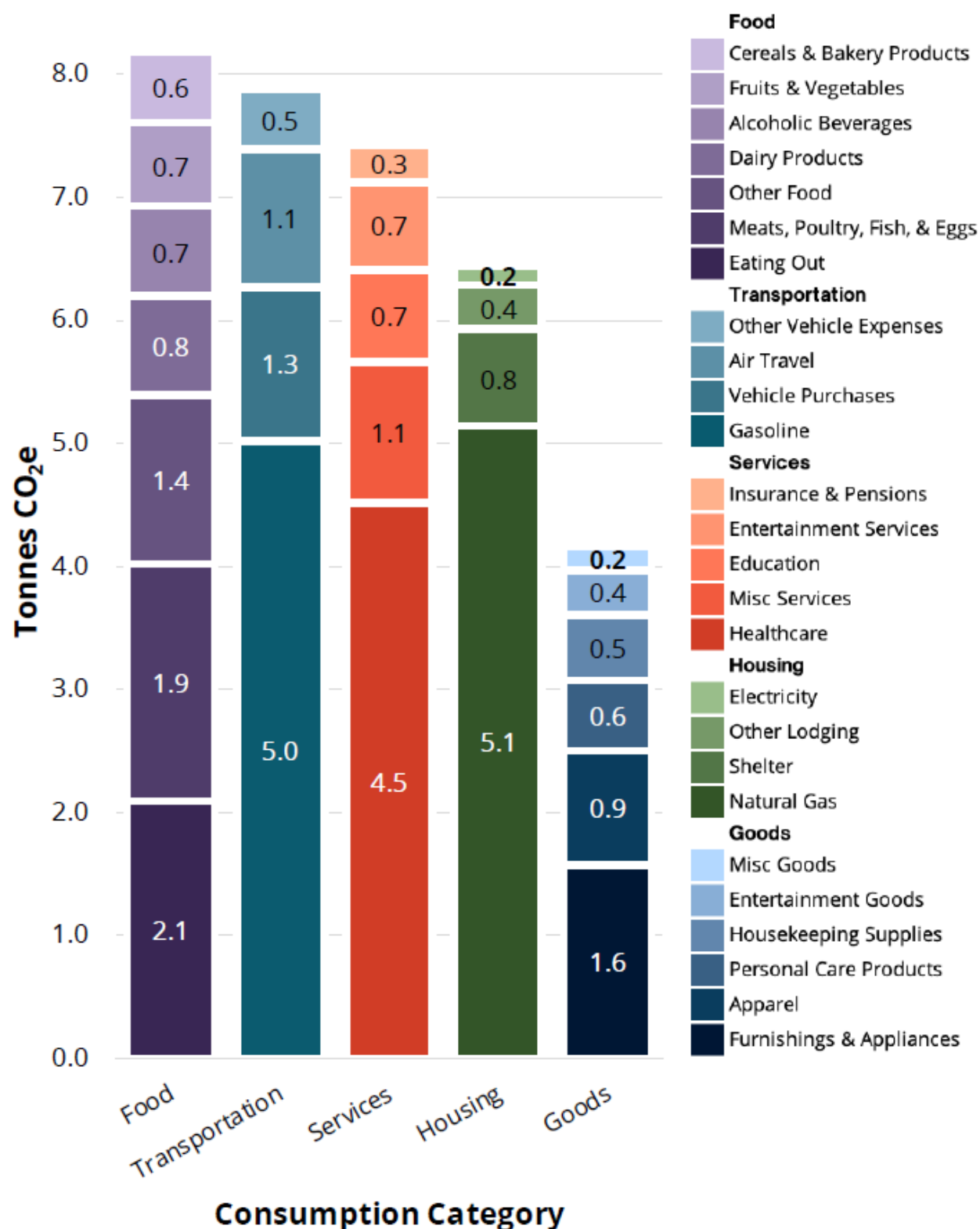


Figure 2: Toronto Average Household Consumption-Based Emissions (2019) by Sub-category

The community-wide CBEI relies upon estimates of household spending (consumption) in various categories and sub-categories, and emission factors associated with each sub-category. Because it is not possible to know exactly what every Toronto resident is buying, or what the emissions factors are for every good and service sold to Toronto residents, the community CBEI relies on a model (a complex mathematical equation) to predict household spending by sub-category. These spending estimates are then combined with economy-wide average emissions per dollar of expenditure by sub-category to get total household emissions. For additional information on the methodology, see *Attachment A: 2019 Community-Wide Consumption-Based Emissions Inventory Report (Appendix A: Methodology)*.

Key emissions categories of corporate CBEI

The City of Toronto's corporate consumption-based emissions are based upon the City's capital budget, operating budget, and corporate SBEI, and are organized into five categories: construction and maintenance, utilities, transportation, goods, and services.

Attachment B: 2019 Corporate Consumption-Based Emissions Inventory Report describes in detail the five consumption categories, organized by North American Industry Classification System (NAICS) sector. NAICS is the standard industry classification system used in the US, Canada, and Mexico to provide common definitions and a common statistical framework for industrial analysis. The City's capital and operating data were evaluated and assigned to a corresponding NAICS code based upon the details of the line item. See *Appendix A: Methodology*.

This corporate CBEI report is a baseline CBEI for the municipal corporation of the City of Toronto, accounting for all emissions generated by the City's activities and other associated goods and services it procures for City Divisions, Agencies and Corporations (DACs). This corporate CBEI does not include emissions from non-City entities, such as residents, businesses, or other non-municipal government institutions. In addition, it does not include emissions associated with employee commutes. The corporate consumption-based emissions are also categorized into Scope as shown in Figure 3:

- Scope 1 emissions are those that occur as a direct result of activity by the City, such as the emissions associated with driving a City-owned vehicle (e.g., transit buses, police patrols, etc.).
- Scope 2 emissions are emissions that occur indirectly as a result of the City's use of electricity, steam, heat, or cooling.
- Scope 3 emissions are the indirect result of activities by the corporation, and include all emissions associated with producing or disposing of goods and services purchased by the corporation. Most emissions in the corporate CBEI are Scope 3 emissions, which predominantly result from the purchase of goods, services, and capital expenditures by the City.

The City's 2019 corporate CBEI totaled 2.4 MtCO₂e, which is significantly larger than the City's corporate SBEI of 0.74 MtCO₂e. The corporate CBEI includes all emissions in the corporate SBEI, plus the emissions associated with construction and maintenance,

indirect emissions from energy use and transportation, and the purchase of other goods and services not otherwise accounted for.

Toronto’s community-wide CBEI was 39 MtCO₂e, which puts the City’s corporate CBEI at about six per cent of the total community-wide consumption-based emissions.

Figure 3 presents the City’s corporate consumption-based emissions in detail by category and scope. The largest sources of corporate consumption-based emissions were construction and maintenance, utilities, and transportation. Overall, Scope 3 emissions comprised 71 per cent of corporate CBEI emissions, followed by Scope 1 emissions at 26 per cent and Scope 2 at two per cent. Among City divisions, Toronto Transit Commission (TTC), Toronto Water, and Transportation Services were the greatest sources of consumption-based emissions, driven heavily by significant expenditures on capital projects.

The DAC with the greatest consumption-based emissions associated with its operations was the TTC, accounting for 681 ktCO₂e, or about 29 per cent of the total corporate CBEI derived from a combination of emissions-intensive capital purchases (buses and subway cars), the construction and maintenance of tracks and bridges, and direct operations of diesel-powered buses.

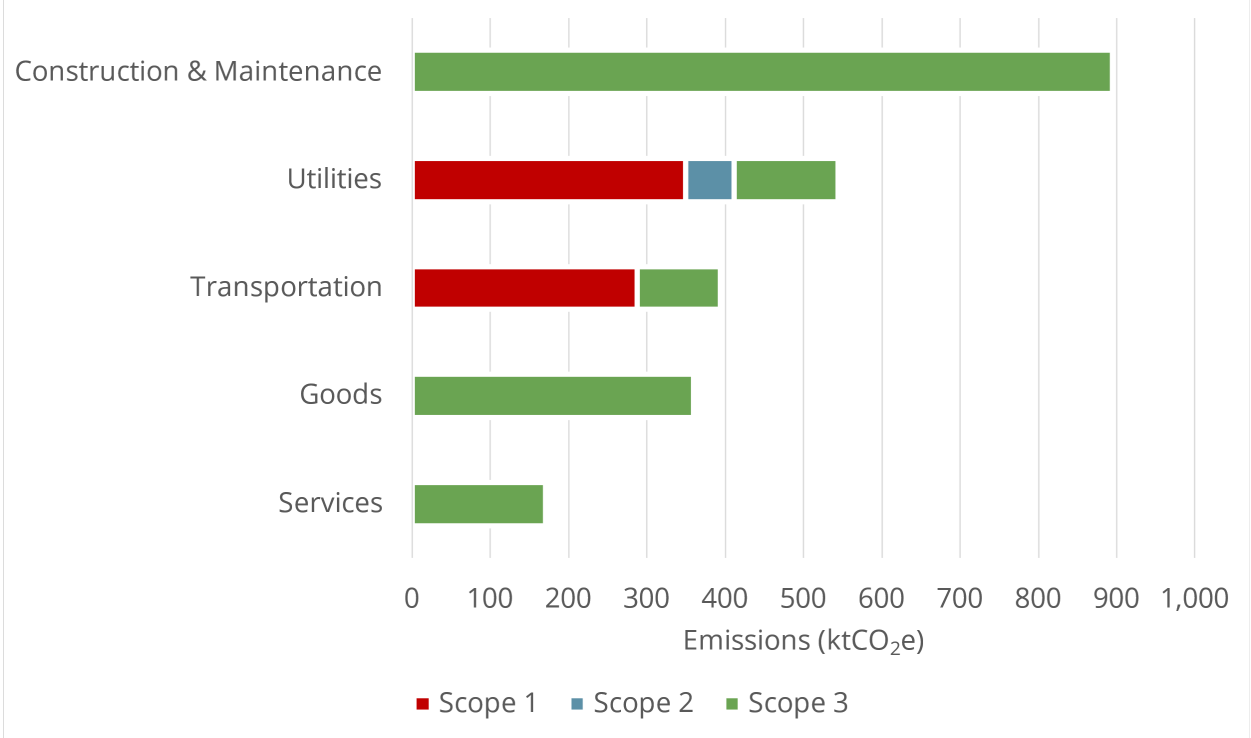


Figure 3 City of Toronto consumption-based emissions by corporate consumption category (2019)

Buildings and linear infrastructure analysis results

In 2023, the City prepared a Toronto community-wide CBEI, as well as an expanded City of Toronto corporate CBEI. Both the community-wide and corporate CBEI information presented above were found to be incomplete as far as a review of the

emissions associated with buildings and linear infrastructure⁶ were concerned. The community-wide CBEI allocates all emissions to households, and does not explicitly calculate emissions associated with local construction activity in a given year. Specifically, the shelter sub-category in the community-wide CBEI report is based upon household spending, not construction data. Households typically spread the cost of housing out across multiple years (for instance, paying a mortgage or paying rent), and so this category reflects the (modeled) long-term average residential construction emissions. Meanwhile, the corporate CBEI calculates emissions associated with construction and maintenance done by the City of Toronto but does not go into detail on either buildings or infrastructure, and does not include non-City construction activity.

Therefore, a detailed look at specific categories of consumption-based emissions (buildings and linear infrastructure), rather than a full inventory of the emissions associated with a jurisdiction (like the community-wide CBEI report) or an organization (like the corporate CBEI report) was undertaken presenting a complementary analysis to the City of Toronto's Community-wide CBEI and Corporate CBEI reports.

The analysis used data from 2019, for both city-wide public and private buildings (through occupancy permits data) as well as corporate infrastructure budgeting (through the City's capital budget data), to establish a potential baseline for setting reduction targets and future monitoring, tracking, and reporting of building and infrastructure emissions.

In 2019, construction and maintenance of buildings and linear infrastructure in Toronto accounted for 1,513 ktCO₂e. Of this total, buildings comprised 1,065 ktCO₂e, while linear infrastructure comprised 448 ktCO₂e.

Across buildings and infrastructure, the largest sources of emissions are:

- New residential construction (439 ktCO₂e)
- Non-residential maintenance and renovations (351 ktCO₂e)
- Water & sewer infrastructure (202 ktCO₂e)
- Highway, street, and bridge construction (167 ktCO₂e)

Together, these four areas made up 1,159 ktCO₂e, or 77 per cent of total buildings and infrastructure emissions.

City of Toronto's Cool Food Pledge commitment

Based on Council direction ([2021.IE26.16, #17](#)), City staff undertook Toronto's 2019 Cool Food Pledge Baseline Report (Cool Food Pledge Baseline Report) which estimated the City's emissions associated with its public food procurement. City staff also estimated Toronto's food-related emissions as part of its 2019 community-wide CBEI. Results and discussions from the Cool Food Pledge Baseline Report along with the community-wide food consumption-based emissions were incorporated in both the community-wide and corporate CBEIs that are attached to this report.

⁶ Linear infrastructure refers to long, narrow physical assets that span significant distances and are used to deliver and support public services, such as roads, railways, and pipelines.

In 2019, the City of Toronto adopted the Cool Food Pledge⁷, committing to reduce the GHG emissions associated with its food procurement by 25 per cent by 2030 relative to a 2019 baseline.

Three divisions, Seniors Services and Long-Term Care (SSLTC), Shelter, Support & Housing Administration (SSHA), and Children's Services (CS) are the main purchasers of food serving seven million meals per year which equate to approximately 3,000 tonnes of food. In 2019, food procured by the City resulted in about 46 ktCO₂e (about two per cent of the total corporate CBEI or roughly 0.1 per cent of the community-wide CBEI). Of those emissions, nearly half were attributable to beef and lamb alone, which comprised only three per cent of total food purchased by weight.

Based on the City of Toronto's Cool Food Pledge Baseline Report, the City can meet its Cool Food Pledge target of reducing food-related emissions by 25 per cent by 2030, relative to a 2019 baseline, through shifting menus away from beef and lamb and towards plant-based options with some low-emission meats (such as seafood and poultry).

The Cool Food Pledge Baseline Report outlines four specific menu shift strategies:

- Delicious center-of-plate meals with plant-based proteins, to make plant-based meal options as appealing as animal-based meals;
- Increasing vegetables on the plate, shifting from a meat-centered plate with a side of vegetables to a vegetable-centric plate with meat on the side;
- Blended meat dishes, which combine both meat and plant-based proteins; and
- Shifting meat (e.g., beef, goat, and pork) to more poultry or fish dishes.

There are multiple considerations to include when deploying these strategies, and any menu changes must be planned closely with front-line nutrition managers and staff who best know the City's clients. For instance, the Cool Food Pledge Baseline Report noted that SSLTC identified that further reductions in beef and lamb could pose difficulties in ensuring residents are still able to get sufficient protein, since plant-based recipes typically require larger portion sizes to meet protein requirements, and larger quantities can be challenging for residents in long-term care to consume. In addition, plant-based recipes are not well received by the residents in Long Term Care homes, and lower food intake may lead to negative clinical outcomes such as weight loss or malnutrition. In SSHA, clients are expressing desires for increased quantities of meat. Working with City Divisions on the careful design of healthy and enticing menus will be key to Toronto's success in reducing its emissions from food. The City of Copenhagen has demonstrated such success through close cooperation with its chefs and dieticians in transitioning away from carbon intensive diets.

In addition to the Cool Food Pledge's commitment to reduce food emissions, the City of Toronto has also adopted a goal of maximizing local, organic and fair-trade procurement. The Cool Food Pledge Baseline Report also addresses this, proposing that the City:

⁷ <https://coolfood.org/pledge/>

- Include local food purchasing priorities and environmentally responsible purchasing practices in the background information for all food procurement documents;
- Require bidders to describe their approach to identifying any food products purchased that are “local” to Ontario; and
- Require bidders to describe their ability to identify certified sustainable, fair trade, and organic food products purchased.

On May 30, 2023, the City awarded RFP 3743044527 to Sysco Toronto for the supply and delivery of groceries for SSLTC, SSHA and CS ([2023.GG4.20](#)) based on a public procurement process which inserted Cool Food Pledge reporting requirements into the public procurement bidding process to ask vendors to quantifying emissions associated with the bids they were submitting. The scoring criteria to evaluate proposals from potential Vendors reflected the Cool Food Pledge requirements.

Supporting community-wide reduction of food-related emissions

Under the Cool Food Pledge, the City has developed a set of initiatives to address emissions associated with public food procurement. This section of the report presents some potential options to inform education and awareness campaigns targeted at Toronto residents who wish to reduce their own personal food emissions footprint:

- Food accounts for 8.2 tCO₂e, or roughly 24 per cent of average household emissions, and the single largest sub-category is eating out at 2.1 tCO₂e, or 26 per cent of total food emissions.
- The remaining 74 per cent of food emissions include meats, poultry, fish, and eggs (23 per cent); other food, including processed foods (17 per cent), dairy products (10 per cent), alcoholic beverages (nine per cent), fruits and vegetables (eight per cent), and cereals and bakery products (seven per cent).
- Meat & dairy, combined, make up the largest sources of at-home food emissions for households.
- In Toronto, meat, poultry, fish, eggs, and dairy combined account for 2.7 tCO₂e of emissions, while fruits and vegetables, cereals, and other foods account for 2.7 tCO₂e.

To reduce emissions from the consumption of meat, poultry, fish, eggs, and dairy, the City could look at successful strategies that shift resident choices around food.

Generally, there are two strategies for shifting diets:

- educate and inform consumers on the impacts of their dietary choices, and
- shift the social, economic, and/or behavioural environments in which consumers make their choices.

Aligning sector-based reduction efforts to support a reduction in consumption-based emissions

Across Toronto's community-wide consumption-based emissions inventory, transportation (specifically gasoline consumption) and natural gas usage present as the greatest, overlapping opportunities for Toronto to reduce emissions. In other words, by supporting efforts to reduce and/or eliminate emissions from natural gas and gasoline, we would achieve the needed trajectory to reach our sector-based goals while also reducing our consumption-based footprint. Toronto's average household consumption-based emissions could be reduced by 10.1 tCO₂e, or 30 per cent overall by targeting gasoline and natural gas usage.

Addressing emissions in these sub-categories directly aligns with existing City efforts and strategies outlined in the Council-adopted TransformTO Net Zero Strategy, Net Zero Existing Buildings Strategy⁸ (ExB), and Electric Vehicle Strategy⁹. The NZS sets an explicit goal of eliminating fossil fuels (especially natural gas used in homes and gasoline used in cars) 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.

Further, the City of Toronto already has a number of goals that align corporate emissions reduction activities to result in a reduction in consumption-based emissions. These goals include achieving the following by 2030:

- City of Toronto corporate greenhouse gas emissions are reduced by 65 per cent over 2008 base year
- All City Agency, Corporation and Division-owned new developments are designed and constructed to applicable Toronto Green Standard Version 4 standard¹⁰ achieving zero carbon emissions, beginning in 2022
- Greenhouse gas emissions from City-owned buildings are reduced by 60 per cent from 2008 levels; by 2040, City-owned buildings reach net zero greenhouse gas emissions
- All City-owned facilities have achieved zero waste
- Generate and utilize 1.5 Million Gigajoules of energy from biogas
- Approximately 107,700 tonnes CO₂e per year are reduced through Organics Processing with Renewable Energy and Landfill Gas Utilization
- 50 per cent of the City-owned fleet is transitioned to zero-emissions vehicles
- 50 per cent of the TTC bus fleet is zero-emissions
- Greenhouse gas emissions from food the City of Toronto procures are reduced by 25 per cent

Figure 4 highlights some of the City's work to support the reduction of community-wide and corporate consumption-based emissions.

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

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

10 <https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/toronto-green-standard-version-4/>

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

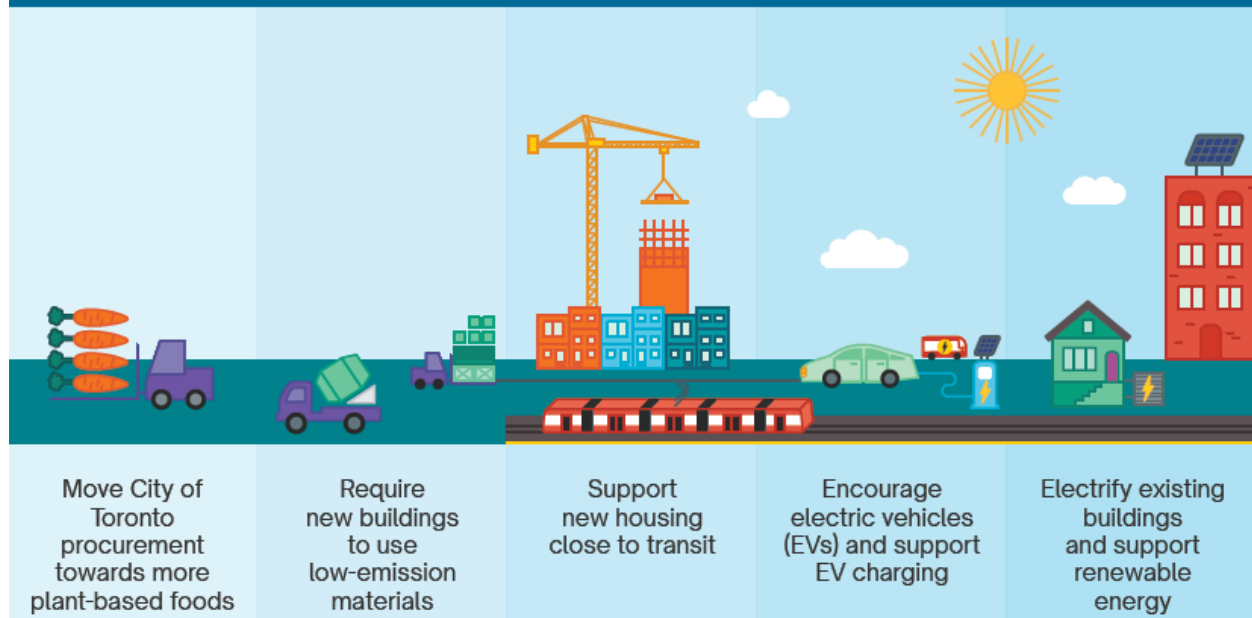


Figure 4 City of Toronto efforts to support a reduction in consumption-based emissions

Discussion: Challenges in setting consumption-based emissions targets

A jurisdictional scan of key cities and their consumption-based emissions targets was conducted resulting in the following:

- The City and County of San Francisco (U.S.) adopted targets to reduce community-wide consumption-based emissions by 40 per cent below 1990 levels by 2030 and 80 per cent below 1990 levels by 2050¹¹, goals which are equivalent to a roughly 16 per cent reduction below 2015 levels by 2030 and a 72 per cent reduction below 2015 levels by 2050¹².
- London (U.K.) has adopted the target of reducing community-wide consumption-based emissions by two thirds below 2001 levels by 2030¹³, equivalent to roughly a 45 per cent reduction from 2018 levels¹⁴.

11 City & County of San Francisco. San Francisco Environment Code, Sec. 902 Climate Action Goals. https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_environment/0-0-0-908

12 City & County of San Francisco. "Consumption-Based Greenhouse Gas Inventory of San Francisco from 1990 to 2015."

https://escholarship.org/content/qt4k19r6z7/qt4k19r6z7_noSplash_fb6cd829c9dc3869b5be1c0c2e7bf683.pdf

13 London Councils. "Consumption-based emissions in London have reduced but not fast enough to meet emission targets, warns new report." <https://beta.londoncouncils.gov.uk/news/2021/consumption-based-emissions-london-boroughs-have-reduced-not-fast-enough-meet-emission>

14 London Councils. "Consumption-based emission profiles for London boroughs."

<https://www.londoncouncils.gov.uk/our-key-themes/climate-change/consumption-based-greenhouse-gas-household-emissions-profiles-london>

- Paris (France) has set targets to reduce consumption-based emissions by 35 per cent below 2004 levels by 2030 and achieve an 80 per cent reduction in consumption-based emissions by 2050^{15,16}.

It is important to note that, at least in the cases of San Francisco and London, these targets were set without technical evaluations of feasibility.

No Canadian cities have set community-wide consumption-based emissions targets that are applicable across all consumption categories. The City of Vancouver has adopted an embodied carbon reduction target for new construction¹⁷.

In addition to a low adoption of target-setting from major leading cities specific to consumption-based emissions, a number of data and methodology limitations restrict Toronto's ability to identify consumption-based emissions reduction targets at this time.

The community-wide CBEI consumption model is based upon U.S. spending patterns, as well as emissions factors based upon the U.S. economy. Ideally, future work would use a consumption model based upon Canadian spending patterns, and emission factors based upon Canada-, Ontario-, or Toronto-specific economic and emissions data. In addition, household characteristics that serve as inputs into the consumption model are taken from national Canadian census data which is only published every five years. The next national census will take place in 2026.

Due to the current limitations on data availability and evolving CBEI methodologies, future CBEIs may not fully reflect changes in local consumption patterns, or the emissions intensities of goods and services consumed, making it less useful for target-setting. These limitations may also mean that the City would only be able to prepare an updated CBEI every five years, with the release of updated national census data, unless the City uses an alternative approach to monitoring and tracking consumption-based emissions.

As an alternative to setting an overall reduction target for consumption-based emissions, the City could instead set policy- or category-specific targets, or even set targets based upon readily available, actionable data that indicates changes in consumption-based emissions without directly monitoring those emissions ("actionable data indicators" or ADI).

15 C40 Cities. "Paris Climate Action Plan: Towards a carbon neutral city and 100 per cent renewable energy." https://www.c40knowledgehub.org/s/article/Paris-Climate-Action-Plan-Towards-a-carbon-neutral-city-and-100-renewable-energy?language=en_US

16 City of Paris. "Paris Climate Action Plan: Towards a Carbon Neutral City and 100 per cent Renewable Energies" (2018). https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ae2f905a2f4220ae645f026/5af7316614ad660b652531de/files/Paris_-_Paris_Climate_Action_Plan.pdf?1526890697

17 <https://mantledev.com/insights/embodied-carbon/vancouver-reduce-embodied-emissions/>

According to C40¹⁸, ADI refers to data and metrics that enable cities to act on consumption-based emissions. These indicators serve cities by bringing understanding to the sources and drivers of emissions, inform baselines, set targets, plan and implement strategies, and measure changes related to actions and policy interventions over time. Cities need a variety of actionable data indicators as the use of each indicator depends on the data type, availability, update frequency, and specific applicability at the city scale. To define them as actionable, it is important that the data are available and updated making them useful and practical for cities climate action planning.

The Cool Food Pledge approach provides an example. Currently, the Cool Pledge sets a specific target for emissions from food procurement for internal operations, without addressing all categories of consumption. If and when the City develops policies for specific sub-categories of emissions, it can also set specific targets for the category or policy outcome and determine appropriate metrics to track progress for that given category. This ADI approach is gaining support from C40 Cities, with forthcoming research published by C40 that may be able to provide additional guidance and support for Toronto upon release.

Significant reduction of consumption-based emissions requires cooperation from Toronto residents, different orders of government as well as businesses and industries that are producing and consuming goods and services within and beyond Toronto's borders. The City of Toronto will continue to use the results of its first CBEI to develop policies and programs that would enable the City to work together with different stakeholders mentioned to reduce consumption-based emissions in Toronto.

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ATTACHMENTS

18 C40 Cities, "Request for Proposals: Actionable Data Indicators for Consumption-Based Emissions for London and New York City" https://www.c40.org/wp-content/uploads/2022/10/C40-RFP_-Actionable-Data-Indicators-for-Consumption-Based-Emissions.pdf

Attachment A: 2019 Community-Wide Consumption-Based Emissions Inventory Report
Attachment B: 2019 Corporate Consumption-Based Emissions Inventory Report
Attachment C: 2019 Buildings and Linear Infrastructure Emissions Analysis
Attachment D: 2019 Consumption-Based Emissions Infographic Report