

A close-up photograph of a woman with dark hair, wearing a grey sweater, holding a white tissue to her forehead. She has a pained expression, with her eyes closed and mouth slightly open, suggesting she has a headache or is unwell. The background is blurred, showing what appears to be a bookshelf.

# Backgrounder on Implementing a Maximum Temperature Bylaw



**Clean Air Partnership**

## **Clean Air Partnership**

Clean Air Partnership (CAP) is an environmental charity that works in partnership to promote and coordinate actions to reduce greenhouse gases for healthy communities. CAP's mission is to transform cities into more sustainable, resilient, and vibrant communities where resources are used efficiently, the air is clean to breathe, and greenhouse gas emissions are minimized.

## **Funding Partner**

This project is funded by Federation of Canadian Municipalities' Green Municipal Fund under the Local Leadership for Climate Adaptation (LLCA) initiative.

## **Photo Credits**

Cover: Pheelings Media via Canva.com

# Introduction

Heat is the leading weather-related cause of death in Canada and heatwaves are increasing in frequency, duration, and intensity across the country. During the 2021 British Columbia (BC) heat dome, the [BC Coroners Service](#) investigated more than 800 deaths, and identified 619 as being heat related.

Many municipalities across Canada have bylaws and policies mandating minimum indoor air temperature in rental and leased residential units, yet similar bylaws or requirements have not been enacted with respect to a maximum indoor air temperature. The purpose of advancing a maximum temperature bylaw in Canadian municipalities is to protect vulnerable residents of the community from the impacts of extreme heat. A maximum temperature bylaw can establish a safe indoor air temperature limit for residential rental and leased units and outline strategies to ensure indoor temperatures are maintained at or below this threshold. The focus of this effort is rental and leased units where tenants don't have direct control over the heating and cooling. Renters are often more vulnerable to extreme weather events, especially if they live in older, poorly insulated buildings. These buildings are less likely to have undergone retrofits that improve energy efficiency, safety, and comfort. Improving conditions in rental housing helps address social inequities and ensures that low-income and marginalized communities do not get left behind while dealing with impacts of climate change.

For municipalities that already have a minimum temperature bylaw, it may be beneficial to explore integrating maximum temperature requirements into the same regulation to avoid duplication of efforts.



## Heat Related Health Impacts

While the proposed maximum safe indoor air temperature is meant to apply to a broad range of the population, some people are at a higher risk of health impacts from prolonged exposure to high temperatures. Several factors add to the complexity of determining what maximum indoor air temperatures are safe.

Elderly adults and children generally have a lower heat tolerance threshold. Other health conditions that are associated with higher heat susceptibility include, but are not limited to, cardiovascular disease, respiratory disease, kidney disease, and poor thermoregulation. There is not sufficient information to establish maximum safe temperatures for specific health conditions and the municipal policies should acknowledge that individuals who require lower temperatures should not be inhibited from making accommodations to meet their needs.

As is true for many environmental hazards, there are gaps in our understanding of a number of factors that impact how prolonged indoor heat exposure might affect any person. People adapt to heat through changes in their physiology and behavior. It is also important to note that there are both short-term and long-term impacts of heat on health. Preliminary studies have indicated that chronic heat stress can lead to increased stress, anxiety, and cognitive impairment. People also adapt to heat through individual changes in their physiology and behavior.



# Economic and Environmental Implications of Advancing a Maximum Temperature Bylaw

There can be significant economic and environmental costs associated with keeping residential rental and leased units cool, particularly when achieved with mechanical air conditioning. These costs arise from the energy required to operate existing buildings and the inclusion of higher-cost equipment and enhanced building envelope features in the design of more energy-efficient new buildings.

In the longer term, electrification of new and retrofit of existing building stock includes increased use of electric heat pumps to replace gas furnaces and water heaters for space and water heating. Over time, this has the potential to substantially decrease the risk of overheating in the housing stock, assuming that the electric grid remains stable, and landlords and tenants are able to afford to operate and maintain cooling equipment.

Access to indoor cooling in rental homes is a fundamental human right because it has the potential to impact human lives and health negatively. As climate change drives increasingly severe and frequent heatwaves, lack of access to cooling can result in heat-related illnesses, worsened health conditions, and fatalities, particularly for vulnerable populations such as low-income renters, seniors, and people with pre-existing morbidity and health issues. [A study](#) analyzing data from 2939 United States counties between 2010 and 2019 found that extreme heat days were associated with a 7.8% increase in Emergency Department visits for any cause, a 66.3% increase for heat-related illnesses, and a 30.4% increase for renal diseases.



---

These findings highlight that exposure to extreme heat can place a significant strain on healthcare systems. Treating access to cooling as a luxury rather than a basic necessity neglects the urgent health risks posed by extreme heat. From a human rights perspective, municipal policies must ensure a minimum standard of care that prioritizes health and safety over economic costs, underpinning the fact that failing to provide adequate cooling is a failure to protect individuals' most basic rights.

The primary trade-offs that should be considered when establishing a maximum safe indoor air temperature for residential rental and leased dwelling units include human health, economic, and environmental impacts. Exposure to high indoor air temperatures can pose health risks across all populations. While conditions that cause acute heat stress at the individual level for healthy individuals have been studied extensively, the impacts of more moderate conditions on the health of large populations are not well understood. This knowledge gap poses a fundamental challenge to establishing maximum safe indoor air temperature guidelines. A lower maximum indoor air temperature may provide more health benefits at the expense of capital, energy costs, and environmental impacts. As the understanding of the relationship between indoor temperatures and health improves over time, the recommended maximum safe temperature limits should be re-examined.



# Challenges of Implementing a Maximum Temperature Bylaw

Implementing a maximum temperature bylaw presents several challenges that municipalities must carefully navigate. One major concern is the risk of landlords passing air conditioning installation and operating costs onto tenants, particularly in low-income rental housing where affordability is already a major concern. This issue is closely linked to the threat of renovictions, where landlords may exploit cooling requirements as a pretext for evicting tenants, upgrading units, and raising rents significantly. Ensuring compliance also poses difficulties, as effective enforcement requires adequate resources, clear protocols, and penalties strong enough to deter non-compliance. Additionally, the Bylaw Enforcement Officers must balance fairness and practicality in their approach, allowing for flexibility where landlords are making genuine efforts to comply or face legitimate financial or technical barriers (such as limitations in electrical capacity of the building or the unit or lack of replacement parts availability due to supply chain issues).

Establishing clear guidelines for landlords and bylaw enforcement officers, providing a list of local funding supports, and equitable enforcement mechanisms need to be in place to ensure that maximum temperature bylaws effectively protect health and safety of tenants. To mitigate renovictions, municipalities can introduce tenant protections, such as requiring landlords to offer units back to displaced tenants at the same rent, providing relocation support and tie local retrofit grants to a commitment to maintain affordability. Pairing bylaws with education, financial incentives (where possible) and strong enforcement mechanisms can help ensure the policy achieves its intended health and equity goals without causing undue consequences for all the parties involved.



## Penalties for Non-Compliance

Penalties for non-compliance can include monetary fines, special fines equivalent to economic gains from violations, and daily fines for continued non-compliance. Municipalities must tailor penalties to balance enforcement with fairness, ensuring landlords are incentivized to comply while allowing discretion for cases of hardship or genuine efforts to meet the standards.

[Mississauga's Adequate Temperature Bylaw](#) includes strict penalties for non-compliance. Individuals who violate the bylaw can face fines of up to \$100,000. Additionally, if a person gains an economic advantage from the violation, they may be required to pay a special fine equivalent to the financial benefit they received. Further offenses include obstructing enforcement, refusing to provide required information, or submitting false statements. Corporate violations hold directors and officers personally liable, with potential fines up to \$100,000. Each day a violation continues is considered a separate offense, with additional fines of up to \$10,000 per day, which can exceed \$100,000 in total. Courts may also issue prohibition orders to prevent further offenses beyond the imposed penalties.

The City of Tempe, Arizona enforces its Thermal Environment Code through civil sanctions based on a fine schedule set by the City Council. Violators can be fined up to \$2,000 per day per property, with no fines allowed to be lower than the established schedule. Additionally, if a person fails to respond to a citation or court summons, a \$50 default penalty is imposed. This approach ensures accountability and compliance with the city's temperature regulations.



---

Most landlords tend to voluntarily comply with temperature regulations; for example, in Mississauga no penalties have been issued since the bylaw was introduced in 2018. Enforcement can always be more flexible than the law allows, providing room for discretion in cases of hardship, extenuating circumstances, or when the landlord is making a sincere effort to comply.

On the other hand, there must be recourse for the rare cases when landlords are persistently non-compliant even after multiple violations and warnings. Penalties serve as a necessary deterrent, ensuring tenant safety and well-being. Penalties must be strict enough that it becomes more expensive for the landlord not to comply than to install and operating the necessary cooling equipment.



## Regional Temperature Differences

Temperature variations across Canada are significant, spanning multiple climate zones with distinct seasonal and regional differences. Municipalities should account for local climate differences while ensuring that safe maximum indoor air temperature standards are in place to protect vulnerable populations in its communities.

Environment and Climate Change Canada (ECCC) and the National Research Council of Canada (NRC) define climate zones for building code compliance and energy efficiency standards. The National Building Code of Canada (NBC) and the Canadian Energy Code for Buildings categorize the country into climate zones based on heating degree days and temperature extremes.

For example, summer high temperatures in Canada can vary widely from an average July mean daily maximum temperature of 16°C - 20°C in St. John's, Newfoundland to over 35°C in Windsor, Ontario, and in the Okanagan region of BC. The difference between the coolest summer regions, such as coastal British Columbia or Northern Quebec, and the hottest regions, such as Southern Ontario and the Prairies, can exceed 20°C.

**Appendix A** highlights top 10 “hottest” metropolitan areas in Canada in the period 2051–2080, based on projections for the three indicators of extreme heat – very hot days over 30°C, warmest maximum temperature, and average length of heat-waves.

The substantial differences in climate across jurisdictions influence the overheating risk for residential buildings, highlighting the need for more comprehensive cooling strategies. Assessing overheating risk and cooling energy



---

use must account for these regional variations, especially as extreme heat events become more frequent due to climate change.

Regional climate differences also influence acclimatization levels among Canadians. Individuals in historically cooler regions, such as Atlantic Canada and Northern Canada, may be less physiologically and behaviorally adapted to extreme heat compared to those in Southern Ontario or the BC Interior, where high temperatures are more common. However, the impacts of acclimatization on heat tolerance remain insufficiently studied, particularly across different demographic groups, making it challenging to establish region-specific indoor temperature thresholds.



## Seasonality of Bylaw Application

Recognizing the temperature variations across Canada, staff need to determine relevant dates for application of a maximum temperature bylaw in their municipalities.

For example, according to the City of Toronto's report on [Establishing a Framework to Address Excessive Indoor Temperatures in Leased Residential Premises](#), Toronto City Council recommended the City's existing bylaw to be updated to require all air-conditioning systems be operated from June 1 to September 30 (previously the requirement was from June 2 to September 14). A key takeaway from that report was that it established 26°C as the temperature to aim for and directed the staff to identify mechanisms to implement that standard.

While it is generally more effective to avoid seasonal limitations on maximum temperature bylaws to account for early and late-season heat events, municipalities may choose to adopt a seasonal approach to help landlords more effectively manage their HVAC system settings, provides certainty to residents and direction to Bylaw Enforcement Officers that once the seasons change, the necessary cooling requirements will be in place.



## Why 26°C?

For this initiative, our approach is to recommend a maximum safe indoor air temperature that is reasonably well supported by existing literature.

A recent study ([Meade et al., 2024](#)) on the physiological effects on elderly subjects in Canada from an 8-hour exposure to a range of thermal conditions found no significant impacts including undue physiological strain including changes in heart rate, blood pressure and sweat production at 26°C and significant impacts at 31°C and above. No conditions between 26°C and 31°C were evaluated.

Sleep quality has direct and important impacts on health. A UK study resulted in a recommendation of 28 °C as an 8-hour average night-time indoor air temperature threshold for most healthy persons and 26°C for special needs, sick and ill persons ([K. J. Lomas & Li, 2023](#)). These threshold temperatures assume that the indoor air is still, without air movement present to cool the occupant.

A [mortality analysis](#) (including any case of death that was not an accident) conducted by Public Health Ontario found that on average, across the entire population of Toronto, there is an increase in the risk of mortality when outdoor temperatures are approximately 26°C or higher, compared with the risk at 20°C. Older adults (>60 years) were identified as particularly vulnerable to the impacts of extreme heat during the heat dome event experienced in British Columbia (BC) in 2021 and in Quebec in 2018.



---

To reduce the symptoms and risks related to high temperatures in Ontario's long-term care homes, the [Fixing Long-Term Care Act of 2021](#) requires homes to a) have a heat-related illness prevention plan, and b) install air conditioning in all resident bedrooms, keeping temperatures between 22°C and 26°C. This plan applies whenever the outdoor temperature reaches 26°C or higher. The Ontario Ministry of Long-Term Care identified a maximum indoor temperature of 26°C as necessary to protect residents with health conditions.

Similarly, in response to recommendations to address overheating risks, the 2024 BC Building Code now requires a maximum design temperature of 26°C for one living space in each new residential unit.



## Alternate Approaches Advanced by Other Jurisdictions

For jurisdictions facing more frequent extreme heat events where it is challenging to maintain a specific indoor temperature threshold, cities/counties provide alternative maximum temperature thresholds for buildings that adopt specific cooling systems. For example, in Phoenix, residential buildings are required to maintain the indoor air temperature below 30°C with evaporative cooling systems, or below 28°C with air conditioning systems (City of Phoenix, 2023). Evaporative cooling systems, which rely on water evaporation, may not achieve temperatures as low as those possible with air conditioning systems.

In regions experiencing extreme heat, municipalities have set indoor heat thresholds relative to outdoor temperatures rather than establishing a fixed maximum temperature (e.g., 26°C). This approach accounts for the challenges of cooling indoor spaces to a specific temperature when outdoor temperatures are extremely high. The approach to indoor thresholds as a certain number of degrees lower than the outdoor temperature ensures that indoor environments remain cooler while avoiding excessive strain on cooling systems and electricity infrastructure. For e.g., Dallas, TX, implements a maximum indoor temperature threshold that is 8.3°C lower than the outdoor temperature, with an upper indoor limit of 29.4°C for all habitable spaces in all rental homes.

Our model bylaw and staff reports are developed to set a maximum temperature limit of 26°C. While this temperature may be considered overprotective for individuals in warmer regions, such as Southern Ontario or the BC Interior, we suggest using it as a threshold to safeguard a broad range of most vulnerable members of the community, including, but not limited to, elderly adults and children, individuals with pre-existing health conditions such as cardiovascular disease, respiratory disease, kidney disease, and poor thermoregulation, and those with mobility challenges.



## Conclusion

Based on the data and information presented in this backgrounder, we suggest Canadian municipalities to develop their policies by using 26°C as the upper indoor temperature threshold because it reflects the climate conditions, public health risks, and lack of physiological adaptation to extreme heat. While warmer regions globally may justify higher temperature thresholds due to local adaptation to high heat, Canada's climate reality supports a more conservative and protective approach.

Municipalities are well positioned to offer practical supports to help landlords comply with maximum temperature bylaws in their jurisdictions while advancing broader climate and decarbonization goals. Some examples of these supports include:

- 1. Financial incentives** from various levels of governments and private entities such as grants, low-interest loans, and tax rebates can help provide necessary capital to landlords to retrofit buildings with energy efficient cooling solutions like heat pumps, which provide both cooling and heating. For e.g., low-income residents who require air cooling equipment such as an air conditioner as part of a health care treatment plan may qualify for funding under Ontario Works discretionary benefits for residents receiving social assistance from Ontario Works or the Ontario Disability Support Program. A similar measure is available in BC as operated by BC Hydro to provide qualifying households with free portable air conditioners based on household income, property value, and a recommendation letter from their regional health authority's Home Care Program.
- 2. Municipalities can lead educational campaigns** and capacity-building efforts, often in partnership with non-



---

profit organizations, community groups, and utilities to raise awareness about the importance of cooling and providing resources to assist landlords and tenants alike.

**3. Streamlined permitting processes and targeted funding** for low-income rental housing further support compliance to the maximum temperature bylaw while promoting equity and building resilience in our communities.

By undertaking these efforts, municipalities can demonstrate that protecting tenant health and safety is a critical piece in enhancing overall community resilience to climate change.



# Appendix A

## Future of Heat Waves in Canada

According to the Intact Centre on Climate Adaptation's recent report titled *Irreversible Extreme Heat: Protecting Canadians and Communities from a Lethal Future*, while flood and fire may be Canada's most costly natural disasters, extreme heat is the "silent killer".

The figures below describe the top 10 "hottest" metropolitan areas in Canada in the period 2051–2080, based on projections for the three indicators of extreme heat – very hot days over 30°C, warmest maximum temperature and average length of heatwaves. You can find data specific to your jurisdiction here: <https://climatedata.ca/>.

Figures a, b and c: "Top 10" metropolitan areas based on projections for three indicators of extreme heat.

*(Figure credits: Irreversible Extreme Heat: Protecting Canadians and Communities from a Lethal Future report)*



Figure a:

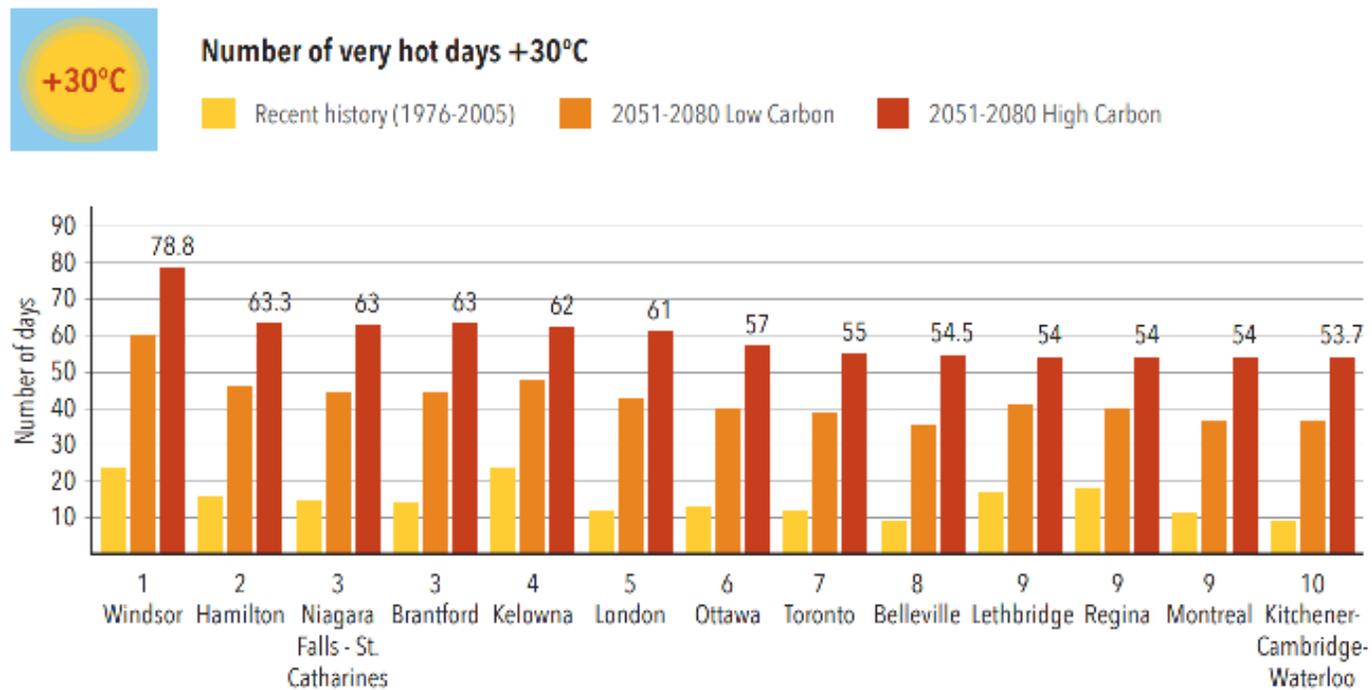


Figure b:

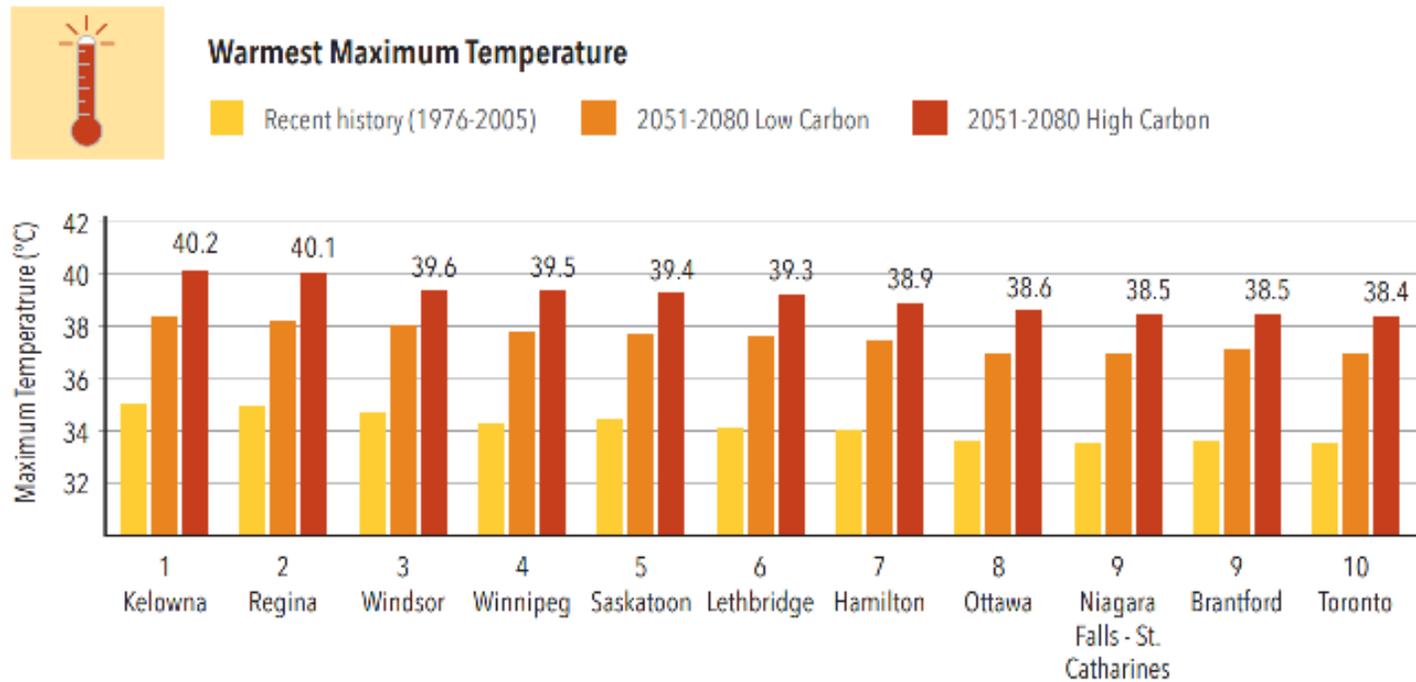
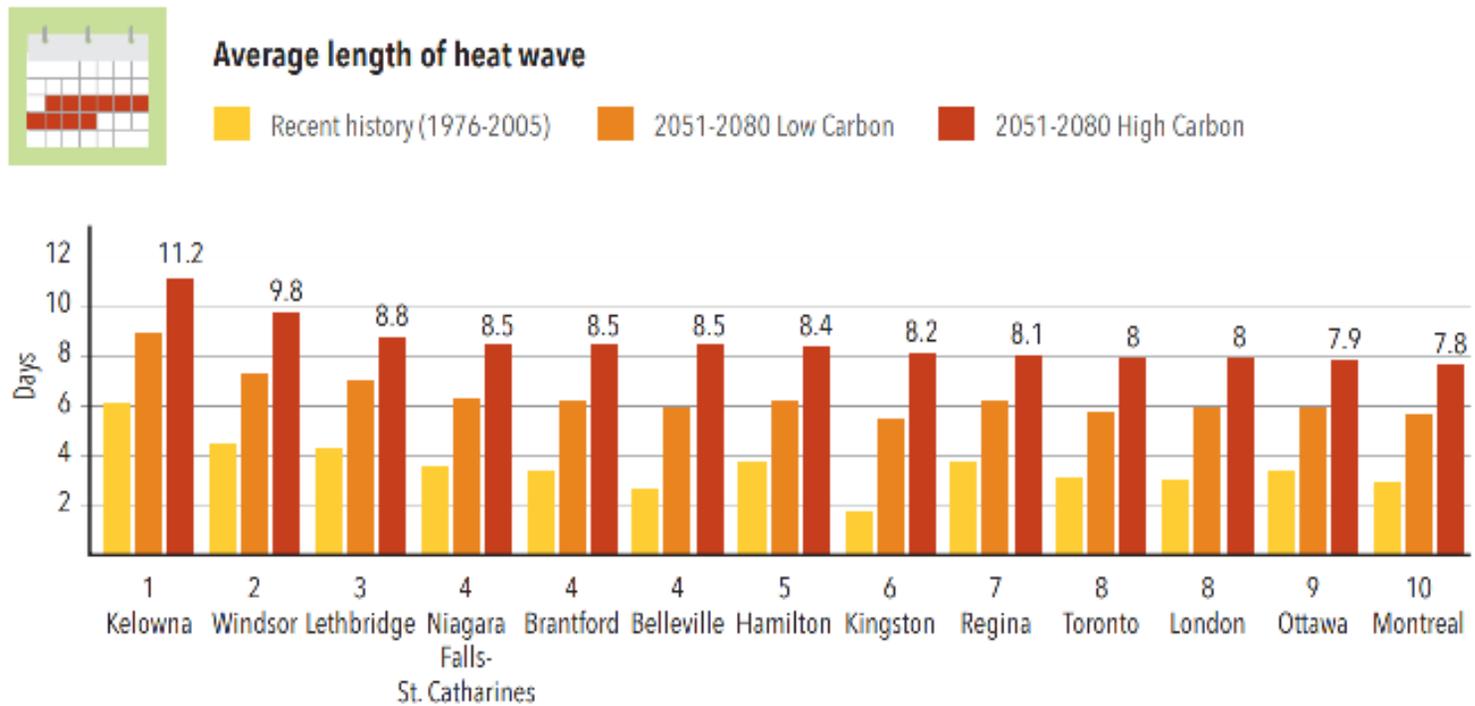


Figure c:





**Clean Air Partnership**