

RMOW CORPORATE GHG REDUCTION PLAN

January 23, 2024



EXECUTIVE SUMMARY

The purpose of the RMOW Corporate GHG Reduction Plan is to set a 2030 corporate greenhouse gas (GHG) emissions reduction target that is aligned with Whistler's Big Moves Climate Action Strategy. This Plan targets a corporate GHG emission reduction of 50% by 2030 relative to 2007 baseline emissions (2,233 t CO_{2e}). This means that by 2030, corporate GHG emissions are 1,117 t CO_{2e}.

To achieve this target, four pathways to reduce GHG emissions have been identified, targeting the largest sources of corporate emissions. These pathways include:

Pathway 1: Fleet electrification

To reach the 2030 corporate GHG emissions target, fleet emissions need to be reduced from 747 t CO_{2e} to 280 t CO_{2e}. This means 66% of the RMOW fleet will need to be electrified by 2030.

Pathway 2: Sewage management

To reach the 2030 GHG emissions target, sewage management emissions must be reduced from 439 t CO_{2e} to 62 t CO_{2e} by 2030. To reach this goal, the efficiency measures outlined in the 2022 Wastewater Treatment Plant Energy Study must be implemented and remaining natural gas boilers need to be switched to a low carbon energy system.

Pathway 3: Recreation

By 2030 recreation emissions must be reduced to from 339 t CO_{2e} to 60 t CO_{2e}. This goal can be met by implementing the Meadow Park Sport Centre efficiency measures outlined in the Clean Communities Fund Feasibility Study and electrifying the remaining natural gas condensing boiler plant.

Pathway 4: Contracted services

By 2030 contracted service emissions need to be reduced from 474 t CO_{2e} to 145 t CO_{2e}. To reach this target, 75% of contractor fleets must be electrified, which can be achieved through a Contracted Services Low Carbon Policy.

Implementation

This Plan details the efforts needed to achieve the goals for each of these pathways, identified as current efforts and enhanced efforts. Current efforts are those that are already underway and enhanced efforts are additional actions that must be taken to achieve the goals.

The Plan also identifies steps to implementation including accountability tools such as a newly proposed internal carbon pricing structure, KPIs and reporting.

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INTRODUCTION

Since 1997, Whistler has been committed to reducing, tracking and reporting annually on community and corporate GHG emissions. Whistler has a history of commitment to action. In 2007, Whistler Council became a signatory to the BC Climate Action Charter. By doing so Whistler is committed to:

1. become carbon neutral in municipal operations,
2. measure and report on community greenhouse gas emissions, and
3. work to create compact, more energy efficient communities.

In 2009, the Resort Municipality of Whistler (RMOW) outlined the steps necessary to achieve its carbon neutrality commitments under the BC Climate Action Charter in the RMOW Carbon Neutral Plan. This plan outlined how the RMOW would achieve carbon neutrality by 2010 and outlined targets to reduce RMOW corporate emissions levels until 2015. However, since 2009, the climate action landscape has changed significantly. We now know that globally we will not achieve less than 2 degrees Celsius of warming by purchasing carbon offsets to be carbon neutral. We must do everything we can to reduce to zero GHG emissions, rather than relying on carbon offsets to get us there.

In 2020, Whistler adopted the Climate Action Big Moves Strategy, setting a 2030 target to reduce Whistler's community wide GHG emissions by 50% below 2007 levels. While corporate GHG emissions are included in the community emissions, it is important to have a separate corporate emissions reduction plan to identify more specific actions to reduce the RMOW's organizational GHG emissions. Rational for this includes:

- Agency: the Municipality has direct control over most corporate activities and can therefore make significant progress in reductions.
- Leading by example: the Municipality can and should provide a positive example, showcasing how emissions can be reduced locally.
- Good data: the Municipality has been tracking corporate emissions for years, and therefore can readily identify opportunities for reductions and assess the effects of actions.

The purpose of the RMOW Corporate GHG Reduction Plan is to set a 2030 corporate GHG emissions reduction target that is aligned with Whistler's Big Moves Climate Strategy. This plan targets a corporate GHG emission reduction of 50% by 2030 relative to 2007 baseline emissions (2,233 t CO₂e). This means that by 2030, corporate GHG emissions are 1,117 t CO₂e.

To achieve this target, four pathways to reduce GHG emissions have been identified, targeting the largest sources of corporate emissions. To create the RMOW Corporate GHG Reduction Plan, the RMOW contracted the services of GHG Accounting Services Ltd to model and produce four pathways that informed this report. These pathways include:

1. Fleet electrification
2. Sewage management
3. Recreation
4. Contracted services

This plan outlines the emissions reductions required for each of these pathways, describes current efforts to reduce emissions and the enhanced efforts needed to meet the corporate GHG emission reduction target.

GHG REDUCTION PATHWAYS

RMOW’s 2020 corporate GHG emissions data was evaluated, to understand what the largest contributors to corporate emissions are and to identify the four pathways to reduce GHG emissions. 2020 was the year that the Big Moves Strategy was adopted and was therefore used to determine the pathways. In 2020, fleet, sewage management, recreation and contracted services (including solid waste management) made up 80% of total corporate GHG emissions, as shown in Figure 1.

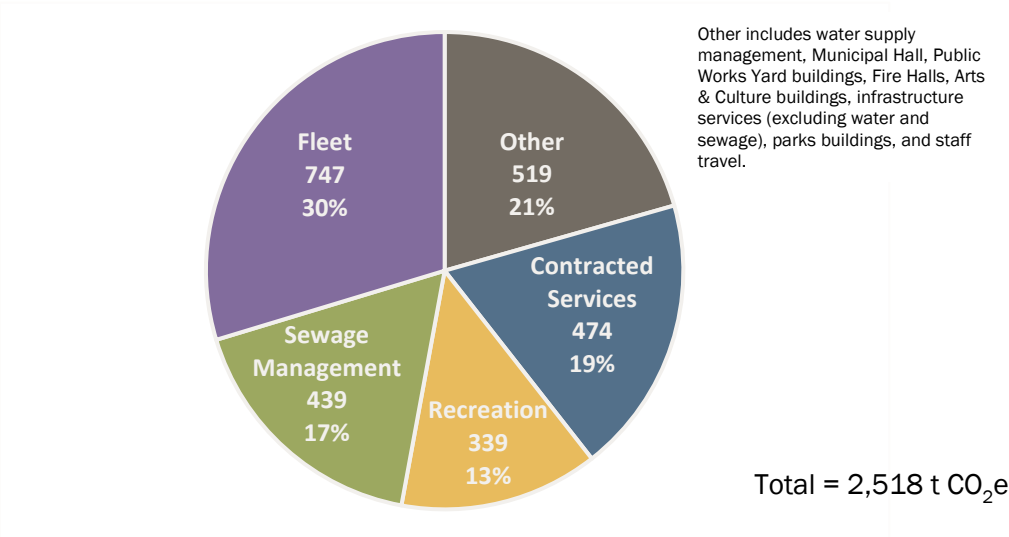


Figure 1. RMOW Corporate GHG Inventory 2020

These four areas are consistently the largest contributors to corporate GHG emissions. Therefore, they were identified as the areas where emissions need to be reduced to meet the corporate GHG emission reduction target. Figure 2 outlines the pathways for emissions reduction in each of these four areas to reach the target of capping RMOW’s corporate GHG emissions to 1,117 t CO₂e. The pathways assume a linear decrease in emissions between 2023 and 2030, with target emissions reductions for each pathway each year.

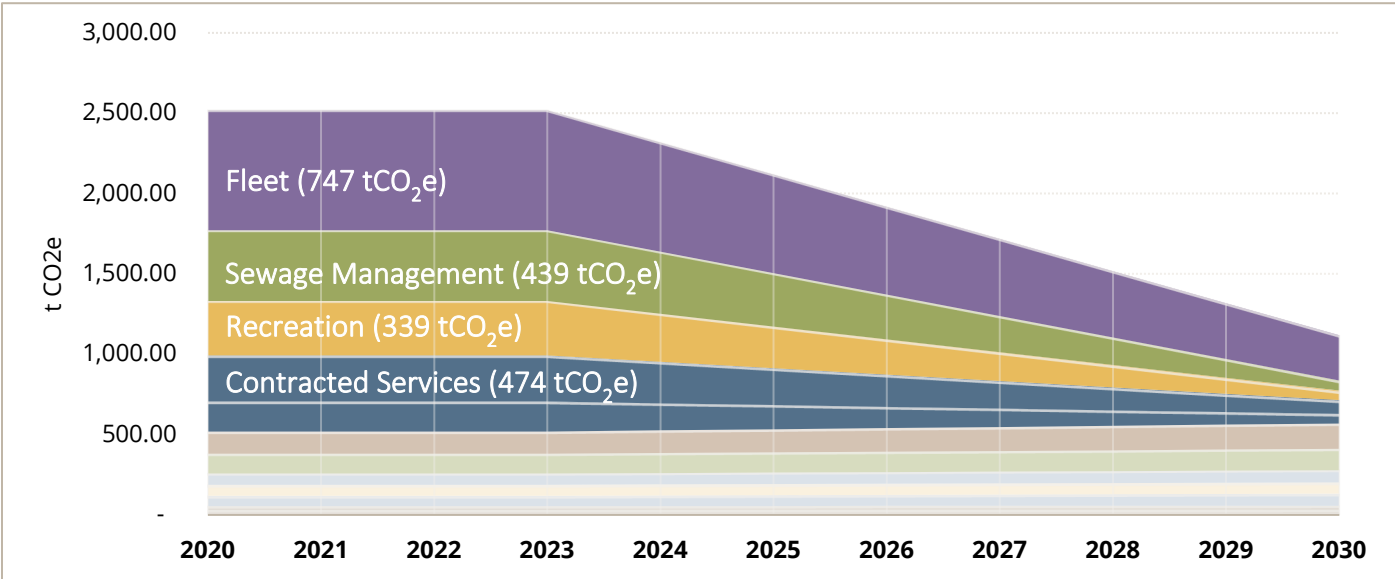


Figure 2. Corporate GHG reduction pathways to reach 1,117 t CO₂e by 2030

Pathway 1: Fleet Electrification

The RMOW fleet represents the largest source of corporate GHG emissions with 747 t CO₂e in 2020, or 30% of all corporate GHG emissions.

The RMOW fleet consists of approximately 167 light and heavy-duty passenger vehicles, offroad vehicles and equipment. This does not include tools such as leaf blowers etc. As of August 2023, there are 160 combustion vehicles / equipment, 1 electric vehicle, 2 electric ice resurfacers, 3 electric manlifts and 1 electric compact work truck in the RMOW fleet. Approximately 4% of RMOW fleet is electric.

Pathway target: to reach the 2030 corporate GHG emissions target, fleet emissions need to be reduced to 280 t CO₂e. Figure 3, outlines the annual emissions reductions between 2023 and 2030 to achieve this target.

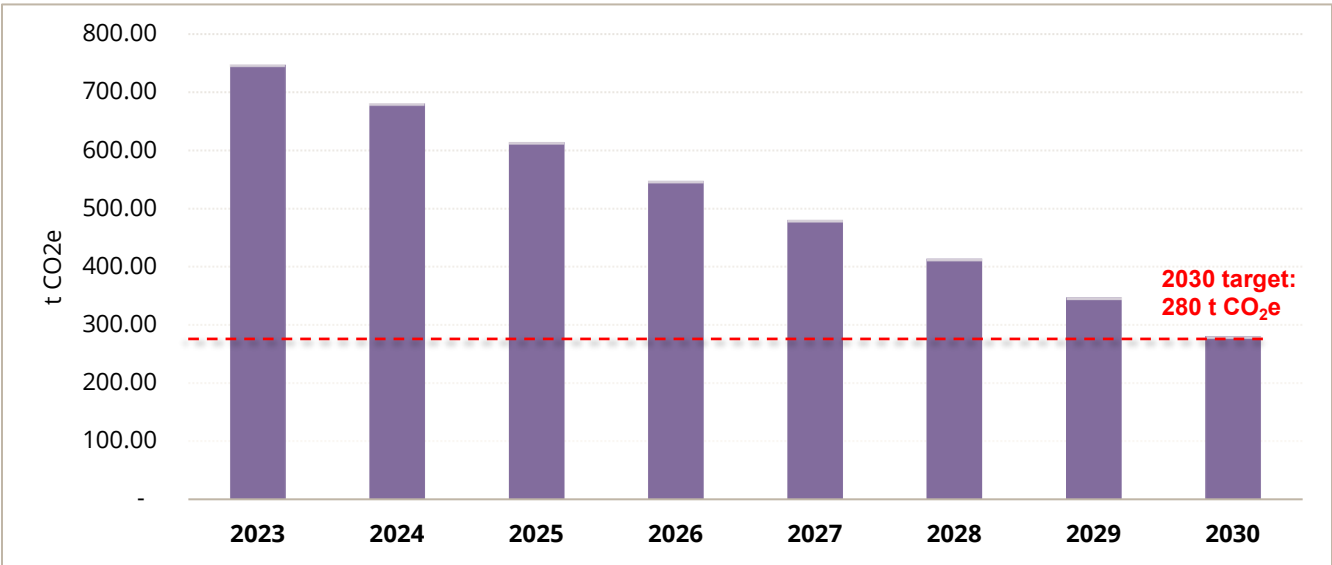


Figure 3. Annual GHG emissions reductions from 2023 to 2030 - Fleet

Current Effort

In 2021, an assessment of light duty vehicles was conducted, outlining a procurement plan for replacing light duty fleet vehicles with zero emission vehicles (ZEVs) between 2022 and 2032. The Balanced Scenario specifies that current fleet vehicles are replaced at the end of their life by a ZEV if the total cost of ownership premium is less than 25%. All internal combustion engine light duty fleet vehicles are due for replacement within the next 10 years assuming end of life after 15 years or 320,000 km travelled.

However, this procurement plan only accounts for 22% of fleet vehicles, as it does not include heavy-duty vehicles. This alone, will not achieve the pathway target of 280 t CO₂e by 2030.

Enhanced Effort

To reach the 2030 emissions reduction target, 66% of the entire RMOW fleet needs to be electrified. While availability of ZEVs and technology will change by 2030, it is safe to assume that most fleet electrification will be in the replacement of light duty trucks and vehicles. However, a portion of the remaining heavy-duty fleet will also need to be replaced by clean fuel alternatives. This goal can be achieved by electrifying 90% of light duty vehicles, 50% of off-road vehicles and 65% of remaining heavy-duty vehicles.

Understanding and managing the demand of current fleet vehicles will play a critical role in ensuring vehicles are used and replaced effectively. For example, the addition of e-bikes to the RMOW fleet may reduce the need for some fleet vehicles.

Figure 4 highlights 2020 fleet emissions, emissions associated with current fleet procurement plans, and emissions required to meet the 2030 target.

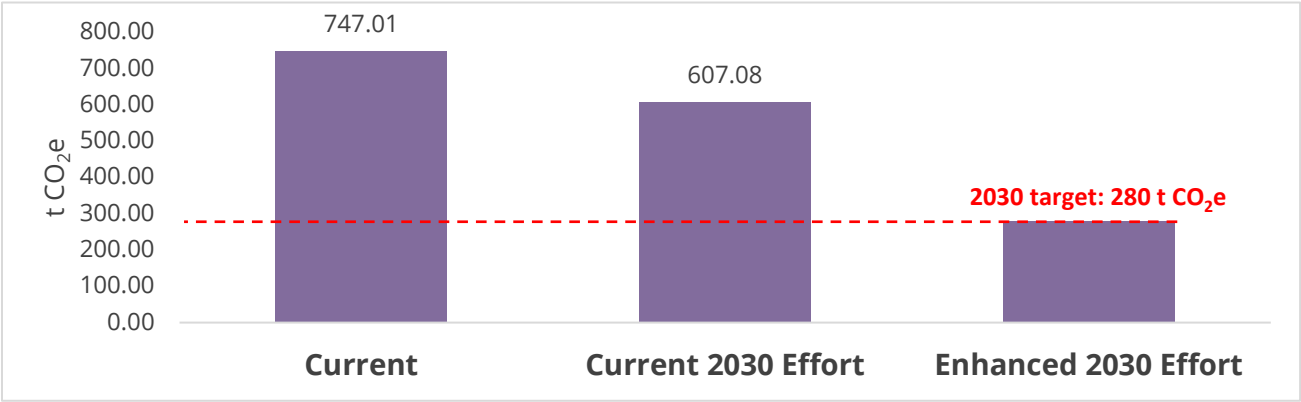


Figure 4. Fleet GHG emissions in 2020, current effort and enhanced effort needed to reach 2030 target.

Next Steps

Commitments to achieve current efforts:

- Implement the Balanced Scenario fleet procurement plan for light duty trucks and vehicles as outlined in the 2022 Light Duty Fleet Assessment.
- Install ZEV chargers in the Public Works Yard, as outlined in the 2023 Fleet Infrastructure Assessment.

Commitments to better understand costing and implementation of enhanced efforts:

- Assess demand management data to correlate replacement requirements with future vehicle demand.
- Conduct a Heavy-Duty Fleet Assessment for the remaining heavy-duty and off-road fleet.

Possible actions leading to the enhanced efforts:

- Develop a procurement plan to replace heavy-duty and off-road fleet with clean fuel alternatives.

Pathway 2: Sewage Management

Sewage management is the second largest source of RMOW’s corporate GHG emissions. In 2020, the wastewater treatment plant made up over 90% of sewage management related GHG emissions (408 t CO₂e). The wastewater treatment plant currently uses a natural gas heating system, energy produced from the District Energy System and electricity to operate. Most wastewater treatment plant emissions come from the natural gas used for processing and heating.

Pathway target: to reach the 2030 corporate GHG emissions target, sewage management emissions need to be reduced to 62 t CO₂e. This means that wastewater treatment plant emissions must be reduced to 27 t CO₂e by 2030. Figure 5 outlines the annual emissions reductions between 2023 and 2030 to achieve this target.

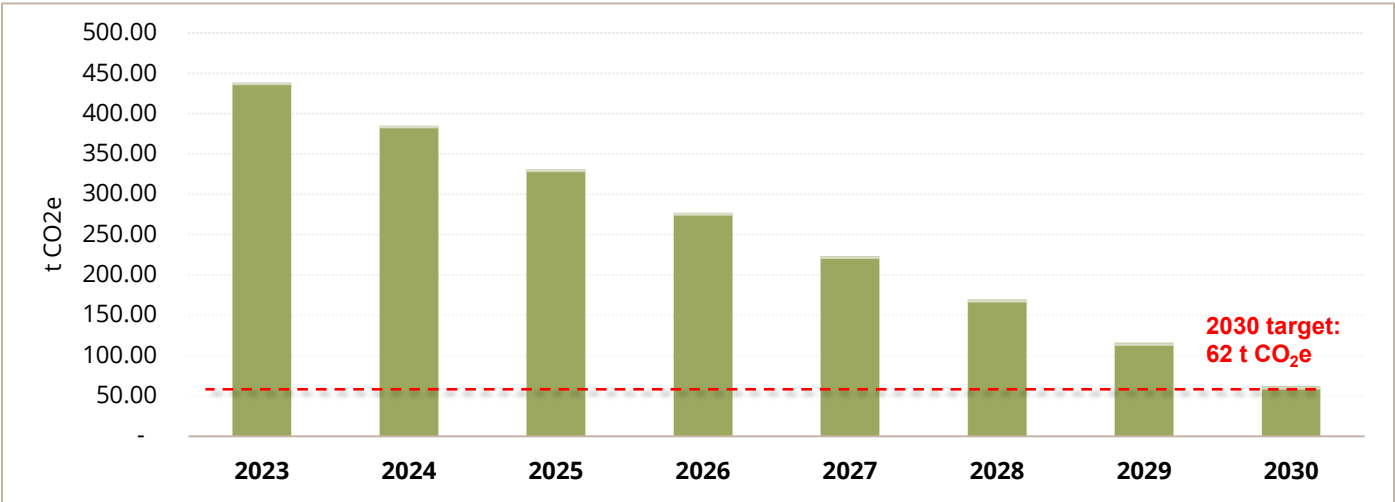


Figure 5. Annual GHG emissions reductions from 2023 - 2030 - Sewage Management

Current Effort

In 2022, a Wastewater Treatment Plant Energy Study was conducted by Building Energy Solutions Ltd. (BES), recommending a set of energy efficiency measures. If implemented, these measures would result in emissions reducing to 296 t CO₂e by 2030. While these energy efficiency measures are an important component of reaching the corporate GHG emissions target, fuel switching will be required to achieve the final pathway target.

Enhanced Effort

To reach 27 tCO₂e emissions for the wastewater treatment plant, both the efficiency measures outlined in the 2022 Wastewater Treatment Plant Energy Study and switching from natural gas heating system to a low carbon energy system is required. This could either be a ground sourced heat pump or shifting entirely to the District Energy System (DES), given it produces its energy by heat from waste. In 2022 the DES system generated 57% of energy by heat from waste. In 2023, this number is anticipated to be higher, as improvements were made to the DES system.

Figure 6 highlights 2020 sewage management emissions, emissions associated with wastewater treatment plant energy efficiency measures, and emissions required to meet the 2030 target.

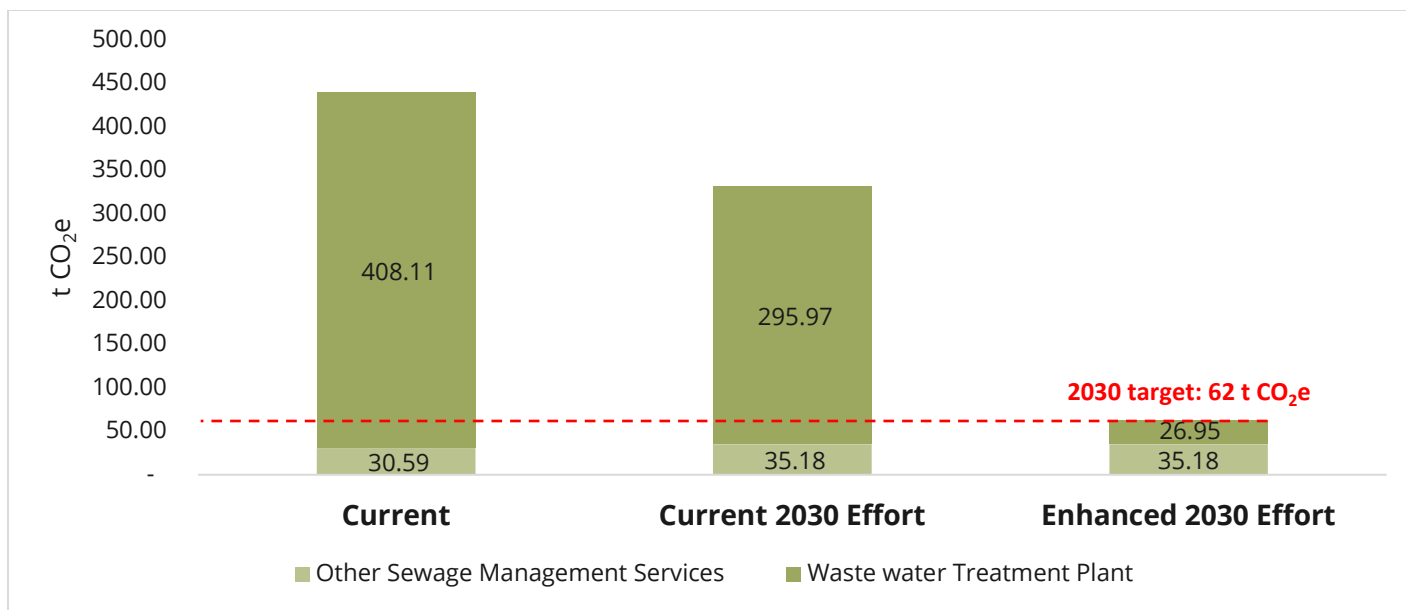


Figure 6. Sewage management GHG emissions in 2020, current effort and enhanced effort needed to reach 2030 target.

Next Steps

Commitments to achieve current efforts:

- Acquire funding and implement energy efficiency measures from 2022 Wastewater Treatment Plant Energy Study.

Commitments to better understand costing and implementation of enhanced efforts:

- Work with utilities group to understand fuel switching opportunities for the WWTP buildings and process requirements.
- Conduct a feasibility study for fuel switching measures at the wastewater treatment plant.

Possible actions leading to the enhanced efforts:

- Acquire funding to implement fuel switching measures at the wastewater treatment plant.

Pathway 3: Recreation

Within Recreation Services, operation of Meadow Park Sports Centre (MPSC) represents almost 90% of the emissions (304 tCO₂e). MPSC currently uses natural gas and electricity to heat the buildings. This includes heating the pool, domestic hot water and occupied spaces on the arena-side. Natural gas consumption contributes to the majority of the MPSC emissions.

Pathway target: to reach the 2030 GHG emissions target, recreation emissions need to be reduced to 60 t CO₂e. This means that MPSC emissions must be reduced to 21 t CO₂e. Figure 7 outlines the annual emissions reductions between 2023 and 2030 to achieve this target.

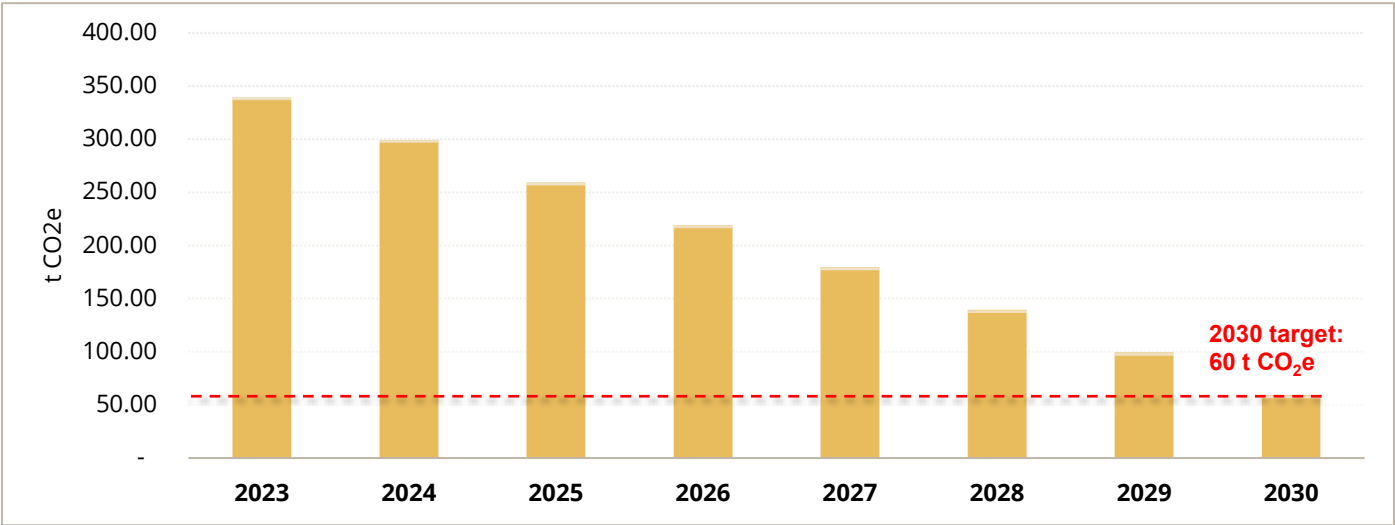


Figure 7. Annual GHG emission reductions from 2023 - 2030 - Recreation

Current Effort

An application for the Clean Communities Fund was put forward in 2022 to implement several energy efficiency measures at MPSC including interconnecting the arena cooling and pool heating, upgrades to the building envelope and replacing the natural gas boiler with an electric boiler. Although the RMOW was not successful in receiving this grant, if BDL-2 energy efficiency measures from the Clean Communities Fund Feasibility Study were implemented, they would reduce 2030 emissions to 67 tCO₂e. The RMOW has since submitted another grant application to fund these efficiency measures. If the RMOW is not successful in receiving this grant, other funding must be identified to successfully achieve the target for this pathway.

Enhanced Effort

To reach the target MPSC emissions of 21 tCO₂e, all measures outlined in the Clean Communities Fund Feasibility Study need to be implemented, along with electrification of the remaining natural gas condensing boiler plant which is intended to be used as a back-up heat source at MPSC.

Figure 8 highlights 2020 recreation services emissions, emissions associated with MPSC energy efficiency measures, and emissions required to meet the 2030 target.

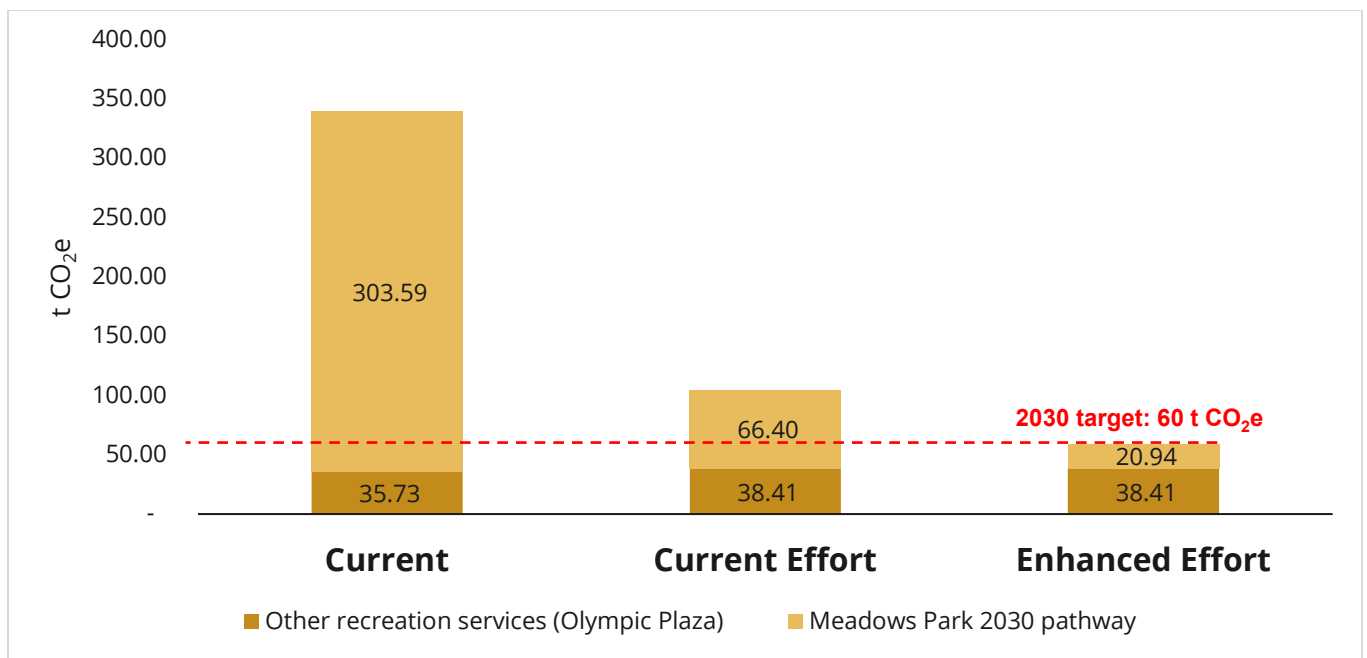


Figure 8. Recreation services GHG emissions in 2020, current effort and enhanced effort needed to reach 2030 target.

Next Steps

Commitments to achieve current efforts:

- Identify alternative funding opportunities.
- Acquire funding and implement BDL-2 energy efficiency measures from Clean Communities Fund Feasibility Study.

Commitments to better understand costing and implementation of enhanced efforts:

- Conduct feasibility study to electrify remaining natural gas boiler plant.

Possible actions leading to the enhanced efforts:

- Acquire funding and implement electrification of remaining natural gas boiler plant.

Pathway 4: Contracted Services

Contracted services are made up of solid waste management (GFL Environmental Ltd.) and other contractors whose services are used for capital projects, and municipal building operations and maintenance. Solid waste management makes up 40% (186 t CO₂e) of contracted service emissions while other contractors represent 60% (288 t CO₂e) of emissions.

Pathway target: to reach the 2030 GHG emissions target, contracted service emissions need to be reduced to 145 t CO₂e. Figure 9 outlines the annual emissions reductions between 2023 and 2030 to achieve this target.

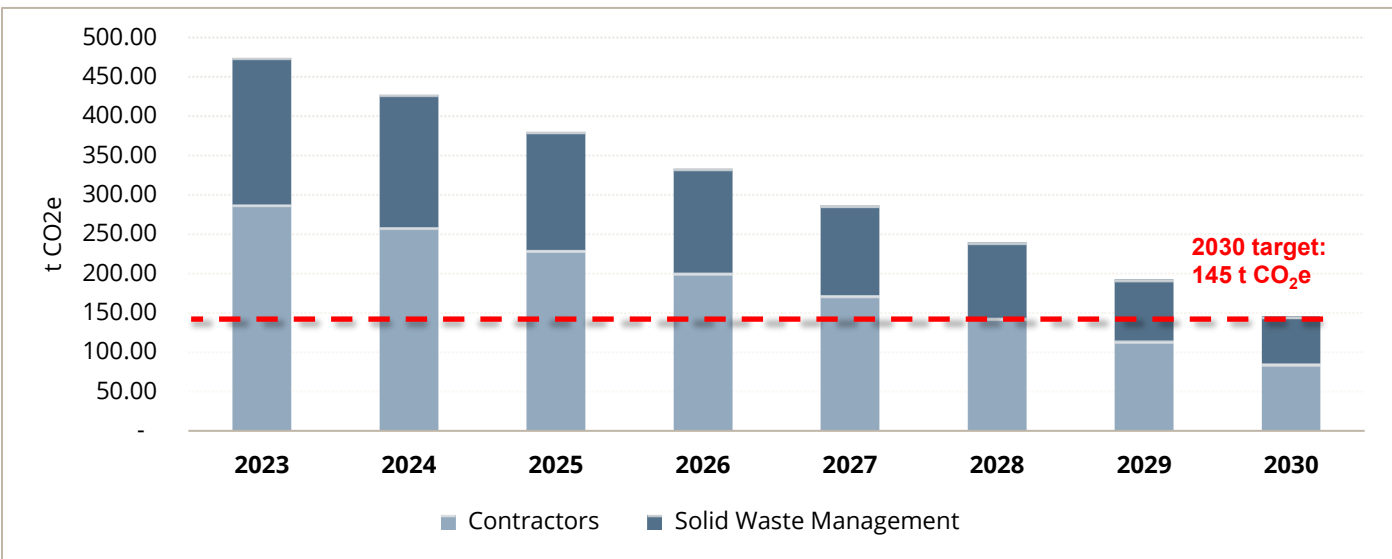


Figure 9. Annual GHG emission reductions from 2023 to 2030 - Contracted Services

Current Effort

There are currently no efforts in place to reduce contracted emissions. This means that by 2030, emissions are projected to increase.

Enhanced Effort

To reach the target of 145 tCO₂e, 75% of solid waste management and other contractor fleets need to be electrified. Through the RMOW procurement process, contractors will first need to provide fuel usage data so contracted emissions can accurately be measured (currently estimations are required). Secondly, consideration of GHG emissions must be included in RMOW procurement criteria and contractors who produce lower GHG emissions must be prioritized. These considerations can be drafted into a Contracted Services Low Carbon Policy and incorporated into the RMOW procurement process.

Figure 10 highlights 2020 contracted services emissions, emissions associated without any efforts in place, and emissions required to meet the 2030 target.

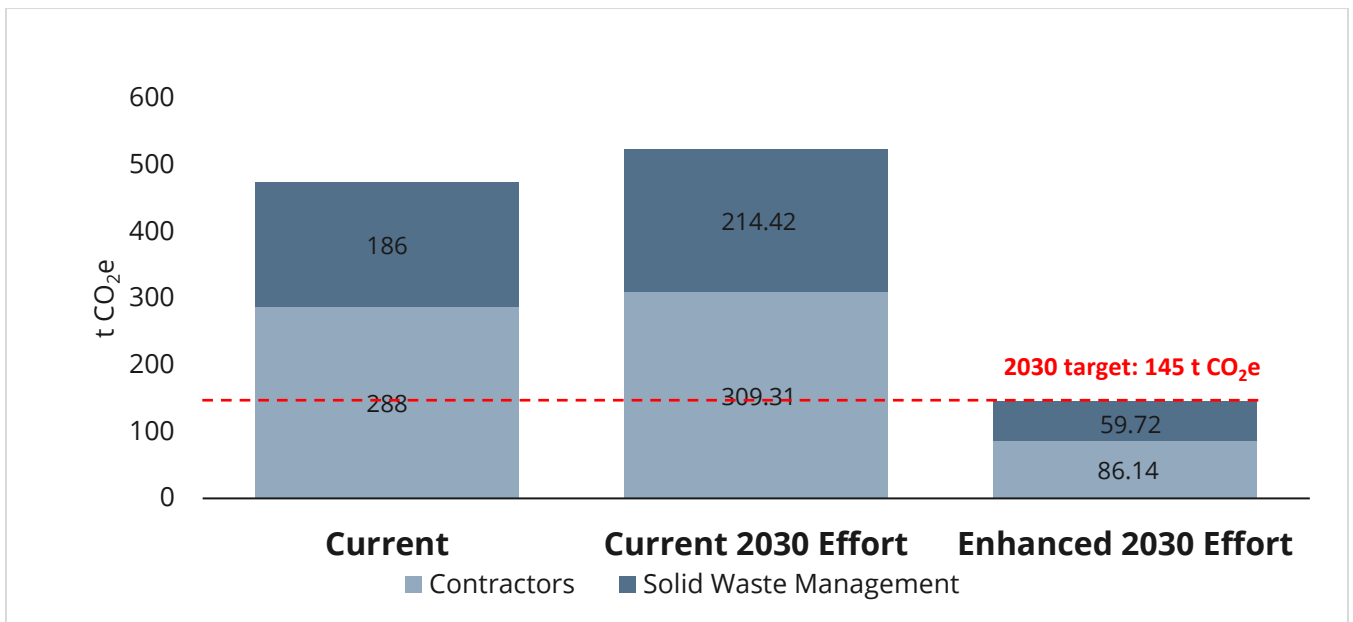


Figure 10. Contracted services GHG emissions in 2020, current effort and enhanced effort needed to reach 2030 target.

Next Steps

Possible actions leading to the enhanced efforts:

- Convene internal staff to develop a Contracted Services Low Carbon Policy.
- Draft a Contracted Services Low Carbon Policy with accompanying decision-making matrix.
- Integrate Contracted Services Low Carbon Policy into procurement process.

IMPLEMENTATION

Implementation of this plan — including planning and executing— is the responsibility of many divisions across the RMOW. A responsible department has been identified for each pathway, as outlined in Table 1 below.

The responsible departments are accountable for the implementation of current efforts and planning and execution of the enhanced efforts. The Climate & Environment (C&E) department will support the responsible departments as needed.

Table 1 Allocation of responsibility for pathway implementation

Pathway		Responsible Department (Implementation)	Responsible Department (Carbon Offsets)	Supporting Department
1	Fleet electrification	Central Services & Fleet	Central Services & Fleet	Climate & Environment
2	Sewage Management	Utilities	Utilities	Climate & Environment
3	Recreation	Facilities Construction & Maintenance	Recreation	Climate & Environment
4	Contracted services	Working group led by Climate & Environment	Capital Projects	Finance Capital Projects Facilities, Construction & Maintenance

Accountability

To achieve these targets, consideration of GHG emissions must be included in capital allocation and corporate decision making. This plan identifies four accountability instruments to support these targets.

1. Operational decisions – GHG emission calculations for capital projects and procurement
2. Tracking progress – key performance indicators
3. Reporting – annual reporting on key performance indicators
4. Incentives – internal carbon pricing structure

Operational Decisions

To achieve the targets outlined in this plan, management and operational decisions need to support the implementation of enhanced efforts. To do this, project level GHG emissions should be factored into operational decision making.

The most effective manner of incorporating actions from this plan into management and operational decision making will be to identify the key points in existing processes where GHG emissions should be considered.

Three organizational processes have been identified that should be updated to consider GHG emissions:

- Fleet vehicle and equipment purchasing
- Capital Project Initiation
- Procurement

As a next step, the Climate & Environment team will work with the responsible departments to update these organizational processes.

Tracking Progress

Key performance indicators (KPIs) have been identified for each pathway to measure progress towards the targets identified in this plan (Table 2). The C&E team will be responsible for calculating these KPIs annually.

Table 2 Key performance indicators

Pathway	KPI #	KPI Description	2030 Goal
Pathway 1: Fleet Electrification	1	Number of ZEVs in fleet	122
	2	Percentage of ZEVs in fleet	66%
	2	Difference between number of ZEVs in light duty fleet and ZEV procurement plan	0
	3	Annual fleet GHG emissions	280 tCO ₂ e
	4	Excess annual fleet GHG emissions	0 tCO ₂ e
Pathway 2: Sewage Management	5	Annual natural gas consumption at wastewater treatment plant	TBC
	6	Annual wastewater treatment plant GHG emissions	27 tCO ₂ e
	7	Excess annual wastewater treatment plant GHG emissions	0 tCO ₂ e
Pathway 3: Recreation	8	Annual natural gas consumption at MPSC	TBC
	9	Annual MPSC GHG emissions	21 tCO ₂ e
	10	Excess annual MPSC GHG emissions	0 tCO ₂ e
Pathway 4: Contracted Services	11	Percentage of contractors providing fuel data	100%
	12	Annual contracted services GHG emissions	145 tCO ₂ e

	13	Excess annual contracted services GHG emissions	0 tCO ₂ e
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Reporting

Reporting on progress is an important aspect of accountability. The KPIs outlined in Table 2 will be calculated annually by the C&E team. The C&E team will reach out to each responsible department to gather the information needed for these KPIs. The C&E team will then report back to each responsible department on progress. The C&E team will also report to Council as part of the annual GHG emissions and Climate Action Implementation Plan reporting.

Incentives

As a signatory of the BC Climate Action Charter, RMOW is committed to carbon neutrality in their corporate operations. This is achieved by purchasing carbon offsets for its corporate emissions each year. These offsets are currently purchased by the C&E department and included in the C&E department budget.

A new internal carbon pricing structure, intended to incentivize department action is outlined below. Each year, excess GHG emissions will be calculated, and a price of carbon will be determined (Figure 11). The responsible department for each given pathway will be required to purchase the offsets associated with excess emissions of that pathway. The C&E department will be responsible for calculating the excess GHG emissions and notifying the responsible department of the cost of the required offset purchases. An example calculation is provided below to demonstrate how the internal carbon pricing structure would work.

Part 1: Adjusted Price of Carbon

Assumed price of carbon = \$25/tCO₂e

Annual corporate GHG emissions in 2025 = 2,518 tCO₂e

Target corporate GHG emissions in 2025 = 2,318 tCO₂e

1. Calculate total excess annual emissions.
 - a. *Annual 2025 corporate emissions – 2025 target emissions*
 - b. $2,518 \text{ tCO}_2\text{e} - 2,318 \text{ tCO}_2\text{e} = 200 \text{ tCO}_2\text{e}$
2. Calculate the total cost of offsets for annual corporate emissions.
 - a. *Annual 2025 corporate emissions x assumed price of carbon*
 - b. $2,518 \text{ tCO}_2\text{e} \times \$25 = \$62,950$
3. Calculate the adjusted price of carbon.
 - a. *Cost of carbon for annual corporate emissions ÷ excess emissions*
 - b. $\$62,950 \div 200 = \text{\textbf{\$315/ tCO}_2\text{e}}$

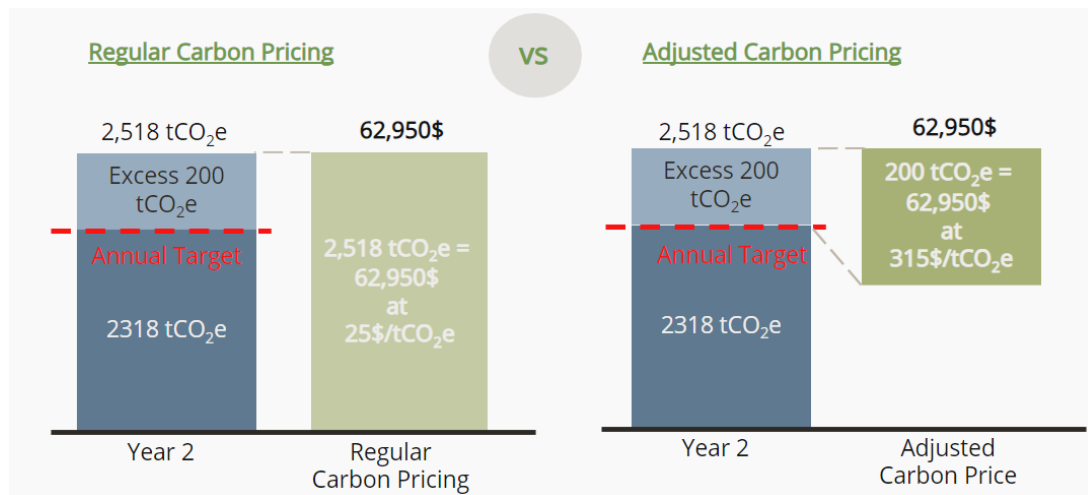


Figure 11. Adjusted Price of Carbon Example Calculation

Part 2: Allocate cost of offsets to responsible department

1. Calculate excess emissions for each pathway.
 - a. *Annual 2025 pathway emissions – 2025 target pathway emissions*
2. Calculate cost of offsets for each responsible department.
 - a. *Excess pathway emissions × adjusted price of carbon*