



Applying a Climate Justice Lens to Heat Pump Retrofits in UBC Neighbourhoods

Prepared by: Haley Magrill, UBC Sustainability Scholar, 2023

Prepared for: Ralph Wells, Community Energy Manager, UBC Campus and Community Planning

August 2023

Disclaimer

This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organizations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability and climate action across the region. This project was conducted under the mentorship of UBC Campus and Community Planning staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of the UBC Campus and Community Planning.

Acknowledgements

The author acknowledges that the work for this project took place on the unceded ancestral lands of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō and Səlilwətaʔ/Selilwitulh (Tsleil- Waututh) Nations.

The author would like to thank the following individuals for their contribution, feedback, and support throughout this project:

Carole Jolly, Director of Community Development and Engagement, Campus and Community Planning

Janeen Alliston, Director of Communications, UBC Transit Projects, Campus and Community Planning

John Madden, Director of Sustainability and Engineering, Campus and Community Planning

Chris Fay, Director of Strategic Policy, Campus and Community Planning

Ralph Wells, Community Climate and Energy Manager, Campus and Community Planning

Kerry Shaw, Senior Neighbourhood Climate Action Planner, Campus and Community Planning

Emily Watt, Data and Visual Analyst, Campus and Community Planning

Emma Luker, Planning Analyst, Campus and Community Planning

Robyn Chan, Sustainability Specialist, University Neighbourhood Association

Elyse Henderson, Market Transformation Policy Specialist, BC Hydro

George Poliusuk, Director of Property Management, UBC Properties Trust

Cover photo courtesy of UBC Campus and Community Planning

Contents

Executive Summary

Introduction: Background Context on Heat Pumps and Extreme Heat

- Research Approach

Climate Justice Framework

- What is Climate Justice?
- Climate Justice and Extreme Heat
- Climate Justice and Regulatory Constraints
- Climate Justice and Policy Making

Engaging the Community

- Neighbourhood Demographics
- Vulnerable Residents in the UBC Neighbourhood Community
- Limitations to Neighbourhood Demographics Data Analysis
- Community Consultations
- Community Questionnaire
- Strata President Questionnaire
- Stakeholders Consultations
- Interview with BC Hydro
- Interview with the University Neighbourhood Association
- Interview with UBC Properties Trust

Understanding the Regulatory Landscape

- UBC Policies Impacting Residents

Applying a Climate Justice Lens to Heat Pump Rebates and Grants for UBC Neighbourhood Residents

- CleanBC Better Homes Heat Pump Rebate
- CleanBC Group Purchase Rebate
- CleanBC Income Qualified Program
- CleanBC Custom and Custom-Lite Programs
- CleanBC Commercial Express Program
- Clean Building Tax Credit
- Canada Greener Homes Grant
- Analysis of Equity Gaps in Heat Pump Rebates and Grants for UBC Neighbourhood Residents

Recommendations

- Policy Recommendations for UBC
- Recommendation: Retrofitting UBC PT operated Faculty and Staff, and Market Rentals with Heat Pumps
- Recommendation: Encourage Heat Pump Uptake Among Homeowners
- Recommendation: Integrate Climate Justice in Retrofit and Rebate Policies
- Recommendation: Climate Actions for the Province
- Recommendation: Future Research

Concluding Thoughts

References

Appendix A

Appendix B

Appendix C

List of Tables and Figures

Figure 1. Map of UBC Neighbourhood Housing Area

Figure 2. 2021 Census UBC Neighbourhood Demographics

Figure 3. Breakdown of Respondents by UBC Neighbourhood

Figure 4. Would your Strata corporation be willing to coordinate CleanBC Group Purchase Rebates?

Figure 5. UBC Neighbourhood Building Breakdown

Figure 6. Incentives Available for Different Resident Groups in the UBC Neighbourhood

Figure 7. Breakdown of UBC Housing Stock

Executive Summary

The production of greenhouse gas (GHG) emissions is the primary driver of the climate crisis and cause of extreme weather, such as heat waves.¹ In Canada, the combustion of fossil fuels for heating and electricity account for 18% of the country's GHG emissions.² In BC, buildings and homes account for 11% of the province's GHG emissions.³ While new constructions must adhere to greener building codes, and therefore tend to be more energy efficient than older buildings, demolishing existing buildings and replacing them with more sustainable ones risks displacing vulnerable people. Instead, plans to achieve net zero emissions by 2050 must take all existing buildings into account, as approximately 70% of buildings standing today will be in use as of 2050.⁴ Retrofitting the existing residential building stock with decarbonized heating and cooling technology, such as heat pumps, will help to achieve GHG emissions reduction targets, thereby countering the acceleration of climate change. At the same time, heat pumps counter the impacts of the climate crisis by providing active cooling during heat waves. This is important considering that many homes in the UBC neighbourhood are not equipped to withstand extreme heat, putting vulnerable individuals at risk.

In response to the climate crisis, UBC has outlined commitments in its 2019 Declaration on the Climate Emergency to reduce carbon emissions in line with the science of 1.5°C warming, to infuse climate justice in the university's activities, priorities, and decision-making frameworks, and to support community coping and adaptation in facing the climate crisis.⁵ Drawing on this commitment, this report supports the development of the UBC Neighbourhood Climate Action Plan (NCAP) by applying a climate justice lens to the goal of heat pump retrofits in the UBC neighbourhoods. In doing so, this report refocuses the conversation of heat pump retrofits on those who are most vulnerable to the impacts of extreme heat, identifies barriers to installing a heat pump that might disproportionately impact certain community members relative to others, and addresses the power disparity inherent to accessing in-home cooling between homeowners and renters. In addition, this report reviews how UBC's unique governance structure as well as the broader regulatory landscape impacts UBC neighbourhood residents in their pursuit of in-home cooling, and recommends actions that the university can take to advance climate justice within the institution and at multiple levels of government.

¹ "Greenhouse gas emissions: drivers and impacts," The Government of Canada, accessed August 10, 2023.

² "Annex: Homes and Buildings," Government of Canada, accessed August 3, 2023.

³ Cole Schisler, "B.C. Hydro says too many carbon emissions due to natural gas home heating," Saanich News, October 12, 2021.

⁴ Pierre Verrière, "The future passes through old buildings," Canadian Climate Institute, May 25, 2020.

⁵ "Declaration on the Climate Emergency," UBC Office of the President, December 5, 2019.

Introduction: Background Context on Heat Pumps and Extreme Heat

Across British Columbia (BC), local communities are feeling the impacts of the climate crisis. Extreme heat events have become more frequent in recent years. Such events can lead to high indoor temperatures, putting residents in the UBC neighbourhood at risk of heat-related death and illnesses. Most recently, in 2021, BC experienced a record-breaking heat dome that resulted in 619 deaths, 98% of which occurred indoors.⁶

In response to the climate crisis, UBC's 2019 Declaration on the Climate Emergency outlines commitments to reduce GHG emissions in line with the science of 1.5°C warming, and to embed a climate justice lens in policies related to health and wellbeing investments.⁷ To help achieve these commitments, UBC's Campus and Community Planning department (C+CP) is developing a Neighbourhood Climate Action Plan (NCAP), which aims to accelerate UBC's pathway to net zero emissions while increasing neighbourhood resiliency to the effects of climate change.⁸

The purpose of this sustainability scholars project is to apply a climate justice lens to the goal of heat pump retrofits in the UBC neighbourhood. In doing so, this report contributes to the development of the NCAP, by providing policy recommendations in two of its climate action areas; emissions reductions for existing buildings and climate emergency preparedness.⁹ Heat pumps reduce emissions by replacing inefficient gas and electric heating systems in the existing building stock, while also providing a solution to the problem of extreme heat. Presently, most households in the UBC neighbourhood are not equipped for extreme heat emergencies. By retrofitting existing homes with heat pumps, residents will have access to in-home cooling, mitigating the risk of heat related death or illness during extreme heat events.

Pursuing heat pump retrofits will require UBC to coordinate across multiple institutional and neighbourhood sectors. The UBC Land Use Plan provides UBC with municipal-like authorities, which means the prioritization and approval of policy related to heat pump retrofits falls under the university's purview of responsibility.¹⁰ Meanwhile, the University Neighbourhood Association (UNA) is uniquely positioned to represent neighbourhood interests in the climate advocacy space in order to access funding for climate resiliency projects through the university, the province of BC, and Metro Vancouver. The majority of buildings in the UBC neighbourhood

⁶ British Columbia Coroners Service (BCCS). "Report: Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021," June 7, 2022, pg. 11; pg. 5.

⁷ "Declaration on the Climate Emergency," UBC Office of the President, December 5, 2019.

⁸ "Neighbourhood Climate Action Plan," UBC Campus and Community Planning, updated July 27, 2023.

⁹ "Neighbourhood Climate Action Plan," UBC Campus and Community Planning, updated July 27, 2023.

¹⁰ "Land Use Plan," UBC Campus and Community Planning, amended to June 2, 2015.

are privately owned and governed under the BC Strata act. UBC will need to coordinate with stratas to implement bylaw changes, streamline communication, and simplify processes to encourage heat pump uptake among homeowners. Finally, UBC Properties Trust (UBC PT) will play a key role in the implementation of heat pump retrofits in its portfolio of rental buildings.

Research Approach

The research approach for this report combines a mixed methodology of qualitative and quantitative analysis with a comprehensive review of the policy and regulatory landscape impacting UBC neighbourhood residents.

The first stage of research consisted of a literature review to develop a climate justice framework. Scholarship by members of equity-deserving groups is emphasized and highlighted in the framework. The second stage involved analysis of UBC neighbourhood demographics using results from the 2021 Census to identify groups within the resident population that may be especially vulnerable to extreme heat.

Building on findings from the 2021 Census, the third stage consisted of original data analysis collected during a community engagement process. Two questionnaires – distributed separately to UBC neighbourhood residents and UBC strata presidents – were analyzed for the purpose of better understanding the community's lived experience in navigating retrofits, concerns about installing heat pumps, and barriers preventing them from accessing in-home cooling. The results of the questionnaires were used to develop policy recommendations tailored to the particular needs and desires of the UBC neighbourhood community.

The fourth stage involved stakeholders interviews. An interview with a representative of BC Hydro was conducted to better understand equity considerations in the development of future heat pump rebate programs. An interview with a representative of the UNA was conducted to better understand the organization's unique position within the climate advocacy space. Finally, a representative of UBC PT provided insight into tenants' experience with extreme heat, and the organization's plans to address resident concerns.

The final stage of research consisted of a review of UBC's regulations and policies related to building retrofits for strata-operated leaseholds and rental properties, and an evaluation of provincial and federal heat pump incentive programs.

Climate Justice Framework

What is Climate Justice?

At its core, climate justice advocates for a holistic reconstruction of climate policy that recenters decision-making processes to better address the disproportionate impact of the climate crisis on vulnerable and equity-deserving groups. Climate justice recognizes that climate change has a ‘multiplier effect,’ which means that impacts such as extreme heat, will amplify existing injustices and inequalities.¹¹

To address these issues, climate justice emphasizes equity, intersectionality, and responsibility to future generations as key principles in policy considerations.¹² Indigenous justice and Indigenous sovereignty are foundational to this work as climate justice acknowledges that Indigenous Peoples in Canada “contribute the least to the growing climate crisis, yet remain among those being impacted the first and hardest by intensifying climate change.”¹³ Integrating Indigenous justice with climate justice means decolonizing climate policy and bringing “Indigenous understandings of balance maintained through reciprocal relationships with the natural world” to the forefront of the policymaking process.¹⁴ This report recognizes that it is limited in its capacity to integrate Indigenous justice and Indigenous sovereignty with the climate justice framework without engaging directly with Indigenous communities. Future work should make space for meaningful, reciprocal, and appropriately compensated, dialogue with Indigenous groups and traditional knowledge keepers.

Responding to climate change requires that we transition away from non-renewable or inefficient energy sources, such as gas furnaces, electric baseboard heating, and air conditioning, and towards carbon friendly technology, like heat pumps, that will help us achieve net zero global emissions by 2050. Climate justice emphasizes that the transition to a decarbonized world is a collective responsibility – one that is centered in respect and care between humans and the more-than-human world.¹⁵

That being said, climate justice recognizes that not everyone possesses the same agency or resources required to partake equally in this transition. As a result, climate justice requires that those with the means and power to act on the climate crisis do so with “the urgency demanded

¹¹ “UBC Climate Emergency Engagement: Final Report and Recommendations,” The University of British Columbia, January 2021, pp. 11.

¹² “Climate Justice Toolkit for Municipalities,” BCCIC, June 2021, pp. 2.

¹³ “Decolonizing Climate Policy in Canada.” Indigenous Climate Action, March 2021, pp. 5.

¹⁴ “Indigenous-led Climate Policy: Phase 2 of ICA’s Decolonizing Climate Policy Project,” Indigenous Climate Action, December 2022, pp. 5.

¹⁵ Jenalee Kluttz. “Centering Justice in Climate Emergency Response.” The University of British Columbia, 2022, pp. 5.

by those who are most acutely at risk.”¹⁶ Transferring the costs of climate change to those with the most resources should be accompanied by policymaking that motivates and simplifies the implementation of sustainable solutions.

However, climate justice does not begin and end with the transferring of costs to the most affluent among us. In order to achieve true justice, policy making must change systems and structures that prevent vulnerable people from becoming active participants in improving their lived environment.

Climate Justice and Extreme Heat

Extreme heat events are a symptom of the climate crisis. Research shows that such events will only intensify in the coming years unless drastic action is taken. During the 2021 heat dome, the BC Coroner’s service reported that 90% of decedents¹⁷ were 60 years of age or older, and 56% of decedents lived alone.¹⁸ Moreover, 69% of decedents had chronic illnesses that impacted their mobility, such as heart failure, arthritis, or Parkinson’s disease, and 64% of decedents had mood or anxiety disorders, such as dementia or schizophrenia, which impacted their ability to seek help or to self-help.¹⁹

The Coroner's report also identified that those with substance use disorder, hypertension, epilepsy, chronic obstructive pulmonary disease, depression, asthma, or diabetes face a heightened risk of heat-related illnesses.²⁰ Climate justice recognizes that the impacts of the climate crisis, and more specifically the impacts of extreme heat events, may have a deeper effect on those with existing and intersecting vulnerabilities.²¹ As such, protecting vulnerable people must be central to the conversation of heat pump retrofits in UBC neighbourhoods.

Following the 2021 heat dome, nineteen UBC faculty and staff members delivered a letter of concern to C+CP, UBC PT, Village Gate Homes, and the owner of the properties, which expressed the following: “We are very concerned that our housing and neighbourhood design are dangerously inadequate to meet the challenges of climate change...given we were attempting to mechanically cool our homes with fans or air conditioners and still struggled or failed to

¹⁶ Jenalee Kluttz. “Centering Justice in Climate Emergency Response.” The University of British Columbia, 2022, pp. 6.

¹⁷ In this context, decedent is defined as a deceased individual.

¹⁸ British Columbia Coroners Service (BCCS). “Report: Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021,” June 7, 2022, pp. 13; pp. 17.

¹⁹ British Columbia Coroners Service (BCCS). “Report: Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021,” June 7, 2022, pp. 14

²⁰ British Columbia Coroners Service (BCCS). “Report: Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021,” June 7, 2022, pp. 5

²¹ Jenalee Kluttz. “Centering Justice in Climate Emergency Response.” The University of British Columbia, 2022, pp. 5.

maintain liveable temperatures.”²² Testimonies from residents indicated concerns over loss of sleep, heat-related illness, dizziness, exacerbation of existing medical issues, negative impacts to mental health, and signs of heat stroke in pets as indoor temperatures reached 31 degrees Celsius in certain units.²³ A just response to the climate crisis requires “careful consideration of an organization or an institution’s responsibility and action over time,” particularly in terms of its responsibility to protect vulnerable groups during extreme heat events.²⁴

Climate Justice and Regulatory Constraints

Regulatory constraints and equity gaps in provincial and federal incentive programs for heat pumps pose barriers to participation in collective action, while placing certain groups at greater risk during extreme heat events. Renters, for instance, face greater challenges in the transition to a decarbonized world as they are generally prevented from retrofitting their residence with a heat pump. In addition, homeowners in Multi-Unit Residential Buildings (MURBs) are not presently eligible for provincial and federal heat pump funding which places a disproportionate financial barrier on certain households, and may reduce uptake overall. As well, individuals with limited conversational knowledge of Canada’s two national languages, English or French, face a barrier in accessing information about heat pumps, and in navigating the heat pump retrofit and rebate process.

Climate justice recognizes that barriers to participation in the transition to a decarbonized world are often rooted in “underlying systemic inequities wherein some communities face stigma and discrimination because of their identities,” making it more difficult for them to secure safe housing and a livable income.²⁵ Climate justice is inherently concerned with historic injustice and systemic discrimination that amplify the risk of the climate emergency for marginalized groups including Indigenous, Black, and People of Colour, low income people, women, LGBTQIA2S+ communities, those with different abilities, and aging populations.²⁶ Furthermore, climate justice recognizes that systemic and structural oppression means that those who feel the greatest impact of the climate crisis often lack the necessary resources to improve their situation.

Climate justice is upheld by the “premise that every body and mind is considered an essential part of the community and that they cannot be left behind in climate emergencies or

²² John Tompkins, “As Heat Dome Descends, UBC Rental Buildings Bake, Residents Roast,” *The Campus Resident*, August 2021, pp. 1; pp. 7.

²³ John Tompkins, “As Heat Dome Descends, UBC Rental Buildings Bake, Residents Roast,” *The Campus Resident*, August 2021, pp. 1; pp. 7.

²⁴ Jenalee Kluttz. “Centering Justice in Climate Emergency Response.” The University of British Columbia, 2022, pp. 3.

²⁵ ‘A Climate Justice Charter for Vancouver.’ City of Vancouver, November 2022, pp. 7.

²⁶ Jenalee Kluttz. “Centering Justice in Climate Emergency Response.” The University of British Columbia, 2022, pp. 5.

responses.”²⁷ Therefore, a just response to these issues aims to remove barriers to participation in the transition to decarbonization, while providing all members of the community with the tools required to protect themselves from the impacts of the climate crisis.

Climate Justice and Policy Making

To achieve climate justice, policy making must not be an entirely top-down endeavour, lest it unintentionally impose additional burdens on vulnerable groups. Making space for those most impacted by climate change to share their lived experience and wisdom is central to climate justice as it allows the community to reclaim decision-making power and contribute to collective climate action.

Historically, marginalized groups, such as Indigenous peoples, People of Colour, people with disabilities, women, youth, and members of the 2SLGBTQIA+ community have been systematically excluded from decision-making circles, which has only increased their vulnerability to the climate crisis and upheld a patriarchal and colonial approach to climate change mitigation.²⁸

Therefore, a just response to the prior exclusion of marginalized groups from the decision making process is procedural justice which aims to meaningfully involve the community in policymaking, amplify the voices of marginalized groups, and ground decision-making in lived experience.²⁹

²⁷ ‘A Climate Justice Charter for Vancouver.’ City of Vancouver, November 2022, pp. 18.

²⁸ “UBC Climate Emergency Engagement: Final Report and Recommendations,” UBC, January 2021, pp. 6.

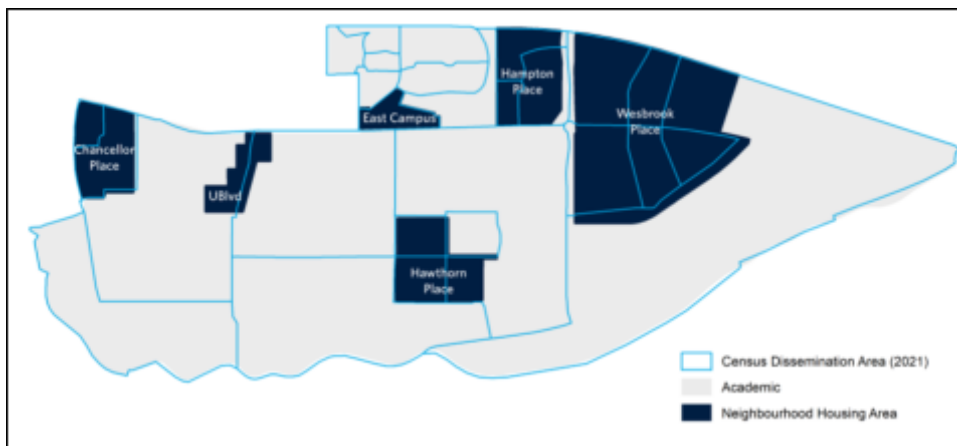
²⁹ Jennifer Dobai, Manuel Riemer, and Bianca Dreyer. “Sustainability Justice in the Context of Municipal Climate Action Planning: Key Consideration.” Viessman Centre for Engagement and Research in Sustainability, September 2020.

Engaging the Community

Neighbourhood Demographics

Analyzing data from the 2021 Census for the University of British Columbia helped to identify groups in the UBC neighbourhood community who may be especially vulnerable to the impacts of extreme heat, as well as groups who may face disproportionate barriers to accessing sustainable in-home cooling. Values reported in Figure 2 include aggregated totals from UBC's six sub-neighbourhoods, Chancellor Place, East Campus, Hawthorn Place, Hampton Place, Wesbrook, and University Boulevard.³⁰ (See figure 1 for a map of the UBC neighbourhood housing area. See Appendix A for demographic breakdown by sub-neighbourhood.) While reported values may have changed slightly since 2021, the community totals are still considered a reliable measure of UBC neighbourhood demographics.

Figure 1. Map of UBC Neighbourhood Housing Area



Vulnerable Residents in the UBC Neighbourhood Community

In 2021, the UBC neighbourhood reported a population of 12,520 residents. Of this population total, 11% were residents aged 65 years and over. Elderly residents are especially vulnerable to the impacts of extreme heat as they are more likely to suffer from existing health conditions that are exacerbated by prolonged periods of high indoor temperatures, or have mobility limitations that might prevent them from traveling to a cooling center. UBC renters also face a higher risk during extreme heat events as they are generally prevented from making any physical changes to the structure of the residence that would help to lower indoor temperatures. In certain cases, BC landlords have even written anti-alteration clauses into

³⁰ Values are rounded up or down to a multiple of '5' or '10' as per Statistics Canada's confidentiality policy.

leases to prevent renters from pursuing retrofits, or risk eviction.³¹ The 2021 Census found that 54% of the population were renters and 46% were homeowners, although since values were drawn from a population sample they may not represent true community proportions.³² That being said, the reported proportion of renters is substantive considering that only 31% of residences in the UBC neighbourhood are purpose-built rentals. Strata presidents have confirmed that private homeowners are renting out their units, however the proportion of renters in privately owned units is currently unknown. Capturing the proportion of those renting privately from homeowners is important within the context of heat pump retrofits as certain funding programs, such as the Canada Greener Homes Grant, exclude private landlords which may reduce motivation for private landlords to pursue costly retrofits. Ultimately, these barriers not only prevent renters from participating in the transition to a decarbonized future, but also places them at greater risk during extreme heat events.

Finances and language can also pose a barrier to heat pump retrofits that disproportionately impacts certain community members relative to others. In BC, a heat pump retrofit is estimated to cost between \$6000 and \$14,000 depending on the type of heat pump and the installation required to support the home.³³ The 2021 Census finds that 35% of the population aged 15 years and over in private households qualify as low-income after tax.³⁴ Of this, 1.5% are low-income residents aged 65 years and over, while 28% are aged 18 to 64. Provincial and federal funding incentives do not currently cover the entirety of a heat pump retrofit. Moreover, MURB owners are not currently eligible for provincial or federal funding. As such, financing a heat pump retrofit may remain out of reach for low-income community members, which can exacerbate their vulnerability to extreme heat. Furthermore, the 2021 Census reports that 5.9% of residents in UBC neighbourhoods have no knowledge of either of Canada's two official languages, English or French. Since information between UBC and the neighbourhood community is predominantly communicated in English, limited English language skills can act as a barrier to accessing information about heat pumps, or navigating the retrofit and rebate process.

Finally, recall that barriers to accessing in-home cooling are often rooted in “underlying systemic inequities wherein some communities face stigma and discrimination because of their

³¹ Maya Korbynn, “The Missing Third: Improving Tenants’ Rights to Energy Efficient, Climate Resilient, and Safe Housing,” Eco Trust Canada, March 2023, pp. 6.

³² Rates are based on a sample of the population. 5670 residents from the total population were included in the sample.

³³ “Heat Pumps,” BC Hydro Power Smart, Accessed July 17, 2023.

³⁴ Total income statistics in 2020 for the population aged 15 years and over in private households is 10,180. The low-income measure after tax refers to a fixed percentage of 50% of median-adjusted-after-tax income of private households. Household after-tax income is adjusted for different households reflecting the fact that as the number of members of the household increase, needs increase as well. Defined as half of the Canadian median of the adjusted household after-tax income multiplied by the square root of the household size (Statistics Canada, 2017).

identities,” which may increase barriers to securing safe housing and a livable income.³⁵ While extensive analysis of the systemic and structural oppression facing marginalized groups within the context of extreme heat events is beyond the scope of this report, it is important to note that the 2021 Census finds that more than half of the UBC neighbourhood population are members of a minority group. More specifically, 68% of UBC neighbourhood residents self-identify as members of the following visible minority groups: South Asian, Chinese, Black, Filipino, Arab, Latin American, Southeast Asian, West Asian, Korean, Japanese, Guyanese, Pacific Islander, Polynesian, Tibetan, and West Indian, while 0.5% of residents identify as Indigenous.³⁶ As such, we must keep in mind that a resident’s vulnerability to extreme heat, as well as barriers to accessing in-home cooling may stem from decades of historical injustice and systemic discrimination.

Figure 2. 2021 Census UBC Neighbourhood Demographics

Demographic:	Total Counts and Rates:
Total Population	12,520 (100%)
Total persons aged 65 years and over	1365 (11%)
Renters	3080 (54%) *Based on a sampled population of 5670 individuals
Homeowners	2595 (46%) *Based on a sampled population of 5670 individuals
Persons for whom the low-income status based on low-income measure after tax applies	3660 (35%) *Based on the total population of 10,180 residents aged 15 years and over in a private household
Persons 65 years and over for whom the low-income status based on low-income measure after tax applies	150 (1.5%) *Based on the total population of 10,180 residents aged 15 years and over in a private household
Total persons with no knowledge of English or French	745 (5.9%)
Total visible minority population	8515 (68%)
Total Indigenous population	60 (0.5%)

³⁵ ‘A Climate Justice Charter for Vancouver.’ City of Vancouver, November 2022, pp. 7.

³⁶ Counts are based on 25% sample data from 2021 Census for The University of British Columbia.

Limitations to Neighbourhood Demographics Data Analysis

There are three notable limitations in the existing Census data on UBC neighbourhood demographics. While the community questionnaire aimed to fill certain gaps, the response to the survey was minimal and cannot be considered proportionally representative. Future data collection should continue to work to close the following gaps.

First, the Census data does not capture health conditions, disabilities, or mobility limitations, which greatly limits our ability to gauge how many residents are especially vulnerable to extreme heat. Without this information, we cannot assess how many residents with high susceptibility to heat-related death and illnesses also face disproportionate barriers to accessing in-home cooling, such as low-income, lack of knowledge of the English language, or other regulatory restrictions.

Second, the Census does not differentiate between renters in purpose-built rentals, such as faculty and staff rentals and market rentals, and those renting privately from individual landlords. While tenants renting from purpose-built rentals can express their concerns of overheating to UBC PT, and work together to drive change at the institutional level, tenants renting from private landlords lack access to formal avenues, and cannot easily unite, which may impose additional challenges to accessing in-home cooling.

Third, the Census may underreport the renter population since students living in UBC neighbourhoods are generally treated as residents of their parents' household, rather than members of the neighbourhood. Future work should aim to reach this group so as to better understand how extreme heat has impacted their lives.

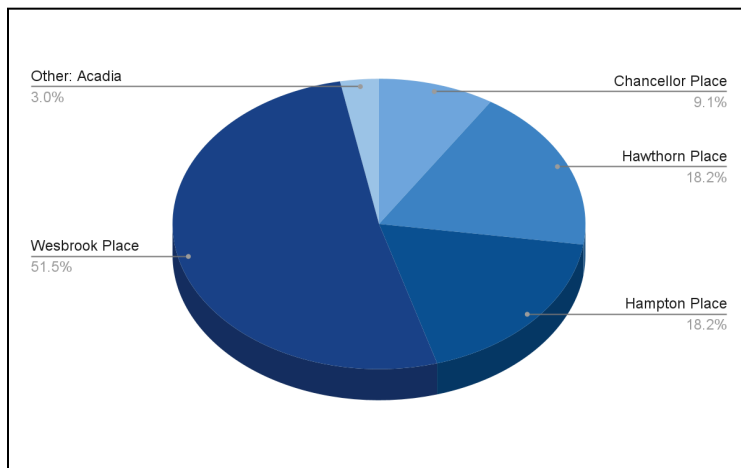
Community Consultations

Consultations with the UBC neighbourhood community took the form of two brief questionnaires disseminated by the UNA to neighbourhood residents and strata presidents. The purpose of the questionnaires was to capture the community's lived experience during extreme heat events, and to understand in their own words the barriers preventing them from accessing in-home cooling, as well as the challenges facing stratas in the transition to decarbonization. Responses were collected from July 7, 2023 to July 18, 2023.

Community Questionnaire

The community questionnaire garnered 32 complete responses from 4 of the 6 UBC sub-neighbourhoods, and 1 complete response from the Acadia neighbourhood.³⁷ The majority of respondents were residents of Wesbrook Place. Respondents resided in 25 different buildings; 16 of which were privately owned market leaseholds and 9 of which were faculty and staff rentals, and market rentals.³⁸ (See figure 3 for graphic breakdown).

Figure 3. Breakdown of Respondents by UBC Neighbourhood



The majority of respondents were homeowners (63%) and aged 65 years and older (39%). Overall, 96% of respondents either indicated that cooling was something that would improve their quality of life or that their residence already had in-home cooling. A significant proportion of respondents (39%) indicated that they had a health condition,

disability, or mobility condition that they felt made them vulnerable to extreme heat (See Appendix B for graphic breakdown).

Following the 2021 heat dome, the BC Coroners service found that individuals with intersecting vulnerabilities, specifically older adults with chronic diseases or health conditions and who lived alone were at greater risk during extreme heat events.³⁹ Results from the community questionnaire show that 6 respondents had 2 or more intersecting vulnerabilities to extreme heat, while 3 respondents had 3 or more intersecting vulnerabilities to extreme heat.⁴⁰ Of these 9 individuals, only 2 indicated that their residence had in-home cooling, while the remaining 7 indicated that in-home cooling was something that would improve their quality of life. Given

³⁷ Respondents were residents of the following neighbourhoods: Wesbrook Place, Hawthorn Place, Chancellor Place, Hampton Place, Acadia. Note: Acadia residents live in student housing, not in the UBC neighbourhoods.

³⁸ Respondents were residents of the following buildings: Pacific, Reflections, Ultima, Tapestry, The Stratford, Corus, The Laureates, Folio, Wyndham Hall, Keenleyside, Binning Tower, Virtuoso, Clements Green, Thames Court, The Balmoral, The Regency, Mundell House, Pine House, Nobel House, Cypress House, Tamarack House, Webber House, Dahlia House, Oakwood, Greenwood Commons, Westcott Commons.

³⁹ British Columbia Coroners Service (BCCS). "Report: Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021," June 7, 2022, pp. 4.

⁴⁰ Vulnerabilities included respondents who were 65 years and over, had a pre-existing health condition, disability, or mobility condition, lived alone, or was a renter.

that the 2021 Census finds that 11% of residents are aged 65 years and over, there is a high possibility that the community questionnaire did not capture all residents who have both intersecting vulnerabilities and who lack access to in-home cooling. Therefore, while the results from the community questionnaire may not be entirely representative of the community, they do demonstrate that more often than not residents with amplified risk of heat-related death and illnesses likely lack access to cooling.

Open ended questions revealed several barriers preventing residents from accessing in-home cooling such as affordability of cooling mechanisms, size and maneuverability of portable air conditioners, lack of knowledge about the cooling options that were allowed by stratas and landlords, as well as a lack of knowledge about the permitting process for heat pumps. One

“These buildings were designed very poorly for natural cooling and it is often 5-6 degrees warmer in this apartment than it is outside, even with all the windows open.” - Renter, Wesbrook Place.

renter in Wesbrook Place stated that they found it difficult to properly use a portable air conditioner because the windows in their unit were not conducive to installing the hose required to pump out hot air. Another resident noted that many companies would not install heat pumps in strata-operated residences. In certain cases, landlords were cited as barriers to installing window air

conditioners.⁴¹ PT allows renters to install window air conditioners, however concerns raised by tenants suggest that messaging about cooling options could be improved.

Moreover, both strata councils’ and other homeowners’ concerns about noise, water drainage, and visual impact, were cited as barriers to installing heat pumps. In fact, one resident in Wesbrook Place indicated that the strata had asked a resident in their building to remove their heat pump because it was not approved by the strata.

Several respondents expressed concerns that installing a heat pump in their residence would cause water damage if there was not proper

“We went [through] the process of a feasibility study, bylaw modification, contractor search, etc. and a small group of owners are about to start the installation process. We are about to request permits from UBC Development. This has been a very long process, almost a year, as we continued to discover barriers and legal requirements.” - Owner, Wesbrook Place.

⁴¹ Renters were tenants of Nobel House and Webber House; faculty and staff rental buildings operated by UBC Properties Trust.

water drainage on the exterior of the unit, or that it would cause damage to the ceiling of the unit if a dedicated line to the electrical panel was needed. One respondent indicated that the complexity, cost, and duration to obtain approval for a heat pump was unreasonable. Another respondent questioned whether the brick walls of their building would physically prevent them from installing a heat pump.

One resident in Wesbrook Place indicated that their strata council is in the process of changing the bylaws to allow owners to install individual heat pumps because the building design does

Policies and Bylaws and Rules have to be changed as I'm not sure how many more heat domes, at my age, I can survive." - Owner, Chancellor Place.

not allow for central air conditioning. However, they noted that the process took almost a year as they continued to discover more barriers and legal requirements.

There was unanimous agreement amongst residents who had installed heat pumps that it had improved their quality of life, with one resident relaying that the temperature in their unit is always comfortable and their electricity bills are half of what they were prior to

installing the heat pump. Another resident stated that while there was a temperature difference between the bottom and top floors of their four-story townhouse, they were grateful to have cooling at all.

Many residents offered helpful suggestions on ways to remove barriers and simplify the process of installing a heat pump, such as developing a clear roadmap of the installation process for owners, and a detailed template for condos to pursue bylaw changes.

Strata President Questionnaire

The strata president questionnaire garnered 18 responses from a mix of condominium and townhome housing complexes.⁴² More than 75% of strata presidents indicated that unit owners in their building had expressed concerns about overheating during extreme heat events. In addition, 88% of strata presidents indicated that, on average, less than 25% of units in their building were being rented out privately by owners (See Appendix B for full graphic breakdown). This is important to note as certain heat pump funding incentives exclude private landlords

⁴² Respondents were strata presidents of the following buildings: Sail, Sandringham, Journey, Hawthorn Green, Argyll House West, Logan Lane Townhouses, Pacific, Wyndham Hall, Reflections, West Hampstead, Corus, Tapestry, Legacy, The Stratford, The Regency, Chancellor Row, Pathways.

which may exacerbate the ‘split-incentive’ problem by further decreasing motivation to pursue costly retrofits.

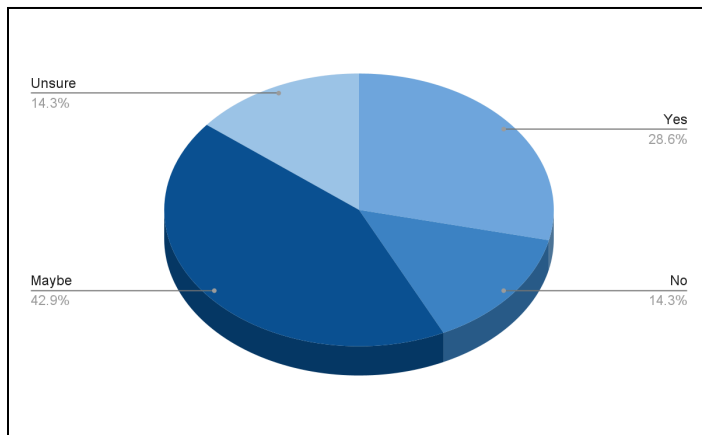
Depending on the type of the building or housing complex the strata operated, presidents were asked whether the strata corporation would be willing to coordinate CleanBC Group Purchase Rebates to encourage heat pump uptake, or whether they would be willing to pursue whole building retrofits on behalf of owners not presently eligible for provincial and federal financial incentives.

For context, a Group Purchase Rebate (GPR) is an additional rebate offer of up to \$500 from CleanBC that rewards homeowners who work together to reduce GHG emissions by switching from natural gas heating to an air source heat pump. Eligible homeowners receive the GPR in addition to the regular CleanBC Better Homes heat pump rebate. (See Evaluation of Incentives Program for full CleanBC program breakdown). The GPR promotes collective action, and is therefore in alignment with the key principles of climate justice.

Presently, individual CleanBC heat pump rebates are not available for condo owners. However, funding incentives for whole building retrofits are available to strata corporations through the CleanBC Custom, Custom-Lite, and Commercial Express programs. (See Evaluation of Incentives Program for more information about CleanBC Custom and Custom-Lite Programs).

In general, strata presidents were moderately receptive to the idea of coordinating additional Clean BC Group Purchase Rebates through the council. (See figure 4 for full graphic breakdown). However, fewer presidents expressed interest in pursuing whole building retrofits on behalf of condo owners. (See Appendix B for full graphic breakdown).

Figure 4. Would your Strata corporation be willing to coordinate CleanBC Group Purchase Rebates?



Open-ended questions revealed that several stratas are in the process of changing their bylaws to allow individual unit owners to install heat pumps. Respondents also provided insight into the challenges strata councils and owners face in navigating heat pump retrofits. Common challenges included

affordability of heat pump installations, especially if additional electrical rewiring is required, mitigating water drainage, and technical feasibility with consideration to the design of the building. For instance, one strata president indicated that the outdoor space did not provide an obvious place to install an air-based or ground-source heat pump. Another strata president noted that since most units in the building had an outdoor balcony, water drainage was a significant issue. The company that supplied one resident's heat pump placed an evaporative drain tray under the unit, however the tray was ineffective in preventing water overflows during high humidity. It is unlikely that all unit owners would be able to continuously monitor trays for overflow, which introduces a risk of flooding and water entry into units below.

Strata presidents raised several questions and concerns in relation to heat pump retrofits. For instance, would their building's electrical system be able to supply added demand? How environmentally friendly are heat pumps really? Would heat pump retrofits compromise the building envelope? Respondents stressed that stratas needed reliable information about the benefits of heat pumps and how they work, to counter misinformation circulating among homeowners.

We have several folks installing Innova units, where the heat pump is entirely indoors, and only the ventilation ducts go through the walls. We had a demonstration in one upper unit, where the Innova was running upstairs and visitors could go into the lower unit to see if there was any annoying noise. I think this persuaded a lot of people that these units were a viable solution - Strata President, Hawthorn Place.

Strata presidents offered many perceptive recommendations on how to remove barriers to heat pump retrofits in their buildings. Recommendations included exploring options to finance whole building retrofits through the BC contingency reserve fund (CRF), providing checklists and presentations to help stratas advise unit owners on the permitting and rebate processes, amending building codes to require proper and safe drainage of heat pumps for condominiums, and organizing demonstrations of an operating heat pump to address noise concerns among residents.

Strata presidents also provided more general recommendations on how to improve in-home cooling, and reduce energy use by implementing higher quality glazing on windows, exterior mounted shading, and more frequent inspections on heat pumps to resolve any issues with water drainage.

Finally, strata presidents indicated that owners in their buildings who had installed heat pumps reported more comfortable temperatures, especially at night, and lower heating bills during the winter months.

Stakeholder Consultations

Stakeholder consultations consisted of interviews with representatives from BC Hydro, the UNA, and UBC PT, to better understand each stakeholders' role in responding to resident concerns about extreme heat, and improving access to sustainable in-home cooling.

Interview with BC Hydro

Discussions with the representative from BC Hydro revealed important developments with respect to future heat pump rebate offerings. As discussed above, renters and owners in MURBs are not eligible for any individual heat pump rebate incentives through the CleanBC program. In addressing this equity gap, BC Hydro plans to develop an incentive program that will be tailored to owners and renters of MURBs.

While specific offerings are still under development, the representative indicated that the program for MURB unit owners will likely follow a prescriptive framework that covers the costs of technology, rather than the current performance-based framework that rewards homeowners and building owners for reducing GHG emissions. In addition, the program will likely provide coaching services for MURBs that are similar to the existing strata advisor energy programs, and partner with organizations such as BC Housing, Engineers and Geoscientists BC (EGBC), and local governments to develop materials and guidance documents that address common questions, concerns, and misperceptions about heat pumps. Finally, the representative indicated that the program would likely consist of a recruitment component to reach a greater number of qualifying individuals.

Interview with the University Neighbourhood Association

Discussions with a staff representative from the UNA helped to identify ways to leverage the organization's unique position within the climate advocacy space. The staff member noted that members of the UNA elect a Board of Directors to provide oversight, develop policies, and set strategic priorities of the society.⁴³ Additionally, the staff member noted that as elected representatives of the community, the Board of Directors can emphasize resident concerns about extreme heat in advocating for retrofit funding from the provincial government and from the university.

⁴³ "Governance," University Neighbourhood Association, accessed August 1, 2023.

Discussion also revealed important equity considerations in the UNA's communications strategies. As previously discussed, minimal familiarity with English may prevent a resident from accessing information about heat pumps and navigating the heat pump retrofit process. The representative indicated that the UNA is aware that a large portion of the community speaks Mandarin, French, Korean, and Farsi and plans to make use of that knowledge to translate important information moving forward. In addition to language considerations, the UNA has begun to change the way that information is presented in the online newsletter to account for blind or visually impaired folks who use screen readers or alt text. Finally, the representative indicated that climate and sustainability related information is always written in plain language so that residents with varying levels of understanding can all engage.

Interview with UBC Properties Trust

Discussions with the representative from UBC PT revealed several ongoing and future plans to address resident concerns about overheating. In 2021, the organization initiated a pilot project in two Wesbrook Village buildings to provide solar shades on 19 west-facing balconies and solar film in 17 west-facing units.

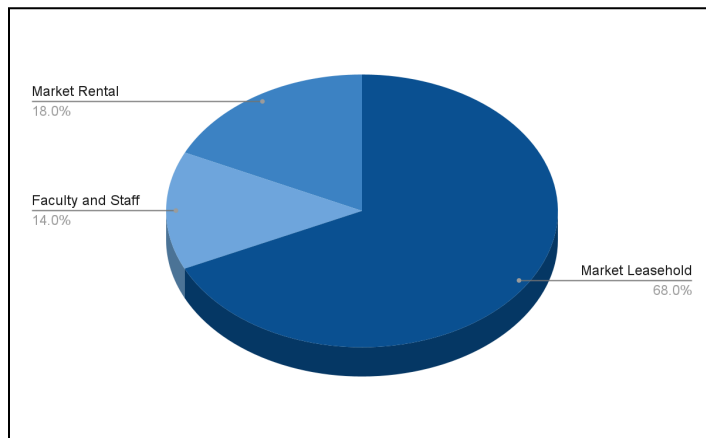
In addition, the organization purchased 350 A/C units and sold them to residents at a discounted rate. UBC PT provided the installation, however residents were allowed to keep the unit on move-out. All A/C units were sold within two years. At present, UBC PT is discussing the possibility of purchasing more A/C units for the upcoming year. Lastly, the representative noted that moving forward all buildings will have central A/C units installed.

Understanding the Regulatory Landscape

The UBC neighbourhood community is housed in a mix of market leaseholds,⁴⁴ faculty and staff rental housing, and market rental housing. Housing types consist of low, medium, and high rise condominiums and apartment buildings, and attached townhomes or rowhomes.

In total, the UBC neighbourhood consists of 73 residential buildings comprising a total 6796 units; 4624 of which are market leaseholds, 1221 of which are market rentals, and 951 of which are faculty and staff rentals.⁴⁵ (See figure 5 for full graphic breakdown.) This is important to consider since residents of market rentals and faculty and staff rentals are generally prevented from pursuing their own heat pump retrofits. Of note, only 11 buildings, comprising 1632 units, in the UBC neighbourhood have air conditioning, of which only 3 buildings, comprising 264 units, are rental housing.⁴⁶

Figure 5. UBC Neighbourhood Building Breakdown⁴⁷



UBC Policies Impacting Residents

Residential buildings in the UBC neighbourhood constructed after 2015 have an exclusive energy services agreement with Corix utilities which imposes a legal constraint on heat pump retrofits.⁴⁸ The agreement specifies that neither the developer, nor any other person, will “perform, provide, install, or realize any other system to provide primary domestic

space heating.”⁴⁹ Since heat pumps provide both heating and cooling, they are prohibited under the energy services agreement. Climate justice emphasizes that no one be left behind as communities respond to the impacts of the climate crisis. Even though residents under exclusive energy services agreements may be prevented from pursuing sustainable options and

⁴⁴ In this context, a market leasehold is defined as a privately owned unit under a 99 year lease.

⁴⁵ “UBC Faculty and Staff Housing Needs Assessment and Programs Review,” Urban Matters CCC, November 2022, pp. 55.

⁴⁶ Complete list of buildings with air conditioning is as follows: Academy, Binning Tower, Evolve, Oakwood, Ivy on the Park, Residences at Nobel Park, Sage, Tapestry, The Laureates, Virtuoso, The Westbrook.

⁴⁷ This breakdown is informed by 2022 figures.

⁴⁸ Complete list of buildings that are unable to retrofit with heat pumps is as follows: Binning Tower, Cypress House, Mundell House, Nobel House, Pine House, Webber House, Georgia Point, Oakwood, Residences at Nobel Park, The Laureates, Virtuoso.

⁴⁹ “Energy Services Agreement,” Neighbourhood District Energy System Corix Utilities, 2014.

participating in collective climate action, they can still install air conditioning systems, which ensures that they are not left behind to face rising temperatures.

In addition, strata presidents have raised legitimate concerns surrounding water drainage and water damage on balconies not designed for such equipment. These concerns will need to be addressed and resolved before heat pumps can be installed in order to mitigate any potential damage to the building. Moreover, in the absence of clearly worded bylaws to facilitate heat pump retrofits, strata councils have the authority to reject a homeowner's retrofit application. Many strata presidents reported that navigating bylaw changes was a challenging undertaking as they continued to discover new technical barriers and legal requirements. In order to simplify and expedite this process across strata councils, UBC should provide a generic model bylaw that stratas can adopt. Doing so would ensure that obtaining strata approval is not a barrier for homeowners who want to install a heat pump.

Finally, the 2023 draft UBC Housing Action Plan (HAP) asserts that recruitment and retention of UBC faculty and staff is the university's primary objective in relation to housing. To achieve this goal, HAP proposes to maintain existing and future rental units at an affordable rate of 25% below rents charged for comparable buildings and unit types on Vancouver's westside.⁵⁰ Furthermore, HAP proposes expanding the Rent-Geared-to-Income pilot program for moderate-income faculty and staff.⁵¹ While keeping rents affordable is a crucial objective, and one that should not be sacrificed, it may also impose challenges on UBC PT's ability to accumulate sufficient revenue to fund climate resilience projects for existing buildings. However, as summers on UBC campus get hotter, in-home cooling will become central to the objective of recruitment and retention. For that reason, it should be considered within the context of housing and budget planning at UBC.

⁵⁰ "UBC Housing Action Plan: Ten-Year Update (2023)," UBC, 2023, pp. 2.

⁵¹ Qualifying faculty and staff in the Rent-Geared-to-Income program pay 30% of their households income before taxes to rent eligible units.

Applying a Climate Justice Lens to Heat Pump Rebates and Grants for UBC Neighbourhood Residents

Heat pump rebates are provided by CleanBC; a Province of BC initiative administered by BC Hydro and Fortis BC to fund energy efficiency improvements for homes and buildings. Similarly, the Canada Greener Homes Initiative is a program administered by the Federal government that provides grants to homeowners switching to efficient energy systems.

The following sections briefly describe how eligibility requirements for CleanBC and Canada Greener Homes Initiative programs impact UBC neighbourhood residents.

CleanBC Better Homes Heat Pump Rebate

The CleanBC Better Homes rebate offers \$1000 for homes heated with electricity supplied by BC Hydro and \$6000 for homes heated with natural gas towards the purchase and installation of a ductless mini-split or multi-split heat pump. Rebates are only available to UBC homeowners living in townhomes where the electricity meter is in the name of the unit resident or homeowner, which means that landlords renting out their townhomes would be eligible. Note that eligible applicants can apply for both the CleanBC Better Homes rebate, the CleanBC Group Purchase Rebate, and the Canada Greener Homes Grant in order to maximize financial benefits.

CleanBC Group Purchase Rebate

The CleanBC Group Purchase Rebate offers up to \$500 on top of the CleanBC Better Homes rebate for groups of homeowners working together to reduce emissions by switching from fossil fuel heating systems to heat pumps. Rebates are available to UBC homeowners living in townhomes primarily heated with natural gas and who reside in the same BC Hydro electricity service area.

CleanBC Income Qualified Program

The CleanBC Income Qualified Program offers up to \$5000 for homes heated with electricity supplied by BC Hydro and up to \$9500 for homes heated with natural gas towards the purchase of a ductless mini-split or multi-split heat pump. Applicants must meet low-income qualification requirements based on the pre-tax annual income of all adults living in the home. Rebates are available to low-income UBC homeowners and low-income UBC renters living in townhomes. Low-income renters must obtain approval for the retrofit from their landlord and the landlord must agree to cover the residual cost of the project.

CleanBC Custom and Custom-Lite Programs

The CleanBC Custom Program offers building owners or operators up to \$200,000 for an air-to-air rooftop heat pump or ground source heat pump, and covers 50% of the cost of a mandatory energy study up to a maximum of \$20,000. The CleanBC Custom-Lite Program offers up to \$72,000 per project for an air-to-air heat pump rooftop unit and covers 50% of the cost of an energy study up to a maximum of \$2000. Financial benefits can be spread across multiple properties up to a maximum of \$750,000. Financial incentives are available to UBC PT as the owner and operator of residential buildings in the UBC neighbourhood. That being said, buildings must demonstrate sufficient GHG emission savings in order to be covered (see Appendix C for GHG emission savings requirements). Incentives may be available to strata corporations if heating in the residential building is centralized. In certain cases, exceptions may be made if equipment is centralized, but charged on a residential rate.

CleanBC Commercial Express Program

The CleanBC Commercial Express Program offers building owners or operators up to \$100,000 towards the purchase and installation of packaged rooftop units equipped with an air source heat pump, distributed mini-split heat pump, or in-suite packaged heat pump and in-suite Heat Recovery Ventilation. The program has no minimum GHG savings threshold and does not require an energy study. Financial incentives would be available to UBC PT as the owner and operator of residential buildings in the UBC neighbourhood. (see Appendix C for GHG emission savings requirements).

Clean Building Tax Credit

The Clean Building Tax Credit offers a 5% tax credit for qualifying expenditures paid on energy efficiency retrofits for corporations with a permanent establishment in BC. Tax credits would be available to UBC PT so long as it is not exempt from paying taxes in BC.

Canada Greener Homes Grant

The Canada Greener Homes Grant offers up to \$5000 towards the purchase and installation of a ductless mini-split or multi-split heat pump, as well as up to \$600 towards the cost of two mandatory EnerGuide evaluations of the home. Grants are available to UBC homeowners living in townhomes, however landlords are not eligible for the benefit. Again, note that eligible applicants can apply for the Canada Greener Homes Grant, in addition to the CleanBC Better Homes rebate, and the Clean BC Group Purchase Rebate in order to maximize financial benefits.

Figure 6. Incentives Available for Different Resident Groups in the UBC Neighbourhood

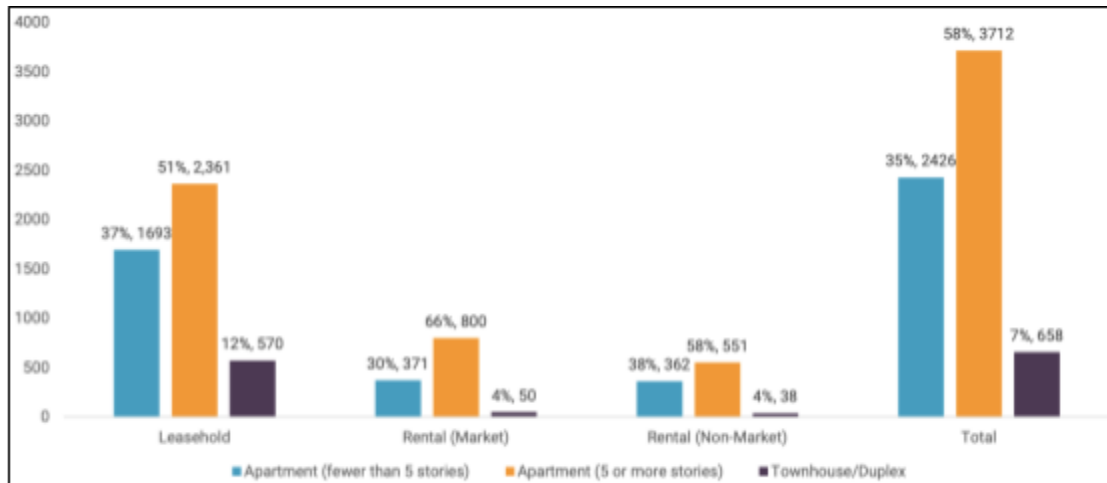
<p>UBC Renters in purpose-built rental MURBs <i>Applicants must be a building owner</i></p> <ul style="list-style-type: none"> - CleanBC Custom and Custom-Lite Programs <i>*Buildings with suite-level heating and multiple residential accounts with BC Hydro are not eligible</i> - CleanBC Commercial Express Program - Clean Building Tax Credit <i>* Available to corporations with a permanent establishment in BC; or an individual, including a trust that is a resident in BC or has income earned in BC for income tax purposes. Entity must <u>not</u> be exempt from BC income tax</i> 	<p>UBC Homeowners and renters in market leasehold MURBs <i>Applicants must be a building operator</i></p> <ul style="list-style-type: none"> - CleanBC Custom and Custom-Lite Programs <i>*Buildings with suite-level heating and multiple residential accounts with BC Hydro are not eligible</i> - CleanBC Commercial Express Program - Clean Building Tax Credit <i>*Available to corporations with a permanent establishment in BC; or an individual, including a trust that is a resident in BC or has income earned in BC for income tax purposes. Entity must <u>not</u> be exempt from BC income tax</i>
<p>UBC Renters in duplexes, townhomes, rowhomes</p> <ul style="list-style-type: none"> - CleanBC Income Qualified Program <i>*Subject to income qualifications and landlord's approval</i> 	<p>UBC Homeowners in duplexes, townhomes, rowhomes</p> <ul style="list-style-type: none"> - CleanBC Better Homes heat pump rebate - CleanBC Group Purchase Rebate <i>*Only for homes heated with natural gas in BC Hydro territory</i> - CleanBC Income Qualified Program <i>*Subject to income qualifications</i> - Canada Greener Homes Grant <i>*Unless homeowner is a landlord</i>

Analysis of Equity Gaps in Heat Pump Rebates and Grants for UBC Neighbourhood Residents

At present, provincial and Federal rebate incentives do not align with the key principles of climate justice. Climate justice advocates for the recentering of climate policy to address the disproportionate impact of the climate crisis on vulnerable and equity-deserving groups, and emphasizes the principle of leaving no one behind in the transition to a decarbonized world. However, current funding incentives primarily serve only homeowners and low-income renters in detached dwellings, duplexes, and townhomes. The majority of residences in the UBC neighbourhood are MURBs, which means that a significant part of the community is excluded from financial incentives for heat pump retrofits. (See figure 7 for full breakdown of UBC neighbourhood housing stock). This imposes a significant policy constraint on overall uptake of heat pumps, and may make it more difficult for UBC to achieve its emission reduction goals. In

addition, even among households that are eligible for rebates, homes heated by electricity receive significantly less financial assistance compared to homes that are heated with fossil fuels, imposing a disproportionate barrier to accessing in-home cooling. (See Appendix C for overview of incentive programs).

Figure 7. Breakdown of UBC Housing Stock



Source: UBC Housing Database, 2022

It is important to note that the program is not designed to facilitate access to in-home cooling, but to encourage households that are the greatest contributors of GHG emissions to transition to decarbonized heating and cooling systems. While reducing GHG emissions is key to climate action, climate justice stresses that it not be prioritized over protecting vulnerable individuals within the context of the climate crisis.

CleanBC programs provide financial incentives based on the home's potential energy savings, which is why the CleanBC Better Homes rebate offers a greater incentive for switching from fossil fuel heating systems to heat pumps than for switching from electric heating systems to heat pumps. However, at the same time, households with electric heating systems may face disproportionate financial barriers to accessing in-home cooling since rebates will only cover a fraction of the cost of a heat pump retrofit. Similarly, the CleanBC Group Purchase Rebate is only available to households that are heated primarily with natural gas, which may reduce the number of eligible households that strata councils can group together to maximize benefits and encourage collective action.

Currently there are no individual rebate offerings available to renters or homeowners in MURBs, making them dependent on the will of the building owner or operator to pursue building retrofits under the CleanBC Custom, Custom-Lite, and Commercial Express Programs. However,

like individual rebate programs, commercial funding programs are also based on the building's potential energy savings, which means that not all MURBs will be eligible to receive benefits. For instance, MURBs with suite-level baseboard heating and multiple residential accounts are not eligible for the CleanBC Custom and Custom-Lite program as there is primarily no GHG savings for switching from baseboards to heat pumps. Therefore, if a building owner or operator is either unable or unwilling to pursue a whole building retrofit and/or pay the residual cost of the retrofit not covered by the program, residents will be left with limited options to access in-home cooling. And as a result, may face greater risks during extreme heat events.

Finally, while individual owners in MURBs can still pursue heat pump retrofits at their own expense, subject to the approval of their strata council, folks renting privately from individual MURB owners cannot. Without access to individual rebates, it is much less likely that private landlords will pursue costly in-suite retrofits for which they will not reap the benefits of cooling and reduced utility costs. As a result, renters with inefficient heating systems may be disproportionately driven into 'energy poverty' as carbon taxation increases the cost of natural gas. Although the CleanBC Income Qualified Program does apply to low-income renters in townhomes, tenants are still dependent on their landlord to pay the residual cost of the retrofit, which creates another opportunity for landlords to deny their tenant access to in-home cooling.

Recommendations

Policy Recommendations for UBC

The following five policy recommendations propose actions that C+CP and the UNA can take to align UBC policy making with the principles of climate justice, as well as actions that the university can take to further climate justice at multiple levels of government. The recommendations aim to solve issues identified in the analysis sections, first by addressing the power disparity inherent in accessing cooling between homeowners and renters, and second by reducing barriers to participation in the transition to decarbonization that disproportionately impact certain community members relative to others.

Recommendation: Retrofitting UBC PT operated Faculty and Staff, and Market Rentals with Heat Pumps

Retrofitting UBC PT operated rental buildings aligns with principles of climate justice by resolving the power disparity inherent to accessing in-home cooling between homeowners and renters, while also protecting the health, wellbeing, and safety of UBC faculty and staff who are essential to the institution's everyday operation, and addressing community concerns about extreme heat.

In addition, this recommendation aligns with UBC's established commitments to climate justice and climate action. As previously discussed, UBC has committed to incorporate climate justice in decision-making frameworks, to reduce carbon emissions in line with the science of 1.5°C warming,⁵² and to "go beyond minimizing harm to becoming net contributors to human and ecological health."⁵³ In order to achieve these outcomes in line with the principles of climate justice, decisions related to heat pump retrofits must be both inclusive and equitable. In other words, policy must 'leave no one behind' in the transition to decarbonization, while also addressing the disproportionate impacts of the climate crisis on vulnerable and equity-deserving groups. Systemic and structural inequities have made equity-deserving groups especially vulnerable to the effects of extreme heat. Therefore, by centering decision-making on their needs, policy produces more inclusive and equitable outcomes.

In addition, this recommendation aligns with commitments and goals identified in the UBC Housing Action Plan, the Wellbeing Framework, the 20-year sustainability plan, and UBC's 2019 Declaration on the Climate Emergency. As previously discussed, the primary goal of the UBC Housing Action Plan is to support recruitment and retention of UBC faculty and staff through

⁵² "Declaration on the Climate Emergency," UBC Office of the President, December 5, 2019.

⁵³ "Shaping UBC's Next Century: Strategic Plan 2018-2028," The University of British Columbia, 2018, pp. 40.

housing programs. The UBC Faculty and Staff Housing Needs Assessment and Program Review identifies ‘housing needs’ and ‘housing aspirations’ as two key concepts that contribute to this goal. ‘Housing needs’ are demonstrated by a household’s basic standards of affordability, suitability, and adequacy. ‘Housing aspirations,’ however, is a broader concept that is specific to the resident’s individual “sense of satisfaction and stability over the long term.”⁵⁴ The report notes that ‘housing aspirations’ are important to consider in the context of recruitment and retention because faculty and staff may choose to seek employment elsewhere if the residence does not meet their ‘housing aspirations.’⁵⁵

As summers on UBC campus get hotter, access to in-home cooling will likely become a ‘housing need.’ At the same time, access to *decarbonized* in-home cooling may fulfill ‘housing aspirations,’ as it allows residents to engage in meaningful, sustainable, and climate forward living. Since residents of rental housing cannot pursue heat pump retrofits on their own, a lack of access to in-home cooling may compel some faculty and staff to seek housing and/or employment elsewhere. This is even more likely if residents are concerned that staying in their UBC rental unit will put their health and wellbeing at risk.

Moreover, retrofitting UBC PT rental buildings with heat pumps aligns with UBC’s commitments to wellbeing and sustainability. UBC’s Wellbeing Strategic Framework was developed to “improve the health of the people who live, learn, work, play, and love on our campuses,” and by doing so “enhance the success of our institutions; create campus cultures of compassion, wellbeing, equity and social justice; and strengthen the ecological, social, and economic sustainability of our communities and wider society.”⁵⁶ In addition, UBC’s Green Building Action Plan (GBAP) aims to drive improvements for buildings towards net positive ecological and human health.⁵⁷ Access to in-home cooling was overwhelmingly agreed upon by respondents in the community questionnaire as something that would improve their quality of life, and thereby their health and wellbeing. At the same time, pursuing heat pump retrofits as a solution to extreme heat aligns with UBC’s 20-Year Sustainability Strategy which emphasizes the application of a sustainability lens in all operational decision-making at UBC.

Still, it is important to recognize that 620 units in 6 different rental buildings cannot be retrofitted with heat pumps due to exclusive energy services agreement with Corix utilities.⁵⁸

⁵⁴ “UBC Faculty and Staff Housing Needs Assessment and Programs Review,” Urban Matters CCC, November 2022, pp. 4.

⁵⁵ “UBC Faculty and Staff Housing Needs Assessment and Programs Review,” Urban Matters CCC, November 2022, pp. 5.

⁵⁶ “Wellbeing Strategic Framework University of British Columbia Vancouver and Okanagan Campuses,” UBC, accessed July 31, 2023, pp. 5.

⁵⁷ “Pathway to a Net Positive Campus: Green Building Action Plan,” University of British Columbia, 2018, pp. 7.

⁵⁸ Cypress House, Mundell House, Nobel House, Pine House, Webber House (all faculty and staff rentals), Georgia Point (Market rentals).

While these units can be retrofitted with central or in-suite A/C, portable air conditioners are already being piloted by UBC PT. Prioritizing portable air conditioners to residents in these buildings will ensure that they are not excluded from access to in-home cooling as the neighbourhood transitions to decarbonization.

Offsetting Costs of Heat Pump Retrofits for Faculty and Staff, and Market Rentals

Retrofitting UBC PT rental buildings with heat pumps will likely be a costly endeavour. To offset costs, UBC PT can stack existing financial incentives offered by CleanBC. For rental MURBs, UBC PT can combine incentives from the CleanBC Custom, Custom-Lite, Commercial Express Programs, as well as the Clean Building Tax Credit. That being said, CleanBC programs are meant to incentivize maximum GHG emission savings by switching from centralized heating systems, such as central boilers, to heat pumps. It is not intended for buildings with in-suite heating and multiple BC Hydro residential accounts, however, exceptions may be made if equipment is centralized but paid for on a residential rate. As such, UBC PT will need to assess which of their buildings are eligible for funding. However, buildings that are not eligible for funding should not be excluded from the retrofit project. Applying for financial incentives is meant to offset the costs of retrofitting the entire rental building stock.

UBC PT can also work with non-MURB renters to access funding through the CleanBC Income Qualified Program. Greenwood Commons and Azalea House are both townhomes and would qualify as eligible building types under the CleanBC Income Qualified Program. By educating residents of these housing complexes about the program's eligibility requirements, UBC PT may be able to access additional rebates to offset the costs of retrofitting. Residents who qualify as low-income according to the program's eligibility requirements can report back to UBC PT for signed approval of their CleanBC Income Qualified Program application. Working together in this manner advances climate justice by encouraging collective action and collaboration in the transition to decarbonization between UBC and the neighbourhood community.

As an elected representative of the UBC neighbourhood community, the UNA Board of Directors can play an important role in relaying residents' concerns to the province about extreme heat and the lack of rebates that serve them. At the same time, UBC could explore additional opportunities for funding with Metro Vancouver as residents of the UBC neighbourhood elect a Director at Metro Vancouver to represent the community in decisions regarding regional land use planning, affordable housing, and air quality management, among other issues.⁵⁹

⁵⁹ "What is Electoral Area A?" Jen McCutcheon, Metro Vancouver Director for Electoral Area A, accessed August 1, 2023.

In 2019, the City of Vancouver provided a \$1.5 million grant to fund the Energy Retrofit PLUS Rental Reinvestment Pilot to support zero emission retrofit projects in market rental buildings. This grant was matched by the province's CleanBC program, culminating in a total of \$3 million. Financial incentives were used to fund heat pump retrofits and envelope improvements to help tenants save on heating costs, provide them with cooler, healthier homes, while working to reduce GHG emissions.⁶⁰ UBC should explore opportunities to establish a similar matching program with CleanBC to help fund retrofits for rental housing in the UBC neighbourhood.

Provincial funding can help to resolve the 'split incentive' problem by ensuring that the cost of the retrofit is not pushed back onto the tenant. Protecting those who are most impacted by the climate crisis is a core pillar of climate justice, and tenants should not have to choose between affordable housing and access to cooling. Climate justice would therefore require that costs are not passed through to vulnerable individuals.

Recommendation: Encourage Heat Pump Uptake Among Homeowners

Climate justice similarly calls for homeowners and private landlords with the means to act on the climate crisis to participate in collective climate action. Privately owned market leaseholds are a significant contributor of GHG emissions since they make up more than half of the residences in the UBC neighbourhood, further demonstrating the need for homeowners and private landlords to participate in the transition to decarbonization.

Educating Stratas and Homeowners: A Communication Toolkit

Foremost, homeowners and private landlords need to be better educated about the financial incentives that are available to them. The overview of provincial and federal incentive programs in Appendix C can be used to develop communications materials. By coordinating communication campaigns with strata councils, C+CP and the UNA can more easily connect with homeowners, landlords, and renters. Materials should identify the programs that are relevant to each group. For instance, private landlords in townhomes would be eligible for CleanBC rebates, but would not qualify for the Canada Greener Homes Grant, whereas homeowners who are not renting out their residence would qualify for both. Messaging should also inform renters in townhomes that they may be eligible for the CleanBC Income Qualified Program.

Information about rebate incentives should be coupled with other education initiatives. The results from the strata president questionnaire revealed that stratas need to be better equipped with knowledge about the benefits of heat pumps. Information opportunities should be available in a variety of ways, such as presentations at strata council meetings, and through

⁶⁰ "Non-Market Housing Climate Resilient Retrofit Grant," City of Vancouver Report, City of Vancouver, 2022.

online communication mediums, such as email, website, and social media, in addition to physical messaging through wall and ground decals and posters. Communication should focus on the permitting, retrofitting, and rebating processes. It may be a good idea to offer separate information opportunities for each issue so that residents are not overwhelmed by information, and can choose the series that are relevant to them.

Results from the strata president and community questionnaires revealed several common concerns and misperceptions about noise and heat pump effectiveness. In responding to these concerns, C+CP should work with stratas to coordinate heat pump demonstrations so that homeowners can experience the technology firsthand. One strata president indicated that such demonstrations persuaded many people in their buildings that heat pumps were a viable solution. Furthermore, concerns about damage caused by heat pump installations must be addressed in order to reduce hesitancy around installing a heat pump. C+CP should work with stratas and unit owners on a building-by-building basis to develop installation requirements, such as proper water drainage in MURBs, that will mitigate potential damage to the unit and to the building.

Many homeowners indicated that a lack of knowledge about UBC's heat pump retrofitting process was a barrier to installing a heat pump in their residence. Currently, the C+CP permitting team is developing checklists that will help strata councils and homeowners navigate heat pump retrofits. Once this process is complete, C+CP and the UNA should develop communication strategies alerting residents to the updated and simplified permitting process. Furthermore, it was noted by one community respondent that many companies do not install heat pumps in strata-operated residences. The BC Hydro website already lists registered contractors that can perform heat pump installation. To ensure that navigating a heat pump retrofit is not disproportionately more difficult for certain homeowners, BC Hydro should identify which companies will install heat pumps in strata-operated residences. In turn, C+CP can help by directing interested homeowners to BC Hydro resources.

As previously discussed, limited knowledge of English can pose a barrier to accessing information about heat pumps and in navigating the permitting process. C+CP and the UNA should explore opportunities to translate communication about heat pump retrofits and permitting in order to better serve the community. Since information about provincial and federal rebate programs are already translated into multiple languages, C+CP and the UNA can simply direct residents to the appropriate resource page. To ensure that communication is inclusive, C+CP and the UNA should also devise communications that can be accessed by those using alt text or screen readers.

Finally, both homeowners and low-income renters should be informed of contact points for the CleanBC Energy Coach service and the Canada Greener Homes Initiative call center if they require additional support in navigating the retrofit process.⁶¹ Both call centers offer translation services, and the Canada Greener Homes Initiative also offers a TTY number for Canadians with different hearing abilities.⁶² To further support the community in the transition to decarbonization, it may be worthwhile to explore opportunities to offer a similar call-in service that would help stratas and homeowners navigate the permitting and retrofitting process. This could be a future responsibility for the C+CP permitting team.

Improving Coordination with Stratas

Improving coordination with stratas can help to increase uptake of heat pumps among homeowners. The strata president questionnaire revealed that some stratas are in the process of changing bylaws, however to encourage neighbourhood-wide bylaw changes, C+CP should set a deadline by when all strata bylaws must allow unit owners to install heat pump retrofits. In order to simplify and expedite this process across strata councils, UBC should provide a generic model bylaw that stratas can adopt. Once adopted, bylaw changes should be appropriately communicated to homeowners in the building or housing complex.

Finally, the review of funding incentives identified that stratas are in a unique position to encourage heat pump uptake through the coordination of the CleanBC Group Purchase Rebates. To facilitate this coordination, C+CP should work with stratas to identify and group together homeowners that are eligible for the program.⁶³ First, C+CP should identify a list of eligible buildings to receive direct communication about the program. Interested homeowners that meet the eligibility requirements can request to be added to a group code. In order to maximize financial benefits, C+CP should coordinate across stratas to create groups of up to 30 households. This will allow each homeowner to receive an additional \$500 incentive, while encouraging collective climate action.

As well, C+CP should inform strata councils about eligibility requirements for the CleanBC Custom, Custom-Lite, and Commercial Express programs, which can allow them to pursue building retrofits on behalf of owners who are not presently eligible for individual CleanBC rebates.

⁶¹ Energy Coach Services were utilized multiple times throughout this project. Service was fast, efficient, and informative.

⁶² CleanBC Energy Coach Toll-Free Hotline: 1-844-881-9790. Clean BC Energy Coach e-mail is available at <https://www.betterhomesbc.ca/connect/>. Canada Greener Homes Grant Toll-Free call centre: 1-833-674-8282. TeleTYpe number for Canadians with different hearing abilities:1-800-465-7735.

⁶³ Eligible applicants are homeowners of townhomes that are primarily heated with natural gas from Fortis BC.

Recommendation: Integrate Climate Justice in Retrofit and Rebate Policies

Climate justice calls for institutional change that is both deep and far reaching. Integrating principles of climate justice into UBC's existing building programs, as well as in collaborative work with external partners contributes to meaningful and long-lasting change.

Update UBC's Green Building Action Plan and Residential Environmental Assessment Program

A priority action identified in UBC's 2018 GBAP is to introduce requirements for retrofit and renovation projects in the UBC neighbourhood.⁶⁴ In developing these requirements, UBC policy should be brought in line with that of the City of Vancouver, which required "as of January 1, 2023, all new permanently installed air-conditioning systems in existing homes to be electricity powered and provide low-carbon heating and cooling."⁶⁵ Following this principle, any homeowner or building owner in the UBC neighbourhood implementing active cooling in their unit or building should be required to install a heat pump, or a comparable electric and low-carbon cooling mechanism, instead of central or suite-level air conditioning. This will ensure that all retrofits and renovations contribute to collective climate action by reducing, rather than increasing, GHG emissions.

Collaborate with BC Hydro on the Development of Rebate Programs for MURBs

UBC's relationship with BC Hydro, and its connections to the Province of BC provide a direct channel to collaborate on the development of CleanBC MURB heat pump rebate programs. The interview with a representative from BC Hydro revealed that MURB rebate programs would likely follow a prescriptive framework that would cover the cost of the technology. The UBC neighbourhood provides a unique opportunity to develop a prescriptive framework because its housing stock is varied with low, medium, and high-rises, which can be used to assess the type of technology that will be required to cool units in different MURBs with distinct environmental factors, designs, and building materials.

UBC can also use this opportunity to integrate principles of climate justice into the design of the program by advocating for equal focus on reducing GHG emissions and providing access to cooling for vulnerable individuals. Finally, the representative from BC Hydro indicated that the program would likely consist of a recruitment component to reach a greater number of qualifying individuals. It may be worthwhile to explore a recruitment pilot in the UBC neighbourhood. UBC can coordinate through stratas to gauge residents' interest in such a program.

⁶⁴ "Pathway to a Net Positive Campus: Green Building Action Plan," University of British Columbia, 2018, pp. 18.

⁶⁵ David Carrigg, "Five things to know about air conditioning in Metro Vancouver," The Vancouver Sun, May 17, 2023.

Recommendation: Climate Actions for the Province

Some of the regulatory barriers to participation in the transition to decarbonization and in accessing in-home cooling exist outside of UBC's scope of powers. However, UBC can play a key role in advocating for change in the provincial regulatory space through continued work with the province and BC Hydro.

Resolve the 'Split Incentive' Problem

The 'split incentive' problem is a major deterrent to heat pump retrofits for rental accommodations. Renters who may be motivated to pursue a heat pump retrofit to reduce the costs of their heating bills are prevented from doing so because they do not own the residence, while landlords who are able to make alterations to the residence are not motivated to do so because they will not enjoy the benefits of lower heating bills and indoor cooling. While providing funding incentives to landlords is a good motivator, without structural changes to the Residential Tenancy Act, landlords may still be reluctant to pursue lengthy and time-consuming retrofits. The following suggestions are meant to be paired with financial incentives to resolve the 'split incentive' problem, thereby encouraging landlords to pursue heat pump retrofits, reducing heating costs for tenants, and providing vulnerable individuals with access to in-home cooling.

First, the Residential Tenancy Act should be amended to prevent landlords from writing anti-alteration clauses into leases and from rejecting any reasonable request for a heat pump retrofit.⁶⁶ This gives renters greater agency in accessing in-home cooling and could have a positive impact on recruitment to the CleanBC Income Qualified Program. In addition, the Residential Tenancy Act should mandate a carbon emission threshold for rental housing which would progressively increase until net-zero emissions are reached. During the transitional period, building owners and private landlords of inefficient residences should be required to pay higher property taxes.⁶⁷ This imposes a cost on landlords and motivates them to pursue energy efficient solutions. At the same time, these actions should be accompanied by financial support for lower-income owners and landlords to ensure an equitable transition to decarbonization.

Reduce Application Barriers to the CleanBC Income Qualified Program

As previously discussed, the CleanBC Income Qualified Program reduces barriers to participation in the transition to decarbonization, and ensures that low-income renters and homeowners alike can access in-home cooling. However, at present, the CleanBC Income

⁶⁶ Maya Korbynn, "The Missing Third: Improving Tenants' Rights to Energy Efficient, Climate Resilient, and Safe Housing," Eco Trust Canada, March 2023, pp. 6.

⁶⁷ Margaryta Pustova, "Paving the Way for Equitable Decarbonization of British Columbia's Residential Homes," EcoTrust Canada, 2023, pp. 6.

Qualified Program forces applicants to ‘prove that they are poor’ in order to access benefits. Research on previous BC Hydro and Fortis BC income qualified programs identified that revealing one’s income may be a sensitive issue for certain individuals, and may deter them from applying.⁶⁸

To address this issue, the Ontario Electricity Support program verified income levels of applicants with the Canada Revenue Agency (CRA) on a yes/no basis.⁶⁹ This not only reduced the burden on the customers, but also reduced the stigma around income-related assistance programs and ultimately removed barriers to application. Adopting a similar approach for the CleanBC Income Qualified Program will similarly simplify and reduce barriers during the application process, and could increase uptake as a result.

Recommendation: Future Research

Little is known about the tenants renting from private landlords in the UBC neighbourhood. As a result, understanding their unique experience in trying to access in-home cooling during extreme heat events remains limited. Future research should seek to close this informational gap by working with stratas to identify and interview renters in their buildings and housing complexes.

Tenants in privately owned market leaseholds must deal directly with their landlord when trying to access cooling. This may create inconsistency since access to cooling is not currently mandated by the Residential Tenancy Act. At the same time, research undertakings should also seek to hear from private landlords operating in the UBC neighbourhood in order to gain a better understanding of barriers that are preventing them from installing a heat pump on behalf of their tenant.

Prior research has suggested the implementation of a ‘Rental Unit Carbon Emissions Report Card,’ which would include information concerning the rental unit’s utility costs and carbon emissions. Armed with information, renters are empowered to make more climate conscious decisions. As such, the system aligns with principles of climate justice by making space for renters to participate in climate action. To make the report card inclusive to renters with varying levels of knowledge about carbon emissions, the report card should feature an ‘Energy Grade’ based on the energy efficiency of the unit, in addition to a breakdown of heating and cooling bills from the past 12 months.⁷⁰ ‘Grading’ rental accommodations based on energy efficiency

⁶⁸ Laura MacTaggart, “Transforming Income-Qualified Home Energy Retrofit Programs in BC,” EcoTrust Canada, 2021, pp. 36-37.

⁶⁹ Laura MacTaggart, “Transforming Income-Qualified Home Energy Retrofit Programs in BC,” EcoTrust Canada, 2021, pp. 37.

⁷⁰ Sydney Bartos, Kael Kropp, and Karina Valcke-Beckett, “Reducing Renters’ Carbon Footprint in the City of Vancouver,” University of British Columbia POLI 533A, December 19, 2022, pp. 14.

may also encourage landlords to invest in more climate conscious technology not only as part of their shared responsibility to reduce GHG emissions, but also to remain competitive in a more transparent rental market.⁷¹

It may be worthwhile to explore how such a system would work in the UBC neighbourhood with stratas at all different stages of amending their bylaws. Future work could also develop a grading system based on residential carbon contributions proportional to the energy efficiency 'A+ standard' of a residence with a heat pump.

⁷¹ Sydney Bartos, Kael Kropp, and Karina Valcke-Beckett, "Reducing Renters' Carbon Footprint in the City of Vancouver," University of British Columbia POLI 533A, December 19, 2022, pp. 14.

Concluding Thoughts

In applying a climate justice lens to heat pump retrofits in the UBC neighbourhood, this report has identified regulatory constraints and barriers that make it disproportionately more difficult for certain community members to access in-home cooling. The recommendations laid out in the final section of this report address these barriers directly and propose recommendations that together work to achieve a more sustainable, just, equitable, and inclusive transition to a decarbonized future for the UBC neighbourhood.

In pursuing the recommendations proposed in this report UBC can fulfill its commitments to act on the climate crisis and to protect vulnerable residents from the impacts of extreme heat. The university's commitments to reduce GHG emissions, to provide affordable and safe housing, and to integrate considerations of health and wellbeing into decision-making frameworks, was a crucial first step in pursuing climate justice. But now, more than ever, the neighbourhood community is depending on UBC to turn its commitments into action.

References

- “A Climate Justice Charter for Vancouver.” City of Vancouver, November 2022.
- Anderson, Vidya, and William A. Gough. "Nature-Based Cooling Potential: A Multi-type Green Infrastructure Evaluation in Toronto, Ontario, Canada." *International Journal of Biometeorology* 66, no. 2, March 30, 202.
- “Annex: Homes and Buildings.” Government of Canada. Accessed August 3, 2023.
- Bartos, Sydney, Kael Kropp, and Karina Valcke-Beckett. “Reducing Renters’ Carbon Footprint in the City of Vancouver.” University of British Columbia POLI 533A. December 19, 2022.
- British Columbia Coroners Service (BCCS). “Report: Extreme Heat and Human Mortality: A Review of Heat- Related Deaths in B.C. in Summer 2021,” June 7, 2022.
- “Canada Greener Homes Grant.” Government of Canada. Accessed July 26, 2023.
- Carrigg, David. “Five things to know about air conditioning in Metro Vancouver.” *The Vancouver Sun*. May 17, 2023.
- “CleanBC Commercial Express Program.” CleanBC Better Buildings. CleanBC. Accessed July 26, 2023.
- “CleanBC Custom Program.” CleanBC Better Buildings. CleanBC. Accessed July 26, 2023.
- “CleanBC Custom-Lite Program.” CleanBC Better Buildings. CleanBC. Accessed July 26, 2023.
- “CleanBC Heat Pump Group Purchase Rebate.” CleanBC Better Homes. CleanBC. Accessed July 26, 2023.
- “CleanBC Income Qualified Program.” CleanBC Better Homes. CleanBC. Accessed July 26, 2023.
- “Clean buildings tax credit.” The official website of the Government of British Columbia. Province of British Columbia. Accessed July 26, 2023.
- “Climate Justice Toolkit for Municipalities.” BCCIC. June 2021.
- “Declaration on the Climate Emergency.” UBC Office of the President. December 5, 2019.
- Dictionary, Census of Population, 2016: Low-income measure, after tax (LIM-AT). Statistics Canada. Last updated on September 13, 2017. Accessed on July 17, 2023.

Dobai, Jennifer, Manuel Riemer, and Bianca Dreyer. "Sustainability Justice in the Context of Municipal Climate Action Planning: Key Consideration." Viessman Centre for Engagement and Research in Sustainability, September 2020.

"Ductless Mini-Split or Multi-Split Heat Pump Rebate." CleanBC Better Homes. CleanBC. Accessed July 26, 2023.

"Energy Services Agreement." Neighbourhood District Energy System Corix Utilities. 2014,

"Enjoy year-round comfort with a \$6000 heat pump rebate." CleanBC Better Homes. CleanBC. Accessed July 26, 2023.

"Governance." University Neighbourhood Association. Accessed August 1, 2023.

"Greenhouse gas emissions: drivers and impacts." The Government of Canada. Accessed August 10, 2023.

"Heat Pumps." BC Hydro Power Smart. BC Hydro. Accessed July 17, 2023.

"Indigenous-led Climate Policy: Phase 2 of ICA's Decolonizing Climate Policy Project." Indigenous Climate Action, December 2022.

Kluttz, Jenalee. "Centering Justice in Climate Emergency Response." The University of British Columbia, 2022.

Korbynn, Maya. "The Missing Third: Improving Tenants' Rights to Energy Efficient, Climate Resilient, and Safe Housing." Eco Trust Canada. March 2023.

"Land Use Plan." UBC Campus and Community Planning. Amended to June 2, 2015.

MacTaggart, Laura. "Transforming Income-Qualified Home Energy Retrofit Programs in BC." EcoTrust Canada. 2021.

"Neighbourhood Climate Action Plan." UBC Campus and Community Planning. Updated July 27, 2023.

"Non-Market Housing Climate Resilient Retrofit Grant." City of Vancouver Report. City of Vancouver. 2022.

"Pathway to a Net Positive Campus: Green Building Action Plan." University of British Columbia. 2018.

Pustova, Margaryta. "Paving the Way for Equitable Decarbonization of British Columbia's Residential Homes." EcoTrust Canada. 2023.

“Residential Environmental Assessment Program: Reference Guide Version 3.3.” University of British Columbia. Last updated June 2023.

“Shaping UBC’s Next Century: Strategic Plan 2018-2028,” The University of British Columbia, 2018, pp. 40.

Schisler, Cole. “B.C. Hydro says too many carbon emissions due to natural gas home heating.” Saanich News. October 12, 2021.

Tompkins, John. “As Heat Dome Descends, UBC Rental Buildings Bake, Residents Roast.” *The Campus Resident*, August 2021.

“UBC Climate Emergency Engagement: Final Report and Recommendations.” The University of British Columbia. January 2021.

“UBC Faculty and Staff Housing Needs Assessment and Programs Review.” Urban Matters CCC. November 2022.

“UBC Facilities: Building Operations.” UBC Vancouver Campus. Accessed August 1, 2023.

“UBC Housing Action Plan: Ten-Year Update (2023).” UBC. 2023.

Verrière, Pierre. “The future passes through old buildings.” Canadian Climate Institute. May 25, 2020.

Weiss, Edith. B. “Climate Change, Intergenerational Equity and International Law: An Introductory Note.” *Climatic Change*, vol. 15, no. 1-2, 1989.

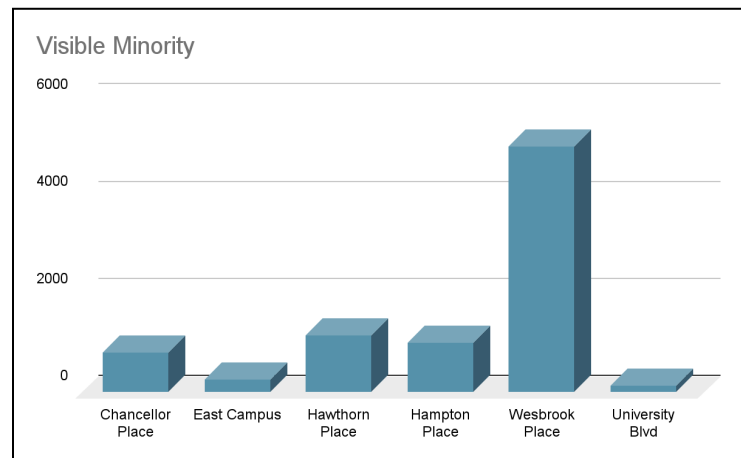
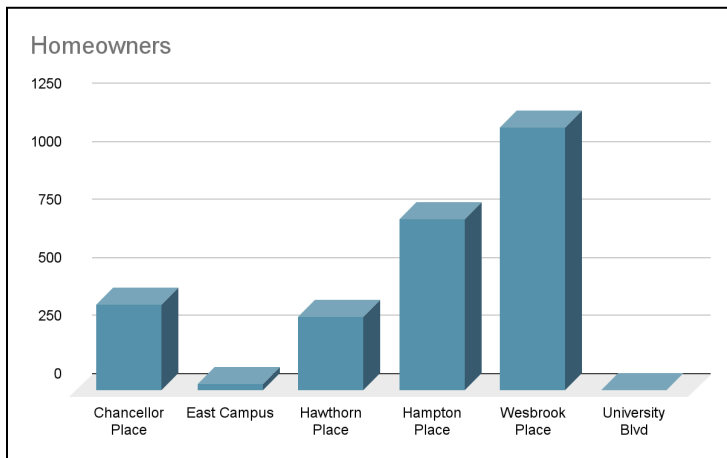
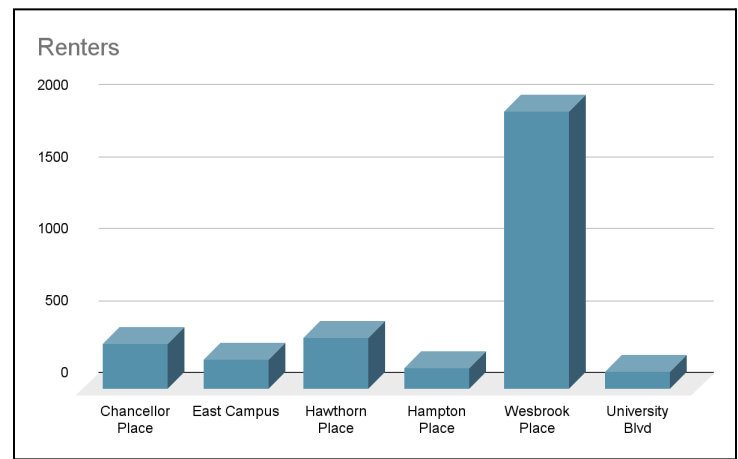
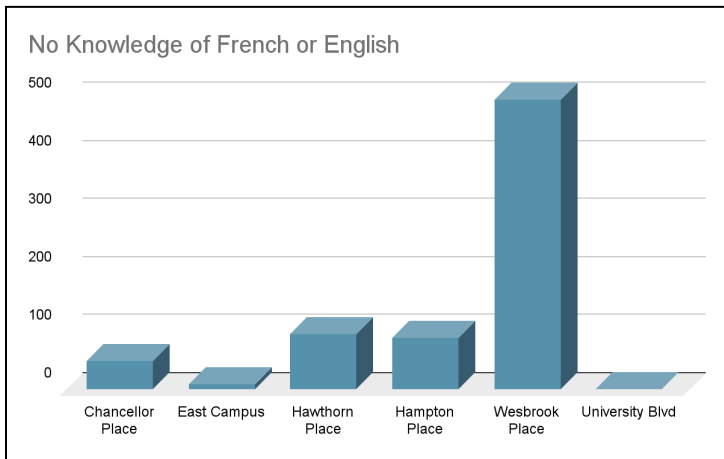
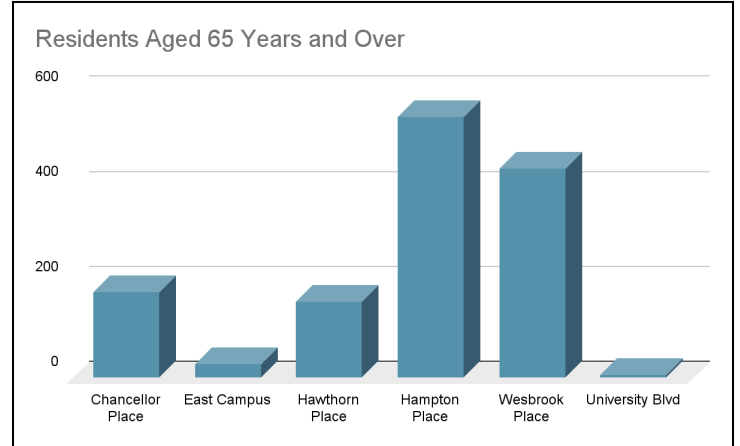
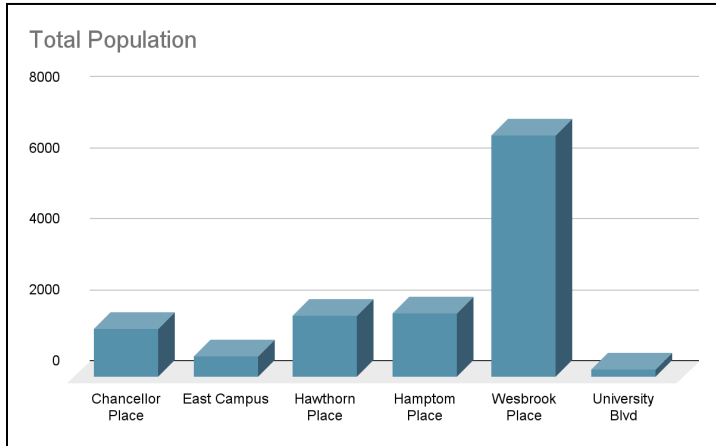
“Wellbeing Strategic Framework University of British Columbia Vancouver and Okanagan Campuses.” UBC. Accessed July 31, 2023.

“What is Electoral Area A?” Jen McCutcheon, Metro Vancouver Director for Electoral Area A. Accessed August 1, 2023.

“20-Year Sustainability Strategy for the University of British Columbia Vancouver Campus.” UBC. 2014.

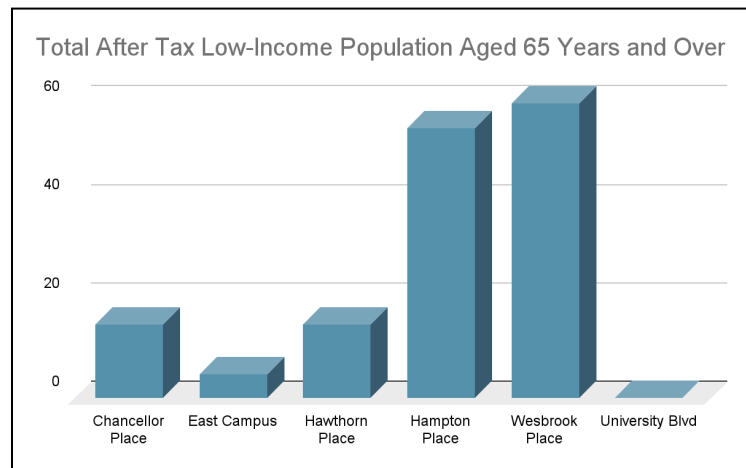
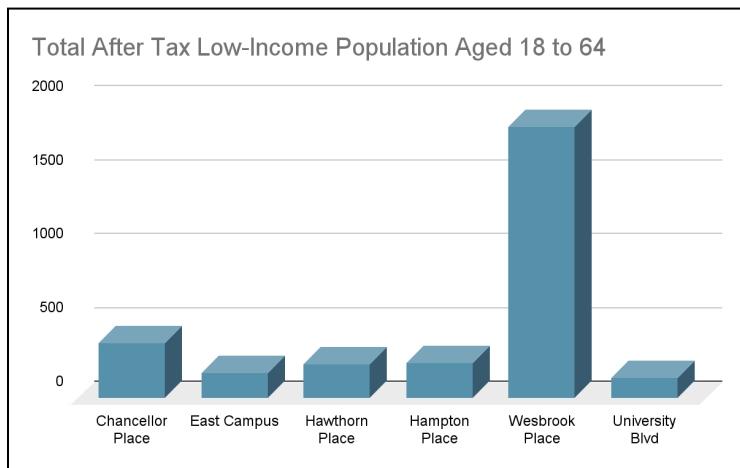
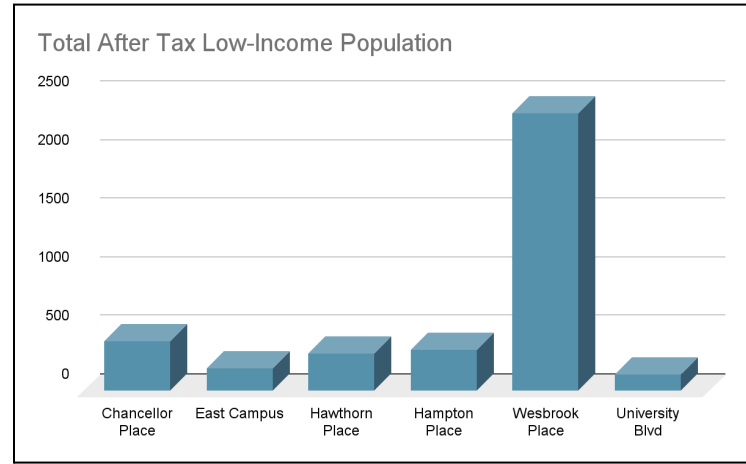
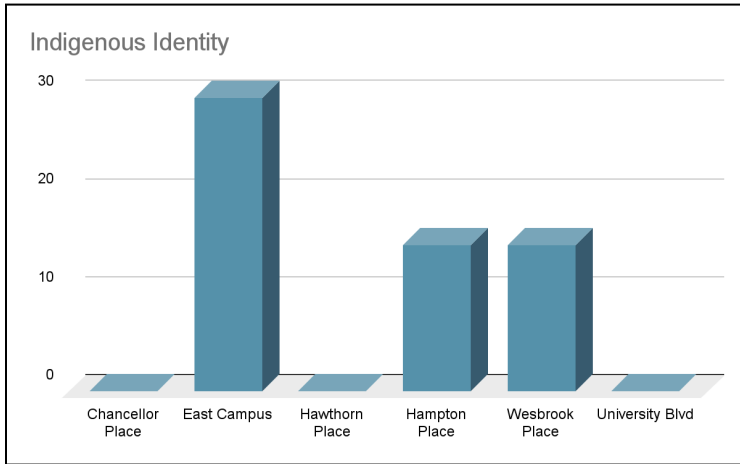
Appendix A

Neighbourhood Demographics



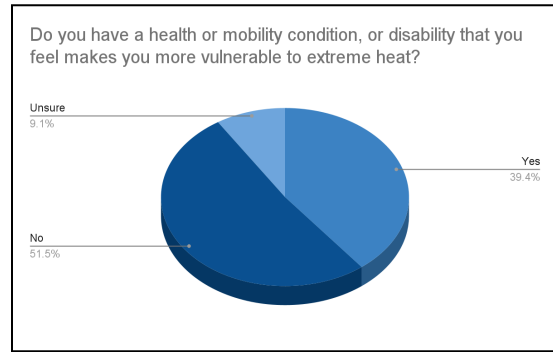
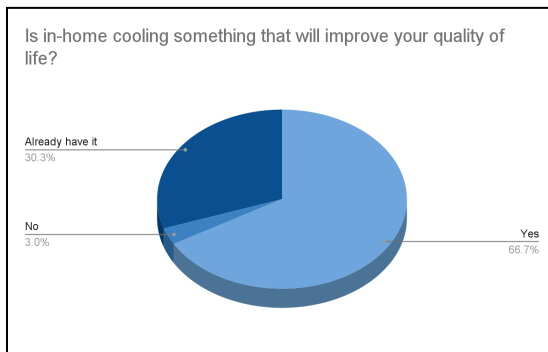
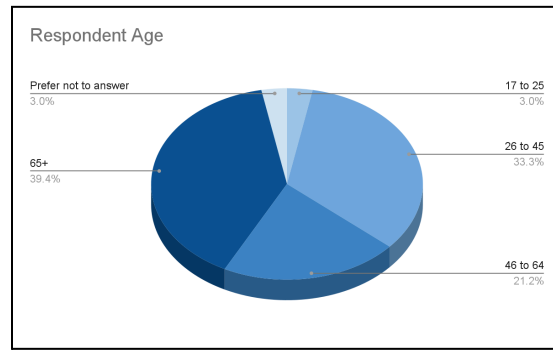
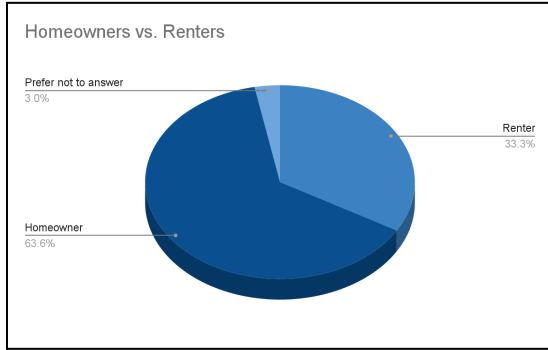
Appendix A (cont'd)

Neighbourhood Demographics

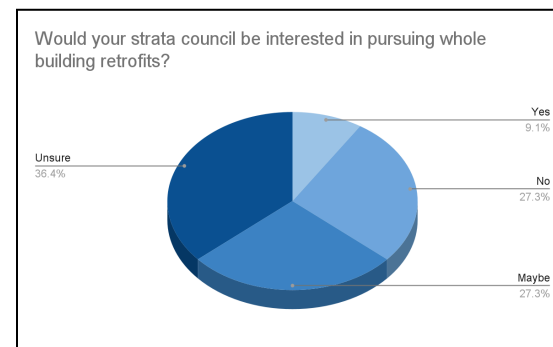
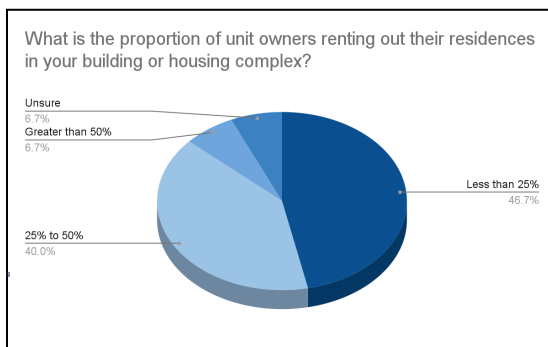
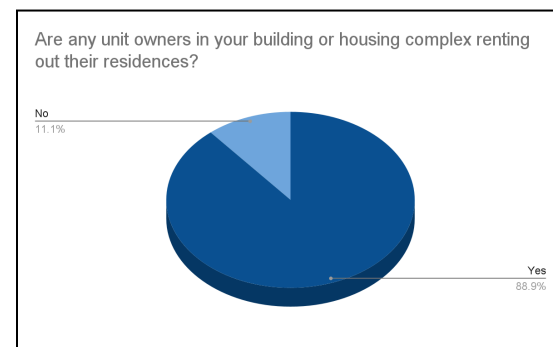
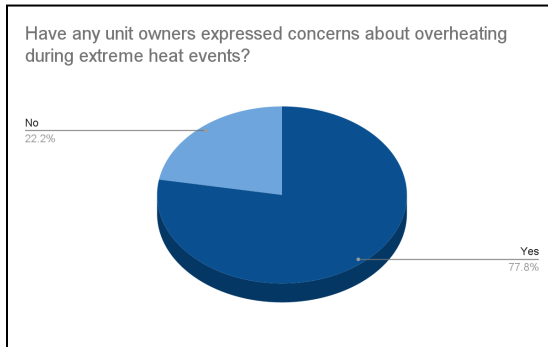


Appendix B

Community Questionnaire Graphic Breakdowns



Strata President Questionnaire Graphic Breakdowns



Appendix C

Overview of Provincial and Federal Rebate Incentive Programs

Individual Funding Incentive: Provincial

CleanBC Better Homes Heat Pump Rebate

Applicants who meet the following eligibility requirements receive up to \$6000 from BC Hydro towards the purchase and installation of a ductless mini-split or multi-split heat pump.

- Applicant is the homeowner of a detached dwelling, duplex, or townhome, where each electricity meter is in the name of the unit resident or homeowner.
- Home is a year-round primary residence and at least 12 months old.
 - \$1000 rebate if home is heated with electricity supplied by BC Hydro. The electrical system must be hard-wired (for example, baseboards or an electric furnace) and the back-up system must be electric.
 - \$6000 rebate if home is heated with natural gas in the BC Hydro electric territory. The fossil fuel heating system must be removed. Emergency replacement of broken fossil fuel heating systems are eligible.
- If the applicant is a landlord, but the BC Hydro utility account is in the name of the tenant, BC Hydro requires the tenant to submit a utility account holder consent form to ensure that the rebate goes to the landlord who is paying for the upgrade to the home.

Individual Funding Incentive: Provincial

CleanBC Group Purchase Rebate

Applicants who meet the following eligibility requirements receive up to \$500 in addition to the CleanBC Better Homes heat pump rebate. Each member of the group must be from the same electricity service area (ie. group members must have their electricity supplied by BC Hydro).

- Applicant is the homeowner of a detached dwelling, duplex, or townhome, where each unit has its own electricity meter in the name of the unit resident or homeowner.
- Home is a year-round primary residence and at least 12 months old.
- Home must be heated with natural gas

Size of the Group	Rebate
2 - 4 Homes	\$200
5 - 9 Homes	\$275
10 - 14 Homes	\$350
15 - 19 Homes	\$425
20 - 30 Homes	\$500

Source: CleanBC Better Homes, 2023

Appendix C (cont'd)

Overview of Provincial and Federal Rebate Incentive Programs

Individual Funding Incentive: Provincial

CleanBC Income Qualified Program

Applicants who meet the following the eligibility requirements receive up to \$9500 towards the purchase and installation of a ductless mini-split or multi-split heat pump. Rebate coverage is based on the combined income of all adults in the home and how many people, including children and adults, live in the home. (See figure 7 for income qualification requirements).

- ☑ Applicant is the homeowner or renter of a detached dwelling, duplex, or townhome, where each unit has its own electricity meter in the name of the unit resident or homeowner.
- ☑ Home is a year-round primary residence and at least 12 months old.
- ☑ Up to \$5000 rebate if home is heated with electricity supplied by BC Hydro. The electrical system must be hard-wired (for example, baseboards, radiant ceilings, radiant floors etc...) and the back-up system must be electric. Emergency replacement of broken electric heating systems are eligible.
 - ☑ Income Level 1 applicants eligible for up to 95% of a maximum of \$5000
 - ☑ Income Level 2 applicants eligible for up to 60% of a maximum of \$5000
- ☑ Up to \$9500 rebate if home is heated with natural gas in the BC Hydro electric territory. Emergency replacement of broken fossil fuel heating systems are eligible.
 - ☑ Income Level 1 applicants eligible for up to 95% of a maximum of \$9500
 - ☑ Income Level 2 applicants eligible for up to 60% of a maximum of \$9500
- ☑ Renters must acquire a landlord consent form.
- ☑ Homeowners and renters must pay their own energy utility bills and have utility accounts in the name of the resident and/or homeowner. If the utility account is in the name of the landlord, but the full amount is paid for by the tenant, applicants can present this to the Income Qualified Program team for review on a case by case basis.

Number of people living in your home (including adults and children)	Combined pre-tax annual income of all adults in your home (excluding dependants):	
	Income Level 1	Income Level 2
1	\$42,593	\$55,903
2	\$53,026	\$69,596
3	\$65,189	\$85,560
4	\$79,147	\$103,880
5	\$89,768	\$117,820
6	\$101,242	\$132,880
7 or more	\$112,718	\$147,943

Source: CleanBC Better Homes, 2023

Appendix C (cont'd)

Overview of Provincial and Federal Rebate Incentive Programs

Individual Funding Incentives: Federal

Canada Greener Homes Grant

Applicants who meet the following eligibility requirements receive up to \$5000, depending on equipment type, towards the purchase and installation of a mini or multi-split ducted or ductless heat pump. Applicants will also receive up to \$600 for two EnerGuide evaluations. Applicants must complete both EnerGuide evaluations and at least one recommended retrofit.

- Applicant is a Canadian homeowner of a detached dwelling, duplex, or townhome.
- Home is the primary residence.
- Applicant is not a landlord and does not rent out the residence.

Building Funding Incentives: Provincial

CleanBC Custom and Custom-Lite Programs

Applicants must be owners or operators of a Multi-Unit Residential Building (MURB) to receive up to a maximum of \$750,000 towards the installation of air-to-air rooftop heat pumps or ground source heat pumps. Funding incentives can be spread across multiple projects/properties. MURBs with centralized heating (ie. a central boiler) would be eligible for fuel switching. On a case by case basis, subject to review by the BC Hydro team, exceptions may be made if equipment is centralized, but charged on a residential rate. However, if heating is individual to each suite (ie. baseboard heating on multiple residential accounts), the MURB would not be eligible for these programs at this time.

- CleanBC Custom projects must demonstrate the potential to contribute at least 1200 tCO₂e lifetime savings.
 - Up to \$72,000 per project for an air-to-air heat pump rooftop unit and 50% of the cost of an energy study up to a maximum of \$2000.
- CleanBC Custom-Lite project must demonstrate the potential to contribute at least 500 and no more than 1200 tCO₂e lifetime savings.
 - Up to \$200,000 for an air-to-air rooftop heat pump or ground source heat pump and 50% of an energy study's cost up to a maximum of \$20,000.

Appendix C (cont'd)

Overview of Provincial and Federal Rebate Incentive Programs

Building Funding Incentives: Provincial

CleanBC Commercial Express Program

Applicants must be an owner or operator of a Multi-Unit Residential Building (MURB) with a BC Hydro commercial utility account to receive Capital Incentive Funding up to \$100,000. Incentives are based on factors specific to the building such as type, age, location, square footage, and type of equipment under consideration. The Commercial Express program facilitates smaller electrification opportunities. There is no minimum GHG savings thresholds and no energy study required.

- Applicant must be a BC Hydro Commercial Customer on either the Small, Medium, or Large General Service rate.
- Depending on building archetype, eligible equipment can include: Packaged rooftop unit equipped with an air source heat pump with gas or electric resistance for supplemental heating, distributed mini-split heat pump, in-suite packaged heat pump and in-suite Heat Recovery Ventilation (HRV).

Building Funding Incentives: Provincial

Clean Building Tax Credit:

Applicants must be a corporation with a permanent establishment in B.C., or an individual, including a trust, that is a resident in B.C., or has income earned in B.C. for income tax purposes to receive a tax credit of 5% for qualifying expenditures paid on the retrofit. Entities that are exempt from BC income tax are not eligible for the clean buildings tax credit.

- Retrofit must be undertaken for the purpose of reducing the energy use intensity of the building.
- Multi-unit residential buildings must have four or more units.
- Note: Qualifying expenditure is reduced by any payments received under a program that provides assistance with the cost of alteration or renovation.⁷²

⁷² "Clean buildings tax credit," The official website of the Government of British Columbia. Province of British Columbia, Accessed July 26, 2023.