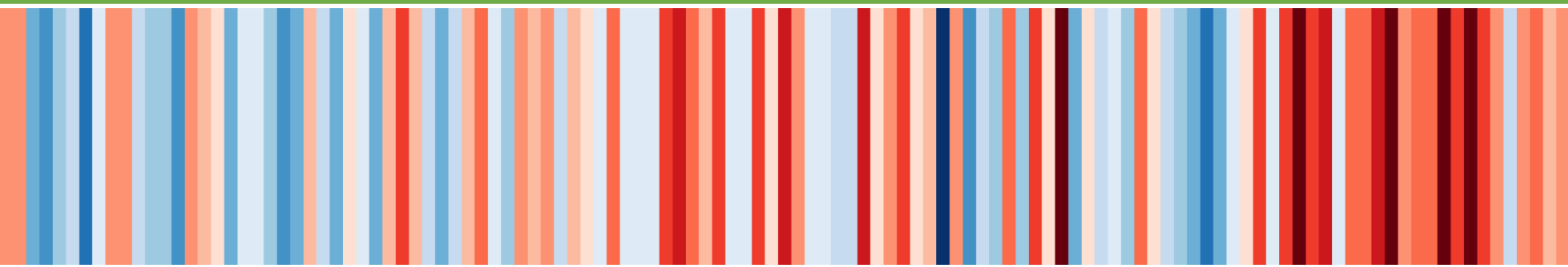
ST. JOHN'S

St. John's Corporate Climate Plan



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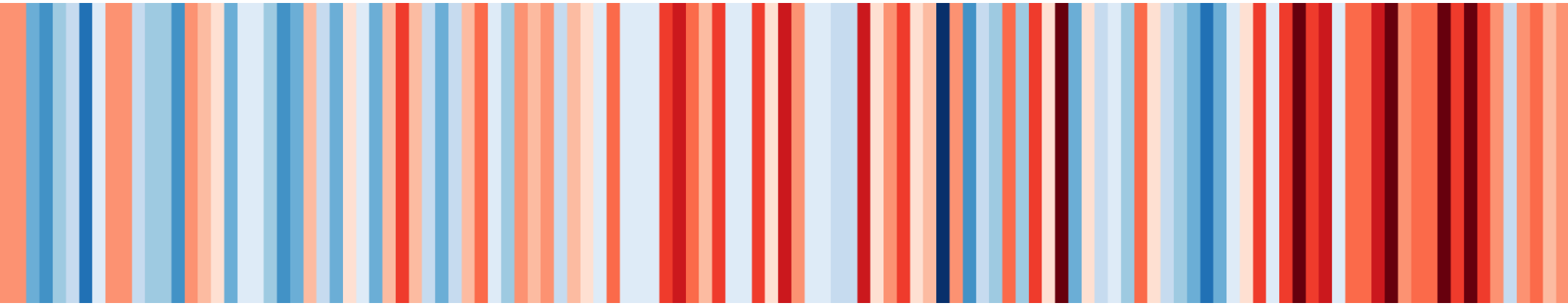
Executive Summary

The purpose of the Corporate Climate Plan ("Plan") is to provide a comprehensive framework ("Framework") to reducing greenhouse gas (GHG) emissions from the corporate operations of the City of St. John's. This Plan responds to Council's declaration of a climate emergency in November 2019.

Climate scientists agree that fast rising global temperatures have created a worldwide climate crisis. The Intergovernmental Panel on Climate Change (IPCC) released The Special Report on Global Warming of 1.5°C providing scientific evidence for the need to limit global warming to 1.5°C. The IPCC states that this is possible but "would require rapid, far-reaching and unprecedented changes in all aspects of society". To align with the scientific evidence, governments, corporations, and institutions around the world are implementing energy use and GHG emissions reduction measures over the coming decade. Internationally, the goal is to achieve net-zero emissions by mid-century or sooner to avoid many of the worst climate impacts. The Government of Canada committed to reaching net-zero GHG emissions nation-wide by 2050 and established legally binding legislation to meet rolling 5-year emission reduction targets, starting with Canada's target of reaching 40% below 2005 level by 2030[1]. Newfoundland and Labrador also committed to reaching net-zero by 2050, which is striking a balance between GHG emissions produced and GHGs eliminated or taken out of the atmosphere.

This Plan establishes corporate GHG emissions reduction targets for the City of St. John's that align with municipal best practices. These targets satisfy commitments made to the Federation of Canadian Municipalities Partners for Climate Protection, as well as the Global Covenant of Mayors for Climate and Energy. The next five to ten years are critical to setting St. John's on the path to meet the Region's GHG emissions reduction targets and to support national and global efforts. The Plan identifies a management framework, as well as priority strategies and tasks for the short (1-2 yrs), medium (3-5 yrs) and long (>5 yrs) term that can be embedded into the City operations to set St. John's on the path to meet the proposed corporate targets.



Temperature Change in Newfoundland and Labrador Since 1901

[1] Bill C-12: An Act respecting transparency and accountability in Canada's efforts to achieve net-zero greenhouse gas emissions by the year 2050. First Reading, November 18, 2020. https://parl.ca/DocumentViewer/en/43-2/bill/C-12/first-reading

Introduction and Background

The climate science from the Intergovernmental Panel on Climate Change's (IPCC) The Special Report on Global Warming of 1.5°C is clear: allowing global temperature rise to exceed 1.5°C will disrupt global social, economic and ecological systems, with severe consequences for the most vulnerable populations[2]. The report states that temperatures are likely to reach 1.5°C between 2030 and 2052 if greenhouse gas emissions (GHG) continue to increase at current global rates. Analysis compiled as part of St. John's Climate Profile indicates that our community would experience various impacts. We have already observed temperature increases of about 0.8°C since 1942, warming of sea surface temperatures, an increase of intensity and duration of some storms, and a long-term sea level rise of about 1.9 mm/year since the 1940's. It is projected that without action temperatures will have increased by 2.7°C by 2050s, leading to other significant changes in precipitation, winter conditions, and sea level rise. This would exacerbate existing risks for vulnerable residents, disrupt infrastructure systems, and lead to economic impacts.

Although projections are alarming, significant opportunities exist for climate action, including various economic opportunities including cost savings, environmental improvements, and job creation. Canada, along with 195 countries around the world endorsed the Paris Agreement in 2015. The Government of Canada has committed to reaching net-zero GHG emissions nation-wide by 2050 and established legally binding legislation to meet rolling 5-year emission reduction targets, starting with Canada's target of reaching 30 per cent below 2005 level by 2030[3]. Provincial governments across Canada, including Newfoundland and Labrador, joined the Pan-Canadian Framework on Clean Growth and Climate Change. In this framework Newfoundland and Labrador committed to approximately 15% reduction by 2020 from 2005, 39-48% by 2030, and recently committed to net-zero GHGs by 2050. Net-zero means striking a balance between GHG emissions produced and GHGs eliminated or taken out of the atmosphere.

The City of St. John's strives to be sustainable today and for future generations. This is a vision expressed in the City of St. John's Strategic Plan. Through various commitments, the City of St. John's Council has re-enforced its ongoing commitment to act and reduce the GHGs emissions, while preparing the City to deal with the challenges and capitalize on opportunities that climate change is presenting. This includes the two components responding to the Climate Emergency Declaration on November 4, 2019 (when St. John's City Council joined a growing global movement calling for urgent action to avert the climate crisis unanimously):

1) **Corporate Climate Plan** This presents a framework for the Corporate City of St. John's to improve energy efficiency and reduce its GHG emissions from its operations and services.
2) **Resilient St. John's Community Climate Plan** This plan presents the environmental and economic plan and analysis to support our community to adopt a low carbon pathway that realizes the economic opportunities of a low carbon future.

[2] https://www.ipcc.ch/sr15/

[3] Bill C-12: An Act respecting transparency and accountability in Canada's efforts to achieve net-zero greenhouse gas emissions by the year 2050. First Reading, November 18, 2020. https://parl.ca/DocumentViewer/en/43-2/bill/C-12/first-reading

Goal and Objectives

The goal of this Plan is to formalize a framework for the City to embed energy and climate considerations as part of operational and investment decision-making, enabling coordinated efforts to achieve substantial corporate GHG emissions reductions over the coming decades. The Corporation of the City of St. John's will achieve this by pursuing the following objectives:

- **Reduce Energy Intensity and Improve Energy Efficiency –** first reducing the energy demand of facilities and other infrastructure through improvements such as scheduling, maintenance, heat recovery. Energy efficiency is well known to be the most cost effective and widely applicable strategy to reduce greenhouse gas emissions in the near term.
- **Create a Culture of Energy Conservation –** foster the culture of energy conservation within the corporation to reduce energy intensity, GHG emissions, and realize the potential of asset management (e.g., life cycle costing) to achieve long-term savings.
- **Increase Staff Energy Management Capacity & Knowledge –** increase the capacity of staff to manage and monitor energy efficiency through a collaborative implementation approach.
- **Switch and/or Generate Energy to Reduce GHG Intensity –** the City recognizes that electrification and production of on-site renewable energy are key strategies that can aid in the efforts to stabilize operating costs while reducing the City's GHG emissions.
- **Demonstrate Municipal Leadership –** lead by example and proactively improve the energy awareness of visitors at City facilities. While the corporate emissions of the City of St. John's represent a small portion of our community-wide emissions, higher levels of energy awareness and education have been demonstrated to result in accelerated climate action in the community.

The corporate framework is a management tool that is used to:

- **Set a reference point**, which helps establish and track an ambitious but realistic corporate GHG reduction target.
- **Take action** by collaboratively identifying significant sources of GHG emissions and energy use. This is necessary to align efforts across operations, priorities, and inform evidence-based decision making.
- **Save money** by reducing the budgetary risk to the increase cost of GHG emissions. The framework also reveals short-term savings opportunities to align the various priorities of the City. It improves capacity and sharing of information which makes funding opportunities for energy and resilience projects easier to obtain (e.g., FCM's Green Municipal Fund, NL Climate Change Challenge Fund).

Price of Carbon emissions (CO_2e)

2030 - $170 per tonne of CO_2e

Current - $40 per tonne of CO_2e

The Corporate Plan deals with energy and greenhouse gas emissions under operational control of the City of St. John's City Council, as per the GHG Protocol Corporate Standard. The Community components of energy and GHG emissions (e.g., personal and public transportation, waste, residential, institutional, commercial, industrial energy use and GHG emissions) will be addressed as part of the "Resilient St. John's Climate Plan".

For more information please visit: http://stjohns.ca/living-st-johns/your-city/sustainability.

Energy Use and GHG Baseline Data

The City of St. John's Energy and Greenhouse Gas Inventory for 2018[4] report was prepared in conformance with the CSA/ISO 14064-1 standard. The inventory follows requirements of the Partners for Climate Protection (PCP) Protocol and incorporates refinements from the 2019 IPCC Guidelines for National Greenhouse Gas Inventories and the Greenhouse Gas Protocol.

In the baseline year of 2018, the City consumed approximately 365,624 GJ of energy (approximately 1.6% of total community energy use). Electricity, diesel, and fuel oil contributed the most to the energy consumption (60%, 20%, and 12% respectively) and to the energy cost, which was estimated to be approximately $12 million. The City of St. John's emitted approximately 12,458 tCO_2e (approximately 1% of total community GHG emissions), which is equivalent to driving a car to Vancouver and back 3,500 times (assuming a vehicle fuel efficiency of 7.8 km/l). Diesel, fuel oil and the GHGs produced in the generation and transmission of the electricity contributed the most to the energy consumption (41%, 26%, and 20% respectively).

Table 1 Comparison of Energy Consumption by Energy Source

Energy	tCO2e	GJ	Cost ($M)
Fuel Oil	3,180	42,281.5	$0.9
Electricity	2,454	219,322.6	$8.6
Diesel	5,184	73,403.4	$1.7
Gasoline	1,255	18,769.4	$0.5
Waste	336.3	-	-
Propane	45.5	755.6	$0.02
Biogas	2.7	11,092.1	-
Total	**12,458**	**365,624.6**	**$12**

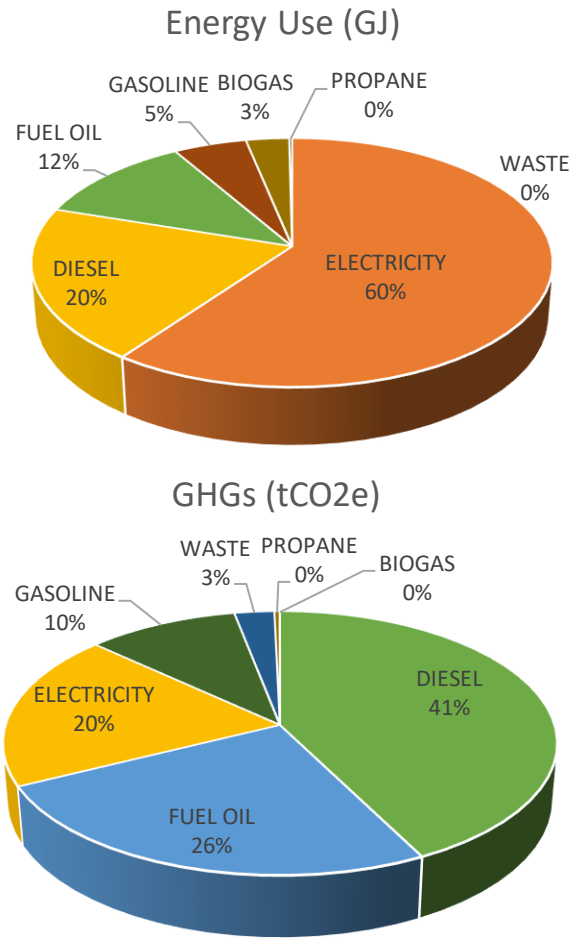


Figure 1 Comparison of Energy Consumption and GHG emissions by Energy Source

In 2018, St. John's consumed approximately 14.4 million gigajoules (GJ) of energy. Which emitted 667,113 tonnes of carbon dioxide equivalents (tCO2e). Corporately, in the same year, the City operations and services consumed 365,625 GJ of energy, which emitted 12,457 tCO2e

[4] http://stjohns.ca/sites/default/files/files/publication/StjohnsCorpCommGHGinventory-Final_0.pdf

From a sector perspective, water, facilities, and transportation were the highest energy consumers in 2018, followed by wastewater and streetlights. However, streetlights contributed the most to the cost of energy used (32%). Billing for streetlighting from the local utility is based on a monthly rate and not a per-kWh rate. This means that there are other factors embedded in the cost for streetlighting, and the price is based on a variety of factors including the type of pole, and the type of light (e.g., High Pressure Sodium vs Light Emitting Diode), operation and maintenance.

Table 2 Comparison of Energy Consumption and GHG Emissions by Sector

Sector	tCO2e	GJ	Cost ($M)
Facilities	3,126	95,436	$2.3
Transportation	5,923	85,037	$2.4
Water	1,622	109,839	$2.5
Wastewater	1,118	48,116	$0.9
Waste	413	4,427	$0.1
Streetlights	253	22,768	$3.9
Total	**12,458**	**365,625**	**$12**

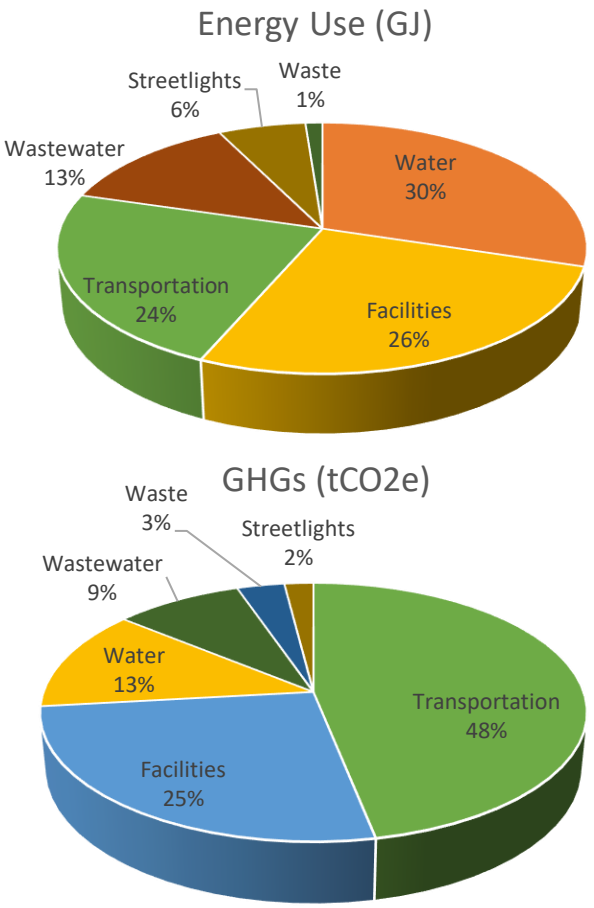


Figure 2 Comparison of Energy Consumption and GHG Emissions by Sector.

The Transportation sector (this sector includes the corporate fleet as well as some miscellaneous use of fossil fuels) accounted for 48% of the total GHG emissions of the corporate operations and services of the City of St. John's. Emissions from the operations of Facilities accounted for 25%, and the emissions associated with Water (production and distribution) accounted for 13%. More detail is provided in each sector's analysis section in this report.

Limitations of Corporate Inventory include:

- Waste Management buildings energy use are included; however, due to its regional scope only the landfill gas (LFG) associated with corporate waste volume is included in this plan. All LFG from our community is incorporated in the community inventory and actions will be included in community plan.
- Emissions from the City's subsidiaries St. John's Transportation Commission (Metrobus) and St. John's Sports and Entertainment (SJSE), while calculated and mentioned in this plan, will be addressed in the community plan in partnership with their respective boards.
- Corporate scope 3 emissions[5] are not included in the current corporate inventory. It is recognized that the City has influence on Scope 3 emissions, including contracted services and employee commuting to work. Future updates to the corporate GHG inventory and this framework will explore opportunities to include relevant Scope 3 emissions for key value chain activities and influence reductions. In addition several Scope 3 emissions to the corporation will be addressed through community targets and reductions.

[5] Scope 3 emissions occur from sources owned or controlled by other entities in the value chain.

Projections

In a business-as-usual scenario, it can be conservatively assumed that the energy consumption of the corporation may follow the population growth trends. The analysis in the following sections presents estimated based on a medium population growth scenario (+5.6% from 2018's population by 2030). The changes in emissions due to hydropower capacity in the province may result in reduced emission, even when increases in population and service could be required. Biogas shows an increase; however, this is partially due to how small the value is and its sensitivity to change. Also, it is likely that the increase in biogas consumption would result in some displacement of fuel oil use.

The predicted overall increase in energy use across all sectors is likely conservative, as several sectors do not require a linear increase in energy use to provide adequate service to the projected increase in population. The sectors that have the greatest share of their energy consumption coming from electricity would see the most benefit with regards to GHG emissions reductions from hydropower generation. Streetlights, for example, only use electricity as energy and therefore see a decrease in emissions of nearly 100%. Water would be a close second due to 94% of its energy usage being from electricity.

Table 3 Comparison of 2018 and Projected (2030) Energy Consumption and Emissions by Sector.

Sectors	GJ (2018)	tCO2e (2018)	GJ (2030)	tCO2e (2030)	Change in GJ	Change in tCO2e
Streetlights	22,768	255	24,011.4	0.0	5.5%	-100%
Water	109,839	1,622	115,835.2	491	5.5%	-56%
Wastewater	48,116	1,117	50,743.1	871	5.5%	-46%
Facilities	95,436	3,126	100,646.1	2,551	5.5%	-18%
Waste	4,427	413	4,669.1	389	5.5%	-6%
Transportation	85,037	5,939	89,678.6	6,246	5.5%	6%
Total	**365,624.6**	**12,457**	**385,584.5**	**10,549**	**5.5%**	**-15%**

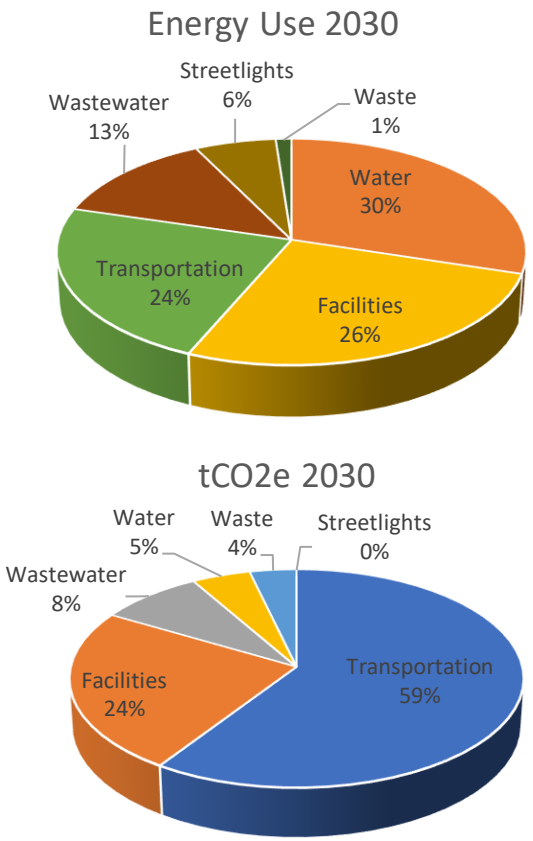


Figure 3 Comparison of Projected Energy Consumption and GHG Emissions by Sector.

Framework Development Process

The framework does not prescribe how the City will achieve its GHG targets at the site level; rather, it describes the strategies that will support staff and St. John's City Council to identify, quantify, prioritize, and balance climate actions among other City priorities. The Framework was developed over the course of 2020 and 2021. Members of staff that were consulted and provided information, review and insight include:

- City Buildings Staff
- Water Treatment Staff
- Wastewater Staff
- Fleet Staff
- Capital Works Staff
- Waste Management Staff
- Roads Staff
- Parks and Open Spaces Staff
- Organization Performance and Strategy Staff
- Housing Staff
- Regional Fire
- Metrobus and SJSE
- Environment and Sustainability Expert Panel

The process began by creating a shared understanding of the baseline energy use and emission through the 2018 Energy and GHG Corporate Inventory and the modeling of potential future energy use for the year near 2030. Following this, ad-hoc information gathering meetings and additional information gathering were used to inform the proposed corporate targets, actions, and implementation considerations captured in this report. Additional information on potential benefits were obtained from experience in the City and ASHRAE Level 1 audits of the most energy intensive facilities in the City's portfolio. The draft framework was reviewed by staff and then brought forward to the Environmental and Sustainability Expert Panel for commentary.

The framework is composed of three components:

1) Proposed Corporate Targets,
2) Governance and Implementation Approach,
3) Strategies to achieve GHG reductions in line with the 2030 target and be well prepared to reach the 2050 target.

City of St. John's Corporate Greenhouse Gas Emissions Targets

As per the Milestone 2 of the PCP Program requirements for the City to adopt a target(s) for GHG reductions, we foresee a long-term Energy and GHG management program where the CSJ starts to implement behavior change and cost-effective energy initiatives while exploring opportunities for investing in renewable energy generation and low carbon technologies.

There is significant uncertainty due to the potential of changing electricity costs in the Newfoundland and Labrador, as well as due to the impact of COVID-19 on the oil and gas industry. Therefore, it is proposed that the City adopts a target, as well as a stretch target, which reflects the ambition and aspiration to do better if external conditions enable the City to do so.

Proposed Corporate Targets for the City of St. John's:

The reduction of greenhouse gas emissions is clearly an urgent matte, and the implementation is challenging. However, GHG reduction targets should reflect the evidence and urgency of the action required to achieve the desired outcome. Municipalities are moving towards annual GHG emission targets, this aligns with annual decision-making cycles. This approach ensures that the City stays on track, provides some flexibility year over year, but maintains accountability for long-term impacts of decisions. It incorporates the reality that the trajectory that we take matters as much as the result we are committed to deliver.

The remaining GHG emissions that can be emitted to prevent the globe from exceeding 1.5 C have been estimated by the international scientific community. Calculating our municipality's fair share of the remaining global carbon budget was completed through guidance from the Science-Based Targets initiative. It proposes that an absolute reduction in emissions of 4.2% per year results in alignment to the ambition to prevent warming from exceeding 1.5 ^{o}C. This means that the City of St. John's has an approximate Carbon budget of 142.1 kilotonnes between 2022 and 2045. Following this reduction pathway year over year, the Corporate City of St. John's could achieve net-zero emissions by 2045.

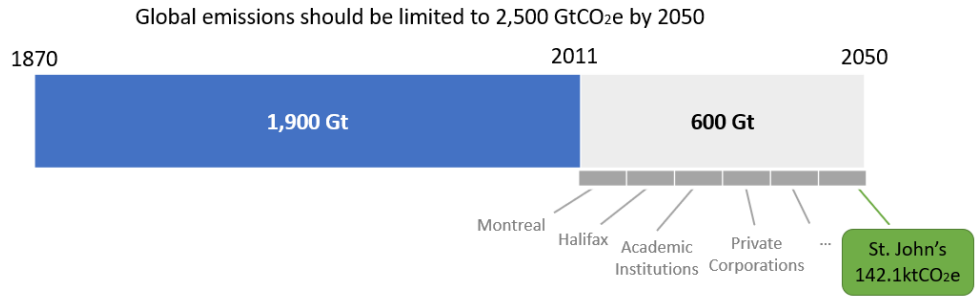


Figure 4 St. John's approximate corporate fair share of GHGs by 2050

Proposed Targets for City of St. John's

- Committed to a 40% reduction by 2030 and a stretch target of 50% by 2030 from 2018 emissions[6].
- Committed to Net-zero by 2050[7] at the latest.

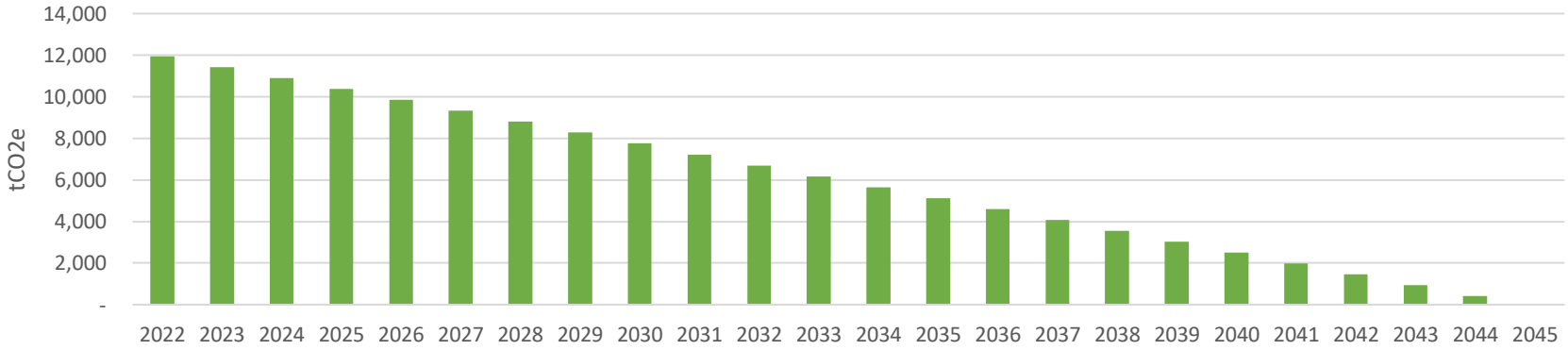


Figure 5 GHG Reduction Pathway 2022-2045

[6] Target set using an absolute emissions contraction method outlined in Science Based Targets initiative based on operational control.

[7] The IPCC defines net-zero as: net-zero emissions are reached when anthropogenic (i.e., human-caused) emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.

Governance and Implementation

The City of St. John's Corporate Climate Plan and the framework proposed will be implemented through a whole-city approach, including clearly defined roles and responsibilities.

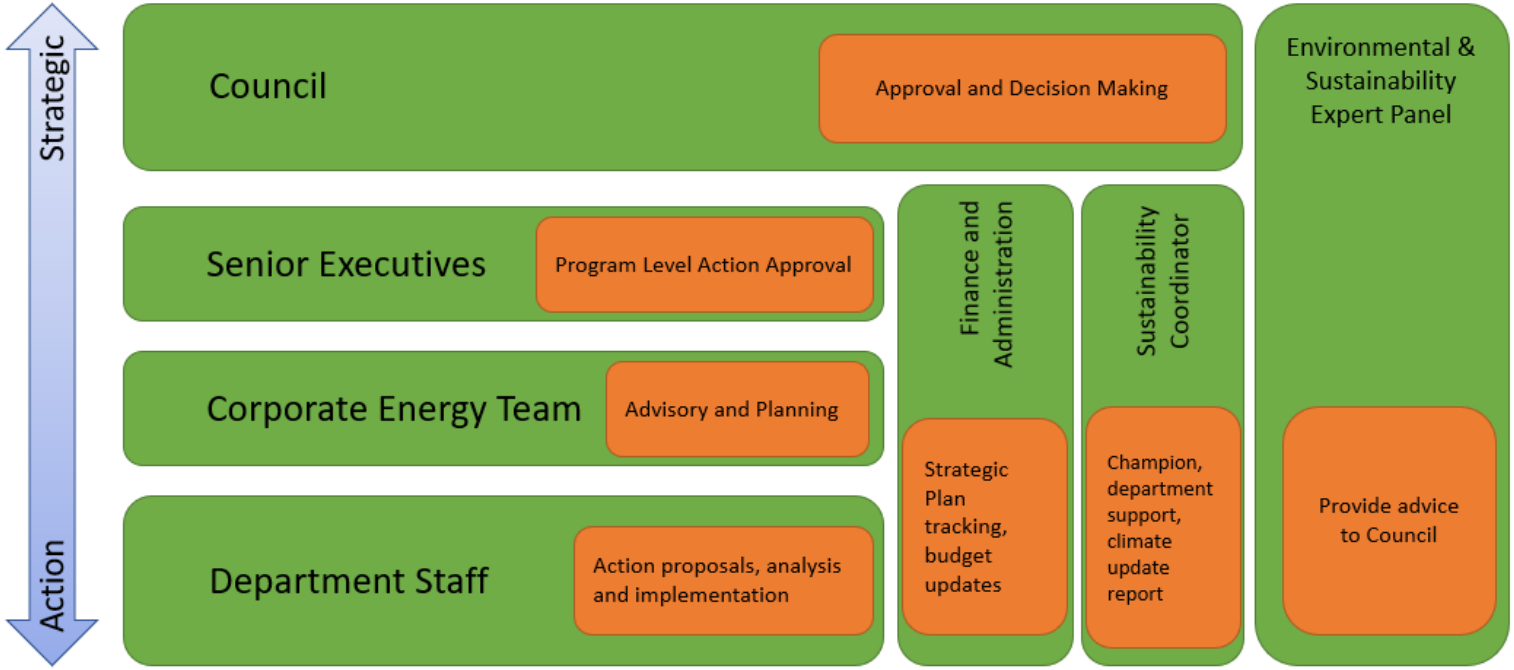


Figure 6 Key Roles

Table 4 Key Roles and Responsibilities

Group	Role	Responsibility
St. John's City Council	Review and approve proposed actions and the City Budget	
Environmental & Sustainability Expert Panel	Sustainability Community Lead	Provide advice to Mayor and Council with respect to the City's response to the climate emergency and other environmental issues
Sustainability Coordinator	Internal Sustainability Champion	Central hub for climate action, leadership, convening and coordinating, reporting, and analyzing.
Senior Executives	Department Lead	Integrate climate considerations into business plans and budget.
Corporate Energy Team	Sustainability Lead	Cross-departmental venue to support action planning and senior decision-makers.
Department Staff	Action Planning & Implementation	GHG reduction options development, analysis, incorporation in projects/programs and budgets.
Finance and Administration	Strategic Plan tracking and City Budget	Evaluate the financial implications at the corporate level, alignment with financial framework.

The Corporate Energy Team

The Corporate Energy Team (CET), comprised of a cross-functional team of corporate stakeholders who have direct responsibility for energy use in City operations, will ensure the City stays informed and on track with the implementation of this framework.

The CET purpose is to:

- Actively collaborate to implement energy efficiency projects and inclusion of best practices in daily operations.
- Identify energy management strategies, incentives, and support proposals that meet various department objectives.
- Increase corporate awareness of the consumption of energy within each department and promote employee engagement and awareness of energy and GHG initiatives and opportunities.
- Provide information for the Annual Report of the framework's implementation.

Corporate Energy Team (CET)	
Membership	**Role in the CET**
Sustainability Coordinator	- Meeting coordination, framework reporting, energy monitoring, chair
Manager, Buildings	- Overview of energy projects involving City non-process facilities
Operations & Systems Engineer, Buildings	- Support of energy projects involving City non-process facilities
Supv. Electrical & Mech. Systems, Buildings	- Support of energy projects and operations for City non-process facilities
Manager, Capital Works	- Overview of major projects in City Facilities
Managers, Water and Regional Treatment	- Overview of energy projects involving water and wastewater infrastructure
Supervisor, Waste Diversion	- Overview of corporate solid waste diversion projects
Manager, Fleet	- Overview of projects involving city vehicles
Program Manager, Asset Management	- Overview of projects with alignment to the asset management program

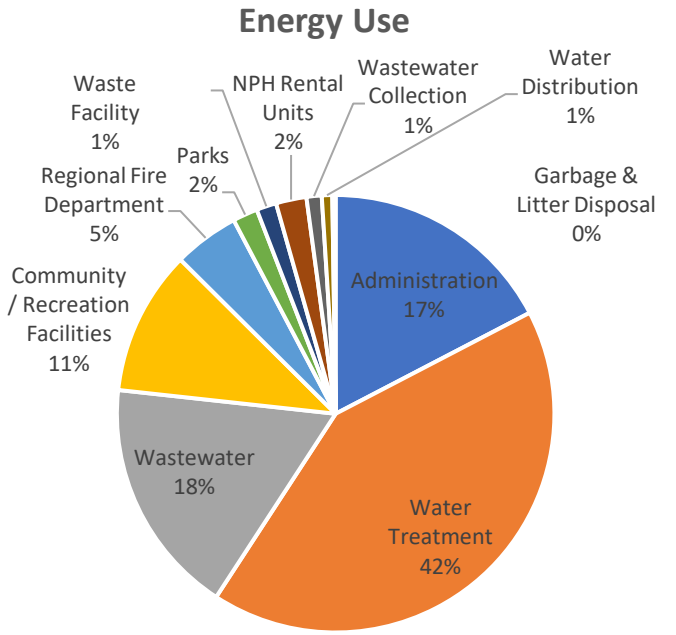
Internal Stakeholder	Role in the Framework
Parks and Open Space	- Meet annual with the CET to align operations, parks development, and retrofit projects with the strategies in this framework. - Work closely with the Sustainability Coordinator to pursue incentives/grants for tree planting projects with the purpose of implementing the Urban Forest Masterplan's Planting Program in City owned land, with the goal of capturing greenhouse gases and reducing fuel use for turf maintenance.
Recreation and Humane Services	- Meet annually with CET to align operations and projects with the strategies in this framework.
Finance and Administration	- Work closely with the CET to implement the framework's strategies and when updating purchasing policies or bylaws aligned with the scope of this framework.
Housing	- Meet annually with CET to align operations and projects with strategies in this framework.
Transportation	- Meet annually with the CET to align efforts on mode share, lighting, and EV charging.
Purchasing & Risk Management	- Work with CET when updating purchasing policies or bylaws to align with objectives of this framework.
Office of the Fire Chief, St John's Regional Fire	- Meet annual with the CET to align operations, plans, and retrofit projects with the strategies in this framework.
Metrobus and St. John's Sports and Entertainment (SJSE)	- Meet annual with the CET to align operations, plans, and retrofit projects with the strategies in this framework.

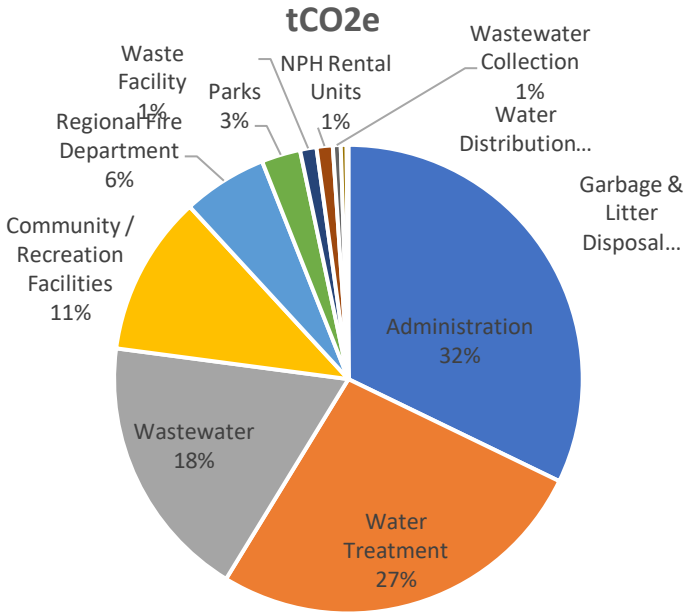
Buildings and Facilities

In Newfoundland and Labrador 9% of the province's emissions comes from Buildings. The City of St. John's currently operates over 50 buildings including recreation facilities, depots, administration buildings, and pays for some utility costs in housing rental units. These buildings collectively consume over 17 million kWh, and 847,000 Liters of heating oil, as well as some propane and fuel for back-up generators.

Process Facilities emit about 25% of the City's corporate emissions. The Administration Buildings emit about 15%, the Community/Recreation Facilities account for 6%, Parks/Housing Rentals (paid by the City)/Regional Fire facilities make up about 4-5%.

Category	GJ	tCO2e	% Total Corp. GHGs
Administration Buildings and Depots	44,766.6	1,902	15%
Community / Recreation Facilities	27,608.5	654	5%
Housing Rental Units (paid by the City)	5,816.8	66	>1%
Parks	4,753.2	159	1%
Regional Fire Department	12,490.9	345	3%
Water Treatment	107,845.90	1,571	13%
Water Distribution	1,993.1	24	>1%
Wastewater	45,228.5	1,085	8.70%
Wastewater Collection	2,887.9	32	>1%
Waste Facility	3,803.1	67	>1%
Garbage & Litter Disposal	624.4	7	>0.01%





Emissions from facilities represent 47% of the corporate emissions. Its energy use and emissions can be broken down by type as shown in the graphics. The City has made strides to both incorporate renewable energy and energy efficiency in its operations including geothermal system in Paul Reynolds, variable frequency drives in water treatment plants, improving the reuse of biogas (providing roughly 40% of the facility's heating) produced by the anaerobic digester (part of the wastewater treatment process). In addition to other ongoing energy efficiency measures such as: LED retrofits, replacement of air handling units, updating building automation systems and programing, among other facility retrofits (e.g., fire stations, city hall annex, 245 Freshwater Rd). The following strategies would enable staff to accelerate the implementation of these types of projects.

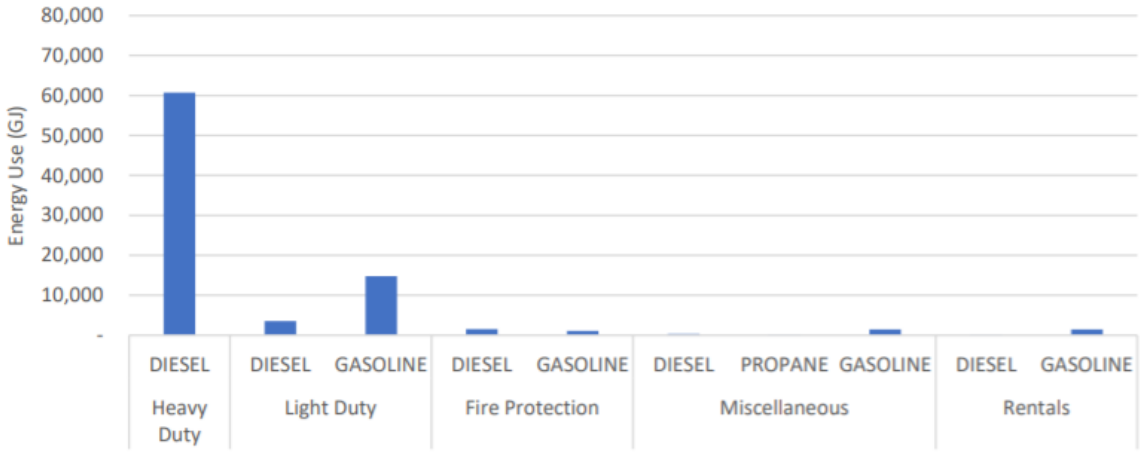
Strategy	Tasks	Responsibility	Tools	Key Performance Indicators	Timeline
Track Facility Energy Performance, and Progress Towards Targets using RETScreen Expert	- Monitor and track energy bills. - Create and update energy performance models using RETScreen Expert for high-use facilities. - Benchmark against best-in-class facilities. - Monitor progress towards targets annually - Collaborate to identify opportunities.	- Sustainability Coordinator - Buildings Staff - Environmental Services Staff	- Corporate Energy Team - RETScreen - City Budget - Utility information	Consistent performance evaluation (Y/N) % of Corp. energy use monitored and tracked	Short – Ongoing
Whole System Approach to Scoping Projects for City Facilities	- Document a check-list type guidance to support retrofit project scoping: considering building envelope, building automation, and lighting upgrades as part of mechanical and other major system renewal/retrofit projects.	- Sustainability Coordinator - Buildings Staff - Capital Works Staff	- Corporate Energy Team - Third Party Funding and Incentive Programs	Number of projects implemented considering whole system approach	Medium
Energy Audits to Identify Opportunities	- Conduct building audits (ASHRAE Level 2) focusing on high savings potential buildings based on benchmarking to prioritize actions.	- Sustainability Coordinator - Buildings Staff - Asset Management Staff	- Corporate Energy Team - Sustainability Operating Fund - Third Party Funding and Incentive Programs	# of Audits Completed Energy savings and associated GHG reduction	Short (Update every 5 years)
Thermal Energy Conservation and Reuse	- Explore thermal imaging audits in facilities known for heat loss and thermal retention issues to identify retrofit opportunities with quick payback.	- Sustainability Coordinator - Buildings Staff - Environmental Services Staff	- Corporate Energy Team - Sustainability Operating Fund	# of thermal audits completed	Medium
Sub-Metering for Energy Use Monitoring and Reporting	- Consider real-time monitoring of electricity and heating fuel for medium and high savings potential buildings.	- Sustainability Coordinator - Buildings Staff	- Corporate Energy Team - Opportunity Assessment - Energy & GHG Inventory	# of facilities with sub-metering	Medium
Equipment Asset Management	- Maintain and share a central inventory of building systems and facility equipment that utilizes energy. - Explore potential to enable lifecycle costing through asset management.	- Sustainability Coordinator - Buildings Staff - Asset Management Staff	- Corporate Energy Team - Asset Management Program - Building Condition Assessments - Energy Audits	% of facilities with equipment kept up to date	Medium – Long Term

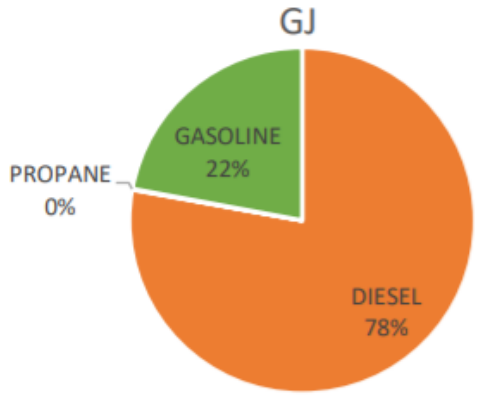
Budget-Neutral Approaches to Energy Efficiency and GHG Reduction	- Explore budget-neutral frameworks to support immediate investment in energy efficiency and GHG reductions (e.g., Energy Performance Contract [EPC]) for measures that can be repaid directly from savings. - Document opportunities that don't fit the scope of these frameworks to be implemented by staff on an opportunity basis.	- Sustainability Coordinator - Buildings Staff - Capital Works Staff - Finance Department Staff	- Corporate Energy Team - Energy Opportunity Assessment - Energy Performance Contract Guidance for Federal Buildings - Third Party Funding and Incentive Programs	Energy savings and associated GHG and cost avoidance	Short
Accelerated Lighting Conservation	- Continue to retrofit fluorescent lighting in facilities and parks with LED fixtures. - Consider upgrades to lighting controls to further reduce energy use.	- Sustainability Coordinator - Buildings Staff - Parks Staff	- Corporate Energy Team - Incentive Programs	# of complete facilities retrofitted to LED	Medium – Ongoing
Corporate Green Building Standard	Develop and adopt a design standard based on best practices for new non-process buildings that considers: - Standards for equipment and building systems (including right-sizing and power density) - High facility energy performance approaches - Renewable energy options instead of greenhouse gas intensive systems - Supportive infrastructure for sustainable transportation	- Sustainability Coordinator - Capital Works Staff - Buildings Staff - Finance Department Staff - Purchasing and Risk Management Staff	- Corporate Energy Team - Existing Green Building Best Practices (e.g., LEED)	Corporate Green Building Standard Adopted (Y/N) # of new facilities built to new standard # of existing facilities retrofitted to fit new standard	Short
Performance Verification in Commissioning	- Document and implement commissioning process to ensure design standard performance is verified for new facilities and major renovations	- Sustainability Coordinator - Buildings Staff - Capital Works Staff	- Corporate Energy Team - Past Scope of Work Documents	Documented process being consistently followed (Y/N)	Medium
Electric Vehicle Charging Infrastructure in City Facilities	- Pursue cost-share funding opportunities to install electric charging infrastructure in City owned buildings and facilities. ○ Explore the inclusion of a nominal fee for public use to offset the upfront cost, support future projects, and ensure an equitable support to residents	- Sustainability Coordinator - Buildings Staff - Transportation Staff	- Corporate Energy Team - Third Party Funding Opportunities	Number of charging stations Number of facilities with charging stations	Short - Ongoing

Renewable Energy Corporate Facilities	- Continue to implement renewable energy in new buildings (e.g., air or geothermal heat pump) - Explore opportunities and detail feasibility for renewable systems in existing administration and recreation facilities to stabilize utility costs and build resilience (e.g., solar, geothermal). - Continue to improve landfill gas collection and explore community partnerships to enable its re-use. - Maximize re-use of biogas in wastewater treatment facility to displace heating oil.	- Sustainability Coordinator - Capital Works Staff - Buildings Staff - Environmental Services Staff	- Corporate Energy Team - Asset Management Program - Building Condition Assessments - Feasibility Studies - Landfill and Biogas Data Monitoring and Past Studies	# renewable energy systems kWh of electricity generated $ of savings generated	Medium - Long Term
Reduce Water Intensity of City Facilities	- Inventory water-using equipment and fixtures - Identify opportunities for replacement with water efficient/ low consumption equipment - Explore opportunities for rainwater for vehicle washing. - Develop a water efficiency replacement policy	- Sustainability Coordinator - Buildings Staff - Capital Works Staff - Parks Staff	- Corporate Energy Team - Asset Management program	Number of equipment replaced under policy	Short

Fleet

In Newfoundland and Labrador 49% of the total energy use is from the Transportation sector, this sector emits 32% of the total GHG emissions. The City of St. John's Fleet inventory includes heavy-duty diesel vehicles, light duty diesel vehicles, and light duty gasoline vehicles. In 2018, the City maintained and operated approximately 125 gasoline light-duty units, and 156 diesel units (including sanders, blowers, trackless vehicles, and garbage trucks). St. John's Fleet accounts for 24% of the energy used, and 48% of the corporate GHG emissions. The energy cost of the City's fleet is approximately $1.9M per year. This section does not include the Metrobus fleet specifically, however, this has been inventoried and some strategies could be applicable. The City of St. John's aims to reduce the overall use of fossil fuels in the corporate fleet through improvements in vehicle/route efficiency, maintenance, timely vehicle replacement, user behavior/awareness, and ultimately greener energy choices.





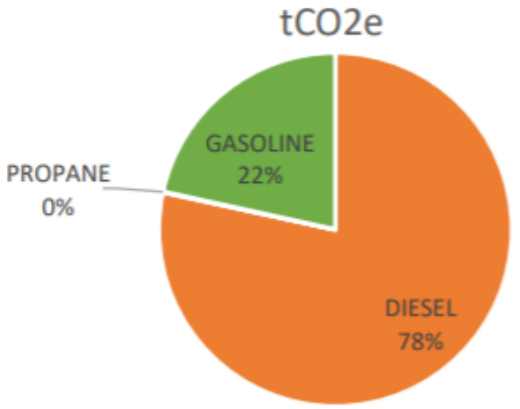


Table 16 Energy Consumption, Cost, and GHG Emissions by Category

Description	GJ	tCO2e	% Corp. Total GHGs
Heavy-Duty	60,709	4,275	34%
Light-Duty	18,331	1,239	10%
Fire Protection	2,618	181	1.4%
Miscellaneous	1,872	126	1%
Rentals	1,508	101	>1%
Total	**85,037**	**5,923**	**48%**

Strategy	Tasks	Responsibility	Tools	Key Performance Indicators	Timeline
Monitor and Report Fuel Consumption	- Explore a weather-corrected annual report of fuel consumption of City's Fleet for review by the CET. - Collaborate to explore opportunities to reduce fuel use (e.g., reducing unnecessary idling, utilization of fuel consumption data in route optimization).	- Sustainability Coordinator - Fleet Staff - Purchasing Staff	- Corporate Energy Team - Asset Management Tools	Fuel is being tracked and reported to operating staff (Y/N) Number of opportunities identified Number of routes optimized	Short – Ongoing
Central List of Vehicles and Equipment	- Explore building upon existing vehicle inventory list to include all fuel-based and future non-fuel-based equipment and vehicles and include their fuel efficiency and estimated lifecycle cost.	- Sustainability Coordinator - Fleet Staff - Asset Management Staff	- Corporate Energy Team - Asset Management Process - Asset Management Tools - Facility Energy Audits	% of all City's fuel consumed by vehicles and equipment in inventory	Long Term
Pathway to Corporate Fleet Electrification	Based on current procurement policy identify pathways to electrify the Corporate fleet including considerations for: - Existing Corporate Fleet Inventory and Use - Corporate Policy - Differential Capital Cost Forecast	- Sustainability Coordinator - Fleet Staff - Fire & Emergency - Recreation Staff - Parks Staff - Purchasing Staff - Finance - Metrobus	- Corporate Energy Team - FCM Green Municipal Fund	Path completed (Y/N) % of Fleet vehicles included in the pathway	Short
Anti-Idling Technologies	- Explore a pilot of technologies that can enable vehicles to maintain function reliability while not wasting fuel (e.g., anti-idling technology).	- Sustainability Coordinator - Fleet Staff	- Corporate Energy Team - FCM Green Municipal Fund	Number of Idling Hours Avoided	Short
Low-Carbon Vehicle Pilot	- Explore opportunities to pilot light-duty low-carbon vehicles (e.g., PHEV, EV). - Explore opportunities to pilot heavy-duty fuel use reducing technologies.	- Sustainability Coordinator - Fleet Staff	- Corporate Energy Team - FCM Green Municipal Fund - NRCan Programs	Number of Opportunities Identified Potential Fuel Reduction from Full Implementation	Short
Advanced Vehicle Replacement	- Explore the development of a tool to support review of costs of maintenance against expected lifecycle cost and cost of replacement, to operate the newest fleet possible.	- Sustainability Coordinator - Fleet Staff	- Corporate Energy Team - Best Practices (e.g., E3 Fleet Program)	Advanced Vehicle Replacement Tool developed and implemented (Y/N	Long Term
Efficient Driver Training Program	- Update training to include best-practices and pilot lessons, as well as continue to raise awareness of fuel efficiency and practices.	- Sustainability Coordinator - Fleet Staff - Parks Staff	- Anti-idling corporate policy	% Staff Operating Vehicles Trained	Medium

Solid Waste

Waste accounts for 5% of our Province's emission. The province of Newfoundland has a strategic goal of diverting 50% of solid waste. The City of St. John's operations and services currently produces approximately 14,000 cubic yards per year of solid waste from 29 operating sites. This ranges from depots, affordable housing, administration buildings, to community services facilities. Waste-to-landfill from corporate operations generate approximately 336 tCO2e per year, which represents about 2.6% of the corporate emissions. The City of St. John's aims to explore opportunities to improve the amount of corporate diverted from landfill, waste data collection and analysis, while working to reduce the amount of waste generated.

Strategy	Tasks	Responsibility	Tools	Key Performance Indicators	Timeline
Corporate Solid Waste Audits	- Implement a corporate solid waste audit to establish a corporate reduction and diversion target.	- Sustainability Coordinator - Environmental Services Staff	- FCM Green Municipal Fund (potential)	Number of facilities (or total waste) characterized by waste audit	Short
Reduce Single Use Plastics in City Operations	- Identify opportunities to align product purchasing with acceptable materials in the City's diversion program. - Develop a strategy to reduce the quantity of single-use plastics purchased by the City.	- Sustainability Coordinator - Environmental Services Staff - Finance and Procurement Staff	- Environmentally Responsible Procurement Policy - Prohibiting the Purchase of Bottled Drinking Water Policy	Number of waste streams addressed in the strategy	Medium to Long-Term
Reduce Paper Waste	Explore potential to reduce paper use through measures like: - Replacement of paper towel dispensers with hand-driers - Reduce paper usage in administrative processes	- Sustainability Coordinator - Facility Staff - Recreation Staff - Strategic Performance Staff	- Continuous Improvement	Number of facilities with hand dryers installed Number of departments/programs moved from paper to electronic	Medium
Battery Collection	- Expand battery collection in City facilities. - Explore providing access to the public.	- Sustainability Coordinator - Facility Staff - Environmental Services Staff	- Corporate Energy Team - Call2Recycle	Kg of batteries collected	Short
Corporate Organics Diversion Program	- Explore an expansion for re-use of corporate organics material diverted from operations.	- Sustainability Coordinator - Environmental Services Staff - Parks Staff - Recreation Staff	- Corporate Energy Team	Diversion rate (%) or weight (Kg)	Medium
Engagement and Education on Waste Diversion	- Continue to provide education materials for staff on how to properly dispose of waste. - Explore expanding the level of engagement of staff in collection events.	- Sustainability Coordinator - Environmental Services Staff	- Corporate Energy Team - Corporate Online Hub	Number of annual communication campaigns	Ongoing

Mainstream Energy and Climate

This section provides strategies for enhance governance, capacity, procurement, and encouragement to incorporate energy efficiency and GHG reduction at all levels in the City as an organization. Implementing these strategies would enhance the City's alignment with external entities, while improving staff capacity to deliver on the target set by this framework.

Strategy	Tasks	Responsibility	Tools	Key Performance Indicators	Timeline
Municipal Carbon Budget Management	- Integrate climate into municipal decision-making through a municipal carbon budget. Carbon budgeting identifies the cost in terms of carbon in capital, business planning, and asset management (e.g., City of Oslo's Climate Budget).	- Sustainability Coordinator - Finance Staff - City Clerk's Office Staff - Asset Management Staff	- Corporate Energy Team - Corporate GHG Target - Asset Management Policy - Business Planning Cycle	Municipal Carbon Budget Process is adopted (Y/N)	Short
Green Funding and Incentive Applications	- Develop an internal hub of up-to-date funding possibilities and requirements to support staff in capitalizing on opportunities, including information on shovel ready projects. - Explore and establish new mechanisms for financing climate action (e.g., revolving fund)	- Sustainability Coordinator - Finance Staff	- Corporate Energy Team - TakeChargeNL - Newfoundland and Labrador Department of Environment, Climate Change and Municipalities	Internal grants hub setup (Y/N)	Medium
Staff Awareness and Capacity to manage Energy and GHGs	- Establish and support a Corporate Energy Team (CET) as proposed to support the implementation of this framework	- Sustainability Coordinator - City Manager	- Executive Team	Corporate Energy Team is formed and terms of reference established (Y/N)	Immediate
Energy Procurement	- Develop guidance for key aspects of energy use and GHG emissions to support staff in enacting the Environmentally Responsible Procurement Policy - Develop supportive documentation for staff purchasing equipment under $50,000 with energy efficiency recommendations. - Explore an energy-efficient procurement policy	- Sustainability Coordinator - Finance and Procurement Staff	- Corporate Energy Team - Existing Environmentally Responsible Procurement Policy	Procurement guidance is developed (Y/N) Energy Procurement Policy is adopted (Y/N)	Short
Incentivize Excellence	- Explore the potential to implement an internal corporate energy award through the CET and Council to recognize outstanding efforts within the City to conserve energy use.	- Sustainability Coordinator - Communications	- Corporate Energy Team - Council - City's Communications Channels	Number of Energy Awards	Ongoing

Pathway to 2030 GHG Target

Given the GHG reduction strategies listed in the previous sections, and the scenario described in Figure 7 , it is viable to achieve a 40% reduction by 2030 from the 2018 baseline. Assuming that:

- Emissions from our facilities and services grow in line with population growth in our community.
- Electricity rate uncertainty is managed through energy efficiency and not switch back to fossil fuels.
- The proposed strategies to reduce the fleet's energy intensity are implemented.
- Fuel switching is done for small and medium sized facilities, while implementing efficiency measures at all facilities.
- Efficiency is improved for the re-use of biogas to further displace oil use at wastewater treatment facility.
- Greenhouse gas intensity and volume of corporate waste is reduced.

Corporate GHG Emission Scenario to 2030

Description	tCO2e/Year	% of Baseline
Baseline 2018	12,457	100%
Population Growth (2030)	+ 685	+ 5.5%
Support Electrification	- 2,588	- 21%
Green Fleet Strategies	- 812	- 7%
Facility Energy Efficiency	- 530	- 4%
Fuel Switching Facilities	- 1,576	- 12.7%
Biogas Reuse Efficiency	- 42	- 0.3%
Solid Waste Reduction	- 49	- 0.40%
Scenario 2030	7,546	40%

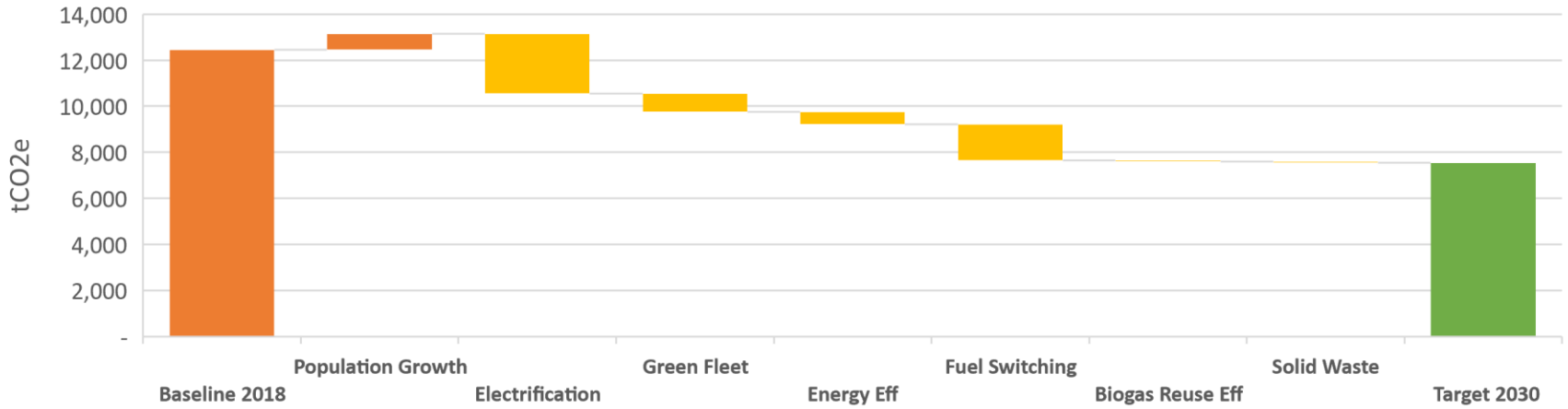


Figure 7 Corporate GHG Emission Scenario to 2030

Although some deeper GHG reduction initiatives may not be cost effective today, a changing regulatory landscape, potential cost of carbon, energy costs, incentives, and technology change are expected to favor the economics of GHG reduction initiatives along the way. Therefore, aspiring to reduce GHG emissions to net-zero by 2050 is not an unrealistic scenario and in line with Newfoundland and Labrador's and Canada's commitment.

Considerations for Implementation

Monitoring and Reporting To ensure the City remains flexible in its approach this framework is a living document which provides a roadmap for the Corporation and builds on the internal capacity and knowledge base to increase energy efficiency and eliminate energy waste. The Corporate Energy and GHG Management Framework Annual Update will be presented to Council along with proposed future energy budgets each year prior to commencing budget deliberations.

Environmental and Sustainability Expert Panel The Environmental and Sustainability Expert Panel is intended to support City staff in the implementation by providing awareness of innovation, collaboration opportunities, comment on expected impact of proposed projects, and by serving as a forum where staff can find resolution to scoping questions in order to improve capacity.

Incentive Funding Staff will work collaboratively with the City's utilities, provincial and federal agencies to ensure the Corporation of the City of St. John's takes advantage of all funding and grant opportunities relevant to energy efficiency programs and projects.

Financing The are no immediate financial implications to the City for this plan, budget requests will be presented to City Council each year as part of the budgeting process and as funding opportunities arise (e.g., FCM Green Municipal Fund, Canada's Low-Carbon Economy Fund, Infrastructure Canada's Investing in Canada Infrastructure Program, NRCAN's Zero-Emission Vehicle Infrastructure Program).

Base Year Adjustments The City will establish 2018 as its base year for tracking corporate GHG reductions. However, when significant changes occur that may confuse the tracking and reporting of emissions and progress towards reductions, the City may retroactively calculate base year emissions. Significant changes that would trigger a base year recalculation include significant addition of service infrastructure with irreducible corporate GHGs; structural changes to ownership or control; significant changes in status of leased assets; significant changes in methodology or improvements in accuracy of emission factors or energy use data; or discovery of significant errors.

Potential Risk and Uncertainty The implementation of this framework is susceptible to three main risks and challenges. These risks should be ongoingly managed as the implementation of the framework proceeds.

- Uncertainty of future energy costs
- Changes in upper-level government policies and incentives
- Staff capacity and resources

Alignment with Other Policy

The Corporation of the City of St. John's has undertaken many initiatives to improve energy and environmental sustainability of our City. Though these efforts it has adopted numerous strategic initiatives such as programs, policies and plans that align with the implementation of this framework.

Program/Policy	Purpose	Year
Recycling Policy	To ensure that materials will be recycled in city facilities wherever possible.	1991
Federation of Canadian Municipalities - Partners for Climate Protection	The PCP program guides municipalities through a five-step Milestone Framework to act on climate change by reducing emissions in your municipality.	2000
Environmentally Responsible Procurement Policy	To promote the purchase or acquisition of goods, equipment, services, technologies, construction projects and otherwise that are Environmentally Responsible, where deemed to be practical and appropriate.	2006
Global Covenant of Mayors for Climate and Energy	Committed mayors and local governments, in alliance with partners, accelerate ambitious, measurable climate and energy initiatives that lead to an inclusive, just, low emission and climate resilient future, helping to meet and exceed the Paris agreement objectives.	2019
Climate Emergency Declaration	Establishes climate mitigation and adaptation as strategic priorities of the City of St. John's	2019
Asset Management Policy	To create an organization-wide Asset Management System.	2020
Economic Development Strategic Plan	The Strategic Economic Roadmap sets the stage for a new era of prosperity and growth in St. John's. It is a long-term vision and action plan that provides a framework to guide the province's largest city through to 2021.	2011 and update
Affordable Housing Strategy (2019-2028)	A ten-year plan that continues and expands from the original Affordable Housing Business Plan. To fully address our municipality's housing needs	2019

Subsidiaries

The Corporate GHG emissions were inventoried, and the plan developed based on the target setting approach known as "operational control" as per the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard. Operational control refers to when "a company has the full authority to introduce and implement its operating policies at the operation". However, the GHG emissions and energy use were accounted for both of the City of St. John's subsidiaries.

St. John's Transportation Commission (Metrobus)

Emissions from the City's subsidiary St. John's Transportation Commission (Metrobus) will be addressed in the community plan because they must be considered alongside the community sectors (e.g., increases in transit emissions may imply decreases in other parts of the transportation sector, reductions in transit emissions and increases in ridership result in deeper transportation sector reductions).

Metrobus

In 2018, Metrobus consumed 79,786 GJ of energy and emitted 5,012.8 tonnes of Carbon Dioxide Equivalents (tCO2e). This is approximately 1.28% of the Transportation sector, and 0.75% of the entire Community's emissions.

Metrobus' emissions come mostly from Diesel (97%) consumed entirely by the fleet, the geothermal and fully electric LEED-certified Depot contributes under 2% of the emissions (118.9 tCO2e).

Energy Use

- 86% Diesel
- 1% Gasoline
- 13% Electricity

Emissions

- 97% Diesel
- 1% Gasoline
- 2% Electricity

St. John's Sports and Entertainment (SJSE)

Emissions from the City’s subsidiary St. John's Sports and Entertainment (SJSE) were quantified and are expected to align and be reduced as part of the initiatives reflected in the community plan.

SJSE

In 2018, SJSE consumed 36,528 GJ of energy and emitted 1,252.9 tonnes of Carbon Dioxide Equivalents (tCO2e). This is approximately 0.2% of the Community emissions, and about 0.8% of the Industrial/Commercial/Institutional sector in our Community.

Energy Use

- 64% Electricity
- 36% Heating Oil

Emissions

- 21% Electricity
- 79% Heating Oil