Progress Report on the Montréal Agglomeration's 2013-2020 Corporate Greenhouse Gas Emissions Reduction Plan

Montréal

COORDINATION AND WRITING
This document is a production of the climate change and special projects team in the Division de la planification et du suivi environnemental (environmental planning and monitoring division) of the Ville de Montréal's Service de l'environnement (environment department). This document is a translation of the *Suivi du Plan de réduction des émissions de gaz à effet de serre corporatives 2013-2020*.

INFORMATION
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COVER
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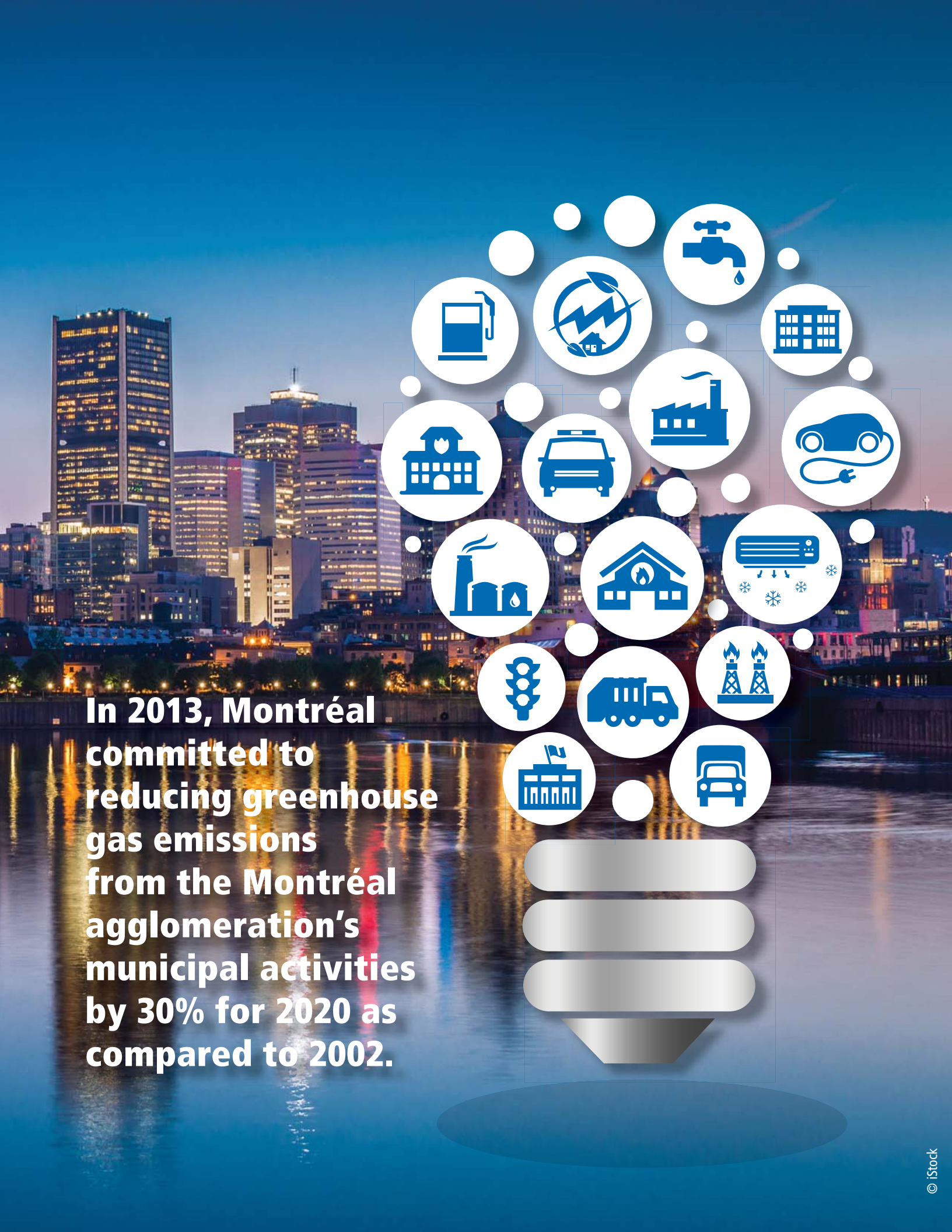


In 2013, Montréal committed to reducing greenhouse gas emissions from the Montréal agglomeration's municipal activities by 30% for 2020 as compared to 2002.

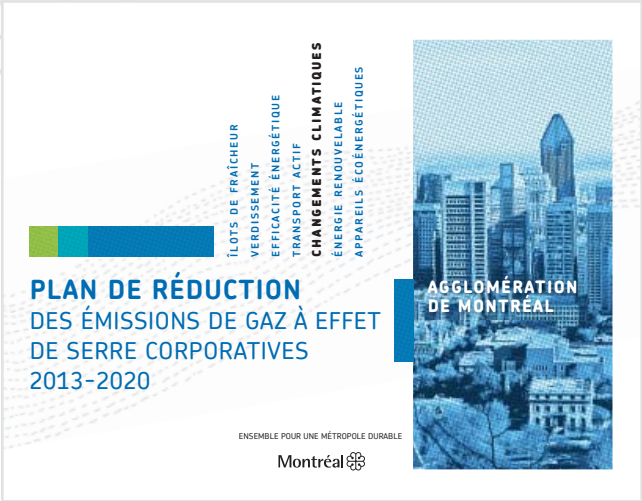
INTRODUCTION

This document presents a follow-up on the Plan de reduction des émissions de gaz à effet de serre corporatives de l'aggomération de Montréal 2013-2020[13] (the Montréal agglomeration's 2013-2020 plan to reduce corporate greenhouse gas emissions; hereafter, the Reduction Plan).

2013-2020 Reduction Plan and reminder of the reduction target

The first reduction plan, 2007-2012, aimed to reduce GHG emissions by 20% as compared to the reference year (2002), a target that was reached in 2010. In 2013, Montréal committed to reducing GHG emissions from municipal activities by 30% for 2020 compared to 2002 levels. Also in 2013, the most recent available inventory showed a reduction gap of 4,224 tonnes of CO_2 equivalent (t CO_2 eq) to reach that target, meaning a 1.5% reduction from 2002.

The Reduction Plan aims to close the gap in order to reach the reduction target of 30%, and even to surpass that goal. The measures it contains add up to reductions of 12,387 t CO_2 eq, or the equivalent of a 4.5% reduction from 2002. These reductions must be accomplished between 2013 and 2020 by the Ville de Montréal's 19 boroughs and some of its central departments as well as by 13 reconstituted cities within the Montréal agglomeration.* This exclusively covers the activities over which municipal organizations hold operational control or in which they can act directly, such as the management of municipal buildings and the vehicle fleet, or drinking water and wastewater treatment.**



Objectives of the progress report

This progress report has two objectives. The first is to draw up a preliminary summary of how the Reduction Plan measures have been implemented. The second is to recommend potential improvements to help fight climate change based on observations made in the first years of the Plan's implementation and during the monitoring phase.

This exercise aims to provide a progress report on the implementation of reduction measures, but not to assess their results. As a consequence, we did not estimate the GHG emissions reductions associated with the measures put into place by the reconstituted cities and the boroughs. We only estimated the reductions associated with the measures put into place by the Ville de Montréal's central departments because these data were available. The most recent data were compiled during the development of the Inventaire 2015 des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal (the 2015 inventory of greenhouse gas emissions for the Montréal agglomeration's municipal activities).[9]

* All the agglomeration's reconstituted cities took part, with the exception of the Ville de Hampstead, which has its own GHG emissions reduction plan, and the Ville de L'Île-Dorval, a municipality that is chiefly home to secondary residences.

** The agglomeration council manages the agglomeration's services (police, fire safety, drinking water production and wastewater treatment, etc.) while the reconstituted cities and boroughs manage their own local services (public works, sports and recreation, urban planning, etc.).

PROGRESS ON THE MEASURES

This section presents the progress made toward implementing the GHG emissions reduction measures from the Reduction Plan. The first part presents a report on the Ville de Montréal's reconstituted cities and boroughs regarding measures that fall under local services. The results are compiled in two tables, the first covering reduction measures for vehicles and equipment and the second covering reduction measures for buildings.

The second part presents a report on the central departments for measures that fall under the agglomeration's services. Since the affairs managed by each of the central departments are different, one section is devoted to each of the departments in question.

Reconstituted cities and boroughs of the Ville de Montréal

The Montréal agglomeration is made up of 16 municipalities, including 15 reconstituted cities (Baie-D'Urfé, Beaconsfield, Côte-Saint-Luc, Dollard-Des Ormeaux, Dorval, Hampstead, Kirkland, L'Île-Dorval (with five permanent residents in 2016[4]), Montréal-Est, Montréal-Ouest, Mont-Royal, Pointe-Claire, Sainte-Anne-de-Bellevue, Senneville and Westmount) and the Ville de Montréal, which is in turn subdivided into 19 boroughs.

© FOTOimage, Shutterstock
Aerial view of the new boulevard Robert-Bourassa and the public green space that has replaced the Bonaventure Expressway

The measures to be put into place by Montréal's reconstituted cities and boroughs aim to reduce GHG emissions from municipal activities by 2,717 t CO_2 eq from 2013 to 2020, meaning 22% of the reductions targeted by the plan (12,387 t CO_2 eq) and a 1% reduction compared to 2002.

As shown in Table 1, the reconstituted cities and boroughs made 281 commitments in the Reduction Plan. In 69% of cases, actions were undertaken or are planned in order to respect these commitments. As well, some put into place measures for which they had not made commitments. Eighty-seven additional measures have thus been implemented since the plan's adoption.

Table 1
Statistics on commitments and accomplishments regarding GHG emissions reduction measures for municipal activities

	Vehicles and equipment	Buildings	Total
Commitments	140	141	281
Commitments for which actions have been implemented or are planned	64%	73%	69%
Measures carried out despite no commitment	35	52	87

Table 2 (see page 8) presents GHG emissions reduction measures for vehicles and motorized equipment. Table 3 (see page 9) presents the measures for buildings. For each measure, we specify which cities and boroughs committed to implementing them and detail their implementation status.

In 2016, the Ville de Montréal placed the management of its vehicle fleet under the governance of the Service du matériel roulant et des ateliers (the rolling stock and municipal shops department, or SMRA). Prior to that, only the vehicles belonging to nine boroughs* had been managed by the SMRA. In Table 2, measures are considered to have been implemented when applied by the SMRA. By that definition, the following measures have been implemented:

- adopt a policy for acquiring vehicles with lower GHG emissions and for avoiding oversizing;
- acquire vehicles and equipment that are electric or that use alternative fuels;
- apply a rigorous preventative maintenance program for vehicles and equipment in order to minimize their fuel consumption.

The Green Vehicle Fund, created in 2012, aimed to encourage the purchase of light hybrid or electric vehicles by paying out a bonus upon purchase, and to discourage the purchase of light vehicles that use gas by imposing a purchase penalty. The fund was abolished when the administrative restructuring centralized vehicle management, since it's now mandatory to purchase hybrid or electric vehicles when acquiring a light vehicle. The Ville de Montréal also aims to replace 230 vehicles of its fleet with battery electric vehicles by 2020.[12] In Table 2, the measure from the Direction du matériel roulant (the rolling stock branch) about taking part in the Green Vehicle Fund is considered to have been implemented by the five boroughs that used the fund before it was abolished.

* Ahuntsic-Cartierville, Côte-des-Neiges–Notre-Dame-de-Grâce, Mercier–Hochelaga-Maisonneuve, Le Plateau-Mont-Royal, Rivière-des-Prairies–Pointe-aux-Trembles, Rosemont–La Petite-Patrie, Le Sud-Ouest, Ville-Marie and Villeray–Saint-Michel–Parc-Extension, meaning the nine boroughs located on the Ville de Montréal territory before the 2002 fusions.

Table 2
GHG emissions reduction measures for vehicles and equipment: commitments and implementation statuses

	Acquiring vehicles and equipment						Driving vehicles and using equipment						Maintaining vehicles and equipment	
	Adopt a policy toward acquiring vehicles with lower GHG emissions and to avoid oversizing		Take part in the Green Vehicle Fund from the Direction du matériel roulant (the rolling stock branch)[1, 2]		Acquire vehicles and equipment that are electric or that use alternative fuels[1]		Monitor the performance criteria for the vehicle fleet so as to implement effective measures to reduce GHG emissions[1]		Adopt eco-driving techniques		Avoid unnecessary idling		Apply a rigorous preventative maintenance program for vehicles and equipment to minimize their fuel consumption[1]	
	Commitment	Status	Commitment	Status	Commitment	Status	Commitment	Status	Commitment	Status	Commitment	Status	Commitment	Status
Ahuntsic-Cartierville		✓	X	✓	X	✓					X	✓		✓
Anjou	X	✓		•		✓					X			✓
Côte-des-Neiges–Notre-Dame-de-Grâce	X	✓	X	✓	X	✓			X		X	✓		✓
Lachine		✓		•	X	✓	X		X		X		X	✓
LaSalle	X	✓		•	X	✓	X				X			✓
Le Plateau-Mont-Royal	X	✓	X	✓	X	✓	X				X	✓	X	✓
Le Sud-Ouest	X	✓		•	X	✓	X		X		X	✓	X	✓
L'Île-Bizard–Sainte-Geneviève	X	✓	X	•	X	✓	X		X		X	✓	X	✓
Mercier–Hochelaga-Maisonneuve	X	✓		•		✓	X						X	✓
Montréal-Nord	X	✓	X	•	X	✓	X	✓	X	✓	X	✓	X	✓
Outremont	X	✓		•	X	✓	X		X		X	✓	X	✓
Pierrefonds-Roxboro		✓		•	X	✓	X	ND	X	ND				✓
Rivière-des-Prairies–Pointe-aux-Trembles	X	✓		•	X	✓	X				X	✓	X	✓
Rosemont–La Petite-Patrie	X	✓		•	X	✓	X	MP	X		X	✓	X	✓
Saint-Laurent	X	✓	X	•	X	✓	X		X	✓	X		X	✓
Saint-Léonard		✓	X	✓	X	✓		✓	X			✓		✓
Verdun		✓		•	X	✓	X		X		X		X	✓
Ville-Marie	X	✓		•	X	✓		✓	X		X	✓		✓
Villeray–Saint-Michel–Parc-Extension	X	✓	X	✓	X	✓	X		X			✓	X	✓
Baie-D'Urfé			•	•	X									
Beaconsfield	X	✓	•	•	X	MP	X		X	✓	X	✓		✓
Côte-Saint-Luc			•	•									X	ND
Dollard-Des Ormeaux	X	✓	•	•			X	✓	X	✓	X	✓		✓
Dorval			•	•	X	✓		✓			X			✓
Kirkland	X	✓	•	•	X	✓	X	✓	X	MP	X	✓	X	✓
Montréal-Est	X		•	•				MP			X		X	✓
Montréal-Ouest	X		•	•					X				X	
Mont-Royal		••	•	•	X	✓		✓	X			✓	X	✓
Pointe-Claire	X	••	•	•	X	MP	X	✓	X	✓	X		X	✓
Senneville			•	•			X	ND						
Sainte-Anne-de-Bellevue	X	✓	•	•	X	✓	X		X		X	✓	X	✓
Westmount	X		•	•	X		X		X	✓	X		X	✓

X Commitment from the 2013-2020 Reduction Plan

✓ Measure implemented (occasionally or continuously)

MP Measure in process (planned actions or intermediate actions carried out)

ND Data not available

• Not applicable, as the action does not concern the administration

•• No formal policy adopted, but eco-friendly criteria are systematically taken into account when purchasing vehicles and equipment

1. The authority to implement this measure was transferred from the boroughs to the Ville de Montréal under its Service du matériel roulant et des ateliers (the rolling stock and municipal shops department) when the administrative restructuring centralized vehicle management.
2. The Ville de Montréal's Green Vehicle Fund was abolished when the administrative restructuring centralized vehicle management for the Ville de Montréal under the Service du matériel roulant et des ateliers (the rolling stock and municipal shops department).

Table 3
GHG emissions reduction measures for buildings: commitments and implementation statuses

	Optimizing buildings' energy consumption														Using energy sources with low GHG emissions			
	Assign a manager the responsibility for monitoring buildings' energy consumption		Put into place a policy and action plan for the efficient management of buildings' energy consumption		Review electromechanical systems; adapt their operation to their conditions of use (retrocommissioning)		Improve the waterproofing and insulation of building envelopes		Optimize spaces that are unoccupied or poorly occupied		Bring arena refrigeration systems up to standard while optimizing their energy efficiency		Adopt energy efficiency criteria for new buildings and major renovations		Replace fuel oil with an energy source that has low GHG emissions		Carry out renewable energy projects	
	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut	Commitment	Statut
Ahuntsic-Cartierville	X	✓		✓		✓						✓		✓	X	✓	X	✓
Anjou					X		X					MP			•	•		
Côte-des-Neiges–Notre-Dame-de-Grâce		✓	X	✓		✓	X	✓		✓	X	✓	X	✓	X	✓	X	✓
Lachine	X		X		X		X	✓	X		X	✓	X	✓	•	•	X	
LaSalle	X	✓	X	✓	X	✓	X	✓	X		X	✓	X	✓	•	•		MP
Le Plateau-Mont-Royal		✓		✓		✓	X	✓	X		X	✓	X	✓		✓	X	✓
Le Sud-Ouest	X	✓		✓			X	✓	X	✓	X	✓	X	✓	X	✓		
L'Île-Bizard–Sainte-Geneviève	X		X		X		X		X		•	•			X			
Mercier–Hochelaga-Maisonneuve		✓		✓		✓		✓			X	✓	X	✓	X	✓		✓
Montréal-Nord	X				X		X	MP				✓	X		X	✓		
Outremont	X		X		X		X	✓	X	✓	X	✓	X		X	✓	X	
Pierrefonds-Roxboro													X					
Rivière-des-Prairies–Pointe-aux-Trembles	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	•	•	X	✓
Rosemont–La Petite-Patrie	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	MP
Saint-Laurent	X	MP	X	MP	X	MP	X	✓	X		X	MP	X	✓	X	✓	X	✓
Saint-Léonard		✓		✓	X	MP		✓			X	✓	X	✓	•	•		
Verdun		✓			X		X					✓		✓	X			✓
Ville-Marie	X	✓		✓		✓	X						X	✓	•	•		
Villeray–Saint-Michel–Parc-Extension	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓
Baie-D'Urfé													X		•	•		
Beaconsfield				✓		✓		✓			X	✓			X	✓		
Côte-Saint-Luc							X								X	ND	X	ND
Dollard-Des Ormeaux	X	✓	X	✓	X	✓	X	✓			X	✓			•	•	X	MP
Dorval						✓					X			✓				✓
Kirkland		✓		✓				✓	X	✓	X	MP		MP	•	•		MP
Montréal-Est						✓		MP	X	MP		MP	X	✓	•	•		
Montréal-Ouest	X	✓																
Mont-Royal		✓		✓		✓		✓		✓		✓	X	✓	X	MP		✓
Pointe-Claire	X	✓	X	MP	X	✓	X	✓	X	✓	X	MP	X	✓	X	✓		MP
Senneville																	X	ND
Sainte-Anne-de-Bellevue			X	✓				MP		MP	•	•			X	✓		✓
Westmount	X				X		X	✓	X		X	✓						

X Commitment from the 2013-2020 Reduction Plan

✓ Measure implemented (occasionally or continuously)

MP Measure in process (planned actions or intermediate actions carried out)

ND Data not available

• Not applicable, as the action does not concern the administration

•• No formal policy adopted, but eco-friendly criteria are systematically taken into account when purchasing vehicles and equipment

Parcours Gouin reception pavilion
LEED Gold Certification
Borough of Ahuntsic-Cartierville

Good practices for reducing GHG emissions in the boroughs

Various Ville de Montréal boroughs have put into place useful practices and projects to reduce GHG emissions. This section presents a few inspiring examples. This is not an exhaustive list, but instead features certain examples that were brought to our attention by means of the Reduction Plan progress report questionnaires filled out by the boroughs.

Ahuntsic-Cartierville: First net zero energy building in Montréal

On June 8, 2017, the Ahuntsic-Cartierville borough inaugurated the Montréal agglomeration's first net zero energy building, a building that should also obtain LEED Gold certification: the Parcours Gouin reception pavilion, a construction with large windows that look out onto Rivière des Prairies located in the heart of Parc Basile-Routhier.

Over one year, a net zero energy building produces as much energy as it consumes. To achieve this, the building was designed to reduce its energy needs as much as possible thanks to, among other things, a high-performance thermal envelope, heat recovery and motion detectors, equipment with low energy consumption, and geothermal energy. As well, solar panels were installed on a multipurpose shelter in order to meet any remaining energy needs.

The elements that make it possible to limit the building's energy consumption are presented inside the building. This meets one of the borough's objectives, which is to help citizens learn about new environmental technologies to better manage our resources. An organization dedicated to promoting the Parcours Gouin's activities has its offices inside the building. In addition to its role in educating about good environmental practices, it ensures that the net zero objective is maintained. The building is also home to a café, a multipurpose room and equipment rental rooms.

Côte-des-Neiges–Notre-Dame-de-Grâce: Optimizing space occupancy with an annual update of occupancy plans

For more than a decade, building managers in the Côte-des-Neiges–Notre-Dame-de-Grâce borough have carefully updated building occupancy plans. All the important information is included in the update, such as wall dimensions, along with information about any physical changes made to occupied spaces in the previous year. To make sure the plans are accurate, the buildings' occupants and managers check and sign them.

The plans are then sent to the Service de la gestion et de la planification immobilière (the property planning and management department, or SGPI). The plan updates, including the buildings' surface areas, are used for budget revisions, lease allocations and building funds as well as occupancy agreements between the borough and its partners (community groups and organizations). At the end of each project, the borough also sends the SGPI as-built plans for all the buildings that have undergone changes, redesigns and renovations.

These measures, simple to apply, make it possible to boost efficiency and save time in all sorts of situations–for example, when purchasing furniture of the right size for the room it will occupy, or when planning renovations or optimizing space occupancy when a work team grows or when large pieces of new equipment need to be purchased. In the medium term, space occupancy optimization makes it possible to avoid increasing GHG emissions by minimizing the area that's used to meet the needs that arise. This in turn helps prevent increases in the number of rooms and buildings, and may in fact reduce that number.

Plateau-Mont-Royal: Responsible procurement policy

On April 4, 2017, the Plateau-Mont-Royal borough adopted a Politique d'approvisionnement responsable (responsible procurement policy)[15], one of the commitments in its local sustainable development plan 2016-2020. This document aims to frame the supply process in such a way as to acquire goods and services that meet the borough's needs while respecting environmental, social and economic criteria. The policy's objective is to limit the borough's ecological footprint, in particular by reducing its needs at the source and encouraging the purchase of environmentally friendly products, which reduces the GHG emissions associated with the borough's activities. It also aims to encourage social reintegration, local work and social equity.

The policy was implemented in all divisions throughout 2017. Support is provided to employees who are responsible for purchasing, and a resource and reference directory will be created. Monitoring indicators will be developed. An assessment is planned for a year and a half after the policy is adopted. It will also be reassessed every two years to evaluate the actions undertaken, enhance them, and set new and more ambitious targets as part of a continuous improvement process.

Saint-Laurent: Local plan to reduce greenhouse gas emissions

The Saint-Laurent administration has long committed to reducing its environmental impacts and implementing sustainable development. For example, in August 2013, Saint-Laurent was the first municipal body in Québec to obtain ISO 14001 certification for its environmental management system; one of the system's objectives is to reduce airborne emissions.

In 2017, in its first Plan local de réduction des émissions de gaz à effet de serre 2016-2020 (local plan to reduce greenhouse gas emissions 2016-2020)[14], the borough listed 20 actions to reduce its corporate emissions. It also set out thirty GHG emissions reduction actions for the community. Each of the actions comes with precise objectives that line up with the objectives in the Montréal agglomeration's Reduction Plan, a division in charge, a timetable, and, when necessary, budgets for expenses and buildings. These various aspects are compiled in a monitoring chart to make sure they are accomplished and to ensure accountability.

Saint-Léonard: Action plan to reduce the energy consumption of buildings

In 2015, the Ville de Montréal's auditor general recommended that the boroughs resulting from Montréal's former suburbs (before the municipal fusions of 2002) should equip themselves with measurable objectives, action plans and accountability mechanisms with a view to optimizing energy costs and reducing GHG emissions related to the buildings under their responsibility. In response, the Saint-Léonard borough developed the Plan d'action 2016-2018 pour la reduction de la consummation d'énergie des bâtiments (action plan to reduce the energy consumption of buildings 2016-2018). For each building, the plan lists their area, their energy consumption and intensity, the energy efficiency actions taken in the past and the ones that should be put into place annually from 2016 to 2018. The objective is to reduce buildings' consumption by 5%. At the start of each financial year, it is updated and submitted to the borough's director.

As well, for the past twenty years, the borough has compiled information about energy consumption for each of its buildings in a centralized way using a specialized software program. This has helped them create a database which allows them to analyze buildings' energy performance and detect anomalies.

Good practices to reduce GHG emissions in the reconstituted cities

Some of the Montréal agglomeration's reconstituted cities have implemented interesting practices and projects to reduce GHG emissions. This section sets out a few inspiring examples. It is not an exhaustive list, but rather a list of certain examples that came to our attention through the Reduction Plan progress report questionnaires filled out by the reconstituted cities.

Beaconsfield: Eco-driving classes for all machine operators and vehicle drivers

In 2012, the Ville de Beaconsfield provided eco-driving classes to all its employees who operate machinery or drive vehicles. Since then, the training has been provided to new employees and a refresher training is given under direct management of the city each year.

Eco-driving consists of a set of driving techniques that help reduce the quantity of fuel each vehicle consumes. This reduction can be as high as 15%.[2] In addition to reducing GHG emissions, improving air quality and reducing fuel costs, the practice of eco-driving techniques also improves travel safety.

The basic training takes one day, and the refresher training takes a half-day. Instructors teach eco-driving techniques and raise awareness to help people avoid idling engines. For the city, this training is important, as it helps prepare employees for winter driving. And since the training and refresher are each pretty short and the refresher is given under the city's direct management, the benefits observed more than justify the costs.

Dollard-Des Ormeaux: SAAQ road vehicle inspection agent

Certain vehicles, such as heavy vehicles, must go through a mandatory mechanical check every six or 12 months. At this check, a mechanic verifies that the vehicle's main components are in good order. This inspection must be performed by a company or organization that is a road vehicle inspection agent for the Société d'assurance automobile du Québec (Québec's automobile insurance board, or SAAQ).

Since it is an SAAQ agent, the Ville de Dollard-Des Ormeaux no longer needs to send its vehicles out for inspection. This helps them save a great deal of time by avoiding multiple back-and-forths for inspections and to have the required repairs checked. The inspections and repairs are carried out during the night shift, which means the trucks are operational for the next day shift.

Dollard-Des Ormeaux: Centralized monitoring of city buildings' energy consumption

In 2014, the Ville de Dollard-Des Ormeaux acquired a software program to monitor all the city buildings' consumption of electricity and natural gas. The software automatically records Gaz Métro invoices and imports consumption files from Hydro-Québec. In doing this, the city can obtain a summary at any time of their buildings' consumption and analyze it by building, group of buildings or type of buildings. This also helps ensure that Hydro-Québec has applied the correct pricing.

The software's implementation and annual use costs depend on the number of electricity meters. The software helps target energy consumption reduction targets, which makes the investment profitable. As well, it helps quickly verify whether the solutions that have been employed are having the desired effect.

Kirkland: Annual audit of all municipal buildings

Every year, the Ville de Kirkland carries out an exhaustive audit of all its buildings. The audit looks at the following aspects: cleanliness, health and safety, electromechanical elements, building architectural elements, and other points observed. A standardized form must be filled out for each building and a number of photos are taken. Even if they don't appear on the form, any aspect requiring correction is noted.

For example, based on observations made in the summer of 2017, the door joints and door closer of a municipal chalet were repaired.

As well, the city acquired a thermographic camera. It's used during winter inspections to detect areas where heat is escaping and to take corrective measures in order to reduce energy consumption.

Pointe-Claire: Mandatory eco-driving training for contractors that provide waste collection and transportation services

The Ville de Pointe-Claire added a clause into its call for bids for providing collection and transportation services for garbage, bulky waste, recycling and organic waste, which requires that the successful bidder's drivers undertake eco-driving training. The attestations showing the drivers have taken recognized training are sent to the city. At the last call for bids, all the applicants met this requirement.

Rio Tinto Alcan Planetarium
LEED Platinum certification
Space for Life department

Central departments

The Ville de Montréal's central departments are putting measures into place to reduce the GHG emissions of municipal activities by 9,670 t CO_2 eq from 2013 to 2020, or 78% of the reductions targeted by the Reduction Plan (12,387 t CO_2 eq) and a 3.5% reduction from 2002.

Table 4 presents the central departments' GHG emissions reduction measures, and, as appropriate, the departments involved. The measures and targets presented here are taken from the Reduction Plan. For each measure, we present the target and its results.

The most recent updated data about the central departments' GHG emissions are from 2015, published in the Inventaire 2015 des émissions de gaz à effet de serre des activités municipales de l'agglomération de Montréal (the 2015 inventory of greenhouse gas emissions for the Montréal agglomeration's municipal activities).[9] The summary for central departments was established based on the results of this inventory and its data, as well as the actions undertaken up to 2015 in order to meet the 2020 targets. These results are then briefly discussed for each department and branch. A number of good practices are also presented.

Table 4
Progress toward implementing measures per department to reduce the GHG emissions of municipal activities for 2020 from 2010 (results in 2015 as compared to 2010)

Administrative unit	Measure	2020 target	Result	Other 2020 target	Result
Service de l'eau Direction de l'eau potable (water department, drinking water branch)	Reduce the production of drinking water	Marginal*	-372 t CO_2 eq	-20% of drinking water produced	-8%
Service de l'eau Direction de l'épuration des eaux usées (water department, wastewater treatment branch)	Conduct trials to optimize gas post-combustion control at the wastewater treatment plant	Indeterminate	Not quantified	1 trial carried out	Accomplished
Service de l'environnement Direction de la gestion des matières résiduelles (environment department, residual materials management branch)	Replace the open flares at the Saint-Michel Environmental Complex (CESM)	-470 t CO_2 eq	To be determined after one year of operation**	1 enclosed flare in operation	Accomplished
Service de l'Espace pour la vie (Space for Life department)	Implement an energy savings program	-1,200 t CO_2 eq	-910 t CO_2 eq	–	–
Service de la gestion et de la planification immobilière (property planning and management department)	Implement an energy savings program for 2013-2015 and other projects	-8,000 t CO_2 eq	-225 t CO_2 eq	–	–

* Reducing the volume of drinking water produced in turn reduces electricity consumption and GHG emissions. However, the addition of water disinfection processes that's currently underway increases electricity consumption, and more or less cancels out the reduction obtained by reducing the volume of water produced.

** Since the new enclosed flare began operating in November 2015, it's not possible to determine its impact on GHG emissions for 2015. The variation of GHG emissions compared to the reference year can be calculated when the enclosed flare has been in operation for one full year.

Service de l'eau

Direction de l'eau potable

Drinking water production dropped 8% in 2015 from 2010. To achieve this, the Service de l'eau (water department) renovated primary and secondary water lines and made a number of repairs. Non-apparent leaks were detected and the information was transmitted to the boroughs for repair purposes.[6] By reducing drinking water losses, they were able to reduce the quantity of drinking water produced and related GHG emissions.

Although the decreased quantity of drinking water produced in turn reduced the electricity demand, it was estimated that this gain would be cancelled out by improvements to water treatment processes. Additions were carried out at the Atwater plant (disinfection by ozonation and ultraviolet rays) and the Charles-J.-Des Baillets plant (disinfection by ultraviolet rays), which increase their energy consumption. An ozonation system is planned for implementation at the Pierrefonds plant for 2021 at the earliest. This process will also increase its energy consumption.

Other actions were implemented to reduce GHG emissions, such as the use of LED light bulbs when replacing lights, the use of bicycles for internal transportation, and awareness-raising to prevent vehicle engine idling. A software program is currently being installed to identify ways to reduce energy expenditures, and GHG emissions as a result. This program will, among other things, make it possible to evaluate and optimize energy expenditures. Consequently, the Direction de l'eau potable (drinking water branch) will be able to revise its operational procedures and work methods or make eco-friendly energy choices when replacing equipment. Lastly, the administrative building being constructed on the Atwater drinking water complex site is aiming to obtain a LEED Gold certification.

While the reduction target for drinking water production for 2020 is not yet reached, the efforts planned by the branch to reduce the quantity of drinking water to produce will allow it to achieve the objective.

Service de l'eau

Direction de l'épuration des eaux usées

Sludge incineration is the procedure that generates the great majority of GHG emissions from activities related to wastewater treatment. One of the principal GHGs emitted with sludge incineration is nitrous oxide (N_2O), whose global warming potential is equivalent to 298 times that of carbon dioxide (CO_2). Optimization trials for the gas post-combustion control, which aim to reduce N_2O emissions, were held in 2012 by the Direction de l'épuration des eaux usées (wastewater treatment branch). However, these led to an increased consumption of natural gas, which in turn increased operating costs. Since the trials were brief, it is difficult to determine whether the reduction of N_2O emissions could be repeated under a range of operating conditions, particularly because sludge composition varies seasonally. Note that the changes made to the incinerator burners in 2005 helped drastically reduce the quantity of natural gas required for gas post-combustion.[6]

To reduce the GHG emissions from municipal activities, further actions will be taken by the Service de l'eau (water department), considering that water treatment is the greatest source of GHGs among all municipal activities (33%). For example, a draft feasibility study on solutions to replace multiple-hearth incinerators is underway, and one of the evaluation criteria for replacement solutions is the minimization of GHG emissions. As such, the reduction of GHG emissions will be a major factor in the decision-making process leading to the replacement of multiple-hearth incinerators.

Service de l'environnement

Direction de la gestion des matières résiduelles

The Direction de la gestion des matières résiduelles (residual materials management branch) is responsible for the capture and combustion of the biogases emitted by the former Saint-Michel Environmental Complex (CESM) landfill site. The biogases are generally converted in a cogeneration plant that produces electricity and heat (in the form of hot water). Sometimes, the plant is unable to convert the biogas, for instance during certain maintenance activities or in cases of major breakdown. When this happens, the biogases are directed to a flare system, where they are burned.

Since November 2015, the efficiency of the CESM's converted flares has been 99.8%. The flares used before had a 95% efficiency. The GHG reductions achieved by this measure could be evaluated when we prepare the GHG emissions inventory for municipal activities in 2016. However, we can predict that the GHG emissions reduction target for the Service de l'environnement (environment department) will be reached in 2020 thanks to this change.

Service de l'Espace pour la vie

In 2015, the reduction of GHG emissions compared to 2010 was 910 t CO_2 eq. The energy savings program put into place by Espace pour la vie (or Space for Life) improved the eco-friendly energy performance of the Biodôme, the Insectarium and the Jardin botanique by using renewable energies[8] and helped reduce GHG emissions. Through the program, geothermal energy systems were installed at the Biodôme and the Insectarium. Other measures completed the program, such as optimizing ventilation systems, modernizing lighting, recovering heat, installing boilers with better performance ratings, and installing solar reflection screens to limit heat loss.[7] The implementation work for these initiatives ended in the fall of 2011.

The Planetarium building, opened in April 2013, obtained LEED Platinum Certification in 2015. This is the highest level of distinction in the LEED system for sustainable buildings, which aims to improve occupants' well-being and buildings' environmental and economic performance.[11] The Planetarium's energy consumption system works in synergy with that of the Biodôme. Lighting optimization, high-energy-efficiency bulbs and motion detectors also help reduce their energy consumption and the GHG emissions attributed to it. Note that 2015 featured 4,301 heating degree days (HDD)* while 2010 had 3,851.[1] While weather conditions did increase heating needs in 2015, the improvements made to the buildings nonetheless reduced GHG emissions.

The actions undertaken by Space for Life facilitate the reduction of GHG emissions and should make it possible to reach the target in 2020.

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* An HDD is counted for each degree whose average daily temperature is below 18 °C. If the temperature were 18 °C or above, the number of degree days would be zero. For example, a day with an average temperature of 15.5 °C would have 2.5 HDDs and a day with an average temperature of 20.5 °C would have zero HDDs. The sum of HDDs gives an idea of how hard a winter is. HDDs are used mainly to estimate buildings' heating needs.

Service de la gestion et de la planification immobilière (SGPI)

The Programme d'économie d'énergie 2013-2015 (2013-2015 energy saving program) and the other measures target buildings under the responsibility of the Service de la gestion et de la planification immobilière (property planning and management department, or SGPI, meaning the central departments' buildings, except for those of the Service de l'eau (water department), and the buildings of the nine boroughs descended from the former Ville de Montréal (Ahuntsic-Cartierville, Côte-des-Neiges–Notre-Dame-de-Grâce, Mercier–Hochelaga-Maisonneuve, Plateau-Mont-Royal, Rivière-des-Prairies–Pointe-aux-Trembles, Rosemont–La Petite-Patrie, Le Sud-Ouest, Verdun, Ville-Marie and Villeray–Saint-Michel–Parc-Extension).

According to energy consumption data provided by the SGPI, GHG emissions for the buildings under their responsibility dropped by only 225 t CO_2. eq in 2015 compared to 2010. This is far below the reduction target of 8,000 t CO_2 eq set for the SGPI in the Reduction Plan. The chances are slim that this target can be reached by 2020. As well, an unfavourable result here will compromise the achievement of the Reduction Plan's overall objective of -12,387 t CO_2 eq, since this target counts for two-thirds of the reductions set out in the plan.

Note that for the same period, the area of the buildings managed by the SGPI increased by 10%, but GHG emissions remained relatively constant. This means the actions undertaken still helped reduce the intensity of GHG emissions* by 10%, from 0.026 t CO_2 eq/m^2 to 0.023 t CO_2 eq/m^2.

In order to reach its GHG reduction targets, the Ville de Montréal will need to include GHG emissions reduction in its criteria for space acquisition, rental and use optimization. The failure to reach the target can be partly explained by the acquisition and rental of additional buildings. We estimate that a further reduction of 2,300 t CO_2 eq, or nearly 30% of the SGPI's reduction target and nearly 20% of the agglomeration's total reduction target, could have been reached if the surface area of the buildings managed by the SGPI had remained stable from 2010 to 2015.

Among the measures that helped reduce the intensity of GHG emissions, let's note that a number of municipal buildings under the SGPI's management obtained LEED or BOMA BEST certification between 2010 and 2015. As well, 14 buildings under the SGPI's responsibility stopped using fuel oil. Other renovations were undertaken toward energy efficiency, such as building envelope repairs, boiler room modernization, the installation of geothermal energy systems, heat recovery ventilation, and the elimination of hydrochlorofluorocarbons in arenas. Lastly, the Montréal soccer stadium located in Parc Frédéric-Back, which began operating in 2015, has a geothermal energy system.

Since the end of the Programme d'économie d'énergie 2013-2015 (2013-2015 energy saving program) further actions toward the program's objectives have been undertaken, or will be in the future. Other LEED and BOMA BEST buildings are planned, other fuel oil systems will be converted to natural gas or electrical systems, and the SGPI will add geothermal energy systems to some municipal buildings under its responsibility. A new action plan for energy savings is currently being developed.

* Total GHG emissions in relation to building surface area.

Bibliothèque du Boisé
LEED Platinum certification
Borough of Saint-Laurent

RECOMMENDATIONS

This Reduction Plan progress report includes a number of observations about the Plan's implementation and progress as well as on the accountability process. Based on these observations, we have formulated three recommendations to help improve GHG emissions reduction and monitoring for the Montréal agglomeration's municipal activities. They are presented below.

Recommendation 1

Put into place an annual declaration process for, among other things, the consumption of combustibles, electricity and halocarbons, as well as reduction measures put into place in the Ville de Montréal's boroughs and departments and in the reconstituted cities.

Currently, it can be a complex task to obtain information on the energy consumption of buildings and vehicles from the Montréal agglomeration's various administrative units. This state of affairs was noted by the Ville de Montréal's auditor general in their 2015 annual report following an audit of buildings' energy management.[5]

The data used for this progress report come from forms filled out by the various administrative units and from a few telephone interviews carried out with certain units. It is not a systematic process where the people responsible for implementing the various measures are designated, or where the information to provide is pre-set and clear, or where follow-up is conducted in a regular and predictable way. The Ville should put into place an annual declaration process, among other things for the consumption of combustibles, electricity and halocarbons, as well as regarding the reduction measures implemented. This would help produce a report that presents data with a higher level of trustworthiness and gathered in a much more efficient manner.

Recommendation 2

Revise the Montréal agglomeration's 2013-2020 plan to reduce corporate greenhouse gas emissions by linking it with new reduction objectives, targeting the most effective measures and using SMART targets and indicators*

Since the publication of the Reduction Plan, the Montréal administration has made new commitments, particularly within the Declaration of the Climate Summit for Local Leaders held in December 2015 in Paris as part of COP21 (the 21st annual Conference of Parties, also known as the Paris Climate Conference). These commitments include setting an intermediate reduction objective that's higher than national objectives for 2030, and reducing GHG emissions by 80% for 2050. To take these new objectives into account, facilitate the implementation of Recommendation 1 and simplify the hierarchy of actions to undertake, a revision of the Reduction Plan appears necessary. This update will also provide an opportunity to propose a more restricted number of measures, so as to prioritize the most effective quantifiable measures.

* Specific, measurable, achievable, realistic and time-bound.

Recommendation 3

Use the new recommendations from the Office de la consultation publique de Montréal (Montréal's public consultation office, or OCPM) and the Montréal agglomeration's committees, when pertinent and applicable, to inform our thinking when listing measures to add when we revise the Montréal agglomeration's 2013-2020 corporate greenhouse gas emissions reduction plan.

Three research and public consultation reports were published after the Reduction Plan was released. They include recommendations for the reduction of GHG emissions for municipal activities. These recommendations need to be included in the Plan. The reports are as follows:

- La réduction de la dépendance de Montréal aux énergies fossiles[3] (on reducing Montréal's dependency on fossil fuels) from the OCPM, released in 2016;
- Mesures administratives, fiscales ou incitatives en vue d'accroître l'utilisation du transport collectif et actif par les employés de la Ville de Montréal, pour les déplacements domicile-travail[17] (on administrative, fiscal and incentivizing measures to increase Ville de Montréal employees' use of public and active transportation) from the Commission sur le transport et les travaux publics (committee on transportation and public works), released in 2016;
- L'aménagement des bâtiments dans une perspective de développement durable sur le territoire de la Ville de Montréal[10] (on building design from a sustainable development perspective on the Ville de Montréal territory) from the Ville de Montréal's Commission sur l'eau, l'environnement, le développement durable et les grands parcs (committee on water, the environment, sustainable development and large parks), released in 2017.

REFERENCES

1. Government of Canada. Daily Data Report for February 2013 (Montréal/Pierre Elliott Trudeau International Airport). Accessed in October 2017 at climat.meteo.gc.ca/climate_data/daily_data_e.html?Prov=QC&StationID=5415&timeframe=2&type=bar&MeasTypeID=heatingdegreedays&Day=1&Year=2015&Month=1&StartYear=1840&EndYear=2017

2. PIT Group. Training. Accessed in November 2017 at thepitgroup.com/expertise/training/

3. Office de consultation publique de Montréal (2016). *Rapport de consultation publique, Réduction de la dépendance de Montréal aux énergies fossiles*. Accessed at ocpm.qc.ca/sites/ocpm.qc.ca/files/pdf/P80/rapport-energies-fossiles.pdf

4. Statistics Canada. Census Profile, 2016 Census. Updated November 3, 2017. Accessed at www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E

5. Auditor General of the Ville de Montréal (2016). Report of the Auditor General of the Ville de Montréal to the City Council and to the Urban Agglomeration Council - For the Year Ended December 31, 2015. Accessed at www.bvgmtl.ca/wp-content/uploads/2016/05/2015AR_FullVersion1.pdf

6. Ville de Montréal (2016). *Bilan 2015. Usage de l'eau potable*, a production of the Service de l'eau. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/eau_fr/media/documents/bilan%20eau%202015%20-%20final.pdf

7. Ville de Montréal. Sustainable Development: Energy Saving Program, a production of the Service espace pour la vie. Accessed in October 2017 at espacepourlavie.ca/en/energy-saving-program

8. Ville de Montréal (2013). *Espace pour la vie – Rapport de développement durable 2011-2013*, a production of the Service espace pour la vie. Accessed at espacepourlavie.ca/sites/espacepourlavie.ca/files/rapport_dd_2011-2013_lr.pdf

9. Ville de Montréal (2017). *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. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/Invent_GES_ActMuni_2015_VF.pdf

10. Ville de Montréal (2017). *L'aménagement des bâtiments dans une perspective de développement durable sur le territoire de la Ville de Montréal – Rapport et recommandations*. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/commissions_perm_v2_fr/media/documents/rapport_cm_20170424.pdf

11. Ville de Montréal (2015, October 15). The Planétarium Rio Tinto Alcan receives the LEED Platinum certification [Blog post]. Accessed in October 2017 at m.espacepourlavie.ca/blogue/en/planetarium-rio-tinto-alcan-receives-leed-platinum-certification

12. Ville de Montréal (2016). *Sustainable Montréal 2016-2020 Plan*, a publication of the Bureau du développement durable. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/d_durable_en/media/documents/plan_de_dd_en_lr.pdf

13. Ville de Montréal (2013). *Plan de réduction des émissions de gaz à effet de serre corporatives 2013-2020*, a publication of the Service de l'environnement. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/enviro_fr/media/documents/plan_corporatif_2013-2020_vf.pdf

14. Ville de Montréal (2017). *Plan local de réduction des émissions de GES 2016-2020*, a publication of the borough of Saint-Laurent. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/arrond_sla_fr/media/documents/plan_local_ges_20170808.pdf

15. Ville de Montréal (2017). *Politique d'approvisionnement responsable*, a publication of the borough of Plateau-Mont-Royal. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/arrond_pmr_fr/media/documents/plateau_approv%20responsable_final.pdf

16. Ville de Montréal. Population totale, a publication of Montréal en Statistiques. Accessed at ville.montreal.qc.ca/portal/page?_pageid=6897,67887840&_dad=portal&_schema=PORTAL

17. Ville de Montréal (2016). *Mesures administratives, fiscales ou incitatives en vue d'accroître l'utilisation du transport collectif et actif par les employés de la Ville de Montréal, pour les déplacements domicile-travail – Rapport et recommandation*. Accessed at ville.montreal.qc.ca/pls/portal/docs/page/commisions_perm_v2_fr/media/documents/rapport_20160620_0.pdf

ville.montreal.qc.ca/changementsclimatiques