



MEMORANDUM

DATE: September 16, 2024

TO: Mayor and City Council

FROM: Eric Holmes, City Manager
Lon Pluckhahn, Deputy City Manager

RE: **2023 Greenhouse Gas Inventory**

CC: Aaron Lande, Policy & Program Manager, CMO
Rebecca Small, Senior Policy Analyst, CMO
Stacey Dalgaard, Associate Climate Program Coordinator, CMO

In December 2022, City Council set ambitious climate goals to reduce our community's contribution to global climate change. Since then, City staff have prioritized actions that cut emissions produced by our municipal operations, while also launching foundational policy development to drive down long-term community emissions.

To monitor our progress and adjust strategies to meet the goals set out in the Climate Action Framework, Council directed the City to update its Greenhouse Gas (GHG) Inventory every four years. The latest update follows previous inventories conducted in 2019 and 2007, and it marks the City's first assessment of the measurable impacts of its early climate action efforts after one year of work under the Climate Action Framework.

This memo summarizes progress as of the end of 2023 toward emissions reduction targets adopted by City Council and highlights key opportunities for the City to continue to set a leading-edge pace for climate action. The municipal inventory is given greater attention as we approach our first interim goal of an 80% reduction in municipal GHG emissions by 2025¹ and enter into the 2025-26 Biennium Budget. Broader community-wide emissions will be addressed in greater detail during the 2026 update to the Climate Action Framework.

Key points:

- The City has made steady progress on reducing emissions from municipal government operations, and more aggressive action is needed to reach interim targets. Projects are planned to significantly cut emissions over the next decade.
- Community-wide emissions have continued a downward trend, but population growth and changing temperatures due to climate change will create upward pressure on emissions that require significant interventions to overcome, particularly in the transportation and building sectors.

The full 2023 Inventory of Community and Government Operations Greenhouse Gas Emissions is included as **Attachment A**, including accounting of methods and data sources and an explanation of improvements made to the data collection process.

¹ An 80% reduction in GHGs as measured relative to a baseline year of 2007, the year the City's first GHG inventory was conducted. The next inventory was not conducted until 2019.

Summary of 2023 Municipal GHG Inventory Results

The City has made steady progress in reducing greenhouse gas emissions from municipal government operations, which total approximately 1% of all emissions community-wide. As of 2023, there has been a 54% reduction in municipal emissions as measured relative to the 2007 baseline inventory (see Figure 2). Major contributors to the City’s carbon footprint remain the electricity and gas used in City buildings and water and wastewater treatment, emissions related to wastewater treatment processes, and gasoline vehicles used in the City fleet (see Figure 1).

To reach our first interim target of 80% reduction in municipal emissions, the City must cut an additional 10,600 metric tons of carbon dioxide equivalent (MTCO_{2e}). Paired with the greening of our purchased electricity as required by Washington’s Clean Energy Transformation

Act (CETA), there is a strong pathway to realize our climate goals if we continue to invest in emissions reduction measures. Capital projects already planned over the next biennium and beyond will significantly cut emissions, particularly in the Buildings & Facilities and Water & Wastewater Treatment sectors. However, these emissions reductions will not be fully realized by the target year of 2025 due to the longer timelines of infrastructure planning and construction.

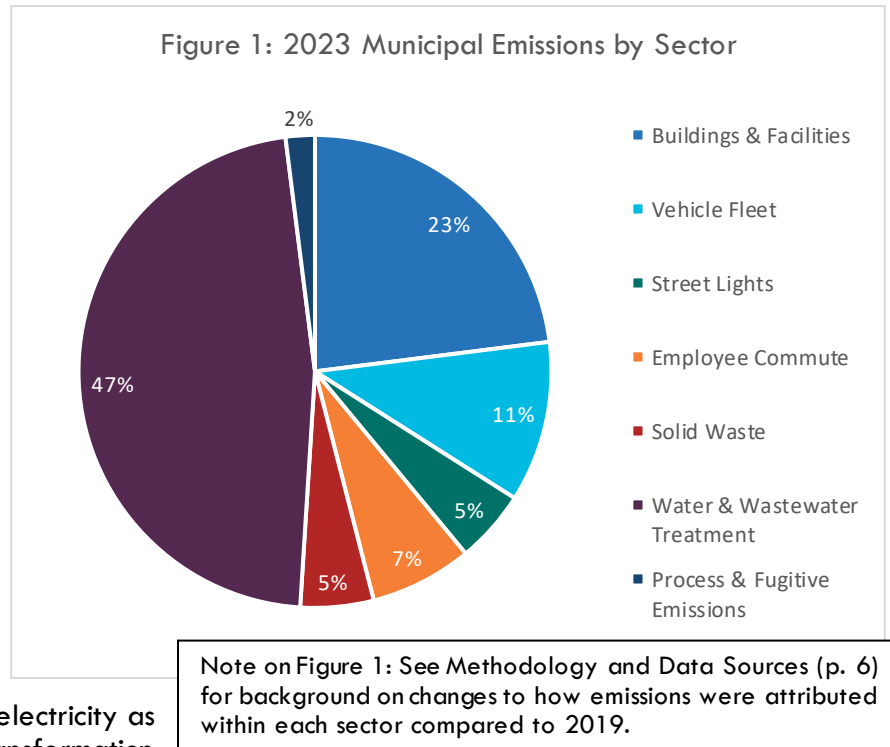
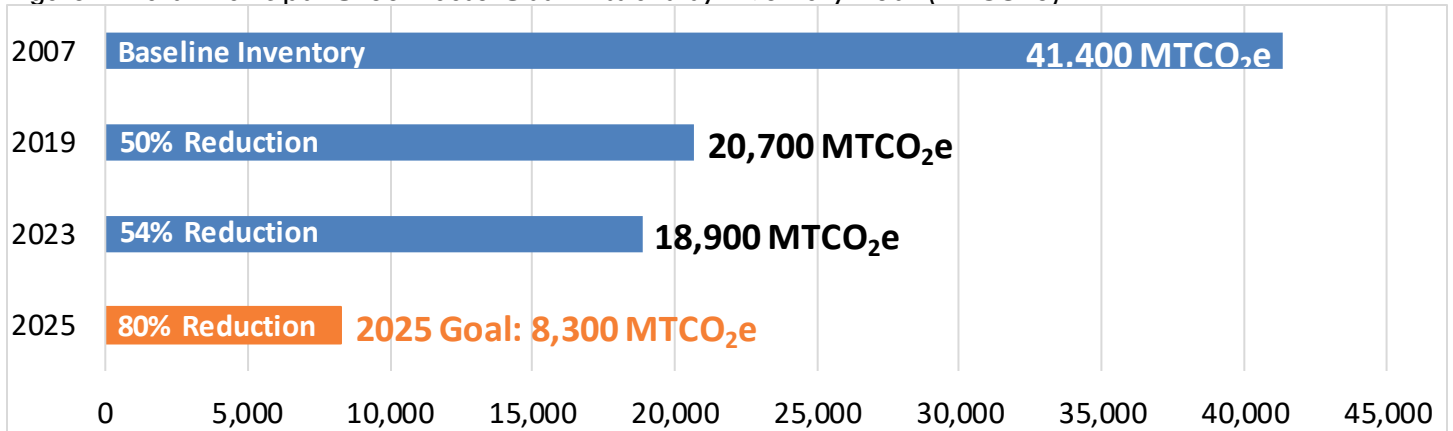


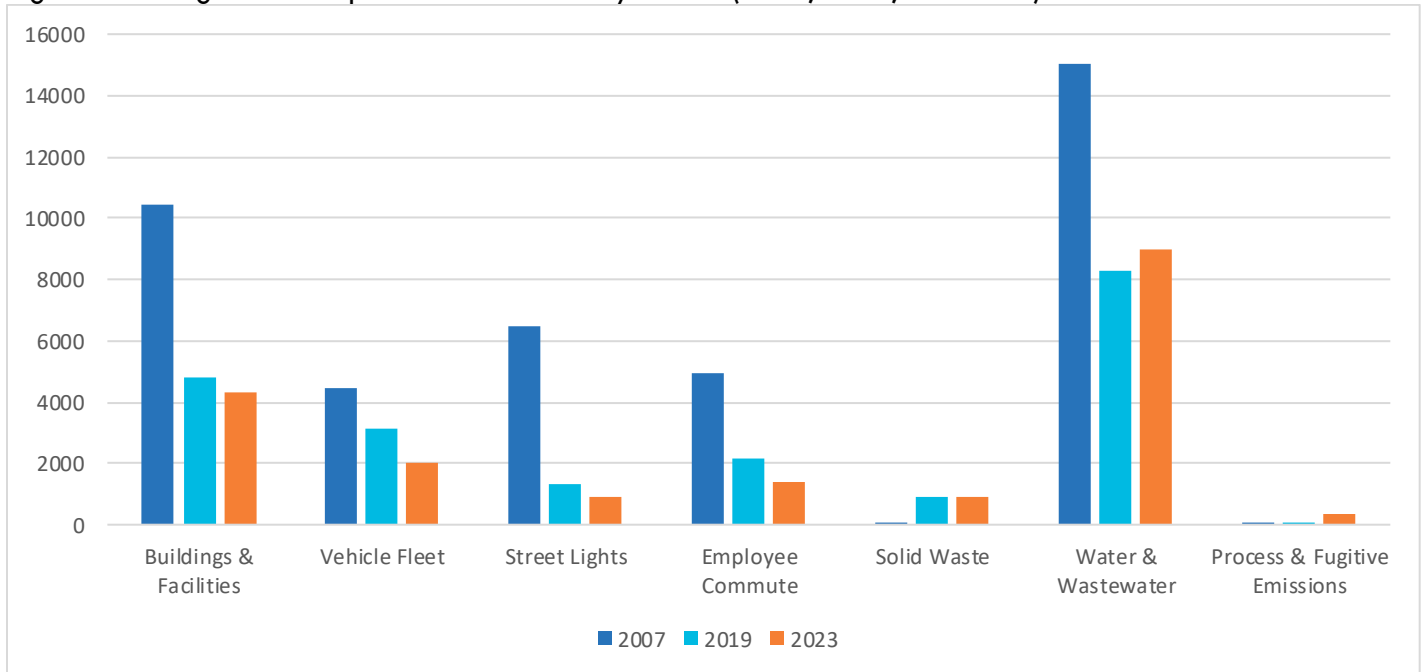
Figure 2: Total Municipal Greenhouse Gas Emissions by Inventory Year (MTCO_{2e})



Drivers of Municipal Emissions Changes

Between 2019 and 2023, significant progress was achieved through ongoing planning and projects, complemented by high-impact operational changes in 2023 and the influence of external factors such as cleaner electricity sources. Figure 3 shows the change over time in municipal greenhouse gas emissions by sector.

Figure 3: Change in Municipal GHG Emissions by Sector (2007, 2019, and 2023)



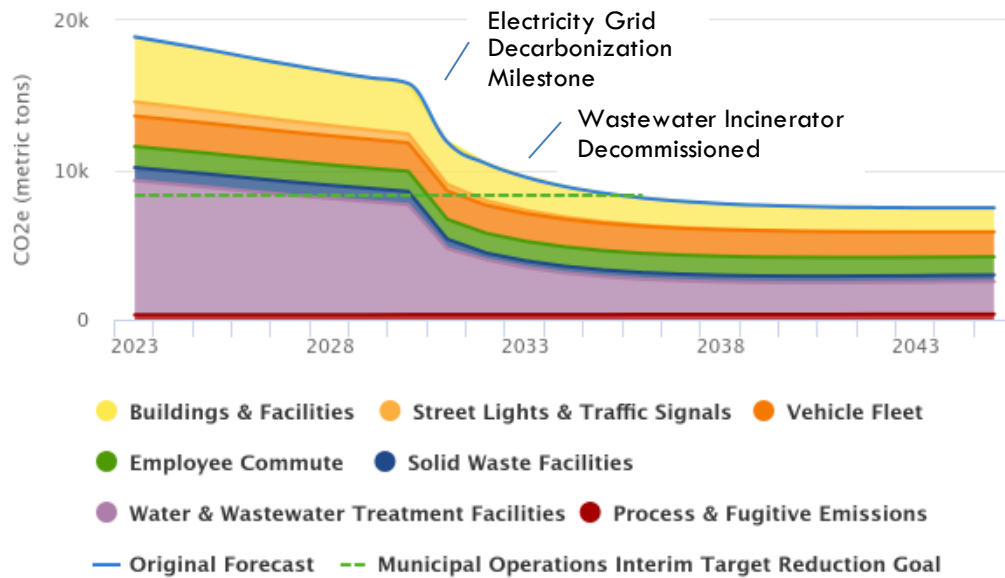
Significant factors driving recent changes in municipal emissions include:

- Fuel Switching:** Fleet Services achieved some of the largest GHG reductions since 2019 through its innovative adoption of renewable fuels. As of 2023, all diesel vehicles and equipment used in City operations have fully transitioned from standard fossil fuel diesel to a 100% renewable, plant-based diesel fuel called R99. This change led to a significant decrease in GHG emissions and other air pollutants from the City’s diesel fleet, leaving gasoline vehicles as the primary source of emissions measured in the Fleet sector of the inventory.
- Energy Efficiency Projects:** Since 2019, Public Works upgraded 18,000 streetlights to more energy efficient LED fixtures and continued our history of regular energy efficiency improvements to our wastewater treatment systems. These projects reduced energy use and associated GHG emissions, while also saving the City more than \$700,000 in energy costs annually. Projects are often developed in partnership with Clark Public Utilities and result in additional energy incentives to the City.
- Telework Policies:** New work-from-home policies implemented during the pandemic, along with Commute Trip Reduction incentive programs, have reduced employee driving trips. Vehicle emissions also continue to trend downward due to federal fuel efficiency standards for new cars.
- Decarbonization of the Electricity Grid:** Clark Public Utilities (CPU), following Washington’s Clean Energy Transformation Act (CETA), is progressing toward its required transition to a carbon-neutral electricity supply by 2030. Cleaner electricity will help drive down emissions from buildings, streetlights, and water and wastewater treatment over time.
- Regional Population Growth:** The net increase in Water & Wastewater sector emissions is likely driven by increases in customers served by our municipal-owned utilities, which serve both residents of the City of Vancouver and neighboring unincorporated areas. Increased water demands community-wide will require increased energy usage by utilities to maintain high levels of service, and Water & Wastewater is expected to remain one of the City’s largest emissions sectors.
- Hotter/Colder Weather:** Without further analysis, we are unable to know how much effect to attribute to more frequent, extreme, and prolonged heat and winter storms, but we do expect that these weather events will have upward pressure on buildings-related emissions and fugitive emissions related to air conditioning refrigerants.

Municipal Emissions Forecast and Planned Actions

Without additional investments in climate action, it is estimated that the City will not meet its first interim target until 2036, when the benefits of CETA mandates for carbon-neutral electricity sources and the Wastewater Solids Renewal Program have been realized. Figure 4 illustrates the City’s emissions trajectory with no additional actions. The green dotted line signifies the City’s 80% reduction target.

Figure 4: Projected Municipal Emissions with No Action Taken



This is a worst-case-scenario that does not incorporate current projects or strategies outlined in the Climate Action Framework. The good news is that, despite limitations in meeting the City’s first interim target by 2025, we are confident there is a valid pathway to carbon neutrality for municipal operations. Reduction measures that are being planned now will dramatically cut municipal emissions over the next decade. Table 1 highlights major efforts underway or completed in 2024 that will make up significant ground toward our first interim target of an 80% reduction.

Accelerating this timeline will require continued investments in infrastructure, staff capacity, and capital projects that have longer planning horizons. Although many of these projects have significant up-front costs, they are also multi-benefit, creating organizational efficiencies, cost savings, resilience, and future-proofing for local government operations. For example, energy savings sustained year-over-year help to stabilize utility rates for households and industries. As energy costs increase and extreme weather drives up demand, energy efficiency investments will get more valuable over their lifespan as they smooth out peak electricity loads. And equipment transitions and fuel switching to electricity will put us on a downward trajectory as the electricity grid is decarbonized. These projects are essential to maintaining a leading-edge pace toward our 2040 goals.

Table 1: Planned and Completed Municipal Emissions Reduction Measures since the 2023 GHG Inventory

| Inventory Sector | Status | Impact |
|------------------------|-----------------|--|
| Vehicle Fleet | Complete (2024) | 30 gasoline vehicles replaced with new hybrid electric (25 vehicles) and all electric options (5 vehicles) will reduce gas VMT |
| Buildings & Facilities | Complete (2024) | 10-kW share of CPU Community Solar East project purchased in 2023 will offset some future building energy use |

| | | |
|------------------------|----------------------|--|
| Water & Wastewater | Complete (2024) | Wastewater treatment system optimization resulted in annual energy savings of 598,000 kWh and a \$227K incentive from CPU |
| Vehicle Fleet | Budget Package | Chkalov EV charger installation project will enable additional Fleet vehicles to transition to electric |
| Buildings & Facilities | Budget Package | Solar PV and battery storage system planned for Firstenburg will provide clean electricity and operational resilience |
| Water & Wastewater | Budget Package | New water efficiency position will create energy savings for both utilities; strategic water reduction projects within the utility will save 170 million gallons of water per year in groundwater wells |
| Buildings & Facilities | Planned (ongoing) | City Hall lighting retrofit project and strategic energy management with CPU for City Hall and Firstenburg (Tier 1 buildings under the WA Clean Building Standards) will reduce electricity consumption; Long Range Facilities Plan will provide direction for municipal building utilization and efficiency |
| Water & Wastewater | Planned (2032) | Wastewater Solids Renewal Program will eliminate emissions from the utility's incinerator (1,866 MTCO ₂ e from biosolids combustion), reduce municipal solid waste, and produce other climate benefits; ongoing Wastewater system optimization and Water Utility strategic energy management with CPU will reduce electricity use |
| Street Lights | Planned (timing TBD) | Phase II of the Street Lights LED replacement project is in development for 7,000 remaining fixtures; will reduce electricity |

Summary of 2023 Community GHG Inventory Results

Vancouver's community-wide greenhouse gas emissions continued to decline from 2019 to 2023 and have now reached a 27% reduction relative to the 2007 baseline inventory (see Figure 5). This change in overall emissions appears to be driven largely by buildings being powered by cleaner electricity sources (i.e. grid decarbonization) and lingering effects of the COVID-19 pandemic on transportation patterns, as well as increased appliance and vehicle efficiency. In other sectors, improved composting is keeping emissions associated with landfilled solid waste down, while fugitive emissions from refrigerants and air conditioning have increased.

Figure 5: Total Community Greenhouse Gas Emissions by Inventory Year (MTCO₂e)

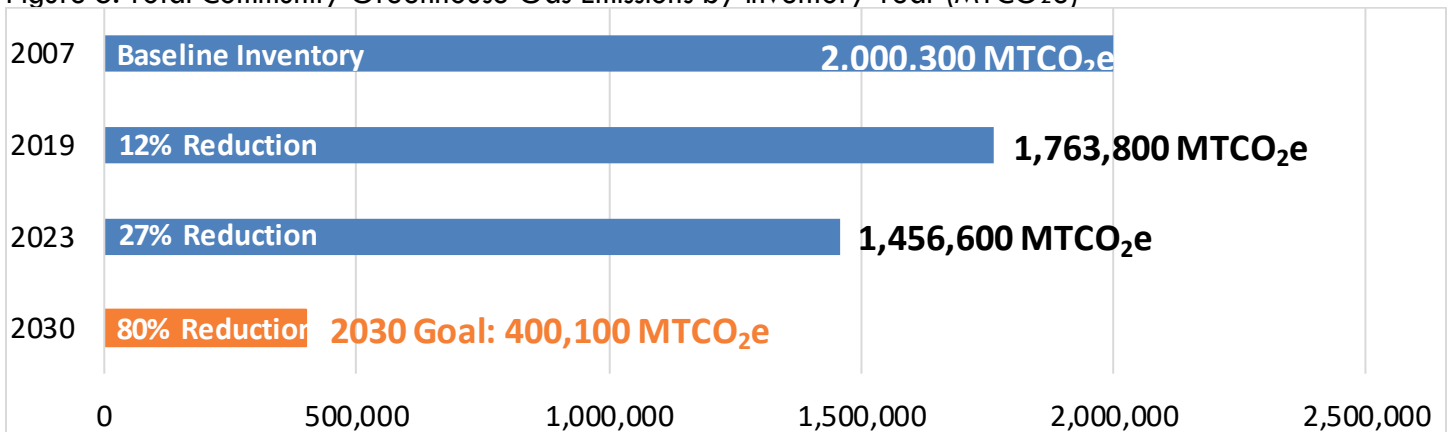


Figure 6 shows that our major community-wide emissions sources remain on-road vehicles (37%) and building energy (15% in residential, 13% in commercial, and 9% in industrial). Over time, buildings and industry powered by electricity (which account for 20% of total emissions) will decline in emissions as Clark Public Utilities adds more clean energy sources to its resource mix in accordance with Washington's Clean Energy

Transformation Act. Simultaneously, population growth and the return to pre-pandemic travel norms are expected to push transportation sector emissions upward. Figure 7 illustrates how emissions are projected to grow over time if significant interventions to shift behavior and retrofit existing buildings are not implemented.

Figure 6: 2023 Community Emissions by Sector

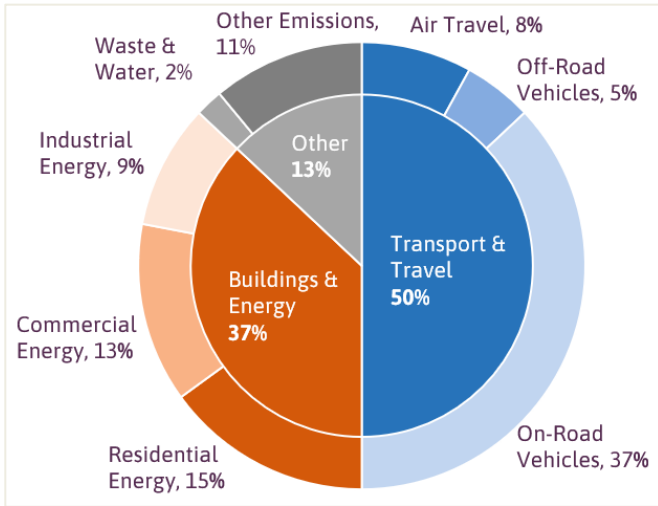
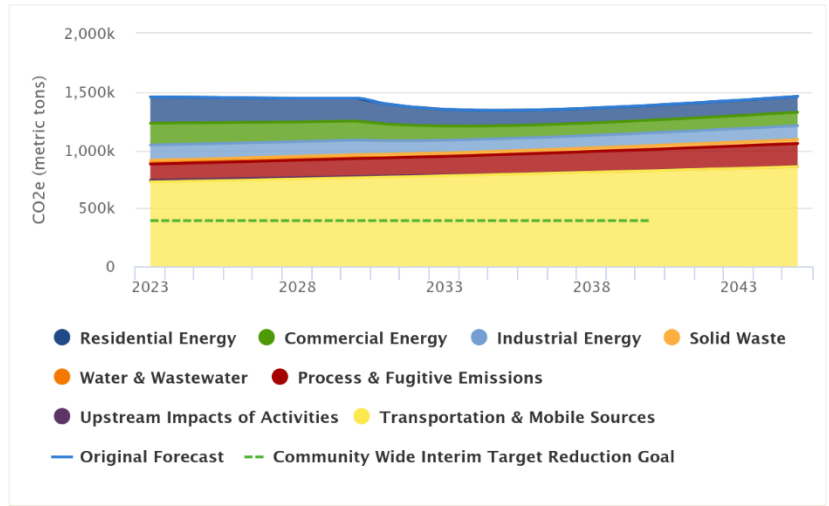


Figure 7: Projected Community Emissions with No Action



Changing the existing built environment and shifting human behavior are two of the hardest challenges we face in shifting our climate future. As our community grows in its size, economy, and vibrancy, reducing emissions in the Buildings and Transportation sectors will require widespread partnership with private citizens and businesses.

However, the City does have significant and direct influence over community-wide emissions through its policies that determine how land use evolves and changes over time and the standards it sets for building and road development. These areas are within the City's immediate control and are crucial for fostering sustainable community growth. By prioritizing emissions-reducing strategies in the upcoming Comprehensive Plan Update and Green Building Strategy, the City has two powerful and immediate opportunities to help mitigate the expected rise in community emissions.

This inventory marks the City's first assessment of the measurable impacts of its early climate action efforts, and these results will inform further refinement and prioritization of the most impactful community actions in the 2026 update to the Climate Action Framework.

Methodology and Data Sources

To complete this inventory, the City of Vancouver utilized tools and guidelines from ICLEI – Local Governments for Sustainability (ICLEI), which provides authoritative direction for greenhouse gas emissions accounting. City staff conducted the inventory in-house following the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions and the Local Government Operations Protocol. ICLEI provided a Quality Assurance and Quality Control review of the 2023 GHG Inventory, and any discrepancies identified were corrected in the final report.

Over time, available data sources and best practices for greenhouse gas accounting have evolved, which can result in changes between inventories. To maintain methodological consistency, improvements made for the 2023 GHG Inventory were also carried over to 2019 data for comparison purposes. The most significant changes from the original 2019 inventory can be observed in how emissions are attributed to the Water and Wastewater Treatment sector in the Municipal Inventory, significantly lower community-wide air travel emissions estimated based on actual emissions at PDX Airport rather than population growth, and overall progress to goal reported in 2019. A detailed accounting of changes to the 2019 GHG Inventory data is included in Attachment A. City Climate Program staff will continue to improve these data and methods in future years to provide efficient and purposeful reporting.

It is also important to note that the City's greenhouse gas inventory reporting process does not reflect all priorities outlined in the Climate Action Framework nor all actions underway to adapt to and mitigate against climate change in our community and municipal operations. For example, natural systems are key to building and sustaining community and ecosystem resilience locally, but the impact of important programs implemented under the Climate Action Framework like Naturespaces and increased street tree planting by Urban Forestry are not directly represented in the GHG Inventory. As we work toward our emissions-based targets, these critical climate actions should not be overlooked or undervalued due to their absence from emissions accounting systems.

Next Steps

- Utilize the 2023 GHG Inventory results to inform upcoming budget and policy decisions.
- Analyze drivers of community emissions to inform 2026 update to the Climate Action Framework.
- Continue to strengthen data tracking and GHG accounting methods to ensure efficient and purposeful reporting on the impact of our actions, including exploration of a natural systems inventory and updating of the 2007 baseline to better compare to current inventories.

Attachments:

A: 2023 Inventory of Community and Government Operations Greenhouse Gas Emissions

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