



# QUÉBEC IN ACTION GREENER BY 2020

2013-2020

## Climate Change Action plan

PHASE 1

 A PLAN FOR  
QUÉBEC

Québec 





## Message from the Premier

With the launching of the 2013-2020 Climate Change Action Plan, Québec is reiterating its intention to remain a leader in North America.

Our determination to pursue our initiatives hinges on a deep-seated conviction that the fight against climate change is not only necessary to ensure our well-being and that of future generations but is also an opportunity for economic growth. More than a challenge to be met, the fight affords us an outstanding opportunity to redirect our economy toward clean energy and technologies, reduce our dependence on fossil energy, and ensure that Quebecers enjoy a healthy, prosperous future.

### Confirmed leadership

Québec began the shift to a greener economy several years ago. The adoption in 2006 of an initial structuring plan, the implementation of the Québec Public Transit Policy and the Québec Energy Strategy 2006-2015, and the establishment of the Green Fund marked a genuine turning point in our fight against climate change. Today, Québec has one of North America's best per capita GHG emission rates. Innovative measures and alliances established with other governments active in the field have earned Québec recognition for its leadership, both in Canada and on the international scene.

### Québec in action

We have adopted for 2020 an ambitious GHG emission reduction target of 20% below the 1990 level and we intend to maintain our commitment in the long term.

The 2013-2020 Climate Change Action Plan is the cornerstone of our strategic approach in the fight against climate change, to which other government initiatives are being added. Accordingly, our choices in the realm of sustainable mobility, land-use planning and energy are also at the forefront of our perspective of Québec society's development. They must contribute significantly to the attainment of our climate change objectives.

For this reason, to ensure an integrated, coherent approach throughout the public administration, the action plan will be reinforced in 2015 bearing in mind the new initiatives proposed in these fields. The action plan is intended to be flexible and focuses resolutely on 2020. It will also change in light of the development of climate science, new technologies and Québec's progress in the attainment of its objectives.

We have decided to establish a carbon market that will enable us both to financially support our ambitions and ensure that the carbon cost is systematically recognized in our individual, organizational and collective choices.

### A plan for all Quebecers

The challenge that climate change poses will make it necessary to review certain practices and ways of doing things. The Québec government knows that it can rely on the vitality of all Quebecers, businesses and organizations in Québec society to support it in the shift that it has undertaken toward a green, prosperous, sustainable economy.

Jean Charest  
Premier





## Message from the Minister

Our government is proud to present the 2013-2020 Climate Change Action Plan, which will enable Québec to pursue its shift toward a green economy and to strengthen the resilience of Québec society to climate change impacts.

### Build on past achievements

Through the efforts of the government and society as a whole, in 2009,

Québec's greenhouse gas (GHG) emissions stood at 2.5% below the 1990 level. While this achievement is remarkable, it also fully reveals the challenge that subsequently awaits us.

Québec has targeted for 2020 a GHG emission reduction of 20% below the 1990 level, an ambitious target for a government nearly half of whose energy portfolio is already made up of renewable energies. We have chosen the target for the numerous benefits that will stem from the initiatives implemented to achieve it.

### Reduce and adapt

Our initiatives focus primarily on the transportation, industry and building sectors because they account for the biggest portion of our emissions inventory and also have the biggest potential for reduction. In Québec, the attainment of the most significant gains depends on the enhancement of energy efficiency, reliance on clean energy sources and changes in our behaviour and ways of doing things. The first phase of the action plan is our roadmap for the coming years. Other Québec policies that have a major impact on climate change will round it out.

At the same time as we make the requisite effort to control and reduce GHG emissions, the action plan proposes government action that will protect even more the natural and built environment and contribute to reducing the vulnerability of current and future generations to climate change impacts.

### An open-ended, entirely self-financing plan

The recently established GHG emission cap-and-trade system will give us the means to act. The sale of emission allowances to the businesses targeted, the main source of funding for the plan, will be rounded out by the extension until 2014 of the levy on fossil fuels. Having adopted a cautious approach to estimate the revenue available, we can rely with assurance on nearly \$2.7 billion over the next eight years.

Starting in 2013, major industrial emitters will be subject to the system and, as of 2015, the transportation and building sectors will also be included. The second phase of the 2013-2020 Climate Change Action Plan will be launched in light of the revenue that the carbon market generates, the progress of our initiatives, and new policy directions governing sustainable mobility, land-use planning and energy.

### All Quebecers in action

We are all concerned by the fight against climate change and the choice to act is ours. We are seeking easier access to mass transit and active transportation, more energy-efficient buildings, improved air quality and communities better prepared for changing climatic conditions. On the strength of Quebecers' support, through its visionary climate change action plan, Québec is moving toward a greener, more responsible world.

Pierre Arcand  
Minister of Sustainable Development, Environment and Parks



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## oreword

This action plan is the cornerstone of Québec's strategic approach to climate change. It presents an array of tools that will contribute to the attainment of Québec's objectives with respect to greenhouse gas (GHG) emission reduction and adaptation to climate change impacts. The action plan is not the only means at Québec's disposal to attain its objectives, far from it: other strategies, policies and key directions will bolster its efforts in the coming years, in particular in the areas of transportation, land-use planning and energy.

One of the key measures in the action plan consists in establishing a GHG emission cap-and-trade system in the context of a North American carbon market. It leads to a price signal linked to carbon in the economy, which encourages GHG emission reductions. The sectors that the market covers account for 85% of Québec's emissions. It will also enable the government to benefit from substantial revenue generated by the sale of GHG emissions allowances. Such revenue is conservatively estimated at nearly \$2.7 billion by 2020. It will be fully reinvested in measures focusing on the reduction of emissions and adaptation to climate change in Québec, thereby fostering a transition toward a greener economy and society that are more resilient to climate change.

The carbon market in Québec has been designed to achieve GHG emission reductions on the order of 20% below the 1990 level on the North American market. However, since the carbon market extends beyond our borders, it does not guarantee that all of the emission reductions will be achieved within our territory. The challenge is, therefore, to ensure that the reductions are achieved in Québec, bearing in mind the significant benefits stemming from them. To this end, the priorities identified in the CCAP 2020 propose incentives to make even more advantageous emission reductions in Québec, both for businesses and for individuals, communities or the Québec economy overall.

The 30 priorities pinpointed in the CCAP 2020 and the attendant initiatives mark the first phase of this open-ended plan. They should lead to reductions on the order of 6.1 megatons of the estimated 11.7 megatons required between 2013 and 2020 to achieve entirely within Québec the GHG emission reduction target.

The CCAP 2020 will be reassessed at midpoint to ensure the efficiency of the measures proposed in it. Moreover, depending on changes in the price of a ton of GHG on the carbon market, revenue from the carbon market could exceed \$2.7 billion. Accordingly, in light of the additional budgets available, other initiatives aimed at further GHG reductions will be added under the second phase of the CCAP 2020.

The attainment of Québec's objectives regarding GHG emission reductions and adaptation to climate change requires the mobilization and commitment of all key stakeholders in Québec society in the municipal sector, industry, private-sector businesses or community organizations. The CCAP 2020 serves, in this regard, as a catalyst that provides the tools necessary to facilitate the general mobilization. Each of us is responsible for acting to reduce our individual and collective carbon footprint and it is with the commitment of each Quebecer that we will do so.



# 1 FROM SCIENCE...

## What science tells us

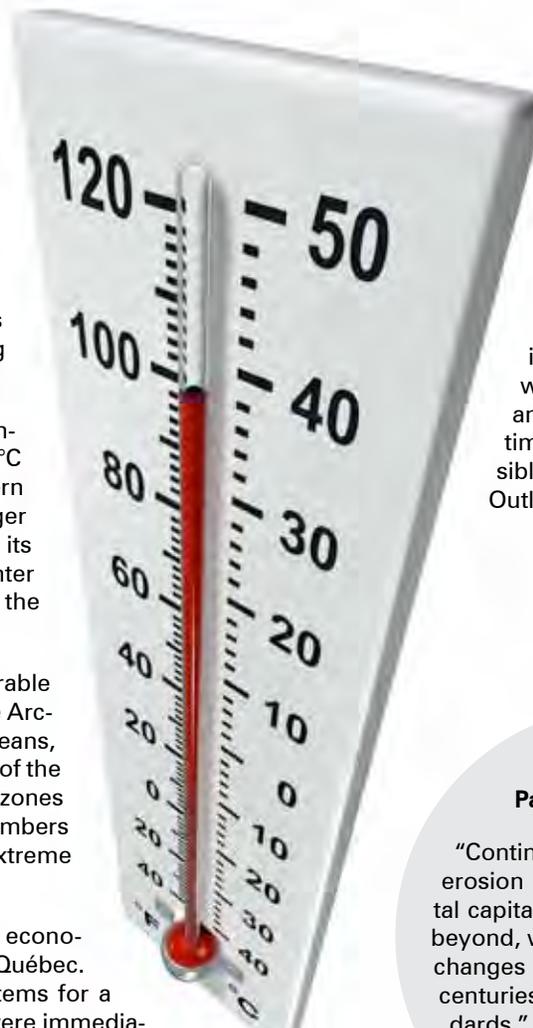
The reality of climate change is now well established. Average temperatures on the surface of the earth and the oceans have risen, leading to climatic disturbances that are already occurring in almost all regions of the world.

It is estimated that worldwide, average temperatures rose by 0.7°C in the 20th century. Furthermore, the past decade (2001-2011) was the hottest recorded by meteorological services and the warming now under way is accelerating (WMO, 2012).

Global warming is also already a reality in Québec. Average annual temperatures in southern Québec increased by 0.3°C to 1.5°C between 1960 and 2008. Snow showers increased in northern Québec but decreased in the south (MDDEP, 2012). In the longer term, Québec's climate is expected to grow warmer throughout its territory, especially during the winter. Accordingly, by 2050, winter temperatures could rise by 3.8°C in southern Québec and 6.5°C in the north (Ouranos, 2010).

Climatic change is already leading to numerous perceptible, measurable phenomena: the gradual disappearance of summer ice cover in the Arctic, accelerated melting of the glaciers, the acidification of the oceans, and so on. Climate modelling predicts a substantial rise in the level of the oceans that would have a devastating impact on low-lying coastal zones and island states in the fairly near future such that the youngest members of society will have to live with the consequences. More frequent extreme weather events such as flooding and drought are also anticipated.

Climate change will directly affect ecosystems, infrastructure, the economy and the well-being of populations the world over, including Québec. Past, present and future GHG emissions will disrupt climate systems for a long time to come. This means that even if worldwide emissions were immediately stabilized and reduced, climate change will continue to affect us for decades to come.



Beyond the gradual impact anticipated because of rising average temperatures around the world, the Intergovernmental Panel on Climate Change (IPCC) estimates that global warming of over 2°C above temperatures in the pre-industrial era exposes us to the risk of abrupt, irreversible changes (tipping points) in the functioning of climate systems. To limit global warming to a maximum increase of 2°C, the IPCC estimates that worldwide GHG emissions must be stabilized by 2015 and be halved before 2050. In short, there is still time to act but the time window in which it is possible to do so is rapidly dwindling (World Energy Outlook, 2011).

### Past gains threatened

"Continued degradation and erosion of natural environmental capital is expected to 2050 and beyond, with the risk of irreversible changes that could endanger two centuries of rising living standards."

OECD, 2012

## The Québec of tomorrow?

Some anticipated impacts on Québec in the coming decades with high human, ecological and economic costs...

- the increased frequency and intensity of extreme weather events in the south (flooding, heavy rain, drought), which will compromise public safety, the security of infrastructure and endanger crops;
- the gradual disappearance of annual sea ice in the Arctic, which will affect the ways of life of the Aboriginal peoples and ecosystems;
- accelerated melting of permafrost in the Arctic, which will lead to the instability of buildings and infrastructure such as roads and runways;
- epidemics of pests and forest fires, which will threaten public safety and cause losses for the logging industry;
- extreme low water levels in the St. Lawrence Seaway, which will hamper navigation and put at risk the availability of drinking water and water quality;
- a shorter snow season, which will curtail the activities of the Québec winter sports industry;
- an increase in the distribution range of human disease vectors, e.g. Lyme disease;

... but also a number of potential benefits in certain sectors

- a reduction in the number of heating degree-days and household energy bills;
- potential tourism development in certain regions;
- broader accessibility of certain northern territories through the opening of the Northwest Passage in the Arctic.

## ...TO ACTION

In the realm of climate change, Québec is acting simultaneously to:

- reduce its GHG emissions;
- strengthen its resilience to anticipated climate change impacts.

In so doing, we are participating in international efforts to solve the problem at the source by reducing our GHG emissions while minimizing the unavoidable impact that climate change will have in Québec.

If Québec has decided to make climate change a key priority, it is because the benefits of action largely outweigh the drawbacks both for individuals, businesses and communities.

Indeed, reducing our GHG emissions affords us an opportunity to review how we produce, consume and travel. We have the possibility to reinvent our society. The fight against climate change is synonymous with investments in energy efficiency, increased use of locally produced renewable energies, and the transition to a green economy. Correspondingly, Québec businesses and the Québec economy will be strengthened and become more competitive, which will have a positive impact from the standpoint of jobs and regional development. The development of products and technologies linked to climate change will also enable businesses to capitalize on new markets and export niches. Our collective and individual vulnerability to rising energy prices and, more specifically, to the price of imported oil, will be reduced.



### Vision of the CCAP 2020

By 2020, Québec will have shown genuine leadership and have contributed to the worldwide effort to fight climate change by reducing its GHG emissions by 20% below the 1990 level. Through its initiatives, the Quebec government will have strengthened Québec society's resilience to climate change impacts and have pursued the transition to a green, prosperous, sustainable economy.

Indeed, while Québec is fortunate in being able to rely on its abundant hydro-power resources, our society and way of life depend heavily on oil for work-related travel and leisure activities, the production and transportation of food and freight to consumption sites, mechanized agricultural production, and so on. Resolute reliance on energy efficiency and renewable energies is a winning strategy. Accordingly, in addition to the imperative to reduce the use of fossil fuels to curtail climate change, we also have an incentive to reduce our vulnerability to the availability of fossil fuels and increases in their price.

Individuals and communities can also achieve savings and enhance their quality of life through the numerous health and environmental benefits stemming from a greener economy. Today, following several years of climate change initiatives, we can conclude that Québec's leadership is bearing fruit.

That is why Québec set in 2009 an ambitious objective for 2020, i.e. to reduce its GHG emissions to 20% below the 1990 level. It is through the overall efforts of international stakeholders such as Québec that significant gains in GHG reduction can be achieved worldwide. We are also relying on our leadership among our partners.

In the same way, from the standpoint of adaptation, our immediate, concerted initiatives will avoid or minimize the human and financial costs stemming from climate change impacts. The well-being of our society, the soundness of our public finances and, indirectly, the leeway available to future generations to build their future are at stake. That is why Québec has also adopted the *Government Strategy for Climate Change Adaptation*, which targets the stakeholders and sectors that are the most vulnerable to climate change impacts.

### Opportunities to be seized

As the United Nations Environment Program (UNEP) notes, the fight against climate change is being perceived increasingly as an opportunity rather than a burden and as an avenue to prosperity rather than an impediment to benefits and employment. The new green economy is leading to invention, innovation and imagination at an unprecedented level since the Industrial Revolution.

UNEP, Annual Report, 2008

### The cost of inaction

"It is already very clear that the economic risks of inaction in the face of climate change are very severe...and the benefits of strong, early action considerably outweigh the costs... and must be viewed as an investment. If these investments are made wisely, the costs will be manageable, and there will be a wide range of opportunities for growth and development along the way."

Stern Report, 2008

Québec's commitment for 2020 pursues the *2006-2012 Climate Change Action Plan* (CCAP 2006-2012) adopted in the wake of the coming into force of the Kyoto Protocol. Through the plan, we have pointed the way to the attainment of our GHG reduction target for 2020. We have also taken important steps to give concrete expression to the vision that is guiding Québec regarding adaptation. Through the CCAP 2020, Québec is going further by setting a bold reduction target and adopting ambitious objectives pertaining to adaptation. The establishment of a carbon market will support the action plan overall. The revenue that the Québec government obtains from it will be invested in the priorities of the action plan. The carbon market is, therefore, an integral part of the action plan.

It is estimated that an initial amount of nearly \$2.7 billion will be allocated to the CCAP 2020. Of this amount, \$220 million will come from the extension until 2014 of the levy on fossil fuels. The carbon market will generate \$2.445 billion in revenue, established according to the minimum price of carbon on the market, which is set by regulation. Additional revenue might be available bearing in mind the actual price of carbon on the market.

## 1.1 QUÉBEC MOVING FORWARD TOWARDS 2020 AND BEYOND

### Intervening in a structuring, long-term manner

The GHG reduction target of 20% below the 1990 level and the Government Strategy for Climate Change Adaptation will guide Québec's initiatives until 2020. Beyond this timeframe, at a time when climate change impacts will be more acutely felt, we will have to go even further in our efforts to reduce GHG and adapt to climate change.

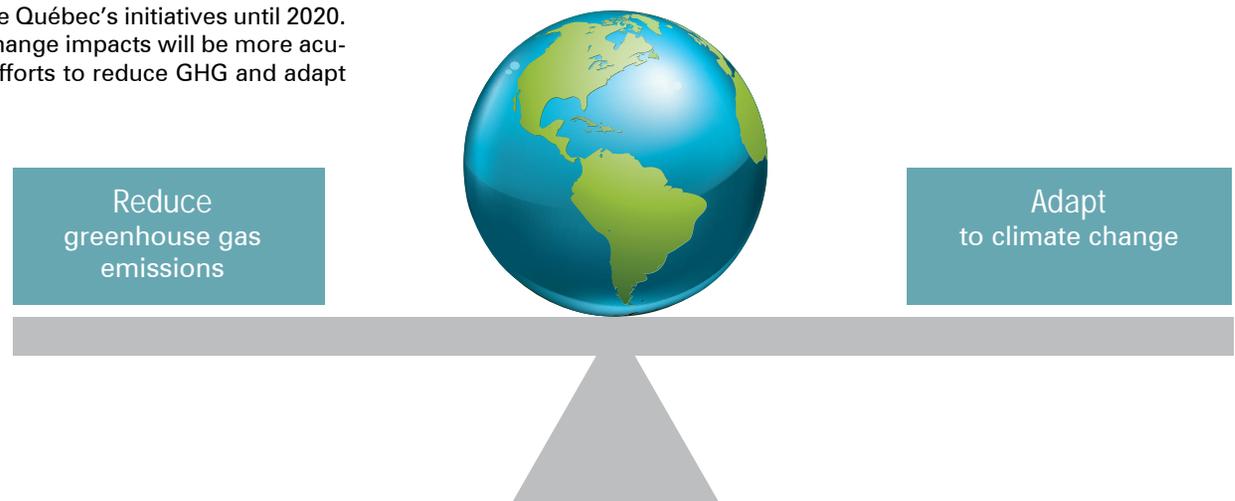
In this perspective, the CCAP 2020 emphasizes transversal initiatives that reinforce the short- and long-term scope of and spinoff from more sectoral measures, both from the standpoint of GHG reduction and adaptation to climate change. Specifically, the initiatives focus on:

- land-use planning and risk management;
- innovation and the development of knowledge, know-how and technology;
- awareness-raising and training;
- integration of a concern for climate change into the public administration and exemplarity.

### Reducing our GHG emissions

To reduce its GHG emissions by 2020, Québec is investing in an array of initiatives that cover all sectors that emit GHG, first and foremost the transportation sector, but also industry and buildings. Niches with reduction potential will also be emphasized in other sectors such as residual materials, agriculture and electricity generation.

### A COMPLEMENTARY APPROACH



## Profile of Québec's GHG emissions in 2009

In 2009, Québec's total GHG emissions stood at 81.8 megatons of CO<sub>2</sub> equivalent, which represents 10.4 tons of GHG per capita, the lowest ratio in all of the Canadian provinces. Transportation accounts for 43.5% of Québec's GHG emissions and now ranks first among the heaviest GHG emitters. Three-quarters of the sector's emissions are attributable to road transport. Industry ranks second (28% of emissions), then the building sector (14%), followed by the agriculture (7.9%), residual materials (5.9%) and electricity (0.8%) sectors. Roughly 70% of Québec's GHG emissions come from the production and consumption of fuels. The remaining 30% of emissions come from non-energy sources, mainly industrial processes, refrigeration systems (HFCs), agriculture (the digestion of animals, manure management and farmland) and residual materials (the decomposition or incineration of organic waste and wastewater treatment).

### Breakdown of Québec's GHG emissions in 2009 by industry sector

| Industry sector       | Sector's share in 2009 | Emissions (MT of CO <sub>2</sub> equivalent) |
|-----------------------|------------------------|--|
| Transportation        | 43.5%                  | 35.57  |
| Industry              | 28.0%                  | 22.93  |
| Residential, tertiary | 14.0%                  | 11.42  |
| Agriculture           | 7.9%                   | 6.45   |
| Residual materials    | 5.9%                   | 4.80   |
| Electricity           | 0.8%                   | 0.61   |
| <b>Total</b>          | <b>100.0%</b>          | <b>81.79</b>                                 |

Source : MDDEP, 2011

## Adapt Québec to climate change

From the standpoint of adaptation, Québec is also investing in several initiatives that will give concrete expression to a significant portion of the *Government Strategy for Climate Change Adaptation*. Several of the initiatives focus on the key challenges defined with respect to adaptation:

- the well-being of the population and communities;
- the pursuit of economic activities;
- the durability and safety of buildings and infrastructure;
- the maintenance of essential ecological services.

## 1.2 AN ACTION PLAN CENTRED ON COMPLEMENTARITY AND PARTNERSHIP

The CCAP 2020 ensures the leadership of the government's strategic approach to climate change. It is also clearly included in a sustainable development approach in keeping with the 16 principles defined in the *Sustainable Development Act*, and is serving as a guide for government choices overall that may affect the attainment of the objectives pursued. Several current or impending government strategies and policies that influence GHG emissions and Québec's ability to adapt to climate change round out the initiatives in the CCAP 2020. Mention should be made, in particular, of strategies and policies focusing on energy, sustainable mobility, sustainable development, residual materials, agriculture, public security, and health.

Accordingly, the initial phase of the CCAP 2020 introduces an array of measures that will enable Québec to take an important step toward the attainment of its climate change objectives. Impending government strategies and policies will round out the initiatives and will be taken into account when phase 2 of the CCAP 2020 is elaborated in late 2015.

## A complementary strategic approach

- the Electric Vehicles Action Plan (2011)
- the Québec Residual Materials Management Policy (2011)
- the Québec Research and Innovation Strategy (2010)
- the Development Strategy for Québec's Environmental and Green Technology Industry (2008)
- the Government Sustainable Development Strategy (2008)
- the Québec Public Transit Policy (2006)
- the Québec Energy Strategy 2006-2015 (2006)
- the Policy Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (2005)
- the Cadre de prévention des risques naturels (2005).

Concrete gestures by Quebecers, businesses, communities and Québec organizations, which will also contribute to reducing Québec's GHG emissions and mitigating climate change impacts, will round out the strategies and policies.

Growing synergy between government policies and the accountability of all of the stakeholders concerned by the problem will be essential to give concrete expression to the gains and changes necessary to attain the CCAP 2020 objectives.

## Partnership is the mainspring of the CCAP 2020

The CCAP 2020 stems from a collaboration between the main government departments and bodies concerned with the fight against climate change, which have worked jointly to analyze the situation in each GHG emitting sector and in respect of adaptation to climate change. The expertise of over 100 organizations has also been profitably employed to define the key issues and priorities to be considered in the CCAP 2020.

The successful implementation of the CCAP 2020 requires the establishment of dynamic partnerships between the government and key stakeholders in Québec society. Accordingly, the Québec government is relying on the contribution from communities, which, through their power of influence over land occupancy and urbanization, are at the forefront of the fight against climate change. The government is also relying on the initiative and dedication of individuals and civil society to commit themselves, mobilize and take action to reduce our carbon footprint and collective vulnerability. It also acknowledges the essential contribution made by institutions and research organizations that are engaged in technological innovation, which are providing solutions to adaptation and developing and disseminating knowledge on climate change in our society. The private sector must be on the lookout for best practices in the realm of sustainable development in order to move resolutely toward a future that is less reliant on carbon, for the benefit of the economy and jobs. The attainment of the GHG reduction objectives must become a genuine societal project.



A willingness to work together and engage in consensus building with respect to climate change is emerging throughout Québec. The joint declaration signed by over 150 stakeholders representing municipal federations, municipalities, the RCMs, transportation companies, the RCEOs, NGOs, unions, and so on at the Forum québécois sur l'énergie held in 2011 is a striking example. The signatories acknowledge that Québec must resolutely commit itself to reducing its dependence on oil and make it the cornerstone of its GHG emission reduction strategy. They also undertake to carry out concrete measures in this respect. Le CCAP 2020 intends to build on this willingness to act in all regions of Québec and in all sectors.

### 1.3 THE CHOICE OF PRIORITIES FOR THE CCAP 2020

The 30 priorities of the CCAP 2020 make up a coherent, structuring whole, the choice of which was guided by the principles of sustainable development and by the scope of the contribution to the attainment of objectives respecting GHG emission reductions or adaptation to climate change. The following factors must also be considered:

- the preventive dimension and the sustainability of the initiatives and their impact;
- reinforcement of the internalization of costs;
- reinforcement of efficiency and economic competitiveness;
- the accountability of all stakeholders in Québec society;
- the coherence and complementarity of government intervention.

Among the criteria used to select priorities aimed at reducing GHG emissions, the cost per ton of GHG reduced or avoided was considered in order to maximize investments and the anticipated gains as regards climate change. However, account was also taken of the structuring nature of the investments and the attendant social, economic and environmental benefits. These criteria justify the choice of initiatives whose implementation cost per ton of GHG reduced is higher than that of others, while paving the way in the long term to decisive shifts in GHG emission reductions. This is true of the priorities focusing on intermodality in freight transportation, sustainable urban planning or the enhancement of industrial processes.

The priorities of the CCAP 2020 are varied. They include financial support measures such as grants or loans that shorten the period of return on investment (PRI) of GHG reduction projects both for businesses and for individuals. Certain priorities are of a regulatory nature. They usually complement the economic support measures and provide for a time limit to enable the market and individuals to prepare themselves.

Initiatives aimed at worker training, guidance for businesses, the acquisition of knowledge and technological development in all sectors covered by the CCAP 2020 are also included. Lastly, measures aimed at awareness-raising, citizen engagement and the education of young people round out the type of initiatives presented in the CCAP 2020.

Through their synergy, the priorities are spurring a gradual transformation of markets, practices and individual and collective behaviour. They will make Québec less reliant on carbon and more resilient to climate change impacts.

## 2 PREPARE FOR THE FUTURE: ENSURE SUSTAINABLE LAND-USE PLANNING, INNOVATE, MOBILIZE AND LEAD THE WAY TO REDUCE OUR GHG EMISSIONS AND ADAPT

In the realm of climate change, Québec is looking to the future beyond 2020. It is in this perspective that we are relying on certain key sectors to support sweeping medium- and long-term changes both in respect of GHG emission reductions and adaptation to climate change impacts: land-use planning, research and development, citizen engagement, and public administration.

Investment in these sectors will also broaden the scope of and spinoff from other sectorial measures devoted to GHG reduction and adaptation to climate change.

In order to reduce GHG emissions, planning differently the development of our cities and towns implies, in particular, increasing their density near public transit corridors, consolidating existing urban and village cores, promoting local services and mixed usage. The application of these principles will reduce the distances to be travelled between the home, the workplace, businesses and the sites of leisure activities, thereby reducing individual travel needs. This area of intervention is important since urban sprawl in Québec has contributed to increasing GHG emissions resulting from the use of automobiles by increasing the distances to be travelled. Urban sprawl also makes it harder and costlier to extend mass transit systems.

In order to reverse this trend, we must plan sustainable mobility in conjunction with land-use planning, and vice versa. In short, to coherence of government and municipal intervention in this respect is essential.

### 2.1 ENSURE SUSTAINABLE LAND-USE PLANNING – QUÉBEC COMMUNITIES AT THE FOREFRONT

With a growing footprint on the territory that persists from generation to generation, we must develop our living environments in a sustainable way. Decisions and initiatives pertaining to land-use planning significantly affect GHG emissions stemming from individual travel, construction and infrastructure maintenance but also the degree of vulnerability of Québec communities to climate change. Land-use planning is, therefore, a matter of priority both to reduce GHG emissions and adapt to climate change.

#### Québec's vision for land-use planning in the context of climate change

By 2020 and beyond, in particular through legislation and taxation that promote GHG emission reductions, Québec municipalities will have halted urban sprawl by hinging their development on densification near mass transit routes and the establishment of local services. Québec municipal bodies and communities have pinpointed their vulnerability and reduced their exposure to climate risks by integrating adaptation to climate change into their territorial planning and risk management.

In addition to reducing the need for travel, properly organized urban densification limits at the source the need for additional infrastructure such as roads, water supply systems, sewers and public lighting while maximizing the use of existing infrastructure. This leads to lower construction and maintenance costs for communities and the attendant reduction in GHG emissions.



Land-use planning is also central to the process of adapting to climate change impacts. The choices that we are making today in this field will affect Quebecers' future well-being. They will have a significant impact on the level of risk for communities linked to climate change. Recent flooding and heavy rains and their consequences (flooded homes, the evacuation of residents) reveal that it is essential to integrate concern about climate change into current and future land-use planning practices and risk management. This will limit the consequences of and costs resulting from climate change.

### Priority 1: Foster sustainable land-use planning of the territory in a perspective of combating climate change

Through the revision of the legislation respecting land-use planning and development, the government will define new policy directions aimed at the municipal sector that will reflect its willingness to act in the realms of climate change and sustainable development. The government policy directions will take the form of objectives and expectations to be considered in land-use planning and development plans not only with regard to GHG reduction but also in fields closely linked to adaptation to climate change, including the security of individuals and property, integrated water resource management, and the preservation and maintenance of biodiversity.

In order to guide the communities in this approach and the implementation of impending *Sustainable Regional and Local Land Use Planning Act*, the government will elaborate and make available to them tools, training and technical guidance. This will reinforce the coherence of government intervention that affects organization of the territory and land-use planning. Furthermore, the government will take steps to acknowledge exemplary municipal initiatives with regard to the sustainable development of communities.

The government will examine the potential of various tools, such as municipal taxation, which might facilitate the attainment of climate change objectives, e.g. by promoting urban densification, the consolidation of existing urban and village cores, and sustainable mobility.

### Priority 2: Support municipal and community initiatives to reduce GHG, adapt to climate change, and engage in sustainable land-use planning

For several years, the government has financially supported through the Climate Municipalities Program municipal bodies that wish to take stock of their GHG emissions and elaborate an action plan to reduce them. The program has broadened knowledge of the sources of emissions in Québec municipalities and revealed the niches in which significant GHG reduction can be contemplated. The implementation of concrete climate change measures is now the priority of the CCAP 2020 to enable Québec municipalities to contribute actively to Québec's climate change objectives and also benefit from the numerous attendant advantages.

The Climate Municipalities Program will, therefore, be enhanced to more extensively guide municipal bodies in pursuing their approach. It will offer financial support to implement concrete GHG reduction measures in the sectors of activity that fall under their jurisdiction. In order to better take adaptation into account at the local and regional levels, the government will also provide support to enable them to pinpoint vulnerabilities in their territory with respect to climate change and to integrate them into their current planning.

Beyond the measures aimed at immediate GHG emission reductions, the Québec government will also support the municipalities that wish to invest in the sustainable development of their communities, in a context of climate change. Accordingly, the municipalities may benefit from financial support to design land-use planning tools and elaborate real estate or land-use planning projects bearing in mind climate change. The conception of sustainable development projects such as eco-neighbourhoods, the revitalization of town cores and central neighbourhoods, densification and requalification, and so on, will also be supported. Support for such projects will be subject to cross-compliance requirements such as density thresholds, functional mix and plant cover. Financial support may also be offered to implement targeted adaptation solutions with respect to urban drainage, e.g. porous pavement, grassed ditches, filter belts and green roof systems. These rainwater management measures will control inflows of water at the source in residential, commercial, urban and other environments. They also offer

worthwhile co-benefits from the standpoint of adaptation to climate change, in particular with respect to combating the impact of heat on health and the preservation of biodiversity in our living environments.

Account will be taken of the conditions specific to urban and rural environments when CCAP 2020 programs intended for the municipal sector are designed.

### Priority 3: Promote risk management that minimizes the vulnerability of communities

To minimize vulnerability and strengthen Québec society's resilience, adaptation to climate change must be considered not only in land-use planning but also in risk management. For this purpose, the government will invest to immediately encourage the municipal sector and other stakeholders in civil security to take into account climate change in their activities.

To this end, financial support may be granted to municipal bodies and Aboriginal communities to enable them to intervene in their territories to prevent climate change-related disasters. Structural interventions such as the protection of homes or the displacement of infrastructure and buildings may also be supported when the risk of disasters related to climate change threatens public safety and the integrity of buildings and infrastructure.

In the realm of civil protection, certain systems are deemed to be essential since a service interruption, e.g. drinking water, electricity, telecommunications or roads, could seriously affect the health and safety of individuals and communities, the continuity of economic and government activities, and the preservation of natural environments. Some examples are transportation, power transmission or drinking water distribution networks. To avoid the occurrence of such interruptions, the government will pinpoint threats to these essential systems and establish solutions that will protect them and make them more robust. This will depend, in particular, on the strengthening of the national civil protection plan, which guides the government's response in the event of a disaster.

Since all risks associated with climate change cannot be reduced by prevention, it is important to establish preparatory measures that will enable us to intervene effectively when disasters occur. Québec will, therefore, adopt an early warning system that will strengthen the response capacity of communities in the event of a disaster. The system will quickly transmit warnings to communities at risk, alert them and provide them with advice on the procedures to be followed.

## 2.2 INNOVATE – DEVELOP KNOWLEDGE AND TECHNOLOGY

Research and innovation enable us to better understand our environment and find technical, economic and social solutions to the challenges that we are facing. They are essential against a backdrop of climate change.

Québec already has an array of programs and measures aimed at fostering technological research and development through various phases of the innovation chain. There are also programs that affect demand for technology, in particular in the realm of energy efficiency, biomethanization, and new processes. However, additional efforts must be made with regard to marketing, i.e. at the stage that follows demonstration, since experience has shown that technologies designed in Québec may find it difficult to complete this stage.



**Québec's vision for research and development in the context of climate change**

By 2020 and beyond, Québec will be a breeding ground for the development and implementation of new technologies and solutions pertaining to GHG emission reduction and adaptation to climate change. Knowledge of climate change impacts, vulnerabilities and cost-benefit analyses related to the implementation of GHG reduction and adaptation solutions will be available and the government and its partners will use them to make enlightened choices in the realm of climate change.

Moreover, although understanding of climate change and its impact has advanced considerably in recent years, there are still gaps in knowledge and know-how. Adaptation initiatives must be able to draw on the most reliable, recent knowledge to identify the threats that climate change poses to health, safety, the economy, infrastructure and the environment, and to pinpoint the optimum adaptation solutions. The acquisition of cutting-edge expertise in the study and modelling of the climate and better knowledge of its impact and society's vulnerability are essential preliminary steps to a properly planned adaptation approach and enlightened decision-making.

The CCAP 2020 will, therefore, pay special attention to research needs and the demonstration and marketing of Québec technologies that will allow by 2020 and beyond for GHG reductions and strengthen the resilience of Québec society to climate change impacts.

**Priority 4: Support innovation and research and the development, demonstration and marketing of technologies aimed at reducing GHG emissions**

Reliance on innovative technologies contributes to GHG emission reduction. Québec is already benefiting from an extensive network of universities and research centres. We must be able to stimulate such creative genius that will reinforce the contribution that the new technologies make to the fight against climate change. To this end, since research is the initial stage in the development of new technologies, the government will launch a call for research proposals aimed at reducing GHG emissions. The projects, carried out by universities or research centres, will satisfy the needs of businesses in different sectors of activity such as industry, transportation or buildings. Programs, chairs or specific research

projects centred on more basic research or of specific interest to Québec will also be supported by the CCAP 2020, in particular in the realm of geological carbon sequestration.

Innovation is the means by which Québec can take its place in a world that is less reliant on carbon. Accordingly, Québec firms engaged in R&D that develop, demonstrate or market new technologies that significantly reduce GHG will be able to benefit from financial support. Québec expertise in technologies to reduce GHG emissions will thus be developed and contribute to the creation of new markets. Québec businesses that wish to test or adapt to their facilities new GHG reduction technologies will also have access to financial support when the development stage of the technology warrants such support.

In order to maximize collaboration between enterprises, researchers and the public sector, catalyst projects may be supported in certain fields, such as intelligent logistics.

**Priority 5: Pursue the development of climatological monitoring networks**

Climate-related monitoring and knowledge acquisition networks make it possible to assess the extent of climate change and are, therefore, necessary for the development of adaptation measures. A vast number of partners are increasingly consulting the data that the networks generate for various purposes: civil security, public health, agriculture, forestry, transportation, land-use planning, and so on. Investments will be made to ensure that the networks optimally cover Québec's territory in light of current and future needs, in particular with respect to air quality. The temporal coverage and type of data will also be enhanced. Beyond the actual networks, the CCAP 2020 will support the processing and dissemination of the data collected. Considering the more acute impact of climate change in the north, the climatic and geothermal monitoring undertaken in Sal-luit will be pursued and the northern network of meteorological and geothermal cable stations will be maintained to ensure the availability of reliable data on changes in the climate and the permafrost. Cartography of the permafrost will also be conducted in other Northern villages.

## Priority 6: Support research in adaptation

The Ouranos Consortium, which already collaborated in the CCAP 2006-2012, will once again be asked to provide expertise and carry out the applied research projects required by the government departments and bodies concerned with planning adaptation to climate change.

Several other research centres are also contributing to the development of knowledge in the realm of adaptation. They, too, will be asked to carry out investigations to enhance knowledge of natural hazards related to climate change and an understanding of their impact, especially as regards civil security and transportation. As for infrastructure, the investigations will ensure its sustainability, pinpoint adaptation solutions and formulate new design, construction and operation criteria adapted to future climatic conditions.

Bearing in mind that the anticipated increase in temperatures in Québec will lead to conditions that are more favourable to pathogens and their conveyors, research in the field of public health will also be emphasized. Such research will focus on risk analysis, monitoring and the prevention of climate-related diseases. For example, studies will be conducted on wildlife species that promote the spread of pathogens such as Lyme disease likely to affect human beings. Funds will also be invested to develop monitoring technologies and to conduct studies on the health risks of zoonotic diseases and the efficacy of preventive measures. The greater health impact of air pollution and social inequality linked to climate change will also be studied. Lastly, the establishment of a virtual observatory on changes in adaptation in the health sector will be supported.

Contrary to biophysical or social impacts, the economic impacts of climate change have hardly been studied in Québec. The cost of climate change impacts and the benefits stemming from the implementation of adaptation measures are unknown in most sectors of activity. To remedy this situation, a research program will be established in collaboration with the Fonds de recherche du Québec. The program will focus on the socioeconomic impact of climate change in several economic sectors and the cost-benefit ratio of adaptation measures.

The Québec Arctic is facing specific climatic challenges. Accordingly, summary cartography of vulnerability in the Québec Arctic will be produced to respond to specific problems of management of the Arctic territory characterized by extreme climatic conditions, a specific hydrological context, and the predominance of permafrost, which is unstable in several ways. Such cartography is an essential prerequisite to the development of communities, business activities and any other form of use of the territory in the Québec Arctic. The cartography will be enhanced by operational recommendations that apply to development work or road and infrastructure construction.

### The Ouranos Consortium

Established in 2001, Ouranos is a Québec consortium that assembles some 250 scientists and professionals from various disciplines. Its initiatives focus on two key themes: climate science, and impact and adaptation. It conducts integrated research projects that combine the development of regional climate projections and the evaluation of the physical and human impact of climate change, while suggesting appropriate measures to prepare for and adapt to such change.

## 2.3 MOBILIZE – ENGAGE QUEBECERS AND PARTNERS IN ACTION

Awareness of the numerous benefits of action in the realm of climate change and the existence of solutions that depend solely on our willingness in order to be carried out are a first step toward the active mobilization of all stakeholders in Québec society.

Québec intends, therefore, to adopt the means necessary to inform all stakeholders in our society of the state of knowledge on climate change worldwide and in our territory, the anticipated impact and the reduction and adaptation solutions available to us, including those that the CCAP 2020 is making available. Through our power of influence and ability to model our governance, production and consumption choices, each one of us can act to guide Québec society toward sustainable development. Participation in public debate to promote the recognition of climate change, the choice of local, low-carbon products or reliance on buses or bicycles for travelling between the workplace and the home are examples of concrete initiatives in the realm of climate change and sustainable development.

### Québec's vision for citizen engagement in the context of climate change

By 2020 and beyond, Quebecers will be mobilized to contend with climate change and will have taken concrete steps to adapt to it and reduce their GHG emissions. Québec will remain a leader in North America in the realm of climate change. Its objectives will be ambitious and will implement means of action that are commensurate with its ambitions.

Civil society can play an important role in heightening awareness and further mobilizing all stakeholders in Québec society. Several organizations possess broad expertise on climate change issues and are able to enhance understanding of the phenomenon, propose avenues for intervention and act as catalysts to implement concrete initiatives.

Individuals in their role as citizens must not be overlooked. Each of their everyday gestures can make a difference and several government programs, including those under the CCAP 2020, are available to guide their desire to reduce their carbon footprint and better adapt to climate change.

### Priority 7: Disseminate knowledge, know-how and solutions pertaining to GHG reduction and adaptation to climate change

In the wake of the CCAP 2006-2012, the government will step up awareness-raising among all stakeholders in Québec society to challenges and solutions in the realm of climate change.

Specific training, awareness-building, knowledge transfer and decision support tools and technical assistance are available to targeted clientele, in particular for stakeholders in the health network, the municipal sector, decision-makers, the tourism industry, professional associations, institutions, businesses, community organizations, and communities in northern and southern Québec.

A government website devoted to climate change will also be created to facilitate the dissemination of knowledge, know-how and the climate change tools available, including specialized information from government departments in all sectors of activity. It will enable individuals, businesses, municipal bodies and all of the other stakeholders concerned to easily pinpoint the support programs under the CCAP 2020 for which they may be eligible. An information service for individuals who wish to act in respect of climate change will also be made available. Applications for smartphones may also emerge to better equip Quebecers in making everyday choices.



## Priority 8: Mobilize Québec by supporting initiatives in civil society and in communities

The CCAP 2020 will continue to support community initiatives and citizen involvement in GHG emission reduction and adaptation to climate change.

The support accorded to civil society will be enhanced and will focus both on GHG reduction and adaptation to climate change. From the perspective of moving from the consciousness-raising to the mobilization stage, particular attention will be paid to major catalyst projects with well-defined spinoff. Local and one-off initiatives will also be included. The target clientele will be broadened to include both non-profit organizations, cooperatives and communities, as well as the Aboriginal communities, for which adaptation to climate change is already a tangible reality. Lastly, the implementation of an educational section will encourage educational institutions to create awareness-raising and mobilization initiatives aimed at students.

Young people must immediately be associated with the fight against climate change. In the elementary and secondary education sector, the notion of climate change can be broached in certain courses in the educational program or on the initiative of trainers through transversal competences or extracurricular activities. Teachers and trainers will be encouraged to acquire and transmit notions on climate change. An assessment of needs, in particular among teachers and their associations, will be conducted to ensure that teachers have at their disposal the appropriate educational programs and tools and that young Quebecers are aware of the reality of and challenges posed by climate change when they complete their compulsory school path.

### Mon climat, ma santé!

The Ministère de la Santé et des Services sociaux, in collaboration with community organizations, has launched two websites aimed at heightening awareness among its clientele of the links between climate change and health. The first website, *Mon climat, ma santé* ([www.monclimatmasante.qc.ca](http://www.monclimatmasante.qc.ca)), summarizes in an accessible manner dozens of Québec and international research reports concerning the impact of climate change on health in addition to presenting illustrations and concrete examples of adaptation. The second website, *Mon climat et moi*, is aimed at the school population ([www.monclimatetmoi.com](http://www.monclimatetmoi.com)).

## Priority 9: Raise Québec's profile in Canada and on the international scene

Since the early 2000s, the Québec government has displayed leadership in the realm of climate change both in North America and abroad. The international partnerships that it has established are enabling it to take advantage of a valuable bank of the best practices adopted on all of the continents. These forums also afford Québec an opportunity to promote abroad its expertise and that Québec's private sector, thereby encouraging its partners to act. One striking example of such partnerships is the establishment of a North American carbon market, in collaboration with California, British Columbia and Ontario. Furthermore, given that a number of regions in the world are now facing the challenges posed by adaptation to climate change, Québec's cutting-edge expertise will be put to good use and international partnerships will be encouraged.

The government will, therefore, pursue its partnerships both in Canada and on the international scene, in particular in the Network of Regional Governments for Sustainable Development (nrg4SD) and the Climate Group. It will also carry out joint projects with its regional partners in the Conference of New England Governors and Eastern Canadian Premiers and the Great Lakes—St. Lawrence River Water Resources Regional Body. It will step up its initiatives in these groups in order to call attention abroad to the crucial role that federated states and regions are playing in the fight against climate change. Accordingly, it will take advantage of all available forums at international UN conferences to promote this role and its leadership in the fight against climate change.

Within Canada, the government will encourage its federal partners to be more ambitious and step up its initiatives by bolstering collaboration in priority fields for Quebecers, such as the electrification of transportation, energy efficiency, and the broader availability of public transit.

## 2.4 LEAD THE WAY - QUÉBEC GOVERNMENT COMMITTED TO SET THE EXAMPLE

By adopting an ambitious GHG emission reduction target and a strategy to adapt to climate change, the Québec government must not only contribute to the attainment of climate change objectives but also do so in an exemplary manner.

Several policies, directives and strategies are already geared to this end. Mention should be made of the *2006-2012 Climate Change Action Plan*, the *Government Sustainable Development Strategy 2008-2013*, the *Act to affirm the collective nature of water resources and provide for increased water resource protection*, the *Dam Safety Act*, and the *Québec Strategy for Drinking Water Conservation*.

The Québec government intends to pursue this course by ensuring the coherence and complementarity of government policies overall and management tools with the GHG emission reduction and adaptation objectives that Québec has adopted. It also intends to do its share to substantially reduce emissions from its operations.

### Québec's vision for government exemplarity in the context of climate change

By 2020 and beyond, climate change tools will be increasingly integrated into legislative and regulatory tools and the government's planning and decision support tools throughout the public administration. The Québec government will have inspired businesses, communities and individuals in the realm of climate change through innovative measures covering its own operations.

### Priority 10: Integrate the concern for climate change into the public administration

In a coherent sustainable development perspective, it is essential to integrate a concern for climate change into the public administration to ensure that government intervention is coherent with the objectives that Québec has adopted in this regard.

To this end, the key government measures (legislative, regulatory, administrative and financial support tools) will be examined, in order to identify the most relevant revisions, adaptations and updates that the government departments and bodies responsible can make. The government will also introduce the concern for climate change, if it is relevant to do so, when new legislative instruments and government policies are elaborated.

Planning and decision support tools must also be adapted to the context of climate change. More specifically, the government plans to reinforce the recognition of climate change when environmental analyses of projects are conducted. It intends to update environmental control processes according to climate change-related risks.

From the standpoint of the acquisition and management of infrastructure and equipment, the duration of the period of return on investments will be reviewed to encourage recourse to renewable energies and green technologies. The operating costs of buildings and rolling stock (maintenance, consumption and other costs) will be taken into account at the time of construction or acquisition, which will foster, in particular, fuel-efficient buildings and vehicles.

## Priority 11: Foster a reduction of GHG generated by the operations of the public administration

Emissions from the Québec government (the public and parapublic sectors) account for 1% of Québec's overall GHG emissions (approximately 1MT of CO<sub>2</sub> equivalent), of which 87% comes from buildings and 13% from the government's vehicle fleet. While this represents only a small proportion of emissions, the government has a duty to display exemplarity. It will, therefore, exercise its leadership by substantially reducing its own emissions.

This maximum reduction approach has been adopted rather than the emission offset approach such that all government funds are used to enhance the energy performance of its buildings and vehicle fleet, making them, by the same token, less vulnerable to higher energy prices. Taxpayers will benefit through lower costs stemming from efficiency gains. However, Québec will continue to monitor the development of and changes in the instruments used to offset emissions and achieve a net zero carbon footprint, and will evaluate, if need be, the relevance of a carbon fund.

The main government departments and bodies will be asked to produce an annual GHG emission balance sheet pertaining to the management of their buildings and travel by their employees (vehicle fleets and business travel) in order to better pinpoint and monitor changes in their GHG emissions. The departments and bodies will periodically report the measures implemented to reduce such emissions. This requirement will be introduced gradually in the government departments covered, then in government bodies by 2020.

### Government buildings

The construction of new buildings in the public and parapublic sectors and the expansion of or major renovations in existing buildings will be subject to new government standards. Starting in 2016, new buildings must use renewable energies to operate their heating systems, in particular geothermal, solar or wind power, or hydroelectricity. Moreover, their energy performance must surpass by 20% the requirements of the *National Energy Code of Canada for Buildings 2011* (NECB).

As for existing buildings, the government is seeking to replace by 2020 heating systems that use heavy or light fuel oil as the main source of energy with systems that rely on the forms of energy mentioned earlier. The annual \$20-million budget allowance from which the health and education networks will benefit until 2016 will, in particular, be used for this purpose. This allowance may be renewed beyond 2016 depending on the funds available.

Moreover, to foster the use of materials with a low carbon footprint, the possibility of using wood as a structural and appearance material must be evaluated at the conception phase of new public buildings. This solution should be emphasized when the conditions are appropriate. Moreover, this approach might apply when grants are awarded for the construction or expansion of cultural, community, sports and tourist buildings.

Lastly, the government will revise the norms governing the location of its public buildings such as schools, local community service centres and government buildings, in particular to promote access by public transit, strengthen the existing urban fabric, and reduce travel. Account will also be taken of this concern when government grants are awarded to municipal and private infrastructure projects.

Overall, these initiatives should enable the public administration to reduce by 2020 emissions from its buildings 15% below the 2009-2010 level, in addition to those already achieved since 2002 (16%).



### Québec's carbon footprint

The Québec government has launched a pilot project aimed at preparing the province-wide establishment of a recognized carbon footprint certification system that enables Québec businesses to display the GHG emissions emitted by their products and services throughout their life cycle. The choice of certification system is of the utmost importance to ensure the credibility of certification and recognition of it outside Québec with a view to exporting our products on external markets. Displaying the carbon footprint of products is a useful instrument in the fight against climate change. It informs individuals of the impact of their consumption choices on GHG emissions and steers them to greener choices ([www.empreintecarbonequebec.org](http://www.empreintecarbonequebec.org)).

### Travel by public servants

In the realm of travel by public servants, the government will adopt the means necessary to reduce the carbon consumption of its vehicle fleet and contribute to the *Electric Vehicles 2011–2020 Action Plan*. The emission reduction objective for the institutional light-duty vehicle fleet is 9% on average and the principal owners of light-duty vehicle fleets will be attributed a specific reduction objective to ensure the attainment of this government target in 2020. The 9% reduction objective has been set bearing in mind the increase in activities and the renewal of the light-duty vehicle fleet.

The government will also pursue the implementation of its sustainable commuting program in government departments and bodies to encourage public servants to relinquish solo car use and opt for public or alternative transport. It will also evaluate the timeliness of limiting the number of parking spaces in new buildings in order to encourage its employees to rely on alternative transportation.



### Government purchasing

Lastly, the government will integrate the concern for its carbon footprint into public procurement in a spirit of respect for the agreements on the opening of public procurement that it has concluded. It will initially indicate those goods and services in respect of which requirements will be imposed in priority in respect of the carbon dioxide and environmental footprint, in particular according to the volumes purchased and the size of the carbon footprint in terms of GHG. Then, when the Québec government has determined the standards for life-cycle analysis, requirements for this purpose might be included in government invitations to tender for such products and services. By stimulating demand for low-carbon-footprint products, the government is supporting firms that wish to reduce their environmental impact.

# 3 REDUCE OUR GREENHOUSE GAS EMISSIONS IN ALL SECTORS

Transportation, industry and buildings are the main sectors targeted by GHG reduction efforts since they account for over 85% of the emissions in Québec's GHG inventory. The sectors also have the most significant emission reduction potentials. An effort will also be made to reduce emissions in sectors that account for a smaller portion of our inventory, i.e. agriculture, residual materials and electricity.

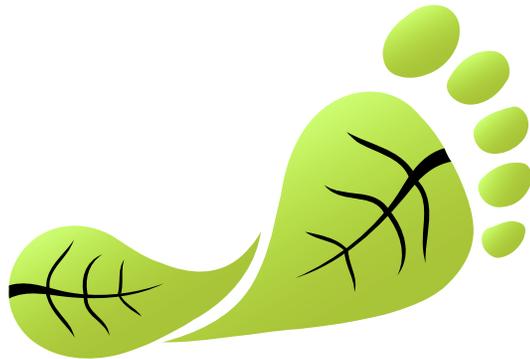
To reduce its carbon dioxide footprint, Québec will rely on measures that reduce GHG emissions as well as on measures that focus on avoiding anticipated emissions. Some development choices such as the Plan Nord can indeed affect anticipated emissions, just as elaborating projects optimally at the early stage of their conception can.

Technical interventions such as energy efficiency, energies that generate less GHG and optimization of processes will mark a significant step toward the reduction target. Other measures will be added and will target behaviour changes in order to advance further in the attainment of the 2020 objective.

Moreover, most of the initiatives will aim energy related emissions reductions, which, generally speaking, are easier to reduce, offer a return on investment and reduce operating costs. Indeed, to effectively fight climate change, we must reduce our dependence on energies that emit substantial GHG emissions. To this end, we can reduce our energy needs at the source through well-designed land-use planning and projects, rely on a more efficient use of the entire array of energy forms, and foster the use of energies that generate fewer GHG. This approach, several components of which are already found in the *Québec Energy Strategy 2006-2015*, will be used in all the sectors that emit GHG in Québec. The attendant initiatives will be presented in the sections devoted to each sector.

Fossil energy now accounts for roughly half of the energy consumed in Québec. Hydroelectricity, and to a lesser extent, biomass, account for the other half. While the replacement of fossil energy by less-polluting energy sources is necessary in a climate change perspective, this strategy has its limits, including the availability of alternative energies, the difficulty of replacing fossil energy for certain uses, and the relative cost of different forms of energy. Moreover, the environmental and social impacts linked to the production and use of all forms of energy must be considered.

While the current limits to the substitution of fossil fuels to energy that generate less GHG may be driven further through technological advances or sweeping societal changes, fossil energy will continue to be present in Québec's energy profile for the foreseeable future. For this reason, the CCAP 2020 relies not only on renewable energies but also on the energy efficiency of all forms of energy and the optimization of projects to reduce energy needs at the source. Furthermore, when reliance on renewable energies cannot be contemplated, the CCAP 2020 will favour, among the different kinds of fossil energy, those that emit the least GHG.



In the fields of energy efficiency and energy innovation, it should be noted that the *2007-2010 Energy Efficiency and New Technology Master Plan* led to the implementation of certain policy directions in the Québec Energy Strategy 2006-2015. The next master plan will stipulate policy directions and priorities respecting energy efficiency and innovation and ensure coherent, effective action with regard to all forms of energy. Energy efficiency and innovation are at the heart of the CCAP 2020 and the government will ensure the coherence and the complementarity of these two approaches to foster the attainment of GHG emission reduction objectives.

Moreover, other types of initiatives are under study at the international level to evaluate their potential to contribute to the fight against climate change, including those centred on GHG capture (at the chimney), geological, mineralogical, biological and other forms of sequestration, or those that affect the albedo of the planet. Bearing in mind that such initiatives are still being studied, experimental or at best, rollout stage, some of them might be subject to analysis or pilot projects in an experimental framework in order to better evaluate their potential contribution to the attainment of Québec's target for 2020 and beyond. This will be true, in particular, for short-lived climate forcers whose emission reduction could contribute significantly to the global warming problem in the medium term.

**What is a short-lived climate forcer?**

The CCAP 2020 makes provision to examine sources of gas and particulate emissions that are deemed to have a significant impact on short-term global warming but about which little is known. Known as short-lived climate forcers (SLCFs), these airborne pollutants are apparently very harmful to agricultural yields, ecosystems and human health. The pollutants include carbon black, e.g. soot emitted into the atmosphere by forest fires or the incomplete combustion of fossil fuels, biofuel and biomass. The Arctic regions are the most affected by carbon black since it accelerates the melting of ice and glaciers. The United Nations Environment Program confirms that substantially reducing SLCFs would limit global warming to half a degree Celsius by 2050.

### 3.1 ESTABLISH A CARBON MARKET

Beyond the measures in each of the sectors of activity, the government is relying on an economic instrument that will play a dominant role in Québec to encourage GHG emission reduction in several sectors, i.e. the GHG emission cap-and-trade system.

#### Priority 12: Send a carbon price signal by establishing a GHG emission cap-and-trade system

According to an OECD study, one of the most effective strategies in the fight against climate change is to set a price for GHG emissions. Unlike conventional regulation under which businesses may not exceed an emission standard (strict limit on the emission of pollutants), a system based on the economy offer to businesses some degree of flexibility since it allows them to decide how they will comply with their short, medium and long-term obligations.

It is in this context that the Québec government has established an ambitious GHG emission cap-and-trade system within the framework of the Western Climate Initiative (WCI), an organization of federated North American states that are seeking to develop a common approach to fight climate change.

Starting January 1, 2013, large emitters in the industrial and electricity sectors, whose annual GHG emissions total 25 000 tons of CO<sub>2</sub> equivalent or more, will be the first to be subject to the system. In January 2015, enterprises that distribute or import fossil fuels in Québec will also have to comply to the system. The price signal sent by the GHG emission cap-and-trade system will also indirectly encourage users to reduce their consumption of fossil fuels.

Within the framework of the cap-and-trade system, businesses are under the obligation to remit to the government the emission allowances for each ton of GHG emitted, bearing in mind that the allowances available on the market are reduced from year to year. If a company does not have a sufficient number of emission allowances to cover its emissions (the government allocates or sells the allowances) then it must purchase them on the carbon market. To avoid or reduce costs associated with the purchase of emission allowances, the company may then decide to reduce its GHG emissions, which is the objective. Indeed, for businesses GHG reduction often means gains in efficiency, profitability and competitiveness. For Québec society overall, this means a more robust economy and reduced dependence on fossil energy.

For this reason, the CCAP 2020 is proposing to businesses incentives and support programs designed to enhance the benefits and advantages stemming from investment decisions in Québec to reduce their GHG emissions.

### 3.2 FOSTER THE SUSTAINABLE MOBILITY OF INDIVIDUALS AND GOODS

Transportation is the leading sector from the standpoint of GHG emissions in Québec (43.5% of the inventory in 2009) and it must contribute significantly to GHG emission reduction for 2020. That is why the government is earmarking such a substantial portion of carbon market revenue for the sector. Indeed, two-thirds of the revenues from the market and the extension of the levy on fuels will fund initiatives that will reduce GHG emissions in the transportation sector.

Emissions in the transportation sector have risen by nearly 30% since 1990. Road transportation alone accounts for over three-quarters of the sector's emissions, which have increased substantially since 1990. This situation is attributable, in particular, to greater numbers of trucks and cars on Québec roads that are traveling greater distances each year. The growing popularity among consumers for sport utility vehicles in recent years has also increased road transport emissions, a trend that has not been reversed by the introduction of less energy-consuming

#### Québec's transportation vision in the context of climate change

By 2020 and beyond, Quebecers will be relying increasingly on the public transit and alternative transportation available to them rather than solo car use because such transportation will be readily accessible and efficient and because of the numerous financial, social and environmental benefits they will derive from it. Freight transportation will rely more extensively on railways and navigable waterways. Investments in energy efficiency and clean energies, intermodality and logistics will generate significant efficiency gains in all modes of transportation.

models. As for the rail, maritime and air transportation sectors, they are contributing much less significantly to emissions in the transportation sector, i.e. 2.2%, 3.7% and 2.1%, respectively. Lastly, the off-road vehicle and pipeline transportation sectors account for nearly 7% of emissions.

The CCAP 2006-2012 already focused extensively on the transportation sector, in particular by supporting public and alternative transportation, intermodality and energy efficiency. Furthermore, the government has made compulsory the installation of speed control devices set at 105 km/h on trucks, adopted a GHG emission standard for light vehicles, an emission opacity standard for heavy vehicles, and tax incentives for the purchase of hybrid or electric vehicles.

Transportation will once again be at the forefront of Québec's GHG reduction efforts for 2020. We will continue to rely on support for public transit and alternative transportation, technological efficiency and innovation in all modes of transportation, and make broader use of less-polluting forms of energy. This type of initiative will enable us to significantly reduce the sector's emissions.

However, we must superimpose on such solutions a sweeping review of our modes of transporting passengers and freight so that Québec is able to reduce its GHG emissions to the desired level in 2020. Indeed, despite the technological improvements and efficiency gains achieved in all modes of transportation since 1990, the sector's emissions have risen markedly since then. Possible solutions depend, in particular, on structuring initiatives in land-use planning, better harmonization of investments in each mode of transportation in light of GHG emission reduction objectives but also on a review of governance methods for certain aspects of the sector.

### Priority 13: Promote public transit and alternative transportation by enhancing their availability, developing infrastructure and facilitating sustainable choices

The shift being sought from solo car use to public transit and alternative transportation implies that sufficient infrastructure and services are available to facilitate travel and adequately satisfy Quebecers' needs.

Significant progress has been made since 2006 with the implementation of the *Québec Public Transit Policy*. The services offer increased by 21% and ridership increased by 11% between 2006 and 2011. The Québec government wishes to go even further in offering concrete alternative solutions to solo car use.



Accordingly, within the framework of the CCAP 2020, substantial investments will be made in public transit, in particular to consolidate the services in cities, between regions and in rural areas, and to enhance the efficiency of rolling stock, e.g. the acquisition of hybrid and electric buses. Moreover, through the CCAP 2020, the government will actively promote the development and use of alternative modes of transportation to solo car use, including carpooling, car-sharing, taxi-sharing and active transportation, such as walking and cycling. It will support, in particular, initiatives that facilitate carpooling to travel to work and the construction of new utilitarian bicycle lanes.

In all likelihood, a simple increase in the availability of public transit and alternative transportation will not succeed in increasing the number of passengers sufficiently to reverse general trends. Other initiatives will be necessary, bearing in mind regional and local characteristics. Demand management is an avenue for action whose efficacy has been confirmed in numerous countries. It implies an array of measures that influence, in particular, the needs, the time of day at which travel occurs or the individual choices of transportation modes. It seeks to foster carpooling, cycling and the management of parking to complete the efforts to develop public transit. Demand management also has the advantage of maximizing the use of existing transportation networks and, consequently, the profitability of the substantial investments made in public transit and alternative transportation both from an economic standpoint and in terms of GHG reduction. Close linking between land-use planning and the development of transportation networks will also contribute to such management.

Investments in public transit and alternative transportation engender numerous benefits for individuals and communities. An accessible, efficient public transit system and fully developed alternative transportation system infrastructure are key economic and social development tools for Québec and its municipalities. They enhance individual mobility and alleviate congestion, which leads to smoother passenger and freight transportation flows. In addition, each modal shift from automobile travel to public transit and alternative transportation contributes to reducing pollutants and GHG emissions and improves the physical condition of users.

Other measures might be contemplated to promote a reduction in the number of kilometres that motorists travel. For example, within the context of pilot projects set up in Oregon, Minnesota, Switzerland and the Netherlands, a device installed in cars counts the kilometres travelled and links a pricing rate to the distance. The installation of intelligent parking metres, as is the case in San Francisco, might also be a means of avoiding needless travel and ascertaining in real time the parking spaces available.

Québec's sustainable mobility policy will come into force in 2013. The new policy will seek to consolidate and develop the services for public transit by 2020. It will propose a new financial framework that allows for the development of public transit services, active transportation, carpooling and car-sharing, and the implementation of demand management strategies. The policy will bring to life the government's perspective of public transit and alternative transportation and contribute to Québec's GHG objectives and the enhancement of Quebecers' quality of life. Details of the policy will be unveiled later.

### **Priority 14: Create a greener car fleet through more fuel-efficient and better maintained vehicles**

While public transit and alternative transportation are the ideal choice when available, reliance on the automobile will still be necessary for many everyday trips. In this context, the government will also intervene to reduce emissions from the car fleet by implementing several initiatives centred on demand for fuel-efficient vehicles and the enhancement of the energy and environmental performance of vehicles.

Through its *Electric Vehicles 2011–2020 Action Plan*, the Québec government wishes to ensure that 25% of new light-duty passenger vehicles sold in 2020 are electric (rechargeable hybrid or entirely electric). Reliance on green energy instead of conventional fossil fuels significantly reduces GHG emissions stemming from individual travel. The discount on the purchase or leasing of electric vehicles and the installation of charging stations, in effect until 2015, is accelerating the arrival in Québec of electric vehicles by offering financial support to Quebecers who wish to reduce the environmental impact of their travel. The plan could be broadened and include motorcycles in the coming years.

A feebate system applicable to the purchase or registration of a new vehicle will be examined as a prime tool to further support the shift to the electrification of transportation, bolster incentives to make ecoenergetic choices and simultaneously reduce Québec consumers' vulnerability to rising gas prices. Clear, compulsory displays will inform consumers of the impact of their choice of vehicle on the cost of fuel and energy that they will incur and the attendant GHG emissions. The coming into force of the new incentives would be planned beyond 2015, in particular to ensure linking with the introduction of more rigorous emission standards.

Having contributed significantly to the adoption of a more stringent GHG vehicle emission standards in North America for the period 2010-2016, the Québec government, in collaboration with its North American partners, intends to continue to rely on the intervention levers available to it to ensure that the standards are reinforced starting in 2017.

Aside from the standards and the choices of vehicle and fuel, behaviour can make a significant difference in regards to energy consumption of vehicles and their GHG emissions. With this in mind, the government will implement a light-duty vehicle inspection and maintenance program (PIEVA). An environmental compliance inspection will be required for vehicles over eight years old when they change owner. The program could then be broadened by 2020. It will not only focus simultaneously on health problems stemming from airborne pollutants by reducing pollutant emissions but also avoid costs related to overconsumption of fuel by motorists. Fuel-efficient driving and the avoidance of idling, which were subject to targeted initiatives in the CCAP 2006-2012, will continue to be promoted as additional means available to motorists who wish to drive in a greener manner and at less cost.

Lastly, within the framework of its participation in the Conference of New England Governors and Eastern Canadian Premiers, Québec is monitoring the development of knowledge on standards concerning low-carbon fuels. This type of measure could be contemplated when the conclusions of deliberations reveal that this option would be beneficial for Québec.

## Priority 15: Invest in intermodality and logistics to optimize freight and passenger transportation

Reliance on railroads and navigable waterways where available in Québec makes it possible to use less energy to transport freight compared to road transport but also to reduce the use of automobile for passenger transport. Moreover, the *Québec Energy Strategy 2006-2015* proposes initiatives to promote the use of railroads and waterways.

In this context and in the wake of the CCAP 2006-2012, the government will, therefore, continue to invest in the development and enhancement of infrastructure and intermodal centres to increase the share of less energy-consuming modes of transportation and to optimize travel by combining different modes of transportation depending on the route traveled. The investments will develop rail and maritime transport, make them more efficient and attractive, and make known their benefits to broaden reliance on them and build customer loyalty. The requisite conditions to sustainably increase the railroads' and navigable waterways' share of modal transportation in the freight transportation sector will be introduced gradually.

Logistics is also a promising avenue both to optimize unimodal transportation and to facilitate intermodality. Projects to enhance logistical practices will, therefore, be implemented to create intermodal transportation hubs. To this end, the best practices in logistics, assisted by the information and communications technologies (ICTs), can contribute to more widespread use of less energy-consuming modes of transportation by allowing better management of infrastructure, traffic and fleets, facilitating goods tracking, and improving the exchange of information between stakeholders in the transportation logistics chain.

## Priority 16: Enhance the efficiency of maritime, rail, air and off-road transportation

In view of the government's determination to promote broader reliance on rail and maritime transport, it is important to focus on the efficiency of these modes of transportation and implement initiatives aimed at reducing their GHG emissions.

In this context, investments will enhance the efficiency of rail and maritime transport, through energy efficiency measures or the enhancement of processes, conversion to less-polluting energy sources, or the modernization of equipment.

While the modal share of rail and maritime transport is still limited in freight transportation, the efficiency gains achieved are significant and sustainable considering the lengthy useful life of rail and maritime infrastructure.

Efficiency gains are also possible in the air and airport equipment sectors. The worldwide airline industry's willingness to reduce its carbon footprint might pave the way to new possibilities for GHG reduction in the sector in the coming years. The use of less-polluting sources of energy in airport equipment such as baggage trucks, delivery trucks, passenger shuttles, and so on, also warrants consideration.

Several governments and associations in the maritime, rail and air sectors are examining the possibility of introducing standards and requirements or elaborating best practice codes to reduce the GHG emissions of these modes of transportation. Québec will promote such efforts, which can contribute to a reduction in the emissions of Québec carriers in its territory and beyond its borders.

Lastly, the possibility of reducing emissions in the off-road vehicle and equipment sector will also be examined. Measures that achieve energy efficiency gains might be contemplated for off-road vehicles used for recreational or transportation purposes (ATVs, snowmobiles, and so on) and for off-road equipment used in several sectors of activity such as mining, forestry or agriculture.

### Priority 17: Reduce the environmental footprint of road freight transport

The trucking and delivery sector must contribute significantly to GHG reductions with a view to attaining the 2020 target. The government will contemplate all possible avenues to increase the efficiency of this mode of transportation and reduce its emissions.

An approach will be established to support fleet managers, in particular, to conduct energy audits, determine the efficiency measures to be introduced and elaborate tools to pinpoint the best maintenance practices or the most fuel-efficient choices when vehicles are replaced.

The government will also continue to financially support fleet owners who wish to invest to enhance the energy efficiency of their vehicles and thus reduce their operating costs, e.g. the installation of equipment to enhance vehicle aerodynamics, the conversion of trucks to electric hybrid vehicles, or conversion to less-polluting energy such as natural gas or biogas. The possibility of defining the use of certain technologies through regulations will be examined.

As is true of automobiles, fuel-efficient driving techniques will be especially appropriate to reduce fuel consumption. Fleet owners who wish to train their employees may thus benefit from financial support in this respect.

Aside from the gains in energy efficiency, energy conservation and GHG reduction, all of these initiatives will also contribute to facilitating compliance by manufacturers with impending North American standards governing the GHG emissions of new heavy-duty vehicles. Québec will support the adoption of more stringent emission standards in this sector.

## 3.3 SUPPORT QUÉBEC FIRMS IN THE TRANSITION TO A LOW-CARBON ECONOMY

The Québec industrial sector ranks second after the transportation sector in terms of GHG emissions by sector, with 28% of the inventory (22.9 megatons of CO<sub>2</sub> equivalent in 2009). Aside from fugitive emissions or emissions from solvents, emissions in this sector are attributable to industrial combustion (55.5%) and manufacturing processes (43.5%). Since 1990, they have declined by roughly 25%, in particular as a result of enhanced energy efficiency and technological choices, substitution of fuels, but also because of the shift in Québec from manufacturing to a service-centred economy.

Québec has several thousand industrial establishments. However, most of the emissions (88%) come from major industrial emitters (25 kilotons of CO<sub>2</sub> or more annually), i.e. fewer than 100 businesses.

The cost of energy and raw materials account for a significant portion of the expenses of a number of businesses. Such firms must, therefore, regularly optimize their manufacturing processes or production methods, or adopt energy efficiency measures. To invest in energy efficiency is to reduce costs, improve the profitability of businesses and their competitiveness. It also reduces their vulnerability to the availability of fossil energy and increases in the price of such fuels. At a time when the world's oil reserves are dwindling because of growing demand and climatic considerations could restrict or increase the cost of using fossil energy, efficiency and austerity in carbon consumption are required.



**Québec's vision for industry  
in the context of climate change**

By 2020 and beyond, Québec industry will have developed while innovating to reduce its greenhouse gas emissions. The optimum conception of projects in order to limit new GHG emissions will be one of the usual good practices of promoters and a factor that the public administration will recognize when authorizing the projects and granting financial support. Businesses, especially in remote areas, will have better access to remote renewable, less-polluting energies and rely on them more extensively.

It goes without saying that businesses that act promptly and modernize will be at the greatest advantage. Since the reduction of GHG emissions is often synonymous with being more efficient, especially from the standpoint of energy, GHG emission reduction combines both the organizational objective of profitability and the environmental objective of GHG emission reduction. By supporting the transition of its economy, the Québec government is displaying vision.

In order to support efforts by Québec firms to reduce their GHG emissions, the CCAP 2006-2012 granted financial support to businesses wishing to convert from fuel oil, butane and propane to a form of energy generating lower GHG emissions or to improve their energy efficiency. The initiatives generated sound outcomes both for the environment and the profitability and competitiveness of the participating businesses.

**Priority 18: Enhance the carbon balance and energy efficiency of Québec firms**

Energy conservation, reliance on renewable energies or energies that produce fewer GHG emissions, the ongoing improvement of industrial processes, and the choice of the most efficient equipment when new projects are carried out are initiatives that will be encouraged to support the sustainable development of Québec firms.

Initially, a single entry point will be established to accelerate and facilitate access by enterprises to government support. The programs under the CCAP 2020 will also be more inclusive than those established previously in order to seize a greater number of opportunities to reduce GHG emissions in the industrial sector. Several sectors of activity and businesses of all sizes, from major emitters to small and medium-sized enterprises (SMEs), will be eligible for financial support in order to improve their productivity while reducing their carbon footprint.

The financial assistance granted, which could take several forms such as non-refundable contributions, loans or loan guarantees, will cover projects that significantly reduce GHG emissions. Such projects may consist in the implementation of on-site efficiency measures, the installation of energy or energy conversion equipment and initiatives aimed at instilling a culture centred on efficiency, the optimization of processes, and energy conservation in businesses. In the latter instance, energy audits or energy integration between industrial sites may be considered.

Guidance initiatives for enterprises and worker training measures pertaining to the new processes, energy management practices and GHG reduction technologies will round out the government assistance.

**3.4 FOSTER THE EMERGENCE OF SUSTAINABLE BUILDINGS**

The building sector accounts for 15% of Québec's GHG emissions, which are mainly attributable to heating. Consequently, they can vary markedly from one year to the next depending on the harshness of the winter. Since 1990, residential emissions have plummeted by 43% because of more widespread use of electric heating. Emissions from institutional buildings (government buildings, educational institutions, hospitals and so on) have fallen by 15% since 2002 as a result of energy efficiency and the conversion of oil-fired heating systems to renewable energies and natural gas.

**Québec's vision for buildings in the context of climate change**

By 2020 and beyond, Québec will be in the vanguard in the construction of green, fuel-efficient buildings thanks to reinforced standards and broader reliance on green technologies and materials. The recognition of the environment into which buildings are integrated will be more widespread in planning. GHG emissions from Québec's building inventory will decline, in particular through a reduction in the use of fuel oil to heat buildings and conversion to renewable energies.

However, the picture is not quite as bright regarding commercial buildings. The significant increase in the surface area of buildings such as megastores and more widespread use of natural gas in new buildings have significantly increased GHG emissions in the sector since 1990.

There are numerous programs in Québec that can contribute to reducing GHG emissions from buildings, focusing on energy efficiency, new technologies and emerging energy sources. To accelerate the emergence in Québec of green buildings, the initiatives that will be put forward within the framework of the CCAP 2020 will complement these programs. They will seek both to enhance standards and regulations governing buildings and to ensure financial support for the reduction of their carbon footprint. A reduction of energy needs and GHG emissions at the source must be taken into account when new buildings are planned or existing buildings are renovated. To this end, an integrated approach will be emphasized.

(residential, commercial and institutional). To this end, the commercial and institutional sectors will be subject to new standards starting in 2015, and those in the residential sector will be revised in 2017.

**Remove obstacles to the use of renewable energies and green technologies**

The emergence of green buildings in Québec depends, in particular, on broader reliance on renewable energies such as solar and geothermal energy, hydroelectricity and wind power. There are several regulatory and normative barriers that hamper their use, e.g. restrictions on the installation of solar panels or wind turbines in urban environments. The government will thoroughly examine the barriers and eliminate those that are no longer warranted.

Priority 19: Adopt greener building standards

**Add green provisions to the Québec Construction Code**

Québec has a number of standards governing buildings, the cornerstone being the Québec Construction Code, which defines the minimal standards to be observed. By focusing on the Code, the government is thus adopting the means of significantly and sustainably altering the construction market.

Through the CCAP 2006-2012, the standard under the Novoclimat program will apply to all new residential construction as of July 1, 2012. For the duration of the CCAP 2020, the government intends to pursue this avenue by reviewing at least every five years the energy efficiency requirements for all types of buildings



## Elaborate a Québec sustainable building strategy

Aside from the issue of climate change, challenges stemming from green buildings must be approached in the broader context of sustainable development. For this reason, the government will elaborate a Québec sustainable building strategy that will focus, in particular, on the environmental impact of buildings from the design stage to their demolition, their impact on Quebecers' health and well-being, and the economic benefits that optimal building design engenders. Among the factors to be covered, mention should be made, in particular, of integrated building design, energy and water needs, the integration of buildings into their environment and the urban fabric, the introduction of new technologies, GHG emissions, adaptation to climate change, and health, both for existing and future buildings. The purpose of the strategy will be to implement measures to make Québec buildings greener but also to mobilize and pool the efforts of all stakeholders.

The carbon footprint of buildings can be reduced by promoting the use of materials that generate fewer GHG emissions over their useful life (from extraction to elimination) or that have sound insulating properties in order to reduce the building's energy consumption over its useful life. In this context, wood is an attractive choice since it generates few GHG emissions compared with other commonly used construction materials. Accordingly, in conjunction with the *Wood Use Strategy for Construction in Québec*, the government will encourage the use of wood in the non-residential construction sector, where its use is much less widespread than in the residential sector. To this end, the Régie du bâtiment du Québec will take steps to facilitate the use of wood in buildings over four storeys in Québec. Several initiatives will be supported to better publicize the relative advantages of wood and other materials with a low carbon footprint and further develop practices, in particular the realization of life cycle analyses adapted to the Québec context and the elaboration and organization of advanced training for professionals in the construction sector. Lastly, the realization of catalyst projects that call for the construction of environmentally responsible wood buildings will demonstrate the possibility of using this material in order to make them reference models.

Moreover, the government will examine the scope of certain environmental certification specific to buildings in the Québec context, e.g. LEED certification and BOMA, and regulatory measures in force abroad that might prove worthwhile in Québec. In particular, the government will examine the potential impact of compulsory energy ratings for residential, commercial and institutional buildings. Depending on the impact revealed, such an initiative might be implemented during the second phase of the CCAP 2020.

## Priority 20: Promote renewable energies and energy efficiency in residential, commercial and institutional buildings

### The residential sector

The Québec residential sector contributes to a lesser extent to Québec's GHG emissions since 79% of households heat with electricity. However, a number of households use light fuel oil to heat their homes. In this context, the government will financially support Quebecers who wish to convert their fossil fuel heating systems to systems that rely on geothermal, hydroelectric, wind or solar power. Assistance for conversion will complement that offered under the Rénoclimat program. This integrated approach will reduce energy needs and promote renewable energies.

Furthermore, the government will fund part of the cost of acquiring equipment for supplying electricity from renewable energies for buildings not connected to Hydro-Québec's grid, which are mainly located in northern Québec and remote areas.

### The commercial and institutional sectors

The government will enhance current energy efficiency subsidies in commercial buildings and will also support recourse to geothermal, hydroelectric, wind or solar power in new buildings and the conversion of fossil fuel heating systems to these forms of energy. In addition, the concomitant establishment of energy

efficiency measures will be encouraged to reduce energy needs at the source and take advantage of all possibilities for enhancing the energy efficiency of the buildings targeted. Lastly, special attention will be paid to initiatives carried out in buildings located in northern Québec and supplied by autonomous electrical grids.

The government will rely on the necessary intervention mechanisms to eliminate by 2018 the use of No. 5 and No. 6 heavy fuel oil to heat commercial and institutional buildings. This initiative will allow for significant gains with regard to energy efficiency, air quality and the reduction of environmental hazards linked to the storage of heavy fuel oil.

### Priority 21: Reduce the use of halocarbons

Halocarbons are GHG with much greater potential for global warming than that of carbon dioxide (CO<sub>2</sub>). The GHG reductions that can be achieved by limiting the use of or leaking of such gases are especially noteworthy in the context of the fight against climate change.

The government will pursue its Refrigeration Optimization Program (OPTER), which seeks to reduce hydrofluorocarbon (HFC) emissions in the refrigeration systems of supermarkets and arenas. Recourse to systems that use little or no HFC will be strongly encouraged and the possibility of extending the approach under the program to other sectors of application will be examined. Furthermore, the *Regulation respecting halocarbons* will be revised to broaden its scope and very strictly limit the use of hydrochlorofluorocarbon (HCFC) and HFC in refrigeration, freezer and air conditioning equipment in the commercial sector and arenas. The new regulatory requirements might apply to all new systems starting in 2014 and all existing systems starting in 2020.

## 3.5 CONTRIBUTE TO THE DEVELOPMENT OF SUSTAINABLE AGRICULTURE

GHG emissions in agriculture stem primarily from livestock production (enteric fermentation and manure management) and soil management. Such emissions have been relatively stable since 1990. They stood at 6.5 megatons of CO<sub>2</sub> equivalent in 2009, i.e. nearly 8% of emissions in the Québec inventory.

It is possible to reduce the emissions by improving certain agricultural and livestock production practices and by reducing the use of fossil fuels, in particular for machinery and greenhouse heating. Under the CCAP 2006-2012, financial support for farming enterprises and agri-food businesses was made available to fund such initiatives.

### Québec's vision for agriculture in the context of climate change

By 2020 and beyond, the agricultural sector will have modified a number of its crop and livestock production practices in order to reduce their impact on Québec's GHG emissions. Through the acquisition of greenhouse heating systems and less energy-consuming equipment or equipment that operates with local, renewable energies, numerous farm producers will be less vulnerable to fluctuating oil prices.



## Priority 22: Equip farmers to better manage GHG emissions from crop and livestock production

Agriculture is contributing significantly to Quebecers' food security and Québec's economic development. The CCAP 2020 therefore wishes to reinforce the sector's position by enhancing the standards governing certain agricultural practices.

Accordingly, the CCAP 2020 will focus on crop, livestock and soil management, in particular the integrated management of mineral nitrogen fertilizers, to avoid over-application, the attendant GHG emissions, and the contamination of ground-water and surface water.

Moreover, projects pertaining to manure management may be supported by the CCAP 2020. Indeed, technologies such as the capture of biogas produced by manure storage structures can contribute to reducing GHG emissions stemming from the decomposition of manure. The CCAP 2020 will also emphasize the dissemination of information, training, awareness-raising and guidance for producers and advisors on technology and agricultural practices aimed at GHG reduction. Other initiatives might also be supported according to the advancement of knowledge of GHG reduction in the agriculture sector.

## 3.6 LINK THE ENVIRONMENT AND THE ECONOMY IN THE MANAGEMENT OF RESIDUAL MATERIALS

In Québec, GHG emissions attributable to the elimination of residual materials account for 6.1% of Québec's total emissions (5.03 megatons of CO<sub>2</sub> equivalent). Such emissions stem primarily from biogas generated by the decomposition of organic residues in landfills. Between 1990 and 2009, the residual materials sector reduced its GHG emissions by 33.5% as a result of the obligation to capture and convert or eliminate biogas in Québec's main landfill sites.

While GHG emissions in this sector are attributed to landfills and incineration, it is also possible to act upstream at different stages in the product life cycle to achieve gains in the reduction or avoidance of GHG, for example through the reduction at the source and eco-design.

The CCAP 2006-2012 facilitated several advances aimed at GHG reduction in the sector through the application of the *Regulation respecting the landfilling and incineration of residual materials* and through biogas capture and support for the processing of organic matter by means of biomethanization and composting. Since 2011, the *Québec Residual Materials Management Policy* and the attendant action plan have, above all, guided government action in this field since it seeks to prohibit landfilling and promote recycling (spreading, composting or biomethanization) of putrescible organic matter for 2020.

### Québec's vision for the management of residual material in a climate change context

By 2020 and beyond, the amount of residual materials per capita generated will have declined. The collection of organic matter to convert it through composting or otherwise will have been added to the collection of other recyclable materials and will be part of the usual services offered. GHG emissions from landfills will decline significantly since they will be captured at most sites and organic matter will no longer be landfilled but converted.

The contribution made by the Société québécoise de récupération et de recyclage (RECYCQUÉBEC) in the management of deposit and separate collection systems is recognized. This government corporation, which is introducing initiatives according to the 3R-R hierarchy (reduce at source, reuse, recycle, reclaim), will complement this action plan. To this effect, the future RECYCQUÉBEC strategic plan will support initiatives aimed at the management of residual material by including, in particular, solutions to prohibit organic matter from landfill sites.

### Priority 23: Support GHG emission reduction linked to the management of residual material

The CCAP 2020 is intended to complement the *Québec Residual Materials Management Policy*. To this end, it will ensure follow-up to the substantial investments granted to several Québec municipalities to install biomethanization equipment to treat municipal organic residues and will account for the attendant emission reductions for 2020. Once the results of the initial biomethanization projects are known, funding and the scope of support for this type of activity will be reassessed.

The CCAP 2020 will also support the recycling of fertilizing residual materials (FRMs), including municipal biosolids, in order to reduce emissions stemming from their incineration or landfilling. FRMs are residual materials that are used to maintain or enhance plant nutrition and the physical and chemical properties and biological activity of soils.

Moreover, the CCAP 2020 will also support efforts to make the manufacturers of products whose life cycle implies GHG emissions aware of their responsibilities. To this end, the *Regulation respecting the recovery and reclamation of products by enterprises* will be amended by 2014 to cover refrigeration, freezer and air-conditioning equipment. The regulation compels businesses that market certain products to recover and process them at the end of their useful life according to the principle of extended producer responsibility. The enterprises targeted must elaborate and implement recovery and conversion programs for such products that satisfy regulatory standards and attain the prescribed recovery objectives. The Regulation also seeks to foster the design of more environmentally-friendly products. The new regulatory provisions will ensure, in particular, the recovery and conversion according to good practices of the devices targeted and, if nee-

ded, the recovery and proper destruction of refrigeration gases and insulating foam found in them and whose composites are halocarbons.

Lastly, it should be noted that financial support aimed at the realization of GHG emission reduction projects by the municipalities under the Climate Municipalities program might also achieve additional gains in the residual materials sector for those that wish to act in this respect.

The support offered by the CCAP 2020 in the residual materials sector will be reviewed, in particular according to the new initiatives stemming from the future strategy to banish organic matter and the budgets available.

## 3.7 CAPITALIZE ON QUÉBEC'S RENEWABLE ENERGY POTENTIAL

Some 97% of Québec's electricity generation now comes from renewable sources (hydroelectricity and wind power). This enviable situation stems, by and large, from the judicious energy development choices that Québec made over 50 years ago when it engaged in the massive development of its hydroelectric power potential.

Since then, the Québec government has clearly demonstrated its intention to pursue the development of renewable energies. In this respect, the *Québec Energy Strategy 2006-2015* calls for the implementation of new hydro-development and wind power projects for the generation of electricity and support for emerging renewable energies. The government has also announced additional electricity generation projects that rely on renewable energies within the framework of the Plan Nord.

Emissions from electricity generation account for only 0.8% of Québec's GHG emissions inventory (2009). The emissions come mainly from Hydro-Québec's thermal power plants, which are operated above all during very cold periods in the winter (La Citière, Cadillac, Bécancour), and 24 diesel-fired power plants, which supply networks (off-the-grid power systems such as the Îles-de-la-Madeleine and the northern communities) that are not connected to Hydro-Québec's central electrical distribution network.

**Québec's energy vision  
in the context of  
climate change**

Several ongoing initiatives should contribute to a reduction in emissions in this sector. Indeed, in 2012, Hydro-Québec permanently closed the Sorel-Tracy thermal power plant. Furthermore, the government corporation is elaborating combined wind/diesel pilot projects in two autonomous networks in Nunavut and the Îles-de-la-Madeleine. It is also evaluating the possibility of using underwater turbines to satisfy local electricity needs in off-the-grid power systems and even to extend its power distribution lines to certain remote communities.

The CCAP 2020 is relying on initiatives that will complement those already implemented by Hydro-Québec. In addition to the priorities related to electricity described later, special attention will be paid to the development of bioenergy in order to diversify Québec's energy portfolio and boost energy production using Québec's resources.

**Priority 24: Foster the emergence of bioenergy**

Genuine interest in bioenergy has been apparent for several years in Québec. Through the avenues that bioenergy offers, such as biofuel and the generation of heat, it can be advantageous. As the case may be, bioenergy can contribute to the reuse of matter otherwise destined for elimination, foster the use of local inputs or reduce our fossil energy needs.

By 2020 and beyond, renewable energies will account for a growing share of our energy consumption. Significant efficiency gains will already have been achieved in all sectors of activity for the benefit of Québec businesses and Quebecers.

When bioenergy replaces fossil energy, it can offer potential GHG emission reductions. However, such potential depends on several factors, i.e. the type of biomass used, the conversion technology, the fuel to be replaced, and the conditions that would have prevailed in the absence of the project (also called the reference scenario).

Within the framework of the CCAP 2020, specific projects devoted to the production, supplying or use of bioenergy will be financially supported insofar as they engender short-term GHG reductions, while preserving air quality. The eligibility criteria will be specified later and will include, in particular, recognition of the carbon debt. Support will initially be confined to projects that use residual biomass. The importance of aiming at short-term GHG emission reductions is warranted, in particular, by the recommendations of the IPCC to stabilize then reduce such emissions as quickly as possible in order to limit climate change impacts. The same goes for the importance attached to airborne pollutants, for reasons of public health and coherence with government measures adopted to enhance air quality.

Furthermore, policy directions governing bioenergy will be elaborated and will allow for the adoption of a structured, coherent approach to the production and conversion of bioenergy in Québec, based on the principles of sustainable development. The policy directions will take into account the numerous challenges that bioenergy poses, in particular the capacity to support the entire development chain of bioenergy, supply guarantees, impact on businesses and jobs linked to existing uses of the raw material, the contribution to the fight against climate change, impact on food production, and impact on air quality. They will take into account the temporal dynamics and sequestration of GHG specific to this form of energy, according to a life cycle approach and evolving scientific knowledge in this field.

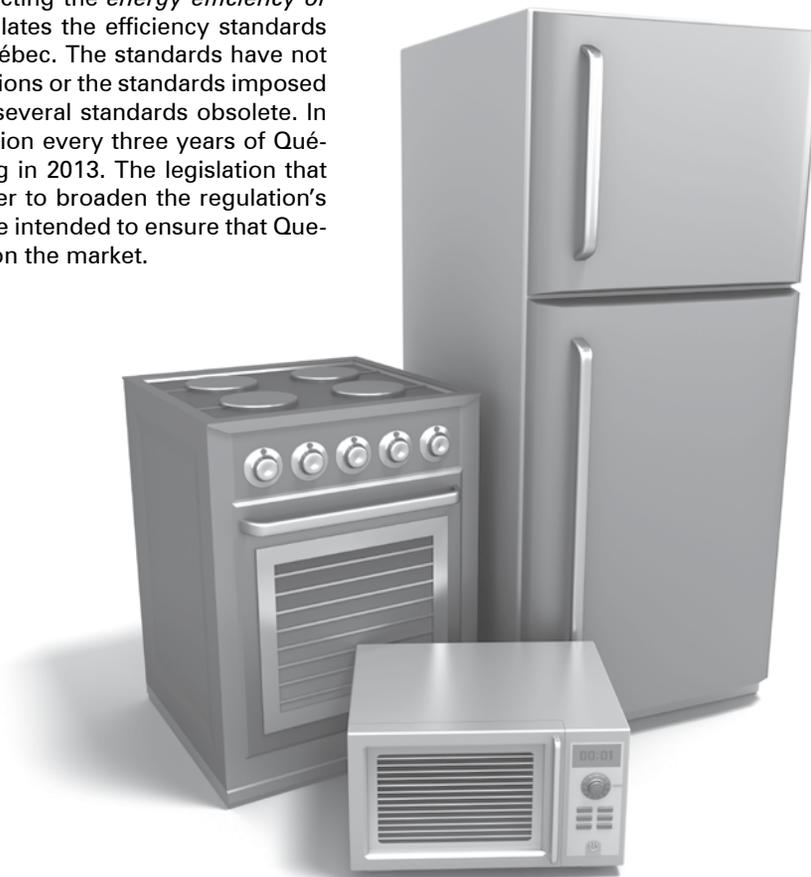
**What is bioenergy?**

Bioenergy is energy that can be produced from biomass, i.e. renewable organic matter. Such biomass can originate in forests or on farms or may come from urban, industrial or other residual materials. Different methods are used to convert biomass into energy, which can take several forms.

## Priority 25: Enhance the energy efficiency of commonly used devices

Québec households and businesses use numerous devices in everyday life that contribute to their quality of life or the smooth functioning of their operations, such as household appliances, water heaters, heating, ventilation and airconditioning systems in buildings, lighting equipment, and so on.

Several legislative and regulatory tools control the energy efficiency of such devices in Canada. In Québec, the Regulation respecting the *energy efficiency of electrical or hydrocarbon-fuelled appliances* stipulates the efficiency standards governing appliances manufactured or sold in Québec. The standards have not been updated in Québec since 1995. Market conditions or the standards imposed by other governments in Canada have rendered several standards obsolete. In this context, the CCAP 2020 will support the revision every three years of Québec standards governing such appliances, starting in 2013. The legislation that frames the regulation will also be updated in order to broaden the regulation's powers and scope. The regulation amendments are intended to ensure that Quebecers benefit from the most efficient appliances on the market.



# 4 STRENGTHEN QUÉBEC SOCIETY'S RESILIENCE TO CLIMATE CHANGE IMPACTS

Aside from the transversal initiatives dealing with adaptation to climate change presented in section 2, the CCAP 2020 will support initiatives specific to health, the economy, infrastructure and the natural environment with a view to strengthening Québec society's resilience to climate change.

## 4.1 MAINTAIN THE HEALTH OF INDIVIDUALS AND COMMUNITIES

Rising average temperatures and the greater frequency and severity of heatwaves and extreme weather events can significantly affect Quebecers' physical and mental health. Climate change is likely to affect health, especially that of young children, seniors and certain individuals whose physical condition, economic situation or geographic location make them sensitive or vulnerable. This situation demands immediate preventive action and solid preparation for the climate hazards.

Regarding public health, the CCAP 2020 is built on the initiatives undertaken in the previous plan and elaborates new initiatives. Priority has been given to initiatives centred on the enhancement of air quality, the prevention of the impact of heatwaves and the prevention and elimination of heat islands. The same applies to the prevention and reduction of psychosocial impact related to disasters stemming from climate change, an area for action in which several needs have been defined.

### Québec's health vision in the context of climate change

By 2020 and beyond, despite changes in Québec's climate, the increased frequency and intensity of extreme weather events and disasters, the health of individuals and communities will be preserved.

### Priority 26: Prevent and limit diseases, injuries, mortality and psychosocial impacts

The impact on health of rising average summer temperatures stems primarily from the degradation of air quality through increased smog formation. This leads to an increase in the gravity and frequency of asthma attacks and respiratory and heart problems.

The same goes for heatwaves, which reduce the human body's ability to resist the adverse effects of pollutants, increases the risk of heatstroke and aggravates chronic diseases such as diabetes, respiratory failure and cardiovascular problems. Heat islands exacerbate such problems, which leads to an increase in visits to emergency rooms,

hospitalization, and the number of premature deaths. Lastly, extreme weather events such as flooding or landslides can have a significant psychosocial impact on disaster victims.

### Air quality

To limit airborne pollutants and reduce the attendant mortality and morbidity, the government will elaborate and implement a Québec air quality policy, which will promote local and regional air quality management. Communities will thus be better equipped to handle the challenges posed by air quality management and adaptation to climate change.

### Prevention and intervention during heatwaves

In addition to further developing knowledge in the field, the government intends to reinforce monitoring and surveillance systems and initiatives that allow for more efficient, prompt interventions during heatwaves. It will also establish telephone alert systems and personalized, automated Internet services for certain groups of vulnerable individuals.

### Why strengthen Québec society's resilience?

A society whose resilience is robust is better able to cope with new threats and extreme weather events by adapting (by resisting or changing) in order to limit the social, economic and environmental repercussions stemming from climate change.

## The fight against heat islands

Within the framework of the CCAP 2006-2012, the municipalities implemented several pilot projects to eliminate existing heat islands in urban environments or prevent them. Mention should be made of tree planting, the construction of shade areas, the use of reflective materials, the preservation of existing cool zones (wetlands, wooded areas, and so on), the installation of green roofs, and the upgrading of buildings. The government intends to pursue initiatives aimed at eliminating heat islands in municipalities by supporting the training of specialized teams and implementing financial incentive measures. Priority will be given to initiatives aimed at vulnerable populations, e.g. seniors' centres, and that rely on cooperative resources or the social economy. A voluntary standard from the Bureau de normalisation du Québec is also being elaborated to plan public parking lots in a perspective of reducing urban heat islands.

Moreover, several government policy directions that will be elaborated within the framework of the revision of the legislation governing land-use planning and urban planning will take into account this problem in order to prevent the appearance of new heat islands when urban development or redevelopment is under way, especially through the preservation of existing cool zones.

## Psychosocial impact of disasters related to climate hazards

The victims of disasters (freezing rain, high tides, flooding) are subject to acute distress because of the significant losses sustained, e.g. death, job loss, loss of housing, and the many steps that must be undertaken related to insurance, transfers, and so on. The government therefore intends to enhance the assistance and psychosocial support measures offered to the population in the wake of such events, such as screening for mental health problems among disaster victims and the enhancement of information and training tools and methods intended for the general public, organizations, medical staff, and elected officials. The government will also evaluate the relevance and feasibility of establishing a monitoring system focusing on the psychosocial impact of extreme weather events in order to plan the appropriate measures to assist the disaster victims.

## 4.2 PRESERVE ECONOMIC PROSPERITY

The degree of vulnerability of economic activity in the face of climate change varies according to the company, since it depends, among other things, on the location, the sector of activity, the clientele targeted or the resources and networks involved. Extreme weather events and climate change impacts are already affecting Québec businesses, whether from the standpoint of infrastructure, supply or distribution chains, operations, profitability, customer traffic, or employee absenteeism. In order to preserve economic prosperity, vulnerable economic players in Québec must receive guidance and support in their adaptation approach and be encouraged to seize new business opportunities and to innovate. To this end, the government will invest in the implementation of adaptation solutions centred on the resilience of economic activity that ensures Québec's economic prosperity.

### Québec's economic vision in the context of climate change

By 2020 and beyond, Québec firms that are likely to be affected by climate change will be aware of their vulnerability. They will be able to protect themselves from the adverse impact and seize new opportunities stemming from climate change, thereby ensuring the resilience of their economic activity and the Québec economy.

## Priority 27: Support vulnerable economic players

The government will initially establish financial support and a guidance service to encourage businesses to take into account adaptation to climate change in their practices. It will encourage them to adopt preventive measures and prepare to cope with disasters. It will support the economic recovery of businesses affected by disasters related to climate change. The jobs of workers in sectors that are vulnerable to climate change will thus be better preserved, either through the transition to other types of activity or the quicker resumption of activity after the disaster.

Moreover, while all of Québec's economic sectors are vulnerable to climate change, some are more vulnerable than others, in particular when they depend directly on natural resources or climatic conditions. This is true of forestry, agriculture, tourism and mining operations.

### Forestry

In a context where climate change and its impact risk being progressive and cumulative, it is important to document such change and anticipate its impact on Québec forests. To this end, the investigations undertaken within the framework of the CCAP 2006-2012 will continue and will enable stakeholders in the sector to adopt preventive, adaptive management of Québec's forest resources. Some examples are the evaluation of the impact of climate change on forest productivity, updating the approach to the management of natural disturbances and transferring the knowledge acquired to decision-makers and regional stakeholders so that it can be integrated into forest management.

### Facing the elements, strengthening the resilience of businesses to climate change

"In a changing climate, firms that routinely incorporate climate change impacts and adaptation in major investment decisions and in decisions with long-term consequences will be better off than their competitors."

NRTEE, 2012

### Agriculture

The agriculture sector must also be able to adapt to the new challenges posed by climate change. The government is proposing adaptation solutions that affect the agronomic, phytosanitary and hydric facets of agriculture and that will reduce the agricultural sector's vulnerability to climate change. The CCAP 2020 will thus support phytosanitary monitoring and the diagnosis of pests already found in Québec. The government will also ensure monitoring, knowledge transfers and early detection of new pests with a view to adjusting intervention strategies. Moreover, it will promote the responsible use of water resources in the agricultural sector. Lastly, it will support the implementation of soil conservation and biodiversity protection practices against a backdrop of adaptation to climate change, in particular through agroforestry development.

### The tourism industry

The tourism industry, which depends both on natural resources and climatic conditions, will face numerous challenges against a backdrop of climate change (more frequent winter mild spells, extreme weather events, longer summers, and so on). To protect themselves from undesirable impacts, overcome the anticipated consequences or seize new opportunities stemming from climate change, tourism enterprises must adapt their products or rely on the elaboration of substitute products. Regional vulnerability analyses will be conducted to inform tourism enterprises of the challenges that they will have to meet in the future and guide them in their adaptation approaches. To this end, the government will elaborate and publish, in particular, a guide to inform tourism industry stakeholders about the adaptation solutions available to them.

## Mining operations

The government plans to make northern Québec a vast economic, social and environmental development project. Mining operations, which are already a major component of the economy of northern Québec, will develop further. There are already 10 new mining projects that could be launched in the coming years in the territory that the Plan Nord covers. The realization of analyses of the hazards linked to the industry will reveal the impact of climate change on mining operations. The government will then be in a position to target the industry's vulnerability and reexamine certain technical criteria pertaining, for example, to the management of mine tailings and the use of water resources. Mining enterprises will also have available the necessary knowledge to implement the appropriate adaptation solutions.

## 4.3 STRENGTHEN THE DURABILITY AND SAFETY OF BUILDINGS AND INFRASTRUCTURE

In view of the vital role that buildings and infrastructure play in our society, we must accord them special attention against a backdrop of climate change. The collapse of several electric power transmission lines in the Montérégie region during the 1998 ice storm and the damage caused to buildings and transportation infrastructure during successive marine submersion and flooding events that affected areas of eastern Québec in 2010 reveal Québec society's vulnerability to climate hazards.

### Québec's infrastructure vision in the context of climate change

By 2020 and beyond, the durability and safety of the buildings and infrastructure mostly likely to be affected by climate change impacts will be ensured through design, management and maintenance adapted to a context of climate change.

The design, management and maintenance of infrastructure and buildings and their physical protection against unknown factors or their relocation in safe areas are also key components of an effective adaptation strategy. The renewal and rehabilitation of our built environment affords a unique opportunity to immediately adapt to future climatic conditions.

Within the framework of the CCAP 2006-2012, several research projects were launched in order to assess the impact of climate change on transportation infrastructure in northern Québec and in several regions of the Gulf of St. Lawrence and the St. Lawrence estuary. In Nunavik, the projects focused, among other things, on the vulnerability of airport, maritime and road infrastructure and the applicability of adaptation methods, in particular regarding melting permafrost. Research is also under way on the vulnerability of road infrastructure and seawalls to protect against coastal erosion in the Bas-Saint-Laurent, Côte-Nord, Gaspésie and Îles-de-la-Madeleine regions, where the provincial road network closely follows the coast.

### Priority 28: Revise infrastructure design criteria and management and maintenance methods

Some infrastructure is likely to be affected by climate change through changes in the conditions to which it is exposed or unexpected extreme weather events. In this context, the CCAP 2020 pays particular attention to the infrastructure most likely to be affected by climate change impacts in order to strengthen its resilience.

### What is the resilience of an ecosystem?

The resilience of an ecosystem refers to its ability to resist and survive disturbances that affect its composition and functioning.

Climate change is likely to alter the composition and structure of ecosystems. It threatens *ipso facto* the ability of our natural environment to render the ecological services on which we depend. Given that ecosystems that display greater biological diversity and are in generally good health are more resilient to disturbances, including those stemming from climate change, the CCAP 2020 will pay special attention to these aspects.

The services that aquatic ecosystems provide are especially crucial from a social, economic and environmental standpoint in Québec. We need only to think of drinking water, hydroelectricity generation, freight and passenger transportation by navigable waterway, and tourist activities such as fishing or swimming to be convinced of it. Possible variations in water resources resulting from climate change will certainly affect the benefits that we derive from such resources. In this context, it is important to pay special attention to conservation and the management of water resources. Through the CCAP 2020, the government will examine water resource management in terms of the anticipated impact of climate change.

As for transportation, several types of infrastructure are concerned, such as roads, railroad lines, ports, bridges, culverts, seawalls, and so on. The government will, therefore, implement adaptation solutions aimed at reinforcing the management and maintenance of existing infrastructure in a context of climate change and will integrate adapted design criteria for the new infrastructure. Special attention will be accorded, in particular, to transportation infrastructure built on the permafrost in Nunavik. The projects will hinge on the most recent outcomes of research, experimentation and monitoring. The government will also ensure that public services are maintained during extreme hydrometeorological and geological events by implementing preventive measures geared to effective, adapted intervention.

The government will adapt the management of public dams to new climatic conditions by elaborating decision support tools to adapt the parameters of the management plans of public dams to anticipated fluctuations in water balance. Moreover, Hydro-Québec will pursue its initiatives aimed at the continuous improvement of its electricity transmission and distribution networks.

## 4.4 PRESERVE BIODIVERSITY AND THE BENEFITS THAT ECOSYSTEMS OFFER

Quebecers' well-being and Québec's economic prosperity depend on the numerous benefits that ecosystems offer. Natural environments provide a vast array of services, e.g. provisioning services such as water, pharmaceutical products, food, and materials; regulating services such as climate control or control over shoreline erosion; cultural services such as recreation, tourism, and the psychological benefits of green spaces; and support services such as the formation of soil and oxygen production.

### Québec's ecosystem conservation vision in the context of climate change

By 2020 and beyond, the adaptation of the management of water resources, biodiversity and ecosystems to climate change will foster the resilience of ecosystems and the maintenance of the essential ecological services that contribute to Quebecers' well-being and prosperity.

### Priority 29: Update biodiversity and ecosystem evaluation, protection and management tools

To preserve the resilience of ecosystems, we must thus ensure the sustainable protection and management of species and populations, recognize the most resilient or the most vulnerable natural or built habitats, and ensure the maintenance of ecological services and the benefits that they afford society.

Accordingly, the government will establish the level of vulnerability of ecosystems and fauna and flora species that are of major environmental, economic or social importance in Québec, including threatened and vulnerable species. It will examine the entry routes and propagation methods of invasive exotic species that climate change favours with a view to implementing adapted detection and control methods. Moreover, the impact of climate change on aquatic and land wildlife species, in particular those that are harvested, will be evaluated so that the management of the species and their habitat can be adapted to new climatic conditions.

As for habitats and ecosystems, those that are already subject to intensive anthropogenic pressure (wildland urban interfaces, agri-environments, wetlands and forest environments) are more vulnerable to climate change impacts. A climate change vulnerability index pertaining to natural environments in southern Québec, adaptation measures in agri-environments and wildland urban interfaces and a strategy to protect and manage resilient or vulnerable ecosystems in southern Québec will be developed to foster the resilience of fragile ecosystems.

Moreover, the monetary value of ecological services has not been estimated to date and is rarely taken into account in the decision-making process, in particular in the field of land-use planning. This gap in our knowledge poses a genuine threat for the protection and conservation of our natural environment, which is of vital importance for the well-being and prosperity of our society. Since climate change is likely to increase pressure on biodiversity and ecosystems, the CCAP 2020 will support the conception of new tools designed to estimate the monetary value of the ecological services that they generate in order to promote their conservation and thus preserve the benefits that they offer us.

### Priority 30: Update knowledge and adapt water resource management tools

Efficient management of water resources in a context of climate change requires the acquisition, modelling, analysis and harnessing of data on the levels and quality of surface water and groundwater. The adaptation of management tools must also be carried out according to the projected changes.

The CCAP 2020 will ensure the long-term survival of hydrometric and groundwater monitoring networks and will thus maximize hydrological and piezometric knowledge (collection, validation and access to data). Moreover, a hydrological modelling platform elaborated within the framework of the CCAP 2006-2012 will be extended to all of Québec's southern drainage basins as well as future hydroclimatic projections. Several hydrological indicators and hydric resource management tools will also be updated according to the most recent data and climate projections. They will, in particular, make it possible to better manage stream discharges to avoid floods and maintain a sufficient water level during droughts to preserve the health of aquatic ecosystems.

## 5 STAY ON COURSE: COORDINATION, FOLLOW-UP AND ACCOUNTABILITY

In their capacity as partners of the Québec government in the fight against climate change, Quebecers, businesses and communities must be informed of progress stemming from the investments made to reduce GHG and adapt to climate change within the framework of the CCAP 2020.

### Coordination, follow-up and accountability

Each year, under the direction of the MDDEP, the government will publish a progress report on the implementation of the priorities defined in the CCAP 2020. The report will present data on the implementation of initiatives and programs stemming from the 30 priorities and their cost, as well as concrete examples of achievements. Data from the annual GHG emission inventory and the review of transactions related to the GHG emission cap-and-trade system are other follow-up tools.

The government also intends to more exhaustively monitor changes in progress achieved through the implementation of the priorities in the CCAP 2020. To this end, a more general review of spinoff will be elaborated every three years according to the following approach:

- Emissions that are reduced or avoided that can be accounted for with a sufficient degree of confidence according to existing protocols or other methodologies will be presented in association with the specific priority of the CCAP 2020 from which they stem. For example, it will be possible to account for GHG reductions obtained through the installation of an energy efficiency device in an industrial establishment or the conversion of an oil-fired building heating system to electricity.
- In some instances it is difficult to quantify the impact of initiatives or programs for various reasons (diffuse impact, absence of protocols, technical complexity or very high cost) or the impact is of a qualitative nature. It may also be difficult to isolate their impact from that of other variables, e.g. other priorities in the CCAP 2020, complementary policies and socioeconomic factors. In such situations, an analysis by sector rather than by priority will be emphasized to better account for the impact of the initiative or program.

In this context, the use of macroeconomic indicators may reveal current trends in a sector or highlight the economic, social or environmental benefits linked to each priority. For example, growth in mass transit ridership in Québec or its mode share with respect to other modes of transportation might clearly indicate the combined

success of measures aimed at the enhancement of the public transit service offer and greater densification of urban environments. Such growth would indicate that Québec is on the right track, without necessarily distinguishing the impact of investments and initiatives under the CCAP 2020 in the realm of public transit from other government action.

- In the realm of adaptation, the *2013-2020 Government Strategy for Climate Change Adaptation* is the cornerstone of initiatives in this field in Québec. The review that will be conducted will thus highlight how the priorities in the CCAP 2020 have contributed to the attainment of the objectives in the Strategy. It will be crucial to pinpoint vulnerabilities in this process to ascertain whether the initiatives implemented mitigate them.

Moreover, this approach responds to the key recommendations of the Auditor General in the spring of 2012, which direct the MDDEP to further evaluate GHG reductions and the efficiency of the measures proposed. More specifically, to carry out the recommendations overall and constantly enhance its procedures, the MDDEP intends to establish a project office that will be responsible, in particular, for developing an integrated management framework for the CCAP 2020. The framework will include clear guidelines concerning the purposes and objectives sought under the CCAP 2020 and the quality of the data associated with the quantification of GHG emission reductions. It will also define the roles and responsibilities of stakeholders in the CCAP 2020.



The project office team will establish detailed planning of the implementation of the CCAP 2020 in order to monitor its outcomes more closely. In the same way, it will ensure follow-up of its financial framework to foster optimal, efficient use of financial resources. To this end, it will, in particular, produce performance indicators that allow for accurate monitoring of deadlines, the budgets granted and government expenditure on all of the programs stemming from the priorities pinpointed in this action plan.

In this context, the efficiency and effectiveness of the priorities defined in the CCAP 2020 will also be thoroughly examined to more rapidly identify discrepancies between actual and anticipated results and foster the adoption of timely remedial measures. The cost per ton of reduced GHG will be one of the performance indicators. However, other indicators will also be used to take into account the numerous benefits stemming from the implementation of the priorities in the CCAP 2020 and the complexity of the factors that underpin it.

In its capacity as the coordinator of the CCAP 2020, the MDDEP will also ensure the coherence of the initiatives that government departments and bodies carry out. It will collaborate with the departments and bodies to ensure that government initiatives overall respect the objectives set by the CCAP 2020. To this end, in the coming months, the MDDEP will specify with the departments concerned the targets and indicators pertaining to the programs that stem from the priorities in the CCAP 2020. The existing interdepartmental coordination mechanisms will be reviewed and new mechanisms may be introduced to ensure better coordination of the action plan.

### **Development of government expertise in the field of climate change**

The production of studies designed to broaden our knowledge of reduction potentials in each sector will support the ongoing process of bolstering the CCAP 2020, in particular from the standpoint of the relevance of new priorities, initiatives and programs aimed at contributing to the attainment of climate change objectives. The studies will pinpoint the most effective measures and optimize the elaboration of programs.

The government will also maintain cutting-edge expertise in the realm of climate change linked to scientific research and changing public policy in North America and abroad. Indeed, scientific knowledge is changing very rapidly as regards life-cycle analysis, GHG emission accounting and understanding of the cross-impacts of climate-related initiatives. The same is true of knowledge of adaptation. The government will base the assessment of the attendant GHG reductions and the choice of the initiatives to be emphasized on a solid scientific footing. Efforts will be pursued to enhance the data presented in Québec's GHG inventory to ensure that it properly reflects the outcomes of initiatives under the CCAP 2020.

### **Changes in the CCAP 2020 and advisory committee**

The CCAP 2020 will be reviewed at midpoint to ensure that the efficacy of the initiatives is maximized and to optimize the use of the funds available to attain the objectives set. The second phase of the CCAP 2020 will thus be elaborated in light of the revenue that the carbon market generates, progress achieved in our initiatives and new policy directions governing sustainable mobility, land-use planning and energy.

Beyond the follow-up carried out by the MDDEP and government departments on the priorities in the CCAP 2020, a new consultation mechanism will be implemented. Indeed, the CCAP 2020 advisory committee, set up in December 2010 to advise the Minister of Sustainable Development, Environment and Parks on the elaboration of the action plan will be expanded and become an advisory committee on follow-up to and the implementation of the CCAP 2020. The committee will be representative of the priority sectors in the action plan and will meet periodically to take stock of the state of advancement of the plan and advise the Minister on other possible measures or the enhancement of the measures under way. Meetings open to the public will be held periodically to foster public support for climate change action.

The CCAP 2020 is an open-ended action plan that will adjust to the development of Québec society.

## Funding of the CCAP 2020

The CCAP 2006-2012 was, by and large, funded through a levy on fuel and fossil fuels, which generates \$200 million in revenue annually. The royalty will be extended until December 2014 to contribute to the funding of the CCAP 2020.

However, funding for the CCAP 2020 hinges mainly on the GHG emission cap-and-trade system. Indeed, the revenue from the auctioning by the Québec government of emission allowances under the system will be paid into the Green Fund and be used to fund the CCAP 2020. The level of funding will depend on changes in the price of carbon on the market. The budgets announced in the action plan hinge on the minimum anticipated revenues, bearing in mind that the floor price of \$10/ton of GHG, indexed annually, was set in the GHG emission cap-and-trade system starting in 2012. Additional revenue might be available from year to year and will then be earmarked for initiatives already under way or new measures following an analysis of the initiatives likely to contribute more significantly to the attainment of the objectives of the CCAP 2020.

# 6 ADVANCING TO THE 2020 TARGET: DATA

Québec has set as its target a 20% reduction by 2020 in its GHG emissions in relation to 1990. A target of this scope is, in itself, already ambitious and it is all the more so for Québec.

Unlike a number of other jurisdictions, Québec does not have significant emission reduction potential in its electricity generation sector, since 97% of its electricity already comes from renewable sources. In this context, it is, above all, the transportation, industry and building sectors that will be called upon to reduce Québec's GHG emissions.

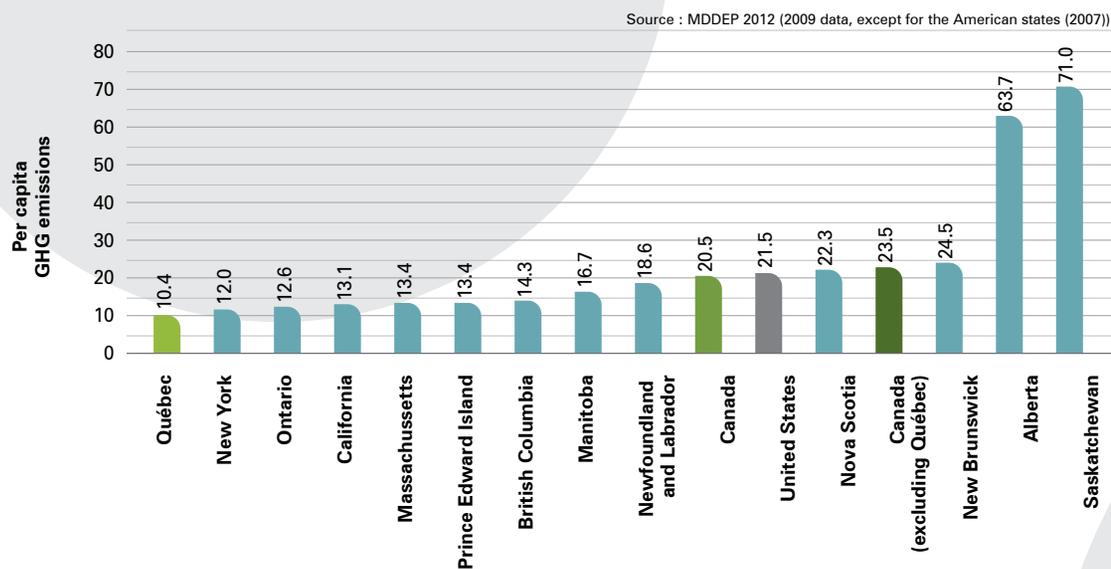
Furthermore, a great deal of effort has already been invested in Québec since 2006 in the field of climate change. Forthcoming reductions will thus be harder to achieve given the considerable effort made in recent years, in particular in the industrial sector. The reductions will have to centre on technology but also on a sweeping review of our behaviour and ways of doing things.

Québec is firmly committed to this course in the long term to benefit from the substantial attendant spinoff for Quebecers, businesses and Québec society as a whole, both from an economic standpoint and in terms of quality of life. The measures that are geared both to the attainment of the 2020 target and to maximizing positive spinoff for Québec will be emphasized, as well as those that lead to a sweeping medium- and long-term transformation of markets and habits.



## Chart 1: Per capita GHG emissions in Canada and the United States

(in tons of CO<sub>2</sub> equivalent per capita)

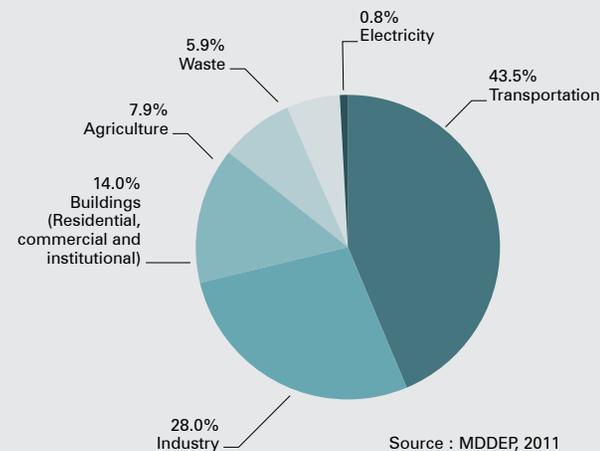


## Profile of Québec's GHG emissions in 2009

In 2009, Québec's total GHG emissions stood at 81.8 megatons of CO<sub>2</sub> equivalent, which represents 10.4 tons of GHG per capita, the lowest ratio in all of the Canadian provinces.

Transportation accounts for 43.5% of Québec's GHG emissions and now ranks first among the heaviest GHG emitters. For this reason, two-thirds of funding under the CCAP 2020 is devoted to the sector. Industry ranks second, then the building sector, followed by the agriculture, residual materials and electricity sectors.

## Chart 2: Breakdown of Québec's GHG emissions in 2009



**Table 1: GHG emissions by economic sector**

|  |  |
|--|--|
| <p><b>Transportation</b></p> <p>1990: 27.4 MT of CO<sub>2</sub> equivalent<br/>2009: 35.6 MT of CO<sub>2</sub> equivalent<br/>Change: +30%</p>                                       | <p>Among all sectors, the transportation sector experienced the biggest increase between 1990 and 2009, i.e. 30%. Road transport is mainly responsible for the increase, i.e. 83% or nearly 7 MT. Pickup trucks, minivans and sport utility vehicles accounted for a larger proportion of the vehicle fleet in 2009 than in 1990. Moreover, significant growth was noted in freight hauling by truck.</p>  |
| <p><b>Industry</b></p> <p>1990: 30.6 MT of CO<sub>2</sub> equivalent<br/>2009: 22.9 MT of CO<sub>2</sub> equivalent<br/>Change: -25%</p>   | <p>Among the factors that explain the striking decrease in GHG emissions in the industry sector since 1990, an appreciable decline was noted in the consumption of fuel oil and natural gas, a marked increase in the use of electricity, technological improvements to processes between 1990 and 2009 in most sectors, and temporary or permanent plant closings. It should be noted that a considerable portion of the reduction in industrial emissions occurred in the pulp and paper sector (over 3 MT).</p>   |
| <p><b>Buildings (Residential, commercial and institutional)</b></p> <p>1990: 10.8 MT of CO<sub>2</sub> equivalent<br/>2009: 11.4 MT of CO<sub>2</sub> equivalent<br/>Change: +6%</p> | <p>The growth observed in GHG emissions in the building sector since 1990 is attributable to the development of the commercial and institutional sector, which is relying increasingly on natural gas. The conversion of the Québec economy from a mainly manufacturing economy to a service-centred economy underpins this trend. Emissions in the residential sector have declined by 43% since 1990 although the population has increased by 12% during the same period, in particular because of the conversion of oil-fired heating systems to electricity.</p> |
| <p><b>Electricity</b></p> <p>1990: 1.5 MT of CO<sub>2</sub> equivalent<br/>2009: 0.6 MT of CO<sub>2</sub> equivalent<br/>Change: -60%</p>  | <p>Electricity generation in Québec is rather unique in that nearly 97% of it relied on renewable energy sources in 2009. Less than 1% of the electricity generated in Québec is derived from the combustion of fossil fuels and it is the emissions linked to such fuels that stand out in the inventory. The emissions can vary significantly from one year to the next depending on the use of power plants that operate with fossil energy, especially to satisfy heating needs during extremely cold weather.</p>   |
| <p><b>Agriculture</b></p> <p>1990: 6.3 MT of CO<sub>2</sub> equivalent<br/>2009: 6.5 MT of CO<sub>2</sub> equivalent<br/>Change: +2.5%</p>   | <p>GHG emissions in the agricultural sector have been fairly stable in Québec since 1990.</p>  |
| <p><b>Residual materials</b></p> <p>1990: 7.2 MT of CO<sub>2</sub> equivalent<br/>2009: 4.8 MT of CO<sub>2</sub> equivalent<br/>Change: -34%</p>                                     | <p>GHG emissions in the residual materials sector have declined substantially since 1990, mainly because of the capture and burning of biogas in several landfills. This trend should continue in the coming years in the wake of the implementation of the <i>Québec Policy on Waste Management</i> and the attendant <i>2011-2015 Action Plan</i>, which, among other things, seeks to banish by 2020 the landfilling of putrescible organic waste.</p>  |

## Emissions forecasts for 2020

To grasp the scope of the challenge to be met in terms of GHG emission reduction, a reference scenario on the change in GHG emissions for 2020 was elaborated in December 2011. It presents the normal course of business (NCB), which hinges on several socioeconomic hypotheses deemed to be the most likely at the time the scenario is designed. The NCB takes into account macroeconomic factors such as the price of oil, in respect of which long-term predictive estimates come from national and international agencies recognized for their expertise in this field. It also considers more specific factors known to the government that may significantly affect changes in GHG emissions in a given sector when their probability of realization, e.g. new development projects, or the extent of their impact on GHG, e.g. regulations or government strategies or policies, is deemed to be sufficiently high.

### Socioeconomic hypotheses of the 2011 NCB

(expressed as average annual growth between 2006 and 2020)

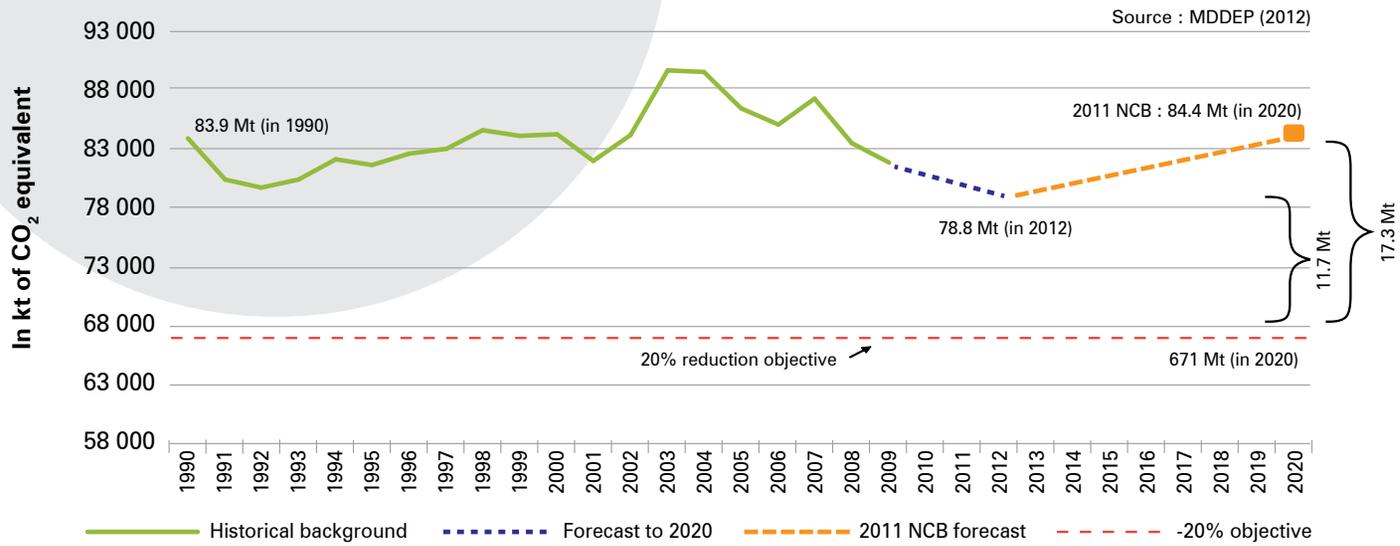
- Real gross domestic product (GDP): 1.8%
- Inflation: 2.0%
- Demography: 0.8%
- Canadian dollar at par with the US dollar in the long term
- Price of a barrel of oil in 2020: US\$99 (2009), US\$119 (current dollars in 2020)

The factors considered in the NCB can vary significantly by 2020 and appreciably affect the estimate of the GHG reduction effort to be made for 2020 to attain Québec's GHG emission reduction target. Certain factors have an especially marked impact since they affect all economic sectors and individual behaviour. Accordingly, an increase or a decrease in the price of a barrel of oil will affect economic development and emissions in the industrial and transportation sectors and the travel choices of individuals.

The NCB will, therefore, be reevaluated regularly between now and 2020 to take into account variations in these factors. This will enable the Québec government to better gauge changes in the effort to reduce GHG that must be made and to adapt its climate change interventions accordingly.

The 2011 NCB banks on a reduction of GHG emissions in Québec that is 6% below the 1990 level. Subsequently, between 2012 and 2020, growth in GHG emissions is anticipated. According to this scenario, GHG emissions should stand at 84.4 MT in 2020, a level slightly above the 1990 level (83.9 MT). Accordingly, to achieve by 2020 the GHG reduction target of 20% below the 1990 level (67.1 MT), the 2011 NCB indicates that GHG emissions should be reduced by roughly 17 MT in 2020 (Chart 3). In relation to the estimated level for 2012, the GHG emission reduction would stand at 11.7 MT.

**Chart 3: Québec's forecast GHG emissions for 2020 according to the normal course of business in 2011**



This profile of GHG emissions for 2020 is changing constantly. However, it does offer a glimpse of the profile of Québec's GHG emissions in 2020 in the absence of the CCAP 2020 and other complementary government intervention that lower GHG emissions and assuming that the hypotheses defined materialize. It shows the importance for the Québec government of pursuing, indeed of stepping up, its efforts to fight climate change.

## The Québec government's adoption of the 2020 target

The Québec government adopted its GHG emission reduction target of 20% below the 1990 level in November 2009, in the wake of a sweeping consultation by the Committee on Transport and the Environment in the National Assembly of Québec. In the public consultation paper prepared at that time, the government compared different reduction target scenarios for Québec, ranging from 10% to 20%, with those of its partners under the Western Climate Initiative (WCI). The 20% target, which ranked Québec as the lowest per capita emitter of GHG in the WCI, is the one that rallied most stakeholders at the public consultation.

## The attainment of the target through the GHG emission cap-and-trade system

The GHG emission cap-and-trade system leads to the attainment of Québec's reduction target of 20% below the 1990 in the North American carbon market. Indeed, it imposes an emission cap which affects the key sources of GHG emissions, i.e. the industrial, transportation and building sectors, which account for over 85% of Québec's overall emissions. Since the GHG emission cap-and-trade system cap is degressive, it leads to an absolute reduction in 2020 of the combined GHG emissions in the participating states or provinces. The GHG emission cap-and-trade system has been calibrated in such a way that the sectors that emit GHG that are not directly covered by the system are also contributing adequately to the GHG emission reduction effort in Québec.

However, the system does not guarantee that GHG emission reductions will occur in Québec. Indeed, on the carbon market, an enterprise subject to an emission cap may choose to reduce its emissions to comply with the regulation or purchase emission allowances or offset credits on the WCI market. Such allowances or credits may come from Québec but also from other jurisdictions participating in the carbon market.

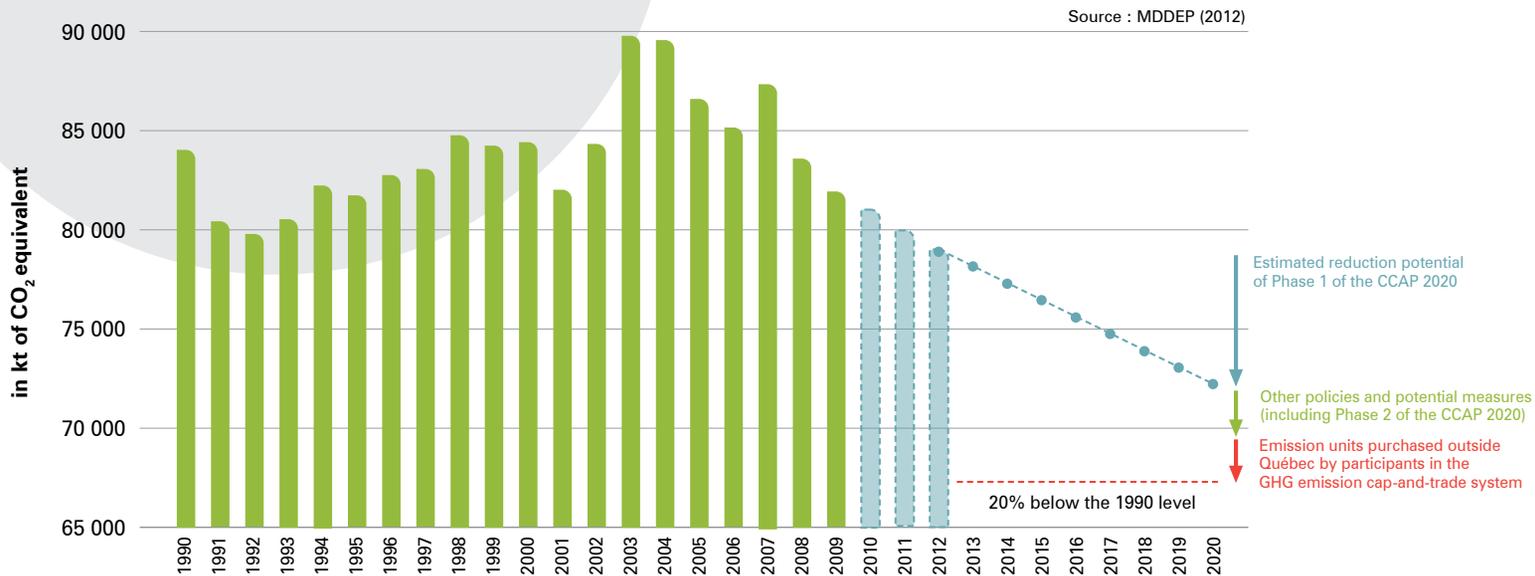
Enterprises and participants in the market, not the government, make the purchases in question. Indeed, recourse to external government purchases to attain Québec's GHG emission reduction target is not currently being contemplated. The government is relying instead on market forces, the current CCAP and other allied government strategies, policies and measures to ensure that the reductions are achieved as much as possible in Québec.

## The CCAP 2020: Reduce emissions... in Québec

To ensure that emission reductions are achieved as much as possible in Québec and that Quebecers and the Québec economy thus fully take advantage of the benefits linked to climate change action, the government is using the revenue generated by the sale of emission allowances under the GHG emission cap-and-trade system to invest in GHG emission reductions in Québec.

The CCAP 2020 therefore presents an array of initiatives that will be implemented to achieve emission reductions in Québec. The priorities defined in the CCAP 2020, combined with other government initiatives already announced, offer significant GHG reduction potential in the key GHG emitting sectors in Québec. According to the investigations conducted when the CCAP 2020 was elaborated, the priorities formulated to date could generate potential GHG reductions on the order of 6 MT for 2020 (see Chart 4). This quantification is an estimate and the potential will be reassessed periodically according to the revisions of the NCB and bearing in mind data that will become available following the implementation of the initiatives and programs in the CCAP 2020.

**Chart 4: Contribution of the CCAP 2020 and other potential policies and initiatives to the attainment of Québec's reduction target for 2020**



The CCAP 2020 will be open-ended and other initiatives will be added to it during the period 2013-2020 according to Québec's progress in the attainment of its target and the funds available. Indeed, in several sectors, studies are underway or will be conducted to determine the additional initiatives most likely to generate GHG reductions in Québec and engender considerable medium- and long-term benefits for Québec society. A long-term perspective is needed since the effort made by 2020 to reduce GHG will initiate an even broader transformation by 2030 and beyond.

Moreover, given that the GHG emission reduction is a government objective, other strategies, policies and initiatives will be added to the CCAP 2020 to further contribute to GHG emission reductions in Québec. Mention should be made, in this respect, of the future Québec policy on sustainable mobility and the impending *Sustainable Regional and Local Land Use Planning Act* through which the government wishes to elaborate a perspective that integrates all facets of sustainable development, or the overall energy efficiency plan and the *Québec Energy Strategy 2006-2015* that should be renewed by 2020. The policies will lead, in particular, to major changes in behaviour and energy performance. Phase 2 of the CCAP 2020 can take them into consideration and propose additional initiatives to bolster their impact.

The implementation of the CCAP 2020 requires the establishment of dynamic partnerships between the government and key interveners in Québec society. The municipalities are at the forefront in the fight against climate change by virtue of their power of influence over land occupancy and urbanization. We hope that the municipal sector will pursue its contribution to the identification of solutions to GHG emission reduction and adaptation to climate change in Québec.

The attainment of Québec's reduction target poses a daunting challenge to which society as a whole is being asked to contribute. The Québec government is playing a leading role in this respect and will establish conditions that enable the Québec economy to benefit to the utmost from positive spinoff from the fight against climate change.



# 7 CONCLUSION

The success of the fight against climate change requires a major change of direction in terms of collective and individual choices. Indeed, the GHG emission reductions necessary for 2020 and beyond hinge on the ability of societies to develop, produce, consume and travel differently. In light of its energy profile and the importance that Quebecers attach to environmental protection, Québec is in a very good position to take advantage of this shift.

We are determined to pursue our initiatives to fight climate change on two complementary, indissociable fronts, i.e. the reduction of GHG emissions and adaptation to climate change. This challenge affords Québec an outstanding opportunity to reduce its dependence on fossil energy, which is primarily responsible for our GHG emissions, accelerate the transition to a green economy and thus ensure current and future generations of Quebecers a healthy, prosperous future in a perspective of sustainable development.

To act immediately to take into account changing climatic conditions and greater threats posed by extreme weather events in territorial development and our societal choices will enable us to prevent or reduce adverse impact for communities, infrastructure and ecosystems. To act immediately to enhance our energy efficiency and rely resolutely on renewable energies will enable us both to reduce our GHG emissions and our vulnerability to anticipated increases in oil prices. These initiatives require, of course, initial investments or changes in our ways of doing things, which will, however, be less substantial than they would be if we fail to act promptly. By planning today the development of an even more efficient Québec, by investing now instead of postponing decisions, we are also reducing the impact of climate change on our future public finances. To maintain the ability of generations to invest in their quality of life is a question of intergenerational fairness and responsible societal choices. That is the choice that we are making.

The attainment of objectives requires the mobilization and commitment of all partners and key players in communities in the municipal sector, industry, private enterprises or community organizations. An integrated perspective that encompasses all sectors of activity and vigorous, structuring, coherent initiatives will be necessary to ensure the realization of our societal project. To this effect, the CCAP 2020 poses a basic milestone but that marks only one stage in the fight against climate change.

For this reason, the CCAP 2020 is open-ended and will adapt to our evolving ambitions, needs and society. The CCAP 2020 also belongs to all Quebecers and we are relying on the commitment of everyone in the coming years to tell us how to go further in the fight against climate change and in respect of sustainable development for the benefit of Quebecers now and in the future. The dialogue is open.

# APPENDIX Funding breakdown of the 2013-2020 Climate Change Action Plan priorities

| PRIORITIES   |   | BUDGET (\$ MILLIONS) |
|--|---|----------------------|
| <b>Plan – Québec communities at the forefront</b>                    |   |                      |
| 1  | Foster sustainable land-use planning of the territory in a perspective of combating climate change  | 6.0                  |
| 2  | Support municipal and community initiatives to reduce GHG, adapt to climate change, and engage in sustainable land-use planning                       | 94.0                 |
| 3  | Promote risk management that minimizes the vulnerability of communities   | 21.2                 |
| <b>Innovate – Develop knowledge and technology</b>                   |   |                      |
| 4  | Support innovation and research and the development, demonstration and marketing of technologies aimed at reducing GHG emissions                      | 40.0                 |
| 5  | Pursue the development of climatological monitoring networks  | 15.0                 |
| 6  | Support research in adaptation  | 45.6                 |
| <b>Mobilize – Engage the population and partners in action</b>       |   |                      |
| 7  | Disseminate knowledge, know-how and solutions pertaining to GHG reduction and adaptation to climate change  | 26.5                 |
| 8  | Mobilize Québec by supporting initiatives in civil society and in communities   | 44.0                 |
| 9  | Raise Québec's profile in Canada and on the international scene   | 2.5                  |
| <b>Lead the way – Québec government committed to set the example</b> |   |                      |
| 10   | Integrate the concern for climate change into the public administration   | 4.5                  |
| 11   | Foster a reduction of GHG generated by the operations of the public administration  | 14.0                 |
| <b>Establish a carbon market</b>                                     |   |                      |
| 12   | Send a carbon price signal by establishing a GHG emission cap-and-trade system  | 8.0                  |
| <b>Foster the sustainable mobility of people and goods</b>           |   |                      |
| 13   | Promote public transit and alternative transportation by enhancing their availability, developing infrastructure and facilitating sustainable choices | 1,536.7              |
| 14   | Create a greener car fleet through more fuel-efficient and better maintained vehicles   | 40.0                 |
| 15   | Invest in intermodality and logistics to optimize freight and passenger transportation  | 85.0                 |
| 16   | Enhance the efficiency of maritime, rail, air and off-road transportation   | 38.0                 |

| PRIORITIES   | BUDGET (\$ MILLIONS) |
|--|----------------------|
| 17 Reduce the environmental footprint of road freight transport  | 77.0                 |
| <b>Support Québec firms in the transition to a lower carbon economy</b>                                    |                      |
| 18 Enhance the carbon balance and energy efficiency of Québec firms  | 200.0                |
| <b>Foster the emergence of sustainable buildings</b>   |                      |
| 19 Adopt greener building standards  | 34.0                 |
| 20 Promote renewable energies and energy efficiency in residential, commercial and institutional buildings | 123.3                |
| 21 Reduce the use of halocarbons   | 19.7                 |
| <b>Contribute to the development of sustainable agriculture</b>  |                      |
| 22 Equip farmers to better manage GHG emissions from crop and livestock production                         | 10.0                 |
| <b>Link the environment and the economy the management of residual materials</b>                           |                      |
| 23 Support GHG emission reduction linked to the management of residual material                            | 10.3                 |
| <b>Take advantage of the potential of renewable energy in Québec</b>                                       |                      |
| 24 Foster the emergence of bioenergy   | 50.0                 |
| 25 Enhance the energy efficiency of commonly used devices  | 0.5                  |
| <b>Maintain the health of individuals and communities</b>  |                      |
| 26 Prevent and limit diseases, injuries, mortality and psychosocial impacts                                | 22.3                 |
| <b>Preserve economic prosperity</b>  |                      |
| 27 Support vulnerable economic players   | 16.4                 |
| <b>Strengthen the durability and safety of buildings and infrastructure</b>                                |                      |
| 28 Revise infrastructure design criteria and management and maintenance methods                            | 11.5                 |
| <b>Conserve biodiversity and the benefits that ecosystems offer</b>  |                      |
| 29 Update biodiversity and ecosystem evaluation, protection and management tools                           | 9.0                  |
| 30 Update knowledge and adapt water resource management tools  | 15.0                 |
| Coordination, monitoring and accountability  | 45.0                 |
| <b>TOTAL</b>   | <b>2,665.0</b>       |





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