

2021 CARBON REPORT

THE GREENHOUSE GAS (GHG) JOURNEY
OF A TYPICAL MAIL PIECE



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Note: This study was commissioned by Prime Data, who was acquired by AIM in July 2022.

INTRODUCTION

I don't think I'm alone when I say that I'm having trouble taking action on climate change because I don't understand how my life and work really affect it. To better understand some of the core greenhouse gas (GHG) emission sources in my business, I commissioned this study by Luke Battock after hearing about his work calculating the GHG emissions for a town's operations in Nova Scotia. I asked him to focus on the core work we do, which is a fairly simple letter into an envelope with a reply envelope, often used by charitable organizations to fundraise. We produce millions of these each year and I thought that many of these organizations would be curious about the outcomes of the study as well.

Our research is not the final word but an opening of the conversation, offering perspective into the various sources of greenhouse gasses in the direct mail business. We hope to inspire dialogue on this subject and enhance our collective understanding of these issues.

I encourage readers who want to stay abreast of direct mail industry environmental issues to join the Sustainable Mail Group www.sustainablemailgroup.ca, and also on LinkedIn, where you will participate in a community of mail industry participants with similar interests.

For more detailed information about methodology and reference to the calculations, please see the appendix. I also welcome questions and feedback which you can address to sfalk@aiim.com.



Steve Falk
VP, Partnerships
& Sustainability,
AIIM

Note: This study was commissioned by Prime Data, who was acquired by AIIM in July 2022.

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- **What steps can be taken to reduce the GHG emissions of direct mail?**
A practical approach to assessing your choices when choosing paper, print and the use cases of direct mail.
- **What could we do in a year to lower the GHG emissions of our work?** Prime Data takes on the challenge of lowering in-plant emissions and providing lower emissions options to it's clients and assesses the impact after 12 months.

SUSTAINABILITY



Author: Luke Battcock

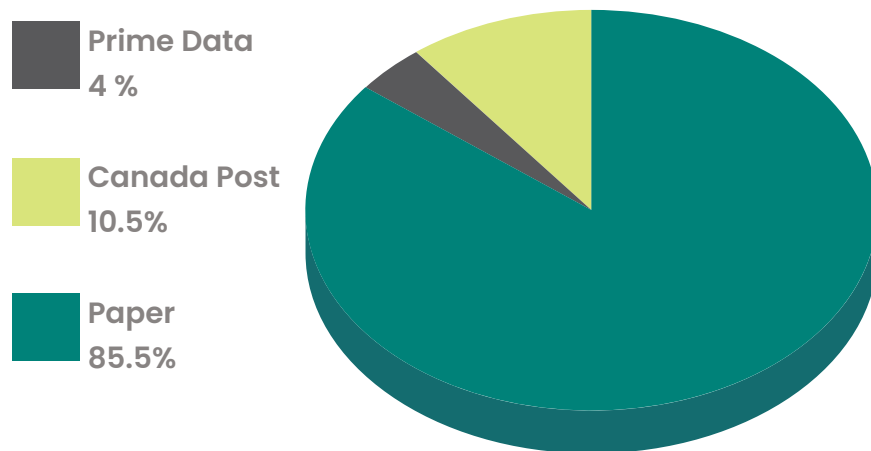
Prime Data (an AIMM company) was curious about the sustainability of their mailouts, so I worked with them to learn more about this crucial issue. Here's a quick glimpse at what we found out:

We divided the mail journey into three sections and assessed the emissions of each. We found that a mail piece sent by Prime Data generates an average GHG footprint of ~205g. Interestingly, these emissions result from the journey of a mail piece weighing an average of only 20g. This estimate includes the emissions from throughout the entire lifespan of the mail piece, including forestry, paper production, employee commute, printing, distribution, and end-of-life processing.

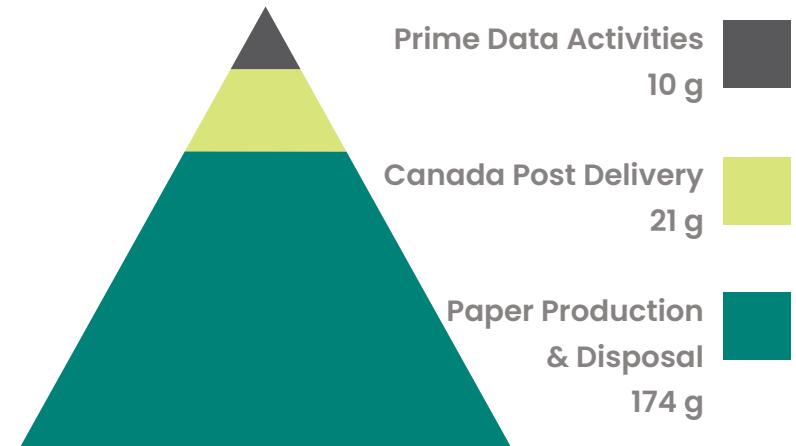
For comparison, 205g is the equivalent of driving about 830m in an average passenger vehicle or charging your smartphone 25 times. It takes approximately 4,880 letters to emit 1 tonne of GHG, the equivalent stored by 1.2 acres of forest in a year¹.

GREENHOUSE GAS FOOTPRINT PER MAIL PIECE SENT BY PRIME DATA

Percentage By Source



Weight By Source



¹ Environmental Protection Agency. (2021, March). Greenhouse Gas Equivalencies Calculator. Retrieved from <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



Our estimates are specific to the paper and production practices used by Prime Data, whose 2019 operations emitted a total of 197 tonnes of CO2 equivalent, or 10g per mail piece.

Here are some immediate actions they're exploring to reduce their carbon footprint:

Paper selection

Increasing recycled paper usage strongly reduces emissions.

Energy efficiency

Promoting energy efficiency in the warehouse addresses one of the largest sources of GHG emissions at Prime Data's facilities by reducing gas burned.

Commute times

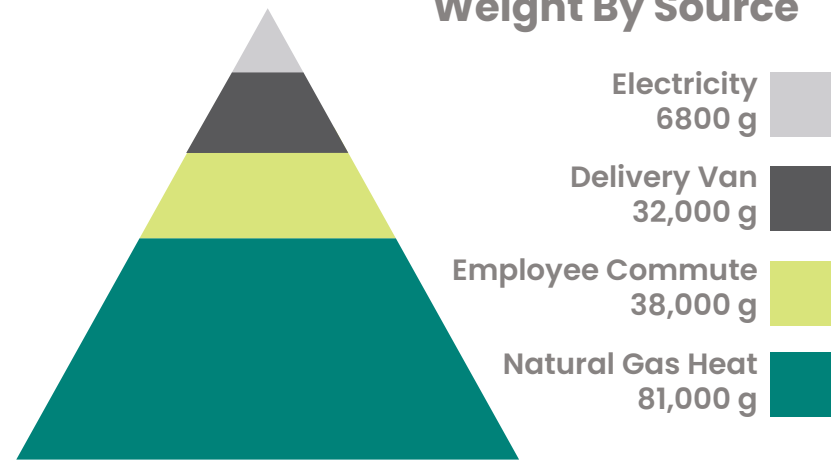
Working online has significantly reduced emissions from employee commutes, and a hybrid work model going forward can help maintain this reduction.

Offset Credits

In addition to reduction efforts, Prime Data is exploring offset options for their operational emissions and those induced by their mailing activities.

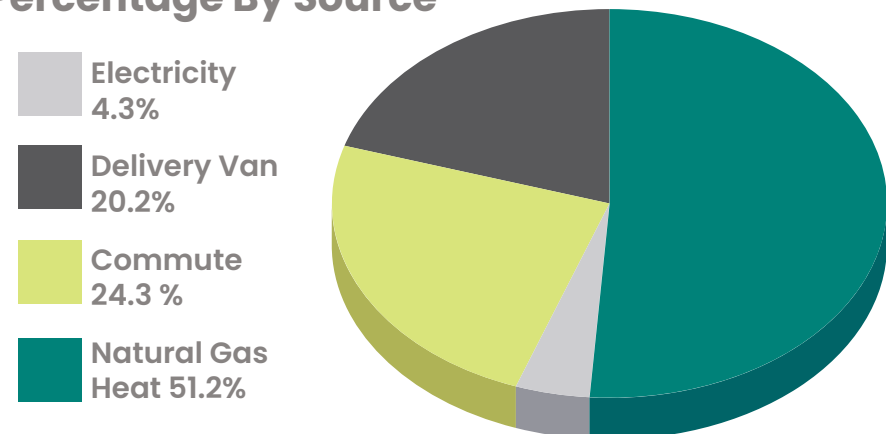
PRIME DATA OPERATIONS FOOTPRINT

Weight By Source



PRIME DATA EMISSIONS BREAKDOWN

Percentage By Source



ABOUT THE AUTHOR

Research, calculations, and reporting were conducted by Luke Battcock, an energy and emissions consultant who has previously worked on greenhouse gas inventories for municipalities in Nova Scotia. The work is a culmination of his interest in climate action and a data-oriented approach to understanding, communicating, and acting on emissions reduction. Luke is passionate about helping organizations understand an accurate picture of their emissions portfolio and informing strategic decision-making to reduce carbon footprints.

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APPENDIX A: METHODOLOGY



Author's note: This appendix explains the decisions made in producing the calculations and results of this report. Given that this is one of the first estimates produced for emissions across the entire journey of a mail piece, we had to make some assumptions and compromises to move the process forward. Unless otherwise noted, all referenced data is from 2019 to capture a more regular portrait of emissions before the impact of pandemic business disruptions. All emissions factors include the values for methane and nitrous oxide converted to carbon dioxide equivalents before calculation. If you have questions about this methodology or richer information to provide, we would love to hear from you to improve our process. It will be an ongoing journey to perfect this reporting. We regard this report as a crucial first step to advance conversations and our collective understanding of mail industry emissions and sustainability solutions.

PAPER EMISSIONS

Using the weight and recycled content of paper used annually by Prime Data generated emissions estimates using the Environmental Paper Network Paper Calculator Version 4.0.1 These estimates include emissions generated throughout the paper lifecycle from forestry harvesting to the end of life disposal/recycling.² Although the type of paper, particularly envelopes, used for specific print jobs may vary, for the sake of this reporting, we assumed the same stock as Prime Data's average paper mix.

PRIME DATA EMISSIONS

Stationary Energy

To calculate stationary energy emissions the quantities of electricity and natural gas consumed at Prime Data's facilities were multiplied by their respective provincial emissions factors (30g Co₂_eq/Kwh)³ and (~1898g Co₂_eq/m³).⁴



Employee Commute

To calculate Prime Data’s emissions generated by commuting, the company distributed an anonymous employee survey asking about 2019 transportation habits and used that to model the emissions from the 30 out of 35 employees who drive to work. The survey asked how many days per week employees drove, took transit, used active transportation, and telecommuted to work. It also asked for commute distance, the vehicle make/model/year, and carpooling details. A Natural Resources Canada tool produced average fuel economy based on vehicle information.⁵ Fuel consumption was calculated by multiplying commute distance and driving frequency by fuel economy. The annual fuel consumption was multiplied by the emissions factor for gasoline (~2315 g Co₂_eq/L)⁶ to produce GHG emissions.

Sample Employee Commute Calculation

Car Details	Drive to Work?	Commute Distance (km)	Carpool ?	Annual Drive Days	Annual Distance (km)	Av. Fuel Economy (L/100km)	Fuel Consumed (L)	Emissions (Kg CO ₂ _eq)
2014 RAV 4 Toyota	5 days/ week	8	No	260	2080	8.9	185.12	429

Delivery Truck

Prime Data contracts a five-tonne truck to transport mail from its facility to the Canada Post centre, a daily journey of ~64 km. The daily distance was multiplied by 1.5 to account for extra induced travel distance, and the multiple orders picked up on the route. The calculated daily travel distance of ~96km was scaled into a yearly value and multiplied by the average fuel economy provided by the courier company (~47 L/100km) to calculate fuel consumed. The annual fuel consumption was then multiplied by the average emissions factor for Heavy-duty Diesel Vehicles (~2711g Co₂_eq/L)⁷ to produce GHG emissions.

CANADA POST EMISSIONS

Canada Post emissions estimates were calculated using a weight distribution method assuming a reasonable connection between delivery weight and emissions generation. In 2019, Canada Post delivered 7.9 billion mail items: 320 million parcels and 7.58 billion mail pieces.⁸



We estimated an average parcel weight of 1kg and an average letter weight of 20g. The letter weight estimation reflects average information from Prime Data. The parcel estimation was produced based on a survey identifying 71% of parcels weighing 1kg or less.⁹ Canada Post was unable to provide average weight information, so we estimated parcel weight based on international delivery averages.

Based on our estimates, Canada Post delivered 471,600 tonnes of delivery weight in 2019 (151,000 tonnes letters & 320,000 tonnes parcels), while emitting 502,600 tonnes of GHG.¹⁰ These figures generated an average ratio of 1.066kg Co₂_eq per kg of delivery weight sent through Canada Post. Multiplying the average letter weight of 0.02 kg by the emissions to delivery weight ratio calculates average emissions of 21.31g Co₂_eq per mail piece sent through Canada Post.

Weight figures have a significant impact on our calculations, so selecting accurate numbers is important. Heavier average parcel weight reduces the GHG impact for mail in our calculations. In selecting a weight-based estimation method, these and other factors may influence our outcomes. We did not account for the variance in emissions generated by different transportation methods, such as the rushing of mail by air or geographical variance. Since parcels rushed more frequently than mail, they may account for a larger share of the overall emissions at Canada Post than we have estimated. We have endeavoured to make conscious decisions so that if these or other factors cause any discrepancy in our calculations, we will have overestimated our mailing footprint rather than under-estimated it. Doing so increases the likelihood that our calculations will accurately inform impactful emissions reduction and offsetting efforts.

OFFSET COSTS

The price to offset emissions generated by Prime Data and its mailing activities was calculated based on an average offset price per tonne of \$24.25. This price was calculated from a sample of "Strong Performing" offset vendors as identified in the report *Purchasing Carbon Offsets: A Guide for Canadian Consumers, Businesses, and Organizations* published by the David Suzuki foundation & Pembina institute.¹¹

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APPENDIX B: CALCULATIONS



PAPER EMISSIONS CALCULATIONS	
Prime Data Paper Use	
80% Husky Opaque (0% recycled)	312,000
20% Roland Hightech (30% recycled)	78,000
Total Prime Data Paper Use	390,000 kg
Emissions Data (kg CO2_Eq)	
Husky Opaque	2,803,201
Roland Hitech	580,598
Total Prime Data Paper Emissions	3,383,799
Emissions per Mail Piece (kg CO2_Eq)	
Emissions per piece of mail	0.1735 (173.53 g)
Emissions per million pieces	173,528



2019 PRIME DATA "IN-PLANT" EMISSIONS TOTALS	
Emissions Data	(kg CO2_Eq)
Natural Gas Heat	80,584
Electricity	6,804
<i>Total Stationary Emissions</i>	<i>87,388</i>
Employee Commute	38,317
Delivery Van	31,837
<i>Total Transportation Emissions</i>	<i>70,155</i>
Total Prime Data Emissions	157,542



2019 Emissions Calculations						
	Prime Data – 2019			Canada Post – 2019		
Delivery Data	Deliveries	Avg. Wt. (kg)	Wt. Delivered (kg)	Deliveries	Avg. Wt. (kg)	Wt. Delivered (kg)
Mail Sample	19,500,000	0.02	390,000	7,580,000,000	0.02	151,600,000
Parcels	0	0	0	320,000,000	1.00	320,000,000
Total	19,500,000		390,000	7,900,000,000		471,600,000
Emissions Data	(kg CO2_Eq)			(kg CO2_Eq)		
Total GHG Emissions	157,542			502,600,000		
Emissions/kg delivery weight	0.404			1.066		
Emissions per Mail Piece	(kg CO2_Eq)			(kg CO2_Eq)		
Emissions/piece of mail	0.0081 (8.08g)			0.021 (21.31g)		
Emissions/million pieces of mail	8,079			21,315		



Lifecycle Emissions for Mail Sent Through Prime Data

Emissions Per Mail Piece	Per Piece (kg CO₂_Eq)	Per Million Pcs (kg CO₂_Eq)
Paper Production & Disposal	0.174	173,528
Prime Data Activities	0.008	8,079
Canada Post Delivery	0.021	21,315
Total Emissions per mail piece	0.203 (204.95g)	202,922

Offset Cost for Mail Sent Through Prime Data

	Offset Cost/single piece	Total offset cost/million pcs
Paper Production & Disposal	\$0.004	\$4,208
Prime Data Activities	\$0.0002	\$196
Canada Post Delivery	\$0.001	\$517
Total Offset Cost per Mail Piece	\$0.005 (half a cent)	\$4,921