

Pacific Northwest Transportation Services



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January 1 to December 31, 2023

Completed By	Rachel Bond & Cameron Thompson
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Completed	21/6/2024



Executive Summary

Pacific Northwest Transportation Services (PNWTS), a wholly owned subsidiary of Western Stevedoring, provides shuttle bus services between the Ogden Point Cruise Ship terminal to downtown Victoria and Butchart Gardens. PNWTS leases one office building on Dallas Road, and owns a fleet of 45 buses, with 24 buses that were operational within the reporting period. 2023 marks the fifth year that PNWTS has measured, reported, and offset its emissions.

Total emissions in 2023 were 644 tCO₂e. The largest emission source from the inventory is diesel fuel (268 tCO₂e), followed by refrigerants (260 tCO₂e) and fuel and energy activities (64.7 tCO₂e). Scope 3 emissions (water, waste, paper, business travel, commuting, fuel and energy activities) contributed 16% of the total footprint. Biogenic emissions from biodiesel (6.19 tBioCO₂) are also included in the inventory, but do not need to be offset.

Both 2020 and 2021 business operations were heavily affected by COVID-19, resulting in the elimination of several emissions sources. As such, these years should not be considered representative of normal business operations.

The inventory boundary has changed for the 2023 footprint in order to capture scope 3 indirect emissions from well-to-tank (WTT) and transportation and distribution (T&D) losses, categorized as fuel and energy activities. These emissions sources accounted for 10% of the total footprint. Inventories from 2019 and 2022 have been recalculated to include WTT emissions to allow for year over year comparison. Emission reduction targets have also been adjusted to reflect the inclusion of WTT in the baseline year. 2020 and 2021 were not recalculated due to COVID-19 impacting regular business activities.

Inventory Information

Company Name	Pacific Northwest Transportation Services		
Contact Information	David Roberts	david@pnwts.com	(778) 405-0301
	Isabella Lai	isabella@pnwts.com	(778) 405-0304
Company Description	One office building and 45 buses		
Reporting Period	January 1 to December 31, 2023		
Inventory Boundary	Scope 1 (Direct Emissions)		
	- Natural Gas, Diesel, Refrigerants (HFC-134a)		
	Scope 2 (Indirect Emissions from Purchased Electricity)		
	- Purchased Electricity (BC Hydro)		
Inventory Boundary	Scope 3 (Indirect Emissions from Other Sources)		
	- Water, Waste, Stationery, Paper Products, Well to Tank, T&D Losses, Business Travel, Staff Commuting		
Inventory Boundary	No Major Scope 3 Exclusions		
Scope 2 Approach	Location Based Emissions Calculation		
Consolidation Approach	Operational Control: Accounting for 100% of emissions from operations over which the company has operational control.		
Primary Measurement	Greenhouse gas emissions measured in Carbon Dioxide Equivalent (CO ₂ e)		
Reporting Guidelines	Aligned with those defined in <i>The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition (The GHG Protocol, www.ghgprotocol.org)</i> . Emissions factors reviewed & approved by Ostrom.		

Summary of Results

Total tCO₂e **644**

Equivalent to:

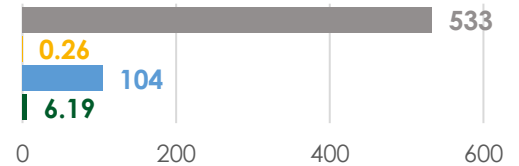


62.1
Cars per Year

Offset Cost **\$19,132**

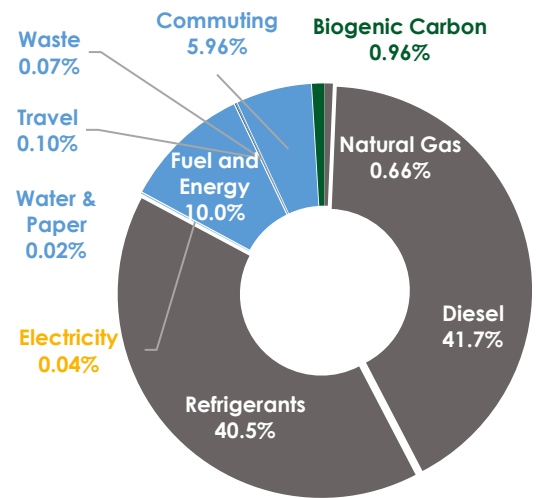
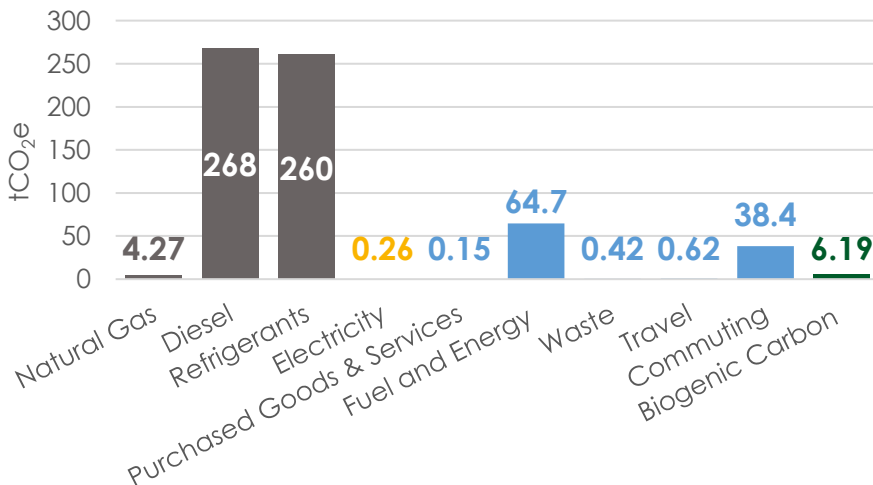
Carbon Footprint by Scope

	tCO ₂ e	
Scope 1 (Direct)	533	83% of total footprint
Scope 2 (Indirect)	0.26	0.04% of total footprint
Scope 3 (Indirect)	104	16% of total footprint
Biogenic Carbon	6.19	1.0% of total footprint
TOTAL EMISSIONS	644	



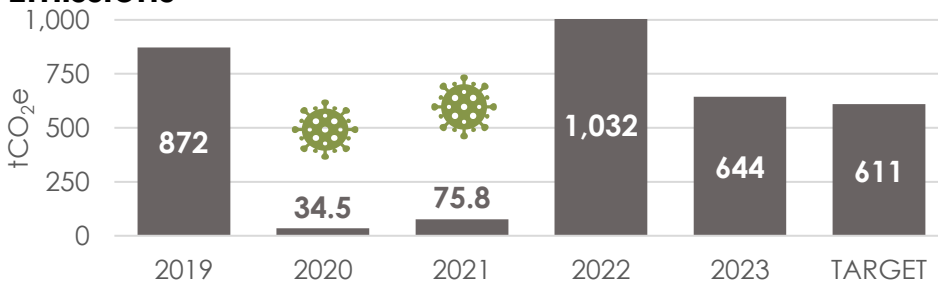
Carbon Footprint By Activity

Emissions by Activity



Carbon Footprint Year Over Year

Emissions



	Net tCO ₂ e	Change since Baseline	
		tCO ₂ e	Percent
2019	872		
2020	34.5	838	-96%
2021	75.8	796	-91%
2022	1,032	-159	18%
2023	644	228	-26%
Target (2026)	611	262	-30%

* Note: 2019 and 2022 totals have been retroactively recalculated to include well-to-tank emissions

Emission Reduction Target



Reduction Targets

30% **50%**
by 2026 by 2030

%
Reduced **26%**
2023

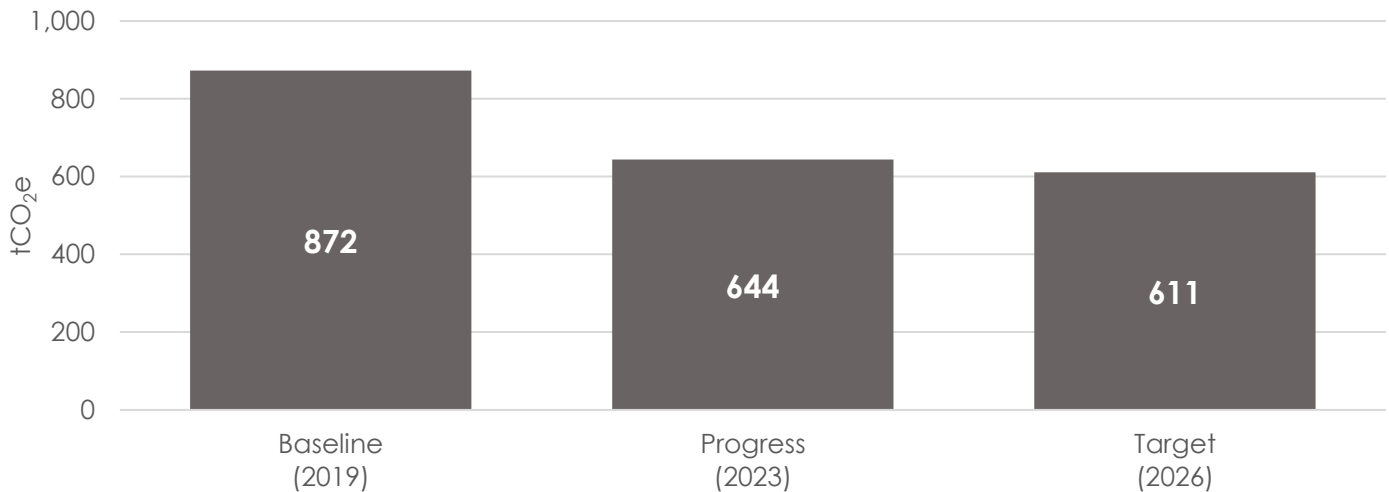
PNWTS has committed to reduce its total footprint (scope 1, 2 and 3 emissions) 30% by 2026 (611 tCO₂e) and 50% by 2030 (436 tCO₂e), from the 2019 baseline level. In 2023, emissions decreased by 26% over the baseline.

Top Emissions Sources

Emissions Source	Baseline (2019)	Progress (2023)	Change Since Baseline
 Refrigerants	tCO ₂ e 110	tCO ₂ e 260	tCO ₂ e +150
 Fuel Use	tCO ₂ e 757	tCO ₂ e 268	tCO ₂ e -489

Overall Progress

Emissions

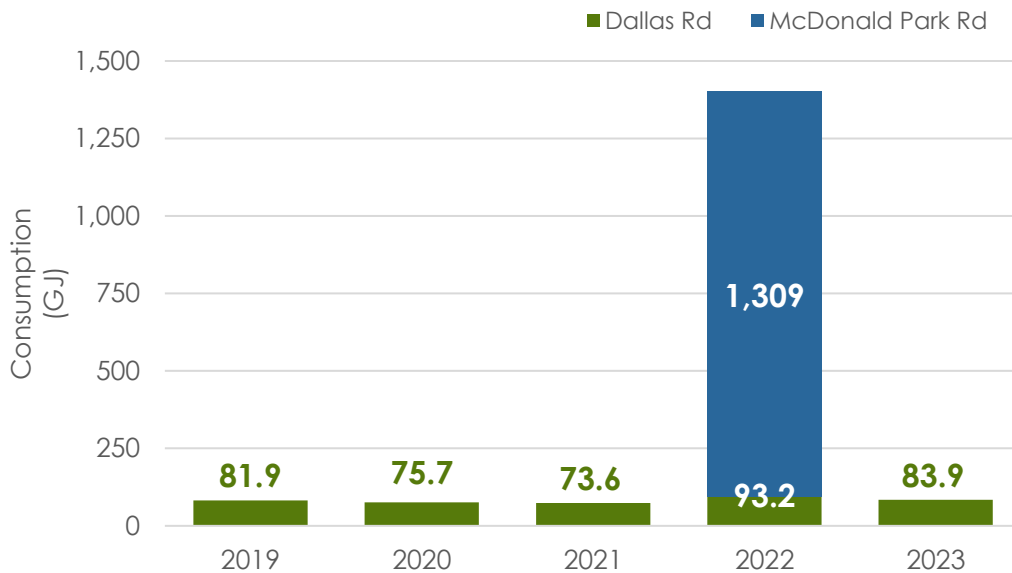


Notes on Targets

PNWTS has committed to reducing its total footprint 30% by 2026 and 50% by 2030 over the 2019 baseline. The total footprint in 2023 resulted in a reduction of 26% of total emissions in comparison to the 2019 baseline. PNWTS has continual plans to upgrade its fleet in order to reduce these emission sources, specifically refrigerant use. This action has resulted in a 47% decrease in refrigerants emissions from 2022, a factor in the progress made towards achieving the identified target. PNWTS is exploring zero-emission bus technology, which will be instrumental in further reducing fuel emissions.

Natural Gas

Natural Gas Consumption



Analysis

Natural gas use for 2023 totaled 4.27 tCO₂e, 0.6% of PNWTS' total footprint. Consumption at the primary office on Dallas Road decreased by 10% from the previous year.

Natural gas consumption underwent a significant change, as the warehouse previously leased under PNWTS is no longer included in the inventory, causing the significant reduction in emissions.

* Note: The McDonald Park Rd. warehouse was leased during the 2022 reporting period. The ownership of the warehouse has been removed from PNWTS in 2023.

tCO₂e **4.27**

% of Total **0.7%**

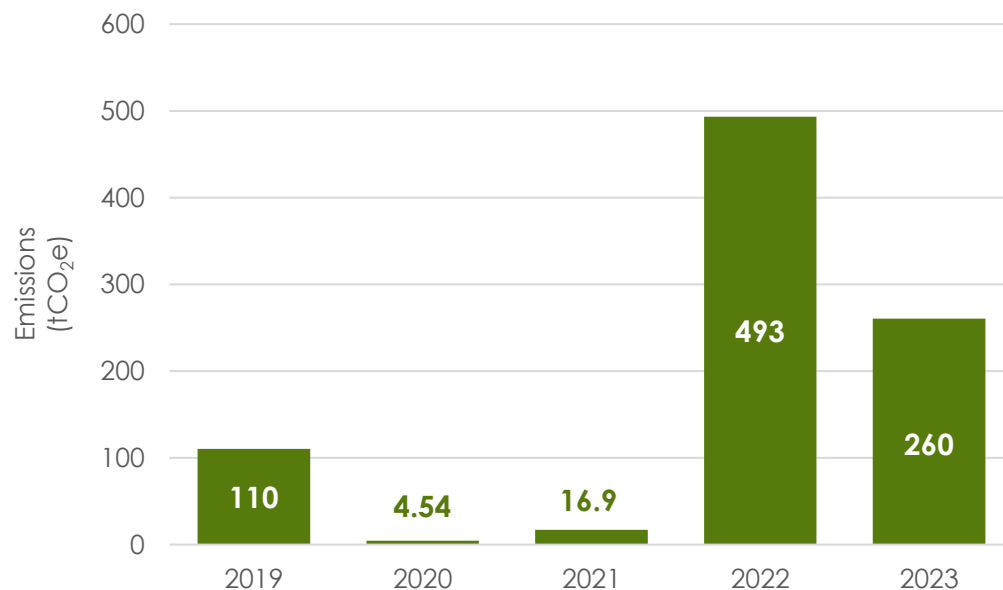
GJ/ft² **0.07**



0.95
Houses

Refrigerants

Refrigerants Usage



Analysis

Refrigerant usage in 2023 totaled to 442 lbs, representing a 42% decrease from 2022, and a 160% increase over the 2019 baseline.

The refrigerant type used by PNWTS is HFC-134a, a commonly used refrigerant for vehicles that has a global warming potential (GWP) of 1,300. The GWP is used to calculate the emissions from refrigerant use, which came to 260 tCO₂e in 2023.

tCO₂e **260**

% of Total **40%**

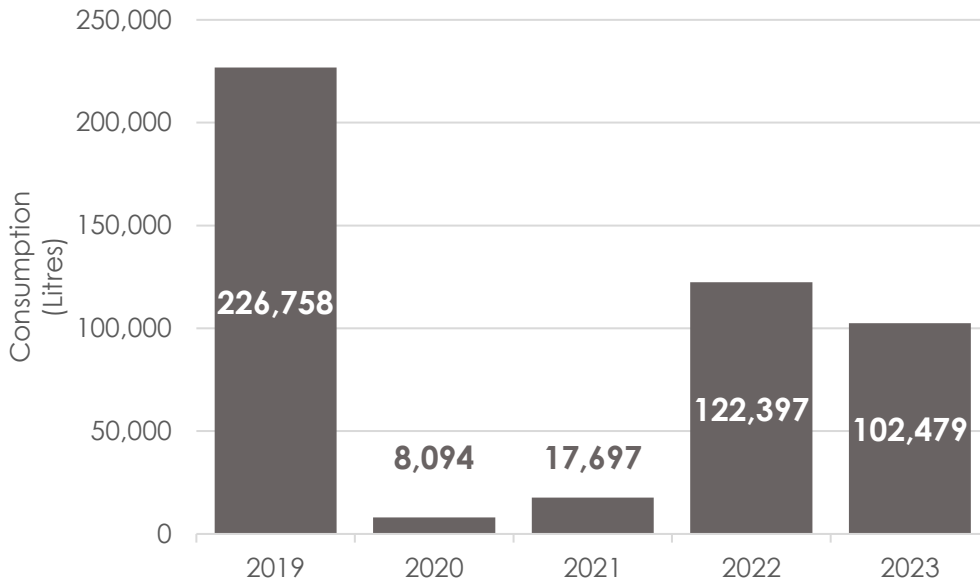
kg/ Bus **8.35**



822
Barrels of Oil

Diesel

Fuel Consumption - Coach



Analysis

Diesel fuel consumption is the primary emission source for PNWTS, totaling to 268 tCO₂e in 2023. Diesel consumption has decreased by 16% when compared to 2022, and by 55% since the baseline year.

Well-to-tank (WTT) emissions have been included in PNWTS' inventory to enable a more accurate depiction of the total emissions, accounting for 9.4% of the total footprint.

tCO₂e **268**

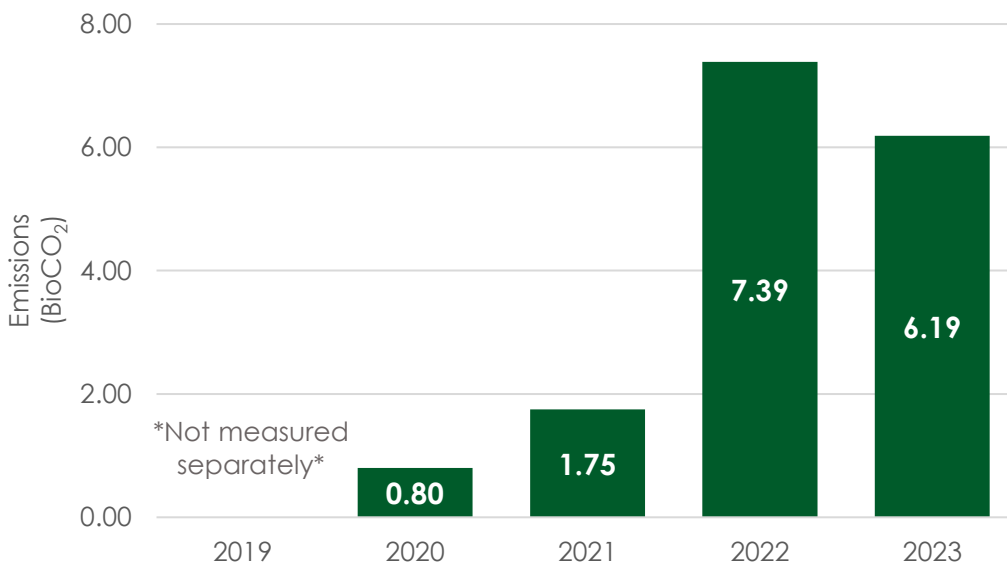
% of Total **42%**

Litres / Bus **4,270**

Well-to-Tank **64.7** tCO₂e

Biogenic CO₂

Biogenic Carbon



Analysis

Biogenic emissions occur as a result of mandatory renewable fuel content in all diesel sold in B.C. (4% minimum). PNWTS' 2023 biogenic carbon emissions totaled 6.19 tBioCO₂, a 16% decrease from 2022. Biogenic carbon accounted for 0.9% of the total footprint in 2023.

Biogenic emissions are reported outside of scopes 1-3 and do not require offsetting.

* Note: Changes in reporting requirements for biogenic carbon mean that these emissions are now reported separately. 2019 biogenic emissions were included in total scope 1 fuel emissions.

Bio-tCO₂ **6.19**

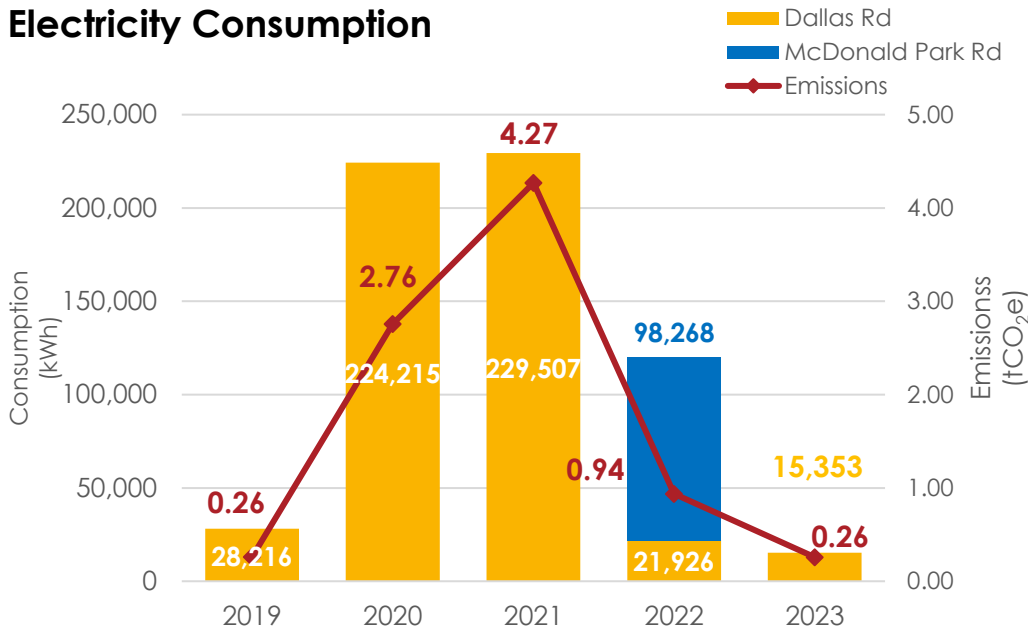
% of Total **1.0%**

tBioCO₂ / Bus **0.26**

 **0.60** Cars / Year

Electricity

Electricity Consumption



Analysis

Electricity consumption in 2023 decreased by 87%, compared to 2022 levels. This reduction in emissions can be attributed to a change in leasing agreements, as the McDonald Park warehouse is no longer leased under PNWTS, significantly changing the scope of reporting in 2023.

At the Dallas Road building specifically, consumption decreased by 30% compared to 2022.

*Note: PNWTS began measuring electricity consumption with a separate meter in 2022, improving the accuracy of consumption totals at the main office building.

tCO₂e **0.26**

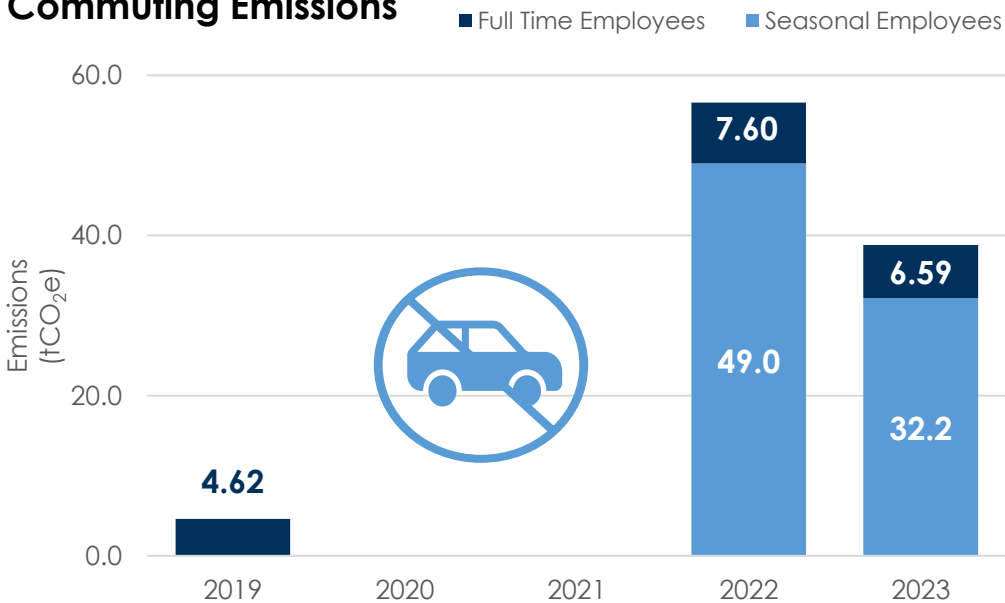
% of Total **0.04%**

kWh / ft² **13.0**

T&D Losses **0.02**
tCO₂e

Employee Commuting

Commuting Emissions



Overview

Staff commuting emissions represents the highest scope 3 emissions source, totaling to 38.4 tCO₂e in 2023. Seasonal employees accounted for 83% of commuting emissions, as 78 of PNWTS' 87 employees work seasonally.

2023 is the second year of measuring commuting emissions after the COVID-19 pandemic affected commuting patterns.

tCO₂e **38.4**

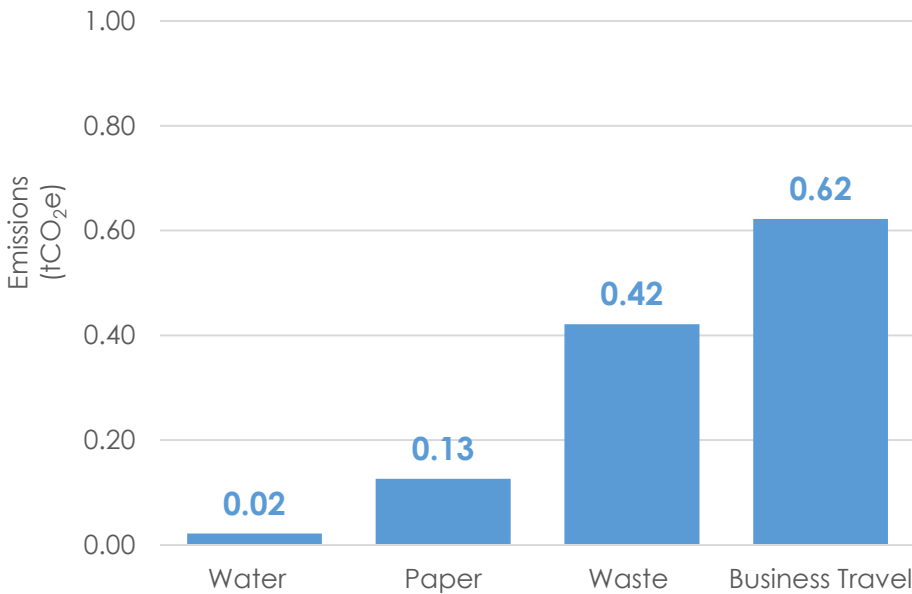
% of Total **6.0%**

tCO₂e / FTE **0.44**

 **3.70**
Cars / Year

Scope 3

Emissions by Activity



Overview

In 2023, the scope 3 emission sources displayed below accounted for 0.2% of the total footprint. In total, scope 3 emissions totaled to 21% of the total footprint, with staff commuting and fuel and energy activities representing the largest emissions sources within scope 3.

Paper consumption is the only emissions source that increased in 2023, as water, waste, and travel all decreased in emissions from the previous inventory. These emissions represented 4.63 tCO₂e in 2022, which has decreased to 1.19 tCO₂e this year.

Notable Reductions

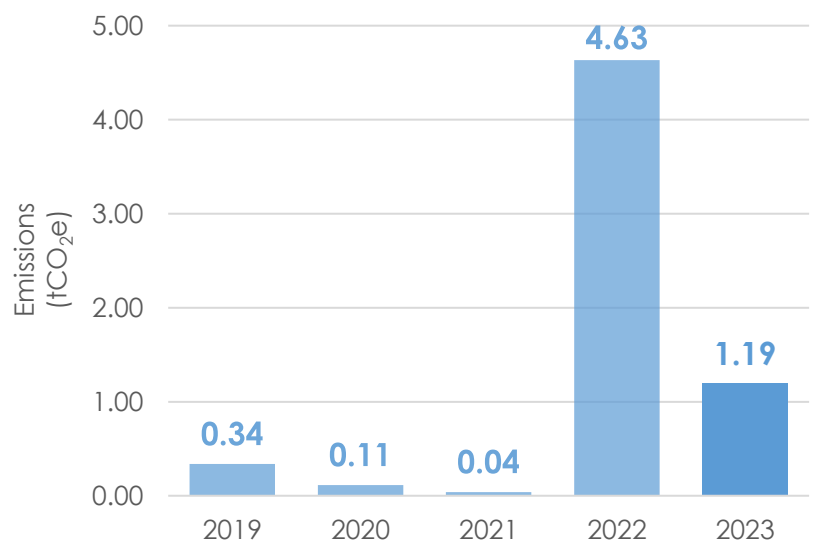
Water consumption saw a significant reduction of 84% in comparison to consumption from 2022. Additionally, emissions generated from business travel also saw a substantial reduction by 83% in comparison to 2022, which is the first year business travel was recorded.

Analysis

There are notable omissions from historical inventories for PNWTS, some of which are due to the COVID-19 pandemic. Water consumption was not recorded in 2019, paper consumption was not recorded in 2020 and 2021, with waste and travel data being captured in 2022 for the first time. Considering this context, the decrease of 3.44 tCO₂e in 2023 reveals impressive reductions within scope 3.

A notable reduction within these categories came from waste, as the diversion rate improved to 55%, and waste generation decreased by 335 kg from 2022.

Scope 3 Yearly Comparison



* Note: The emissions factor for waste has increased significantly due to improved methodology for measuring the waste emissions. Due to this change, the emissions from waste in 2022 may increase.

tCO₂e **1.19**

% of Total **0.2%**



3.53
Trees / Year



55%
Diversion Rate

Conclusion

2023 marks the fifth year that PNWTS has measured, reported, and offset its carbon emissions.

Overall emissions in 2023 totaled 644 tCO₂e, 26% lower than the 2019 baseline. The two largest emissions sources continue to be diesel fuel and refrigerants. However, both of these scope 1 emissions sources saw reductions in 2023, as diesel fuel consumption decreased by 16%, and refrigerant usage was reduced by 42%, well done! Natural gas and electricity also saw reductions, largely due to a change in leasing structure, as the warehouse is no longer leased by PNWTS. Scope 3 emissions combined contributed 16% of the total footprint.

To reduce future emissions, PNWTS should continue exploring strategies to reduce staff commuting emissions, and continue to explore opportunities for low-fuel options for the fleet of buses.

Achievements

- Measured, reported, and offset emissions for the fifth year
- Reduced total emissions by 38% compared to last year's inventory (2022)
- Achieved reductions in all scope 1 and 2 emissions sources
- Achieved a reduction in overall emissions even with the change in scope 3 inventory practices

Moving Forward

- Continue to measure and report carbon emissions
- When purchasing new buses in the future, identify options that use the R1234YF refrigerant type, due to its global warming potential (GWP), which is around 1, compared to a GWP of 1300 with HFC-134a
- Implement a waste reduction strategy to improve the waste diversion rate and implement composting on site

Data Collection & Methodologies

Emission Source	Data Type	Data Quality	Notes
Natural Gas	Account Summary	Very Good	Ideal Data Source
Diesel	Invoices	Very Good	Invoices and Summary Spreadsheet
Refrigerants	Invoices	Very Good	Invoices and Summary Spreadsheet
Electricity	Account Summary	Very Good	Ideal Data Source
Water	Account Summary	Very Good	Ideal Data Source
Paper	Invoices	Very Good	Ideal Data Source
Waste	Invoices	Good	Invoices from Tymac provided
Travel	Account Summary	Very Good	Travel Tracking Worksheet
Commuting	Staff Survey	Good	Third party staff survey conducted

Information on Inventory Uncertainty

* Staff commuting emissions are estimated based on a survey conducted from a separate, internal project which researched staff commuting habits. The results from this survey have been implemented to represent staff commuting during the current reporting period.

Emissions References

- 2023 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions
https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/methodology/2023_pso_methodology_for_quantifying_greenhouse_gas_emissions.pdf
- Environment Canada's National Inventory Report (1990-2021); Part 2 & 3.
<https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/inventory.html>
- Department for Environment, Food & Rural Affairs (UK) Carbon Factors 2023
<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023>
- Intergovernmental Panel on Climate Change (Global Warming Potentials)
http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

All emissions factors are reviewed and approved by Ostrom Climate Solutions (<https://ostromclimate.com/>) on an annual basis.

Policy for Base Year Recalculation:

Base year emissions, and other previous emissions, shall be retroactively recalculated if a change in organizational structure or data quality is expected to exceed a significance threshold of 10% of base year emissions. These changes may arise from structural changes such as mergers, acquisitions, divestments, outsourcing or insourcing, changes in calculation methodology and improvements in accuracy, or discovery of significant errors.

Glossary of Terms

Term	Description
Carbon Neutral	Companies are carbon neutral when they remove GHG emissions equivalent to all their scope 1, 2 and material (>5%) scope 3 emissions, usually by purchasing carbon offsets.
Biogenic	Carbon emissions generated from sources naturally occurring in the carbon cycle (i.e. organic matter), rather than the result of fossil fuel combustion.
Emissions Factor	The volume of emissions created by an emissions producing activity (i.e. fuel combustion), calculated based on the amount of the activity (volume, distance, etc.).
GHG	Greenhouse Gas (emissions): Atmospheric gasses contributing to the greenhouse effect, including Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O), etc.
GJ	Gigajoule: Unit of natural gas equal to 26.137 m ³ or 0.947 MMBtu
Net-Zero	Companies with a zero-emission carbon footprint, usually achieved by minimizing outputs and negating the remaining emissions through carbon removal activities.
psg-km	Passenger-Kilometer: Unit separating total emissions between passengers per km
tCO ₂ e	Tonnes of Carbon Dioxide Equivalent: a combined term capturing the emissions from various GHGs.
T&D Losses	Transportation & Distribution Losses: The estimated share of electricity that is lost during the transmission from the power generation site to the consumer.
WTT	Well to Tank: The lifecycle impact of fuel generation, including extraction, processing, transportation and distribution.

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