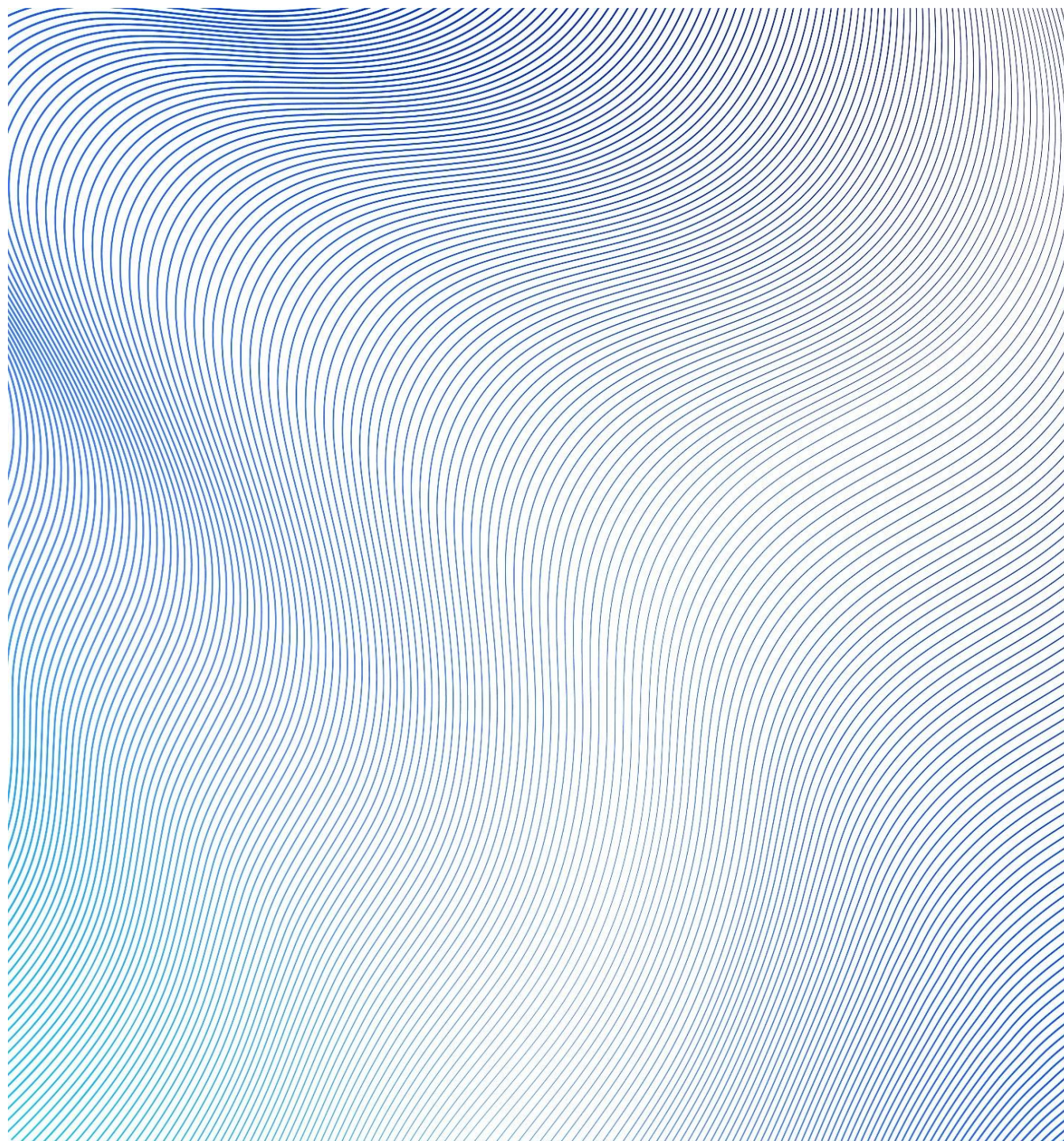


Saskatoon Climate Action Plan Technical Analyses

GHG Emissions Modelling

Technical Memo



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Project Office

Suite 180
200 Granville Street
Vancouver
BC
Canada
V6C 1S4

Project Contact

Sydney Hoffman
sydney.hoffman@introba.com

Eduard Cubi
eduard.cubi@introba.com

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Acronyms

AEB	Alterations to Existing Buildings
BAU	Business as Usual
BLD	Benchmarking, Labeling, and Disclosure
CAP	Climate Action Plan
CEEP	Community Energy and Emissions Planning
EUI	Energy Use Intensity
GHG	Greenhouse Gas
HDV	Heavy Duty Vehicle
IPPU	Industrial Processes and Product Use
LDV	Light Duty Vehicle
LEC	Low Emissions Community Plan
MURB	Multi-Unit Residential Building
NBC	National Building Code
NECB	National Energy Code of Canada for Buildings
VKT	Vehicle Kilometers Travelled

Glossary

The Alterations to Existing Buildings (AEB)	The Alterations to Existing Buildings (AEB) is a federal model code for existing buildings to help guide energy efficiency improvements when an existing building undergoes alterations or renovations.
Benchmarking, labelling and disclosure (BLD)	Benchmarking, labeling, and disclosure (BLD) are policies that measure a building's energy and/or greenhouse gas performance, compare it to similar buildings or past performance, and then require this information to be publicly disclosed.
Building Performance Standard	Building Performance Standards are policies that require owners of existing buildings to meet specific, and increasingly higher, energy or greenhouse gas (GHG) emission performance targets over time.
Clean fuel regulations	The federal Clean Fuel Regulations require liquid fossil fuel (gasoline and diesel) suppliers to gradually reduce the carbon intensity or the amount of pollution from the fuels they produce and sell for use in Canada over time, leading to a decrease of approximately 15% (below 2016 levels) in the carbon intensity of gasoline and diesel used in Canada by 2030.
Electric Vehicle Availability Standard	Under this federal standard, automakers and importers are required to meet annual ZEV sales targets, reaching 100% ZEV sales for all new light-duty vehicles by 2035, with interim targets of at least 20% by 2026 and 60% by 2030.
Existing buildings	Within this report, "Existing Buildings" refers to buildings existing at the starting point for modelling, which is the year 2023.
Fuel switching	Fuel switching refers to the process of changing from a high-emission fuel source to a cleaner fuel source, often involving a shift from fossil fuels to renewables or electricity.
High Performance Civic Building Policy	The High Performance Civic Building Policy establishes standards for new civic buildings, including LEED Silver certification, Net-Zero Energy Ready performance and air tightness target, and requirements for water access and accessibility.
Home Energy Labeling	Home energy labelling provides a standardized rating of a home's energy performance, similar to labels on appliances.
National Building Code (NBC)	The Government of Saskatchewan adopted the 2020 editions of the National Building Code (NBC), which came into effect on January 1, 2024. The code incorporates a tiered approach to energy performance, providing a framework to progressively advance buildings toward net-zero energy ready. The NBC sets energy efficiency standards for houses and small buildings.
National Energy Code of Canada for Buildings (NECB)	The Government of Saskatchewan adopted the 2020 editions of the National Energy Code of Canada for Buildings (NECB), which came into effect on January 1, 2024. The code incorporates a tiered approach to energy performance, providing a framework to progressively advance buildings toward net-zero energy ready. The NECB applies to medium and large buildings.
New construction	Within this report, "New Construction" refers to buildings constructed following the starting of modelling, which is 2023.
Part 3	Part 3 refers to Part 9 of the NECB and applies to larger or more complex buildings.
Part 9	Part 9 refer to Part 9 of the NBC and include smaller, simpler buildings: up to 3 storeys, 600 m ² , and 12 units max.
Residual emissions	Residual emissions are the emissions that remain after all policies within a defined scenario have been modelled.

1 Introduction

Since the adoption of the Low Emissions Community (LEC) Plan in 2019, the City of Saskatoon (the City) has been working to reduce greenhouse gas (GHG) emissions across its civic operations and the wider community. The LEC Plan set a pathway to an 80% reduction in emissions by 2050 and has guided climate action over the past several years. Building on this foundation, Saskatoon has recently set a more ambitious target, committing to achieve net-zero emissions by 2050. To support this commitment, the City is developing an updated Climate Action Plan (CAP), scheduled for release in 2026.

As part of this update, the City commissioned the consulting team (Introba and TYLin) to conduct technical analyses to inform the plan. A central component of this work was GHG emissions modelling, completed using the consultant team's (Introba) Community Energy and Emissions Planning (CEEP) model. The modelling explored future emissions projections under multiple policy scenarios and grid carbon intensities and provided insight into key existing and potential policies to decarbonize Saskatoon. Two versions of the model were created, one community and one corporate, to align with the City's emissions reporting and enable progress to be tracked against both community and corporate targets.

The results of the modelling will inform the key actions and areas of focus in the Climate Action Plan update. They illustrate how different levels of action influence Saskatoon's emissions trajectory and provide a technical foundation for new interim targets on the path to net-zero by 2050.

2 Building an Emissions Baseline

The analysis began with establishing baselines of Saskatoon's existing conditions, including emissions, energy use, building floor area, and vehicle travel, which provide the foundation for future projections. This step was necessary because the CEEP model requires a granular characterization of stock and activity data to simulate the impact of different policies, each of which affects different parts of the stock in different ways. The projections start from a baseline year, representing the year with the most recent and comprehensive data. However, some baseline inputs, such as energy use intensities (EUIs) by building type, were not available at the required level of detail to feed directly into the model. Therefore, the first step involved estimating the granular modelling inputs for the baseline year using the best available data, references, and benchmark sources to calibrate them.

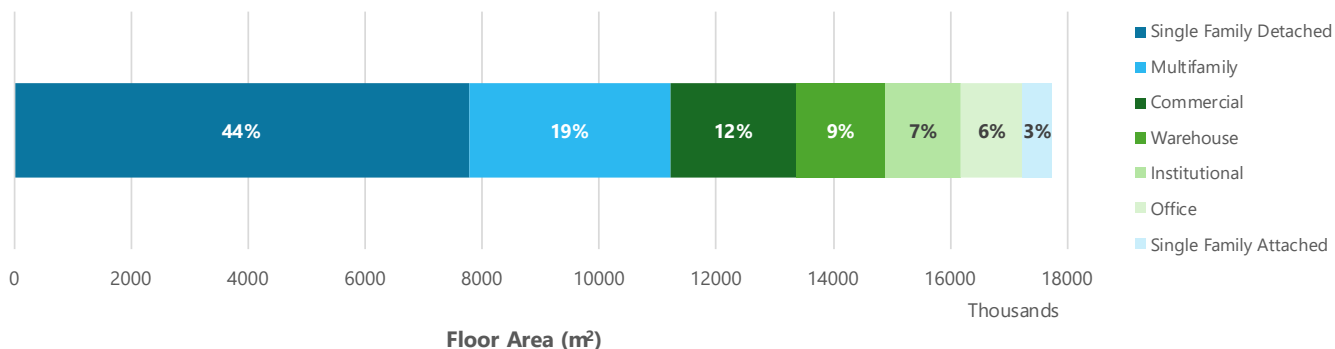
2023 was selected as the baseline year, as it aligns with the most recent available GHG emissions inventories. Developing baselines for the existing buildings and transportation sectors required data manipulation to generate the metrics used in the model. The methods used to develop these metrics are described in this section. For other sectors, the energy use and emissions values reported in the 2023 inventories were used directly as the modelling inputs and metrics.

2.1 Existing Buildings

The primary data sources used to analyze Saskatoon's existing building stock were provided by the City. The community data from the City Assessor's Office provided building-level information, including predominant property type, year built, floor area, and number of stories. The predominant property type was then used to group this data into building types, which represent segments of the building stock with shared characteristics. These building types (Single Family Detached, Single Family Attached, Multifamily, Commercial, Warehouse, Institutional, and Office) are high-level groupings derived from the City Assessor's data and were defined for

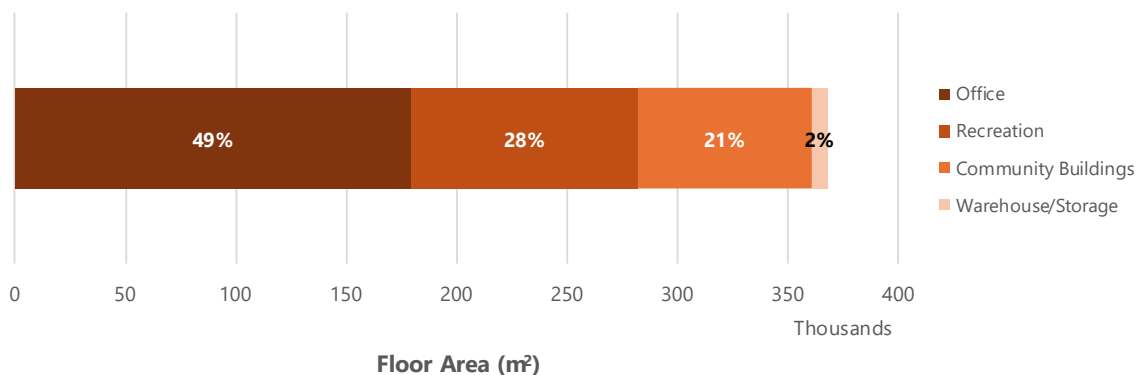
modelling purposes to align with the modelled policies. A breakdown of floor area by building type is provided in Figure 1.

Figure 1 – Community Existing Building Floor Area by Building Type



The corporate data provided by the City included building floor area by type. For modelling purposes, these building types were consolidated into a shorter list by grouping building types with similar characteristics. Figure 2 shows the breakdown of corporate floor area by building type.

Figure 2 – Corporate Existing Building Floor Area by Building Type



Once the breakdowns of total floor area by building type were established, the next step was to develop baseline EUIs for each fuel and building type. Average EUIs for both the corporate and community models were determined using the same approach. Initial reference values were drawn from two primary sources: Natural Resources Canada's 2019 Survey of Household Energy Use (SHEU-2019)¹ for Part 9 buildings, and NECB 2017 Reference Building EUIs provided by the City, the latter based on energy modelling simulations conducted by NRC Research. These reference EUIs were then adjusted to ensure that total building-sector energy use (calculated by multiplying floor area by EUIs) aligned with the values reported in the City's 2023 Community and Corporate GHG Inventories. Table 1 and Table 2 summarize the adjusted EUIs by building type. Both the floor area and, in particular, the EUI values presented in these tables carry significant uncertainty. The number of significant figures shown should not be interpreted as confidence in the estimates, but rather as a means of ensuring completeness and ease of comparison.

¹ Natural Resources Canada. Survey of Household Energy Use (SHEU-2019) data tables. Available: [2019 Survey of Household Energy Use \(SHEU-2019\) Data Tables | Natural Resources Canada](#)

Note that the adjustments to the initial EUIs differed between Part 9 and Part 3 buildings. Because the NECB represents a new construction code, its reference values are higher-performing (lower EUIs) than most existing buildings, requiring more substantial adjustments. In addition, modelled energy use tends to be lower than actual energy use. By contrast, the household survey reflects actual energy use, meaning Part 9 EUIs required less adjustment.

Emissions from water and wastewater treatment and from manufacturing industries and construction were excluded from the existing building sector. This decision was made because process loads account for a large share of their energy use and associated emissions, and policies targeting buildings (e.g., energy efficiency or fuel switching) would not typically affect these loads. Considering them separately avoids overstating potential savings from policies applied to the existing building sector.

Table 1 – Community Baseline Building Floor Area and Adjusted EUIs

Building Type	Floor Area (m ²)	Electricity EUI (kWh/m ²)	Natural Gas EUI (kWh/m ²)
Single Family Detached	7,770,481	63	156
Single Family Attached	508,664	63	156
Multifamily	3,442,380	78	231
Institutional	1,124,253	197	163
Commercial	2,155,806	243	292
Office	869,597	197	163
Warehouse	1,505,878	99	222

Table 2 – Corporate Baseline Building Floor Area and Adjusted EUIs

Building Type	Floor Area (m ²)	Electricity EUI (kWh/m ²)	Natural Gas EUI (kWh/m ²)
Office	179,454	99	100
Recreation	102,722	111	377
Warehouse/Storage	7,373	50	136
Community Buildings	78,411	111	377

2.2 Transportation

For the transportation sector, the CEEP model uses vehicle kilometres travelled (VKT) as the key metric. Because Saskatoon's GHG inventories report transportation emissions using a fuel sales approach, VKT baselines had to be derived. Baseline values for both the community and corporate models were calculated using the same method. Vehicle counts were drawn from City-provided sources: community vehicle counts from 2023 Vehicle Registration data and corporate vehicle counts from 2023 Corporate Fuel data. These counts were then used to disaggregate fuel consumption reported in the GHG inventories.

Average fuel efficiencies for each vehicle type were provided by the consultant team (TYLin) and combined with the fuel consumption values reported in the 2023 Corporate and Community GHG Inventories to calculate VKT estimates. These estimates were then validated by the consultant team (TYLin) by comparing VKT-per-vehicle values to expected ranges based on other project experience.

Finally, fuel intensities were calculated using reported fuel consumption and emissions data from the inventories. Tables 3 and 4 summarize the baseline VKT estimates, fuel efficiencies, and fuel intensities by vehicle type. These values, in particular VKT values, carry significant uncertainty, and the number of significant figures shown should not be interpreted as confidence in the estimates, but rather as a means of ensuring completeness and ease of comparison. Due to data limitations, the same fuel efficiency factor was applied to electric LDVs, HDVs, and motorcycles. This assumption has a negligible impact on the modelling results.

Table 3 – Community Baseline Transportation Inputs

Vehicle Type	VKT (km)	Fuel Efficiency (kWh/km)	GHG Intensity of Fuel (kgCO ₂ e/kWh)
LDV - Gasoline	2,675,148,363	0.85	0.26
LDV - Electric	7,459,251	0.20	0.54*
HDV - Diesel	258,896,697	3.28	0.30
HDV - Gasoline	156,066,552	3.68	0.26
HDV - Electric	0	0.20	0.54*
Motorcycles - Gasoline	16,058,045	0.47	0.26
Motorcycles - Electric	0	0.20	0.54*

*Note: This is the baseline value used. The electricity emissions factor changes over time in the model.

Table 4 – Corporate Baseline Transportation Inputs

Vehicle Type	VKT (km)	Fuel Efficiency (kWh/km)	GHG Intensity of Fuel (kgCO ₂ e/kWh)
LDV - Gasoline	18,143,460	0.85	0.26
LDV - Electric	204,516	0.20	0.54*
HDV - Diesel	5,796,621	3.28	0.30
HDV - Gasoline	1,236,852	3.68	0.26
HDV - Electric	0	0.20	0.54*
Bus - Gasoline	6,373,632	5.51	0.26
Bus - Electric	573,566	3.74	0.54*

*Note: This is the baseline value used. The electricity emissions factor changes over time in the model.

3 Community Trends

Growth projections are a key input to the CEEP model as they drive future energy use and emissions. To ensure consistency, the same set of assumptions was applied throughout all the scenarios described in Section 4. Table 5 details these assumptions.

Table 5 – Growth Projection Assumptions

Input	Assumption
Population Projections	Population values for 2014-2024 were taken from the Growth Monitoring Report 2024. The 2024 value was then extrapolated to develop annual population projections. 2% annual population growth was assumed from 2024-2050. This assumption was informed by City staff.
Employment Projections	Employment values (number of full-time employees) for 2023 and 2024 were taken from the City's Growth Monitoring Report 2024. These values were used to extrapolate past and future values. 1.7% annual growth in full-time employees was assumed. This assumption was informed by City staff.
Community New Construction Floor Area	Annual new residential floor area was calculated using dwelling unit growth projections provided by the City. Note that there is some inconsistency between these projections and population projections. In line with the City's Official Community Plan (OCP) target, it was assumed that 50% of new dwelling units are built as infill development (primarily MURBs), while the remaining 50% are constructed in new development areas as single-family dwellings. Annual new commercial floor area was calculated using employment projections (see above). Note that it is also assumed that 1% of existing buildings are demolished and replaced by new construction each year, an assumption based on Introba's modelling experience and consistent with

	previous modelling work. Hence, the total new construction floor area is equal to the replaced floor area plus the new floor area.
Corporate New Construction Floor Area	Annual new corporate floor area was estimated using expected development information provided by the City. Because project timelines were provided as ranges (e.g., by 2030, between 2030 and 2050) rather than specific years, growth was represented as a steady annual increase in floor area (ranging from 1%-14% depending on the time period and building type) rather than as step changes tied to individual projects. This approach may not capture significant annual fluctuations in emissions but provides a clearer picture of long-term trends while reducing uncertainty around specific project timelines. Demolition and redevelopment were also incorporated into the projections.
VKT Growth	For light-duty vehicles (LDVs), VKT growth projections were calculated using trip estimates and average trip length data provided by the consultant team (TYLin), in combination with assumptions from the City's OCP that 50% of future growth will occur within existing urban areas (infill development) and 50% in new development areas. These assumptions were applied to estimate total VKT growth out to 2050 for LDVs. For other vehicle types, including heavy duty vehicles (HDVs), it is assumed that with population growth, there is no change in VKT per capita, hence, a 1% increase in population equates to a 1% increase in total VKT.
Waste Growth	It was assumed that with population growth, there is no change in waste generation per capita, hence, a 1% increase in population equates to a 1% increase in total generated waste.
Land Use Change	It was assumed that land use change is directly correlated with the increase in new development (see Community New Construction Floor Area). A density of 14 single-family homes per hectare of greenfield development was assumed, based on the consultant team's (TYLin) previous project experience.

4 Modelling Different Scenarios

With the baseline established, the next step in the modelling process was to explore the impact of policies from all levels of government, including actions being considered by the City. While some policies and programs from higher levels of government will play a role in reducing Saskatoon's emissions, much of the implementation responsibility falls at the municipal level.

At the same time, the role of the electricity grid represents a critical factor in Saskatoon's decarbonization. Without significant progress toward grid decarbonization, many of the emissions reductions required to achieve net-zero will not be possible. However, municipal action remains essential to reduce the demand for fossil fuels, advance electrification, and prepare the community for a cleaner grid.

To understand the importance of different policies and programs, the modelling exercise developed a set of projections that start from the year 2024 and explore the impact on emissions across the community and the corporation. The following projections (hereafter referred to as "scenarios") were explored:

- **No Action:** Projected future emissions if no further climate action is realized, and emissions increase with growth alone. *Example: Current energy use intensities (EUIs) remain constant (existing buildings remain with current EUIs, and new construction buildings are per NBC and NECB Tier 1 through 2050).*
- **Business As Usual (BAU):** Projected future emissions if currently approved policies continue, with every level of government funding the same activities, services, and infrastructure in the same way, proportional to a population and economy that is growing. *Example: Across the province, NBC Tier 2 applies to smaller buildings, including houses, and NECB Tier 1 applies to larger buildings. Both codes are assumed to maintain the current energy efficiency tier requirements through 2050.* Modelling Two Grid Sensitivities

The electricity grid in Saskatoon is a major source of uncertainty and has a substantial influence on the City's overall decarbonization efforts. Even with improvements in efficiency across sectors (e.g., buildings, transportation), energy use will not go to zero. Therefore, achieving a climate strategy that reaches net-zero emissions by 2050 relies on the availability of zero- or near-zero-GHG energy sources as a key enabler.

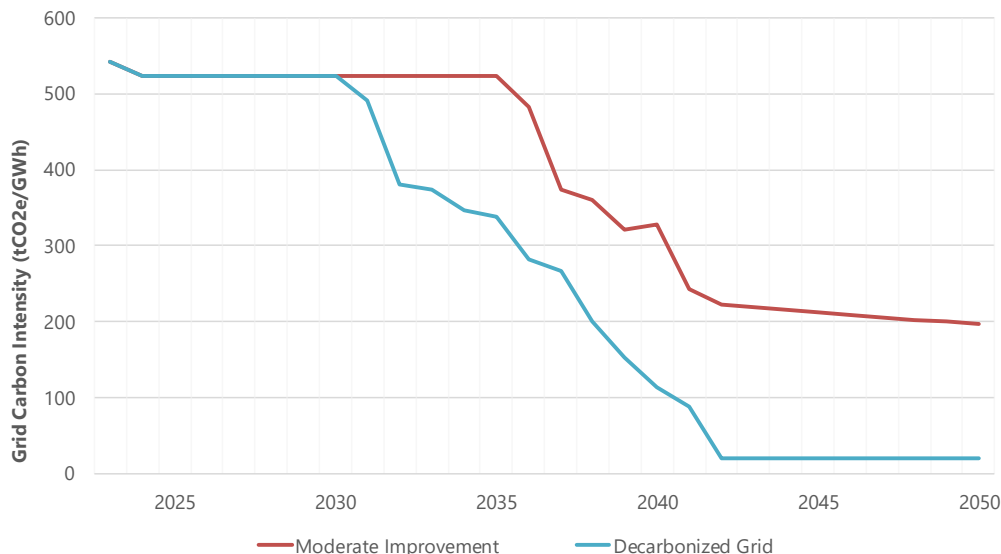
Because of its significant impact, the carbon intensity of the grid was treated as a sensitivity in the analysis. Two grid trajectories were considered: Moderate Improvement and Decarbonized Grid.

These sensitivities of grid carbon intensity were developed based on electricity generation projections by energy source from the Canada Energy Regulator's (CER) *Canada's Energy Future 2023* datasets. The CER is a federal agency responsible for regulating energy development and providing energy data and projections based on different policy scenarios for Canada, making its projections a credible foundation for this analysis. The trajectories were then refined based on input from SaskPower and the City to better reflect locally plausible pathways. The following assumptions describe the two sensitivities:

- **Moderate Improvement:** Based on communication from SaskPower, it is assumed that there is no reduction in carbon intensity over the next decade. The 2024 carbon intensity (523 tCO₂e/GWh) is assumed to stay constant until 2035. Starting in 2036, it is assumed that the carbon intensity of the grid follows the CER's Current Measures trajectory² (adjusted to start in 2035). This trajectory results in a 64% reduction in the carbon intensity of the grid by 2050.
- **Decarbonized Grid:** The carbon intensity of the grid is assumed to stay constant at 2024 intensity (523 tCO₂e/GWh) until 2030. Starting in 2031, it is assumed that the carbon intensity of the grid follows the CER's Canada Net-Zero trajectory³, which reaches a 96% reduction in carbon intensity by 2050.

As illustrated in Figure 3, these two trajectories represent contrasting futures: one where climate action is prioritized, leading toward a near-zero emissions grid, and another where moderate progress is made without a full net-zero commitment.

Figure 3 – Electricity Grid Sensitivities



² From the [CER](#): "The Current Measures Scenario does not aim for net-zero emissions; it assumes minimal effort to reduce GHG emissions beyond the existing measures and has the slowest pace of technological development of all the scenarios. The scenario offers a glimpse into Canada's future if no additional action is taken to combat climate change beyond the current measures in place."

³ From the [CER](#): "In the Canada Net-Zero Scenario, Canada achieves net-zero emissions by 2050, but the rest of the world moves more slowly to reduce GHG emissions."

5 Community Modelling Results

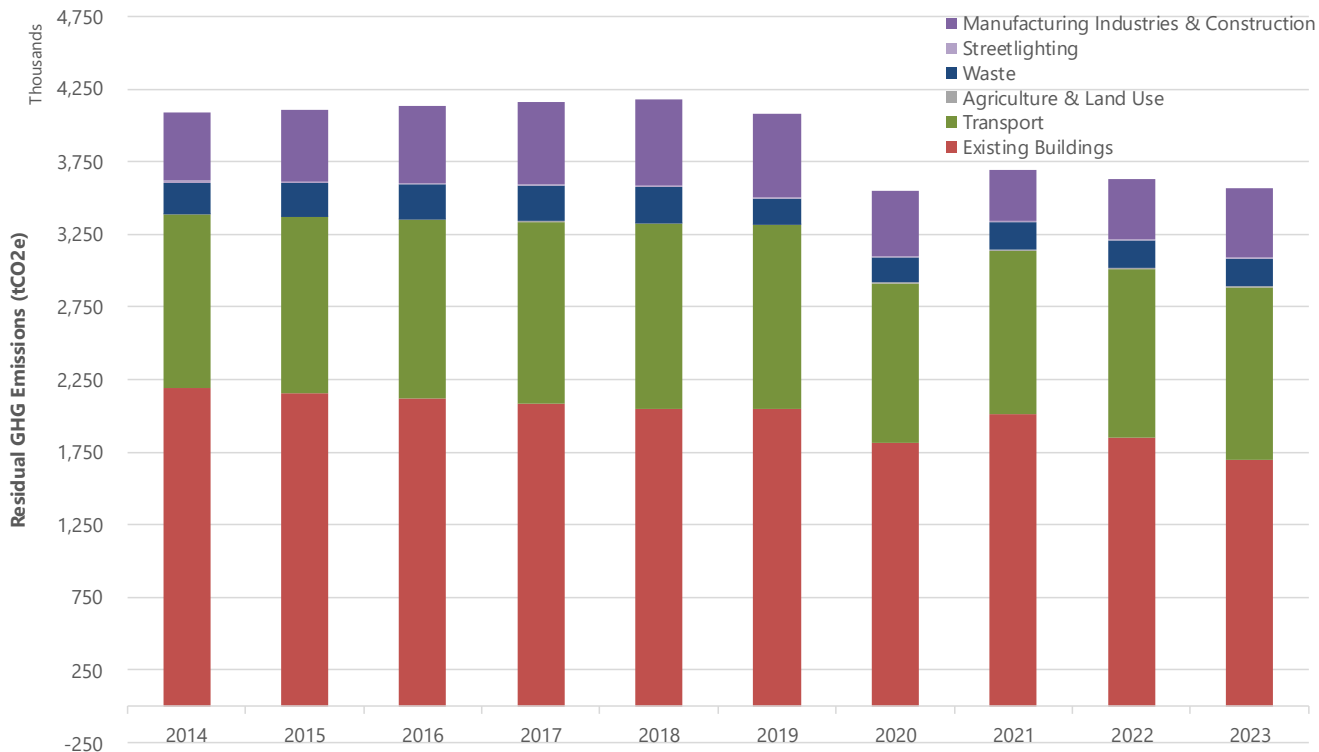
The projections for the BAU and Climate Action scenarios are presented using wedge charts, which show emissions reductions by policy area relative to the No Action scenario. While Saskatoon's GHG emissions reduction target is relative to a 2014 baseline, showing savings relative to the No Action scenario illustrates the impact that policies are yet to have. The 2050 reduction target shown on the charts (and summarized above each figure) reflects the City's commitment to achieve net-zero by 2050.

Corporate emissions are included within the community totals, meaning that community results represent all emissions occurring within Saskatoon, including those from City operations. The wedge charts also include Saskatoon's historic emissions from 2014–2023 to provide context on trends. These historic emissions (presented in Figure 4) were drawn from the *2023 Climate Action Progress Report* and interpolated.

To complement the wedge charts, graphs of residual emissions are provided to highlight where emissions remain in the community under each scenario.

In addition, results for both BAU and Climate Action scenarios are explored under two grid sensitivities (Moderate Improvement and Decarbonized Grid). Because the carbon intensity of the SaskPower grid is a critical and uncertain factor in Saskatoon's decarbonization, both sensitivities were explored under each scenario to illustrate the difference in outcomes under a low-carbon grid and one that remains carbon-intensive. The wedge diagrams under both sensitivities were included in the main body of the report for easy comparison and the residual emissions graphs under the Moderate Improvement sensitivity are available in Appendix B.

Figure 4 – Historic Community GHG Emissions



5.1 Business as Usual

The Business as Usual (BAU) scenario models emissions based on an assumption that currently approved policies continue, with every level of government funding the same activities, services, and infrastructure in the same way, proportional to a population and economy that is growing.

Policies introduced in this scenario include:

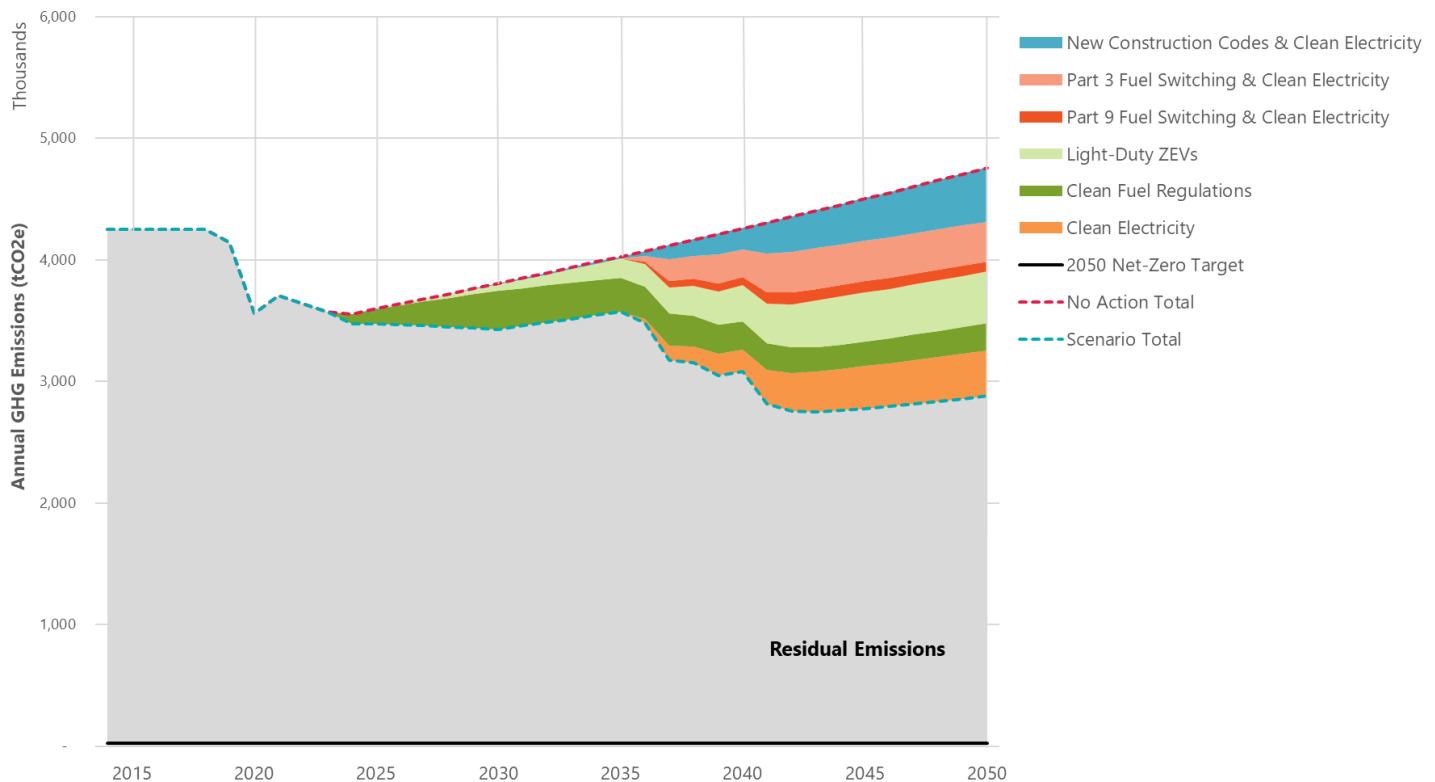
Table 6: BAU Policy Inputs and Wedge Impact (Detailed assumptions in Appendix A)

Sector	Policy Input	Graph Wedge
Buildings	NBC Tier 2 and NECB Tier 1 for new construction	New Construction Codes & Clean Electricity (reductions in BAU are from clean electricity)
	High-Performance Civic Building Policy	New Construction Codes and Clean Electricity
Transport	Electric Vehicle Availability Standard	Light-Duty ZEVs
	Clean Fuel Regulations	Clean Fuel Regulations

Projected emissions reductions relative to the 2014 baseline under the Moderate Improvement grid sensitivity:

- 2035: **16%**
- 2050: **32%** (target = net-zero)

Figure 5 – Community Business as Usual GHG Emissions Reductions, Moderate Improvement



Projected emissions reductions relative to the 2014 baseline under the Decarbonized Grid sensitivity:

- 2035: **29%**
- 2050: **47%** (target = net-zero)

Figure 6 – Community Business as Usual GHG Emissions Reductions, Decarbonized Grid

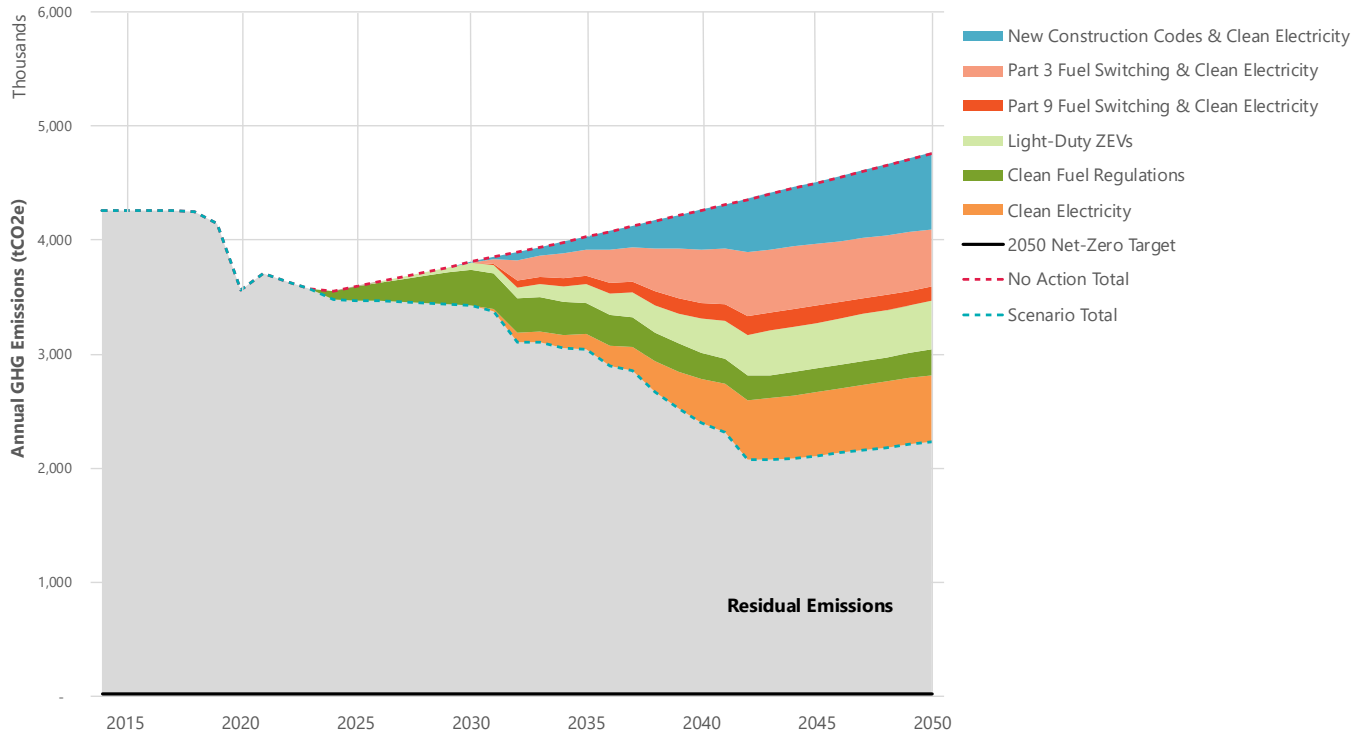
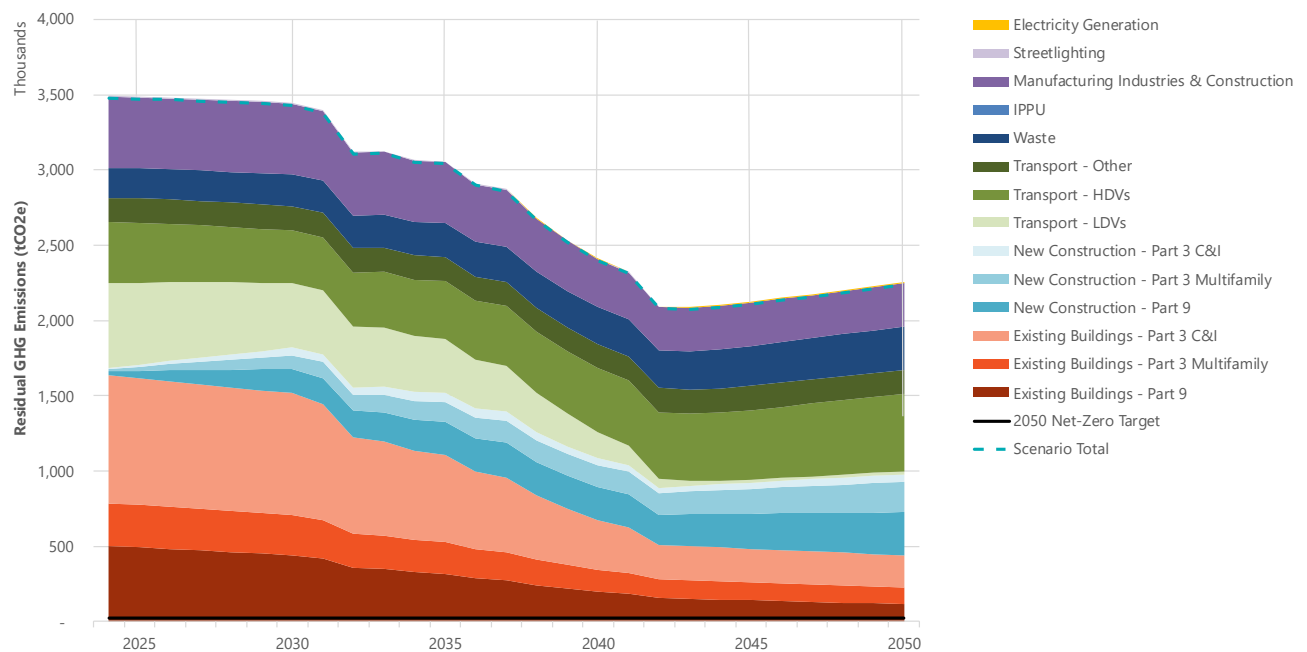


Figure 7 below shows the make-up of the residual emissions that remain after the policies in the BAU scenario have been modelled under the Decarbonized Grid sensitivity.

Figure 7 – Community Business as Usual Residual Emissions, Decarbonized Grid



Key findings from the modelling include the following:

- In the BAU scenario, most emissions reductions are driven by grid decarbonization. Because there are no policies requiring fuel switching in buildings (either existing buildings or new construction), the vast majority of savings in existing and new construction buildings can be attributed to cleaner electricity. In total, these emissions reductions account for 74% of the total reductions in 2050. Under the Decarbonized Grid sensitivity, grid decarbonization begins in 2030, with the majority of reductions occurring before 2045. This pattern is reflected in the emissions reductions.
- Light-duty zero-emissions vehicle sales due to the Electric Vehicle Availability Standard account for a significant portion of emissions reductions (17% in 2050). It is assumed that 20% of light duty vehicle sales will be ZEVs by 2026, 60% by 2030, and 100% by 2035, based on Canada's Zero-Emission vehicle sales targets.
- Canada's Clean Fuel Regulations account for an additional 9% of emissions reductions in 2050. Emissions savings increase steadily until 2030 and then remain relatively constant, reflecting the assumption that the carbon intensity of diesel and gasoline declines by 15% below 2016 levels by 2030 and holds steady through 2050.
- Projected emissions reductions fall short of the net-zero target, with 53% shortfall or gap in 2050.
- In 2050, the building sector is the largest contributor to residual emissions, accounting for 44% of the total. Interestingly, in 2050, the new construction sector is a larger contributor to residual emissions (24%) than existing buildings (20%). This highlights the impact that buildings built over the next 25 years will have in achieving Saskatoon's targets. Policy targeting new construction will play a key role in community decarbonization.
- Heavy-duty vehicles are the second largest source of residual emissions, representing 23%. This sector was not targeted by major policies such as fuel-switching measures or requirements for heavy-duty zero-emission vehicles, which explains its high residual emissions.
- Manufacturing industries and construction, and waste also make notable contributions to residual emissions, at 13% each.

5.2 Climate Action

The Climate Action scenario models emissions based on an assumption that the City follows through on policy changes and actions to reduce emissions. These are layered on top of the BAU scenario.

Policies introduced in this scenario include:

Table 7: Climate Action Policy Inputs and Wedge Impact (Detailed Assumptions in Appendix A)

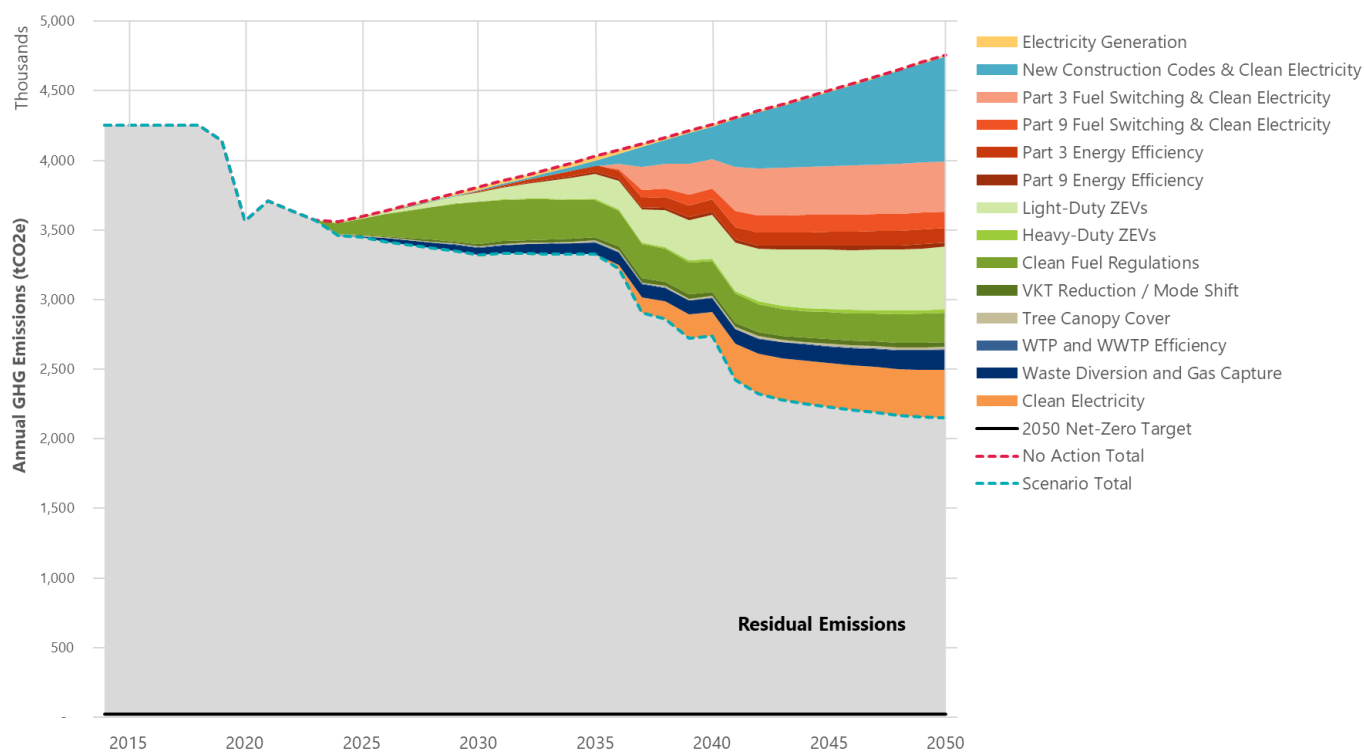
Sector	Policy Input	Graph Wedge Impacted
Buildings	Incentives and support for existing buildings	Part 9 & Part 3 Energy efficiency Part 9 & Part 3 Fuel Switching & Clean Electricity
	Alterations to Existing Buildings Code	Part 9 & Part 3 Energy efficiency
	Energy Benchmarking, Labeling and Disclosure	Part 3 Energy efficiency
	Home Energy Labeling	Part 9 Energy efficiency
	Building Performance Standard	Part 3 Fuel Switching & Clean Electricity
	Accelerating Fuel Switching	Part 9 Fuel Switching & Clean Electricity
	Incentives for adoption of higher energy tiers	New construction codes and Clean Electricity
	Accelerated adoption of higher NECB and NBC	New construction codes and Clean Electricity
Transport	Support for the adoption of personal ZEVs	Light-Duty ZEVs

	Mode shift, increased walking, cycling, and transit	VKT Reduction / Mode shift
Waste	Increased waste reduction and diversion	Waste diversion and landfill gas capture
Agriculture & Land use	Natural areas conservation	Agriculture and Land-use (residual emissions only)
	Increase tree canopy cover	Tree Canopy
Corporate Actions	All corporate climate actions (See 7.2 Corporate Climate Action)	Various (section 7.X Corporate Climate Action)

Projected emissions reductions relative to the 2014 baseline under the Moderate Improvement grid sensitivity:

- 2035: **22%**
- 2050: **49%** (target = net-zero)

Figure 8 – Community Climate Action GHG Emissions Reductions, Moderate Improvement



Projected emissions reductions relative to 2014 baseline under the Decarbonized Grid sensitivity:

- 2035: **34%**
- 2050: **69%** (target = net-zero)

Figure 9 – Community Climate Action GHG Emissions Reductions, Decarbonized Grid

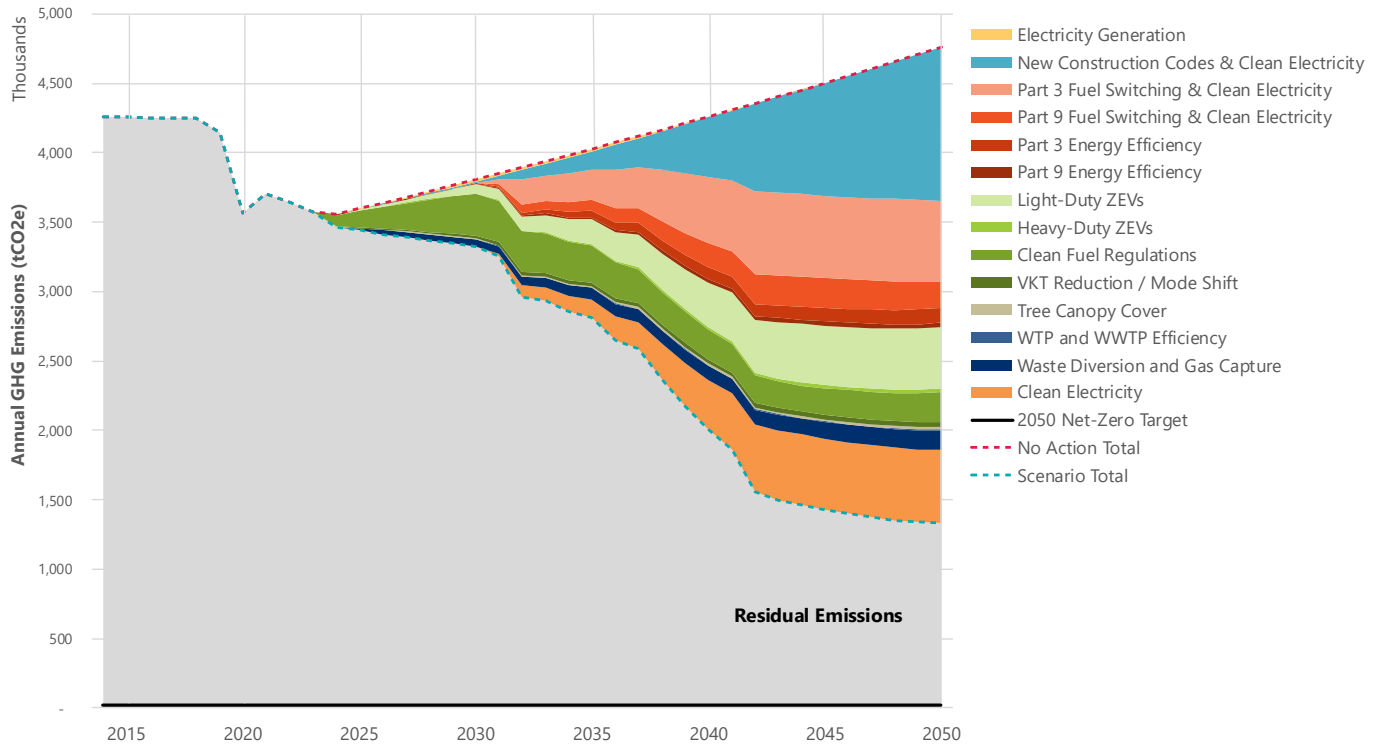


Figure 10 below shows the make-up of the residual emissions that remain after the policies in the Climate Action scenario have been modelled under the Decarbonized Grid sensitivity.

Figure 10 – Community Climate Action Residual Emissions, Decarbonized Grid

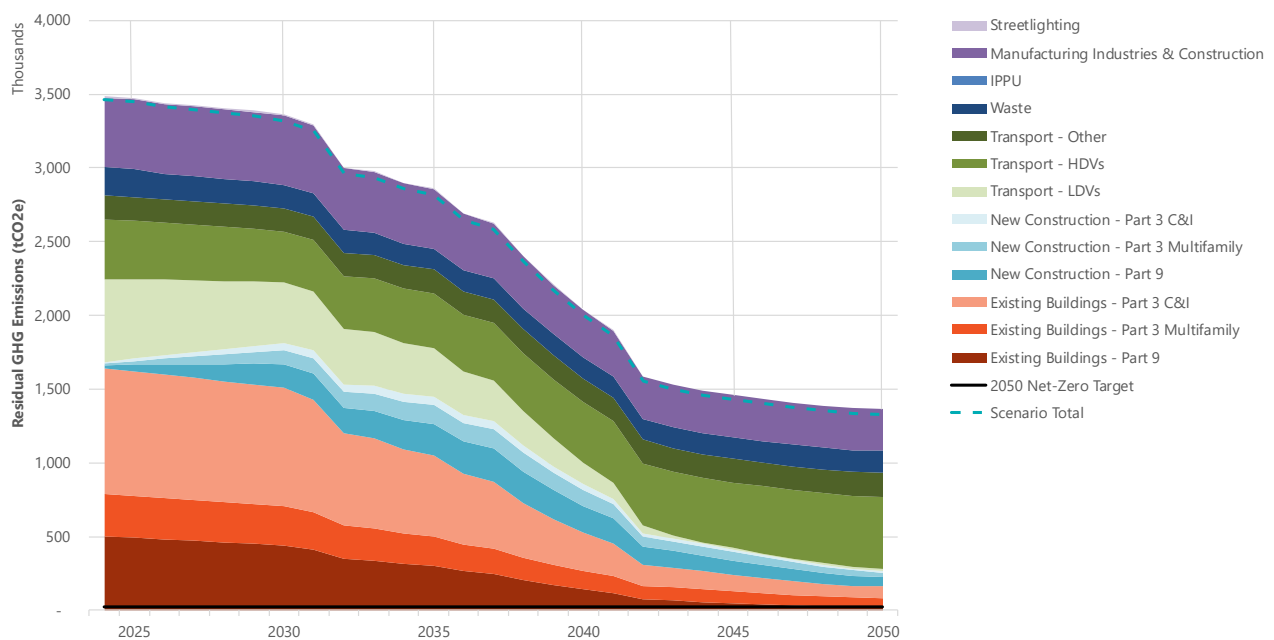


Table 8: Community Climate Action 2050 Residual Emissions by Sector, Decarbonized Grid

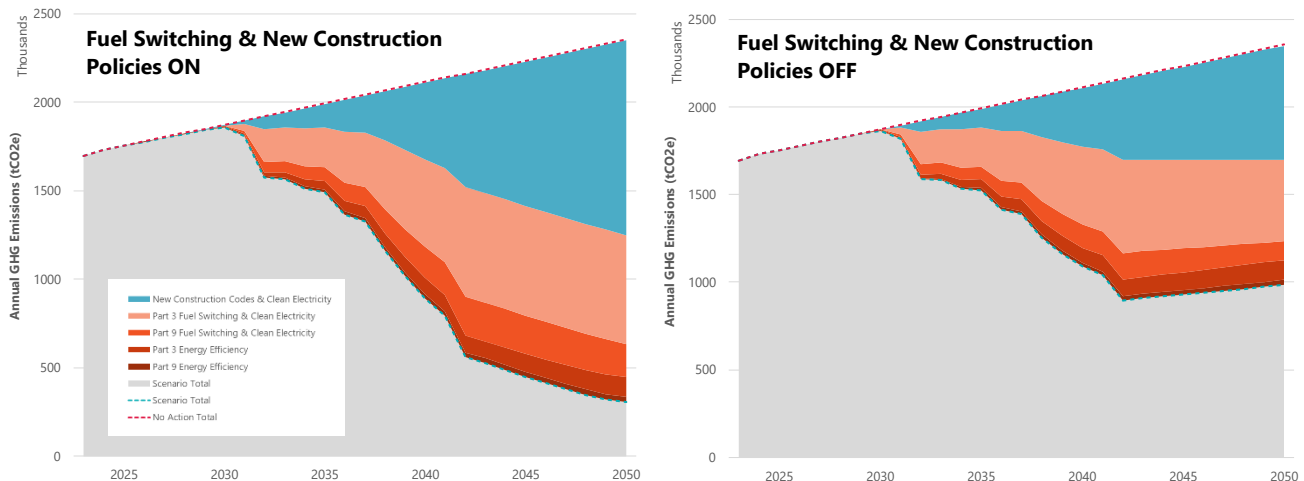
Emission Sector	% of Residual Emissions
Transport – Heavy Duty Vehicles	36%
Manufacturing Industries & Construction	21%
Existing Buildings (Part 3 & 9)	12%
Transport – Other (railway, waterborne, aviation)	12%
Waste	11%
New Construction (Part 3 & 9)	7%
Other	1%

Key findings from the modelling include the following:

- In the Climate Action scenario, a large portion of emissions reductions comes from the existing building sector. Fuel-switching policies, including the Building Performance Standard and Accelerated Residential Fuel Switching, contribute significantly to these reductions, especially in combination with a decarbonized grid (23% in 2050). These policies are introduced in 2035, which is why emissions reductions increase notably after that year.
- Additional emissions reductions are achieved through the new construction standards (NECB and NBC), again in combination with a decarbonized grid (32% in 2050). This scenario assumes that the City adopts increasingly higher tiers of the standards, which require fuel switching starting in 2035. It also includes incentives for new buildings to exceed the minimum required tier.
- Figure 11 was developed to help address a key challenge of savings attribution in wedge charts, where emissions reductions can be difficult to assign to a single policy area because multiple factors often act together. A key example is the interaction between fuel switching policies and grid decarbonization, which both need to occur to achieve the modelled savings. To better isolate the impact of fuel switching and new construction policies from the effects of grid decarbonization, two building-sector wedge charts were prepared: one with all fuel switching and new construction policies included, and another with them turned off. When these policies are included, emissions in the buildings sector are 87% below the No Action total in 2050. When these policies are turned off, emissions are only 58% below the No Action total, which highlights the significant contribution of fuel switching and new construction policies to emissions reductions.
- Energy efficiency improvements driven by Energy Benchmarking and Home Energy Labeling also contribute to emissions reductions starting in 2030. In 2050, energy efficiency improvements account for 4% of emissions reductions.
- There is a modest increase in emissions reductions from light-duty ZEVs, due to municipal supports.
- The remaining savings come from waste diversion and landfill gas capture, mode shift, expanded tree canopy cover and natural area conservation, efficiency upgrades at water and wastewater treatment plants, and grid decarbonization. Grid decarbonization reductions include electricity-related emissions from the transportation sector, water and wastewater operations, streetlighting, manufacturing and construction, and other corporate electricity use.
- Savings from natural area conservation, assuming 30% conservation in new development areas, were very small and effectively negligible.
- A significant gap remains between projected emissions and the City's 2050 target. The Climate Action scenario projects a 69% reduction by 2050, which falls short of the net-zero target.

- Under the Decarbonized Grid sensitivity, the difference in emissions reductions by 2050 between the BAU and Climate Action scenarios is 22% (69% reduction under Climate Action versus 47% under BAU). Emissions reductions in the BAU scenario are driven largely by federal regulations (e.g., the Electric Vehicle Availability Standard and the Clean Fuel Regulations), while the Climate Action scenario focuses on additional strategies for the City to implement. Because the difference between the two scenarios is smaller than the reductions achieved under BAU alone, this highlights the role of policies from other levels of government in driving emissions reductions. However, these reductions will not occur without active municipal support and implementation.
- The largest source of residual emissions in 2050 is heavy-duty vehicles in the commercial and industrial sectors (36%). Because no policy directly targets this sector, significant emissions remain. The City may wish to explore policies specifically addressing heavy-duty vehicles in the commercial and industrial sectors.
- Compared to the BAU scenario, buildings account for a significantly smaller portion of residual emissions in 2050 (19% compared to 44% in the BAU scenario). In particular, new construction only accounts for 8% of residual emissions in 2050 (compared to 24% in the BAU scenario). This change in residual emissions highlights the positive impact of advancing policies targeting the new construction sector can have on reducing emissions.
- Other significant sources of residual emissions in 2050 include manufacturing industries and construction (21%) and waste (11%). No specific policy was modelled to target manufacturing industries and construction emissions, explaining its high residual emissions. To approach net-zero by 2050, it will be important to find a clean energy source for manufacturing industries and construction.

Figure 11 – Building Sector Emissions Reductions Comparison

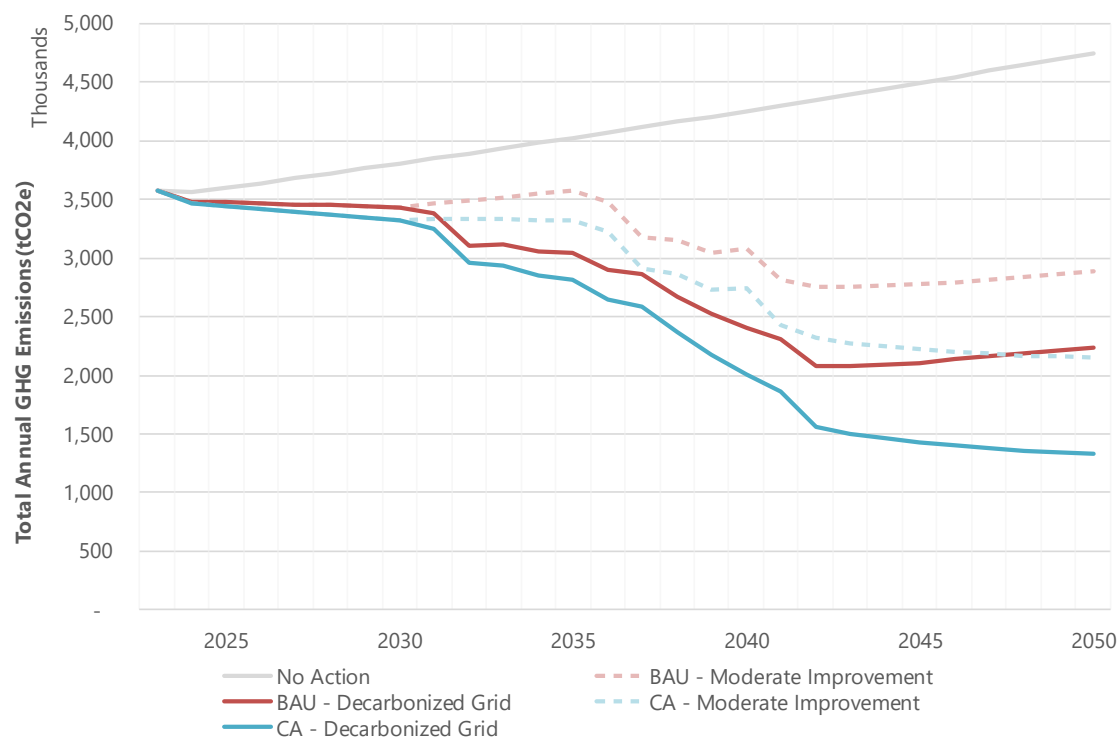


5.3 Electrical Grid Sensitivities

Because the carbon intensity of the electricity grid has a major influence on overall emissions outcomes, two grid sensitivities were analyzed to compare modelling results and assess the extent of the grid's impact. Please refer to Section 5 for details on the two grid sensitivities.

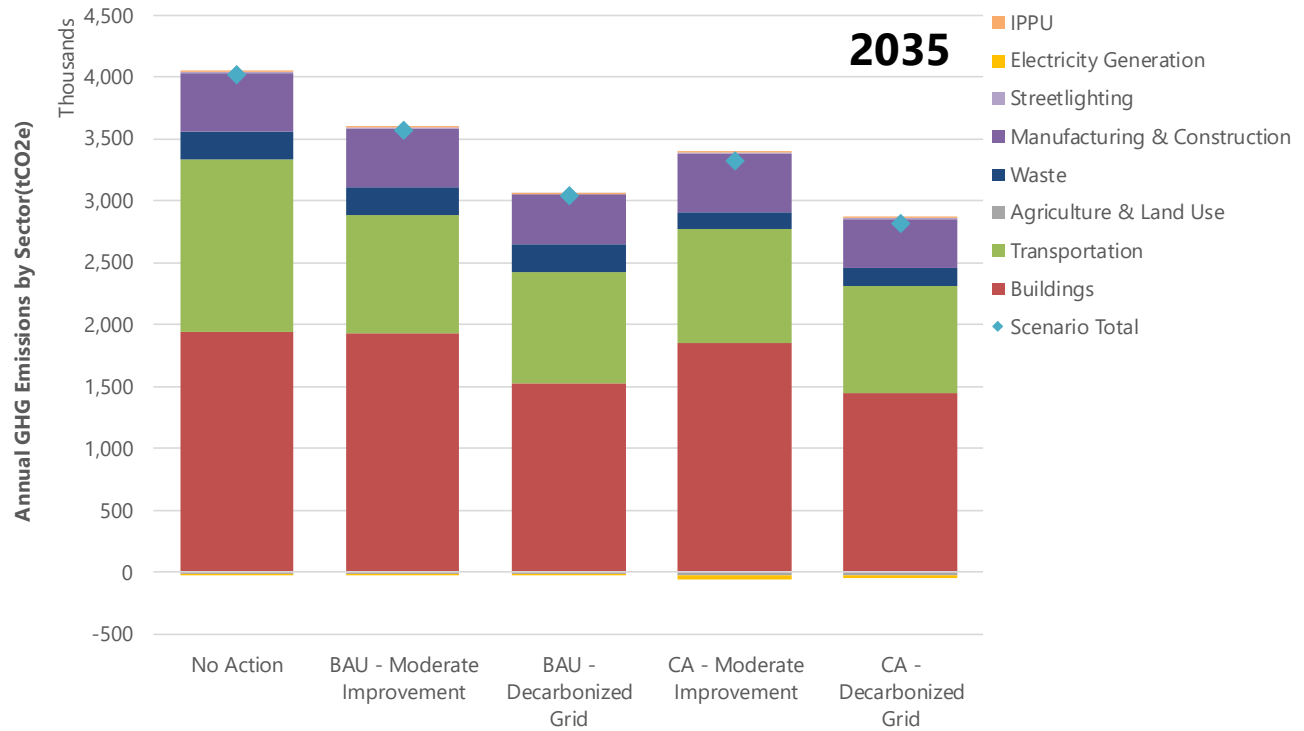
Figure 12 illustrates the total projected community emissions under the two scenarios and grid sensitivities for comparison. To provide further insight, Figures 13 and 14 present emissions by sector for each scenario and sensitivity in 2035 and 2050, respectively.

Figure 12 – Community GHG Emissions by Scenario and Sensitivity



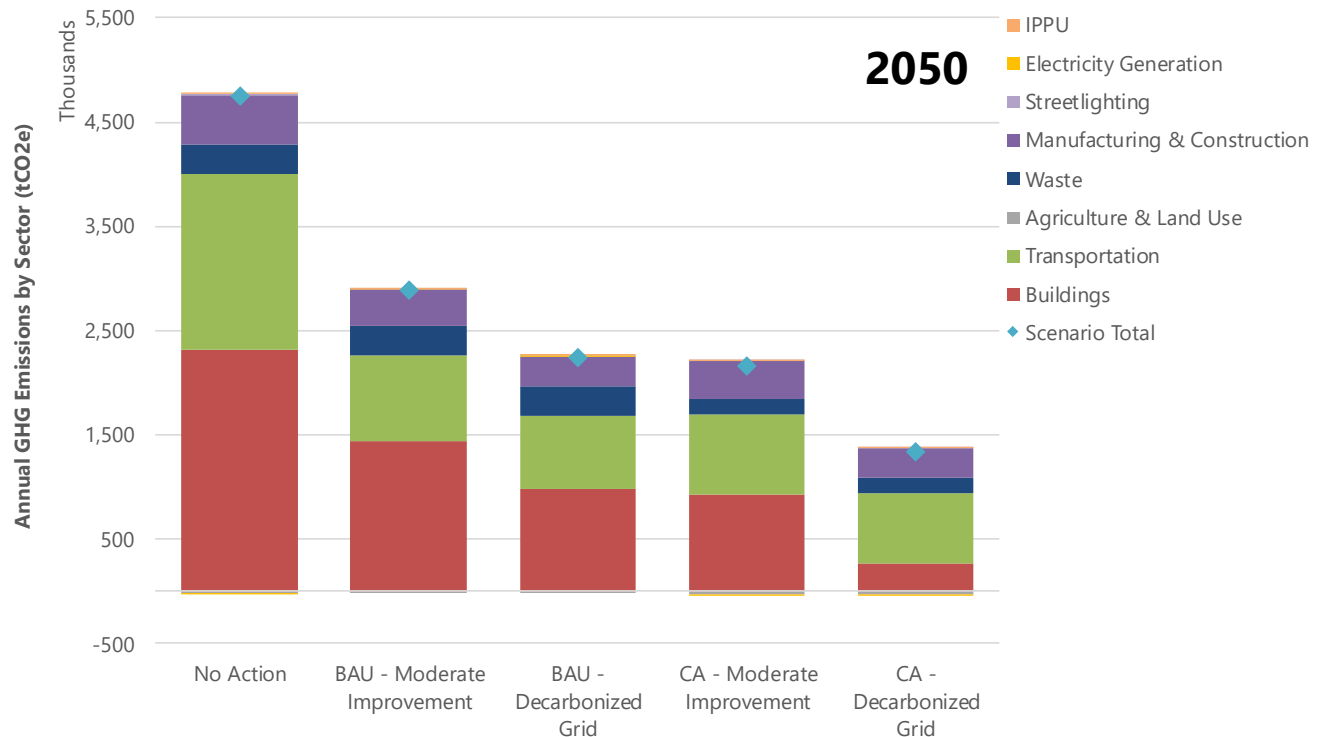
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Figure 13 – 2035 Community Residual GHG Emissions by Sector, Scenario, and Sensitivity



Note: Emissions below zero represent negative emissions and the blue diamond represents the adjusted scenario total

Figure 14 – 2050 Community Residual GHG Emissions by Sector, Scenario, and Sensitivity



Note: Emissions below zero represent negative emissions and the blue diamond represents the adjusted scenario total

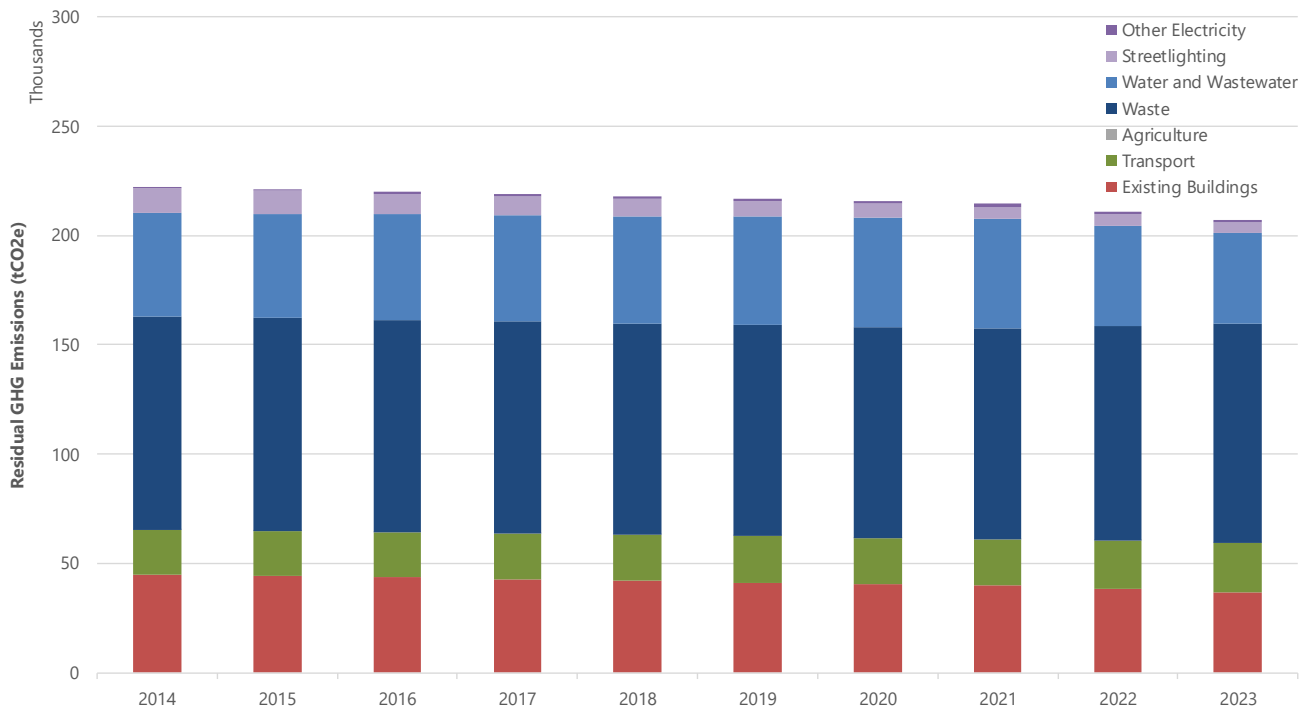
Key findings from the sensitivity analysis include the following:

- The building sector is the most affected by the carbon intensity of the electricity grid in both 2035 and 2050, due to its high electricity use and the shift toward electric heating and domestic hot water systems. Other sectors, such as waste are less dependent on grid electricity.
- The transportation sector is also influenced by the carbon intensity of the grid due to the transition to ZEVs. However, the overall impact is smaller because of the significant residual emissions from heavy-duty vehicles, which remain largely dependent on fossil fuels.
- Similarly to transportation, emissions from manufacturing industries and construction are influenced by the carbon intensity of the electricity grid. However, the overall impact is smaller because a significant share of emissions in this sector continues to come from fossil fuels.
- A few sectors, specifically electricity generation and agriculture & land use, are represented as net-negative emissions on the graphs, largely due to solar electricity generation and increased tree canopy cover. Emissions savings from solar electricity are influenced by the carbon intensity of the grid, with higher savings under the Moderate Improvement sensitivity because a dirtier grid results in greater avoided emissions from solar.
- The impact of the grid becomes more pronounced by 2050. In 2035, emissions under the Decarbonized Grid sensitivity are 15% lower than under the Moderate Improvement grid sensitivity across both the BAU and Climate Action scenarios. By 2050, this difference increases to 22% for the BAU scenario and 38% for the Climate Action scenario. This growing gap reflects greater electrification in 2050, particularly in the Climate Action scenario, where all large buildings and most residential buildings are assumed to use electric systems by 2050.

6 Corporate Modelling Results

The corporate modelling results are presented in the same format as the community results, using wedge charts to illustrate emissions reductions by policy area relative to the No Action scenario, complemented by charts showing residual emissions. The wedge charts also include the City's historical emissions from 2014 to 2023 to provide context on recent trends. These historical emissions, shown in Figure 15, were drawn from the 2023 *Climate Action Progress Report* and interpolated.

Figure 15 – Corporate Historical GHG Emissions



Corporate emissions were also analyzed under two grid sensitivities (Moderate Improvement and Decarbonized Grid). A comparison between these two grid sensitivities is discussed in this section.

6.1 Business as Usual

The Business as Usual (BAU) scenario models emissions based on an assumption that currently approved policies continue, with every level of government funding the same activities, services, and infrastructure in the same way, proportional to a population and economy that is growing.

Policies introduced in this scenario include:

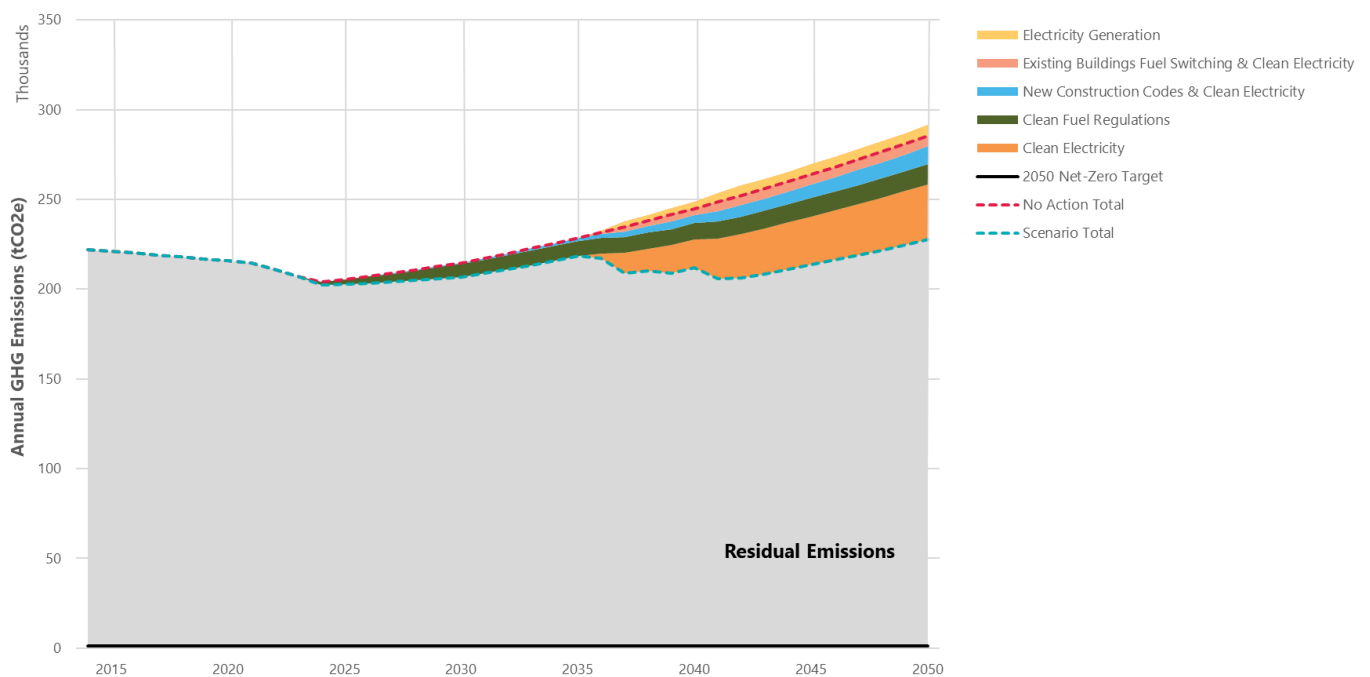
Table 9: Corporate BAU Policy Inputs and Wedge Impact (Detailed Assumptions in Appendix A)

Sector	Policy Input	Graph Wedge
Buildings	High-Performance Civic Building Policy	New Construction Codes and Clean Electricity (reductions in BAU are from clean electricity)
Transport	Clean Fuel Regulations	Clean Fuel Regulations
Energy	Electricity Generation from Landfill Gas	Electricity Generation

Projected emissions reductions relative to 2014 baseline under the Moderate Improvement sensitivity:

- 2035: **2%**
- 2050: **-3%** (target = net-zero)

Figure 16 – Corporate Business as Usual GHG Emissions Reductions, Moderate Improvement



Projected emissions reductions relative to 2014 baseline under the Decarbonized Grid sensitivity:

- 2035: **10%**
- 2050: **7%** (target = net-zero)

Figure 17 – Corporate Business as Usual GHG Emissions Reductions, Decarbonized Grid

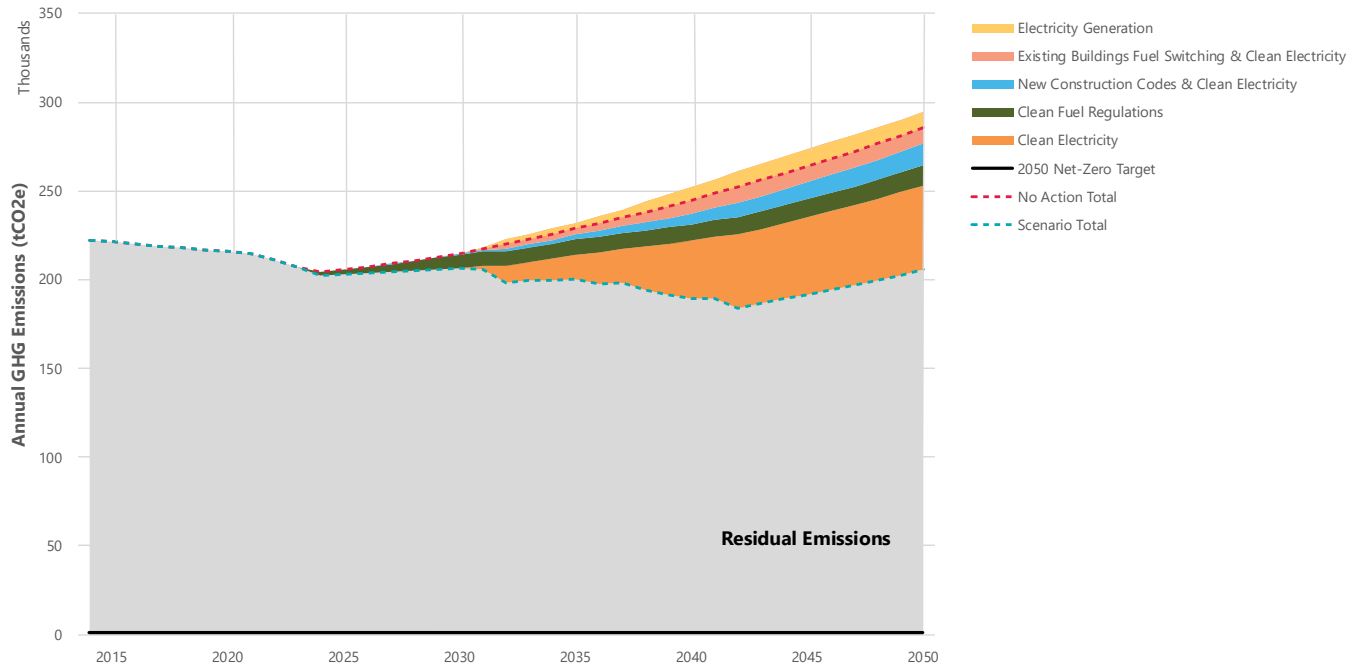
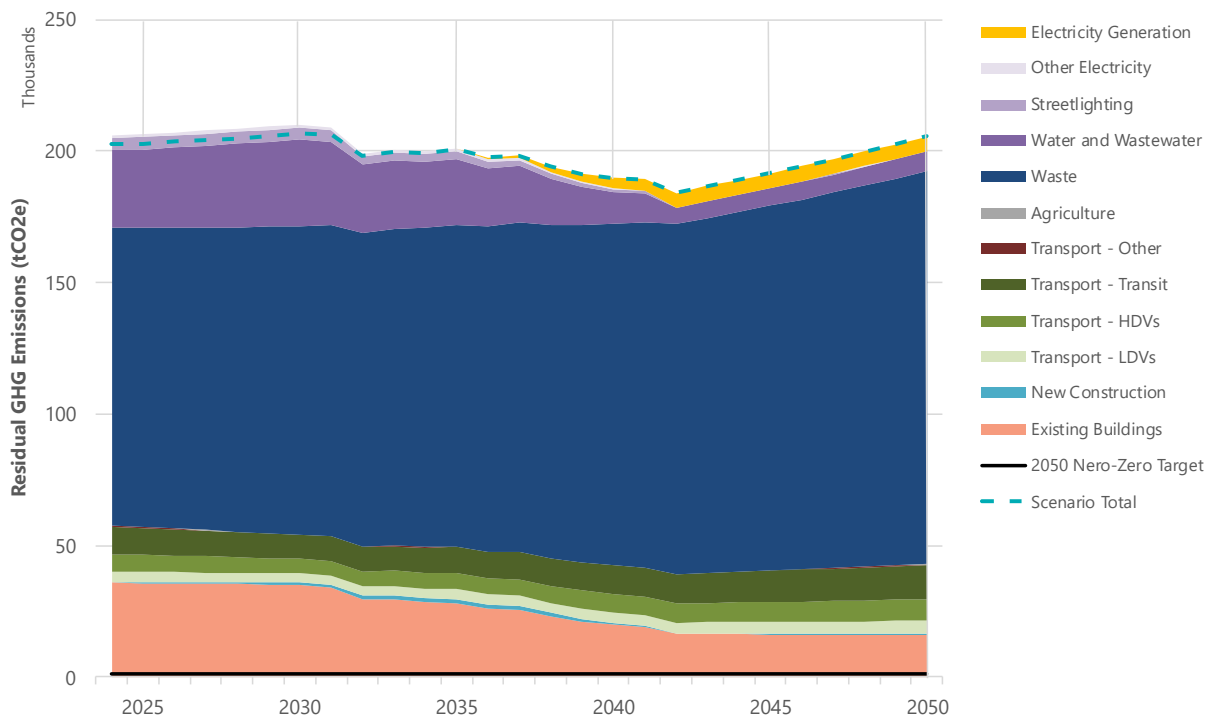


Figure 18 below shows the make-up of the residual emissions that remain after the policies in the Climate Action scenario have been modelled under the Decarbonized Grid sensitivity.

Figure 18 – Corporate Business as Usual Residual Emissions, Decarbonized Grid



Key findings from the modelling include the following:

- In the BAU scenario, the majority of emissions reductions are driven by the decreasing carbon intensity of the electricity grid. Most of these reductions come from electricity use in buildings, streetlighting, and water and wastewater treatment plants. In combination with grid decarbonization, the High Performance Civic Building Policy also contributes to emissions reductions, with the two factors accounting for 87% of total emissions reductions in 2050.
- The remaining emissions reductions (13% in 2050) result from the federal Clean Fuel Regulations.
- Electricity generation appears as a net-positive emissions source in this scenario. As the grid decarbonizes and landfill gas capture continues at the same rate as in the No Action scenario, the associated emissions savings diminish, becoming net-positive because the grid itself becomes cleaner. See Appendix E for additional details on how emissions from landfill gas capture were calculated. The dotted blue line represents the scenario total, accounting for both positive and negative emissions.
- The BAU projections fall significantly short of the 2050 corporate GHG reduction target, highlighting the need for additional effort beyond what is currently in place.
- 2050 residual emissions are primarily associated with the waste sector (73%), as community-wide waste in the Saskatoon Landfill is included in corporate emissions.
- Transportation emissions account for an additional 13% of residual emissions in 2050, reflecting the lack of policies requiring ZEVs in this scenario.
- Other sources of residual emissions in 2050 include buildings (8%), water and wastewater systems (4%), and electricity generation (3%).
- The slight difference between the scenario total emissions line and the total stacked residual emissions reflects emissions reductions from electricity generation using captured landfill gas.

6.2 Climate Action

The Climate Action scenario models emissions based on an assumption that the City follows through on policy changes and actions to reduce emissions. These are layered on top of the BAU scenario.

Policies introduced in this scenario include:

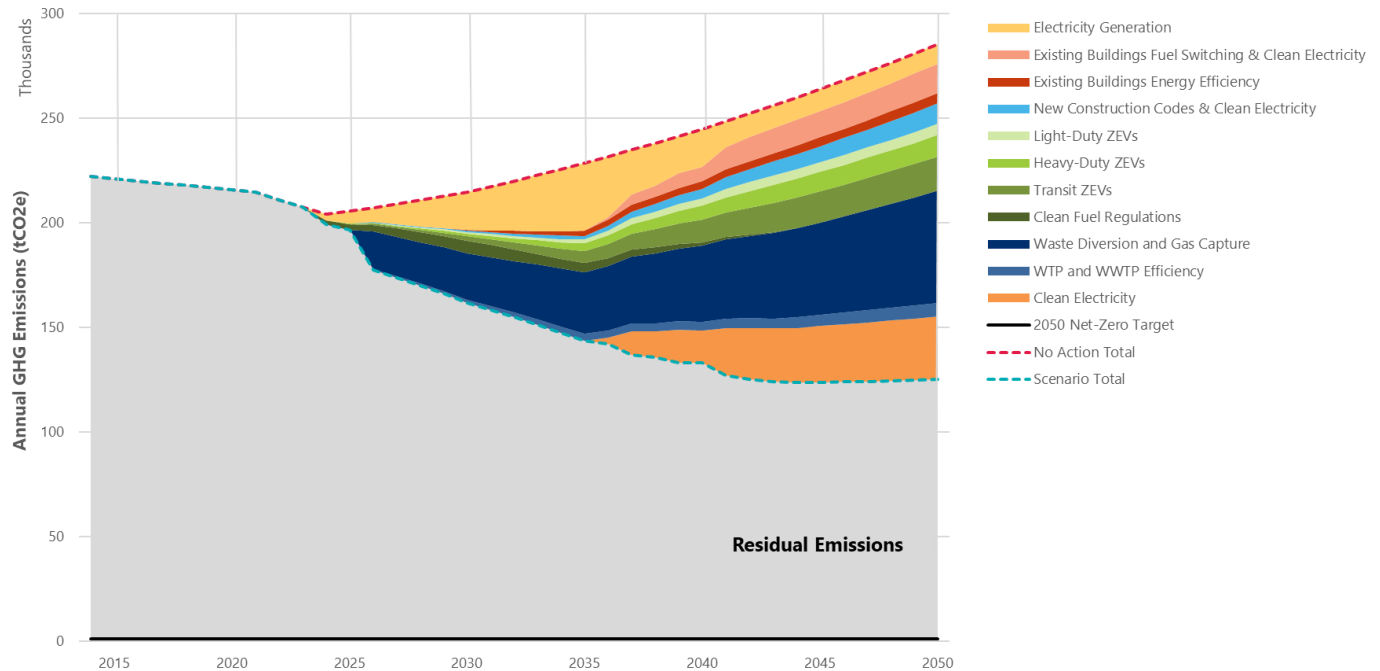
Table 10: Climate Action Policy Inputs and Wedge Impact (Detailed Assumptions in Appendix A)

Sector	Policy Input	Graph Wedge Impacted
Buildings	Civic Building Benchmarking, Labeling, and Disclosure	Existing Buildings – Energy Efficiency
	Civic Building Energy Efficiency Retrofits	Existing Buildings – Energy Efficiency
	Net-Zero Ready Civic Buildings	Existing Buildings – Fuel Switching and Clean Electricity
Transport	Civic Fleet Transition to ZEV	Light Duty ZEV Heavy Duty ZEV Transit ZEV
Water and Wastewater	Water Treatment and Wastewater Treatment Energy Efficiency Upgrades	WTP and WWTP Efficiency
Waste	Increased waste reduction and diversion	Waste diversion and landfill gas capture
	Landfill gas capture Upgrades	Waste diversion and landfill gas capture
Energy	Solar Electricity Generation	Electricity Generation

Projected emissions reductions relative to 2014 baseline under the Moderate Improvement sensitivity:

- 2035: **35%**
- 2050: **44%** (target = net-zero)

Figure 19 – Corporate Climate Action GHG Emissions Reductions, Moderate Improvement



Projected emissions reductions relative to 2014 baseline under the Decarbonized Grid sensitivity:

- 2035: **38%**
- 2050: **51%** (target = net-zero)

Figure 20 – Corporate Climate Action GHG Emissions Reductions, Decarbonized Grid

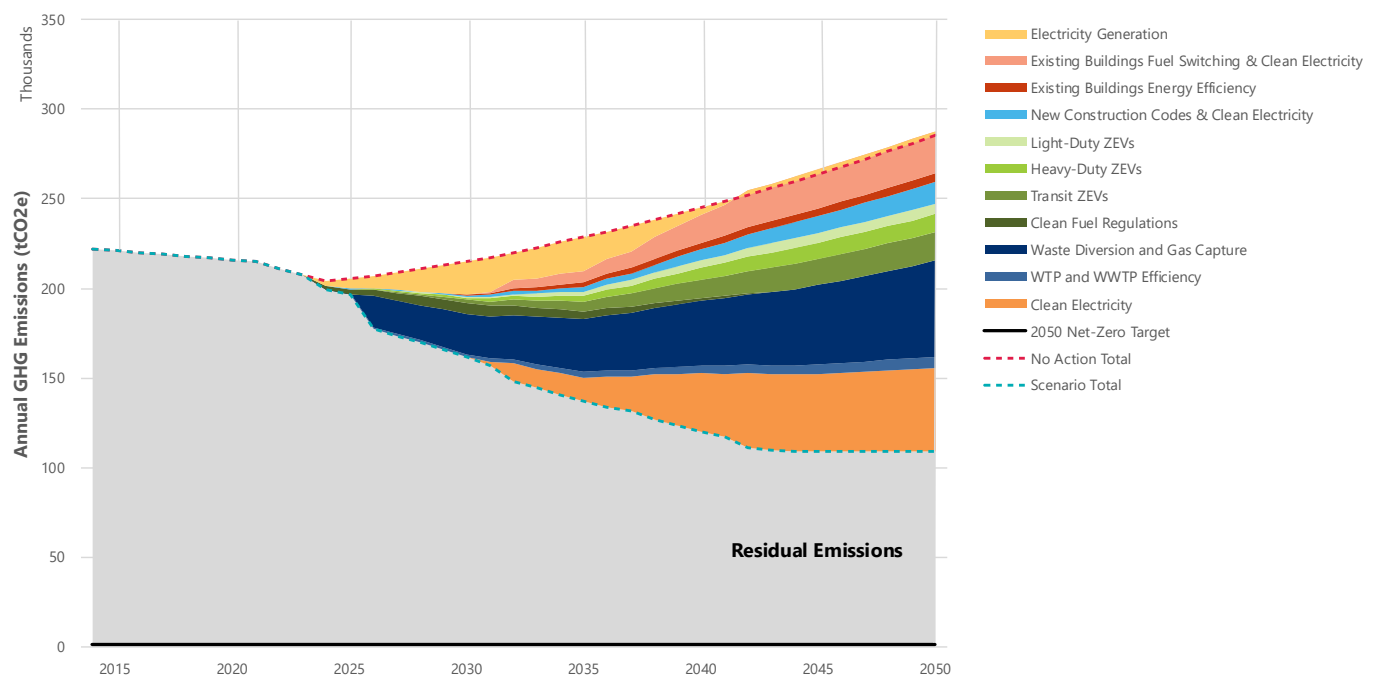


Figure 21 below shows the make-up of the residual emissions that remain after the policies in the Climate Action scenario have been modelled under the Decarbonized Grid sensitivity.

Figure 21 – Corporate Climate Action Residual Emissions, Decarbonized Grid

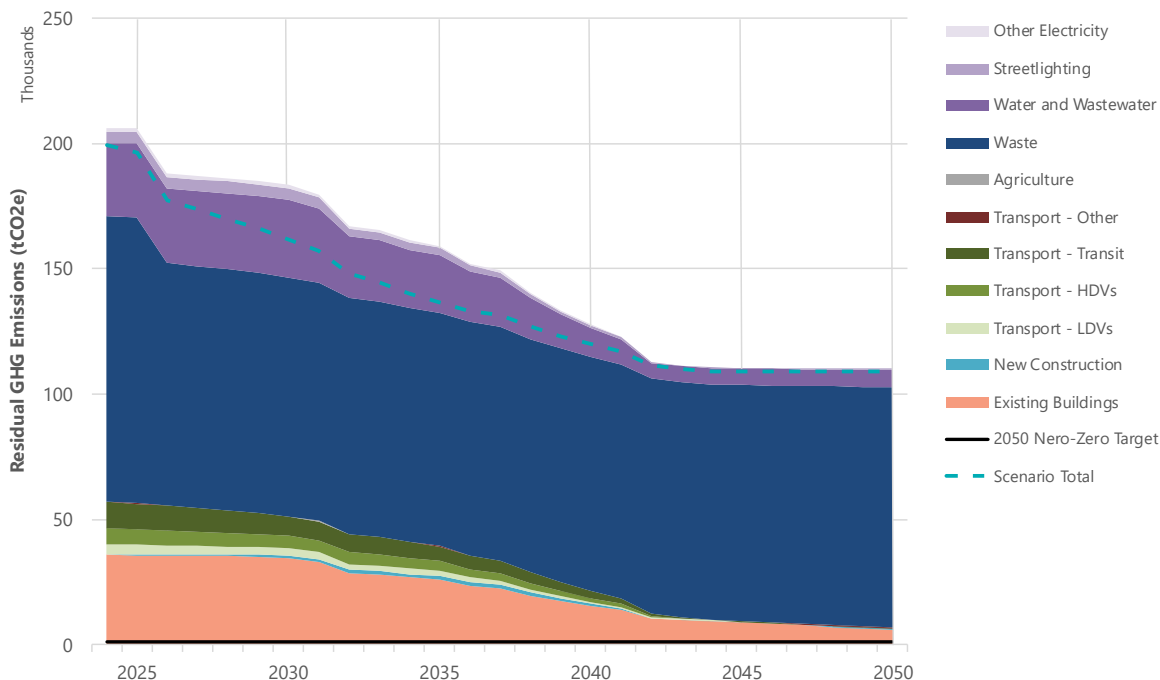


Table 11: Corporate Climate Action 2050 Residual Emissions by Sector, Decarbonized Grid

Emission Sector	% of Residual Emissions
Waste	87%
Existing Buildings	6%
Water and Wastewater	6%
Other	1%

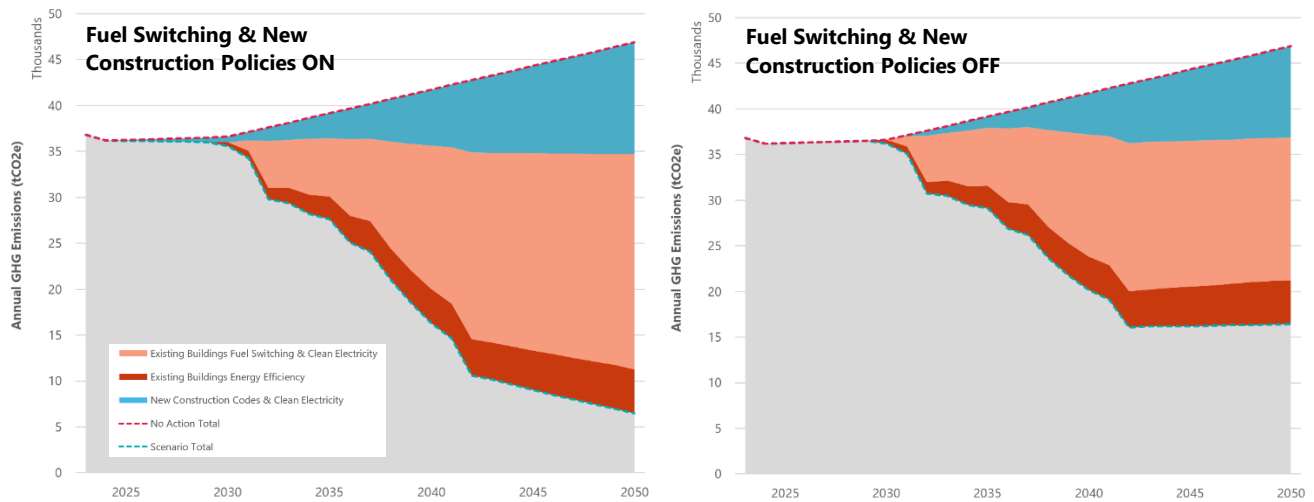
Key findings from the modelling include the following:

- In the Climate Action scenario, the largest share of emissions reductions (30%) comes from waste diversion and landfill gas capture. This significant contribution is due to community waste in Saskatoon Landfill being included in corporate emissions. It was assumed that the City will achieve its waste diversion targets of 70% by 2035 and 75% by 2050. Achieving these goals will require substantial effort from both the City and the community. For landfill gas capture, it was assumed that methane capture will increase from 38% to 50% in 2026, reach 55% by 2035, and remain at that level through 2050. This improvement explains the sharp decline in waste-related emissions beginning in 2026. See Appendix E for additional details on how waste sector emissions were calculated.
- Emissions reductions from fuel switching in buildings, new construction codes, and the decreasing carbon intensity of the grid also account for a significant share of emissions savings in 2050 (46%). Figure 22 was developed to help address a key challenge of savings attribution in wedge charts, where emissions reductions can be difficult to assign to a single policy area because multiple factors often act together. A key example is the interaction between fuel switching policies and grid decarbonization, which both need to occur to achieve the modelled savings. To better isolate the impact of fuel switching

and new construction policies from the effects of grid decarbonization, two building-sector wedge charts were prepared: one with all fuel switching and new construction policies included, and another with them turned off. When these policies are included, emissions in the buildings sector are 86% below the No Action total in 2050. When these policies are turned off, emissions are only 65% below the No Action total, which shows that these policies do make a considerable impact on total emissions reductions.

- Additional emissions reductions (18%) are achieved through the transition of the civic fleet to ZEVs. It was assumed that light-duty vehicles and equipment will be zero-emission by 2040, heavy-duty and emergency vehicles will reach zero-emissions by 2050, and the transit fleet will transition to zero-emissions between 2035 and 2050.
- Energy efficiency improvements in both existing buildings and the water and wastewater treatment plants account for the remaining emissions savings.
- Under the Climate Action scenario, electricity generation contributes significantly to emissions savings in the short- to medium-term. These early savings are driven by the addition of solar capacity, with 50 MW of solar assumed to be installed between 2025 and 2035. However, as the electricity grid begins to decarbonize after 2030, the relative emissions benefits of solar generation decline. Electricity generation from captured landfill gas is also included in this scenario but is assumed to be phased out once it becomes unfavourable from a GHG perspective (i.e., when electricity generation from landfill gas becomes more carbon-intensive than grid electricity). As a result, the Climate Action scenario shows fewer net-positive emissions from electricity generation compared to the BAU scenario. See Appendix E for additional details regarding how landfill gas capture emissions were calculated.
- A significant gap remains between projected emissions and the corporate 2050 emissions reduction target. The scenario projects a 51% reduction by 2050, falling short of the net-zero goal. This highlights the need for additional action to achieve net-zero.
- There is a notable difference between projected emissions reductions under the BAU scenario (7%) and the Climate Action scenario (51%). Because the BAU focuses on federal policies and municipal actions already underway, this gap highlights how much additional work the City must undertake to reduce its corporate emissions. Significant municipal action is required to realize the emissions reductions modelled in the Climate Action scenario, with further action needed to achieve the City's net-zero target by 2050.
- The largest source of residual emissions in 2050 is waste (87%) due to its dominant role in total corporate emissions.
- Other sources of residual emissions include water and wastewater (6%), and existing civic buildings (6%).
- The significant difference between the scenario total emissions line and the total stacked residual emissions from 2025 to around 2040 reflects the emissions savings from solar electricity generation. The assumed 50 MW solar installation, which accounts for approximately 59% of corporate electricity use in 2035, drives these emissions savings. These savings create a net reduction in overall emissions during that period, offsetting residual emissions from other sectors.

Figure 22 – Building Sector Wedge Chart Comparison

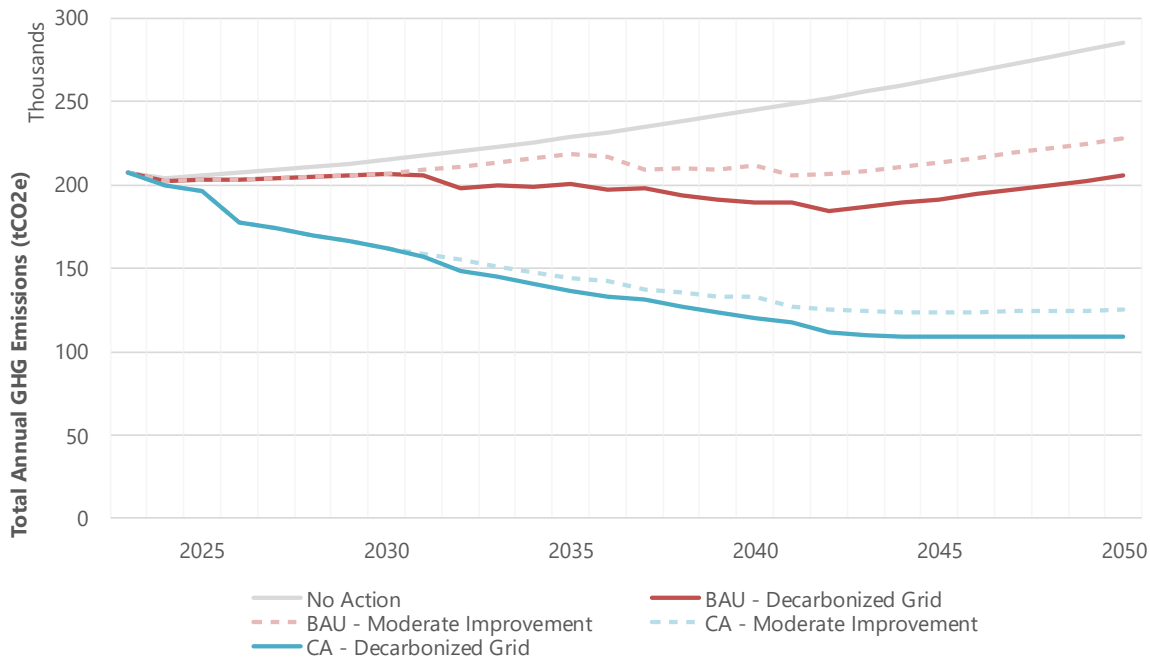


6.3 Electrical Grid Sensitivities

Because the carbon intensity of the electricity grid has a major influence on overall emissions outcomes, two sensitivities (Moderate Improvement and Decarbonized Grid) were analyzed to compare modelling results and assess the extent of the grid's impact.

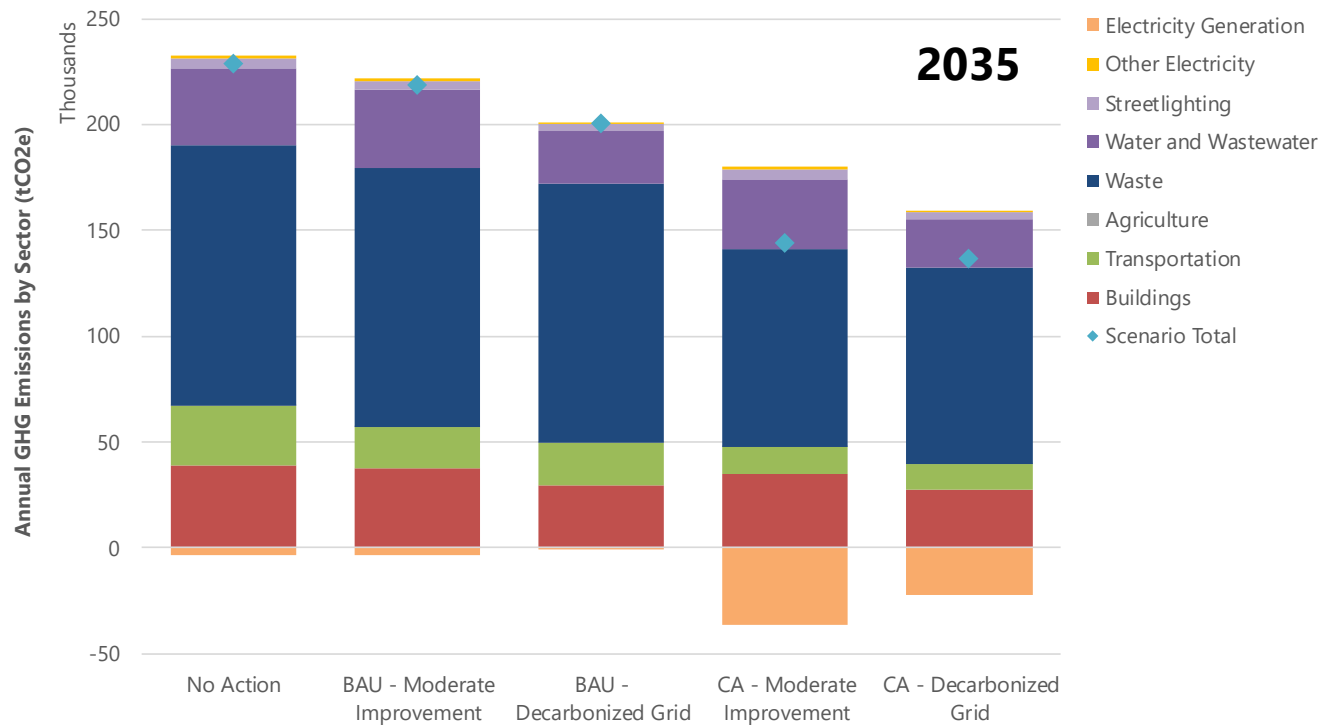
Figure 23 illustrates the total projected corporate emissions under the two scenarios and grid sensitivities for comparison. To provide further insight, Figures 24 and 25 present emissions by sector for each scenario and sensitivity in 2035 and 2050, respectively.

Figure 23 – Corporate GHG Emissions by Scenario and Sensitivity



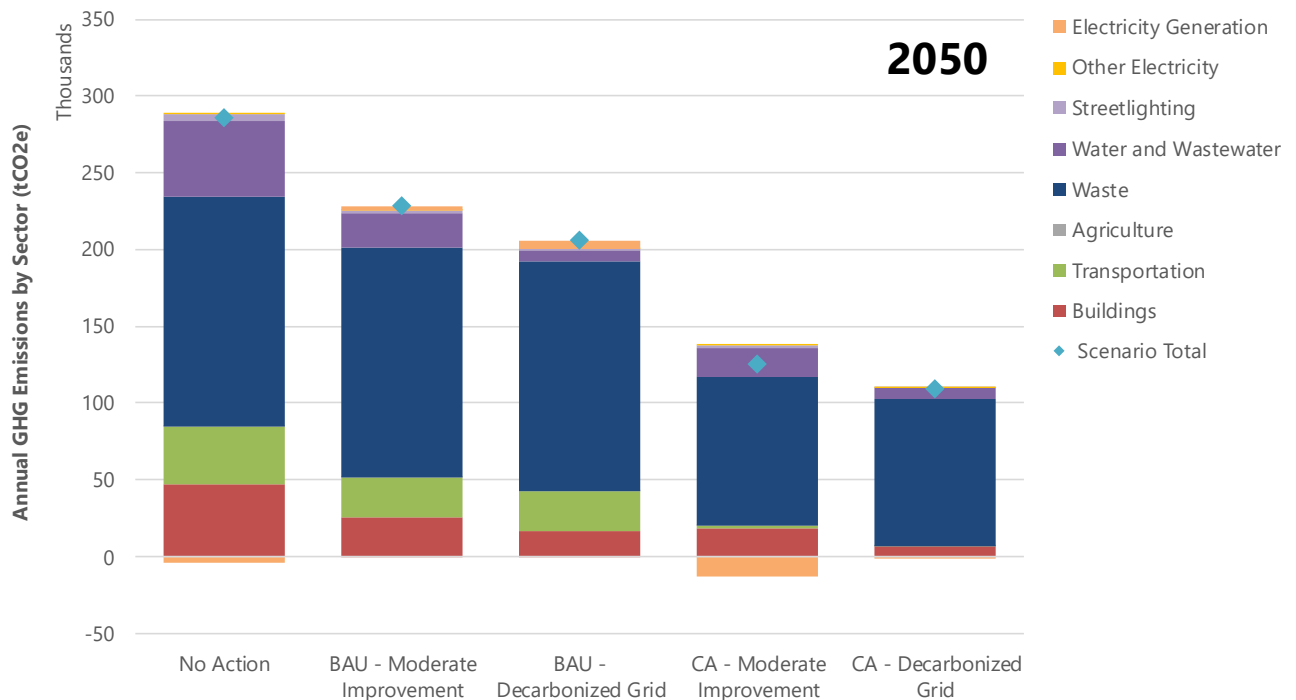
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Figure 24 – 2035 Corporate Residual GHG Emissions by Sector, Scenario, and Sensitivity



Note: Emissions below zero represent negative emissions and the blue diamond represents the adjusted scenario total

Figure 25 – 2050 Corporate Residual GHG Emissions by Sector, Scenario, and Sensitivity



Note: Emissions below zero represent negative emissions and the blue diamond represents the adjusted scenario total

Key findings from the sensitivity analysis include the following:

- Although the overall impact of grid decarbonization on total corporate emissions is relatively small in both 2035 and 2050 (less than 10% across both scenarios and sensitivities), the effect on individual sectors, particularly in 2050, is much greater. Under the Climate Action scenario in 2050, the following changes in emissions between the Moderate Improvement and Decarbonized Grid sensitivities were projected:
 - Water and wastewater emissions dropped 64% (12,475 tCO₂e)
 - Building emissions dropped 64% (11,642 tCO₂e)
 - Transportation emissions dropped 86% (1,978 tCO₂e)
 - Streetlighting emissions dropped 90% (1,547 tCO₂e)
 - and other electricity emissions dropped 90% (426 tCO₂e)
- Water and wastewater emissions are sensitive to the grid's carbon intensity due to their high electricity use and the assumed increase in energy demand with population growth.
- The building sector is affected by the carbon intensity of the electricity grid, especially by 2050, because of both high electricity consumption and the transition to electric systems in civic buildings.
- The transportation sector is also influenced by the carbon intensity of the grid due to the transition of the entire civic fleet to ZEVs by 2050.
- Emissions savings associated with electricity generation are strongly affected by the grid sensitivities. In 2035, under the BAU scenario, emissions savings from electricity generation using captured landfill gas decrease going from the Moderate Improvement to the Decarbonized Grid sensitivity. Similarly, under the Climate Action scenario, savings from both solar and landfill gas electricity generation also decline, as the avoided emissions are smaller under a more decarbonized grid. By 2050, the benefits of generating electricity from these sources diminish further, leading to increased net-emissions under the BAU scenario and reduced emissions savings under the Climate Action scenario.

7 Discussion and Recommendations

7.1 General Findings

Across the modelled scenarios, a number of overarching findings were identified, including the following:

- While some decarbonization policies (e.g., Clean Fuel Regulations, Electric Vehicle Availability Standard) are federal, the majority of actions modelled are City-led. Unlike in provinces with stronger provincial programs or regulations supporting local decarbonization, Saskatoon's progress will depend heavily on municipal leadership to design, implement, and sustain the modelled policies and programs. This will require coordinated action across departments, partnerships with community stakeholders, and broad support from the community as a whole.
- The carbon intensity of the electricity grid remains an important and uncertain factor influencing emissions outcomes across both the community and corporate scales. The modelling highlights how critical continued advocacy and collaboration with SaskPower and the Province will be to ensure grid decarbonization supports the City's long-term climate goals.
- Although the electricity grid plays an important role, grid decarbonization alone is not enough to achieve the emissions reductions projected in the modelling. Realizing these outcomes, particularly those associated with fuel switching, requires both significant local action to electrify key sectors (e.g., buildings and transportation) and a cleaner grid. Continued progress on energy efficiency will also be critical to limiting demand growth and reducing strain on the grid as electrification increases. Together, these efforts will play a key role in determining the overall pace and success of Saskatoon's decarbonization.
- Access to other low-carbon energy sources will also be an important factor in Saskatoon's decarbonization. Beyond access to a decarbonized grid, progress in hard-to-abate areas such as manufacturing industries and construction, and water and wastewater treatment will likely depend on the availability of alternative low-carbon energy sources.
- Inherently, there is large uncertainty with projections modelling. Much of the projections modelling is based on targets which reflect the intended outcomes of certain policies. These targets are understandably ambitious as they reflect the level of action required to mitigate to most severe consequences of climate change.

7.2 Community Findings

At the community scale, key findings from the modelling include the following:

- Emissions reductions from the building sector account for the largest portion (59%) of total community emissions savings under the Climate Action scenario. This highlights the importance of carefully designing and effectively implementing the building-focused policies the City is considering and actively developing such as Energy Benchmarking, Accelerated Residential Fuel Switching, and the Building Performance Standard. In addition, policies targeting new construction have a major influence on residual emissions in 2050, with new construction contributing 24% of residual emissions under the BAU scenario (which assumes minimal new construction requirements), and only 8% under the Climate Action scenario which includes increasingly higher NBC and NECB tiers. The pace of emissions reductions in the new construction sector is influenced by both the timing of grid decarbonization and the stringency of fuel-switching requirements. As a result, residual building emissions in 2050 are strongly influenced by

the timing of grid decarbonization, which is largely outside the City's control. This highlights the importance of preparing policies and buildings now for future fuel switching so that emissions reductions can be quickly realized as the electricity grid becomes cleaner.

- The transportation sector accounts for a significant portion of the modelled emissions reductions under the Climate Action scenario (21%), driven by light-duty ZEV adoption, the federal Clean Fuel Regulations, and mode shift initiatives. Despite these savings, there remains a major opportunity to further decarbonize the sector by addressing heavy-duty vehicles, which represent the largest source of residual emissions in 2050. Currently, the City has minimal insight or oversight into commercial or industrial transportation activities in Saskatoon. Information gathering and collaboration with industrial and commercial partners could identify future opportunities.
- Manufacturing industries and construction (21%) remain a major source of residual community emissions in 2050. These sectors are particularly difficult to decarbonize due to high process energy demands and technological limitations. Despite these challenges, they represent a significant opportunity for future emissions reductions and should be thoughtfully considered in long-term planning through collaboration with industry partners.

7.3 Corporate Findings

At the corporate scale, key findings from the modelling include the following:

- Fleet electrification represents a significant contribution to emissions reductions, reflecting the City's existing corporate fleet transition targets. Continued focus and effort will be required to ensure these targets are met. Light-duty and equipment fleet electrification has started and must continue through 2040. Monitoring commercial developments of heavy-duty, transit, and emergency fleet options is necessary to prepare for transition starting in 2035. Aligning procurement decisions and funding with the City's zero-emission fleet goals will be critical to staying on track.
- Waste continues to account for a large portion of residual corporate emissions in 2050 (87%), and landfill-related emissions can be particularly difficult to abate. Reducing and diverting waste will always be the first priority and this depends on community participation and behavioural change, including engagement in recycling and organics programs and reducing overall waste generation. With regards to waste management, the City can explore emerging innovations in this area such as waste to energy technologies, additional monitoring and verification of emissions, or advanced supplemental landfill gas capture approaches.
- Building are a key area of opportunity where the City can make meaningful progress. The City has direct control over these emissions and can lead by example through the electrification of civic facilities, even with the challenges associated with certain building types (e.g., recreation centres, warehouses). Taking advantage of this opportunity will require proactive capital planning and the integration of energy efficiency and electrification into ongoing asset management and renewal processes.

7.4 Interim Targets

The modelling work was undertaken to understand potential trajectories of GHG emissions under various policy scenarios and grid conditions. Based on the findings, a set of interim emissions reduction targets was developed in collaboration with City staff.

The modelling results were used to identify targets that are both achievable and ambitious on the corporate and community sides, based on the scale of policies and programs modelled. Both interim targets were informed by the most optimistic modelling scenario (Climate Action) and the Decarbonized Grid sensitivity. This combination assumes continued municipal action across sectors and a future where SaskPower begins decarbonizing the grid in the early 2030s, complementing local action.

Under these assumptions, the modelling projected:

- **34% reduction in community emissions** in 2035 relative to the 2014 baseline
- **38% reduction in corporate emissions** in 2035 relative to the 2014 baseline

Based on these results, and in collaboration with the City, the following interim targets were determined:

- **Community: 35% reduction below 2014 levels by 2035**
- **Corporate: 40% reduction below 2014 levels by 2035**

These interim targets for 2035 provide a 10-year window for the City to demonstrate measurable progress toward decarbonization. This mid-term horizon strikes a balance between being near enough to create urgency and align with regular planning cycles, while also being far enough away to allow for ambition within the City's typical constraints, such as budgeting and staffing capacity. The final targets were developed in collaboration with the City, ensuring they reflect both analytical evidence and strategic direction.

Because these interim targets were developed based results from the most optimistic scenario, which includes grid decarbonization starting in 2030, the electricity grid is a major contributing factor to achieving them. Under the Moderate Improvement grid sensitivity (where grid decarbonization begins in 2035), the modelling projects a much smaller reduction of 22% in community emissions below 2014 levels by 2035. The grid has a smaller influence on the corporate side, with 35% emissions reductions projected under the same sensitivity. This impact highlights the importance of grid decarbonization as a key factor in meeting Saskatoon's targets, which should remain an ongoing consideration for the City.

7.5 Comparing the Results to Saskatoon's Targets

Table 12 summarizes the modelled emissions reductions compared to the City's 2035 and 2050 targets for both the community and corporate scales.

Table 12 – Comparison to 2035 and 2050 Emissions Reductions Targets, Decarbonized Grid

Scale	Scenario	2035 Emissions Reductions	2035 Target	2050 Emissions Reductions	2050 Target
Community	Business as Usual	29%	35%	47%	100%
	Climate Action	34%	35%	69%	100%
Corporate	Business as Usual	10%	40%	7%	100%
	Climate Action	38%	40%	51%	100%

Modelling results under the Climate Action scenario and Decarbonized Grid sensitivity show that the 2035 interim targets for both the community and corporate scales are within reach. Projected emissions reductions of 34% on the community side and 38% on the corporate side fall just short of the 35% and 40% targets, respectively, suggesting that these goals are achievable with continued focus and follow-through. Maintaining progress will depend on consistent implementation, adequate funding and staff capacity, and sustained momentum across key sectors.

Looking ahead to 2050, the results indicate that the modelled policies and programs alone will not be sufficient to reach the City's net-zero targets. Under the Climate Action scenario, emissions are projected to fall by 69% on the community side and 51% on the corporate side, leaving substantial residual emissions to address. In part, this shortfall or gap reflects the City's intentional decision in the modelling work to omit highly uncertain policies, such as those related to heavy-duty vehicle decarbonization, and instead use the results to identify key areas of high emissions for future policy development. Because of this approach, the residual emissions represent priority areas for further exploration, where new policies, partnerships, low-carbon energy sources, and/or technologies will be required to close the remaining wedge between projected outcomes and the 2050 targets. As illustrated

in Figures 26 and 27, this gap is relatively small in 2035 but grows considerably by 2050, underscoring the importance of continued innovation, collaboration, and adaptive planning to sustain long-term progress toward net-zero.

Figure 26 – Community Simplified Wedge Chart

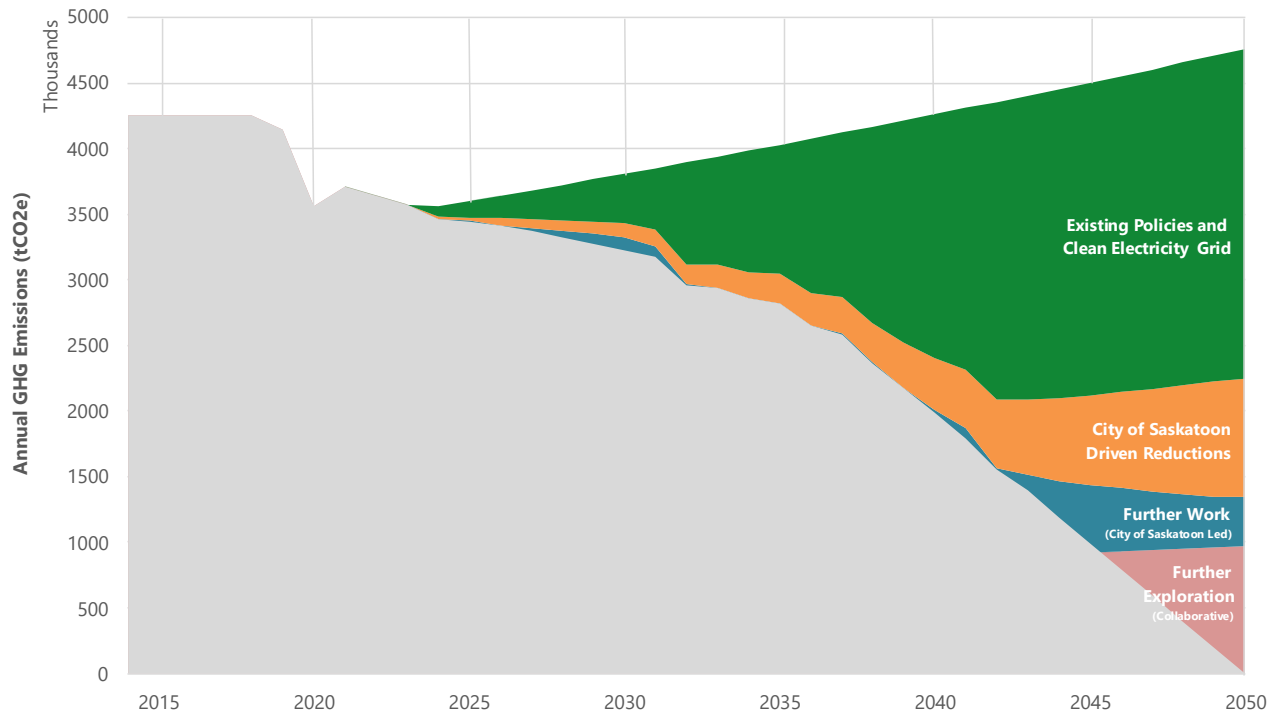
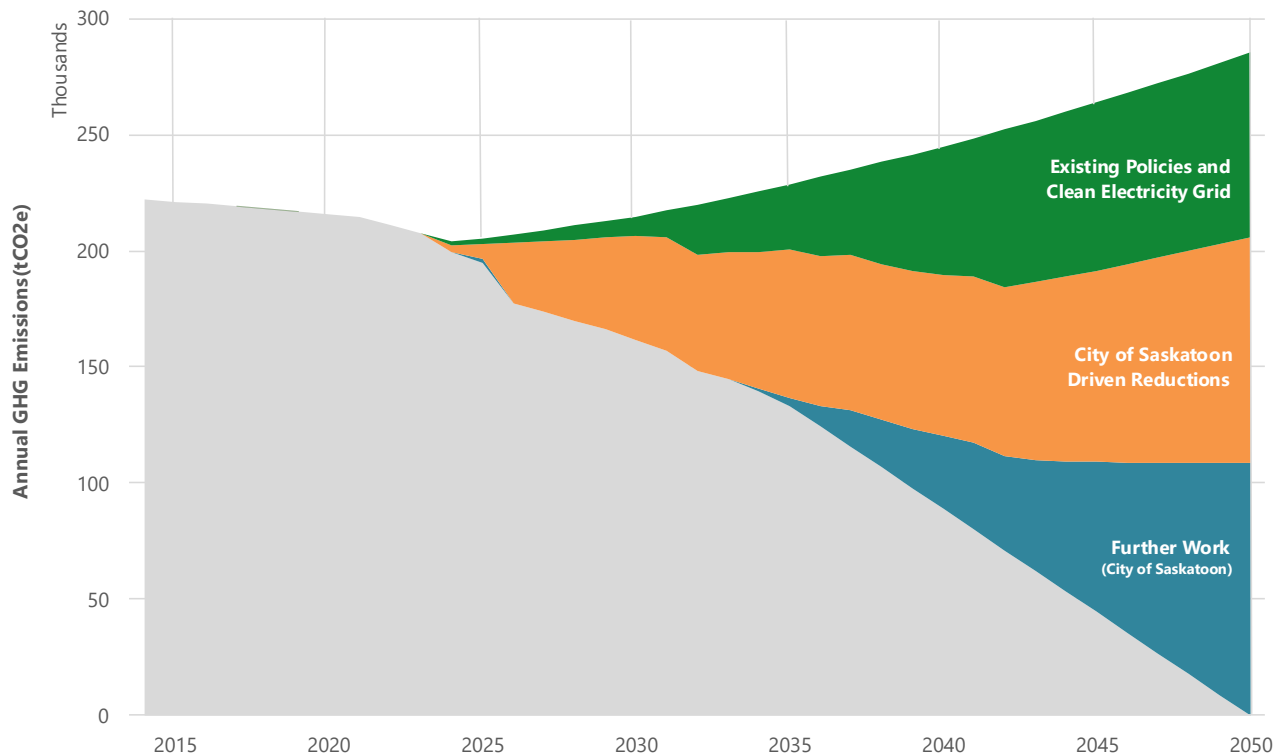


Figure 27 – Corporate Simplified Wedge Chart



8 Appendix A – Detailed Modelling Assumptions

Table 13 provides detailed descriptions of the assumptions used for each policy under the three scenarios (No Action, Business as Usual, Climate Action).

Table 13 – Detailed Policy Assumptions

Policy	Scenario	Detailed Assumption
Solar Electricity Generation	No Action	As of November 2024, no utility-scale solar (0 MW) has been installed, and it is assumed that no renewable energy resources will be added for grid supply through 2050.
	Business as Usual	As above.
	Climate Action	It is assumed that the City of Saskatoon and Saskatoon Light and Power will install 50 MW of solar capacity between 2025 and 2035.
Electricity Generation from Landfill Gas	No Action	Methane capture from the landfill was at 38% in 2023 and is assumed to remain at this level through 2050. Electricity generation from this captured gas is assumed to remain at the same level through 2050, irrespective of increasing methane capture rates. The avoided emissions from electricity generation are calculated based on the amount of methane captured and the emissions factor of the SaskPower grid.
	Business as Usual	As above.
	Climate Action	Electricity generation from landfill gas capture is assumed to remain at the same level as above (based on City of Saskatoon decision to maintain current generation capacity) until it becomes unfavourable from a GHG perspective (i.e., electricity generation from landfill gas becomes more carbon-intensive than grid electricity). At that point, the landfill gas is assumed to displace natural gas use elsewhere, rather than being used to generate electricity.
NECB and NBC	No Action	Current energy use intensities (EUIs) remain constant (NBC Tier 1 and NECB Tier 1).
	Business as Usual	Across the province, NBC Tier 2 applies to smaller buildings, including houses, and NECB Tier 1 applies to larger buildings. Both codes are assumed to maintain the current tier energy efficiency tier requirements through 2050.
	Climate Action	The City of Saskatoon implements an accelerated adoption timeline for energy performance tiers under the NBC and NECB. The following implementation schedule is expected: NBC: Tier 2 NBC in 2025 Tier 3 NBC in 2030 Tier 4 NBC in 2035 Tier 5 NBC in 2040 NECB: Tier 1 NECB 2025 Tier 2 NECB 2030 Tier 3 NECB 2035 Tier 4 NECB 2040
NECB and NBC Incentives	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	This consists of incentives to encourage new construction above the required NBC or NECB tier (including and building on SaskEnergy's existing incentive). It is assumed that between now and 2036, 1% of new construction will be incentivized to adopt a higher Tier ahead of the requirements.

High Performance Civic Building Policy	No Action	As of 2023, 0% of civic buildings are built to Net-Zero Energy Ready standards, and this is expected to remain the case through 2050. New civic buildings are assumed to be built to Tier 1 of the NECB.
	Business as Usual	The High Performance Civic Building Policy establishes standards for new civic buildings, including LEED Silver certification, Net-Zero Energy Ready performance and air tightness target, and requirements for water access and accessibility. The specific requirements vary based on occupancy type and building size. All new civic buildings are built to Net-Zero Energy Ready. Assuming Net-Zero Energy Ready aligns with Tier 4 of the NECB.
	Climate Action	As above.
Alterations Code	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	The Alterations to Existing Buildings (AEB) is a federal model code for existing buildings to help guide energy efficiency improvements when an existing building undergoes alterations or renovations. It is assumed that the AEB will come into effect in 2030 and will be adopted at the community level. It will apply to all building types and is expected to trigger energy efficiency improvements based on the following assumptions: • Annual Penetration: 1% of the building stock annually, reflecting the duration of the policy and the assumption that only 20% of buildings carry out work that triggers energy efficiency improvements (20% assumption based on previous modelling work). • Average Energy Savings: 25% for Part 9 buildings and 30–45% for Part 3 buildings (based on previous modelling work, and input from the City of Saskatoon). - Additionality to Other Policies: 50% (based on experience).
Energy Benchmarking Labeling, and Disclosure	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	Benchmarking, labeling, and disclosure (BLD) are policies that measure a building's energy and/or greenhouse gas performance, compare it to similar buildings or past performance, and then require this information to be publicly disclosed. It is assumed that the requirement will come into effect in 2030 and applies to all buildings over 10,000 sq ft s). A two-year lag is assumed between implementation and the realization of energy efficiency savings: • Annual Penetration: Max compliance is achieved after 5 years. 85% for all other ICI building types. • Average Energy Savings: It is assumed that there is a 7% reduction in energy use over 3 years based on existing studies. • Additionality to other Policies: 100% as energy savings are associated with improved operation of systems rather than envelope improvements.
Home Energy Labeling	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	Home energy labelling provides a standardized rating of a home's energy performance. This policy would require Home Energy Labeling at time of sale. It is assumed that the requirement will come into effect in 2030 and applies to all Part 9 buildings. A two-year lag is assumed between implementation and the realization of energy efficiency savings: • Annual Penetration: Annual penetration of 6% is assumed to represent the requirement applying at time of sale. 6% calculated using total households in Saskatoon and CMHC

		values from the 2025 Housing Market Outlook). Assume 85% compliance. • Average Energy Savings: It is assumed that there is a 7% reduction in energy use over 3 years based on existing studies. • Additionality to other Policies: 100% as energy savings are associated with improved operation of systems rather than envelope improvements.
Building Performance Standard	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	The City of Saskatoon plans to adopt a building performance standard following the energy benchmarking requirement. The standard will set performance requirements for existing ICI buildings and residential buildings, with timelines varying by building type. It is assumed that the requirement will come into effect in 2035 and applies to all buildings over 10,000 sq ft. It is assumed that all of these buildings will fuel switch by 2050 to be net-zero ready. Fuel Switching Assumptions: • Annual penetration for buildings varies between 3-5%, based on an end date of 2050. • Compliance rate of 85% for buildings over 10,000 sq ft Approach and assumptions align with modelling of potential Building Performance Standards in other jurisdictions (e.g., Maple Ridge, CRD) It was assumed that the Building Performance Standard would also apply to the new construction sector, ensuring that buildings constructed prior to the implementation of NECB Tier 3 (which requires fuel switching) would fuel switch by 2050.
Incentives and Supports for Existing Buildings	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	This consists of financial incentives and home/building owner support energy efficiency and for electrification in homes and multifamily buildings. Due to the lack of granular data on incentive uptake and energy savings for individual programs, the impact of incentives is modeled collectively through to 2035 (the introduction of the Building Performance Standard and the Accelerated Residential Fuel Switching in Part 9 buildings). Assumptions: • Annual Penetration: 0.5% for residential buildings (SF and MURBs assuming HELP program expands to MURBs and further financial support is provided by the City of Saskatoon to increase uptake) • Average Energy Savings: 25% (based on BC rebate program data) • Additionality to Other Policies: 50% (assumption based on experience)
WTP + WWTP Upgrades	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	Planned measures include upgrades to lift and pump stations, reservoir systems, and the integration of biogas and combined heat and power systems at treatment plants. Water and wastewater treatment operations are assumed to be 10% more energy efficient by 2035, and 15% more efficient by 2050. 15% is a very high-level, general, conservative estimate based on the list of planned improvements. Energy use is assumed to increase with population growth. Energy efficiency improvements are assumed to reduce electricity use. Natural gas is not reduced as it is assumed to be primarily associated with process loads and would likely be one of the last uses of natural gas by the City of Saskatoon.

Municipal Building Benchmarking, Labeling, and Disclosure	No Action	Not modelled.
	Business as Usual	Not modelled.
		The City of Saskatoon improves operational energy efficiency through early voluntary adoption of the Benchmarking, Labelling, and Disclosure program in 2028. This applies to civic buildings over 10,000 sq ft. A two-year lag is assumed between implementation and the realization of energy efficiency savings: • Annual Penetration: Max compliance is achieved after 5 years. 100% for civic buildings • Average Energy Savings: It is assumed that there is a 7% reduction in energy use over 3 years based on existing studies. • Additionality to other Policies: 100% as energy savings are associated with improved operation of systems rather than envelope improvements.
Civic Building Energy Efficiency Retrofits	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	The City of Saskatoon undertakes energy efficiency retrofits to existing civic buildings. This applies to all civic building types and is expected to trigger energy efficiency improvements based on the following assumptions: • Annual Penetration: 1% of the building stock annually, reflecting the duration of the policy and the assumption that only 20% of buildings carry out work that triggers energy efficiency improvements. (20% assumption based on previous modelling work). • Average Energy Savings: 25% for Part 9 buildings and 30–45% for Part 3 buildings (based on previous modelling work, and input from the City of Saskatoon). - Additionality to Other Policies: 50% (based on experience).
Net-Zero Ready Civic Buildings	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	The City of Saskatoon undertakes retrofits to fuel switching civic buildings. Fuel switching in civic buildings to be net-zero ready is assumed to start in 2035 (in line with the Building Performance Standard). Fuel Switching Assumptions: • Annual Penetration: 7%, which is a result of equipment life span and assumed compliance rate. It is assumed that equipment has a lifespan of 25 years and that the compliance rate is 100%. • Additionality to other Policies: 0% as the policy typically represents the highest penetration rate for fuel switching.
Accelerated Residential Fuel Switching	No Action	Not modelled.
	Business as Usual	Not modelled.
	Climate Action	The City of Saskatoon is exploring the feasibility of applying mandatory requirements to phase out fossil fuel space heating systems in residential buildings to align with the long-term net-zero goals. Fuel switching as a result of point-of-sale regulations is assumed to start in 2035 (in line with the Building Performance Standard). Fuel Switching Assumptions: • Annual Penetration: 7%, which is a result of equipment life span and assumed compliance rate. It is assumed that equipment in Part 9 buildings has a lifespan of 15 years and that the compliance rate is 100%. These assumptions are the same as those used to model the Highest Efficiency Equipment Standard (HEES) in BC for Part 9 buildings.

		• Additionality to other Policies: 0% as the policy typically represents the highest penetration rate for fuel switching. It was assumed that Accelerated Residential Fuel Switching would apply to the new construction sector to ensure that residential buildings constructed prior to the implementation of NBC Tier 4 (which requires fuel switching) would fuel switch at the time of system replacement.
Clean Fuel Regulations	No Action	Fuel intensities stay constant through 2050.
	Business as Usual	The federal Clean Fuel Regulations require liquid fossil fuel (gasoline and diesel) suppliers to gradually reduce the carbon intensity or the amount of pollution from the fuels they produce and sell for use in Canada. The fuel intensity of diesel and gasoline reduces by 15% (below 2016 levels) by 2030, and the fuel intensity is assumed to hold steady through 2050.
	Climate Action	As above.
Electric Vehicle Availability Standard	No Action	0.4% of personal vehicle registrations in Saskatoon were EV or PHEV, and this share is assumed to persist at this level through 2050.
	Business as Usual	Under this federal standard, automakers and importers are required to meet annual ZEV sales targets. 20% of light duty vehicle sales will be ZEVs by 2026, 60% by 2030, and 100% by 2035, based on Canada's Zero-Emission vehicle sales targets, and stays at 100% through 2050.
	Climate Action	As above.
Civic Fleet Transition to ZEVs	No Action	As of November 2024, 1% of the civic fleet is electrified, and this share is assumed to remain at this level through 2050.
	Business as Usual	As above.
	Climate Action	The City of Saskatoon is committed to transitioning the municipal civic fleet to zero-emission vehicles. 100% of the City of Saskatoon's light-duty and equipment fleet will be zero-emission by 2040 (through electrification), and the heavy-duty and emergency fleet will reach 100% zero-emission by 2050 (not necessarily through electrification). Assuming the civic bus fleet begins transitioning to ZEVs in 2035 and is fully transitioned by 2050.
Incentives for ZEVs	No Action	No additional incentive uptake is assumed beyond current levels through 2050.
	Business as Usual	As above.
	Climate Action	The City of Saskatoon is planning to provide supports that address barriers to adopting financial incentives for purchasing personal ZEVs. It is assumed that incentives for light-duty ZEVs increase overall EV sales to 65% in 2030, and 100% in 2033 (two years ahead of Canada's Zero-Emission vehicle sales targets).
Mode Shift	No Action	Transit mode share accounts for 6% of all trips, and mode shares for walking and cycling represent 10% and 3% of all trips, respectively, as reported in the 2023 Household Travel Survey. The bus ridership in 2019 was 35.3 trips per capita. All the rates are assumed locked in through 2050.
	Business as Usual	As above.
	Climate Action	Enhancements to transit services, including the Bus Rapid Transit (BRT) system, and active transportation infrastructure will contribute to achieving the mode shift target outlined in the Transportation Master Plan

		Walking and cycling trips are projected to account for 24% of all daily trips and 15% of all commute trips by 2045, and transit ridership is expected to reach 62 trips per capita between 2050 and 2060. Assume mode shift accounts for 31% of daily trips in 2050 (24% from walking and cycling, 7% from transit).
Waste Diversion	No Action	The percentage of waste diverted from the landfill in 2024 was 34%, and is assumed to remain at this rate through 2050.
	Business as Usual	As above.
	Climate Action	Increased waste reduction and diversion in future years, assuming 70% diversion by 2035, and 75% diversion by 2050. This is inclusive of actions and programs delivered by different levels of government.
Landfill Gas Capture	No Action	Methane capture from the landfill was at 38% in 2023 and is assumed to remain at this level through 2050.
	Business as Usual	As above.
	Climate Action	Landfill Gas projects completed in 2023 include the addition of a second blower to improve system reliability and increase uptime, and the installation of a second smaller flare to allow for increased LFG destruction. Work in 2024 includes the drilling of 16 new LFG collection wells to increase LFG collection capacity. Methane capture increases to 50% in 2026, increases from 50% to 55% from 2026-2035, then remains at 55% of gas captured annually from 2035-2050.
Natural Area Conservation	No Action	Assuming the baseline of 14% of natural areas stays constant for new development.
	Business as Usual	As above.
	Climate Action	This include implementation of policies that limit the impact of urban development on the loss of natural areas, green space, trees, and agricultural lands, which removes carbon sinks and lowers annual sequestration rates. Conserve 30% of natural areas within new development, through full implementation of the Wetland Policy and new conservation measures.
Tree Canopy Cover	No Action	Tree canopy cover is assumed to remain at 9% (current baseline) through 2050.
	Business as Usual	As above.
	Climate Action	The City of Saskatoon aims to achieve a tree canopy cover of 15% by 2060. Achieve a city-wide tree canopy cover of 15% by 2060.

9 Appendix B - Moderate Improvement Emissions

The following graphs depict residual emissions under the Moderate Improvement grid sensitivity across the various scenarios and scales.

9.1 Community Results

Figure 28 – Community Business as Usual Residual Emissions – Moderate Improvement

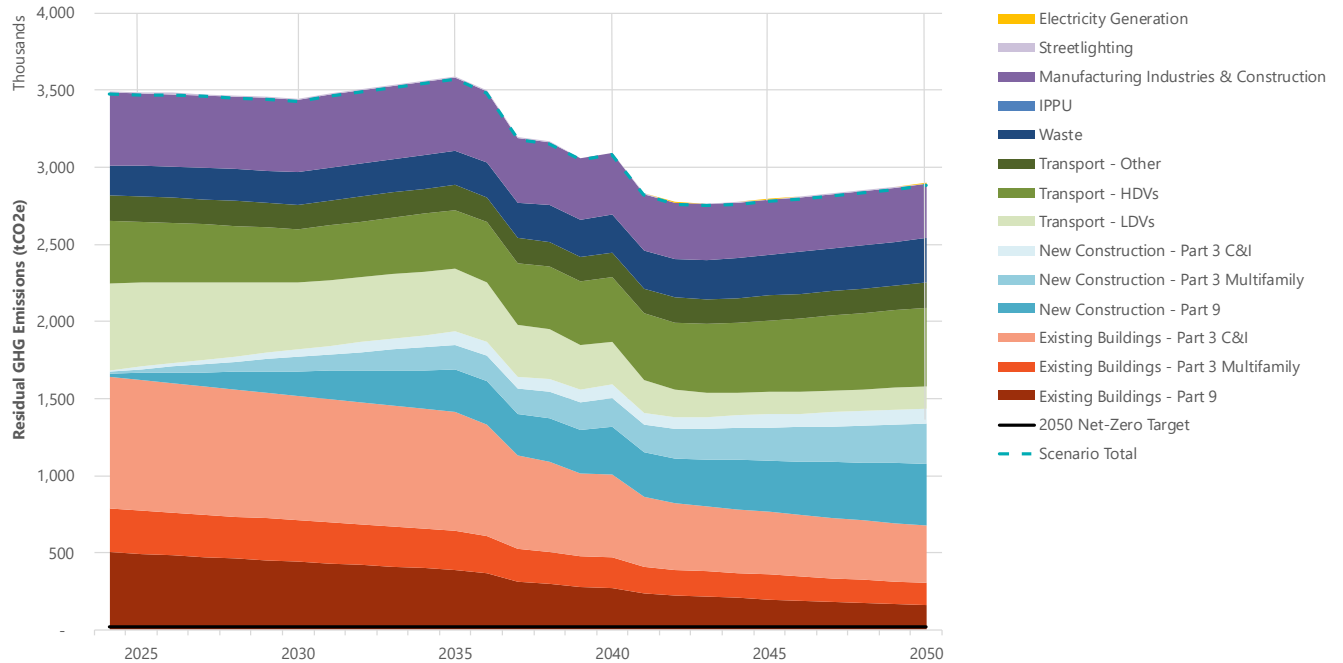
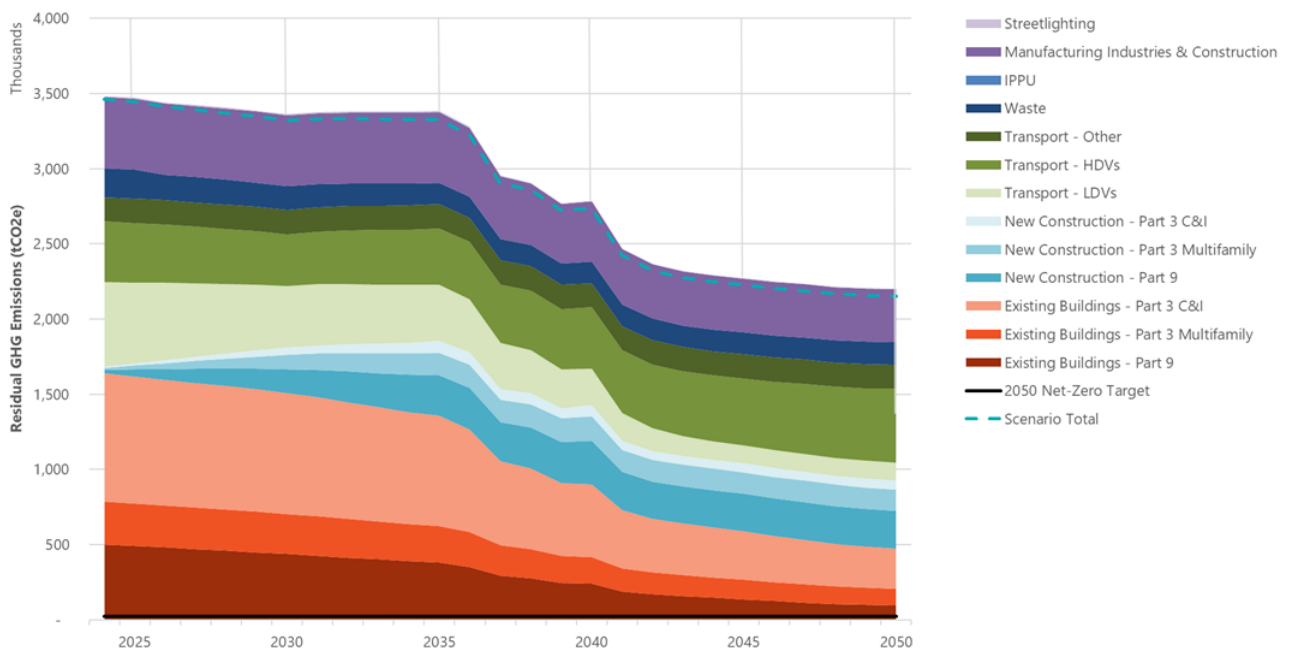


Figure 29 – Community Climate Action Residual Emissions - Moderate Improvement



9.2 Corporate Results

Figure 30 – Corporate Business as Usual Residual Emissions - Moderate Improvement

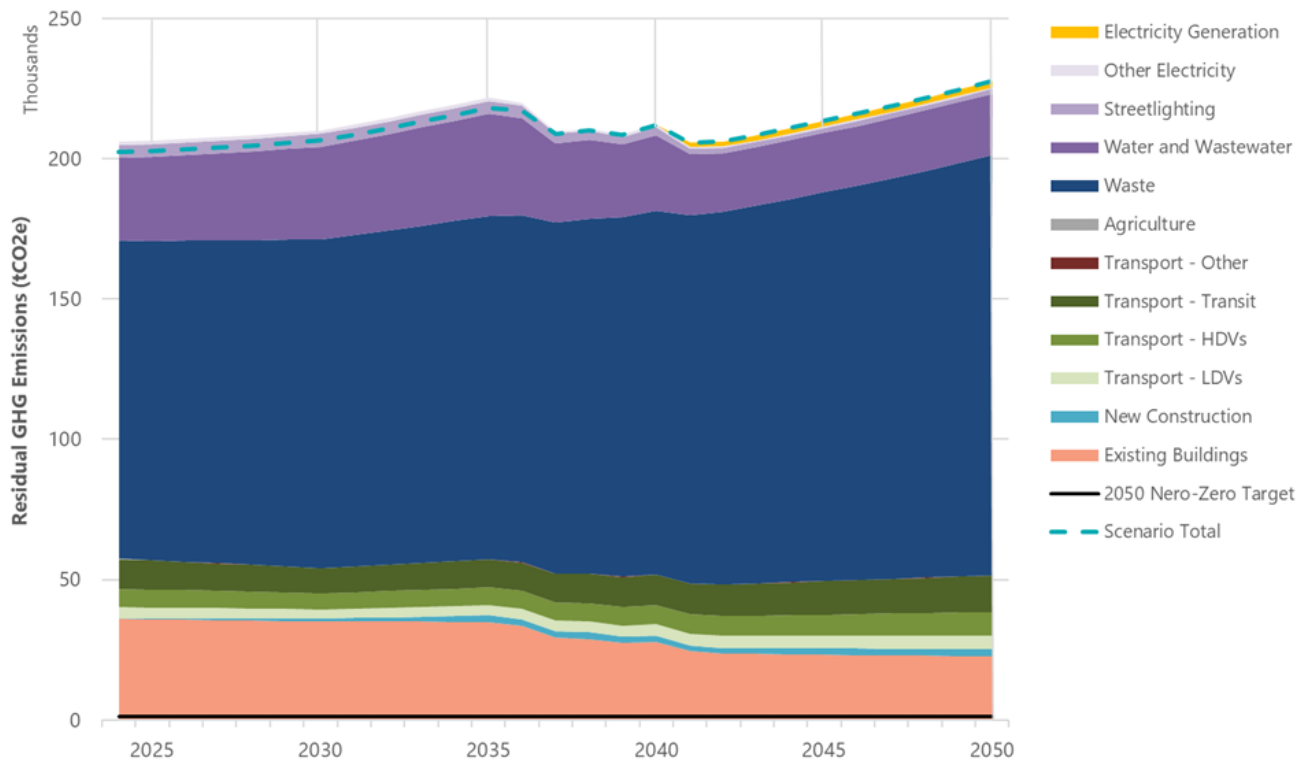
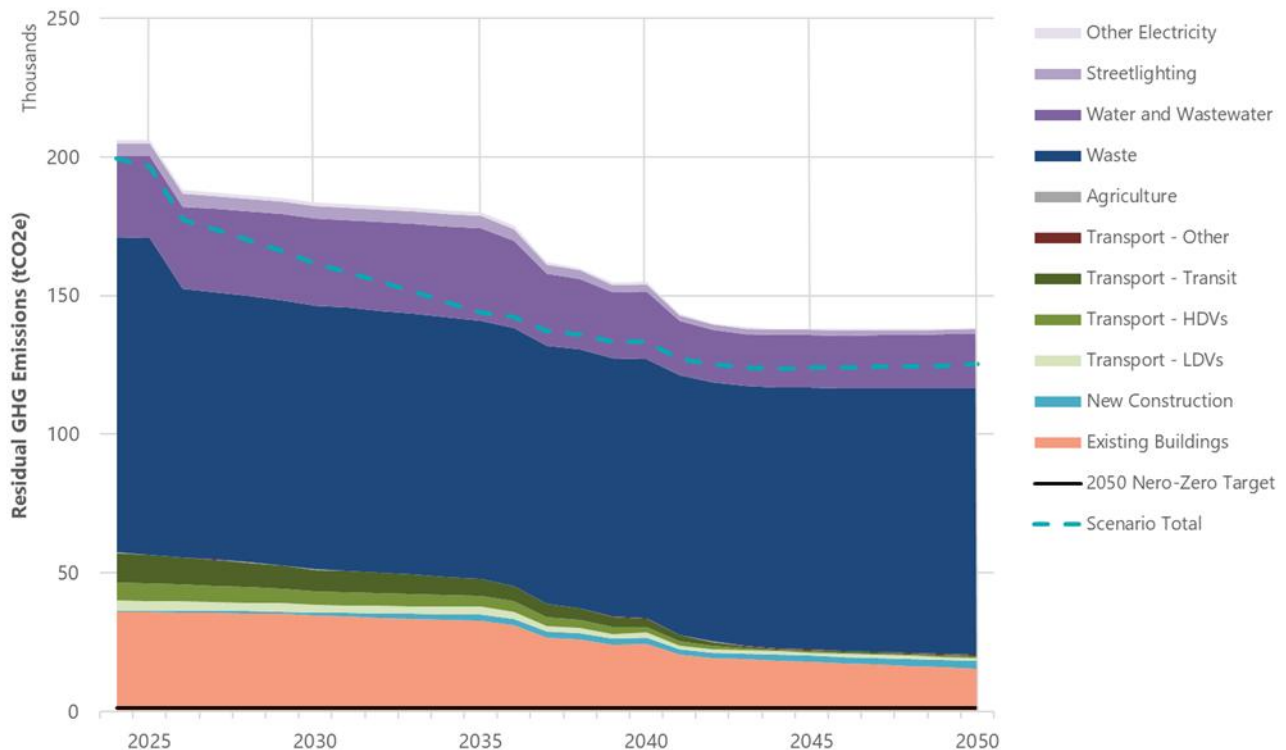


Figure 31 – Corporate Climate Action Residual Emissions - Moderate Improvement



10 Appendix C – New Construction Codes

Emissions from the new construction sector were estimated based on the energy use of new buildings. Energy use was calculated using electricity and natural gas EUIs developed for each NBC and NECB tier to represent performance at different code levels. Tables 14 and 15 summarize these EUIs.

Table 14 – Community NBC and NECB Target EUIs (kWh/m²)

Building Type	Target NBC EUIs										Target NECB EUIs							
	1		2		3		4		5		1		2		3		4	
	Elec	NG	Elec	NG	Elec	NG	Elec	NG	Elec	NG	Elec	NG	Elec	NG	Elec	NG	Elec	NG
Single Family Detached	62	142	59	135	55	127	96	40	80	0								
Single Family Attached	62	130	59	124	55	117	93	37	77	0								
Multifamily											48	163	39	123	101	0	79	0
Institutional											69	39	51	29	53	0	44	0
Commercial											83	71	62	53	72	0	60	0
Warehouse											37	64	28	48	30	24	26	13
Office											69	39	51	29	53	0	44	0

Table 15 – Corporate NECB Target EUIs (kWh/m²)

Building Type	Target NECB EUIs							
	1		2		3		4	
	Elec	NG	Elec	NG	Elec	NG	Elec	NG
Community Buildings	69	39	51	29	53	0	44	0
Recreation	69	39	51	29	53	0	44	0
Warehouse/storage	37	64	28	48	30	24	26	13
Office	69	39	51	29	53	0	44	0

NBC and NECB performance requirements are defined in terms of energy performance, and do not distinguish between electricity and natural gas use. However, this distinction by energy type is critical for the purposes of this analysis, given the difference in emissions factors for the two energy sources. Therefore, electricity and natural gas specific EUIs were developed as part of the analysis.

The energy requirements in both NECB and NBC are defined in terms of “% energy savings over a reference building”. Electricity and Natural Gas EUIs for NECB 2020 buildings were extracted from recent research conducted by NRC Research that the City of Saskatoon had access to. These values were specific for Saskatoon, and based on archetypal information. Energy use intensities for the higher performance tiers were developed by the consultant team assuming that fuel switching from natural gas to electricity (heat pump-based systems) would start at Step 3 of the NECB (part 3 buildings) and Step 4 of the NBC (part 9 buildings, single family dwellings). Reductions on loads through efficiency measures outside of fuel switching (e.g., improved enclosure performance, lower domestic hot water use, improved lighting) were adjusted based on experience to meet the energy performance requirements of the higher performance tiers.

A “rigid” application of the NECB methodology requires that the “reference building” also switches to a heat pump based system when the proposed design uses this technology. This improvement in performance of the reference building leads to a drastic increase in stringency of the energy performance requirements when heat pumps are used. The EUIs developed for the purposes of this analysis assume a less stringent application of the NECB requirements, leading to a set of EUIs that are slightly higher, more conservative, and more aligned with best industry understanding.

11 Appendix D – Land Use Change Methodology

Emissions associated with land use change were estimated to account for the conversion of undeveloped land (greenfield areas) into new neighbourhoods within Saskatoon.

Projections of new development area (hectares) were developed using single-family dwellings projections from the new construction sector. An assumption of 14 single-family homes per gross hectare of greenfield development was used for the conversion. This assumption was developed based on the consultant team's (TYLin) previous project experience.

Emissions from this new development were estimated following the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. A Tier 1 estimate (simplest method) considers three carbon stocks: biomass, dead organic matter (DOM), and soil organic carbon (SOC). In this assessment, only biomass and SOC were considered. DOM was assumed to be negligible.

Two main sources of carbon loss were therefore included:

- **Biomass**, representing the carbon stored in vegetation removed during development; and
- **Soil Organic Carbon**, representing the carbon stored in soils that is released when land is disturbed.

Both biomass and soil carbon losses were treated as one-time emissions occurring in the year of land conversion. The IPCC Guidelines make the same assumption for biomass; however, SOC is typically treated over a 20-year transition period. This assumption was simplified for the purpose of this analysis, so SOC was also treated as a one-time change in the year of conversion.

The total emissions from land use change were estimated by combining the carbon losses from biomass removal and soil carbon change. The results provided a high-level estimate of the GHG impacts associated with new land development, which were found to be almost negligible in the context of the overall analysis.

12 Appendix E – Waste Sector

Emissions from the waste sector were included in both the corporate and community totals. Waste generated in Saskatoon is sent to three landfills:

- Saskatoon Landfill
- Loraas Landfill
- Green Prairie Environmental Landfill

In alignment with the City's GHG inventories, only emissions associated with the Saskatoon Landfill were included in the corporate emissions modelling. Emissions from the Loraas and Green Prairie Environmental landfills were included only at the community level, along with those from the Saskatoon Landfill (as all corporate emissions are incorporated within the community totals).

Not all waste going to the Loraas and Green Prairie Environmental landfills originates from within Saskatoon city limits; therefore, only the portion attributed to Saskatoon in the GHG inventory (75%) was included in the modelling and assumed to contribute to community emissions.

The following methods were used to estimate future emissions from the waste sector in the modelling.

12.1 Solid Waste

Emissions from the waste sector were calculated using two different methods, based on data availability for each landfill. Under both methods, the total tonnes of waste disposed were assumed to increase proportionally with population growth in the city of Saskatoon (i.e., waste generation per capita was held constant).

The projected total tonnes of waste were then divided into landfilled waste, compost, and recycled materials according to the waste diversion assumptions in each scenario, providing the total amount of solid waste landfilled each year. To estimate the associated emissions, the following approaches were used:

- **Saskatoon Landfill:** Emissions were estimated using the same methodology as the City's 2023 Landfill Emissions Calculator. The calculation sheet from this tool was used to project future emissions by inputting the projected annual tonnes of waste added to the landfill. All model parameters and assumptions from the existing calculator (e.g., methane generation rate constant, methane generation potential, waste production period) were kept consistent with the original model.
- **Loraas Landfill and Green Prairie Environmental:** A simplified approach was used for these facilities due to limited data availability. Information on existing landfill volumes and historical waste deposits was not available, making it difficult to apply the same method as the Saskatoon Landfill. Instead, an emission factor (tCO₂e per tonne of waste) was derived from baseline 2023 emissions data and applied to the projected tonnes of waste disposed in future years.

12.2 Landfill Gas Capture

Landfill gas capture from Saskatoon Landfill was incorporated into the modelling in two ways.

First, within the waste sector, the model accounted for the avoided emissions directly associated with capturing methane, rather than allowing it to be released to the atmosphere.

Second, within the electricity generation sector, the emissions from combusting methane to generate electricity were accounted for. This methane-fired electricity displaces grid electricity, resulting in a net reduction in emissions when the carbon intensity of the grid is higher than that of methane-fired generation. Because Saskatoon's grid remains relatively carbon-intensive in the short- to medium-term, using landfill gas for electricity generation provides an overall emissions benefit by offsetting grid electricity.