

Climate Emissions and Mitigation in Powell River, BC: Its Climate Downfalls

By: Grace Dice¹ (-)

Intro

Along the northern Sunshine Coast of BC (British Columbia) sits Powell River, a coastal town with a long history tied to natural resources. Its origins started with the Powell River Company, then forming the well-known mill preceding its townsite and expansion of populace [1]. Its area comprises a lot of coastal lands, surrounded by the Pacific Ocean and the unceded lands of the Tla'amin Nation, occupying over "400 square kilometers" [2]. Throughout history, the town has transitioned from resource extraction to a mixed economy, though it remains vulnerable to climate change and emission impacts. This report assesses the communities' greenhouse gas (GHG) emissions profile and proposes mitigation options, building on its adaptation needs outlined in "Climate Impacts and Adaptation in Powell River, BC: Safeguarding a Coastal Community and Its Ecosystems" by Grace Dice [3].

Previously addressed in the former paper, Powell River is a town with a primarily older population, and economically, it has shifted from forestry and pulp to tourism and aquaculture [3]. Since 2007, Powell River has committed to the BC Climate Action Charter, aiming for carbon neutrality, reflecting the local awareness of GHG impacts [4]. Even with this, Powell River's GHG emissions stem from its historical industrial base, current economic activities, and community lifestyle. Its four main emission contributors are transportation, forestry, the mill, and residential and commercial energy use.

Transportation

As a coastal town, Powell River is heavily dependent on its ferries and personal vehicles. Additionally, with no Uber or Lyft drivers and limited public transport, cars and trucks are a necessity. Overall, on the coast of BC, BC Ferries account for roughly 13,000 tonnes of GHG emissions a year, which is said to be around 3,800 cars [5]. Half of the town's transport is a result of the fuel needed for private vehicles due to the lack of other modes of transport, as shown below by the data found by the City of Powell River [6].

¹ This report was written entirely by me, and has not received any previous academic credit at this or any other institution.

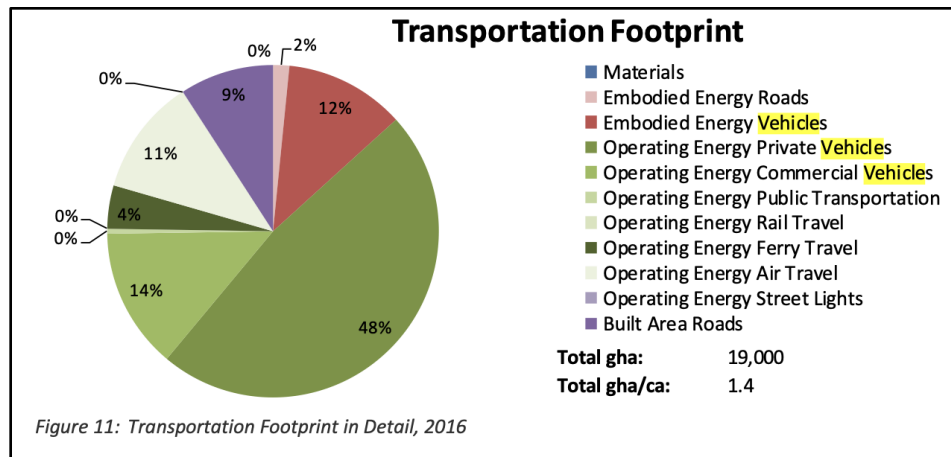


Figure 1: Transportation Footprint. Adapted from [6].

These vessels are the lifeline for goods and travel to the mainland, connecting Powell River to the nearby island and Vancouver.

The town's aging population encourages car use over walking or cycling, further raising emissions from gasoline and diesel vehicles. With no rail or extensive bus network and ferry schedules dictating daily life, transportation contributes so much to the emissions of the town's footprint.

Forestry

Forestry and land use have shifted from a carbon sink to a notable emissions source in Powell River, driven by climate-induced beetle outbreaks, logging, and tree cover loss [7]. The Global Forest Watch Dashboard reveals that Powell River lost 3.36 kha of tree cover from 2001 to 2023, an 11% decrease since 2000, with 774 ha lost in 2023 alone, emitting 918 kt CO₂e [7]. The decay of dead timber, added to the heightened wildfire activity, releases all of the stored carbon back into the atmosphere [8]. Ongoing logging activities, which have been going on since the early 1900s, further increase these emissions [9]. This shift represents a deep ecological transformation, sabotaging the forests' traditional capacity to mitigate climate impacts and showing broader impacts related to the province as a whole. The logging industry itself has been very lucrative, as I have seen firsthand, due to my grandparents being a part of its history and gaining much success from it. Though there was an influx of new jobs for families, it negatively impacted the environment due to the amount of logging they did for the mill.

Pulp mill

The industrial legacy of the Catalyst Paper Tiskwat mill, though no longer operating, remains a significant contributor to emissions with lingering effects today. Before shutting down, the mill relied heavily on fossil fuels and biomass combustion to operate. A more recent incident had the company getting fined due to 3,500,000 liters of effluent released into the Malaspina Strait [10].

Patterns of these dumpings emerge everywhere in articles throughout the mill's history. The Encyclopedia of BC Preview provides a deeper historical context, noting, "In the isolated company town of Powell River... Colin Palmer ...stated that the paper mill, now the largest in the world, consumed more than twice as much water as New York City and dumped 50 million gallons of untreated effluent daily into Malaspina Strait" in 1970 [11].

Mill (industrial process)	Effluent (million gallons/day)
Powell River (sulphite)	75
Harmac-Nanaimo (kraft)	72
Elk Falls-Campbell River (kraft)	56
Crofton (kraft)	54
Port Mellon (sulphite)	32
Woodfibre (sulphite)	31
Four new mills in the Upper Fraser watershed	140
Total effluent from BC's 17 major pulp & paper mills	811

Figure 2: Volume of effluent for Day. Adapted from [11].

This massive effluent volume—75 million gallons/day per the table above gathered from the same source shows the mill's scale, inferring a massive amount of energy needed for processing the wood into pulp and releasing methane and CO₂.

Residential and Commercial Energy

Residential and commercial energy use drives emissions in Powell River, primarily through heating demands in aging buildings. Despite BC's generally low 12% of emissions being due to these buildings, it holds a higher value in Powell River due to the elderly population [12]. Most of the population occupies decades-old structures that lack modern insulation or heating. Small businesses along the waterfront and tourist facilities, catering to visitors, add to this load with gas-powered heat and hot water systems. Although BC has a low percentage, knowing the area of Powell River and its population, I can personally infer that it has a higher percentage than that of BC as a whole in relation.

Mitigation for Transportation

Transitioning to low-carbon transportation offers a way to curb Powell River's reliance on fossil-fuel-dependent modes of transportation, like ferries and personal vehicles. Introducing electric or hybrid ferry systems, like those currently in development by BC Ferries, which are battery-electric hybrids [13]. For personal vehicles, incentivizing electric vehicle adoption through subsidies or charging infrastructure along main routes could influence the town away from gasoline and diesel. A lot of the outer area of Powell River is composed of people who do care

deeply for the environment, as many would call hippies, and if their influence of these green energy can translate to the general population, then that would aid in lowering fuel emissions. Given the aging population and lack of walking or biking, the town itself could provide an electric shuttle service to be able to transport more citizens, lower car emissions, and aid with mobility needs. This approach focuses more on the need to invest in infrastructure and needs the coordination of the governing bodies.

Mitigation for Forestry

Enhancing reforestation to fight back against the history of logging would provide a means to repopulate the forests of Powell River and aid in the consumption of CO₂ and other emissions from the air. Strategic replanting with more resilient native species, such as cedar or fir, could rebuild forest cover diminished by the 3.36 kha lost since the 2000s, as noted earlier [7]. Implementing controlled burns, a practice that has historically been practiced by the Indigenous peoples, could reduce wildfire fuel loads and prevent the uncontrolled release of stored carbon [14]. This practice has given benefits such as managing regeneration and pests, such as the beetles mentioned in the previous essay, getting better agricultural open land, and stimulating plant productivity [3], [14]. This option demands collaboration with the Tla'amin Nation and forestry experts but does promise a preferable transformation in the forest sector.

Mitigation for the Mill

The shuttered Catalyst Paper mill now presents a unique opportunity for mitigation through adaptive reuse, from polluting to green energy. Recent discussions with the Tla'amin Nation have created an opening for them to buy back their land and reuse it as a green hydrogen site or to help fix the salmon ladder that runs along it [15]. Converting the site to a clean hydrogen energy facility could leverage clean energy to power the local industry or transportation. Alternatively, transforming the mill into a biomass facility, utilizing forestry waste from any logging or dead trees, could generate energy while managing waste streams that would decompose into emissions anyway. A solar farm on the site could also offer another alternative to a clean energy solution, though that path requires more funding for the proper equipment.

Mitigation for Residential and Commercial Energy

Upgrading residential and commercial buildings to enhance energy efficiency directly addresses the heating and cooling-driven emissions from the town's aging infrastructure. Retrofitting older homes with improved insulation, heat pumps, and electric heating systems could greatly cut down on natural gas consumption. Incentives for small businesses and tourist facilities along the waterfront to adopt similar upgrading would lower the sector's footprint even more. Many of the buildings along the main town are incredibly old, and some were there years before I ever knew the town myself. Even with the overall mild weather in the region, these measures would cut energy demands even more and better the community and its ecological footprint.

Implementation relies much on the public and businesses and potentially the governing bodies to provide incentives to rebuild. At the bottom line, it would improve residents' homes and provide a more attractive environment to potential tourists.

Synergies and Trade-Offs

Reflecting on my adaptive analysis, Powell River faces an elevated risk of flooding, extreme heat, forest stress, and marine disruption. Reforestation mitigates forestry emissions while also supporting proper forest management by enhancing carbon sinks and reducing the beetle habitat through the proposed controlled burns, which aligns with the previous papers' pest control focus. Similarly, repurposing the mill site for green energy could provide the means for powering flood-resilient infrastructure, reducing emissions and flood risk. However, tradeoffs do occur like retrofitting homes for energy efficiency competes with funds for heat action plans like cooling centers, or flood defenses could limit land for a solar farm on the millsite. Balancing these brings the need to prioritize tourism revenue to fund both and leverage Powell River's adaptive capacity and cooperation with the Tla'amin Nation.

Conclusion

Powell River exemplifies the interplay between historical resource dependence and contemporary climate challenges faced by coastal communities across Canada. Its greenhouse gas emissions are rooted in transportation reliance, a changing forestry landscape, the lingering effects of a pulp mill, and energy-intensive aging infrastructure. The mitigation strategies proposed—low-carbon transportation, reforestation, repurposing the pulp mill, and energy efficiency—offer ways to align with carbon neutrality goals. These efforts connect Powell River's local actions to broader provincial and national climate goals, where even small towns like Powell River can have an impact on Canada's overall emissions.

The community's overall mitigative capacity remains constrained yet promising. The town itself possesses a generally committed populace, evidenced by its early adoption of the Climate Action Charter and the environmental ethos of its residents. Yet, its aging population, limited economic resources post-mill closure, and dependence on external infrastructure (eg, BC Ferries) pose challenges. Implementation of the proposed options requires investment and coordination with many bodies of people. Nevertheless, the town's historical resilience and shift toward tourism suggest that the town has an adaptive spirit that could tackle climate action.

Balancing these priorities demands strategic planning and ultimately depends on local strengths such as its natural surroundings, cultural ties, collective will, and community spirit to align with Canada's net-zero goals.

References

- [1] “Photo History of Powell River,” powellriver.ca. Accessed: Mar. 01, 2025. [Online]. Available: <https://powellriver.ca/pages/photo-history-of-powell-river>
- [2] “Tla’amin Nation.” Accessed: Mar. 15, 2025. [Online]. Available: <https://www.tlaaminnation.com/>
- [3] G. Dice, “Climate Impacts and Adaptation in Powell River, BC: Safeguarding a Coastal Community and Its Ecosystems,” Pers. Work, p. 10, Mar. 2025.
- [4] “Climate Action - City of Powell River.” Accessed: Mar. 15, 2025. [Online]. Available: <https://powellriver.ca/pages/climate-action#>
- [5] R. Baker, “West Coast electric ferries lack the power to ditch diesel | Canada’s National Observer: Climate News.” Accessed: Mar. 15, 2025. [Online]. Available: <https://www.nationalobserver.com/2023/03/01/news/west-coast-electric-ferries-lack-power-ditch-diesel>
- [6] “Powell_River_ecoCity_Footprint_Tool_Report.pdf.” Accessed: Mar. 15, 2025. [Online]. Available: https://www.qathetclimatealliance.ca/wp-content/uploads/Powell_River_ecoCity_Footprint_Tool_Report.pdf
- [7] Vizzuality, “Powell River, British Columbia, Canada Deforestation Rates & Statistics | GFW.” Accessed: Mar. 15, 2025. [Online]. Available: <https://www.globalforestwatch.org/dashboards/country/CAN/2/23?category=forest-change>
- [8] “Think Hazard - Powell River - Wildfire.” Accessed: Mar. 15, 2025. [Online]. Available: <https://thinkhazard.org/en/report/12561-canada-british-columbia-colombie-britannique-powell-river/WF>
- [9] “Early Logging.” Accessed: Mar. 15, 2025. [Online]. Available: <http://prfhs.org/forestry-heritage/forest-eras/early-logging/15-4-2-historic-logging>
- [10] E. and C. C. Canada, “Catalyst Paper fined \$200,000 for deposit of untreated pulp and paper effluent.” Accessed: Mar. 15, 2025. [Online]. Available: <https://www.canada.ca/en/environment-climate-change/services/environmental-enforcement/notifications/catalyst-paper-deposit-untreated-effluent.html>
- [11] “5. The Strait as Waste Dump -- KnowBC - the leading source of BC information.” Accessed: Mar. 15, 2025. [Online]. Available: <https://www.knowbc.com/limited/Books/Views-of-the-Salish-Sea/5.-The-Strait-as-Waste-Dump>
- [12] “Buildings - CleanBC.” Accessed: Mar. 15, 2025. [Online]. Available:

<https://cleanbc.gov.bc.ca/about-climate-change/drivers/buildings/>

- [13] N. H. Prevljak, "BC Ferries prepares to invest in green ship fleet," Offshore Energy. Accessed: Mar. 24, 2025. [Online]. Available: <https://www.offshore-energy.biz/bc-ferries-prepares-to-invest-in-green-ship-fleet/>
- [14] "Indigenous Fire Management and Traditional Knowledge." Accessed: Mar. 24, 2025. [Online]. Available: <https://www.ictinc.ca/blog/indigenous-fire-management-and-traditional-knowledge#>
- [15] "Tla'amin Nation assembles team for mill site plan," The Peak. Accessed: Mar. 24, 2025. [Online]. Available: <https://www.prpeak.com/local-news/tlaamin-nation-assembles-team-for-mill-site-plan-5988353>