Estimating the Carbon Footprint of Canada's Audio-Visual Sector

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Report
commissioned by:

TELEFILM CANADA PARTNER OF CHOICE

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Executive Summary

The purpose of this report is to provide an initial understanding of the total annual emissions from Canadian-funded film and TV content. This collaborative report, commissioned by Telefilm Canada (Telefilm) as part of its efforts in Phase 1 of its *Eco-responsibility Action Plan 2021-2023,* aims to raise awareness of production impacts and build capacity for sustainability in the Canadian film and TV industry.[1] This report achieves that purpose by providing unique findings and insights applicable to Canadian industry production methods.

A total of 22 productions who voluntarily participated were **engaged between the spring of 2022 to spring 2023** and, following training, provided production activity information to calculate their carbon footprint. Based on CMPA's Profile 2022 report[2], these productions were generally representative of content creation across Canada, spanning various budget sizes, regions, genres, and formats. Footprint results were aggregated to provide insights on high-emissions activities and extrapolated using production volumes from *Profile 2022* to estimate emissions from the Canadian film and TV industry at large.

Emissions from these study productions averaged 28 t CO_2e[3] per hour of content, equivalent to the annual emissions from 8.6 passenger vehicles, or the energy use of 6.6 homes[4] (Figure 1).

Travel and Transport was found to be the highest source of emissions (58%) for Canadian productions, primarily due to the use of gas-powered vehicles. Road transportation, in particular, contributed more to the average total production footprint as compared to other global production regions, such as the USA or UK. Travel and Transport remained the largest emissions source regardless of budget, genre, region or format, thereby highlighting that transportation is a key focus area for Canadian productions to reduce emissions. The consumption of Materials was the second biggest emissions source for Canadian productions at 23%, with food and textiles being the primary contributors.

The production of fiction content had significantly higher emissions per hour compared to other genres. Relatedly, scripted content filming on both location and in studio had higher emissions compared to other formats.

An analysis of emissions intensity on feature films revealed a positive relationship between total emissions and budget, notably as budgets increased so did total emissions. Data revealed an emissions average of 2 t CO_2e per $100,000 spent and aligns with estimated emissions per spend noted by the Sustainable Production Alliance.[5] **Results suggest that the primary issue is not higher budgets, but rather how to spend money on lower carbon intensive products and services.**

[1] Telefilm Canada. *Eco-Responsibility Action Plan 2021-2023 | PHASE 1 – December 2021*. Accessed Oct 11, 2023 from https://telefilm.ca/en/who-we-are/our-engagement/environmental-sustainability

[2] Canadian Media Producers Association (CMPA). *Profile 2022*. Accessed Oct 11, 2023 from https://cmpa.ca/profile/

[3] Metric tonnes of carbon dioxide equivalent

[4] Emissions equivalencies determined using the NRCAN Greenhouse Gas Equivalencies Calculator.

[5] Sustainable Production Alliance. *Close up: Carbon Emissions of Film and Television Production*. March 2021. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

Opportunities and recommendations to reduce emissions on Canadian productions include:

- Reducing total emissions by decoupling budget spend from high emissions sources, such as gas-powered vehicles. This is achieved by applying a sustainability lens to the budget during early planning and preparation phases, so the default shifts to a mindset of spending money on lower emitting choices **first.**

- **Transportation**: crew and materials do not require fuel, what they need is the capacity to move around.
    - Engage with vendors to provide electric vehicle rentals where budgets and availability allow
    - Prioritise EVs and hybrids vehicles in high-frequency transportation departments
    - Choose and limit locations strategically to reduce trips
    - Plan to carpool and provide shuttles to reduce individual vehicle travel;
    - Right size vehicles to the activity;
    - Use available, local crew members, cast and/or equipment already based in selected locations.

- **Materials**: establish a reduction goal and consult reuse centres, consignment stores, other productions (peers) and rental opportunities before purchasing any new materials.
    - Prioritise selling, donating or upcycling materials before adding to the waste stream

- **Food**: use the existing budget to prioritise locally grown, in season and/or low carbon plant-based protein meals, with animal protein as a secondary option where/if needed;

Finally, study results were projected onto the larger volume of Canadian productions in order to estimate the total carbon footprint of Canadian-funded audio-visual content. Using a 3-year production volume averaged from CMPA's Profile reports[6], **the total annual carbon footprint was estimated at 7,126 t CO_2e for Canadian Feature Film production (Figure 10), and 260,843 t CO_2e for Canadian TV Series** (equivalent to 1,669 and 61,087 homes' energy use for a year, respectively).

Importantly, opportunities exist today to pursue efforts that can be applied in the near term to reduce emissions from road transportation, air travel, and material consumption. With better planning, knowledge sharing of impacts as well as opportunities to implement sustainable practices, meaningful change can occur within a short timeframe.

[6] Three-year production volumes were averaged using *CMPA's Profile* data from 2018/19, 2019/20 and 2021/22

Introduction

The film and television industry is in the midst of a transformative sustainability journey, both in Canada and globally. Industry awareness of the cumulative environmental impact of certain production practices is increasing. In turn, this increased attention is fostering momentum and collaborative efforts aimed at transitioning towards more sustainable, future-fit storytelling and content creation practices.

In recent years, the conversation around sustainable production practices has largely focused on the industry's Scope 1 and 2 carbon emissions, with discussions largely informed by industry- specific carbon emissions reports released in 2020 and 2021. Notably, reports by the USA's Sustainable Production Alliance[7], the United Kingdom's albert[8], and France's Ecoprod[9], found that over 50% of emissions from production activities could be attributed to fuel consumption. Of this proportion, 70% was attributed to road transportation, and 30% to generator use.

These reports have sparked needed discussion and action amongst audio-visual stakeholders in Canada and abroad, yet these aggregated findings did not necessarily reflect the reality of the Canadian audio-visual sector. Feedback captured from Telefilm Canada's (Telefilm) *2022 Eco-Awareness Survey*[10], for instance, highlighted the need to better understand sustainable production from a holistic perspective that includes regional differences, financial challenges, training opportunities in Canada. Hence, this research would help inform tangible next steps for Canadian production by clarifying which practices contributed most significantly to carbon emissions, in what manner, and if these varied by region, genre or budget.

[7] Sustainable Production Alliance. *Close up: Carbon Emissions of Film and Television Production*. March 2021. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

[8] Albert. *Screen New Deal*. July 2020. Accessed Oct 11, 2023 from https://wearealbert.org/2020/07/22/screen-new-deal/

[9] Ecoprod. *Study: Environment & Climate: New Challenges for the Audiovisual Industry*. November 2020. Accessed November 14, 2022 from https://www.ecoprod.com/fr/agenda/agenda-ecoprod/1258-etude-environnement-et-climat-de-nouveaux-enseignements-pour-les-acteurs-audiovisuels

[10] Telefilm Canada. *Telefilm Canada releases its Eco-Awareness Survey Report*, September 2022. Accessed August 28, 2023.

In March 2022, Telefilm commissioned research related to assessing the carbon footprint of the Canadian audio-visual industry, specifically by helping to establish an initial measurement, via case studies, of content production. Research objectives were:

- to establish a preliminary assessment of the carbon emissions profile of select Canadian film and TV productions,
- to understand the primary contributing factors to these emissions,
- to use and apply the data to the broader Canadian audio-visual sector to establish an initial picture on the cumulative size and scope of sector emissions in the country, as well as potential insights related to budget, genre or region,
- to contribute to the sustainable production conversation,
- to help identify and prioritise next steps for action for relevant industry stakeholders, as well as further research, and
- to help productions contributing to this research to learn carbon calculation skills and to begin adopting sustainable production practices.

Methodology

Study Productions

Research was conducted from Spring 2022 - Spring 2023 and encompassed a total of 22 Canadian productions, notably:

- 15 feature films, 7 TV series (both scripted and unscripted)
- 144 content hours[11]
- Canada-wide regional representation in alignment with Canadian Media Producers Association (CMPA's) Profile 2022 regional production breakdown[12]
- All budget ranges included[13]

The sample size for feature films represents approximately 10% of all features produced in Canada in 2022, which facilitates a statistically meaningful discussion.

While available data from seven participating television series productions are indicative of specific trends, practices and valuable insights, the sample size doesn't yet allow for a complete picture. Definitive conclusions are anticipated as more production data is added to this initial subset.

Table 1 provides a summary of the production genres that were included and excluded from this research. The scope of production genres could be expanded in any future national carbon accounting research as the use of carbon calculators for production continues to grow.

Table 1: Profile 2022 Production genres included and excluded from study data.

Genres Included	Genres Excluded
• Fiction • Documentary • Lifestyle & Human Interest • Variety & Performing Arts	• Broadcaster in-house productions • Children's and youth content • Animation • CMF Experimental Stream

[11] Crew sizes and total hours of production activity data were unavailable
[12] Using the regional breakdown from the CMPA's Profile 2022 – British Columbia, Prairie Provinces & Territories, Ontario, Québec, and Atlantic Canada.
[13] Using the budget range breakdown from the CMPA's Profile 2022 – Less than $1 million, $1-2.5 million, $2.5-5 million, and $5 million plus (all CAD).

Data Collection and Aggregation

Data provided for this report was volunteered by productions. Contributing productions completed a carbon footprint encompassing their production activities (Table 2)[14] in the albert carbon calculator tool - an industry specific tool developed in alignment with the Greenhouse Gas Protocol. Training and support on the albert tool, as well as data needs, and means of collection was provided by Green Spark Group, primarily during prep and prior to principal photography.[15]

Table 2: Production activity area and carbon footprint contributor description[16]

Production Activity	Scope 1, 2 and 3 Carbon footprint Metric
Non-filming Spaces	• energy consumption (electricity and fuel) • metered water consumption (if applicable)
Filming Spaces	• energy consumption (electricity and fuel) • metered water consumption (if applicable)
Travel & Transport	• vehicle fuel consumption and/or mileage by mode of transportation (including air, ferry, boat, rail, and ground transportation) • shipping weight, distance, and transportation mode
Accommodation	• number of room nights spent by accommodation type (including hotel scales and apartment or house rentals)
Materials	• amounts of new materials purchased across various categories (batteries, cardboard, food, glass, metal, paint, paper, plastics, textiles, and timber)
Disposal	• amounts of waste disposed by type and disposal method (e.g., mixed waste to landfill, mixed recycling, organics to composting)
Post-Production	• energy consumption (electricity, or benchmark by editing hours)

[14] For a detailed description of the albert Carbon Calculator factors, please see https://wearealbert.org/production-handbook/toolkit-methodology/. Accessed online 10/06/2023.

[15] Two productions submitted their data directly without external training.

[16] These production activities include Scope 1 (direct emissions), Scope 2 (emissions from purchased power) and Scope 3 (purchased materials, travel and waste management) in contrast with previous industry reports which primarily focused on Scope 1 and 2.

Green Spark Group assessed, categorised and compiled all data for quality assurance. There is a high degree of confidence in the data quality of the study productions as 81% of carbon emissions were estimated using exact data or GHG Protocol benchmarks. Remaining emissions were estimated based on available data and/or based on similar production activity. Each footprint was subsequently submitted to albert for audit.

Following the albert audit, final carbon footprint data was exported to a spreadsheet for aggregation and analysis. For two productions, a carbon footprint was completed using financial data. All information was anonymized, and no production details or data were shared with Telefilm.

Carbon footprint results were then aggregated and averaged across different focus criteria: budget, genre, region, and production format (Table 3) to assess whether distinct findings could be gleaned.

Table 3: Criteria for analysis for average results by budget, genre, region,[17] and format[18]

Category	Description
Budget Range (CAD)	• Less than $1 million • $1-2.5 million • $2.5-5 million • $5 million plus
Genre	• Fiction • Documentary • Lifestyle & Human Interest • Variety & Performing Arts
Region	• British Columbia • Prairie Provinces & Territories • Ontario • Québec • Atlantic Canada
Format	• Scripted (Location) • Scripted (Studio & Location) • Unscripted (Location) • Unscripted (Studio)

[17] Canadian Media Producers Association (CMPA). *Profile 2022*. Accessed Oct 11, 2023 from https://cmpa.ca/profile/

[18] These format types have been identified by albert as key factors for differences between carbon footprints of productions. Other formats also identified by albert were not represented in the study sample. See albert's 2020-21 Annual Review for other categories.

Results and Analysis: Study Productions

Average emissions for the 22 productions were standardised by hour of produced content.[19] This facilitates comparison and analysis. All emissions are in metric tonnes of carbon dioxide equivalent (t CO_2e). In order to glean distinct insights, emission results are provided below as follows:

- Average emissions estimates for all productions
- Average emissions intensity by budget
- Average emissions by genre
- Average emissions by region, and
- Average emissions by format

Average Emissions Estimates

While total emissions per production varied significantly due to the range of budgets and production methods:

- Average emissions across the 22 feature films and TV series amounted to **280 t CO_2e.**
- Average emissions per hour of content were **28 t CO_2e** (Figure 1), almost twice what the average Canadian person emits over the course of a year (15 t CO_2e per year).[20]
- Comparing results between feature films and TV series, the latter had both higher total emissions, as well as higher emissions per hour (Figure 2).

[19] This report normalises emissions per hour of content produced, future analysis may also include normalising by emissions intensity per day or production activity to facilitate comparison across all global regions.

[20] Statista. *Per capita carbon dioxide (CO_2) emissions from fossil fuels in Canada from 1970 to 2022*. Accessed Sep 20, 2023.

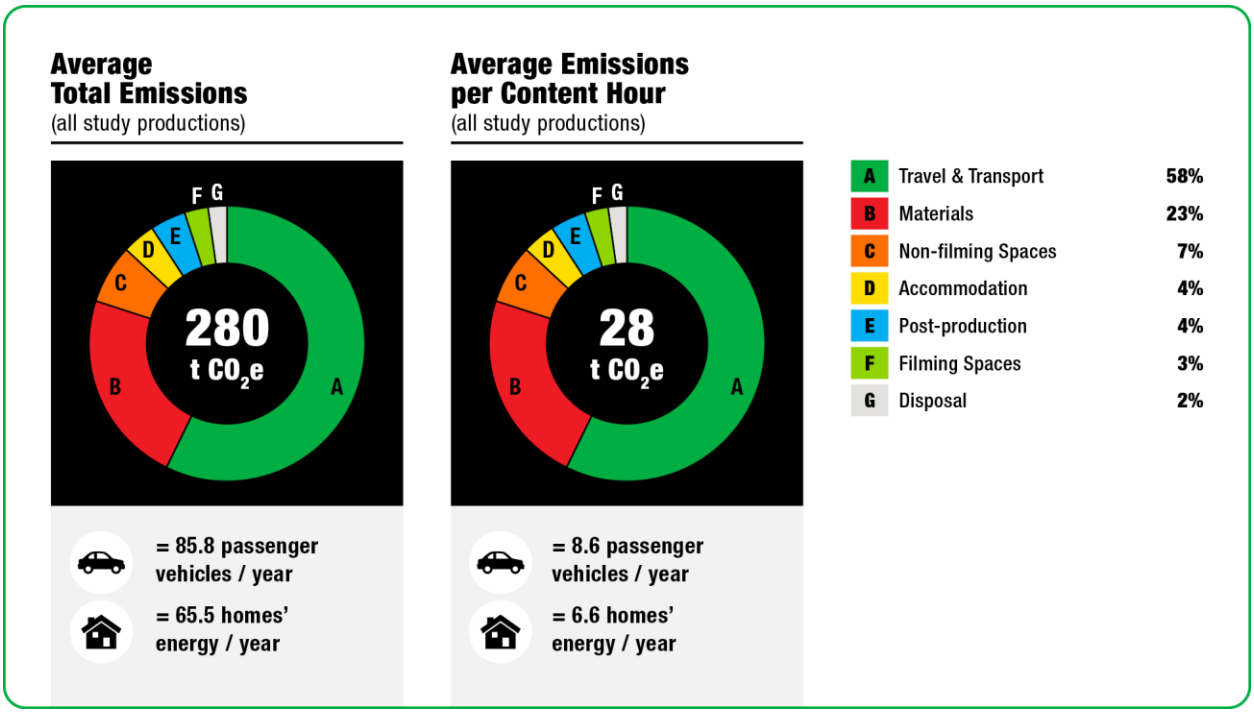


Figure 1: Average emissions and Average emissions content per hour (all productions)*

* *Emissions equivalencies determined using the NRCAN Greenhouse Gas Equivalencies Calculator.*

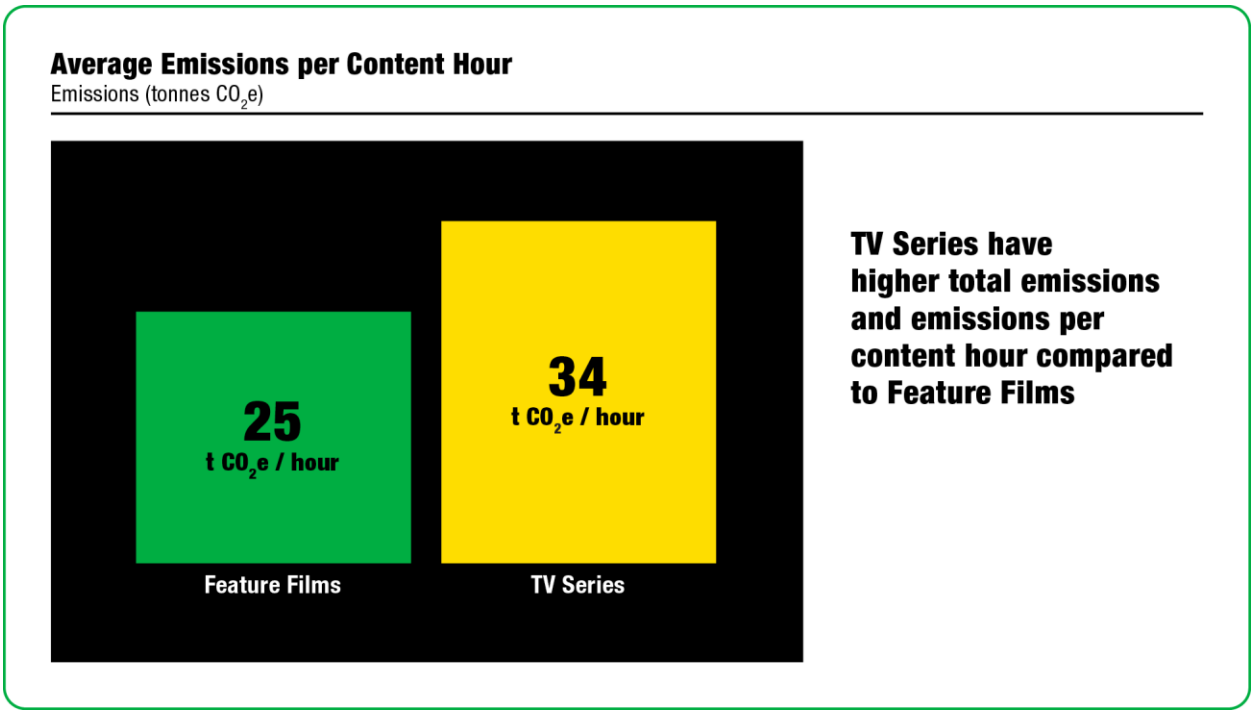
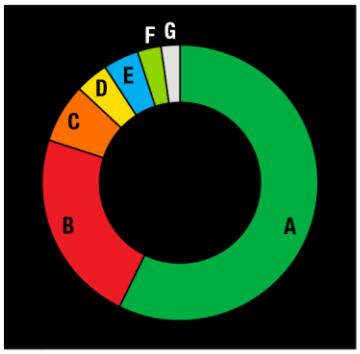


Figure 2: Average emissions per content hour for Canadian Feature Films and TV Series

Activities related to Travel & Transport (58%) and Materials (23%) contributed the most to emissions. All other activities contributed between 2% and 7% of total average emissions (Figure 3).

- A deeper look within Travel & Transport revealed that 70% of emissions originated from fuel consumed in gas vehicles
- Approximately 22% were attributed to air travel, both domestic and international
- Diesel vehicles contributed the remaining 4% (Figure 3).



A	Travel & Transport	58 %
B	Materials	23 %
C	Non-filming Spaces	7 %
D	Accommodation	4 %
E	Post-production	4 %
F	Filming Spaces	3 %
G	Disposal	2 %

Average Total Emissions (all budgets)

A

Travel & Transport

Gas Vehicles	70%
Air Travel	22%
Diesel Vehicles	4%

C F

Non-filming and Filming Spaces

Electricity	62%
Diesel Generators	28%
Gas Generators	5%

B

Materials

Food	61%
Textiles	35%
Plastic	2%

Figure 3: Average emissions from all sample productions

These results suggest that vehicles used for road transport contribute proportionally more to emissions for productions in Canada as compared to other jurisdictions. All study productions used gas vehicles for transportation, whereas 18 used commercial air travel.

For emissions attributed to Materials, 61% of these were from food, and 35% from textiles. These results differ from research in other regions where lumber materials are frequently a top emissions category. All productions procured food, whereas only 9 productions procured textiles. Comparisons with other jurisdictions were not possible as aggregate emissions data for Materials were unavailable.

Results suggest that addressing emissions from gas vehicles and food consumption are priority areas for Canadian productions to meaningfully reduce their overall carbon footprints.

The proportionally low emissions contribution from filming and non-filming spaces is likely due to:

1. Most feature films did not use large production offices or soundstage facilities. Instead, they used small or home offices and filmed mostly on location, using small amounts of house power that was not explicitly tracked. Further, the majority (80%) of electric power consumption in Canada is from no to low-carbon sources, including hydro-electric, wind and nuclear.[21]

2. Generator use was recorded on 5 productions; the other 17 met their power needs through available grid power on location or by charging reusable batteries for camera and sound equipment using vehicles. Emissions from generator use only contributed about 3% to the average total emissions (33% of emissions from Non-filming and Filming Spaces, Figure 3). Larger feature films and TV series were more likely to use both facilities and generators compared to smaller productions.

[21] Canada Energy Regulator. Provincial and Territorial Energy Profiles – Canada. Accessed Oct 11, 2023.

Average Emissions Intensity by Budget (Feature Film only)

Understanding the emissions intensity of production can help identify opportunities to decouple specific expenditures from emissions. An initial look at feature film results showed that:

- as budgets increased so did their emissions (Figure 4)
- productions with budgets under $1 million emitted an average of 12 t CO_2e per hour, compared to 59 t CO_2e per hour for production budgets over $5 million.

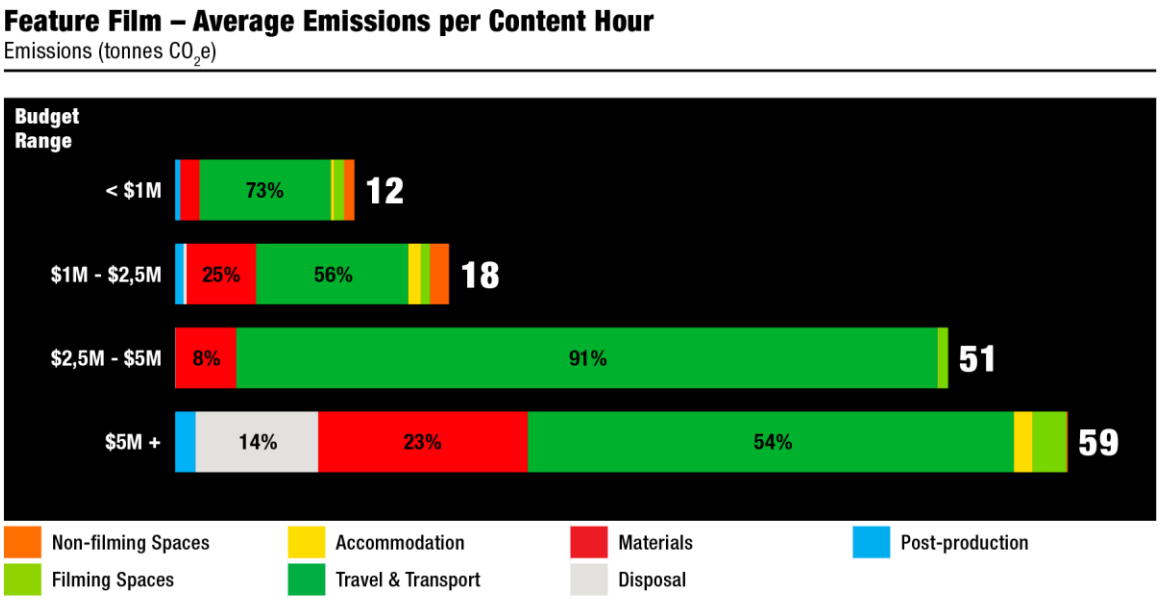


Figure 4: Average emissions per hour by budget category (Feature Film only)

In all budget ranges, emissions from Travel & Transport represented the largest category by far, ranging from 54% to 91%. Larger budgets facilitate more spending on activities such as travel and transportation, as well as production design.

Results suggest that the primary issue is not higher budgets, but rather how to spend money on lower carbon intensive products/services such as EVs, thereby decoupling expenditures from high emission sources such as gas vehicles.

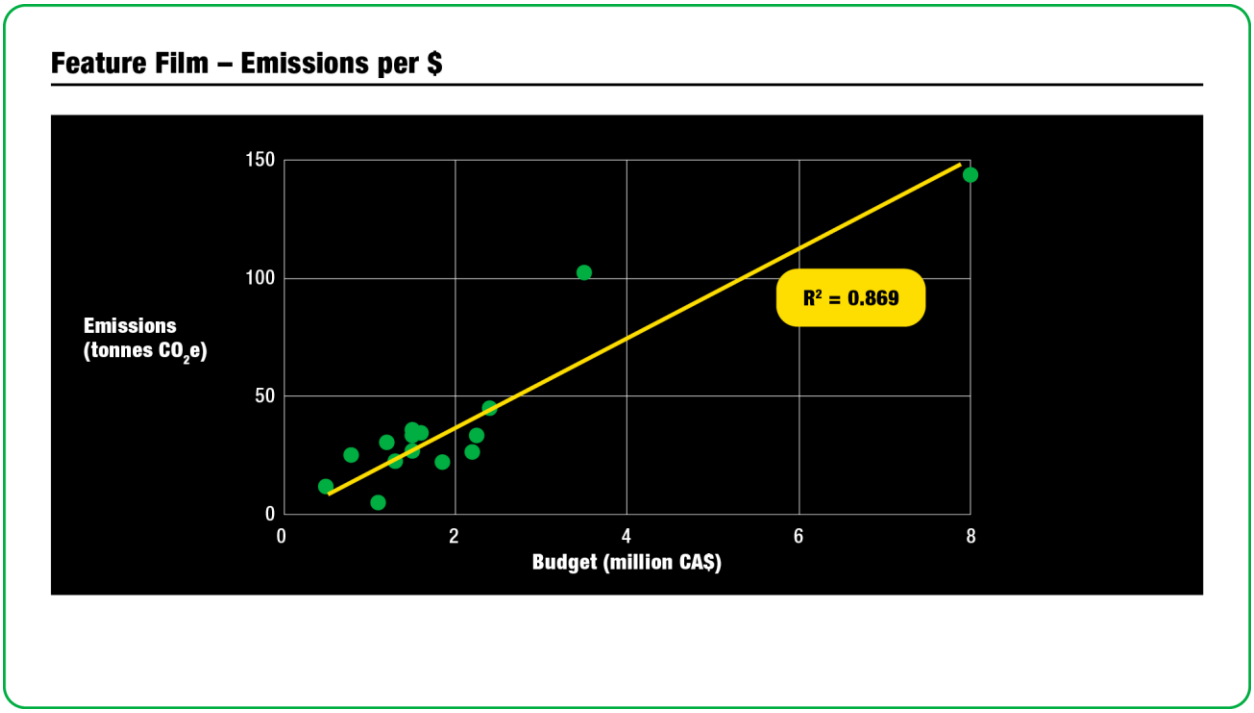


Figure 5: Relationship between budget spend and emissions for feature films.

Plotting feature films on a graph revealed a strong linear relationship (R^2=0.869)[22] between budget and emissions (Figure 5).

- Additional analysis helped assess the emissions intensity of production budgets at 2 t CO_2e per CA$100,000 expenditure.
- This relationship between feature film budgets and total emissions aligns with results from the USA's Sustainable Production Alliance *Close Up* reports[23, 24] which found the emissions intensity of their dataset to be approximately 2.5 t CO_2e per CA$100,000.
- Extending the graph to include this study's feature films and average emissions from the *Close Up* report indicated that the linear relationship between the datasets remains strong (R^2=0.854).

Emissions intensity per CA$100,000 for Canadian productions is similar to the Sustainable Production Alliance report for foreign service productions

TV series were excluded from the budget intensity analysis due to the smaller sample size. As the dataset continues to expand, further analysis for TV series will be possible.

[22] R^2 is a goodness-of-fit measure for linear regression models. R^2 measures the strength of the relationship between a model and the dependent variable, with 1 = 100% relationship.
[23] Sustainable Production Alliance. *Close up: Carbon Emissions of Film and Television Production*. March 2021. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6
[24] Sustainable Production Alliance. *Close up Look in North America*. July 2022. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

Average Emissions by Genre

This study comprised four production genres: Fiction, Documentary, Lifestyle & Human Interest, Variety & Performing Arts.

- Fiction (feature films and TV series) had higher average emissions per hour compared to other genres (36 t CO_2e as compared to less than 7 t CO_2e for all other genres)
- An average of 55% of emissions were attributed to Travel & Transport, followed by Materials at 28%
- Emissions from Travel & Transport for Documentary, Lifestyle & Human Interest, Variety & Performing Arts were proportionally higher, averaging between 60 to 72% of total emissions.
- Emissions from Materials in all other production genres were below 9% (Figure 6).

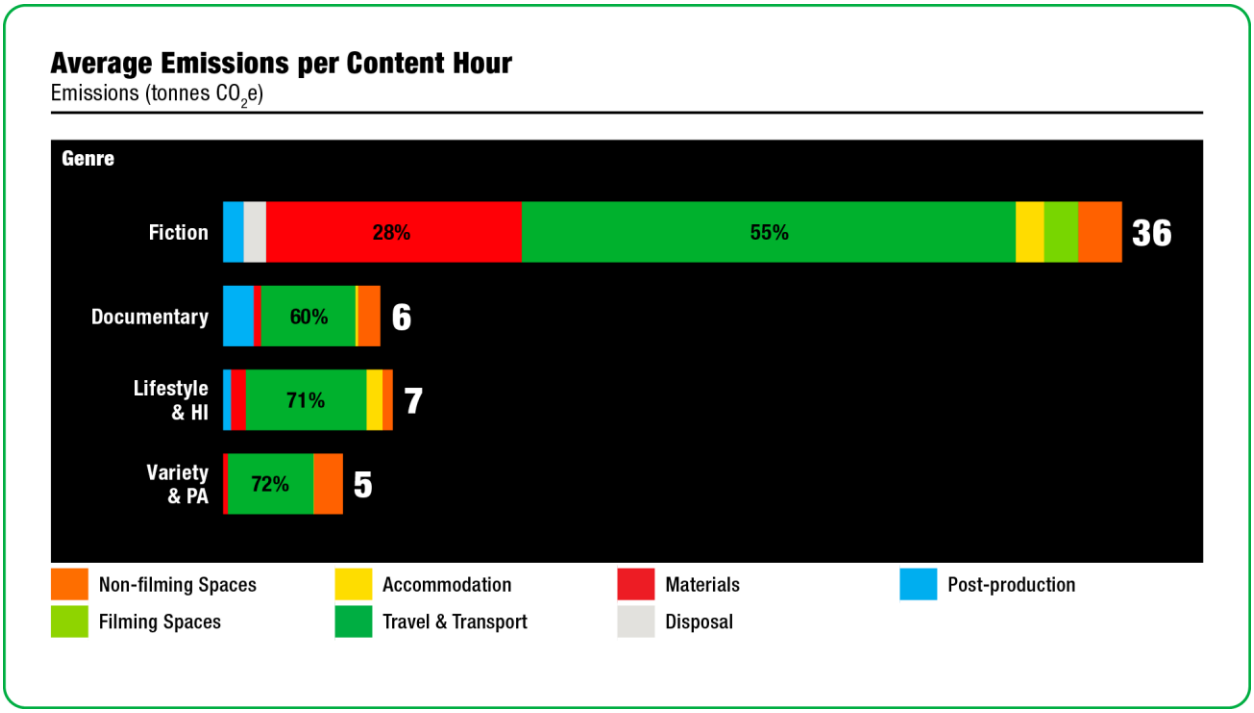


Figure 6: Average emissions per content hour by genre

Results reveal an emissions profile broadly aligned with the anticipated types of activities for each genre, with Transport & Travel to locations comprising their largest emissions source.

- Documentary productions have lower overall emissions as both set builds and crew sizes are typically minimal.
- Lifestyle & Human Interest and Variety & Performing Arts series may build sets, however these sets often have a multi-year lifespan. Furthermore, most production activities for these occur in office and editing facilities, as well as soundstages.
- In contrast, Fiction productions typically have larger crews, more material needs for both set and crew, and transportation needs related to these, which increases their total emissions footprint relative to other genres.

The highest average contributor to Travel & Transport emissions for all genres was gas vehicles (70%), followed by flights (22%, Figure 7). All 22 productions used gas vehicles for transportation, and 18 productions used commercial air travel. **This finding further reinforces that transportation is a key focus area for Canadian productions to reduce emissions.**

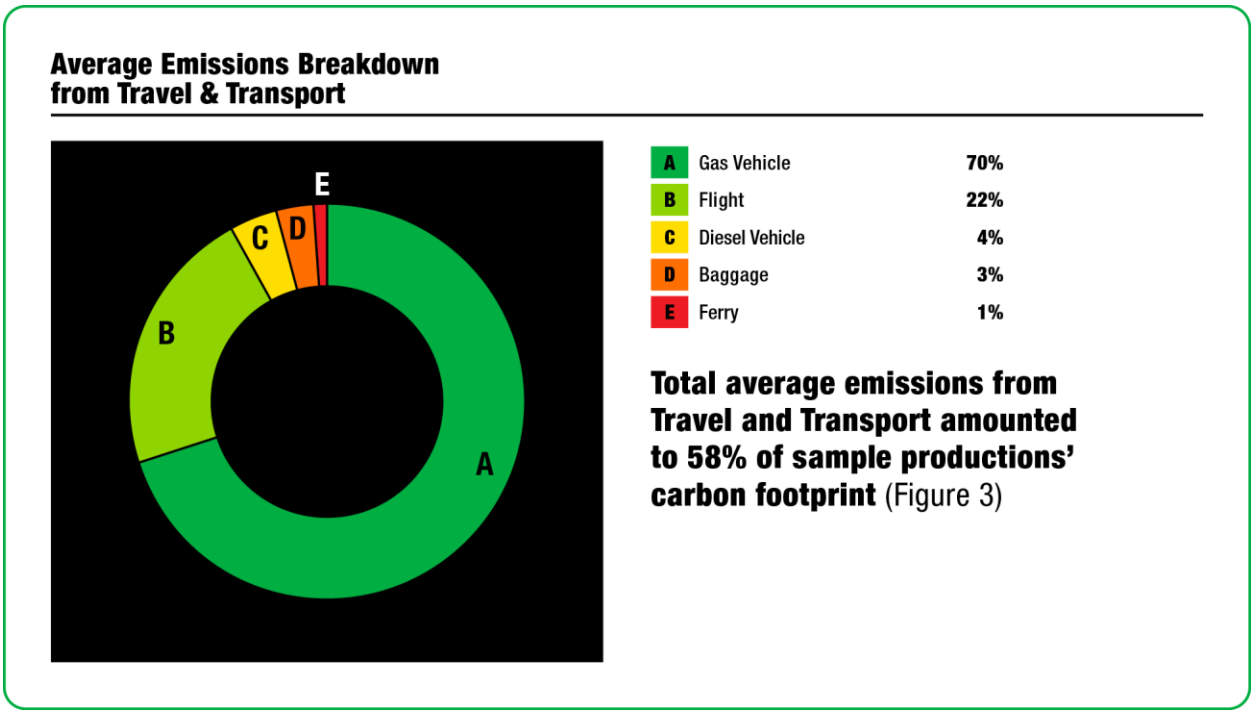


Figure 7: Average emissions from travel and transportation

Average Emissions by Region

Assessing regional variation in emissions from productions may help identify unique challenges and/or pathways for reduction. Productions from every Canadian region were included in this study.

Table 4: Distribution of sample productions by region*

Region	Total Sample Productions	Number of Fiction Production
Quebec	4	3
Ontario	9	9
Prairies & Territories	2	0
British Columbia	6	3

* *Atlantic Canada is excluded from this regional analysis due to the small sample size. However, data from the region was included in the overall report.*

A look at regional variations indicates that Ontario had the highest result at 46 t CO_2 per hour. Production in British Columbia and the Prairies & Territories had the lowest average per hour, at almost 11 t CO_2 and 7.2 t CO_2 respectively. These results are informed by the total number of fiction productions filmed in Ontario as compared to other regions whose sample productions included Documentary, Lifestyle & Human Interest, and Variety & Performing Arts (Table 4).

Travel & Transport remained the highest emissions category in all regions, averaging between 50% in Ontario and 74% in Quebec (Figure 8). Results broadly indicate that current production activities in all Canadian regions require extensive ground transportation. **Hence, planning in early production to reduce location travel, optimize transportation vehicle requirements, and explore hybrid and electric vehicles provide meaningful pathways for reducing emissions.**

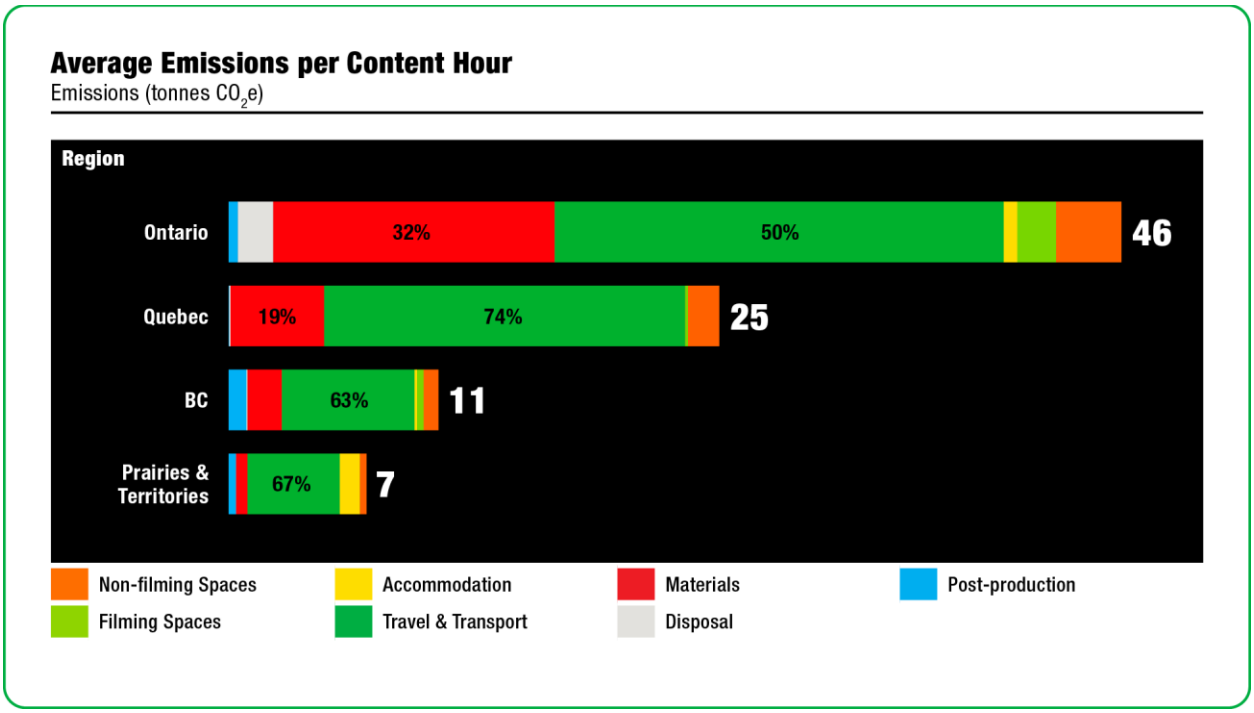


Figure 8: Average emissions per content hour by region

Average Emissions by Format

A final analysis was completed by production format as other global research has found trends when assessing productions in this way.[25,26] Four formats were assessed: Scripted (location), Scripted (Studio and Location), Unscripted (Location), and Unscripted (studio).

- Scripted (Studio and Location) content was found to have higher average emissions per hour (83.5 t CO_2) than other format types (Figure 9).
- Emissions for unscripted productions (both location and studio) were several orders of magnitude lower than for Scripted (Studio and Location).
- Scripted (Studio and Location) typically applies to fictional content, thereby supporting findings within the Average Emissions by Production Genre section.
- Results for total average emissions per hour for all formats aligned with previously published research from other jurisdictions.

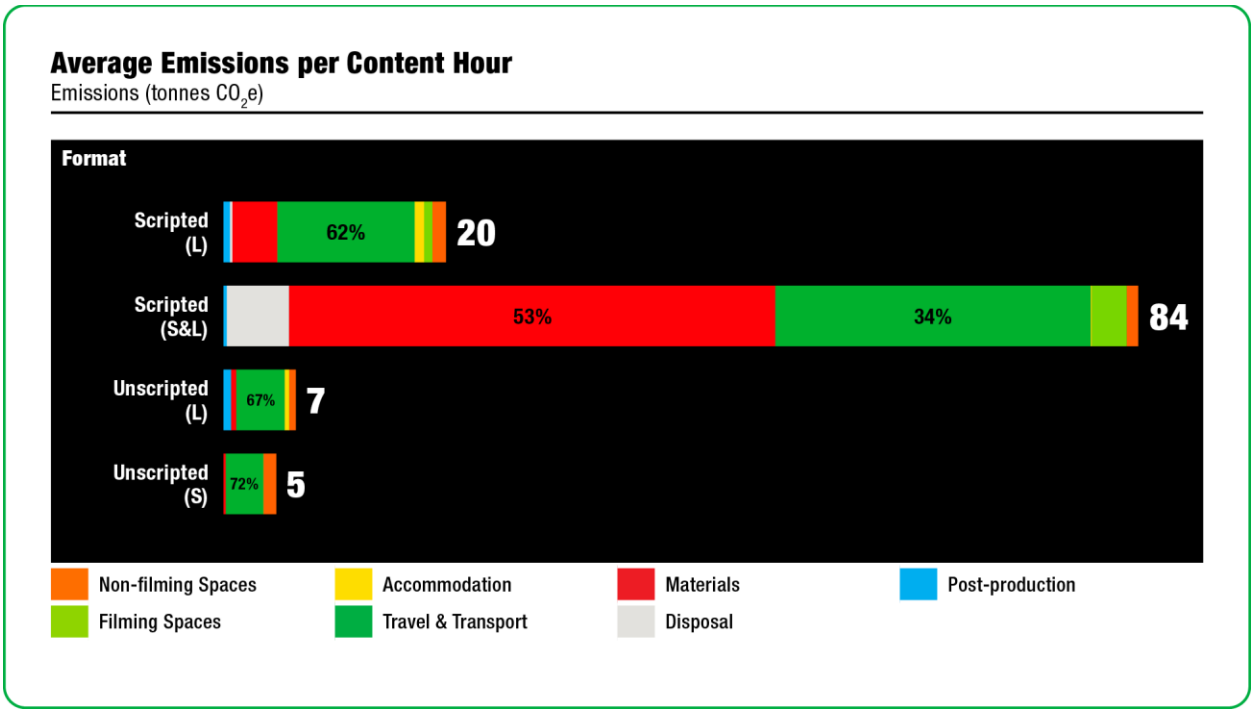


Figure 9: Average emissions per hour by production format

[25] Albert. *Annual Review 2020-21*. Appendix, p. 51-61. Accessed Oct 11, 2023 from https://wearealbert.org/2022/06/13/our-2021-annual-review-is-out/

[26] Albert. *Annual Review May 2020-April 2021*. Appendix p. 37-50. Accessed Oct 11, 2023 from https://wearealbert.org/2021/09/09/our-2020-21-annual-review-is-out/

Opportunities for Emissions Reduction

Planning for Emissions Reduction

The decisions on how and where production budgets and resources are allocated, or spent, are largely made during planning and production prep, well before principal photography begins. The most significant opportunities for productions to reduce emissions is therefore in the careful planning of how to execute a production's creative narrative process, particularly as these relate to transport and material use.

Decoupling Budget Spend from Emissions

In alignment with other reports,[27] a strong relationship exists between budget spend on specific line items and the total size of a production's carbon footprint. The relationship can be minimized through informed decision-making.

All productions cost money to make. The most significant opportunities for emissions reductions occur when a shift in what becomes default spending is applied to expenditures. When applying a sustainability lens, the default shifts to a mindset of spending money on sustainable choices **first.** Once these have been explored and assessed, less sustainable options can be considered next if/as needed. Examples of sustainability spend by default include:

- **Transportation**: crew and materials do not require fuel; they need to be moved around.
    - Exploring EVs, hybrids and carpooling before considering the use of gas vehicles
    - Prioritising EVs and hybrids vehicles in high-frequency transportation departments, such as set decoration and locations department.
- **Materials**: consult reuse centres, consignment stores, other productions (peers) and rental opportunities before purchasing any new materials.
- **Food**: use the existing budget to prioritise locally grown, in season and/or low carbon plant-based protein meals, with animal protein as a possible secondary option where/if needed.
- **Locations shooting**: assess how to power the set using grid power and/or rental cleantech. Use diesel generators if necessary should these options not be available.

[27] Sustainable Production Alliance. *Close up: Carbon Emissions of Film and Television Production*. March 2021. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

Travel & Transport

Transportation is clearly a primary focus area for Canadian productions to reduce emissions. Road transportation, in particular, contributes more to the average total production footprint as compared to other global production regions. This remains true across productions whether assessing by budget, genre, region or format.

The prevalence of emissions from gas vehicles highlights a priority focus area for emissions reductions. Opportunities for optimising road travel include working with the Transportation and Locations crew members (or departments should the production have them) to create a transportation plan early in pre-production and ensuring the production has the vehicles they need. Early opportunities include:

- Choosing and limiting locations strategically to reduce trips;
- Engaging with vendors to provide electric vehicle rentals where budgets and availability allow, and using these for high-frequency driving roles/departments;
- Planning to carpool and provide shuttles to reduce individual vehicle travel;
- Right sizing vehicles to the activity;
- Instead of transporting to certain locations, using available crew members, cast and/or local equipment already based there.

Materials

Emissions from materials fall within Scope 3 emissions for productions. On Canadian productions, materials emissions were primarily attributed to food (61%) and textiles (35%). Both materials were also identified as primary materials' categories in a recent Ontario-based industry waste report.[28] Opportunities to reduce emissions in pre-production planning include:

- **Catering**: request low-carbon and/or plant rich menus with vendors.
    - Promote accountability by requesting weekly reports from vendors on local sourcing, organic and amount of protein served (by type);
    - Donate leftovers to food rescue organizations.
- **Textiles**: establish a goal in pre-production and procure a higher percentage of second- hand, reused, or rented materials, as well as from online marketplaces (e.g. Craigslist, Facebook Marketplace, etc.) before purchasing new.
    - Report on progress towards this goal throughout production.

[28] Ontario Creates, Advancing Waste Management Practices in Ontario's Film and Television Industry, June 2023. Accessed September 18, 2023.

Carbon Footprint of Canada's Audio-Visual Industry: Estimate

Study results were projected onto the larger ecosystem of Canadian productions using national data in order to estimate the carbon footprint of Canadian-funded audio-visual content. Results were extrapolated using a three-year average of production volumes and budget categories,[29] excluding 2020/21 due to impacts resulting from the COVID-19 pandemic.

Emissions from Canadian Feature Films

The study's 15 feature film productions represented approximately 10% of all feature film content in 2022 and aligned with CMPA's production regions and budget categories. Based on total data from study productions and a 3-year production volume average, the annual carbon footprint of Canadian feature film is estimated at 7,126 t CO_2e (Figure 10).

On average, an estimated 60% of the carbon footprint of Canadian feature films can be attributed to travel and transport. Almost a quarter of the emissions originated from material use and consumption (Scope 3 emissions).

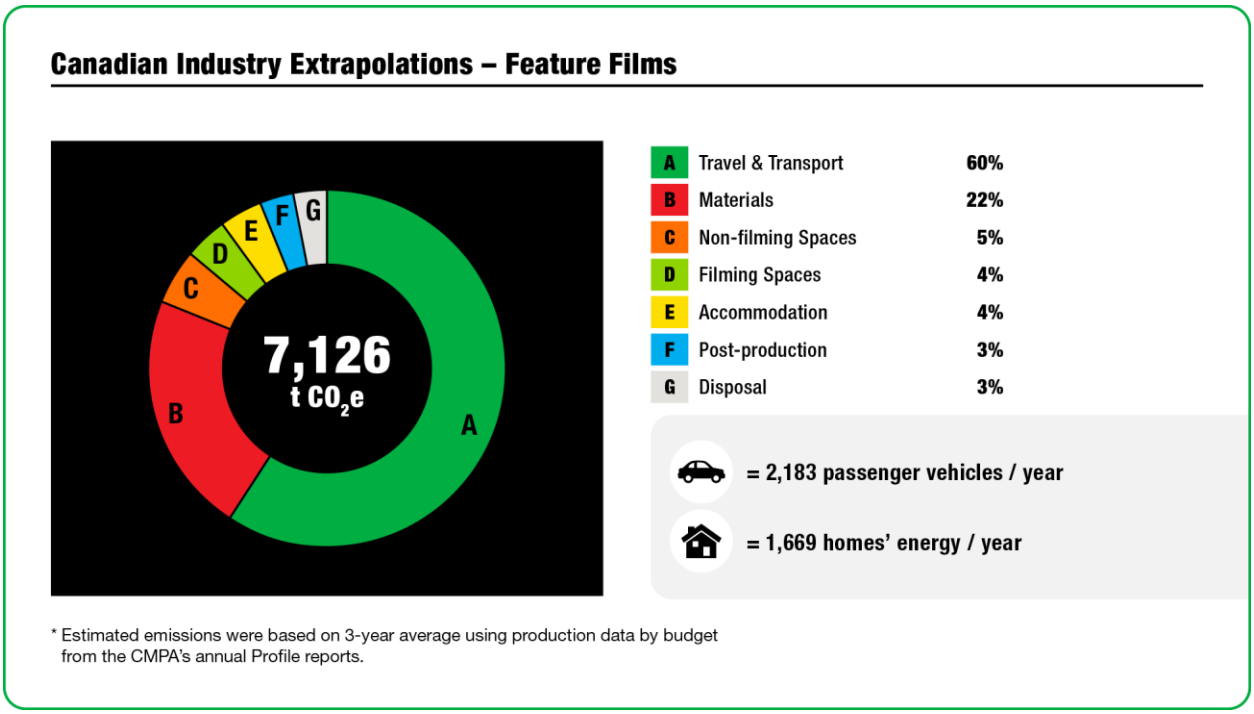


Figure 10: Annual carbon footprint of Canadian feature film content (3 year average)*

* *Emissions equivalencies determined using the NRCAN Greenhouse Gas Equivalencies Calculator.*

[29] Canadian Media Producers Association (CMPA). Profile 2022. Accessed Oct 11, 2023 from https://cmpa.ca/profile/

Emissions from Canadian TV Series

By comparison, the preliminary carbon footprint for Canadian TV Series using a 3-year production volume average is estimated at 260,843 t CO_2e (Figure 11). This study's seven productions represent a small proportion of the total Canadian TV series production landscape. As such, extrapolations are high-level estimates only and are based on the assumption that the total average emissions for each budget category apply to every production. Nevertheless, the results are broadly indicative, allowing for a number of inferences to be made, and provide an initial baseline by which to compare future data to.

On average, 52% of the carbon footprint of Canadian TV Series was estimated as attributed to travel and transport[30]. The decrease as compared to feature films may be attributed to more of these productions based in studio soundstages. TV Series had a proportionally similar emissions contribution from materials, though a notably larger impact from disposal (10%) and non-filming spaces (13%).

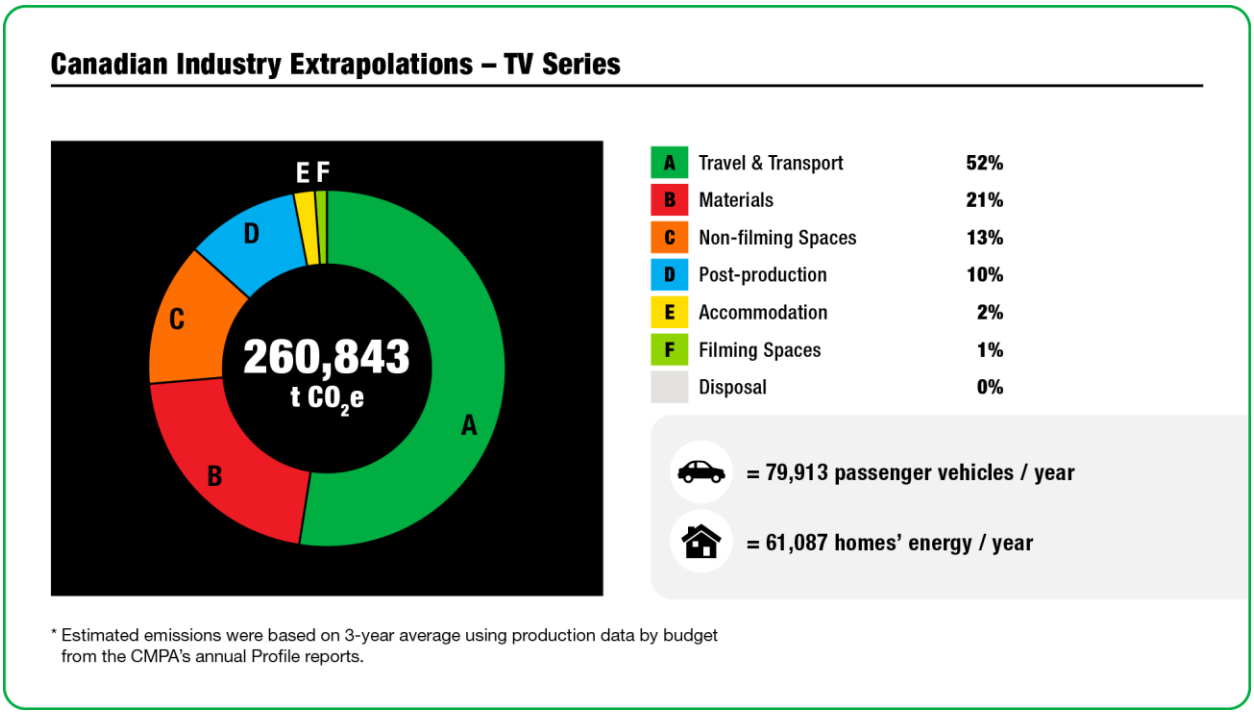


Figure 11: Annual carbon footprint of Canadian TV Series production (3 year average)*

* *Emissions equivalencies determined using the NRCAN Greenhouse Gas Equivalencies Calculator.*

[30] A November 2023 report released by the Canadian Broadcasting Centre also found that travel and transport, at almost 43%, was responsible for the highest emissions on Canadian produced TV Series.

Conclusion

As both the Canadian and global screen industries continue to transform production practices to be more sustainable, this report focusing on Canadian productions provides an initial look at this country's unique circumstances and opportunities. In doing so, it provides initial insights and indications on impacts and emissions, while also offering prospects to explore emission reduction opportunities. Results may be used to spur dialogue across the country, within regional jurisdictions, municipalities, with production teams, unions, guilds and the industry's suppliers.

It is hoped that this Canadian research provides a foundation to be built upon with new data from future productions willing to contribute their carbon footprints, thereby enabling more definitive insights as they relate to budget, region, genre and format.

Key take-aways from this research are that proportionately, the emission intensity for Canadian productions is similar to that of foreign service productions with larger budgets[31,32], however Canadian productions' carbon footprints have a proportionally higher prevalence of gas-powered vehicles contributing to emissions.

Production decisions on how and where budgets are spent directly inform and influence a production's carbon footprint.

Efforts to pursue sustainable production practices as a default are recommended to encourage the rapid reduction of our industry's carbon emissions.

Opportunities exist to pursue efforts that can be applied in the near term to reduce emissions from road transportation, air travel, and material consumption.

[31] Sustainable Production Alliance. Close up: Carbon Emissions of Film and Television Production. March 2021. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

[32] Sustainable Production Alliance. Close up Look in North America. July 2022. Accessed Oct 11, 2023 from https://greenproductionguide.com/in-action/#pg-2660-6

Appendix 1
List of Available Resources, Tools and Training

1. Academy of Canadian Cinema and Television
2. ACTRA Toronto
3. Association Québécoise de la Production Médiatique (Quebec Association of Media Production)
4. Bureau du Cinéma et de la Télévision du Québec / Quebec Film and Television Council
5. Canadian Media Producers Association (CMPA)
6. CBC/Radio Canada
7. CMF (Canadian Media Fund)
8. Creative BC and Reel Green
9. DGC Green
10. L'Association des réalisateurs et réalisatrices du Québec (Association of Directors of Quebec)
11. Manitoba Film and Music - Reel Green
12. NABET 700-M UNIFOR
13. Newfoundland and Labrador Reel Green (based at Film & Development Corp)
14. Ontario Creates and Ontario Green Screen
15. Reel Green National Committee
16. Rolling Green/On Tourne Vert
17. Teamsters Canada
18. Telefilm Canada
19. Union des Artistes (UDA)
20. Writers Guild of Canada