

Climate Plan 2020–2030



Montréal
2030

Building an inclusive, resilient carbon-neutral city



The Climate Plan 2020–2030 is one of the tools that will enable Montréal to achieve carbon neutrality by 2050, in keeping with the One Planet Charter to which it adheres.

The city thanks the following partners in the collaboration agreement for making this plan possible:

- C40 Cities Climate Leadership Group
- Trottier Family Foundation
- David Suzuki Foundation
- Caisse de dépôt et placement du Québec
- Centre intégré universitaire de santé et de services sociaux du Centre-Sud-de-l'Île-de-Montréal
- Claudine and Stephen Bronfman Family Foundation
- J.W. McConnell Family Foundation
- Echo Foundation
- Space for Life Foundation

Table of contents



Messages	06
Message from the mayor	06
Message from the elected official responsible for the ecological transition and resilience, Space for Life and urban agriculture	08
Message from the director of the Bureau de la transition écologique et de la résilience	10
Message from the co-chairs of the climate advisory committee	12
Summary	16
Portrait of Montréal at the dawn of the ecological transition	26
Achieving the ecological transition together	40
Sector 1: Mobilization of the Montréal community	44
Sector 2: Mobility, urban planning, and urban development	58
Sector 3: Buildings	74
Sector 4: Exemplarity of the city	86
Sector 5: Governance	102
Follow-up indicators	108
Appendices	112
Chronology of steps leading to the Climate Plan 2020–2030	113
Members of the climate advisory committee	114
Glossary	115
References	118

Message from the mayor





The year 2020 was marked by COVID-19, which caused many upheavals and exacerbated social and economic inequalities in Montréal and around the world. Climate change has unfortunately had a similar effect on our lives for decades. Even as the city embarks on a period of economic recovery and is striving to support its population in the new normal imposed by the pandemic, it must also undertake a major ecological shift.

Montréal's Climate Plan 2020–2030 was developed with a view to making the city more resilient, greener and carbon neutral, but also more inclusive and fairer. As part of its fight against COVID-19, Montréal has made a huge effort to ensure that no one is left behind. This same vision applies to the fight against climate change, which affects the entire population but poses a particular threat to the most vulnerable.

Montréal can count on a committed population that is ready to act and make the ecological transition a reality. No fewer than 500,000 people took to the streets of the city during the massive Climate March in September 2019, demanding tangible action for the environment. This desire for change is also present within the city administration, which is firmly committed to creating healthier and more sustainable living environments. The signing of the One Planet Charter at the Global Climate Action Summit in San Francisco in September 2018 paved the way for major changes that will enable us to ensure a greener city for future generations.

The Climate Plan 2020–2030 will enable Montréal to meet its commitments and maintain its leadership role in the fight against climate change, while improving the quality of life of its population in the short, medium and long term. In September 2019, at the UN Climate Change Summit organized by the Secretary-General of the United Nations, I made a commitment on behalf of Montrealers to decrease the city's greenhouse gas (GHG) emissions

by at least 55 per cent below 1990 levels by 2030. Meeting this target would put Montréal on the path to carbon neutrality by 2050, a necessary objective to limit global warming to 1.5 °C. Montréal is thus placing science at the heart of its Climate Plan.

Nonetheless, to reach these climate objectives, which are similar to those set by large cities such as Paris, London, Toronto and New York, the whole community of Montréal must be mobilized, together with our allies. Strengthened by support from the population, the city will need to rally all its employees and all levels of government, industries and businesses on its territory, along with civil society organizations. This mobilization will result in more sustainable and resilient districts that can effectively respond to climate hazards and health crises, such as the COVID-19 pandemic that we are currently experiencing.

Montrealers are responding to the COVID-19 pandemic with admirable courage and resilience. Their determination allows us to approach the coming years confidently. These years will be marked by economic recovery and the ecological transition, two key elements that will ensure a sustainable, inclusive and enviable future for Montréal.

Valérie Plante
Mayor of Montréal

Message from the elected official





Montréal's Climate Plan 2020–2030 reflects the city's population. Montrealers are stakeholders in this ambitious plan, which is the fruit of numerous public consultations. From developing districts to dependence on fossil fuels and waste management, Montrealers have had the opportunity to express their opinions on a number of important issues that will shape our fight against climate change and ensure the success of our ecological transition.

Montrealers have made it clear to us that they are ready to ensure a brighter future for our planet. The year 2020 was marked by the COVID-19 pandemic, which sent our lives into turmoil and highlighted the importance of being able to rely on a resilient city, on a human scale, that meets the needs of its population. The Climate Plan that we are presenting is a step in the same direction. It will enable us to offer future generations a greener, more resilient and more inclusive city where everyone can reach their full potential.

To respond to the expectations of the Montréal community, the city formed a climate advisory committee made up of 19 members from a vast spectrum of backgrounds, whose suggestions greatly contributed to the Climate Plan 2020–2030.

This plan belongs to the citizens, community organizations, merchants, businesses and city staff. It aims to respond to their requests, particularly for a low-carbon economy, green spaces, access to an electric charging infrastructure and equity in public transport services. It will also contribute to creating resilient living environments that are well adapted to climate change.

Montréal will make every effort to reach the targets of the Climate Plan 2020–2030 by acting together with the members of the community. The ecological transition affects the whole community, and the city is determined not to leave anyone behind in this large-scale project. This is my commitment to Montrealers.

Laurence Lavigne Lalonde

Executive committee member
in charge of ecological transition, resilience,
Space for Life and urban agriculture

Message from the director





In 2020, we estimate that Montréal will emit 11,000 kilotons of CO₂ equivalent (CO₂eq), which corresponds to a 30 per cent reduction in GHG emissions compared with 1990 levels. Far from being trivial, this achievement marks the attainment of Montréal's first climate target, set in 2005, on the sidelines of the 11th United Nations Climate Change Conference (COP11). Nonetheless, the scientific data suggest that considerable efforts are still required to limit global warming to 1.5 °C and to overcome other significant environmental issues. We must set even more ambitious targets if we wish to achieve these goals.

The Climate Plan 2020–2030 is the main tool to reach the city's new target, namely to reduce its GHG emissions by 55 per cent by 2030, in order to be carbon neutral by 2050. This plan will also enable the Montréal community to reinforce its resilience in order to prepare for and adapt to the upheavals caused by climate change and other environmental disruptions.

The Intergovernmental Panel on Climate Change (IPCC) has stated unequivocally that the next decade will be crucial in the fight against climate change. Montréal is determined to contribute to these efforts. The city will set an example, notably by mobilizing all its allies, procuring the best possible data on emissions, launching a vast building renovation project, and imposing a climate test that will limit the climate impact of its decisions.

Throughout the implementation of the Climate Plan 2020–2030, the city will remain accountable to the population. To publicize the evolution of the plan and attainments of its targets, the Bureau de la transition écologique et de la résilience will produce an annual progress report on the different actions outlined in the plan. The success of the ecological transition rests on trust and a shared understanding of the challenge we face.

Sidney Ribaux

Director

Bureau de la transition écologique
et de la résilience

Message from the co-chairs of the climate advisory committee



In June 2019, Montréal mayor Valérie Plante announced the creation of an advisory committee that would support her in drafting a plan to make Québec's metropolis truly resilient to climate change. It also aimed to equip the city to overcome various environmental challenges and achieve carbon neutrality by 2050.

Our respective organizations, already deeply engaged in climate and environmental action, were given the mandate to co-chair this committee. We directed its work, always bearing in mind the interests of Montrealers and the role that the city can play in the ecological transition.

The advisory committee, made up of 19 members from diverse backgrounds, conducted its work between June 2019 and March 2020. We would like to thank everyone who actively and enthusiastically participated in the committee's discussions by sharing their perspectives and expertise, be it in public health, scientific research, finance, philanthropy, business or the environment. Their contribution is significant and demonstrates a sustained commitment throughout these 10 months of work.

In addition to engaging in dialogue and follow-ups, the committee held workshops on five themes: buildings, mobility and urban planning, adaptation and resilience, mobilization and industry. The results of these workshops informed the city's analysis of the Plan's strategic directions and prioritized the lines of action to adopt.

We would also like to thank the political and administrative staff of Montréal, particularly the members of the Bureau de la transition écologique et de la résilience, for constructive dialogue regarding the advisory committee's proposals.

In our view, this plan is a call for the entire Montréal community to mobilize, as well as a reminder that given the scope of the climate and environmental challenge, it is more crucial than ever that we remain united and work together.

Karel Mayrandⁱ

President and CEO

Foundation of Greater Montréal



Kim Thomassin

Executive Vice-President

Legal Affairs and Secretariat

Caisse de dépôt et placement du Québec



ⁱ Karel Mayrand was the Director General, Québec and Atlantic Canada of the David Suzuki Foundation during the work of the Montréal Climate Advisory Committee (MCAC). The David Suzuki Foundation also played a pivotal role in supporting the MCAC's work.

Montréal 2030 and the Climate Plan

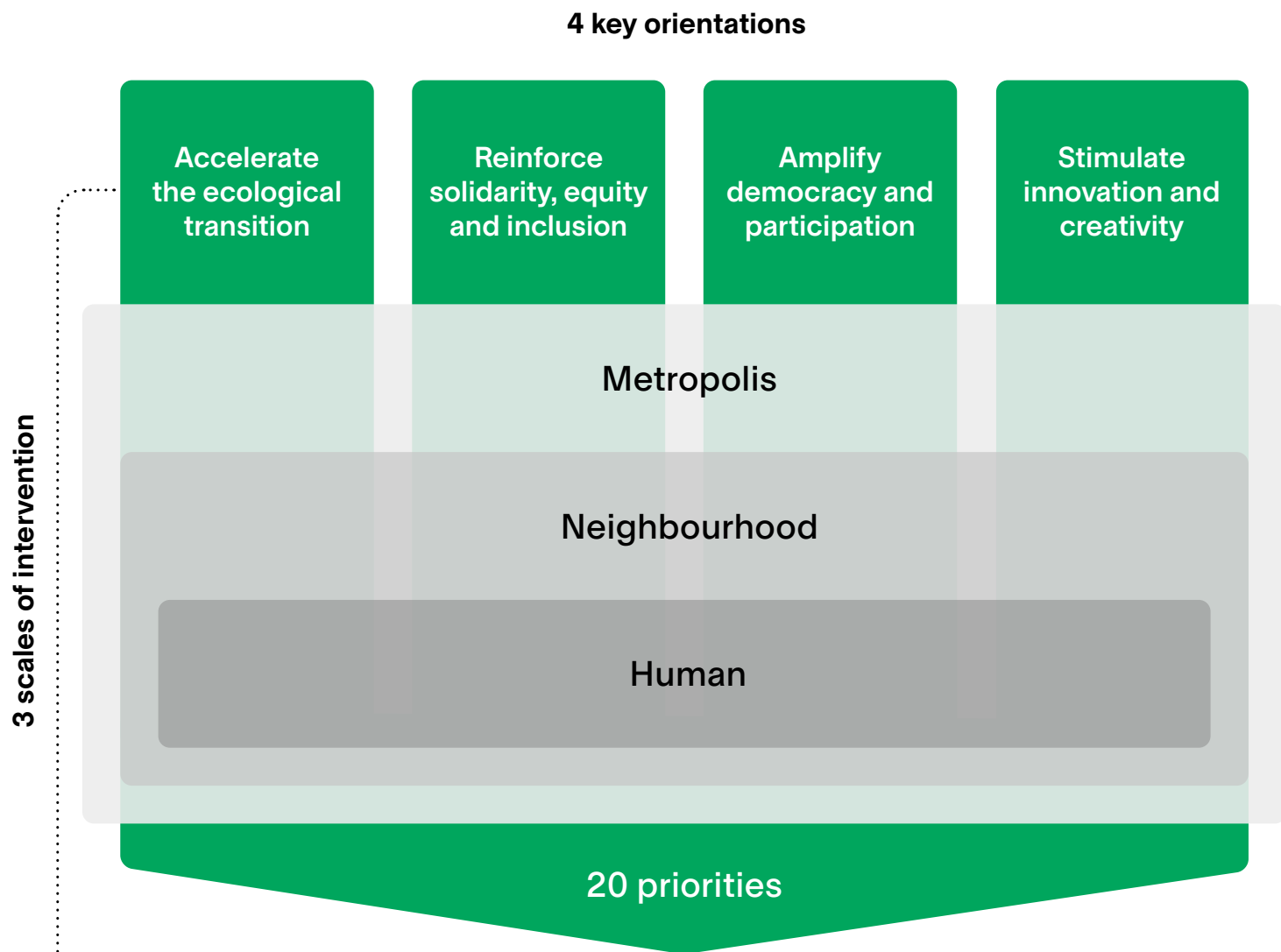
The Climate Plan is an offshoot of Montréal 2030, a recovery process built around a vision of the future.

Montréal 2030 is a 10-year strategic plan for a more resilient, greener and more inclusive city. Following collective reflection, and in response to the health crisis, Montréal has begun a recovery process based on a vision of the future designed to guide and increase the coherence and impact of municipal action in the coming years.

Montréal 2030 aims to enhance the city's economic, social and ecological resilience in order to improve the quality of life of all residents and to collectively give us the means to meet the challenges of today and tomorrow.

By implementing the measures announced in its major plans, programs and policies, Montréal is realizing this vision of a more results-oriented metropolis providing more efficient services to residents.

The Climate Plan provides tangible support for the implementation of Montréal 2030. By catalyzing the city's driving forces and accelerating its organizational transformation process, Montréal 2030 will contribute to the success of the ecological transition.



Montréal 2030
has set 20 priorities,
including:

GHG
reduction

Nature
in the
city

Sustainable
mobility

Zero
waste

Green and
inclusive
economy

Living
environments
and
proximity

Summary



The health crisis triggered by COVID-19 has highlighted the importance of resilience to ensure the well-being of cities' residents and the vitality of businesses and infrastructure. As Montréal embarks on an economic recovery, it is more crucial than ever that resilience and the ecological transition guide the actions that the city will undertake. Many observersⁱⁱ believe that a low-carbon economy will be more robust and resilient.¹ Montréal, which has already embarked on the path to carbon neutrality, notably embodied in its economic recovery strategy,² intends to increase its support for businesses that wish to make or amplify a green shift.

Cities are at the forefront of the climate and environmental emergency. Fortunately, the Montréal community is one of the most mobilized in the world in the face of this major challenge.

The Climate Plan 2020–2030 aims to encourage and catalyze this mobilization in order to reach, by 2030, Montréal's target of reducing its GHG emissions by at least 55 per cent below 1990 levels. This achievement will also enable the city to become carbon neutral by 2050. The ultimate goal of this plan is to increase the community's resilience and capacity to adapt to climate hazards, environmental disruptions and potential pandemics that could once again cause havoc in our society.

All sectors of society will be called upon to contribute to the ecological transition: the city, the population, businesses, civil society and institutional partners. Similar to the determination shown by the population in its fight against COVID-19, we will have to demonstrate solidarity in order to successfully implement the actions set out in the Climate Plan 2020–2030.

ⁱⁱ Observers include the United Nations (UN), the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF).

The plan: 5 sectors and 46 actions

The Climate Plan 2020–2030 contains 46 actions—including 16 key actions—grouped into five sectors. Most of these actions should be implemented by 2030. The key actions will have a particularly significant impact in terms of mobilization, reduction of GHG emissions or adaptation to climate change. These actions are essential to achieving the city’s targets.

Sector 1

Mobilization of the Montréal community

All the members of the Montréal community—residents, industries, businesses, property owners, community organizations, members of the city staff, etc.—will play a crucial role in achieving a successful ecological transition. This transformation toward greater sustainability and reinforced resilience is a collective project in which everyone must play a role and that must be implemented throughout Montréal’s territory, district by district.

Key actions of Sector 1

To mobilize the community, Montréal will focus on access to information and will put in place support measures and incentives to bring about the necessary changes. These actions will be crucial to support the population, organizations and businesses, and encourage their support for the various measures proposed.

- Deploy strategies to promote the adoption of eco-responsible practices. Montréal will, for example, support companies that wish to adopt emission-free delivery services, as it did with the Colibri projectⁱⁱⁱ downtown.
- Stimulate and consolidate the circular economy by creating networks among businesses, merchants and community organizations. An innovation pole in bio-foods focused on the circular economy will be established in order to reinforce the food processing ecosystem and to offer specialized support to businesses.
- Launch a strategy to reduce food waste and facilitate textile donation and recycling in collaboration with the governments of Québec and Canada. This strategy will be implemented with a view to lowering expenses for businesses and citizens, and reducing waste and GHG emissions.

ⁱⁱⁱ The Colibri project is a pilot project for green urban delivery in Montreal led jointly by the city and Jalon Montréal, an organization with expertise in the field of sustainable and intelligent mobility. This project aims to improve the quality of life downtown by reducing the impacts of the last kilometre of delivery by swapping delivery trucks for more efficient, economical and environmentally friendly vehicles.

Sector 2

Mobility, urban planning, and urban development

Public space and ways to move around within it constitute the soul of a city. They reflect the collective choices that guide our daily actions. Montréal is known for its lively neighbourhoods where local businesses thrive amid schools, offices, green spaces and residences. This mix is Montréal's strength and contributes to the quality of life on which the city has built its reputation. Today, Montrealers are demanding safer and more user-friendly streets that favour optimal sharing among all means of transportation including motorized transport, active transport, public transport and various shared mobility modes. Residents also envision greener, more dynamic and more resilient living environments.

Key actions of Sector 2

Transportation is the sector with the greatest potential for GHG emission reductions by 2030. In fact, road transportation is the largest source of GHG emissions in Montréal, accounting for approximately 30 per cent of its total emissions. Serious reflection on the transportation modes favoured by the population is therefore required. Accordingly, the city is promoting the development of public transport on its territory and is making representations to higher levels of government in this area. Structural projects, such as the REM, the extension of the Blue line and of the western branch of the Orange line, and the construction of the Pink line, will help improve the service offering and achieve this objective. The city will also need to

encourage car-sharing, carpooling and electrification of transportation, and continue to promote the use of active transport. Ultimately, the goal is to shift nearly 25 per cent of solo car trips to these less energy-intensive modes of transportation. At the same time, land use densification, particularly near metro stations, will have to continue in order to create neighbourhoods on a human scale and thus reduce GHG emissions, as will a major greening of the city, which will enable Montréal to increase its resilience to climate hazards such as heat waves, heavy rain and destructive storms. Finally, the electrification of both passenger and freight transportation will have to be promoted in order to meet science-based reduction targets.

- Promote the development of lively neighbourhoods on a human scale that are adapted to climate change, in particular by integrating the Climate Plan's targets into Montréal's Urban Planning and Mobility Plan. Such developments will contribute to a 50 per cent reduction in GHG emissions from road transportation.
- In all districts, develop public and active transport and favour car sharing, taxi use and carpooling.
- Favour and increase the proportion of electric vehicles in downtown Montréal.
- Encourage greening and stimulate the densification of the city by converting parking lots into open spaces.
- Plant, maintain and protect 500,000 trees, especially in zones vulnerable to heat waves.



Sector 3

Buildings

In Montréal, the residential, commercial and institutional building stock generates about 28 per cent of GHG emissions in the city. Renovating this stock and constructing low-carbon buildings that consume less energy is not only a necessity but also an unprecedented opportunity to improve the quality of life of Montréal residents. The transformation of the city's building stock is intended to offer the population housing that is comfortable, resilient, fully powered by electricity and energy efficient.

Key actions of Sector 3

The city will promote greater energy efficiency in buildings within its boundaries, while reducing the use of fossil-based natural gas and eliminating the use of heating oil. The latter measure alone will reduce Montréal's GHG emissions by about 5 per cent.

- Eliminate the use of heating oil in buildings and favour renewable energy sources.
- Adapt by-laws and support programs to enhance the energy efficiency and resilience of all types of buildings.
- Design a funding program for property owners to support healthy and environmentally friendly renovation work.
- Improve the energy performance of large buildings through a system of rating and disclosure of their energy consumption and GHG emissions.

Sector 4

Exemplarity of the city

The ecological transition is a collective effort, and Montréal must lead by example by implementing best practices in its areas of jurisdiction. Although GHG emissions from municipal activities account for less than 2 per cent of total emissions in Montréal, the city is still obliged to take action to protect the environment and the climate.

Key actions of Sector 4

In order to convince the community to get on board with the programs and standards that will be proposed as part of the Climate Plan, Montréal believes it is essential to be an exemplary corporate citizen. Thus, the city intends to focus on the municipal real estate stock before imposing these same transformations on the private sector. Similarly, the city intends to facilitate the use of active and public transport among its 28,000 employees in order to convince the population and businesses to make this modal shift from solo driving to more environmentally friendly modes.

- Convert 100 per cent of the municipal real estate stock to net-zero carbon. The renovation of city hall is one of the first major projects in this area.
- Decarbonize the business travel of city staff and encourage the use of sustainable transport modes for home–work commutes.



Sector 5

Governance

Montréal will revise its governance rules to systematically consider the climate and environmental impact of all its decisions, be they tax- or budget-related, administrative or regulatory. This important change in the city's governance will require the mobilization of all its employees.

Key actions of Sector 5

The city will ensure that its decision-making and budgeting processes are consistent with ecological transition and resilience. Consistency is a key element of mobilization, which will be critical to the success of the Climate Plan. The following two actions will transform municipal government at all levels, from finance and infrastructure to public policy. Among the measures of the Climate Plan, it is these actions that could ultimately have the greatest impact.

- Apply a climate test to all city decisions. In doing so, Montréal will ensure that it limits the impacts of its decisions in terms of GHG emissions and maximizes the benefits in terms of adaptation to climate change. The city's desire to make its building stock carbon neutral is an example of a decision made based on the climate test.
- Allot 10 to 15 per cent of the Ten-Year Capital Expenditures Program budget to adapting to climate change.

Implementation and monitoring of the Climate Plan

Montréal has foreseen several measures to assist residents who carry out climate and environmental actions to ensure a successful ecological transition. Businesses will receive support, coaching and eventually regulation to help them achieve their objectives. Furthermore, Montréal will set an example by highlighting innovation and quickly adopting the necessary science-based measures to reduce its own GHG emissions.



Lastly, the city will mobilize all its allies to attain its objectives. Aid and collaboration from higher levels of government is crucial, notably regarding deployment of public transport services throughout the territory of Montréal.

To monitor the evolution of the Climate Plan 2020–2030, Montréal will publish an annual report on the progress of its actions. It will also track eight indicators.

Reduction of GHG

- ① GHG emissions produced by the community and by municipal activities.
Target: A 55 per cent reduction in GHG emissions.
- ② Consumption of fossil fuels by the Montréal community (fuel, diesel, natural gas, oil and propane).
Target: A decrease in consumption.
- ③ Use of different travel modes, including the modal share of automobiles.
Target: A 25 per cent reduction in the share of solo car trips.
- ④ Percentage of electric vehicles registered in the agglomeration of Montréal.
Target: 47 per cent of electric vehicles registered.

Resilience/adaptation

- ⑤ Number of trees planted by the city and its partners (with vulnerable areas prioritized).
Target: 500,000 trees planted.
- ⑥ Area of protected zones.
Target: 10 per cent of the territory.
- ⑦ Status of various climate hazards.
Target: A decrease in vulnerability.
- ⑧ Area of heat islands.
Target: A reduction in the area.

Portrait of Montréal at the dawn of the ecological transition



Context



Montréal's Climate Plan 2020–2030 was developed with a view to making the city more resilient, greener and carbon neutral, but also more inclusive and fairer. The health crisis triggered by COVID-19 has prompted serious reflection on the degree of our communities' preparedness for sudden, very intense disruptions. It has also reminded us of how our daily actions can have major impacts on our communities. Lastly, it has underlined the importance of green spaces. This reflection will also apply to the fight we must wage against climate change, which is the cause of more frequent extreme weather and environmental events that have major impacts on human health and the economy, in particular.

The challenge is formidable. To limit global warming to 1.5 °C, the level set by the international community, we must achieve carbon neutrality by 2050. Much work also remains to be done to reinforce the sustainability of our communities, such as advancing toward a zero-waste lifestyle, reclaiming our natural spaces, favouring the emergence of a circular economy, and developing dynamic and healthy urban agriculture.

By signing the One Planet Charter in 2018, Montréal pledged to:

- Develop, by the end of 2020, an action plan to support the implementation of the Paris Agreement on climate change and make Montréal a carbon-neutral resilient city by 2050; it also committed to set an interim target for 2030
- Make municipal buildings and all new construction in the community net-zero carbon by 2030 and extend this measure to all buildings in Montréal by 2050
- Advance toward zero waste
- Propose inclusive climate and environmental actions that improve conditions for the most vulnerable people, and that do not compromise the ability of future generations to meet their needs

The actions undertaken between 2020 and 2030, set out in the Climate Plan, will help us meet our commitments and sustainably improve the quality of life of the population. In 2050, Montréal hopes that the ecological transition will have encouraged the population to respect the planet's ecological limits by relying, in particular, on sustainable mobility. Furthermore, the transition will ideally have made it possible to generalize the use of renewable energies and will have favoured local agriculture and the circular economy. Neighbourhoods will have been transformed to reflect the principles of sustainability and user-friendliness for the benefit of all.

On the strength of their close relationship with residents and their leverage in the areas of land use and development, mobility, waste management and economic development, municipalities are key actors in the ecological transition. Backed by essential cooperation from all its allies, including the different levels of government, Montréal will rise to this challenge. The ecological transition represents an unprecedented opportunity to improve Montrealers' living conditions, one that the city intends to seize forcefully and ambitiously.



What are ecological transition, adaptation to climate change and urban resilience?

Ecological transition proposes a new economic and social model that respects the limits of ecosystems and that reduces GHG emissions. For Montréal, ecological transition mainly entails adapting to climate change and radically transforming the way we produce and consume goods and energy, protecting biodiversity and reinforcing the resilience of our ecosystems and community. In implementing all these measures, the city must ensure that no Montrealer is left behind.

Climate change adaptation is a process by which communities and their ecosystems adjust and prepare for changes in order to limit the negative consequences and reap the potential benefits of the evolving climate.³ Urban resilience is the capacity of a city's people, communities, institutions, businesses and systems to survive, adapt and grow, regardless of the types of chronic stresses (ecological, social, economic, etc.) and acute shocks (meteorological, geophysical, hydrological, health, etc.) they experience.⁴

To measure the path leading to attainment of the objectives of the Climate Plan 2020–2030, it is essential to paint a portrait of the current situation in the entire agglomeration of Montréal. Although the present plan has been developed by the city, the other entities of the agglomeration of Montréal will act together with the city.

The agglomeration of Montréal consists of 16 municipalities: 15 reconstituted cities plus Montréal, which is made up of 19 boroughs. The agglomeration manages common services (e.g., police, fire, water production and wastewater treatment), whereas the reconstituted cities, downtown Montréal and the city's boroughs possess "local" jurisdiction over domains such as public works, libraries, and sports and recreation. In addition, some jurisdictions are shared, notably those related to urban planning and mobility.

A large road network comprising highways, streets, main thoroughfares and bike paths crisscrosses Montréal's territory, together with a metro and suburban train network. Large parks, numerous neighbourhood parks, green alleys and street trees also grace the urban landscape. In addition, the agglomeration is home to many community and collective gardens, and urban agriculture is increasingly popular.

Montréal excels in several promising niches, such as clean technologies, electric and smart transportation, sustainable mobility, artificial intelligence and the digital industry. With a gross domestic product (GDP) at the basic price of \$134 billion, Montréal's economy represents 35 per cent of Québec's GDP.⁵

Territory

499 km²
Area of the territory⁶

>90%
Urbanized territory
in Montréal⁷

4,073.9
People per square
kilometre⁸



Population

2M
Inhabitants of
the territory⁹

14%
Low-income families¹¹

77%
Workers ages 25–64¹⁰

\$38,246
Median employment
income of people
ages 25–64¹²



Landscape features

190 hectares
Parc du Mont-Royal¹³

2,000 hectares
Over 20 large parks¹⁶

21%
Plant cover (canopy)
of the agglomeration¹⁴

4%
Area of the agricultural
zone of the agglomeration
(in the west end)¹⁷

6.1%
Area of protected
spaces in the
agglomeration¹⁵





Transportation of goods

Freight transport hub

Montréal is home to the country's second largest port¹⁸ and third largest airport,¹⁹ together with two rail networks.



Sustainable mobility

Greater Montréal

6
Suburban train lines,
including 59 stations²⁰

26
Réseau express métro-
politain (REM) stations
planned²¹



Agglomeration of Montréal

1,869 buses²²
Including more than
477 hybrid buses²³

64
Metro stations²⁵

876 km
Of bike paths²⁶

222
Bus routes²⁴



Climate hazards²⁷



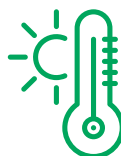
Heavy
rain



Heat
waves



Floods




Rise in average
temperatures



Droughts



Destructive
storms

Climate		Climate data for 1981–2010 are presented alongside climate projections for 2041–2070 and 2071–2100, which indicate that the climate will continue to change.	
			
1981–2010 ²⁸	2041–2070 ²⁹	2071–2100 ³⁰	
6.9 °C Average annual temperature	10.1 °C Average annual temperature	12.6 °C Average annual temperature	
20.2 °C Annual summer average	23.4 °C Annual summer average	26.0 °C Annual summer average	
11 Number of days >30 °C	41 Number of days >30 °C	74 Number of days >30 °C	
1,000 mm Total annual precipitation	1,110 mm Total annual precipitation	1,130 mm Total annual precipitation	
72 mm Maximum precipitation (5 days)	78 mm Maximum precipitation (5 days)	84 mm Maximum precipitation (5 days)	
71 Number of freeze-thaw episodes	58 Number of freeze-thaw episodes	51 Number of freeze-thaw episodes	

Strategic directions of Montréal's Resilient City Strategy regarding urban residence³¹

This strategy presents the vision for the city as an alert, proactive and inclusive community acting to meet social, economic and environmental challenges.

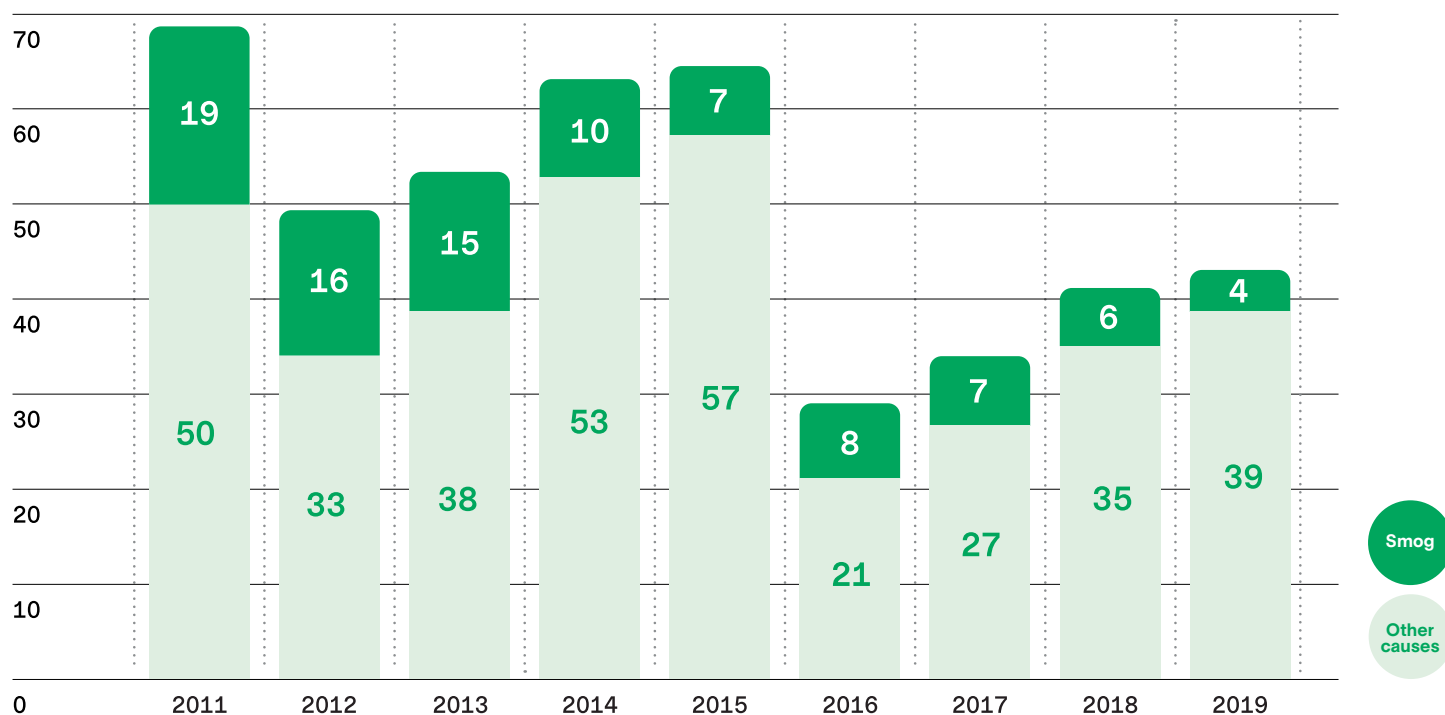
- Support a unified and safe community
- Protect our living environment
- Maintain a diversified and innovative economy
- Promote integrated governance in the service of the community



Poor air quality days in Montréal by year since 2011^{iv, 32}

The number of smog days has been declining since 2011. After a decrease in the number of poor air quality days between 2012 and 2016, the number of smog days is gradually increasing again. According to the Environmental Assessment Report 2019: Air Quality in Montréal 2019, “A study published in 2019 has shown that fine particle pollution levels have

increased by 5.5% from 2016 to 2018 due to the smoke of forest fires, a growing economy and the lax application of the *Clean Air Act*. Given that the air knows no boundaries, this increase has had an impact on the concentrations observed in Montréal, which may partially explain the increase in fine particles observed since 2016.”^{v, vi, 33}



^{iv} 2011 to 2013 data provided by the Réseau de la surveillance de la qualité de l'air of the Service de l'environnement.

^v Based on established criteria, a day is deemed poor in terms of air quality as soon as fine particulate matter concentrations (PM2.5) exceed 35 µg/m³ for at least 3 hours in a given station. A poor air quality day is characterized as a smog day when concentrations of PM2.5 exceed 5 µg/m³ during at least 3 hours over more than 5 per cent of the agglomeration's territory. During a smog day, concentrations of PM2.5 generally remain high for 24 hours and sometimes longer.

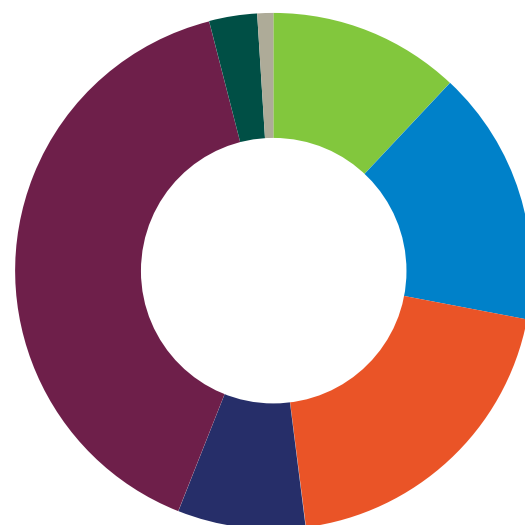
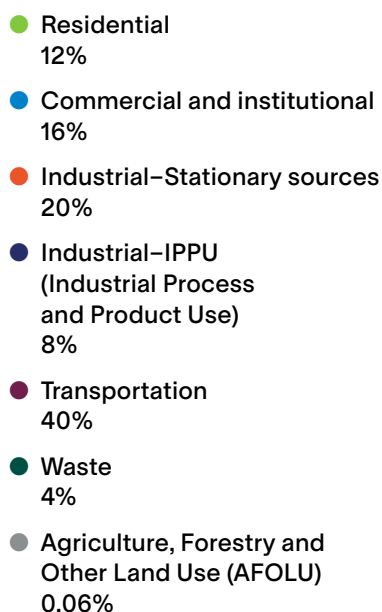
^{vi} Additional explanation provided by the Réseau de la surveillance de la qualité de l'air of the Service de l'environnement.



GHG emissions in Montréal*

Human activities have caused global warming, and GHG emissions generated by Montréal are exacerbating this phenomenon. The latest annual inventory indicates that GHG emissions of the agglomeration of Montréal for the year 2015 are 28 per cent lower than those of 1990. The city estimates that this reduction will reach 30 per cent in 2020. These GHG emissions come largely from transport, along with stationary sources, namely residential, commercial, industrial and institutional sectors.

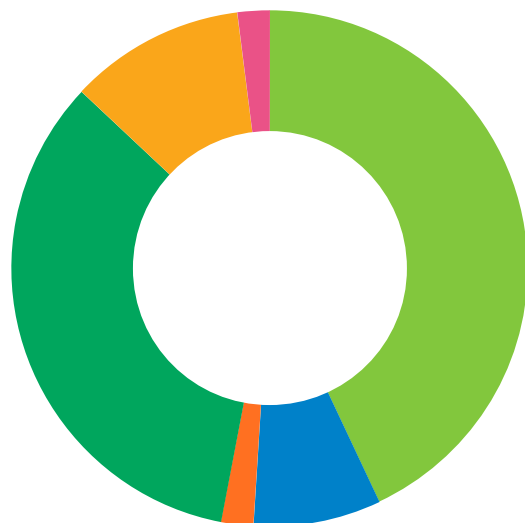
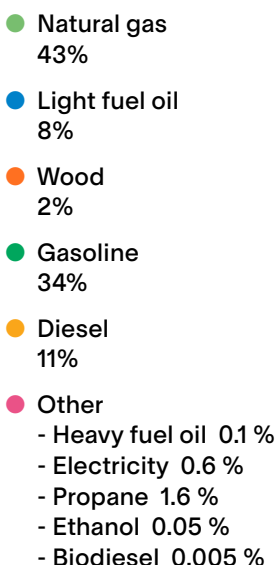
*Inventory of greenhouse gas emissions produced by the Montréal community in 2015³⁴



Distribution of the community's GHG emissions in 2015 by energy source*

The main sources of energy that generate GHG emissions in the community are natural gas for the stationary sources sector (i.e. residential, commercial and institutional) and fuel for the road transport sector.

*Inventory of greenhouse gas emissions produced by the Montréal community in 2015³⁵



Montréal 2050: a carbon-neutral, resilient city

Vision

In 2050, at the foot of Mount Royal, on the shores of the St. Lawrence River, stands a carbon-neutral, resilient city, renowned worldwide for its exceptional quality of life. The population respects the ecological limits of the planet, notably by favouring sustainable mobility, generalized use of renewable energies, local agriculture and the circular economy. Districts have been transformed to reflect the principles of sustainability and user-friendliness. On a human scale, they favour social interaction and protection of ecosystems. The residents of Montréal have participated actively in transforming the city to make it more inclusive, greener and adapted to climate change. Montrealers have forged ties conducive to mutual aid in case of extreme climate events, which have become increasingly frequent, or any other crises that the citizens may face. This resilient city results from actions taken between 2020 and 2030 by the entire Montréal community, which charted the city's path toward carbon neutrality.



In 2030...

By implementing the Climate Plan 2020–2030, Montréal has truly embarked on the transition toward sustainable mobility, the circular economy and sustainable districts that emphasize local services.

Montrealers live in healthy environments where nature increasingly flourishes. The city's tree canopy has burgeoned. Numerous trees of various species absorb rainfall, filter the air and host a broad diversity of wildlife. Their shade cools homes and gardens. Heat islands have nearly disappeared in all the districts. Montréal considers its most vulnerable citizens in all its urban planning efforts, thereby reducing social, economic and environmental inequalities in the territory.

The Montréal community increasingly moves about on foot or by bike in safe environments whose visual layout and soundscape are designed to foster physical and mental health alike. For those who need to travel longer distances, the electric public transport network provides quick links between different neighbourhoods and a lively downtown core, where congestion has been eased considerably.

Fewer people own vehicles. When a motorized vehicle is needed, electric shared mobility services are available to facilitate modal transfer. Transportation of goods is optimized and more sustainable. Telework has also become more popular, reducing pressure on transport networks during peak periods.

Consequently, with the phasing out of vehicles powered by fossil fuels, air quality has improved dramatically. Furthermore, a growing portion of the Montréal community works and lives in healthy eco-friendly buildings that are well insulated and resilient to climate hazards.

The fight against climate change and other environmental issues has galvanized the economy in new innovative niches. Montrealers can easily share their expertise in quality jobs aligned with their values.

Montréal has become a leader of the circular economy. Its population adopts a zero waste lifestyle, and the few remaining waste materials are mostly integrated in production cycles within the territory.

Montrealers have created support networks to adapt to climate change and other potential crises, particularly health-related. Notably, they are better prepared to cope with heavy rain and extreme heat. The city's infrastructure integrates climate change scenarios. When the rare misstep occurs, it is handled effectively.

Residents, companies, industries, businesses, community organizations and municipal staff are mobilized and work together effectively, transparently and constructively to provide living environments that are resilient, adapted to climate change and carbon neutral.

Montréal is fully assuming the role of metropolis: as a true leader, it is mobilizing the entire community around the ecological transition, in tandem with all regions of Québec.

Achieving ecological transition together



The Climate Plan 2020–2030 contains 46 actions—including 16 key actions—intended to reduce Montréal’s GHG emissions by 55 per cent below 1990 levels by 2030, in order to attain carbon neutrality by 2050. By 2025, all of Montréal’s policies, plans, strategies and programs will take climate issues into account. By 2050, Montréal will increase its resilience by targeting the territory’s non-significant vulnerability to climate hazards. In addition, people’s vulnerabilities will be taken into account in the implementation of the actions set out in the plan.

Key actions will have a particularly significant impact in terms of mobilization, reduction of GHG emissions and adaptation to climate change. These actions are essential to achieving the city’s targets.

The actions proposed in the plan are grouped into 5 projects:

In the subsections below, each of these sectors is presented, together with the actions they contain. Unless otherwise indicated, these actions should be implemented by 2030.



Mobilization of the Montréal community



Mobility, urban planning and urban development



Buildings



Exemplarity of the city



Governance

Adapt Montréal's economy to the imperatives of the ecological transition

To successfully realize the ecological transition, the entire Montréal economy—all sectors combined—will need to transform in order to fully integrate the concepts of sustainability and circularity. The city will participate in this transformation, notably by using public contracts as a lever to spur the growth of innovative industries, by formulating a working plan to eliminate GHG emissions from construction projects and by ensuring a just transition for workers in sectors affected by the ecological transition.

The economic recovery plan, launched in December 2020, confirmed the intention of the city to make the ecological transition one of its pillars.

The industrial sector is a particularly important economic domain for ecological transition in Montréal. It contributes about 28 per cent of the city's total GHG emissions: 20 per cent from stationary sources (GHG emissions resulting from the energy use of fuels and fugitive emissions from processes that generate, supply or consume different forms of energy

such as heat or electricity)³⁶ and 8 per cent from industrial processes and product use (IPPU).

The Montréal Protocol and the Kigali Accord demonstrate that progress has been achieved in efforts to mitigate the climate and environmental impact of the industrial sector. However, it is essential to take rigorous action to accelerate the transformation of this sector. Some measures of the Climate Plan 2020–2030, such as creating networks to stimulate the circular economy and industrial ecology, therefore prioritize this sector.

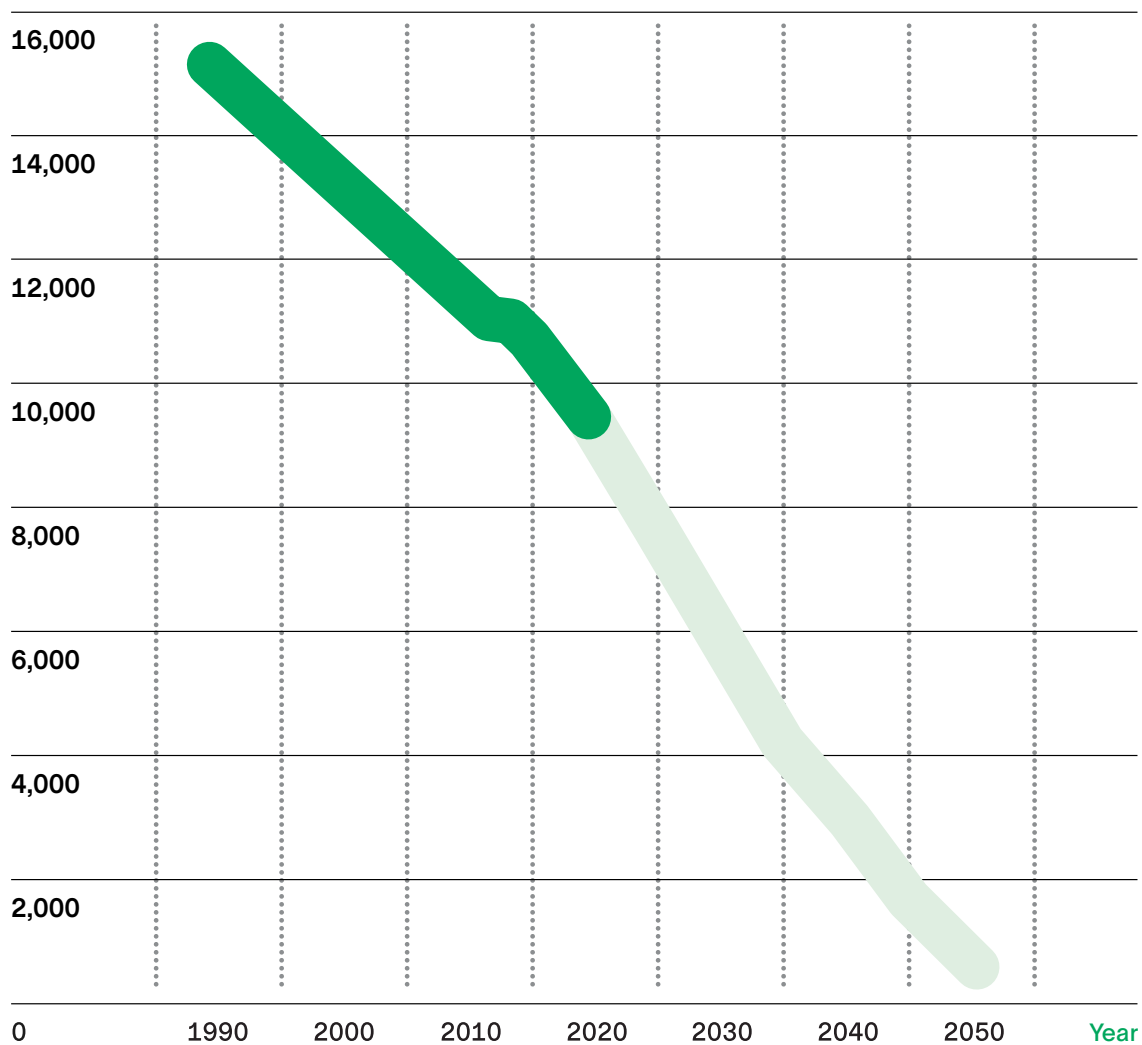
Given their diversity, the actions intended to transform the economy and the industrial sector are categorized into the five sectors mentioned above.



Trajectory of GHG emissions from 1990 to 2050

*Based on technical and economic modelling of GHG emissions
reduction

GHG emissions
(kt CO₂eq)





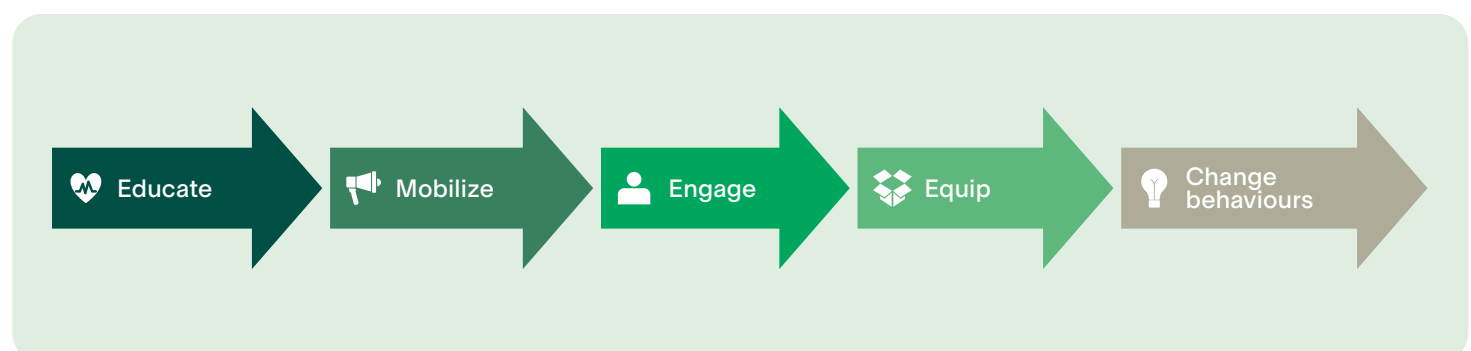
Sector 1

Mobilization of the Montréal community

The whole of the Montréal community is responsible for the ecological transition. It cannot be achieved without the participation of all community members. Montréal's transformation toward greater sustainability and reinforced resilience is a collective project that must be implemented throughout the whole territory, district by district. A number of residents, businesses, industries, institutions, organizations and city staff have already embarked on the ecological transition. Montréal will support them by multiplying opportunities for learning and engagement to ensure that everyone can contribute to building the metropolis of tomorrow.

Montréal will act on several fronts to facilitate changes in behaviour. Specifically, it will focus on educating, mobilizing, engaging and equipping. It will create programs that take into consideration intercultural and intergenerational differences, the gender spectrum and varying levels of engagement that characterize the Montréal community. Local initiatives will receive sufficient support, notably through financial and technical contributions, and by creating environments conducive to experimentation. Montréal will also act as a catalyst of innovation by bringing together the actors who can contribute to the emergence of the circular economy and by stimulating multistakeholder reflection on the ecological transition of the construction sector.

Trajectory leading to behavioural changes



Action 1

Mobilize Montréal's community to orchestrate the ecological transition in all the districts

To mobilize local actors, Montréal will support citizen initiatives linked to the ecological transition. Specifically, the city will introduce, in each borough, a mechanism of collaboration between local administrations, the central services of the city and local actors. These mechanisms will be based on co-construction, pooling of resources, delegation and citizen participation.

Such social innovation projects create social capital between residents and increase the autonomy of local communities by multiplying opportunities for linkage and sharing.

To encourage local initiatives, Montréal will:

- Support organizations that promote local citizen participation in collaboration with the boroughs and local stakeholders
- Create open spaces, notably by applying the transitory urbanism approach
- Favour synergy and knowledge sharing between different projects and partners
- Promote and facilitate collaboration between boroughs and the population
- Facilitate access to various funding programs, notably by increasing participatory budgets and calls for citizen projects, and by disseminating information
- Highlight the identity of communities and promote the vitality of districts and the culture of proximity by developing cultural quarters^{vii, 37}

^{vii} Montréal subscribes to the definition of “cultural quarter” proposed by Culture Montréal: “A lively environment in which the presence of arts and culture is recognized as a key factor in the healthy development of local communities, particularly in terms of a sense of community, economic vitality, relationships between individuals, quality of life, etc.”

Transitory urbanism: The Young Project

Transitory urbanism involves repurposing empty or abandoned space, such as a building or lot. This open approach that reinvigorates land use is part of participatory urban planning. Its aim is to mobilize actors in dynamic and tangible operations intended to breathe new life into underused sites. These inherently transitory forms of occupancy can define the sustainable vocation of places in a gradual and evolving way, thus refreshing the meaning and usage of these sites.

The Young Project, the first Montréal pilot project that spotlights transitory occupancy, is the fruit of an unprecedented partnership between the city, the organization Entremise, the Maison de l'innovation sociale (MIS) and the McConnell Foundation. It is a particularly interesting example of a new approach to transforming underused sites. As part of this project, a vacant building owned by the city provided space to tenants such as the MIS, entrepreneurs, community groups and artists for 22 months at an affordable cost.

Not only did the Young Project allow the city to test the emergent practice of transitory usage in a municipal building, but by providing the space to the MIS as the main tenant, the project thus constituted an unprecedented framework to support diverse social innovation projects and initiatives.

The Young Project stands out as a pioneering achievement that marks the emerging field of urban regeneration in Montréal. This collaborative innovation has drawn significant interest on the Québec and international scenes.

Transitory urbanism will be enshrined in the next urban planning and mobility plan and will thus contribute to the achievement of socioecological transition by experimenting with new forms of public/community collaboration, such as the commons (a form of usage and of collective management of a place or resources).

Action 2

Support partners in the ecological transition

In Montréal, several actors are engaged in environmental and climate action. To attain its targets and implement numerous adapted and high-impact solutions, the city will need the collaboration of each of these actors, be they public, private, community or institutional.

Montréal will introduce a new support program for organizations whose actions contribute to the main objectives of the Climate Plan 2020–2030, namely reduction of the city's GHG emissions and reinforcement of all districts' resilience and ability to adapt. The city will highlight their successes in order to inspire other actors and projects. It will also design dissemination tools intended for different groups to use in their initiatives, projects and events associated with the ecological transition on Montréal's territory.

Action 3

Produce a Montréal Ecodistrict Charter

Montréal will produce a charter that links all urban development actors to the city and provides them with incentives to innovate living environment design in various domains: social inclusion, mobility, energy, urban agriculture and greening, waste management, social and circular economy, conservation and heritage enhancement, forms of citizen self-organization, pooling of services and equipment, etc. To bolster this approach, the city has identified some areas in which Ecodistrict development is planned. These areas will become laboratories where Montréal will redefine, together with the community and a network of experts, ways to develop and experience the city.

The charter will include guidelines and evolving measures for supervision and follow-up, to better adapt districts to climate change, improve communities' resilience and favour the ecological transition in Montréal.

Action 4

Deploy incentive campaigns for adoption of environmentally responsible practices

Montréal will carry out campaigns to motivate changes in behaviour to support the Montréal community in resilience and the ecological transition. These programs will target various groups according to the actions set out in the present plan, including:

- Electrifying residential building heating systems to eliminate the use of heating oil
- Increasing the modal share of bicycles by targeting people who live or work near cycling infrastructure³⁸
- Supporting businesses in the transition to the circular economy
- Reducing solo car trips by the staff of large businesses, and encouraging senior managers to favour telework for all positions that allow it
- Increasing zero emission deliveries by large businesses

Action 5

Stimulate and consolidate the circular economy by creating networks between businesses, stores and community organizations

Economic transformation is a key element of the ecological transition and a low-carbon economy. Businesses embarking on this transformation must have the support of cities and governments.

Montréal will support and facilitate networking among industries, stores and community organizations already operating on its territory to encourage their transition toward circular economy practices, and will multiply its efforts to attract stakeholders already involved in the circular economy. To this end, the city will use its influence to encourage dialogue and support different actors among, notably, the industrial hubs.

Montréal will also complete a profile of the possibilities of implementing the circular economy on its territory. This profile will include analyses of material and energy flow for promising sectors islandwide. The degree of implementation of the circular economy will be measured using an evolving circularity index.

This process will help identify market prospects in applied industrial ecology, namely situations where outputs (such as heat, steam or a chemical compound) and waste materials from industrial processes can be reused as inputs and raw materials in the processes of other organizations. The implementation profile of the circular economy will specify the interventions required to harness these synergies.



The circular economy: respecting the ecological limits of the Earth

The limits of the classic, or “linear,”^{viii, 39} economic model have been reached. The planet’s capacity can no longer has the capacity to support the logic of the “take-make-dispose” sequence.

The circular economy has therefore emerged as an alternative solution that values efficacy and efficiency in the use of natural resources, along with respect for the capacity of ecosystems. This model proposes “a production, exchange and consumption system that optimizes the use of resources at all stages of the life cycle of a good or a service, in a circular logic, while reducing the environmental footprint and contributing to the well-being of individuals and communities.”⁴⁰

The circular economy offers several environment-related advantages: it reduces GHG emissions and the quantity of waste materials and protects biodiversity. It also generates socio-economic benefits, notably by dampening the volatility of raw material prices and by creating jobs. Montréal has already begun to execute programs to accelerate the implementation of the circular economy on its territory, such as putting in place a circular economy investment fund for innovative businesses, jointly with Fondation, and it plans to go even further.

Going further with innovation zones

As part of a process initiated by the Québec government, Montréal will establish innovation zones that will host industrial, entrepreneurial, knowledge, networking and collaborative activities. The innovation zones will create ecosystems to nurture

emerging technologies. They will meet certain criteria, including promoting clean and sustainable growth and helping to reduce Québec’s environmental footprint.⁴¹

^{viii} According to the Institut de l’environnement, du développement durable et de l’économie circulaire, the linear economic model forces one to “harvest more and more resources to meet the needs of a growing population.” Furthermore, “in the past century, we increased our consumption of materials eightfold.” It should be noted that the Institut EDDEC has now closed down. The Centre d’études et de recherche intersectorielles en économie circulaire, which was created in the summer of 2020, has taken over research in the area of the circular economy in Québec.

Action 6

Form a multistakeholder work team to eliminate GHG emissions from construction projects

Based on the most compelling international initiatives, including construction regulation approaches deployed in the city of Oslo,⁴² Montréal will draft a working plan that will reduce direct and indirect GHG emissions generated by construction sites. It will form a multistakeholder work team to put in place measures to lower these emissions. This team will examine avenues, such as the replacement of fossil fuels with electricity and procurement of low-carbon materials. It will also take into account other benefits brought about by these orientations, such as reduction of noise and atmospheric pollution.



Action 7

Launch a strategy to reduce food waste by 50 per cent by 2025 and facilitate textile donation and recycling

As indicated in its proposed Plan directeur de gestion des matières résiduelles 2020-2025 (Waste Management Master Plan, PDGMR),⁴³ Montréal will reduce food waste by 2025 on its territory by 50 per cent by 2025. To do so, it will require the cooperation of stakeholders and the whole population. In 2021, it will hold a public consultation aimed at adopting a strategy to fight food waste and promote behavioural changes.

The city will also make a concerted effort to facilitate the donation and reuse of textiles, which represent 4 per cent of the total emissions of large cities around the world.⁴⁴ In fact, this industrial and commercial sector uses more than 1 billion kWh annually.⁴⁵ In addition to banning the disposal of unsold inventory and production waste in the local textiles sector, as stated in the PDGMR 2020–2025, the city will regulate the installation of donation boxes in a more targeted way and will encourage the community to make greater use of them.

In addition to potentially reducing GHG emissions significantly, this measure will mobilize the population and many businesses by offering them a simple way to reduce waste.

Contribution of zero waste and waste management to the fight against climate change

Tackling overconsumption and waste production can not only reduce pressure on our resources and the contamination of our living environments, but it also contributes directly to the fight against climate change. The treatment and elimin-

ation of waste generates methane, a GHG 25 times more powerful than CO₂. Waste management^{ix} produces 4 per cent of GHG emissions in the agglomeration.⁴⁶ In addition, although highly efficient collection systems are in place in landfill sites, decomposition of waste currently in landfills will continue to produce methane and other atmospheric pollutants for several decades to come. These emissions represent a major environmental liability for future generations.

Montréal will build two organic material processing centres by 2022, whose annual GHG emission reduction potential is estimated at 22 kt CO₂eq.⁴⁷

^{ix} The collection, treatment and elimination of waste leave a carbon footprint equivalent to the use of slightly less than 100,000 automobiles travelling more than 18,500 km per year.

Action 8

Educate Montrealers about the ecological transition by prioritizing the resilience of people in vulnerable situations

The participation of all Montrealers will be essential to the success of the ecological transition. To become engaged in the process, residents will have to be stakeholders in the changes being made. Montréal will therefore put in place awareness programs that emphasize the advantages of achieving the ecological transition in several spheres such as health, quality of life, mobility and finances.

Montréal will devote particular attention to the main groups that are vulnerable to climate change.⁴⁸ These groups include seniors, children, the homeless, people whose situation is precarious and those living in poverty.

Montréal will cooperate with its partners in public health, social development, housing and urban safety. Several projects are already under way in boroughs vulnerable to spring floods,⁴⁹ and the city will review its special response plans regularly to ensure the safety of the population in light of the main risks affecting the territory, particularly health crises.⁵⁰

The following projects are examples of education and awareness programs that will be put in place.

Cultural and scientific institutions, awareness-raising venues

To reach its population, Montréal will enlist its cultural and scientific institutions. They are plentiful, renowned, well-established, heavily visited and conducive to the development of activity programs related to the ecological transition. Montréal will deploy at least one of these programs in each of its institutions, including the maisons de la culture, the Centre d'histoire de Montréal, and the libraries and museums of the Space for Life (Biodôme, Botanical Garden, Insectarium and Planétarium).



Youth, a source of influence and change

Young people are catalysts for major change. Montréal will give youth a voice by multiplying opportunities for them to express themselves, exert influence and bring about sustainable changes in the lifestyles of Montrealers. The city will support local actors in designing awareness programs for youth⁵¹ by providing them with municipal resources (expertise, teaching tools, large parks, libraries, transport networks, etc.).

Youth contact with nature

Montréal maintains a network of large parks available to one and all. In August 2019, it announced the creation of the Grand parc de l'Ouest, whose area—30 km² (nearly eight times that of New York City's Central Park)—will make it the largest park under municipal jurisdiction in Canada. The city will continue to improve the quality and extent of urban nature. Montréal will maximize the use of this network to ensure that all youth, particularly those living in underprivileged areas, can derive the social and environmental benefits of nature.

To do so, Montréal will gradually increase the supply of rental equipment in its network by 2025 and will tailor its offering to the interests of youths ages 12 to 17. In addition, it will provide more support for local initiatives that, through contact with nature, educate youth about urban ecology and community action while developing their social capital.

Heat waves

To better stave off the effects of heat waves in Montréal, the city and its public health and housing partners will launch an annual awareness campaign that will target the most vulnerable sectors.

Action 9

Foster the local emergence of climate resilience hubs

Programs intended to make districts greener, favour urban agriculture and increase social cohesion and urban safety exist in several boroughs.⁵² To tackle these community resilience issues jointly, the city will tap into local and regional expertise to enhance citizens' ability to act and nurture a sense of neighbourhood solidarity by facilitating the emergence of resilience hubs in districts.

Therefore, starting in 2021, a pilot project will test the co-construction and implementation of resilience hubs. These hubs will be based on good practices already established in Montréal⁵³ and elsewhere in North America,⁵⁴ as well as in Europe.⁵⁵





Action 10

Measure and support the development of Montrealers' social capital

Montréal will seek to better understand the social capital of its community by collaborating more closely with the Direction régionale de la santé publique of Montréal and several local partners. The city will first study the social conditions of older people in Montréal, followed by a second study of the social capital of the population aged 18 and over. These studies will illustrate the strength of social ties in districts, along with interventions that can counter isolation and favour a sense of security and solidarity between individuals. A detailed portrait, produced every five years, will serve as an indicator of community resilience to climate, environmental and public health issues, to allow the city to better respond to urban safety challenges and to measure the well-being of the population.

A just transition to employability

It is crucial that the ecological transition unfold equitably. Montréal will work with stakeholders to ensure a just transition for workers in all affected sectors. It will seek to redirect workers' expertise toward emerging sectors.

Montréal will also develop a sustainable mobility plan for all the priority economic development hubs to ensure equitable access to new emerging employment hubs.⁵⁶



Sector 2

Mobility, urban planning,
and urban development

Public space and the ways to move within it make up the soul of a city. They reflect the collective choices that guide our daily actions. For decades, urban development has focused on the use of cars, mineralization of the territory and separation of the different city functions: recreation, work, businesses and homes. As a result, road transport constitutes the biggest source of GHG emissions in Montréal, nearly 30 per cent of total emissions. Another consequence is the heat island phenomenon, which affects several sectors of the city.

Today Montrealers are demanding safer and more user-friendly streets conducive to shared use among all means of transportation, including active transport, collective transport and various shared mobility modes. Montréal commits to deploy these sustainable mobility services equitably throughout the territory.

Transportation is the sector in which the greatest GHG emission reductions are possible over the next 10 years. The city's recommended approach is to **reduce** motorized vehicle travel by increasing the density of development, particularly around metro stations, to **transfer** 25 per cent of solo car trips within its territory to less energy-intensive modes, such as public transit, and to **improve** the performance of passenger and freight vehicles by promoting electrification. Considering the science-based reduction targets, we must act simultaneously on all three approaches. The challenge is daunting, especially since the COVID-19 pandemic has altered the travel habits of many people.

Rethinking urban planning also means making the city greener to increase its resilience to climate hazards such as heat waves, heavy rain and destructive storms. Montrealers envision greener, more dynamic and more resilient living environments. The Climate Plan 2020–2030 aims to respond to this demand, notably by increasing protected areas and the tree canopy in Montréal's territory, reducing heat islands, restoring the riverbanks and favouring the development of healthy and dynamic urban agriculture.

Action 11

In all districts, develop collective and active transport, and favour car sharing, taxis and carpooling

Collective and active transport, together with shared mobility, will significantly shape the development and form of the metropolis of 2050. Montréal wants to equitably share the benefits resulting from the choice of sustainable mobility by increasing residents' access to services in all the districts. This increased access to sustainable mobility entails the development of new projects throughout the city's territory.

In January 2018, Montréal announced the addition of 300 hybrid buses to the Société de transport de Montréal (STM) network. In tandem with its public transport partners, it will also increase its transportation services and its main network, notably by extending the Blue line⁵⁷ in the east end of Montréal, completing the integration of rapid transit service on Boulevard Pie-IX (Pie-IX BRT)⁵⁸ and building the Réseau express métropolitain (REM), managed by CDPQ Infra, which will have 26 stations in Greater Montréal. With support from its partners, the city will also continue to develop and improve the resilience of its public transport network by carrying out projects such as the extension of the Orange line northbound and the construction of the Pink line. Montréal will make substantial investments in these projects because inaction also has a cost: road congestion in Greater Montréal has doubled in 10 years, incurring financial losses of \$4.2 billion in 2018, according to the Communauté métropolitaine de Montréal (CMM).⁵⁹ The growth of public transport will mitigate the need for car travel and thus alleviate the pressure on the main arteries.

To encourage active transport, the city will continue to develop the bike network, by favouring quality protected installations such as the Express Bike Network (EBN)—184 km of bike paths that will span the entire island of Montréal, with 17 lines accessible year-round—along with infrastructure such as bicycle lanes. In addition, it will increase the supply of shared bicycles, particularly electric bikes.

Furthermore, Montréal will maintain its support for services that supplement public transport, such as car sharing, the taxi industry and carpooling services.

These measures will generate substantial savings for Montrealers, who will no longer need to own a car. Operating a private vehicle costs citizens on average \$7,000 to \$10,000 per year.⁶⁰



Action 12

Ensure universal access to sustainable mobility

Some challenges concerning modes of public transport persist, notably regarding universal accessibility, safety, social exclusion and pricing.⁶¹ In the coming years, Montréal will work with its public transport and shared mobility partners to further enhance the offering of sustainable mobility services in some sectors of the city that are poorly served and often underprivileged.⁶² The city will continue to work toward implementing social pricing of regional public transport with the ARTM and the financial support from the Québec government.⁶³ The city has already set aside the necessary amount in its budget in order to reduce by 50 per cent the public transit fare for seniors in Montréal and to offer free transit for children under the age of 12.

In Montréal, transportation equity also implies universal accessibility to public transport, namely for families and people with disabilities. The STM and the other public transport partners of Greater Montréal are making accessibility a priority.⁶⁴

Development of Montréal's public transport network will improve equitable access to jobs and basic services. In the coming years, the city and its partners will strive to better understand this challenge in order to act more effectively in the more underprivileged sectors of the metropolis.

Action 13

Favour and increase the proportion of electric vehicles in downtown Montréal

Innovation, new technologies and sustainable development must be key components of the positioning of downtown. Montréal will invest in significantly boosting the presence of electric vehicles in this area. Increasing the proportion of electric vehicles will not only reduce GHG emissions, but it will also create a healthier living and working environment by limiting air and noise pollution. As a result, the downtown core will stand out. The city will continue to promote a modal shift to carbon-neutral options for people who travel to and from the downtown core, through planning, projects and investments that encourage the use of active and public transport downtown.

By 2030, a zero-emission zone should be in place, similar to those currently found in other large cities around the world. This zone will be deployed and developed gradually, and the support of partners and the population will be instrumental to the success of this initiative. All efforts to move toward this goal will be the subject of discussions with partners and public consultation, and will be consistent with other urban planning and mobility projects in the sector. Globally, more than 30 cities, including London, Paris and Los Angeles, have pledged within the C40 Cities Climate Leadership Group to create zero-emission zones by 2030.⁶⁵ Montréal's desire to electrify its downtown core and promote active and public transport is aligned with this trend.

To support the electrification of the downtown core, Montréal will increase public and private charging infrastructure that favours the electrification of personal and commercial vehicles, in line with Hydro-Québec's initiatives. It will also continue to purchase and test electric vehicles for municipal purposes and will support businesses, particularly delivery companies, that wish to electrify their vehicle fleets. In addition, the city will work with companies and researchers to build its reputation as a showcase for transportation electrification, and thus remain a leader in this sector.

This commitment by the city is consistent with the provincial and federal governments' orientations. Specifically, the Government of Canada has launched the Zero Emission Vehicle Infrastructure Program, and the Québec government has developed a strategy for the electrification of vehicles and charging infrastructure that targets downtown areas, among others, and that aims for a ban on the sale of gasoline-powered vehicles by 2035. The creation of a zero-emission zone is therefore aligned with and complements the various measures taken by other levels of government.

Districts under development and requalification

To ensure that urban development is combined with resilience and the ecological transition, neighbourhoods under development and requalification (particularly when Special Planning Programs are established) will be developed in line with the carbon-neutrality objective that the city has set for 2050. These districts, such as Namur-Hippodrome, offer historic opportunities for design, proximity to services, access to affordable energy-efficient housing and sustainable mobility alternatives. They also accelerate the transition to electric vehicles.



Action 14

**Electrify 100 per cent
of STM buses**

Montréal will support the STM in its efforts to fully electrify its bus fleet by 2040. It will also encourage the Québec government to continue to help public transport corporations and school boards, among other organizations, accelerate their transition to carbon-neutral public transport.

Action 15

**Increase the number of
charging stations on
Montréal's territory and
adopt a passenger road
transport electrification
strategy**

The city will extend its charging station network throughout its territory and define a strategy to increase the electrification of transport, to ensure that at least 30 per cent of person-trips by vehicle on Montréal's territory are electric. In addition, the charging station system will be adjusted to the needs of commercial fleets, which are expected to increase. This strategy will be deployed in collaboration with local partners as well as the Québec government and Hydro-Québec, key players in electrification in Québec.

Electrification of transportation: a priority for Montréal

In 2016, the city produced its Transportation Electrification Strategy 2016–2020, intended to enable the city to take a leadership role in this area, and to improve the carbon footprint of mobility in the community.⁶⁶ Today, the Island of Montréal has more than 1,500 public charging stations,⁶⁷ which facilitate the transition to electric mobility. Of this number, 900 were installed by the city. In keeping with the Climate Plan, a new electrification strategy is being drafted.

Action 16

Formulate a strategy to reduce the carbon footprint of transportation of goods by road to ensure that 25 per cent of deliveries are zero emission

Several technological and operational avenues to reduce the carbon footprint of freight transport are emerging. Together with local actors, the city will deploy a coherent strategy to reach a target of 25 per cent zero emission deliveries.^x The city will promote the development and deployment of pilot projects and incentives to accelerate the electrification of the urban delivery industry or to make it more carbon efficient. It will also sustain and enhance the deployment of local urban logistics spaces, such as the Colibri pilot project, to serve a larger territory. The city will also work with affected business units to accelerate the deployment of charging stations for freight delivery vehicles.



^x This target was obtained from technico-economic modelling consistent with the 2050 carbon neutrality trajectory for the agglomeration of Montréal.

Action 17

Enhance land-use planning and regulation tools to favour the development of districts on a human scale and adapted to climate change

In recent years, Montréal has been rethinking the development of its neighbourhoods from a sustainable development perspective. The development of new sectors, such as the former Hippodrome de Montréal site, offers an unparalleled opportunity to plan new neighbourhoods based on today's needs: mixed, diversified and resilient living environments that rely on active and public transit, greening and local services. With this goal in mind, the city submitted the proposal to make the Hippodrome sector Montréal's first carbon-neutral ecodistrict for public consultation.

To favour the development of neighbourhoods on a human scale that are adapted to climate change, the city will work in cooperation with stakeholders to improve land-use planning and regulation.^{xi} These tools will specify the orientations, objectives and measures, notably regulatory, that will help the city reach its targets for GHG emission reduction and adaptation to climate change. Because the boroughs will also participate in implementing the planning documents and by-laws, Montréal will be receptive to their needs.

^{xi} Including the land use and development plan of the agglomeration of Montréal, the future master plan and mobility and land use regulation.

Reducing GHG emissions

Reducing GHG emissions. Some of these tools will aim to reduce the community's GHG emissions in line with the Reduce–Transfer–Improve (RTI)^{xii} approach. First, the city will review its facilities in order to phase

out motorized travel in favour of active transport (reduce). It will then put in place measures to transfer 25 per cent of solo car trips to public transport, active transport and shared mobility (transfer).^{xiii} Lastly, the reduction of emissions linked to necessary road transport will entail reducing the

carbon footprint of vehicles (improve). These measures are intended to reduce GHG emissions by 50 per cent from road transport by 2030. These emissions currently represent about 30 per cent of total emissions in Montréal.

Adapting to climate change

Climate change already affects the population, the built and natural environment, the economy, services and operations in Montréal. From now on, each private or public facility must meet various criteria to adapt to and combat climate change. To address these climate issues, the city will:

- Improve the vulnerability analysis performed as part of the *Climate Change Adaptation Plan for the Montréal Urban Agglomeration 2015–2020* and integrate it in the next urban planning and mobility plan: it will identify the most vulnerable sectors, for which it will introduce consequential urban planning rules and define priority interventions
- Amend the urban planning regulation to take into account the intensity, frequency and increasing duration of climate disruptions on its territory, including heavy rain, heat waves and floods
- Adopt measures, notably regulatory ones that take into account the topography of sites in order to mitigate the consequences of heavy rain
- Define the criteria for adaptation to climate change, starting from the first steps of a project

Urban planning and mobility plan adapted to the climate and environmental emergency

In the coming years, the city intends to create or develop resilient districts adapted to the new climate and environmental context, in addition to implementing sustainable mobility modes that are practical and accessible. In many ways, the city is already moving in this direction by

promoting traffic calming measures, the development of bicycle paths and the promotion of new public transport services. In its next urban planning and mobility plan, the city will:

- Consolidate already built areas
- Design, construct, renovate and maintain buildings, public and private sites and infrastructure with climate change in mind;
- Make its territory greener, protect natural areas and increase biodiversity;
- Recover and manage rainwater, a precious resource in an urban setting, and implement natural and green infrastructure that will reduce pressure on existing networks;
- Set up people-friendly streets designed for all users and for all modes of transport⁶⁸
- Advance toward zero emission mobility.

Heat islands

Montréal, in collaboration with external partners, is working to map the physical properties of surface materials for the territory of the agglomeration, such as their reflectivity or heat storage capacity. It will also develop characterization of

surface materials (mineral and plant surfaces) to graft physical properties on them. This information will be useful for evaluating the vulnerability to heat waves.

^{xii} The city favours the “Reduce–Transfer–Improve” (RTI) approach in order to prioritize its initiatives intended to reduce its GHG emissions, consistent with the Sustainable Mobility Policy – 2030 produced by the Québec government.

^{xiii} This objective ensues from the goal of reducing solo car trips by 20 per cent, depending on the degree of urbanization of the agglomeration, stated in the Sustainable Mobility Policy – 2030 produced by the Québec government..

Action 18

Encourage greening and stimulate densification by transforming open-air parking lots

Several parking spaces near public transit are underutilized. Montréal wishes to encourage the greening of off-street parking lots near metro stations, train stations, reserved lanes and future REM stations. The densification of the city will also be encouraged by converting open-air parking lots into real-estate projects developed in line with best practices in sustainable urban planning. In addition, 30 per cent of parking spaces will be reserved for shared vehicles, carpooling or electric vehicles. By promoting the greening or development of these lots, the city will stimulate economic activity while helping to encourage a modal shift and reduce GHG emissions.



Action 19

Increase the proportion of protected areas on the Montréal community's territory to 10 per cent

The proportion of protected land on the Montréal community's territory will increase from 6.1 per cent to 10 per cent. To attain this objective, Montréal will create new parks and green corridors, along with wetlands and water environments. It will thus consolidate the natural corridors required for wildlife movement and plant dispersal, essential factors for maintaining and developing biodiversity.



Action 20

Plant, maintain and protect 500,000 trees in zones vulnerable to heat waves

A mature tree absorbs rainwater, filters the air, reduces noise pollution, provides an ecosystem for many animal species and allows the temperature of homes to be modulated to reduce the energy needed for air conditioning during heat waves or for heating during high winds. Increasing the number of trees in Montréal is therefore one of the most significant actions to be taken to better adapt to climate hazards.

From 2020 to 2030, there will be 500,000 trees planted on the territory of the Montréal community. The city will plant trees on public property; residents, organizations and businesses will be invited to do the same on private property. Montréal will set aside funds in its Ten-Year Capital Expenditures Program to reach 50 per cent of this target. Higher levels of governments and the private sector will be called upon to complete the funding.

To maximize the trees' contributions to the ecosystem as quickly and for as long as possible, Montréal will ensure the optimal growth of the trees it plants by deliberately selecting species that are most resilient to climate change, by favouring diversity, by increasing the underground space for roots, by reviewing the maintenance schedule and method of irrigating young plants, by better protecting trees during construction work, by intervening in trees' immediate environment and by adjusting its pruning practices to favour the robustness and longevity of trees. Some of these practices will also be made obligatory during the planting of trees on private property.

Montréal will implement measures to increase the planting of trees in the sectors most vulnerable to the heat waves. The city will continue to support the boroughs in identifying potential planting sites, including sites that need to be demineralized, which are very often located in heat island zones. The city is carrying out more detailed mapping and will provide new opportunities for short-term analysis and will make it possible to monitor and refine this measure.

Importance of biodiversity

Preserving biodiversity in urban centres is crucial. Natural environments and trees, which contribute to this goal, bear the brunt of climate change. Pests and invasive exotic species are a growing threat.⁶⁹

In this context, ensuring species diversity is a major concern to reduce the vulnerability of the urban forests and reinforce their resilience. In Montréal, for example, maple and ash account for more than 60 per cent of trees on streets.⁷⁰

The density of the built environment and extensive mineralized surfaces (asphalt, cobblestone, concrete) nonetheless limit tree planting. To take on this challenge, Montréal will earmark sizeable funds for planting and protecting trees. However, to increase the proportion of protected areas and riverbanks on its territory, the city will need assistance from the provincial and federal governments.

Action 21

Restore the public riverbanks of the large parks network

Public riverbanks in the large parks network that are deemed a priority will be restored by 2030. The large parks network alone has a total of nearly 50 km of banks that, each year, are subject to mounting pressure due to climate change. For example, flooding erodes the shorelines and their ecosystems due to accelerated deterioration of riverbanks. The restoration, protection and conservation of riverbanks will increase the resilience of these riverside ecosystems and some of the territory's infrastructure. The banks will also be landscaped.

To this end, Montréal will develop internal expertise in the rehabilitation of wetlands, streams and riverbanks. A uniform methodology for surveying and analyzing river conditions will also be designed. Montréal will conduct an audit of the banks within the major parks network to improve knowledge. A 10-year intervention program will be produced to define what the city needs to restore the banks.

Action 22

Develop urban agriculture

In addition to green spaces, protected areas and the tree canopy, practices linked to urban agriculture can also contribute to the greening of Montréal while improving access to fresh and local foods and strengthening the city's capacity to adapt to climate change. Montréal already has several initiatives in place to promote urban agriculture together with committed partners that have helped make Montréal a hub of innovation in this area. To further its development, the city will team up with local actors to establish an integrated vision of urban agriculture in its territory.

The city of Montréal intends to tap into the expertise of its partners that are active in the field, to enhance its actions. As one example, during the health crisis, the city collaborated with the Botanical Garden to expand the area dedicated to the production of vegetable plants and distributed the produce to community organizations. The experts at the Botanical Garden also served as resources to residents who wanted to grow their own vegetable garden.

Action 23

Tighten the municipal by-law concerning pesticide use

Pesticides have toxic effects on living organisms, including humans. These products pose risks to human health (neurological and respiratory conditions, cancer, endocrine and reproductive system disorders, fetal growth disruptions, etc.) and to the environment (pollinating insects, aquatic organisms, etc.).

In addition, some studies predict that climate change will reduce the efficiency of pesticides. For example, a period of extreme heat may hinder the distribution of many pesticides in some plants, making them less effective.

Given this context, the municipal by-law concerning pesticide use will be tightened, some practices will be revised, and alternatives to the use of these products, such as biological control measures, will be promoted and adopted.



Sector **3**

Buildings

In Montréal, the residential, commercial and institutional building stock generates about 28 per cent of GHG emissions.⁷¹ In addition, buildings are vulnerable to climate hazards. Heavy rain episodes in Montréal will surely increase. These episodes, along with hotter summers and heat waves, already represent a challenge in many sectors of the city. Energy efficiency measures and traditional air-conditioning methods may not suffice to meet this public health and social equity challenge.

The renovation of the city's building stock and the construction of new low-carbon, energy-efficient buildings is crucial. It also represents an opportunity to improve Montrealers' quality of life. The goal of the transformation of Montréal's building stock is to offer residents housing that is comfortable, resilient, fully powered by clean energy and energy efficient.

Building owners will be offered tools, particularly regulatory ones, and resources to enable them to increase and accelerate energy efficiency projects and favour ecological construction. Measures will be put in place to ensure that these building improvements do not put the housing units beyond the ability of tenants to afford them.

Comparison of the GHG emissions* of the residential, commercial and institutional sectors and number of assessment units in 2015**

*Inventory of greenhouse gas emissions of the Montréal community 2015

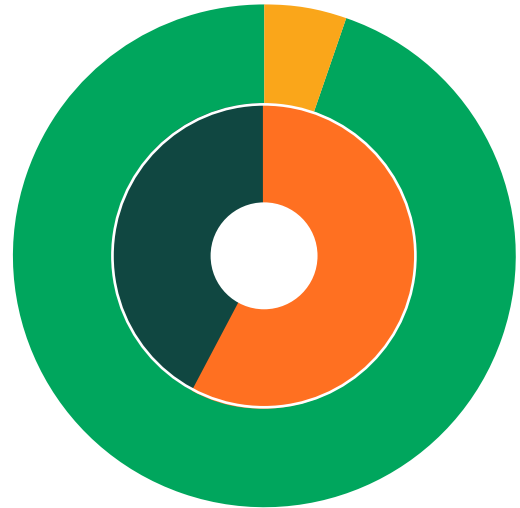
**Property assessment roll 2015

GHG emissions

- Residential
43%
- Commercial and institutional
57%

Number of assessment units

- Residential
520,851**
- Commercial and institutional
30,141**



Where do the GHG emissions in buildings come from?

Emissions from buildings in the agglomeration of Montréal are directly linked to heating equipment that uses fossil fuels (heating oil, fossil natural gas and propane).

The amount of effort required to eliminate GHG emissions in buildings varies depending on the sector. Montréal's building stock is largely dominated by the residential sector, which represents more than 94 per cent of building owners. Emissions in the sector accounted for 12 per cent of the city's total emissions in 2015.

They are spread across a very large number of buildings, whereas the commercial and institutional sectors, which accounted for 16 per cent of total emissions, represent a smaller number of buildings. A more sustained effort to reduce GHG emissions is thus required in the residential sector than in the commercial and institutional sectors. In addition, GHG emissions per square metre of the commercial sector are about 2.6 times higher than those of the residential sector (29 kg and 11 kg CO₂eq/m² respectively).^{xiv}

Each year the city issues more than 16,000 permits, on average, to build or modify residential, industrial, commercial and institutional buildings on its territory, excluding the reconstituted cities.⁷² Each permit provides an opportunity to improve the resilience and energy efficiency of the built heritage, and to reduce GHG emissions. Given that Montréal is a largely built city, it is inevitable that the measures taken to reduce the GHG emissions of its 475,000 buildings will involve the existing built stock.⁷³

^{xiv} Information taken from the 2015 property assessment roll of the inventory of greenhouse gas emissions of the Montréal community 2015. The data and statistics presented are compiled from data entered in the assessment rolls at the time of publication of the inventory of greenhouse gas emissions of the Montréal community 2015. The data are presented solely to illustrate the comparison between the number of assessment units and GHG emissions.



Action 24

Eliminate the use of heating oil in buildings

On May 6, 2019, Montréal announced that it intends to end the use of heating oil in buildings⁷⁴ in a quest to tackle a significant source of GHG emissions known for its impact on external air quality. It will collaborate with the Québec government in order first to eliminate oil heating systems in new constructions and, in a second phase, in existing buildings. Lastly, it will adapt these measures to reduce the burden of this transition on low-income households. To increase its scope, this action will be carried out jointly with Action 25, which promotes energy efficiency.

Eliminating the use of heating oil in buildings will reduce Montréal's GHG emissions by about 5 per cent.

Action 25

Adapt by-laws and support programs to improve energy efficiency and the resilience of all types of buildings

In the past few years, the city has issued more than 16,000 renovation or construction permits annually. Each permit provides an opportunity to reduce GHG emissions and improve the resilience of the city's built heritage. This measure therefore has the potential to reach and influence approximately 160,000 projects over 10 years.

Montréal will adapt its by-laws on building construction and renovation to the imperatives of the ecological transition, by reducing energy consumption and GHG emissions and bolstering resilience to climate change.



● Upgrading by-laws related to energy efficiency

The city will undertake an ambitious upgrading of its *By-law concerning the construction and conversion of buildings* that will include criteria pertaining to energy efficiency and resilient and bioclimatic architecture, according to the types of buildings. It will modernize its by-laws so that buildings can receive specific types of installations such as charging systems for electric cars or solar-powered equipment.

The update to the city's by-law will be in line with the most recent National Energy Code for Buildings in order to set the highest energy efficiency standards. The requirements will be imposed on all new buildings.

This regulatory improvement will be done in consultation with energy efficiency experts as well as the construction and real estate development community. Guidance will also be offered to developers.

● Improving by-laws governing resilience to climate change

To increase the resilience of the buildings, the city will favour bioclimatic architecture: careful siting of buildings, natural ventilation methods, installation of a sunshade according to the orientation of the building, replacement of mineralized surfaces with permeable surfaces, greening of heat islands and targeted use of innovative air-conditioning technologies.

This approach will guide the developers in planning their construction projects and the city in its regulatory planning. For example, Montréal has fine-tuned the by-law concerning direct connection of gutters to the sewage system^{xv, 75} or toward permeable surfaces. It will also support demineralization initiatives and reinforce or modulate the minimum greening requirement depending on the characteristics of the setting.

^{xv} The By-law 20-030 concerning the construction and conversion of buildings has banned the connection of gutters to the sewer network for new construction since January 2020. For existing buildings, the by-law concerning connections to the waterworks and sewer systems and storm water management, which came into force on June 22, 2020, prohibits this type of connection.

In addition to regulation, Montréal offers financial aid programs for residential, commercial and industrial purposes. Although most of these municipal programs already include more stringent environmental criteria than the existing by-law, they will be enhanced to help property owners who are early adopters of environmental innovations.

The city is also committed to actively soliciting the collaboration of government stakeholders whose programs and investments are needed to support the improvement of residential buildings. Through agreements with these jurisdictions, the city will undertake the following actions:

- **Improving the AccèsLogis program.**

The city will revise the AccèsLogis program, which finances social and community housing projects on the Island of Montréal, to improve the energy efficiency and resilience to climate change of this type of housing.

- **Creating new programs for owners of multi-rental buildings.**

The city will create and implement renovation subsidy programs directed at owners of residential rental buildings. These enhanced programs will encourage landlords to incorporate the best environmental practices into their renovation projects and to improve tenants' living conditions. A program will offer subsidies to owners of buildings with 2 to 5 units. Replacement of an oil heating system will also be required when applicable. This program will complement the existing Affordable Housing Reno Program,⁷⁶ which offers subsidies to owners of buildings containing 6 or more units in which one-third of the units are leased at affordable rents. The subsidy is equivalent to 30 to 40 per cent of the contractor's bill for eligible work.

- **Promoting energy efficiency and GHG emissions reduction programs.**

The city will work with energy distributors and the Québec government to promote various energy efficiency and GHG emissions reduction programs.

Construction and renovation that promote energy efficiency: tools at the city's disposal

The Québec Regulation respecting the application of the *Building Act* (chapter B-1.1, r. 1) exempts some buildings from the application of chapter I of the Québec Construction Code (chapter B-1.1, r. 2). However, the regulation does not automatically exempt these buildings from the application of Montréal's *By-law concerning the construction and conversion of buildings* (11-018). Under the *Act respecting land use planning and development* (chapter A-19.1) and the *Building Act* (chapter B-1.1), Montréal may notably adopt its own standards for insulation, safety, sanitary conditions and strength of buildings, which may be more stringent than those foreseen in the most recent Construction Code or in a regulation issued by the Québec government or the Régie du bâtiment du Québec.

Furthermore, the Government of Canada has pledged to work with the provinces and territories to develop a net-zero energy ready building code. In the meantime, Montréal will ground its by-law in best practices, including the federal recommendations of the most recent National Energy Code of Canada for Buildings, which sets out technical requirements for the energy efficient design and construction of new buildings.⁷⁷



Action 26

Develop a funding program for building owners to support healthy and environmentally sound renovation

Many homeowners do not consider the investment required for energy-efficient renovations worthwhile. New funding mechanisms could make these investments more attractive and thus accelerate the work. Montréal will develop a support program to encourage owners of some buildings to carry out healthy and environmentally sound renovation. It will model the program on existing initiatives through which property owners can obtain a loan to carry out work intended to improve energy efficiency and other eligible work linked to GHG emissions reduction and adaptation to climate change. Property owners will also be able to receive technical support from energy efficiency specialists. To maximize GHG emissions reduction generated by this program, Montréal will assess the efficiency of such measures to determine which buildings would benefit the most from the program.

Innovative funding programs for healthy and environmentally friendly renovations can help reduce obstacles associated with these investments, such as the high initial cost, limited funding and the long delay before earning a return on investment.⁷⁸ Beyond the economic aspect, technical support is necessary to provide Montréal property owners with sufficient information. This will reduce their uncertainty and encourage them to improve the energy profile of their buildings.

A financing program of this kind can eventually accelerate and optimize the deployment of measures that promote energy efficiency, along with the transition to renewable energies and adaptation to climate change.

Action 27

Improve the energy performance of large buildings via an energy-consumption and GHG emissions rating and disclosure system

A rating and disclosure system for the energy consumption and GHG emissions of buildings will encourage property owners and tenants to improve their energy efficiency and reduce their emissions. A comparison of results will also encourage a change in behaviour.

After consulting property owners and experts in the field, the city will gradually implement this rating and disclosure system beginning with large commercial and institutional buildings.

Montréal will cooperate with governments, and the training and private sectors to train a workforce that specializes in assessing energy efficiency. A transitional phase during which a performance rating will be indicated or assigned to each building for information purposes will favour the development of the energy efficiency assessment sector and of firms specializing in this field. This transition period will raise collective awareness and give property owners time to adapt.

Performance benchmarks will eventually be imposed to attain the objective of making Montréal's building stock net-zero carbon.

Action 28

Encourage sustainable construction by providing information and support

The construction world comprises numerous regulatory frameworks and a wide diversity of stakeholders, such as energy and material suppliers and certification managers. It is a complex environment for specialists in the field and especially for individuals. To help citizens, Montréal will support information and assistance centres that will guide property owners in their construction or renovation processes. It will promote these information centres among property owners as soon as they apply for their first permit.

Property owners can obtain support from these centres regarding the choice of ecological materials or energy sources, along with explanations about the regulatory requirements of sustainable construction and information on funding programs. The staff of these centres will be knowledgeable about the specific characteristics of each district in Montréal. This support will facilitate cooperation among all actors, including researchers, to help large property owners innovate.

Action 29

Develop a collaborative approach to ensure respect for tenants' rights

Montréal has over half a million rental units,⁷⁹ representing both private and social housing. It will intensify its efforts to maintain this housing stock while keeping it affordable for the population.

Montréal will adapt its rental housing stock to the imperatives of ecological transition while respecting tenants' rights and ability to pay. It will raise tenants' and landlords' awareness about the Québec legislative framework. In some cases, obtaining real social equity will require more sustained actions by public authorities, both provincial and municipal, particularly regarding the most vulnerable populations.

The city is also committed to including a specific component to protect the affordable rental housing stock in a five-year Housing Action Plan. This plan will be the subject of a public report presenting the means mobilized and the results obtained.





Sector 4

Exemplarity of the city

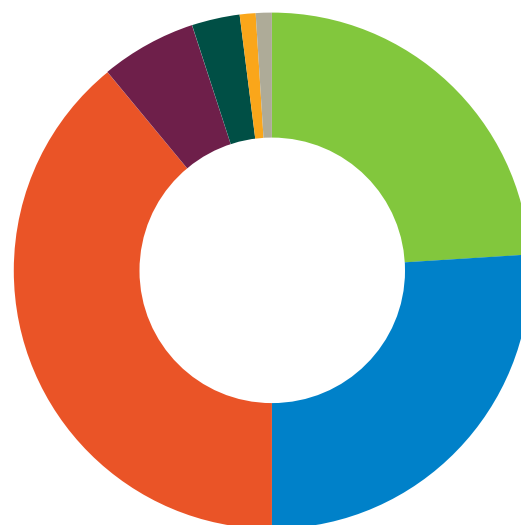
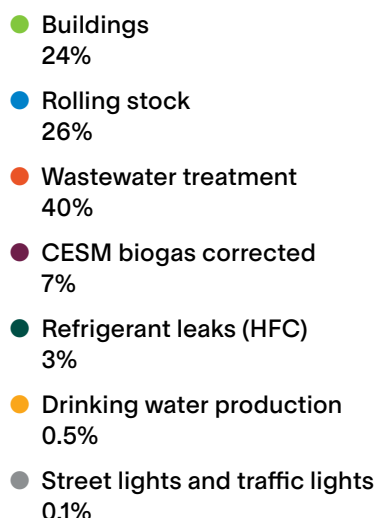


Ecological transition is a collective effort and Montréal must lead by example. Although GHG emissions from municipal activities account for less than 2 per cent of those of the entire community, this does not relieve the city of its responsibility and duty to take action to protect the environment and the climate. Montréal will set an example by attaining carbon neutrality by 2040, namely 10 years before the agglomeration as a whole.

The city will take the necessary measures to reduce GHG emissions from its wastewater treatment plant, vehicle fleet and building stock. Montréal will also set an example by favouring a responsible procurement process, by positioning itself as a pioneer in the adoption of new low-carbon technologies—thus stimulating the growth of new promising sectors—and by mobilizing and encouraging its staff to participate fully in the ecological transition.

Distribution of GHG emissions by municipal activity in 2015*

*Excluding subcontracting. The proportion of biogas emissions of the Complexe environnemental de Saint-Michel (CESM) was also corrected to exclude the exceptional situation of 2015, during which the cogeneration plant did not operate for much of the year.⁸⁰



The 3 main sources of GHG emissions in Montréal

Source 1 Wastewater treatment⁸¹

The Jean-R.-Marcotte treatment plant deals with sanitary wastewater and runoff water from the sanitary and combined sewer system of the agglomeration of Montréal. The average volume of water treated each day could fill the Olympic Stadium. It is the third largest treatment plant in the world.⁸²

Nearly 98 per cent of GHG emissions produced by wastewater treatment results from the incineration of sewage sludge. About one-third of these emissions are generated by the use of fossil natural gas required for sludge incineration. The remaining two-thirds come from a chemical reaction produced by heating sludge to a certain temperature: the nitrogen they contain is then transformed into nitrous oxide (N_2O), a powerful GHG.⁸³

Source 2 Vehicle and equipment use⁸⁴

Nearly half of GHG emissions produced by the municipal vehicle fleet (43 per cent) comes from heavy vehicles. Light trucks represent 21 per cent of the emissions of rolling stock, automobiles 19 per cent and off-road vehicles and other equipment 17 per cent.

Source 3 Building operations⁸⁵

Montréal owns over 1,750 buildings, 463 of which have an area of over 25,000 square feet. In addition, the city rents an area of nearly 1.8 million square feet for its activities. The city will make its whole building stock net-zero carbon by 2030, setting the tone for attainment of the same objective for all buildings in the community by 2050.⁸⁶ Although Montréal will invest considerable amounts to execute these actions, financial aid from the provincial and federal governments is required for their implementation.

Action 30

Make 100 per cent of the municipal building stock net-zero carbon

By 2050, all of Montréal's real estate, both private and public, must be net zero carbon. This major project will be demanding and will require a change in the community's way of doing things. For more than 10 years, the city has been integrating green criteria into the buildings it builds and has already set up a team dedicated to the green transition within the building department. By 2030, the city's exemplary approach will allow it to experiment with and demonstrate the viability of different building decarbonizing approaches.

The city will ban the use of fossil fuels (fossil natural gas, heating oil, propane) in all municipal buildings, and will replace them with renewable energy. To do so it will:

- Launch a program to discontinue fossil fuel use in existing municipal buildings
- Rent net zero carbon spaces or, where this is not possible, plan their transformation to zero carbon in a maximum time frame of five years following their rental, taking into account real estate market trends
- Make buildings net zero carbon within five years of their purchase

In particular, Montréal will:

- Put in place a specific ecological transition program for 30 municipal buildings that emit high levels of GHGs, to boost their efficiency and reduce GHG emissions by 14,000 tonnes of CO₂eq
- Replace about 150 air-conditioning systems that use refrigerants that are at the end of life, in order to eliminate about 6,000 tonnes of CO₂eq due to refrigerant leakage
- Reduce the area of administrative premises by allowing staff members to work remotely, and thereby decrease the city's emissions

Action 31

Optimize the energy performance of municipal buildings

During construction, expansion or major renovations of existing buildings, Montréal will meet the following requirements:

- Reduce energy consumption to lower operating costs and costs linked to the transition to renewable energy
- Reduce GHG emissions linked to energy consumption and the use of refrigerants
- Ensure that all municipal buildings are powered by renewable energy

In addition, Montréal will:

- Apply new requirements for energy and GHG emissions for city-owned buildings starting in 2021
- Adopt a new ecological transition and sustainable development policy in municipal buildings in 2021
- Launch a program to repair building cladding by prioritizing 50 high-energy consuming and GHG emitting buildings to improve their energy efficiency
- Carry out about 10 (construction or renovation) projects according to the Passive House principles, to improve the energy performance of cladding
- Put in place a program to overhaul electromechanical systems for 50 high energy-consuming buildings, to reduce their consumption
- Continue to optimize energy management and remote management of buildings;
- Implement an annual accountability process for energy performance and GHG emissions in all buildings, including rental space (benchmarking).^{xvi}

^{xvi} This goes further than the rating and disclosure system proposed in Action 27 because the action that targets municipal buildings includes all buildings regardless of their surface area.

Action 32

Reduce GHG emissions linked to the use of refrigerants in municipal activities

Montréal's GHG emissions linked to halocarbon refrigerants have ballooned by 147 per cent since 2002.^{xvii} The city will significantly reduce leakage of refrigerants used in municipal facilities by installing efficient air conditioning and cooling systems, which it will manage in an exemplary fashion. The city will ban variable refrigerant volume flow systems due to their greater refrigerant losses, along with refrigerants whose global warming potential is above a certain level. It will also launch a refrigerant management plan that includes the compilation of quantities of refrigerants added periodically.



^{xvii} The 147 per cent increase in GHG emissions from fugitive refrigerant (halocarbon) emissions compared with 2002 is associated with the use of alternatives to ozone-depleting substances (ODS), which are covered by the Montréal Protocol, to which the federal government is committed: <https://www.canada.ca/en/environnement-climate-change/corporate/international-affairs/partnerships-organizations/ozone-layer-depletion-montreal-convention.html>

ODS are powerful GHG generators because they have high Global Warming Potential (GWP). However, they are not accounted for in GHG inventories (in accordance with the 2006 Guidelines of the Intergovernmental Panel on Climate Change—IPCC). In contrast, alternative halocarbons that are also powerful GHG generators are included in GHG inventories. Given that the Montréal Protocol requires that all ODS be phased out over a 20-year period, that is, from 1990 to 2020, GHG emissions attributed to refrigerants have been steadily increasing. After 2020, GHG emissions attributed to this activity are expected to stagnate when all ODS have been replaced.

Action 33

Pioneer clean technologies and innovations in electrification

As a major contractor and consumer of goods and services, the city will systematically weigh the possibility of integrating electrification and clean technologies in its projects. In addition, it will electrify its entire vehicle fleet. Lastly, it will conduct a range of research and pilot projects in several sectors to determine which green technologies to adopt.

The electric mobility and clean technologies sectors in Montréal

The successful transition to a carbon neutral society requires a sustained innovation capacity. Dependence on fossil fuels incurs not only an ecological cost but also an economic one. According to the HEC Montréal Chair in Energy Sector Management, “Quebec’s trade balance runs at a wide deficit in the energy sector (-\$6G)”⁸⁷ largely due to its oil imports. To improve its ecological footprint, the community must change its methods and adopt renewable energies. Notably, hydro-electricity represents a renewable, local and affordable energy source whose carbon footprint is minimal.⁸⁸

Montréal’s approach prioritizes motorized electric, smart and sustainable mobility. This key sector offers many prime opportunities to reduce the ecological footprint of consumption and production modes. The city must harness this potential in conjunction with other sustainable modes of transporting goods and people. To do so requires logistic coordination that takes into account wholesale and retail trade, e-commerce, distribution centres and delivery of goods to consumers.

Support for innovation in electrification goes hand in hand with the promotion of clean technology, which reconciles economic growth and environmental performance. These technologies reduce negative impacts on the environment, offer users superior performance at a lower cost, and help improve quality of life by optimizing resource use.⁸⁹

Montréal has 120 subsidiaries in the clean technology sector. They employ more than 15,300 people, equal to 60 per cent of jobs in Québec in this sector.⁹⁰ Cleantech constitutes a fast-growing sector essential for Montréal’s transition to carbon neutrality by 2050.



Action 34

Consolidate Montréal's leadership in electric, smart and sustainable mobility

Winner of the \$50 million grand prize in the federal government's Smart Cities Challenge, Montréal has already made a commitment to take bold action on both integrated and shared mobility at the neighbourhood level. To consolidate its leadership, the city will pursue and further strengthen these efforts:

- By electrifying its vehicle fleet and auxiliary equipment; obsolete vehicles and equipment will be replaced with electric solutions as they become available on the market
- By conducting experiments to offer the community new collective transport modes and shared mobility options
- By supporting the existing ecosystem (through programs such as Jalon MTL, which finances sustainable mobility initiatives)
- By multiplying zero-emission delivery projects (such as the ecological urban delivery pilot project Colibri, which reduces the environmental impact of “last-mile” delivery)

Action 35

Optimize the use of the municipal vehicle fleet and equipment

When replacing obsolete vehicles and equipment, the city will assess its real operational needs in order to optimize the use of existing and future resources, reduce the number of vehicles that it buys, and purchase the smallest vehicles or equipment possible. If electric vehicles are not available when replacing obsolete vehicles and equipment, the city will require the integration of engine shutoffs and compartment heaters where possible. It will also optimize car and light truck use by proposing a car-sharing solution between staff members and, potentially, with the population. In addition, the city will gradually standardize its practices and consequently its vehicles and equipment. Lastly, it will upgrade snow-clearing operations (Parcours^{xviii} and SIT-Neige 2^{xix} projects) by 2025 and increase snow blowing onto private or public land by 2030, where the built framework permits.

^{xviii} Integration of GPS in all snow-clearing equipment to determine optimal snow-clearing routes and guide trucks.

^{xix} Deployment of the latest GPS and information technologies to track operations in real time and optimize their monitoring and control.

Action 36

Decarbonize business trips of city staff and encourage the use of sustainable transport for home-work commutes

Home-work commutes and business travel by employees of many businesses and public services are major sources of GHG emissions in Montréal.

The city will first seek to decarbonize travel by its 28,000 employees by facilitating telework and the use of active transport, public transport and electric vehicles, and by reducing work-related travel, notably by facilitating virtual meetings.

The massive shift to telework triggered by the COVID-19 pandemic has made it possible to measure the advantages and limits of this approach. This new work organization will be integrated into the city's human resources practices with a view to maintaining the goodwill necessary for local economic vitality at the various employment hubs. By setting an example, the city will also encourage all Montréal employers to promote telework on a par with other approaches to decarbonizing transportation.

The city will also review current practices and frameworks notably concerning automobile allowances and parking made available to city staff.

A periodic assessment of these measures in the Montréal community will also be carried out. This assessment will make it possible to take into account the long-term effect of the measures (economic impact, energy consumption, urban sprawl) and to orient the policies, guidelines and means put forward.

Action 37

Replace the incinerators of the Jean-R.-Marcotte wastewater treatment plant

The sludge incinerators of the Jean-R.-Marcotte wastewater treatment plant have reached their end of life. Montréal is conducting a study to find alternative sludge management solutions. It will analyze each of these solutions by 2022 in order to choose the one best adapted to its needs. The final selection criteria, in addition to GHG emissions reduction, will include the reduction of emissions of contaminants in the atmosphere; a positive energy profile that includes the heating of the buildings of the treatment plant buildings and cooling of pumps; and the generation of biosolids with the highest potential for agronomic reuse. The four incinerators will be replaced by 2035. Although Montréal will invest a considerable amount to execute this action, this project will also require financial aid from the governments of Québec and Canada.

Action 38

Install passive biofilters to reduce GHG emissions associated with low-methane biogas produced by the Complexe environnemental de Saint-Michel (CESM)

The CESM^{xx} provides an excellent opportunity for GHG emissions reduction at a low cost. The Complex reuses nearly all the biogas that it captures. However, a small fraction of the biogas containing methane (CH₄)—a GHG 25 times more powerful than CO₂—is not captured and is consequently released into the atmosphere. The CESM cannot recover or burn this biogas because its concentration of CH₄ is too low. To reduce these GHG emissions, the city will install passive biofilters to oxidize and degrade this CH₄. It will initially carry out a pilot project covering 10 per cent of the need.

^{xx} The CESM is located on the site of a former quarry (Miron limestone quarry), which was converted into a 75 hectare landfill site in 1978. The CESM occupies 192 hectares in the heart of Villeray–Saint-Michel–Parc-Extension. It is becoming the second-largest green space in Montréal, after the Parc du Mont-Royal.

Action 39

Conduct an inventory of GHG emissions resulting from consumption by the Montréal community

By adopting new methods to analyze interregional trade, Montréal will be able to pinpoint the main sources of direct and indirect GHG emissions resulting from the consumption in its community. The city will draw on this inventory to enhance its strategies and determine which measures to adopt in order to reduce the carbon footprint of the community.

Taking steps to reduce the carbon footprint of Montréal's population

Like Paris,⁹¹ London⁹² and Portland,⁹³ Montréal will extend its efforts to reduce the indirect emissions generated by the community, that is, those that do not directly result from activities carried out in its territory, but rather from the consumption and behavioural choices that cause GHG emissions elsewhere in the world. These indirect emissions are generally omitted from inventories compiled by cities.

The Montréal community must change its consumption habits if it wants to prevent indirect emissions from nearly doubling by 2050.⁹⁴ To do so, the city needs to target categories of goods and services with the highest indirect GHG emissions, such as textiles, foods, electronic devices, private transport and construction.

The city will work closely with partners within and outside its territory to formulate and apply strategies to reduce indirect emissions.

To attain the objectives of the Paris Agreement, the C40 Cities Climate Leadership Group estimates that the urban population of member nations must decrease its carbon footprint by half resulting from consumption habits by 2030 and by 80 per cent by 2050.⁹⁵ According to some estimates, up to two-thirds of the carbon footprint attributable to the consumption of goods and services in cities actually originate beyond the city borders.⁹⁶ The community's consumption therefore has a significant impact on GHG emissions outside the territory.

Action 40

Execute the actions
of the PDGMR
(waste management
master plan)

The city will implement a series of measures to achieve the waste management objectives of the agglomeration. These measures are based on four main principles:

- Hierarchy of 4Rs-E (reduce at the source, reuse, recycle, recover and eliminate)
- Reduction of GHG emissions linked to waste collection and processing
- Implementation of the circular economy and ecological transition
- Mobilization of all stakeholders in the community



The PDGMR presents a set of actions that will help Montréal reduce at the source and reuse waste in order to advance toward zero waste by 2030, notably:

- **End the use of non-recyclable plastic and other single-use materials**

Montréal will set an example by banning the sale and distribution of plastic bottles in its buildings and at events that it organizes.

- **Facilitate the donation and recycling of textiles**

Montréal will review the regulation of clothing donation boxes. It will ban the disposal of unsold stock and production waste in the textile industry and stores.

- **Mobilize the community**

Montréal will provide support for events and initiatives that promote a reduction at the source. It will also study eco-taxation in waste management.

Furthermore, Montréal will mobilize and empower various actors that generate waste in order to stimulate responsible product design and the development of a circular economy. It will lead by example, notably by increasing the recycling of construction, renovation and demolition (CRD) debris during demolition. It will implement the collection of organic materials in schools and extend the collection of recyclable materials outside the home, to high-traffic areas and in non-residential buildings whose volume of generated materials is comparable to that of homes. In addition, it will extend the collection of organic materials to buildings with nine units or more. Furthermore, it will invest in innovative, efficient and local infrastructure to recover more waste, using biomethanization, composting and sorting centres, among other means.

Action 41

Measure the ecological transition progress of the city and the performance of administrative units

Montréal will develop a performance measurement framework for each of its strategic directions, including ecological transition and resilience. The Climate Plan 2020–2030 will be studied and evaluated in accordance with this monitoring, evaluation and learning framework.

To obtain tangible results, the objectives related to ecological transition and resilience will be integrated in the organizational priorities of the Direction générale and in the performance objectives of city managers. The Direction générale, backed by the Bureau de la transition écologique et de la résilience, will ensure this integration, support the directors of the main services and of the boroughs in defining their specific objectives, and measure their performance.

Action 42

Implement a change management program for staff

To ensure that all city employees engage in the ecological transition, Montréal will deploy a comprehensive change management program within the municipal administration. It will regularly communicate with staff to publicize its vision, promote its tools and highlight the successes achieved by units. It will develop and disseminate an activity program and training workshops to educate each of its employees about issues related to the climate and environmental crises and to reinforce the role of each unit in the ecological transition. In the short term, it will make an online training activity mandatory for all employees.

The city will create an expertise hub made up of units that are innovative in terms of the ecological transition in order to improve their knowledge, make it easily accessible and share it with the population of Montréal. A network of leaders associated with this hub will transmit knowledge, experiences and learning between local administrations and municipal central departments. Montréal will help all the boroughs increase their ability to implement projects that promote mobilization and citizen participation.

The city will also launch various initiatives to recognize and highlight its employees' efforts and will publicize its successes.





Sector **5** Governance

Montréal will undertake several steps to comply with the objectives and commitments made in the Climate Plan 2020–2030. Notably, the city will revise its governance rules to systematically take into account the climate and environmental impact of all its decisions, be they tax- or budget-related, administrative or regulatory. To this end, it will impose a climate test, adopt a carbon budget and incorporate the adaptation to and fight against climate change in its budget and financial documents.

It will also support the administrative units and the boroughs to ensure that the city's future plans incorporate the objectives of the Climate Plan 2020–2030. It will organize specific consultations on some actions included in this plan in order to implement them in partnership with the various stakeholders, in addition to pursuing ongoing collaboration with existing bodies.

Action 43

Impose a climate test on all the city's decisions to limit their impact in terms of GHG emissions and maximize those linked to adaptation to climate change

The city's operating and investment budget endows it with significant financial capacity that must be leveraged to support the ecological transition and the fight against climate change. From now on, each important decision that the city makes will be accompanied by an analysis of its impact on GHG emissions and its contribution to the adaptation to climate change. For example, in the case of an infrastructure project to be authorized, the climate benefits linked to the option retained must be demonstrated. In addition, Montréal will integrate climate criteria in the quotes and calls for tenders in order to encourage its suppliers to get on board with the ecological transition.

This ambitious climate test will be implemented in stages. Over a three-year period, the test will be developed and gradually applied to all the city's decisions, starting with those that have the greatest impact, such as major infrastructure projects. For each category of decisions (buildings, transportation, civil engineering, regulations, etc.), the city must:

- Identify which decisions are subject to a climate test
- Adopt a methodology for assessing climate impacts, such as GHG emissions and adaptation
- Establish an acceptable threshold that, in the case of buildings, for example, is already set at zero carbon for heating

Action 44

Establish the carbon budget of GHG emissions for the Montréal community

Montréal will gradually implement a carbon budget for the community. This governance tool will contribute to attaining the objectives adopted by the city administration. It will cover all GHG emissions reduction actions set out in the Climate Plan 2020–2030. Montréal's carbon budget will be established in line with the overall budget and based on the approach endorsed by the C40. It will also take into account the local context in order to be realistic, fair, science-based and consistent with the targets set by the city.



Action 45

Add a chapter on climate to the city's annual budget and financial statements

The city will add a chapter on climate to its annual budget plan (operating budget and Ten-Year Capital Expenditures Program). This chapter will explain how the choices concerning taxation, expenses and investments will influence the attainment of the objectives of the Climate Plan 2020–2030.

Since 2019, the city's financial report has also included an unaudited section intended to make financial information related to climate change transparent. The main objectives⁹⁷ of this disclosure are to:

- Propose a systematic and standardized process to identify the risks, opportunities and financial impacts of climate change on the city
- Favour effective capital allocation to facilitate the transition to a low-carbon emission economy
- Provide information to allow a qualitative and quantitative assessment of the risks and opportunities linked to climate change
- Make markets more transparent for citizens, investors, insurers and other stakeholders



Action 46

Allocate 10 to 15 per cent of the budget of the Ten-Year Capital Expenditures Program to adaptation to climate change

In every action, Montréal will seek to reduce GHG emissions and to better adapt to climate hazards. This is crucial since the city will make major investments in the maintenance of its waterworks and sewage system, as well as its roads and public transport system, in the coming years.

To better plan its investments over the longer term, Montréal will strive to reinforce the resilience of its infrastructure. In addition, it will integrate climate indicators in its financial planning and asset management that will enable it to measure the performance all of its programs and projects. These criteria will cover the integration of natural and innovative infrastructure, which must represent 10 to 15 per cent of the budget of the city's Ten-Year Capital Expenditures Program.

Follow-up indicators of the Climate Plan 2020–2030



To monitor the evolution of this plan and ensure the achievement of its objectives, Montréal will publish an annual progress report on the Climate Plan based on the indicators below. Each year, the emphasis will be on different indicators depending on the frequency of data published.

There is not necessarily a specific target for each indicator. For example, the first indicator has a specific target of reducing by 55 per cent GHG emissions by 2030 from 1990 levels, while the second indicator does not. The variation in the consumption of fossil fuels will highlight the evolution of reduction efforts for the different sectors targeted by the Climate Plan. For some sectors, such as buildings, this indicator will allow us to track a specific target such as eliminating the use of fuel oil. For others, such as freight transportation, it will allow

us to track the reduction in fossil fuel consumption under possible scenarios to reach a target of 25 per cent of deliveries without GHG emissions, particularly in light of technological and economic changes. Although data to monitor these indicators exist, it is important to note that some data will not be available annually, while the compilation of other data on an annual basis will require the collaboration of third parties such as governments. Finally, an expert committee formed by the city will examine the appropriateness of refining or adding certain indicators related to resilience and adaptation.

Reduction of GHG emissions

- ① GHG emissions produced by the community and by municipal activities.
Target: A 55 per cent reduction in GHG emissions.
- ② Consumption of fossil fuels by the Montréal community (fuel, diesel, natural gas, oil and propane).
Target: A decrease in consumption.
- ③ Use of different travel modes, including the modal share of automobiles.
Target: A 25 per cent reduction in the share of solo car trips.
- ④ Percentage of electric vehicles registered in the agglomeration of Montréal.
Target: 47 per cent of electric vehicles registered.

Resilience/adaptation

- ⑤ Number of trees planted by the city and its partners (with vulnerable areas prioritized).
Target: 500,000 trees planted.
- ⑥ Area of protected zones.
Target: 10 per cent of the territory.
- ⑦ Status of various climate hazard shown on vulnerability maps.
Target: A decrease in vulnerability.
- ⑧ Area of heat islands.
Target: A reduction in the area.

Once a year, the city will post a progress report on the Climate Plan 2020–2030 in the form of a follow-up table that the public can access on its website. This table will contain indicators and an update on the progress of the actions stated in the plan. Its form and content will evolve according to the needs of public authorities and residents. The Climate Plan 2020–2030 will be updated every five years.

Where measurable, the impact of the actions of the Climate Plan 2020–2030 on the environment, GHG emissions reductions and adaptation to climate change will be evaluated. However, some GHG emissions are still partly beyond the city's control, including those linked to maritime transport, air transport and processes used by certain industries. Ecological advances will probably reduce them in the future. In the meantime, Montréal will aim to offset or capture these emissions. To set an example, the city will ultimately sequester and offset residual GHG emissions to make municipal activities carbon neutral.



Appendices



Chronology of steps leading to the Climate Plan 2020–2030

September 2018: Montréal signs the One Planet Charter at the Global Climate Action Summit in San Francisco. The Charter comprises four sections:

- The Paris-Compatible Climate Action Plan Commitment, or Deadline 2020, in which the signatories commit to produce an action plan by late 2020 to attain the objectives of the Paris Agreement on climate change.^{xxi}
- The Net Zero Carbon Buildings Commitment,^{xxii} in which cities pledge to ensure that municipal buildings and new buildings in their community meet net zero carbon standards by 2030; they also commit to extend this measure to all buildings in their community by 2050.
- The Advancing Towards Zero Waste Declaration, in which cities and regions pledge to:
 - Reduce production of solid municipal waste per inhabitant by at least 15 per cent by 2030 compared with 2015
 - Reduce the quantity of solid municipal waste sent to landfills by at least 50 per cent by 2030 compared with 2015
 - Increase the diversion rate away from landfill by at least 70 per cent by 2030.
- Achieving an Equitable Low-carbon Transformation (or Equity Pledge), in which cities pledge to develop inclusive climate action that benefits the most disadvantaged, and does not compromise the ability of future generations to meet their own needs.^{xxiii}

December 2018: Montréal signs a collaboration agreement with the C40 Cities Climate Leadership Group, the Trottier Family Foundation and the David Suzuki Foundation in order to develop a plan to respond to the climate and environmental emergency.

June 2019: The Caisse de dépôt et placement du Québec, the Centre intégré universitaire de santé et de services sociaux du Centre-Sud-de-l'Île-de-Montréal, the Claudine and Stephen Bronfman Family Foundation, the J.W. McConnell Family Foundation, the Echo Foundation and the Space for Life Foundation are included in the collaboration agreement.

June 2019: The climate advisory committee, made up of 19 members from diverse backgrounds, is created as part of the collaboration agreement.

September 2019: Montréal announces a commitment at the UN Climate Change Summit, organized by the Secretary-General of the United Nations, to decrease the city's GHG emissions by at least 55 per cent below 1990 levels by 2030 and to achieve carbon neutrality by 2050.

March 2020: The Climate advisory committee finishes its work.

December 2020: The Climate Plan 2020–2030 is unveiled.

^{xxi} The current plan aims for carbon neutrality by 2050.

^{xxii} Montréal will adopt by laws and policies to eliminate the use of fossil fuels in its building stock.

^{xxiii} Montréal will put in place innovative practices to make its districts sustainable, green and connected. It also plans to quickly change citizens' lifestyles by implementing ambitious climate policies that will protect the most disadvantaged individuals and preserve the ability of future generations to meet their own needs.

Members of the climate advisory committee

Kim Thomassin

Executive Vice-President,
Legal Affairs and Secretariat,
Caisse de dépôt et placement
du Québec

Karel Mayrand

Director General, Québec and Atlantic
Canada, David Suzuki Foundation^{xxiv}

Alain Bourque

Executive Director, Ouranos

Leïla Copti

President, COPTICOM

Coralie Deny*

Executive Director, Conseil régional
de l'environnement de Montréal
(CRE-Montréal)

Mylène Drouin

Regional Director, Public Health,
CIUSSS du Centre-Sud-de-l'Île-
de-Montréal

Sarah Houde

CEO, Propulsion Québec

Frédéric Krikorian

Vice-President,
Sustainable Development, Public &
Government Affairs, Énergir

Michel Labrecque

Head of the Division of Research
and Scientific Development,
Institut de recherche en biologie
végétale – Space for Life

Michelle LLambías Meunier

Vice-President, Corporate and
Public Affairs, Chamber of Commerce
of Metropolitan Montréal

Michèle Meier

Vice-President, Communications,
Corporate Marketing,
CSR and International Affairs,
Ivanhoé Cambridge

Catherine Morency

Professor, holder of the Mobility
Chair and of the Canada Research
Chair on Personal Mobility,
Polytechnique Montréal

André-Yanne Parent

Executive Director,
Climate Reality Canada

Daniel Pearl

Architect, Office de l'éclectisme urbain
et fonctionnel (l'ÉUF) and Associate
Professor, School of Architecture,
Université de Montréal

Élise Proulx

Vice-President, Communications and
Government Affairs, Hydro-Québec

Christian Savard

Director General, Vivre en Ville

Isabelle Thomas

Professor, School of urban planning
and landscape architecture,
Université de Montréal

Natalie Volland

Founder and President,
Gestion immobilière Quo Vadis

Johanne Whitmore

Senior Researcher,
Chair in Energy Sector Management,
HEC Montréal

*Coralie Deny died on July 2, 2020. Her contribution to the Climate Plan 2020–2030 was important, but her impact on Montréal was even more significant. A brilliant environmentalist, remarkable humanist and indefatigable citizen, as Executive Director of the Conseil régional de l'environnement de Montréal (CRE-Montréal) and through her determination, sensitivity and vivacious spirit, she played a significant role in transforming Montréal into a greener, more sustainable, more equitable and more pleasant city for Montrealers today and for future generations.

^{xxiv} Karel Mayrand was the Director General, Québec and Atlantic Canada of the David Suzuki Foundation during the work of the Montréal climate advisory committee (MCAC). He has since become the President and CEO of the Foundation of Greater Montréal.

Glossary

Biogas

Gas produced by the breakdown of organic materials in the absence of oxygen. The landfilling of waste generates GHG due to the methane present in biogas.

Biosolids

Solid materials resulting from the processing of sludge.

Canopy

The cover formed by trees in a territory. The extent of the tree canopy is determined by calculating the area of coverage of the ground provided by the crowns of trees relative to the total area of the territory studied.⁹⁸

Carbon budget

Net and maximum quantity of GHG that can be emitted in the atmosphere according to attainment of a target linked to global warming. For example, the objective set at the 2015 United Nations Climate Change Conference (COP21) of not exceeding 2 °C compared with the preindustrial period translates into a global carbon budget of 3,500 billion tonnes (Gt) of CO₂.

Carbon dioxide equivalent (CO₂eq)

The universal unit of measurement that indicates the global warming potential of GHG. The CO₂eq serves to evaluate the effects of (or absence of) waste produced by different GHGs.

GHG emissions are calculated in CO₂ equivalent (CO₂eq). CO₂ is the reference gas with which other gases are compared according to their global-warming potential (GWP). GWP is a relative measure of the capacity of each GHG to retain heat in the atmosphere. CO₂, the reference gas, has a GWP of 1.

The main GHGs are CO₂, methane (CH₄) and nitrous oxide (N₂O). Other GHGs recorded include hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

Carbon neutrality

Achieving net-zero carbon dioxide emissions by offsetting them with carbon removal or simply by eliminating carbon emissions altogether.

Carbon sequestration

The trapping of substances containing carbon, including those originating from carbon dioxide,⁹⁹ in reservoirs called “wells,” notably found in oceans, soil and forests.

Circular economy (definition of the Institut de l'environnement, du développement durable et de l'économie circulaire^{xxv})

Production, exchange and consumption system intended to optimize the use of resources at all stages of the lifecycle of a good or service, using a circular logic while reducing the environmental footprint and contributing to the well-being of individuals and communities.¹⁰⁰

Climate hazard

A phenomenon, physical manifestation or human activity that is likely to result in the loss of human life or injury, damage to property, social and economic disruption or environmental degradation. Each hazard is notably characterized by a given probability of occurrence and intensity at a given point.¹⁰¹

Climate projection¹⁰²

Simulation of the climate system's response to a future scenario of emissions or concentrations of greenhouse gases and aerosols, usually obtained using climate models. Climate projections differ from climate predictions in that they depend on the emission, concentration or radiative forcing scenarios used, which are based on assumptions about, for example, future socio-economic and technological advances, which may or may not be realized.

Ecological transition

Ecological transition proposes a new economic and social model that respects the limits of ecosystems and reduces GHG emissions. For Montréal, ecological transition entails primarily adapting to climate change and radically transforming the way we produce and consume goods and energy, protecting biodiversity and reinforcing the resilience of our ecosystems and our community. In implementing all these measures, the city must ensure that no citizen is left behind.

GHG emissions from Industrial Processes and Product Use (IPPU)

GHG emissions from chemical reactions produced by industrial processes, use of GHGs in products (e.g. halocarbons) and non-energy uses of carbon from fossil fuels. Note that this definition excludes GHG emissions from fuel combustion, which is the intentional oxidation of materials within an apparatus that is designed to provide heat or mechanical work to a process, or for use away from the apparatus.¹⁰³

Greenhouse effect

A natural phenomenon that traps a portion of the sun's warmth in the Earth's atmosphere.

Green infrastructure¹⁰⁴

Green facilities designed to drain, slow or store water. Structures of this type, based on best management practices (BMP), may take different forms: a bioretention basin, a structure with absorbing soil, a green trough (dry basin), a structure to collect water from roofs, a ditch or a green roof.

Halocarbons

Synthetic (man-made) chemical compounds used as refrigerant gases to replace ozone-depleting substances (ODS). Hydrofluorocarbons (HFC) and perfluorocarbons (PFC) are used for refrigeration and for the production of plastic foams, solvents, aerosol propellants and anesthetics.

Heat islands

Intra-urban zones whose air or surface temperature is higher than that in other zones in the same urban area (e.g. a paved parking lot). This difference in temperature can exceed 10°C. Heat islands are influenced by various factors, such as tree cover, the thermal properties of materials and how impervious they are.¹⁰⁵

Linear economy

A model based on the "take-make-waste"¹⁰⁶ approach to goods and services production.

Natural infrastructure¹⁰⁷

An interconnected network of green and blue spaces that preserve the values and functions of natural ecosystems by providing various benefits to human populations.

Net-zero carbon building

A building that is highly energy efficient and fully powered by sources of renewable energy produced on-site and/or off-site, and whose annual balance of direct and indirect carbon dioxide (CO₂) emissions^{xxvi} is zero or negative.

^{xxv} It should be noted that the Institut de l'environnement, du développement durable et de l'économie circulaire has ceased its activities. The Centre d'études et de recherche intersectorielles en économie circulaire, created in the summer of 2020, is continuing its research work in Quebec on circular economy.

^{xxvi} With reference to the definition of "the direct emission of greenhouse gas" standard CSA ISO 14064-1 Greenhouse Gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions.

Passive House standard (definition adapted from Ecohome¹⁰⁸ and the Pembina Institute¹⁰⁹)

Certification given to buildings that use about 90 per cent less energy than an average building,¹¹⁰ by following six principles:

- High level of insulation and high performance windows
- Minimized thermal bridges
- Airtight construction
- Heat recovery continuous ventilation system
- Passive heating using energy from the sun and the earth
- Appliances that limit energy consumption

Certification of Passive House buildings is based on quantitative performance targets, and their construction must meet a series of specific requirements for thermal comfort, humidity, noise and user satisfaction.

Resilience hub¹¹¹

Centralized resource and training facility serving the community in support of citizens' capacity to act, social cohesion and sense of belonging in neighbourhoods. The resilience hubs provide an opportunity to work in synergy on issues of community resilience, emergency management, climate change mitigation and adaptation, and social equity to help these communities become communities to become more self-determining, socially connected before, during and after disruptions.

Social capital

A set of resources that individuals gain through their social relationships.¹¹²

Social equity

Social equity entails offering all citizens, regardless of their economic resources or personal characteristics, just and fair living conditions to meet their basic needs (food, clothing, housing, education, etc.).

Ten-Year Capital Expenditure Program¹¹³

A set of investment projects that the city plans to carry out on its territory in the next 10 years in order to maintain its infrastructure, stimulate economic, cultural and social development, and improve the quality of life in Montréal through better urban land development. These investments require different sources of funding, notably long-term loans.

Zero-emission zone

A zone where only zero-emission transport modes (including electric vehicles and active transport) are permitted for the transportation of passengers and of freight. This type of zone contributes to improving the quality of life at the district level by reducing pollution, noise and GHG emissions generated by vehicles that run on fossil fuels.

References

- 1 United Nations (n.d.). Six Climate-Positive Actions to Help Rebuild Economies from COVID-19 Pandemic. Retrieved in October 2020; Organisation for Economic Co-operation and Development (2020, June 5). Rebuilding Better: Towards a Sustainable and Resilient Recovery from COVID-19. Retrieved in October 2020; International Monetary Fund (2020). Climate Change, Green Recovery, Greening the Recovery. Retrieved in October 2020 from www.imf.org/en/Topics/climate-change/green-recovery#Topic%201
- 2 Ville de Montréal (2020). *Plan de relance économique de Montréal: Une impulsion pour la métropole : agir maintenant*. (Montréal's Economic Recovery Plan: A Boost for Our Metropolis: Time to Act.) Retrieved on November 18, 2020 from res.cloudinary.com/villemontreal/image/upload/v1592420847/portail/dtfrt3lazo3oyvplcpu.pdf ; Ville de Montréal (2020) *Plan de relance phase 2: Agir maintenant pour préparer la relance: Mesures de soutien économique 2021*. (Recovery Plan Phase 2: Acting Now to Prepare Recovery: 2021 Measures to Support the Economy.) res.cloudinary.com/villemontreal/image/upload/v1607007571/portail/x7xppfte2xjbpsm9rqlh.pdf
- 3 Ville de Montréal (2017). Plan d'adaptation aux changements climatiques de l'agglomération de Montréal 2015-2020, Les constats (Climate change adaptation plan for the agglomeration of Montréal), a publication of the Service de l'environnement. Retrieved on September 17 from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/paccam_2015-2020_lesconstats.pdf
- 4 Ville de Montréal (2018). Montreal's Resilient City strategy. Retrieved on January 29, 2019 from <https://resilient.montreal.ca/assets/doc/strategie-montreal-ville-resiliente-en.pdf>
- 5 Institut de la statistique du Québec (2019). Produit intérieur brut aux prix de base par région administrative et région métropolitaine recensement, Québec. Retrieved on July 15, 2020 from www.stat.gouv.qc.ca/statistiques/economie/comptes-economiques/comptes-production/pib-ra-rmr.htm#tri_type_regn=87&tri_mesr_pivot=1
- 6 Ville de Montréal (2017). *Population totale et superficie des arrondissements de Montréal et des villes liées, agglomération de Montréal, 2016*. Retrieved on February 28, 2020 from ville.montreal.qc.ca/pls/portal/docs/page/mtl_stats_fr/media/documents/POPULATION%20ET%20SUPERFICIE%202016.PDF
- 7 Ville de Montréal (2015). *Schéma d'aménagement et de développement de l'agglomération de Montréal*. Retrieved on February 18, 2020 from ville.montreal.qc.ca/pls/portal/docs/PAGE/PROJ_URBAINS_FR/MEDIA/DOCUMENTS/Schema20170301.pdf
- 8 Institut de la statistique du Québec (2019). *Le bilan démographique du Québec. Édition 2019*. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/population-demographie/bilan2019.pdf
- 9 Institut de la statistique du Québec (2019). *Le bilan démographique du Québec. Édition 2019*. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/population-demographie/bilan2019.pdf
- 10 Institut de la statistique du Québec. Coup d'œil sur les régions et les MRC. 06 – Montréal. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/profils/region_06/region_06_00.htm
- 11 Institut de la statistique du Québec. Coup d'œil sur les régions et les MRC. 06 – Montréal. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/profils/region_06/region_06_00.htm
- 12 Institut de la statistique du Québec. Coup d'œil sur les régions et les MRC. 06 – Montréal. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/profils/region_06/region_06_00.htm
- 13 Ville de Montréal. Banque d'information 311, Grands parcs, parcs métropolitains, parcs-nature et parcs urbains, update of January 14, 2020. Retrieved on February 18, 2020 from www1.ville.montreal.qc.ca/banque311/node/87
- 14 Ville de Montréal. Rapport Montréal durable, update of September 2018. Retrieved on September 12, 2019 from accept.ville.montreal.qc.ca/rapportmontrealdurable/
- 15 Ville de Montréal. Rapport Montréal durable, update of September 2018. Retrieved on September 12, 2019 from accept.ville.montreal.qc.ca/rapportmontrealdurable/
- 16 Ville de Montréal. Grands parcs, Cartes et autres plans des grands parcs. Retrieved on February 18, 2020 from ville.montreal.qc.ca/portal/page?_pageid=7377123235660&_dad=portal&_schema=PORTAL
- 17 Ville de Montréal (2015). *Schéma d'aménagement et de développement de l'agglomération de Montréal*. Retrieved on February 18, 2020 from ville.montreal.qc.ca/pls/portal/docs/PAGE/PROJ_URBAINS_FR/MEDIA/DOCUMENTS/Schema20170301.pdf
- 18 Port de Montréal (March 21 2019). The MPA and LOGISTEC Boosting Container Handling Capacity at the Port of Montréal [Press release]. Retrieved on February 18, 2020 from <https://www.port-montreal.com/en/the-port-of-montreal/news/press-release/viau2-en>
- 19 Statistics Canada. Air passenger traffic at Canadian airports, annual, update of February 18, 2020. Retrieved from www150.statcan.gc.ca/t1/tb1/en/tv.action?pid=2310025301&request_locale=en
- 20 EXO (n.d.). *Réseau de trains de banlieue*. Retrieved on February 18, 2020 from exo.quebec/Media/Default/pdf/section4/Carte_reseau_train_de_banlieue_rtm.pdf
- 21 Réseau express métropolitain. Le REM. Retrieved on February 18, 2020 from rem.info/fr/reseau-express-metropolitain
- 22 Société de transport de Montréal. Rapport annuel 2019. Retrieved on July 22, 2020 from www.stm.info/fr/a-propos/informations-entreprise-et-financieres/rapport-annuel-2019
- 23 Société de transport de Montréal. Bus hybrides. Retrieved on July 22, 2020 from www.stm.info/fr/a-propos/grands-projets/grands-projets-bus-electrification-du-reseau-de-surface/bus-hybrides
- 24 Société de transport de Montréal. Rapport annuel 2018. Retrieved on February 18, 2020 from www.stm.info/fr/a-propos/informations-entreprise-et-financieres/rapport-annuel-2018
- 25 Société de transport de Montréal. Métro – Infos pratiques. Retrieved on February 18, 2020 from www.stm.info/fr/infos/reseaux/metro
- 26 Ville de Montréal (2018). *Suivi du Plan de réduction des émissions de gaz à effet de serre de la collectivité montréalaise 2013-2020*, a publication of the Service de l'environnement, 64 pages. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/SuiviPlanCollectivite2013-2020.PDF
- 27 Ville de Montréal (2017). *Plan d'adaptation aux changements climatiques de l'agglomération de Montréal 2015-2020, Les constats*, une production du Service de l'environnement. Retrieved on September 17 from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/paccam_2015-2020_lesconstats.pdf
- 28 Ouranos (2018). Climate Portraits. Retrieved on February 27 from www.ouranos.ca/climate-portraits/#/
- 29 Ouranos (2018). Climate Portraits. Retrieved on February 27 from www.ouranos.ca/climate-portraits/#/
- 30 Ouranos. (2018). Climate Portraits. Retrieved on February 27 from www.ouranos.ca/climate-portraits/#/
- 31 City of Montreal. (2020). Environmental Assessment Report Air Quality in Montréal 2019, a production of the Service de l'environnement. Retrieved in August 2020 from [https://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20\(ANG\).PDF](https://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20(ANG).PDF)
- 32 City of Montreal (2020). Environmental Assessment Report Air Quality in Montréal 2019, a production of the Service de l'environnement. Retrieved in August 2020 from [ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20\(FR\).PDF](http://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20(FR).PDF)
- 33 Ville de Montréal. (2020). *Bilan 2019 de la qualité de l'air à Montréal*, une production du Service de l'environnement. Retrieved in August 2020 from [ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20\(FR\).PDF](http://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20(FR).PDF)
- 34 Ville de Montréal (2019). Environmental Assessment Report Air Quality in Montréal 2019, a production of the Service de l'environnement. Retrieved in August 2020 from [ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20\(FR\).PDF](http://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_EN/MEDIA/DOCUMENTS/BILAN%20QUALIT%C9%20DE%20L'AIR%20(FR).PDF)
- 35 Ville de Montréal (2019). *Inventaire des émissions de gaz à effet de serre de la collectivité montréalaise 2015*, a publication of the Bureau de la transition écologique et de la résilience. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/INVENTAIRECOLLECTIVITEGES_2015.PDF
- 36 Ville de Montréal (2019). *Inventaire 2015 des émissions de gaz à effet de serre de la collectivité montréalaise*, a publication of the Bureau de la transition écologique et de la résilience. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/INVENTAIRECOLLECTIVITEGES_2015.PDF
- 37 Ville de Montréal (2011). *Les quartiers culturels*, a publication of the Direction de la culture et du patrimoine. Retrieved from ville.montreal.qc.ca/culture/sites/ville.montreal.qc.ca/culture/files/docume1.pdf
- 38 Vélo Québec (2016). *L'état du vélo à Montréal en 2015*. Retrieved on October 9, 2019 from ville.montreal.qc.ca/pls/portal/docs/page/transport_fr/media/documents/etat_velo_2015.pdf
- 39 Institut de la statistique du Québec. Coup d'œil sur les régions et les MRC. 06 – Montréal. Retrieved on February 18, 2020 from www.stat.gouv.qc.ca/statistiques/profils/region_06/region_06_00.htm
- 40 Institut de l'environnement, de développement durable et de l'économie circulaire. Économie circulaire. Retrieved from institutedec.org/themes/economie-circulaire/#1478637474475-2c0d9976-6af5
- 41 Gouvernement du Québec (2020). Zone d'innovation Québec. Retrieved on September 14, 2020 from economie.gouv.qc.ca/bibliotheques/zones-dinnovation/creation-de-zones-dinnovation/
- 42 City of Oslo (2019). Zero-Emission Construction Sites. Retrieved on December 16, 2019 from www.oslo.kommune.no/politics-and-administration/smart-oslo/projects/zero-emission-construction-sites/#gref
- 43 Ville de Montréal (2019). *Stratégie du Plan directeur de gestion des matières résiduelles 2020-2025*, a publication of the Service de l'environnement. Retrieved on October 25, 2019 from ville.montreal.qc.ca/pdgmtr



- 44 C40 Cities, Arup and the University of Leeds (2019). The Future of Urban Consumption in a 1.5 °C World. Retrieved from www.c40.org/consumption
- 45 Rana, S., Pichandi, S., Karunamoorthy, S., Bhattacharyya, A., Parveen, S., & Fanguero, R. (2015). Carbon Footprint of Textile and Clothing Products. In S. Senthilkannan Muthu (Ed.), *Handbook of Sustainable Apparel Production* (1st ed., pp. 141-166). CRC Press.
- 46 Ville de Montréal (2019). *Inventaire des émissions de gaz à effet de serre de la collectivité montréalaise 2015*, a publication of the Bureau de la transition écologique et de la résilience. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/INVENTAIRECOLLECTIVITEGES_2015.PDF
- 47 Gouvernement du Québec. Fiches de suivi des actions financées par le Fonds vert. Retrieved from www.environnement.gouv.qc.ca/cgfv/documents/fiches-suivi/index.htm
- 48 Ville de Montréal (2017). *Plan d'adaptation aux changements climatiques de l'agglomération de Montréal 2015-2020, Les constats*, a publication of the Service de l'environnement. Retrieved on September 17 from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/paccam_2015-2020_lesconstats.pdf
- 49 Ville de Montréal. Flooding. Retrieved on July 22, 2020 from montreal.ca/sujets/inondations. <https://montreal.ca/en/topics/flooding>
- 50 Ville de Montréal. *La sécurité civile à Montréal, Plan de sécurité civile*. Retrieved on October 22, 2019 from ville.montreal.qc.ca/portal/page?_pageid=7637,82415650&_dad=portal&_schema=PORTAL
- 51 Université du Québec à Montréal. Canada Research Chair in Environmental Education (2018). *Stratégie québécoise d'éducation en matière d'environnement et d'écocitoyenneté*. Retrieved on October 9, 2019 from centrere.uqam.ca/vers-une-strategie-quebecoise-deducation-en-matiere-denvironnement-et-decocitoyennete
- 52 Ville de Montréal. *Programme montréalais de soutien à l'action citoyenne en sécurité urbaine dans les arrondissements – Tandem*. Retrieved on November 18, 2019 from ville.montreal.qc.ca/portal/page?_pageid=8258,90489812&_dad=portal&_schema=PORTAL; Ville de Montréal. Community Gardens. Retrieved on February 20, 2020 from <https://montreal.ca/en/topics/community-gardens>
- 53 Réseau québécois des villes et villages en santé. Voisins solidaires. Retrieved on November 19, 2019 from voisinsolidaires.ca; École nationale d'administration publique du Québec, Cité-ID Living Lab sur la gouvernance de la résilience urbaine. Résilience et capital social: préparation aux catastrophes. Retrieved on November 18, 2019 from cite-id.com/projets/capital-social-preparation
- 54 Urban Sustainability Directors Network (USDN) (2018). Resilience Hubs–Shifting Power to Communities and Increasing Community Capacity. Retrieved on November 18, 2019 from www.usdn.org/uploads/cms/documents/usdn_resiliencehubs_2018.pdf
- 55 UN Habitat. Urban Resilience Hub-Making Cities Sustainable and Resilient Action. Retrieved on November 18, 2019 from urbanresiliencehub.org/making-cities-sustainable-and-resilient-action
- 56 Ville de Montréal (2018). Montréal, Geared Up for Tomorrow: 2018–2022 Economic Development Strategy. Retrieved from https://ville.montreal.qc.ca/pls/portal/docs/PAGE/AFFAIRES_EN/MEDIA/DOCUMENTS/MTL_STRATEGY_EN.PDF
- 57 Ville de Montréal. Banque d'information 311, Projet de prolongement de la ligne bleue, update of June 12, 2019. Retrieved on September 20, 2019 from www1.ville.montreal.qc.ca/banque311/content/projet-de-prolongement-de-la-ligne-bleue
- 58 Ville de Montréal. Axe Pie-IX, Projet intégré SRB Pie-IX. Retrieved on September 20, 2019 from ville.montreal.qc.ca/portal/page?_pageid=8957,99621783&_dad=portal&_schema=PORTAL
- 59 Communauté métropolitaine de Montréal (2019). Source de financement du transport collectif dans le Grand Montréal, Rapport de la commission du transport de la Communauté métropolitaine de Montréal. Retrieved on October 28, 2019 from cmm.qc.ca/fileadmin/user_upload/documents/20190401_TC_Financement_Rapport.pdf
- 60 CAA. Driving costs calculator. Retrieved from <https://carcosts.caa.ca/>
- 61 Agence de la santé et des services sociaux de Montréal (2006). Le transport urbain, une question de santé – Rapport annuel 2006 sur la santé de la population montréalaise. Retrieved on September 12, 2019 from santemontreal.qc.ca/fileadmin/user_upload/Uploads/tx_assmpublications/pdf/publications/2-89494-491-8.pdf; Paulhiac Scherrer, F. (2018). Rapport final: Portrait des disparités en matière de mobilité dans l'agglomération de Montréal. Étude portant sur la caractérisation des inégalités de mobilité quotidienne. Ville de Montréal et Chaire In.SITU. Retrieved on September 16, 2019 from chairesinsitu.esg.uqam.ca/nouvelles/publicationsrecentes/cahiersinsitu/cahier-in-situ-n3-portrait-des-disparites-en-matiere-de-mobilite-dans-lagglomeration-de-montreal
- 62 Ville de Montréal. Axe Pie-IX, Projet intégré SRB Pie-IX. Retrieved on September 20, 2019 from ville.montreal.qc.ca/portal/page?_pageid=8957,99621783&_dad=portal&_schema=PORTAL; Ville de Montréal. Banque d'information 311, Projet de prolongement de la ligne bleue, update of June 12, 2019. Retrieved on September 20, 2019 from www1.ville.montreal.qc.ca/banque311/content/projet-de-prolongement-de-la-ligne-bleue; Ville de Montréal (August 26, 2019). Faire avancer d'importants dossiers pour Montréal: la ligne rose [Press release]. Retrieved on September 20, 2019 from ville.montreal.qc.ca/portal/page?_pageid=5798,42657625&_dad=portal&_schema=PORTAL&id=31924
- 63 Communauté métropolitaine de Montréal (2019). Orientations et attentes à l'égard de la tarification sociale du transport en commun sur le territoire de la Communauté métropolitaine de Montréal – Rapport de la Commission du transport de la Communauté métropolitaine de Montréal. Retrieved on September 16, 2019 from cmm.qc.ca/fileadmin/user_upload/documents/Rapport_1.pdf
- 64 Autorité régionale de transport métropolitain (n.d.). Politique d'accessibilité universelle. Retrieved on December 17, 2019 from www.artm.quebec.ca/wp-content/uploads/2019/06/Politique_accessibilite_universelle_ARTM.pdf; EXO (2018). Plan de développement de l'accessibilité du réseau d'exo 2018-2022. Retrieved on December 17, 2019 from exo.quebec.ca/Media/Default/pdf/section8/publications/plan-developpement-accessibilite-exo-2018-2022.pdf
- 65 C40 Cities. Fossil Fuel Free Streets Declaration. Retrieved on November 14, 2020 from c40.org/other/green-and-healthy-streets#:~:text=Fossil%20Fuel%20Free%20Streets%20De%20claration,and%20free%20from%20harmful%20emissions
- 66 Ville de Montréal (2016). Stratégie d'électrification des transports 2016-2020, a publication of the Service de la mise en valeur du territoire. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/PROJ_URBAINS_FR/MEDIA/DOCUMENTS/strategie_electrification_v2.pdf
- 67 Charge Hub (2020). Charge Your EV in Montréal. Retrieved on February 27, 2020 from chargehub.com/en/countries/canada/quebec/montreal.html?city_id=315
- 68 Réseau quartiers verts. Complete Streets. Co-Designing the Active City. Retrieved from participatoryplanning.ca/reflexions/complete-streets?_ga=2.223651480.2008286034.1597712535-493776196.1597712535
- 69 Ouranos (2015). Summary of the Synthesis on Climate Change Knowledge in Quebec. Retrieved from www.ouranos.ca/publication-scientifique/Synthesis_Summary.pdf
- 70 Paquette, Alain (2016). Repenser le reboisement – Guide stratégique pour l'augmentation de la canopée et de la résilience de la forêt urbaine de la région métropolitaine de Montréal. Edited by Cornelia Garbe, Jour de la Terre Québec, and the Comité de reboisement de la CMM. Retrieved on November 12 from www.biopolis.ca/wp-content/uploads/2016/10/Repenser-le-reboisement.pdf
- 71 Ville de Montréal (2019). Inventaire des émissions de gaz à effet de serre de la collectivité montréalaise 2015, a publication of the Bureau de la transition écologique et de la résilience. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/INVENTAIRECOLLECTIVITEGES_2015.PDF
- 72 Ville de Montréal. Vue sur les indicateurs de performance. Nombre de permis de construction émis. Retrieved from ville.montreal.qc.ca/vuesurlesindicateurs/index.php?pkpi=2563
- 73 Écobatiment and A. Bourassa (2019). Valoriser les bâtiments existants – un levier pour le développement durable, 156 p.
- 74 Ville de Montréal (May 6 2019). Carbon Neutrality Objective | The City Announces a First Step Towards Carbon Neutrality for Its Real Estate Assets [Press release]. Consulted in January 2020 from http://ville.montreal.qc.ca/portal/page?_pageid=5977,43117560&_dad=portal&_schema=PORTAL&id=31553
- 75 Ville de Montréal. By-law concerning the construction and conversion of buildings 11-018, Office consolidation from December 22, 2016. Retrieved from ville.montreal.qc.ca/sel/sypre-consultation/afficherpdf?idDoc=29950&typeDoc=1
- 76 Ville de Montréal (s.d.). Nouveau programme Rénovation abordable : Retrieved in October 2020 from ville.montreal.qc.ca/portal/page?_pageid=9337,14327288&_dad=portal&_schema=PORTAL
- 77 Government of Canada. National Energy Code of Canada for Buildings 2017. Retrieved from <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-energy-code-canada-buildings-2017>
- 78 Amy, C. (2017). Efficiency Evaluation of Hypothetical Whole Home Energy Efficiency Programs: In British Columbia, Canada. [Master's thesis]. Retrieved on May 27, 2020 from openaccess.nhh.no/nhh-xmlui/bitstream/handle/11250/2454055/masterthesis.PDF?sequence=1; Jensen, P. A., Maslesa, E., Berg, J. B. & Thuesen, C. (2018). 10 Questions Concerning Sustainable Building Renovation. Building and Environment, 143, 130–137. Retrieved on May 27, 2020 from www.sciencedirect.com/science/article/abs/pii/S0360132318303950

- 79 Ville de Montréal. Habitation, a publication of Montréal en statistiques. Retrieved on February 18, 2020 from ville.montreal.qc.ca/portal/page?_pageid=689767885745&_dad=portal&_schema=PORTAL.
- 80 Ville de Montréal (2018). *Inventaire des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal 2015*, a publication of the Service de l'environnement. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/invent_ges_actmuni_2015_vf.pdf
- 81 Ville de Montréal. L'eau de Montréal, La Station d'épuration Jean-R. Marcotte. Retrieved on September 17, 2019 from ville.montreal.qc.ca/portal/page?_pageid=649754345571&_dad=portal&_schema=PORTAL
- 82 Ville de Montréal. L'eau de Montréal, La Station d'épuration Jean-R. Marcotte. Retrieved on September 17, 2019 from ville.montreal.qc.ca/portal/page?_pageid=649754345571&_dad=portal&_schema=PORTAL
- 83 Ville de Montréal (2018). *Inventaire 2015 des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal*, a publication of the Service de l'environnement. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/invent_ges_actmuni_2015_vf.pdf
- 84 Ville de Montréal (2018). *Inventaire des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal 2015*, a publication of the Service de l'environnement. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/invent_ges_actmuni_2015_vf.pdf
- 85 Ville de Montréal (2018). *Inventaire des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal 2015*, a publication of the Service de l'environnement. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/invent_ges_actmuni_2015_vf.pdf
- 86 C40 Cities. The Net Zero Carbon Buildings Declaration. Retrieved on September 19, 2019 from c40-production-images.s3.amazonaws.com/other_uploads/images/1889_FR_NZC_Buildings_Declaration_FINAL.original.pdf <https://www.c40.org/other/net-zero-carbon-buildings-declaration#:~:text=Net%20zero%20carbon%20buildings%20are,schools%20free%20from%20dirty%20air>
- 87 Whitmore, J. & Pineau, P.-O. (2018). The State of Energy in Québec 2019, Chair in Energy Management, HEC Montréal, prepared for Transition énergétique Québec. Retrieved from energie.hec.ca/wp-content/uploads/2018/12/EEQ2019_WEB.pdf https://energie.hec.ca/wp-content/uploads/2019/05/EEQ2019_EN_WEB.pdf
- 88 Hydro-Québec (2018). CO₂ Emissions and Hydro-Québec Electricity, 1990–2018. Retrieved from <https://www.hydroquebec.com/data/developpement-durable/pdf/co2-emissions-electricity-2018.pdf>
- 89 Ecotech Québec. *Cleantech*. Retrieved from ecotechquebec.com/technologies-propres/technologies-propres-1 <https://ecotechquebec.com/en/clean-technologies/cleantech/>
- 90 Ville de Montréal (2018). Montréal, Geared Up for Tomorrow: 2018–2022 Economic Development Strategy. Retrieved from ville.montreal.qc.ca/pls/portal/docs/AFFAIRES_EN/MEDIA/DOCUMENTS/MTL_STRATEGY_EN.PDF
- 91 Mairie de Paris (2018). Plan climat de Paris – Vers une Ville neutre en carbone et 100 % énergies renouvelables. Retrieved from cdn.paris.fr/paris/2019/07/24/0695318b97ca7fde65710d4c9d55054b.pdf
- 92 Greater London Authority (2019). Application of PAS 2070 – London Case Study. Retrieved on October 8, 2019 from data.london.gov.uk/dataset/application-pas-2070-london-case-study
- 93 City of Portland (2015). Climate action plan – Local strategies to address climate change. Retrieved from www.portlandoregon.gov/bps/article/531984
- 94 C40 Cities, Arup & the University of Leeds (2019). The Future of Urban Consumption in a 1.5°C World. Retrieved from www.c40.org/consumption
- 95 C40 Cities, Arup & the University of Leeds (2019). The Future of Urban Consumption in a 1.5°C World. Retrieved from www.c40.org/consumption
- 96 British Standards Institution (2014). PAS2070: 2013 – Specification for the Assessment of Greenhouse Gas Emissions of a City. Retrieved from shop.bsigroup.com/upload/PASs/Free-Download/PAS-2070-2013.pdf; Broekhoff, D., Erickson P. and Piggot, G. (2019). Estimating Consumption-based Greenhouse Gas Emissions at the City Scale—A guide for local governments. Retrieved from www.sei.org/publications/consumption-based-greenhouse-gas-emissions-city-scale; Hertwich, E.G. and Wood, R. (2018). The Growing Importance of Scope 3 Greenhouse Gas Emissions from Industry. Environmental Research Letters 13. Retrieved from iopscience.iop.org/article/10.1088/1748-9326/aae19a; C40 Cities (2018). Consumption-based GHG Emissions of C40 Cities. Retrieved from www.c40.org/researches/consumption-based-emissions
- 97 Ville de Montréal (2020). *Annual financial Report – Fiscal Year Ended December 31, 2019*, a publication of the Service des finances. Retrieved from ville.montreal.qc.ca/pls/portal/docs/PAGE/SERVICE_FIN_EN/MEDIA/DOCUMENTS/2019_ANNUAL_FINANCIAL_REPORT.PDF
- 98 Ville de Montréal. Rapport Montréal durable, updated in September 2018. Retrieved on September 12, 2019 from ville.montreal.qc.ca/rapportmontrealdurable/en/
- 99 Intergovernmental panel on climate change (2013). Annex III: Glossary [Planton, S. (ed.)]. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Q in, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Retrieved on November 25, 2019 from www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_AnnexIII_FINAL.pdf
- 100 Institut de l'environnement, de développement durable et de l'économie circulaire. Économie circulaire. Retrieved from institutedec.org/themes/economie-circulaire/#1478637474475-2c0d9976-6af5
- 101 Gouvernement du Québec. Ministère de la sécurité publique. (2008). *Annexe 1 – Glossaire, Concepts de base en sécurité civile*. Retrieved in 2015 from www.securitepublique.gouv.qc.ca/fileadmin/Documents/securite_civile/publications/concepts_base/concepts_base_partie_5.pdf
- 102 Intergovernmental panel on climate change (2016). 2006 IPCC Guidelines for National Greenhouse Gas Inventories, IPCC National Greenhouse Gas Inventories Program (S. Eggleston, L. Buendia, K. Miwa, T. Ngara and K. Tanabe, editors). Retrieved from <https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html> <http://www.ipcc-nggip.iges.or.jp/public/2006gl/french>
- 103 Ville de Montréal (2015). Quelles infrastructures vertes pour la gestion des eaux de ruissellement? Service de l'eau, 45 p.
- 104 Institut national de la santé publique du Québec. Îlots de chaleur. Mon climat, ma santé. Retrieved in February 2020 from www.monclimatmasante.qc.ca/%C3%AElots-de-chaleur.aspx
- 105 The Chair in Energy Sector Management – HEC Montréal. Économie circulaire | Portrait et pistes de réduction des émissions de GES industrielles au Québec. Retrieved from energie.hec.ca/gesindustriels-volet1
- 106 Maure, F., Bronwyn, R., Martins K. T., Garbe, C., Dupras, J., Auclair, J., Wood, S., Messier, C., Larocque, M., Gonzalez, A. (2018). Le rôle des infrastructures naturelles dans la prévention des inondations dans la Communauté métropolitaine de Montréal. Sommet sur les infrastructures naturelles et les phytotechnologies. Retrieved from nature-action.qc.ca/site/sites/default/files/pdf/Autres/CV-Le-roole-des-infrastructures-naturelles.pdf
- 107 Ecohome (2012). Everything You Need to Know about Passive House Certification. Retrieved on January 22, 2020 from <https://www.ecohome.net/guides/2191/everything-you-need-to-know-about-passive-house/>
- 108 Pembina Institute (2016). Accelerating Market Transformation for High-Performance Building Enclosures. Retrieved on January 22, 2020 from www.pembina.org/pub/passive-house-report
- 109 Passive House Institute (2015). About Passive House – What Is a Passive House? Retrieved on January 22 from passivehouse.com/02_informations/01_what_is_a_passive_house/01_what_is_a_passive_house.htm
- 110 Urban Sustainability Directors Network (2018). Resilience Hubs - Shifting Power to Communities and Increasing Community Capacity. Retrieved in January 2020 from resilience-hub.org
- 111 École nationale d'administration publique du Québec, Cité-ID Living Lab sur la gouvernance de la résilience urbaine (2019). Mesurer le capital social: Guide destiné aux organisations. Retrieved on December 11, 2019 from cite-id.com/documents/atelier-mesurer-le-capital-social-guide-destin%C3%A9-aux-organisations/Guide-de-mesure-du-capital-social.pdf
- 112 Ville de Montréal (2019). Faits saillants. Budget 2020. PTI 2020-2022. Un budget pour vous. Retrieved from ville.montreal.qc.ca/pls/portal/docs/page/service_fin_fr/media/documents/budget_2020_faits_saillants_fr.pdf

Photo Credits

Cover: Getty Images
8: AlexandreCv
10: Myriam Baril Tessier
12-1: Caisse de dépôt et de placement du Québec
12-2: Caisse de dépôt et de placement du Québec
27: Jp Valery, Unsplash
35: Getty Images
44: Eric Demers
52: Alamy Stock Photo
58: Mélanie Dusseault
61: Louis-Étienne Doré
66: Groupe CNW/Ville de Montréal
69: Mathieu Sparks
70: Tourisme Montréal—Madore—Daphné Caron
74: Jean Gagnon
81: Mathieu Sparks
85: Myriam Baril-Tessier
86: Mathieu Sparks
91: Denis Labine
98: Mathieu Sparks
101: Mathieu Sparks
102: Alamy Stock Photo
105: Fermes Lufa
111: Alamy Stock Photo

