



# USING ENERGY

**To Build the Québec of Tomorrow**

**Québec Energy Strategy 2006-2015**

The text of this publication is available on the website  
of the ministère des Ressources naturelles et de la Faune.

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Québec Energy Strategy 2006-2015





## Message from the Premier

### *Improving the present and preparing for the future*

Québec is a world leader in the energy field. Hydro-Québec is one of the planet's largest electricity utility. Thanks to James Bay's development, Québec is home to the world's largest hydroelectric complex.

The development of our hydroelectric resources is a source of collective pride, and has also proved to be a profitable investment. The revenues generated help fund our public services, and contribute to the well-being of the entire population.

We have made the right energy choices. This source of wealth must be used, as never before, to improve the present, but also to prepare for the future. This is the aim of the new Québec energy strategy, **Using energy to build the Québec of tomorrow.**

The strategy is ambitious. It expresses our firm belief that by developing our full potential and using energy more efficiently, we can increase our prosperity, better protect the environment and better prepare to face the challenges of the future.

The new energy strategy sets out the path that Québec will follow over the next ten years. It expresses our Government's vision concerning our resources development and use. It calls for immediate actions that will help prepare our children's future.

#### **A new step forward**

The energy strategy released by our Government opens up a new era in a long history of achievements and success. The creation of Hydro-Québec, the nationalization of electricity and the James Bay project prepared the way for achievements that are now the envy of the world.

We are taking a new step forward in this impressive journey which is making us so proud, one that will prove as stimulating and inspirational as the ones before.

The strategy's purpose is to empower the Québec society to maximize the economic, social and environmental benefits associated with the development of its energy resources.

We will resume and speed up the development of our hydroelectric potential. This will strengthen our energy supply security, and our hydroelectric potential will, more than ever before, become a lever for regional and economic development, including the expansion and introduction of industries that create wealth and jobs. Québec's hydroelectric resources will be developed at a pace unequalled since James Bay's second phase.

We are committed to sustainable development, and we will become a leader in this field by developing our own potential for renewable energy, by investing in energy efficiency and by increasing the pace of development and implementation of new energy technologies. Thanks to our resources and the way we use them, we will ensure an environmentally friendly form of economic development.

We are mobilizing all the resources needed to make a significant contribution to the prevention of climate change. At the same time, our Government will go further than any of its predecessors in the area of energy efficiency. And by exporting more energy, we will help improve the greenhouse gas performance of the entire continent.

A further goal of our strategy is to prepare the Québec of tomorrow – a more prosperous Québec that is more concerned about the environment, and less burdened by debt. Hydroelectric development, through the Generations Fund, will fully contribute to reducing the weight of debt on the shoulders of present and future generations.

This is the path that our Government is proposing to the citizens of Québec. I firmly believe that it will rally support throughout Québec.

This new energy strategy is entirely consistent with the objectives we set since April 2003 for all Government actions. It illustrates Québec's ability to build on the heritage we have received as we prepare resolutely for the future.

Our goal is to foster a more responsible use of energy.

A handwritten signature in black ink, appearing to read 'Jean Charest', with a stylized, flowing script.

Jean Charest  
Premier of Québec



## Message from the Minister of Natural Resources and Wildlife

### *A STRATEGY FOR ALL QUEBECERS*

The energy strategy released by the Government is the strategy of all Quebecers. To draft it, the Government has indeed applied an open and transparent approach based on receptivity and accessibility, generating public interest.

Discussions with experts, a parliamentary committee hearing and the on-line consultation reached out to a record number of citizens. The Web-based consultation alone attracted over 10,000 participants, and 2,000 briefs and comments were forwarded by individuals and organizations

#### **Strong messages**

Citizens, businesses and stakeholders in the energy field all stated their point of view forcefully. The Government listened.

Many of the comments concerned hydroelectricity.

Our hydroelectric resources give us a lever for development whose value continues to increase in a world in which other resources are becoming ever scarcer. Hydroelectricity is our first response to the difficult question of energy security. Few industrialized countries can count on such abundant potential for renewable energy, and we must take full advantage of this situation.

The development of wind energy is set on a firm footing. It will become the perfect complement to our unique hydroelectric potential, as many participants in the consultation process pointed out.

Other comments concerned energy savings.

There is an urgent need to use energy more efficiently, to match specific types of energy to specific uses, to change some of our behaviour patterns and to improve our equipment. The goal is to save energy, and also to act responsibly with respect to the challenges that must be met worldwide, since greenhouse gas emissions can only be reduced by controlling our energy consumption. Our privileged position as a producer of clean energy does not exempt us from the responsibility we all share to protect the future.

To draw up the new energy strategy, the Government was able to count on a wealth of suggestions and proposals, which it used to define objectives and the measures needed to achieve them.



## **An innovative strategy**

The objectives and measures presented here by the Government are daring and visionary, and open up new avenues. The strategy proposed will make Québec a leader in the development of renewable energy in North America. For many of our neighbours and partners, energy is a problematic issue. In Québec, it is a source of opportunities and challenges.

The energy strategy innovates in many different ways. It proposes a new approach to hydroelectric development, based on a “portfolio” of projects, in response to the increasing constraints affecting hydroelectric development projects.

It also involves local and regional communities, as well as the First Nations, in future developments. In this way, the Government intends to maximize the local and regional benefits of future investments, while ensuring that the new developments are environmentally friendly and are supported by the communities directly affected.

The Government innovates by providing sustained funding for energy efficiency in the energy field, defined under a comprehensive plan for all forms of energy. The mission of the Agence de l'efficacité énergétique will be broadened, and the Régie de l'énergie will be given increased powers.

Thanks to the new rules defined by the Government, the energy efficiency plan will be subject to strict accountability requirements, to ensure that the resources invested produce the desired results and that the money directed to energy efficiency is properly managed.

## **Focusing on new energy technologies**

The Government also innovates in the area of new energy technologies.

A new institutional and financial framework is set up to accelerate the use of promising technologies in Québec. Priority will be given to the development of bio-fuels, and to the promotion of geothermal and solar energy.

Geothermal energy offers a particularly attractive way to save energy, while solar energy technologies offer new potential. Both of these energies will be developed.

The Government also innovates by updating the regulatory framework to encourage the initiatives taken by individuals and businesses.

### **An achievable vision for the future**

The objectives of the new energy strategy are ambitious and achievable.

The initiatives it announces are stimulating. They are consistent with an overall view of Québec's energy sector, its future development and the benefits it generates.

**With Using energy to build the Québec of tomorrow**, the Government shows that it is possible to reconcile wealth creation with environmental protection and social development. In short, the Government has established one of the fundamental foundations for its vision of sustainable development, which it hopes will rally public opinion generally.



Pierre Corbeil  
Minister of Natural Resources and Wildlife



## SUMMARY

Following a broadly-based consultation process that began in November 2004, this document sets out the Government's energy strategy, *Using Energy to Build the Québec of Tomorrow*.

### OBJECTIVES

The energy strategy has six objectives:

- 1) Québec must strengthen **its energy supply security**.
- 2) We must make better use of **energy as a lever for economic development**. Priority is given to hydroelectricity, wind energy potential, hydrocarbon reserves and the diversification of our natural gas supplies.
- 3) **Local and regional communities and First Nations** must be given more say.
- 4) We must use energy **more efficiently**.
- 5) Québec must become a leader in the **sustainable development** field.
- 6) **Electricity rates** must be set at a level that promotes our interests and ensures proper management of resources, thus improving price signals while protecting consumers and Québec's industrial structure.

To meet these six objectives, the energy strategy is expressed in terms of orientations and priority actions determined for hydroelectricity, wind energy, energy efficiency, new energy technologies and hydrocarbons.

### ORIENTATIONS AND PRIORITY ACTIONS

#### 1) RESUME AND ACCELERATE THE PACE OF DEVELOPMENT OF OUR HYDROELECTRIC POTENTIAL

- In recent years, **hydroelectric development has experienced a slowdown** and, to correct the situation, the Government has decided to resume and accelerate the development of our hydroelectric potential with the implementation of new projects totalling **4,500 MW** within the next five years.
  - The new projects will represent a pace of development **equal to James Bay's second phase**, and add more capacity than the total of the past 15 years. This translates into investments of \$25 billion and 70,000 jobs over ten years – in addition to the \$4 billion in investments and 888 MW produced by the Eastmain 1A/Rupert Diversion/La Sarcelle project that is currently going through an environmental assessment.
  - The 4,500 MW added capacity will be sufficient to meet Québec's long-term demand, promote wealth-creating industrial development, and support exports.
- **The projects** will be developed using an **innovative approach** involving the constitution of a **"portfolio" of projects**.
  - Work to complete a major hydroelectric project normally takes ten years and comprises two main phases:
    - negotiations, studies and environmental assessments (five years);
    - engineering and construction (five years).

- The “portfolio” approach consists in launching the first phase of several projects at the same time, ensuring that all necessary agreements and environmental permits are obtained by 2010. The main advantages are:
  - the possibility of adjusting each project’s construction schedule to address unexpected situations that arise during implementation;
  - flexibility for better risk management, and competition between projects;
  - greater efficiency, allowing for an overall gain of at least five years.

The Government does not intend to promote the development of small, privately-owned generating stations. These projects of 50 MW and less are not essential to our energy security and no block of electricity from this type of generating station has been included in the Strategy.

Some local and Aboriginal communities see this as an interesting opportunity for social and economic development in their regions. The Government feels that the best approach is to leave interested communities free to develop such projects provided they have the support of the local population, generate benefits for the region, and are under the control of the community.

In other words, the development of small generating projects (50 MW and less) will be pursued by and for local communities.

Each project will be subject to an environmental assessment by the BAPE, and an agreement concerning the purchase price of the electricity produced must be signed with Hydro-Québec before the project is presented to the Government.

- The Government also intends to ensure that Québec is able to **increase its electricity exports**, once its own needs have been met. It has therefore man-

dated Hydro-Québec to begin discussions with potential partners in view of signing electricity export agreements. The crown corporation will also report on interconnections with neighbouring grids. One of its short-term priorities will be to strengthen interconnections with Ontario.

- The strategy confirms the Government’s desire to **preserve Québec’s advantage in the way of electricity rates** by maintaining:
  - **the heritage block**: most supplies (95% of the current supply) will continue to be priced at the fixed rate of 2.79 ¢/kWh;
  - **competitive rates** to promote economic development: a comparative advantage for industries that create wealth and jobs.

## 2) DEVELOP WIND POWER, AN ENERGY SOURCE FOR THE FUTURE

- It is estimated that Québec has a potential of **4,000 MW of wind power that can be economically connected** to the Hydro-Québec grid by 2015, based on current technology. This represents approximately 10% of the peak electricity demand.
  - The Government intends to develop this potential.
- The Government’s priority for wind power is to **complete the process launched by the two requests for proposals** issued in 2003 and 2005 by Hydro Québec **totalling 3,000 MW of supply**.
- The requests for proposals generate investments of \$4.9 billion. They include requirements concerning Québec content (60%), with a special focus on the Gaspésie-Îles-de-la-Madeleine region and the Matane MRC.
  - Three plants are already established in Matane and Gaspé.

- The Government further intends to issue other requests for proposals for **wind power**, when **conditions are more favourable**. This will depend on:
    - the pace at which the additional **4,500 MW of hydroelectric projects** can be implemented: 100 MW of wind power will be added for every 1 000 MW of new hydroelectricity;
    - **new technological developments** and the cost of connecting to the Hydro-Québec grid. To this effect, Hydro-Québec has been mandated to improve conditions for connecting wind power to the grid.
  - **An additional request for proposals of 500 MW will be issued for the supply of two separate blocks of 250 MW each, one earmarked for the regions (MRC), and the other for the First Nations.**
    - Individual projects will be limited to 25 MW in order to encourage direct involvement by small communities.
    - The requests for proposals will generate investments of \$700 to \$750 million.
  - **Combined wind/diesel power** generation pilot projects will be carried out for off-grid supply networks, aimed at reducing the use of costly and polluting diesel power generation. The first of these projects, in the Îles-de-la-Madeleine, should be in operation by the summer of 2007. The second, in Nunavik, will be implemented in consultation with the Inuit. Based on these pilot projects, Hydro-Québec could generalize this approach in the off-grid supply networks.
- 
- ### 3) USE ENERGY MORE EFFICIENTLY
- Energy efficiency will be a core element of the energy strategy. The actions proposed by the Government will, **between now and 2015, increase the overall energy efficiency target by a factor of eight compared to the current targets.**
  - This will allow for \$2.5 billion in annual savings by consumers;
  - These actions will bring a significant contribution to the prevention of climate change, by eventually avoiding 9.4 million tonnes of greenhouse gas emissions each year. This will be a first step in a more general climate change strategy to be released later by the Government.
  - For the first time, the Government will propose a **comprehensive plan for all markets and all forms of energy**, with concrete implementation means. To this effect, the Agence de l'efficacité énergétique will have a mandate to:
    - identify cost-effective savings to achieve with programs based on third party involvement, without replacing the Hydro Québec and Gaz Métro programs.
    - **a new element of this plan will be to establish an energy savings target in the petroleum products sector:** 2 million tonnes oil equivalent (TOE) by 2015 (equal to just over 10% of Québec's current annual consumption).
    - the funding mechanisms for this comprehensive plan will ensure stability and ongoing action. The funding authorized by the Régie will be used exclusively to implement and administer programs under the plan, and may be increased by amounts paid by the federal Government for energy efficiency initiatives.
  - **The Government intends to promote renewable fuels** such as ethanol and biodiesel. Its goal is to achieve an **average of 5% of ethanol in all gasoline sold by 2012.**
    - Ethanol allows to replace an equivalent quantity of gasoline.
    - **The use of forest and agricultural biomass** and urban waste will be given priority over **grain corn**. Although it is technologically more difficult, it is also environmentally and economically more beneficial for Québec.

- For passenger transportation, the Government will **promote improvements to the passenger car fleet** by:
  - reimbursing the QST (maximum \$1 000) for new hybrid vehicles (2006-2007 Budget);
  - examining the possibility of creating more financial incentives towards the purchase of fuel-efficient vehicles;
  - changing the standards governing vehicles sold in Québec to make them more stringent in respect to energy consumption (California standards).
- **Public transit** will be supported to make it more attractive to new users.
- **Energy efficiency in the freight transportation sector** will be improved.
- **Petroleum products consumption** will be reduced in several sectors through various programs:
  - Use of better performing equipment in heating and industrial processes;
  - improved thermal efficiency for existing building envelopes.
- The Agence de l'efficacité énergétique will propose amendments to the regulations governing energy savings in new buildings in Québec, and their inclusion in the Construction Code.
- The Government will promote **more efficient use of electricity**. Accordingly, Hydro-Québec's energy efficiency target is increased from 4.1 TWh in 2010, to 8.0 TWh by 2015. This represents twice the total electrical consumption of the greater Québec City area households.
- In addition to its energy efficiency programs, the Government has instructed Hydro-Québec to include energy efficiency projects in future requests for proposals.
- Hydro-Québec has also been mandated to file a **new pricing structure** with the Régie de l'énergie, which must include:
  - a wider gap between the two rate levels currently paid by residential consumers, or the introduction of a third rate level (without changing the total bill for consumers);
  - rates that vary by season and time of use, thus allowing consumers to manage their electricity consumption more effectively.
- In regard to natural gas, targets have more than tripled: the 96.9 million cubic metres target by 2008 has been increased to 350 million cubic metres by 2015.
- The Government will apply a plan to improve energy performance for public buildings and for its vehicle fleet. Among other things, the plan will be designed to:
  - reduce unit energy consumption in buildings by 10% to 14% between now and 2010, depending on the sector;
  - reduce fuel consumption by government departments and agencies by 20% between now and 2010.
- Innovative energy consumption actions in the education and health and social services sectors will be recognized, and special financial support will be provided from a \$20 million annual budget.
- The Agence will provide assistance for municipalities requesting help in drafting and implementing energy efficiency plans.
- Energy efficiency assistance programs for low-income households will be improved.

#### 4) INNOVATE IN THE ENERGY FIELD

- The Agence de l'efficacité énergétique's mandate has been broadened to support and promote innovation in the energy field.
- An assistance plan for new energy technologies (approved by the Government and monitored by the Régie) will be included in the comprehensive energy efficiency plan prepared by the Agence.
- This plan **will be financed** through part of the **levy garnered on all forms of energy**, as **determined by the Régie**.
  - An annual target of \$10 million is set. It could generate up to \$40 million in total investments per year by all partners.
- Support for ethanol and the development of an ethanol production industry in Québec will be a central element in the new energy technology support plan devised by the Agence de l'efficacité énergétique.
- The Government intends to give priority to the recovery of forest and agricultural residue and urban waste, rather than corn grain.
- However, some significant technological challenges will have to be met. Accordingly, the Government intends to:
  - support Québec's research teams in this area;
  - establish a pilot cellulosic ethanol plant to begin operation by 2008, so that the technology can be developed by 2010 and production facilities opened by 2012.
- A task force will be created to better identify potential sources of feedstock and identify the business model best suited to maximize the spin-offs from this new endeavour.
- The Government also intends to increase the market penetration of biodiesel.
- Geothermal and solar energy will be promoted and supported by:
  - circulating more information concerning potential gains from **geothermal and passive solar energy**;
  - introducing a **financial assistance program to improve the market penetration of geothermal energy** in the residential, institutional and commercial sectors;
  - systematically exploring the potential contribution of geothermal energy in building design in the public and parapublic sectors, including the Centre hospitalier de l'Université de Montréal (CHUM) and the Centre universitaire de santé McGill (CUSM);
  - mandating the Agence de l'efficacité énergétique, in collaboration with Hydro-Québec, to develop a program to support the capture of solar energy and submit it to the Régie de l'énergie.
- The Government will also lift certain regulatory obstacles that hinder initiatives by consumers and producers to develop other energy potentials.
  - For example, the Government intends to facilitate the decentralized production of electricity and mandates Hydro-Québec to submit two proposals to the Régie de l'énergie by 2007, to:
    - propose conditions on which individuals and businesses may sell excess production to Hydro Québec;
    - develop and propose a program to purchase electricity from **microproducers** (less than 1 MW).
  - The Government also intends to proceed with the **deregulation of biogas distribution activities** to ensure their development and reduce their related greenhouse gas emissions.

## 5) CONSOLIDATE AND DIVERSIFY SOURCES OF OIL AND GAS SUPPLY

- The Government hopes to develop the oil and gas resources in the gulf of St. Lawrence and estuary.
- **The Government's approach will be environmentally friendly.** It includes the following avenues:
  - the application of the "Guide to good practice for seismic surveys in the marine environment" that is currently being prepared in conjunction with other Canadian provinces and the federal government;
  - a strategic environmental assessment of the gulf of St. Lawrence and estuary to ensure that development respects the marine environment;
  - subjecting seismic surveys to section 22 of the Environment Quality Act, by incorporating the results of the strategic environmental assessment into the permits issued.
- The Government will collaborate with the federal government to settle the territorial dispute concerning hydrocarbon exploration and production in the gulf and St. Lawrence estuary. The agreements signed by the federal government with Newfoundland and Labrador and Nova Scotia constitute precedents that Québec would like to apply to its own situation.
- Liquefied natural gas (LNG) terminals could be used to diversify our supply options and strengthen our energy security in view of our dependency on natural gas supplies from Western Canada for which demand is high and depend on a single supply route.
- The Government emphasizes that all analyses and assessments currently under way for these projects will be carried out as rigorously as possible. It will also ensure that citizens are able to express their concerns and receive all relevant information on the projects.
- **To ensure the availability of petroleum products**, the Government intends to:
  - require petroleum companies to file a supply security plan, in the event of difficulties with the availability of petroleum products;
  - work with the industry in order to see how fuel oil and propane consumers can be protected from the consequences of a weaker distribution network.

## 6) MODERNIZE THE LEGISLATIVE AND REGULATORY FRAMEWORK

- **To respond more effectively to the situation of low-income households**, the Government will introduce various measures.
- **Sustainable development will be better taken into account when energy projects are analyzed.** The Government will give the Régie de l'énergie responsibility for assessing the energy-related and economic justification of projects.
  - The BAPE will continue to examine the environmental aspects of energy projects subject to the Environment Quality Act.
- The Régie de l'énergie will be given the power to oversee the application of **electricity transmission reliability standards**, in the wake of recommendations from the Canada-US task force concerning the August 14, 2003 power blackout.

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## Introduction

This document, **Using Energy to Build the Québec of Tomorrow**, sets out the Government's energy strategy.

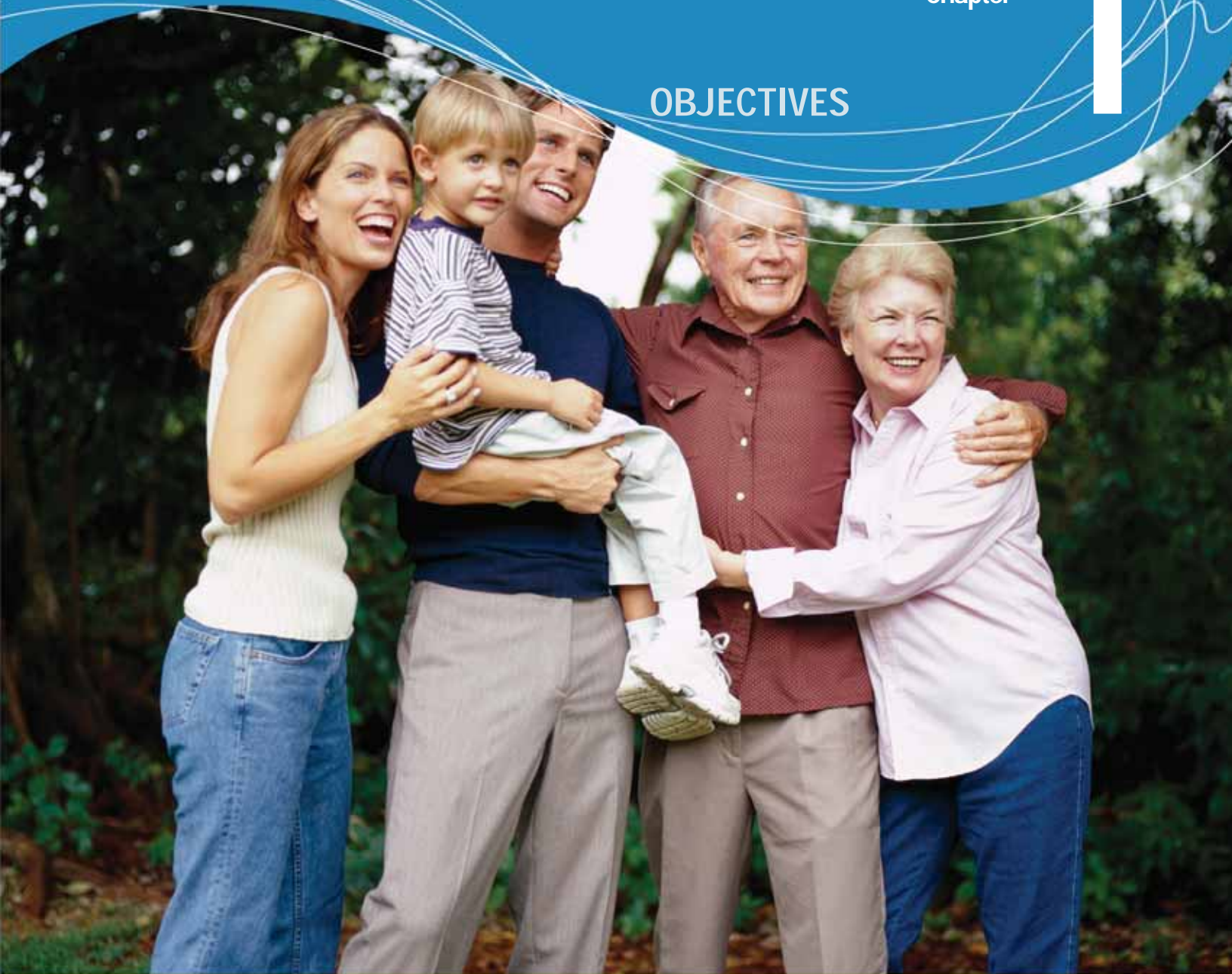
Following a broadly-based consultation process launched in November 2004, the Government offers the population this new vision for our energy sector, defining the actions that must be taken and the goals that must be met over the next ten years.

- The **objectives** selected result directly from the discussions that took place during the public consultation process. They are consistent with other priorities for government action.
- To guide the implementation of the objectives, the Government also sets out orientations and priority actions in each energy sector. The **orientations** and **priority actions** concern all players in the energy field – citizens, businesses, institutions and organizations. Their involvement will be a key factor in the success of the process as a whole.

The proposed energy strategy addresses several of the challenges facing us today: to increase the security of our supplies, make Québec more prosperous, ensure that energy is used more effectively and, ultimately, guarantee sustainable development.



## OBJECTIVES

**THE ENERGY STRATEGY CENTRES ON THE SIX FOLLOWING OBJECTIVES:**

- Making our energy supplies more secure.
- Making better use of energy as a lever for economic development.
- Giving local and regional communities and First Nations more say in energy development.
- Using energy more efficiently.
- Becoming a leader in the field of sustainable development.
- Setting electricity rates to promote our interests and ensure proper management of the resource.



## OBJECTIVES

### 1) MAKING OUR ENERGY SUPPLIES MORE SECURE

A secure energy supply is essential if modern societies are to function correctly. Our quality of life depends on energy. Our economic development is directly linked to energy.

In today's deregulated energy market, the security of the energy supply depends on both the physical reliability of each source and on the price at which it is available.

At an equivalent price, it is obviously in our interest to prioritize the energy available within Québec. However, hydroelectric development must be planned over the long term, given the time needed to harness water resources.

For energy that must, in any case, be imported, we must diversify our sources of supply and exchange power in the ways that best serve our interests.

Energy security also depends on the reliability of the facilities of all kinds used to make energy available to consumers. For this reason, we must ensure that electricity transmission and distribution lines operate properly, and also that oil and gas supply systems are reliable.

### 2) MAKING BETTER USE OF ENERGY AS A LEVER FOR ECONOMIC DEVELOPMENT

Energy is not just a prerequisite for economic development. In Québec, it is also one of our key comparative advantages, especially for supporting and developing our industrial base. We must therefore take advantage of this situation.

#### A LAND OF HYDROELECTRICITY

Québec is a land of hydroelectricity, which forms the foundation for much of the development of Québec society and its entry into the modern era.

Thanks to its geomorphology and hydroelectric resources, Québec has access to a clean, renewable and secure source of energy. Québec is one of the jurisdictions in North America with the lowest electricity rates. The availability of hydroelectric power at competitive rates has allowed us to attract industrial investment that, in turn, generates multiple spin-offs. To develop this exceptional heritage, we can count on Hydro-Québec – one of the largest power companies in the world – and the most extensive transmission grid in North America.

Québec's hydroelectricity is a key asset, of even greater value in a context of exhaustible resources and the fight against greenhouse gas emissions. Thanks mainly to its hydroelectric generation of power, Québec produces only half the amount of greenhouse gas emissions per capita as Canada.

This is one of our key advantages, but it is not the only one.

#### **WIND ENERGY**

Québec is lucky enough to be able to count on a second form of renewable energy, and the use of this resource will further improve our record on greenhouse gas emissions. Impressive amounts of energy can be generated in Québec from wind resources. In addition, wind generation is an ideal complement to hydroelectric generation, and Hydro-Québec fully intends to take advantage of this situation.

Since 2003, Québec has moved resolutely to develop wind energy resources. Hydro-Québec has invested in know-how, methods and management tools to ensure that wind farms are fully integrated into its system. We can now use the development of our wind generation potential to build a competitive, high-performance industry in Québec, able to compete on an equal footing in an area of especially rapid growth worldwide.

#### **HYDROCARBONS**

Québec has an extensive, efficient system to transport and distribute natural gas. Our geographic location explains several major investment projects to construct liquefied natural gas terminals.

Much depends on the possible existence of significant on-shore and off-shore hydrocarbons reserves in Québec. Development of this resource would reduce our dependence on outside supplies by replacing some of the fuels we currently have to import.

#### **INVESTMENT AND EMPLOYMENT**

The energy strategy will allow us to benefit fully from all these advantages.

By meeting the challenge of economic development, energy projects will generate investments and jobs.

The availability of energy at competitive rates and in a variety of forms will help reinforce the economic framework in all regions of Québec, and in the province as a whole. Increased energy exports will improve our balance of trade and provide additional revenue. Overall, energy development will help ensure our prosperity and that of future generations.

### **3) GIVING LOCAL AND REGIONAL COMMUNITIES AND FIRST NATIONS MORE SAY IN ENERGY DEVELOPMENT**

The energy development challenge in Québec is to ensure that all stakeholders are involved in projects, that local and regional – and especially Native – communities are associated with each project, that the benefits for Québec as a whole are maximized and, of course, that the projects comply with the principles of sustainable development.

If these conditions are met, we can develop our energy resources in a way that benefits the whole population and creates wealth.

We must take advantage of our energy resources to build and strengthen a regional approach to economic development, in which each region participates in the development of its own resources. The energy strategy illustrates, once again, the intention of the Québec government to become the government of the regions, and to build a strong partnership with the First Nations.

#### 4) USING ENERGY MORE EFFICIENTLY

Energy savings are a core element of the energy strategy.

Québec is a major consumer of energy, mainly because of its industrial structure, geography and climate.

Energy must be used more effectively. We must optimize the energy used for a given purpose – whether to heat our homes or travel from place to place. Our behaviour patterns must change, and must become more responsible in terms of the future of the planet. Our equipment must become more efficient, and we must use the right energy for the right purpose.

The use of energy from emerging sources or produced by new technologies must also be considered.

Collectively and individually, we all stand to gain from becoming more informed, more efficient users of energy. We will improve our energy security. We will reduce the environmental impact of our activities, and our greenhouse gas emissions in particular. In economic terms, we will reduce our energy bills, which is clearly a benefit for consumers and businesses.

#### 5) BECOMING A LEADER IN THE FIELD OF SUSTAINABLE DEVELOPMENT

The Québec government has made sustainable development one of its main priorities.

Sustainable development is an exacting concept, because it requires a balance between economic development, environmental protection and social equity, while leaving future generations all the assets they will need for their own development.

The energy strategy will lead to the implementation of the three components of sustainable development – economic, environmental and social. As a powerful tool for job creation and collective enrichment, the type of energy development targeted by the Government gives priority to clean energy sources. It is based on partnerships with local communities and the First Nations.

Practically all of Québec's electricity is generated from hydroelectricity – a renewable energy source that creates almost no greenhouse gas emissions. Thanks to its hydroelectric resources, Québec is in the best position of all the Canadian provinces to respond to the concerns addressed in the *Kyoto Protocol*.

Wind energy is another form of renewable energy widely available in Québec, which will make a direct contribution to the fight against global warming. Energy savings also offer important opportunities to contribute to sustainable development.

Thanks to the characteristics of its energy resources, Québec is in a stronger position than most industrialized nations to respect all the dimensions of sustainable development and to champion this approach.

These advantages also create a responsibility. Québec must become a leader in the field of sustainable development and help improve the state of our planet. The energy strategy gives us the tools we need to achieve this goal.

## **6) SETTING ELECTRICITY RATES THAT PROMOTE OUR INTERESTS AND ENSURE PROPER MANAGEMENT OF THE RESOURCE**

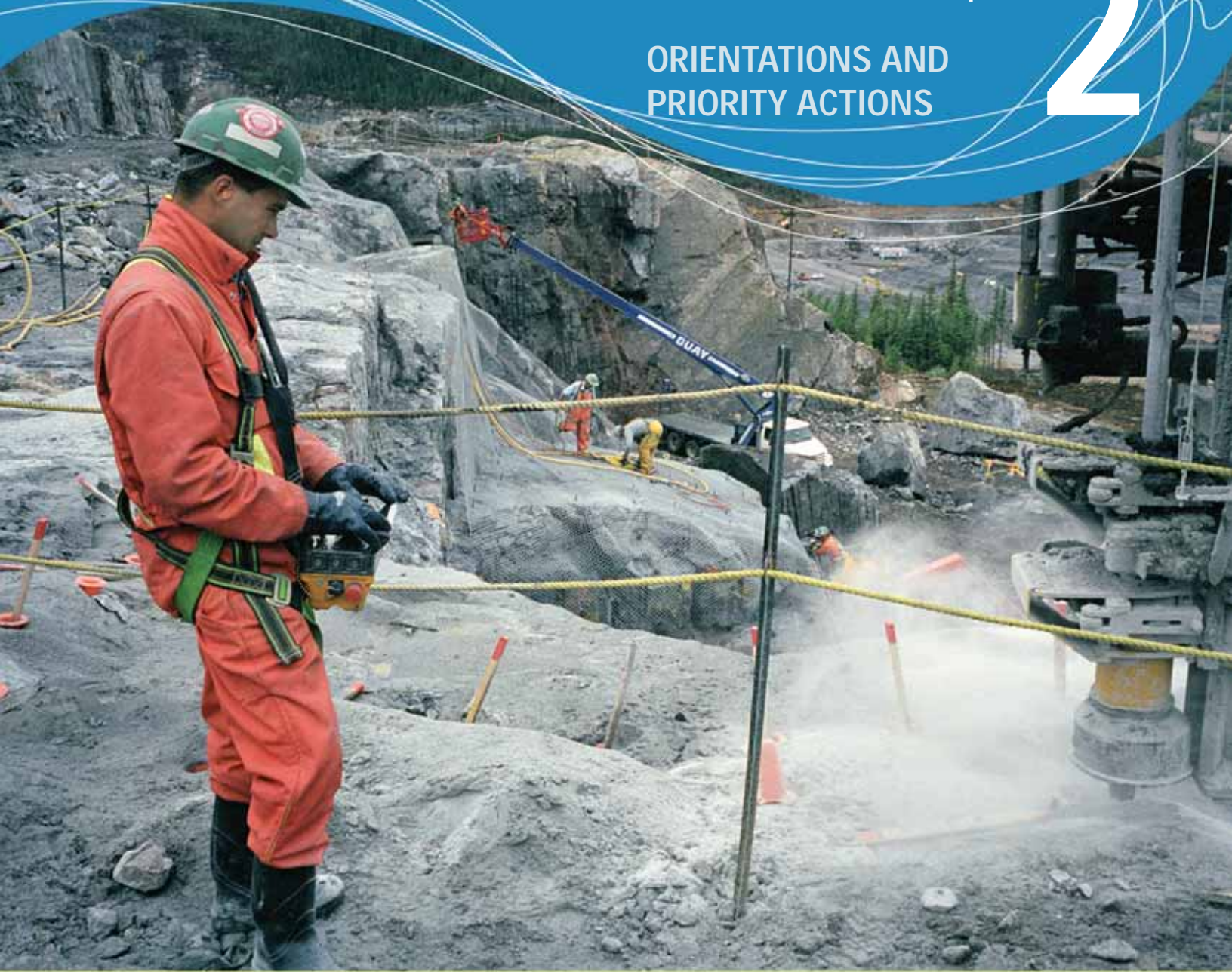
In terms of electricity rates, Québec is in a privileged position. Hydroelectricity is available to businesses and individuals at a highly advantageous price.

During the consultation process leading up to the drafting of the energy strategy, several groups and experts highlighted the negative impacts of electricity rates that are set too low, encouraging waste, discouraging energy conservation, and leading consumers to switch from one energy source to another with costly overall results.

Clearly, electricity prices must remain competitive. Part of our industrial structure is founded on the price advantage we can offer. For consumers, affordable electricity is part of the quality of life in Québec.

The Government's energy strategy will send a clearer price signal to consumers. At the same time, all the necessary precautions will be taken to protect consumers and avoid damage to our industrial structure.



ORIENTATIONS AND  
PRIORITY ACTIONS

TO MEET THE SIX OBJECTIVES OUTLINED ABOVE, THE ENERGY STRATEGY IS EXPRESSED IN TERMS OF ORIENTATIONS, *APPROACHES* AND *PRIORITY ACTIONS*, WHOSE GOAL IS TO:

- resume and accelerate the pace of hydroelectric development,
- develop wind energy as an energy source for the future,
- use energy more efficiently,
- introduce innovations in the field of energy,
- consolidate and diversify sources of oil and gas supply,
- modernize the legislative and regulatory framework.

Québec's new energy strategy aims, first, to resume and accelerate the pace of hydroelectric development, after the slowdown of the late 1990s.



## RESUME AND ACCELERATE THE PACE OF HYDROELECTRIC DEVELOPMENT

### A KEY ASSET

Hydroelectricity gives Québec a competitive, renewable source of energy with impacts on the environment and climate that remain limited compared to conventional forms of power generation. The current energy context has given this asset even greater value.

### AN ENVIABLE POSITION

Québec has been able to take advantage of this prime asset. On December 31, 2005, the total available hydroelectric capacity<sup>1</sup> in Québec was 41 340 MW,<sup>2</sup> making up 94% of all capacity.

### PRIORITY ACTIONS

- 1) Launch new major hydroelectric projects totalling 4 500 MW
- 2) Increase electricity exports, once our own needs have been met
- 3) Use our rate advantage to benefit Québec
- 4) Limit the role played by nuclear energy in Québec by developing hydroelectric resources

Québec is the world's fourth largest producer of hydroelectricity, behind China, Brazil and the United States but ahead of Russia, the rest of Canada and Norway.

This enviable position can be traced back to the early 1960s. In 1963, the nationalization of electricity announced a new era of major projects, and the development of the Manicouagan and Outardes rivers moved ahead at a faster pace. In 1971, a major step forward in the harnessing of our water resources occurred when the first phase of development in James Bay was launched. The project was of unprecedented scope, with 18,000 people involved at various sites at the height of the work. In 1987 the second phase of the James Bay project began, and once completed gave Québec the world's largest hydroelectric complex with a total installed capacity of over 16,000 MW. Today, the James Bay complex represents two-fifths of Québec's total installed hydroelectric capacity, and equals the installed capacity of certain countries, such as Belgium.

The development of Québec's hydroelectric potential through these major projects has become a source of pride for all Quebecers. It has also had a considerable economic impact, whether in terms of direct investment in hydroelectric facilities, the arrival of new industries attracted by the availability and guaranteed price of Québec's power, or the development within Québec of technical expertise and engineering firms of international renown.

1. Including electricity available from the long-term delivery contract signed by Hydro-Québec and the company that runs the Churchill Falls facility in Labrador.

2. 1 MW (megawatt) is equal to 1 million watts ( $10^6$ ). In the electricity sector, the energy unit is the watthour, corresponding to the use of 1 watt for 1 hour. A quantity of 1 TWh (terawatthour) corresponds to 1 billion watthours ( $10^9$ ), or the electricity needs of 50,000 households using electricity for heating for one year.

Since this time, the pace of hydroelectric development in Québec has slowed, especially during the period 1996-2000.

- In 1994, Québec Premier Daniel Johnson launched the SM-3 project, the last major construction work announced during the 1990s.
- The only large project launched between 1996 and 2000 was to improve the Grand-Mère dam and reservoir, which increased Hydro-Québec's installed capacity by only 80 MW.

### HYDROELECTRIC DEVELOPMENT IN QUÉBEC: A STORY OF DARING AND VISION

In 1944, the government under Adélard Godbout nationalized the assets of the Montreal Light Heat and Power and created the Québec Hydro-Electric Commission, today known as Hydro-Québec. Québec took control of its own water resources, to protect the interests of consumers and use hydroelectricity as a lever for economic development.

Hydroelectric development in Québec continued thanks to the daring and vision of two later Premiers, Jean Lesage and Robert Bourassa.

- In the early 1960s, major hydroelectric development began in Québec when Hydro-Québec began work to harness the Manicouagan and Outardes rivers on the North Shore – later to become the Manic complex.

- In 1963, the second government of Jean Lesage nationalized electricity, and Hydro-Québec became one of the largest power companies in North America, and indeed in the world.
- In 1971, one year after his election as Premier of Québec, Robert Bourassa announced the construction of the Bay James complex – the most ambitious project ever undertaken in Québec. The project involved a total investment of \$14.6 billion, and at the height of the work, 18,000 people were working at the various sites. Once completed, the project gave Québec an additional 10,800 MW. Robert Bourassa gave life to an idea whose economic, environmental and social repercussions are still felt today.
- In 1987, once again under a government led by Robert Bourassa, the second phase of work at James Bay began. Over 6,600 workers were present on site at the peak of activities. Total investment amounted to \$9.7 billion, and the new project added 5,200 MW to Hydro-Québec's production capacity.
- The facilities built during the two phases of the project have given Québec the world's largest hydroelectric complex, with a total installed capacity of over 16,000 MW – 38.8% of Québec's current total installed hydroelectric capacity.

## THE COST OF DELAY

The slowdown in major projects is beginning to be felt now that demand is increasing on Québec's electricity market. In recent years, demand has seen sustained growth, while supply has increased at a far slower rate. Between 1999 and 2005, for example, Hydro-Québec connected roughly 250,000 new dwellings to the grid, and also supplied new power for an aluminium smelter.

We are now paying for the delay in developing our hydroelectric potential. At certain times, we must import high-priced electricity from outside Québec. Québec's economy has not benefited as much as it could have done from the powerful economic lever offered by hydroelectric development. Québec's expertise in engineering and managing major projects has not been fully utilized. The volume of our electricity sales outside the province has dropped considerably.

## CORRECTING THE SITUATION

There is an urgent need to correct the situation, and investments have already been made to further this objective.

- In 2003, the Government clearly stated that it would give priority to a resumption of major hydroelectric projects. Several projects are currently underway, including Eastmain-1 (480 MW), Péribonka (385 MW) and Chute-Allard/Rapide-des-Cœurs (138 MW), and will eventually add 1 054 MW of installed capacity. Altogether, they will involve an investment of almost \$4.5 billion, and will create the equivalent of 18,000 person-years of employment.<sup>3</sup>
- Another large-scale project is undergoing environmental assessment: the Eastmain-1-A/Rupert River diversion/La Sarcelle project, with an estimated construction cost of over \$4 billion. Once built, the project will add almost 900 MW of installed capacity and will produce 8.5 TWh of electricity each year.

The completion of this project is essential in order to secure the electricity supply of the Québec population. The development costs are advantageous, and the project has been the subject of several in-depth environmental assessments. Several crucial design parameters with an impact on the environment have been established in cooperation with the Cree Nation.

It is important for Québec that these projects be completed within the scheduled time-frame.

### ENVIRONMENTAL ASSESSMENT OF THE EASTMAIN-1-A/RUPERT RIVER DIVERSION/LA SARCELLE PROJECT

The Eastmain-1-A/Rupert River diversion/La Sarcelle project, once the environmental assessment is complete, will be the next major hydroelectric project undertaken by Hydro-Québec. It results directly from an agreement, known as the Peace of the Brave, between Québec and the Crees, and another agreement, the Boumhounan Agreement, between the Crees and Hydro-Québec that defines several important parameters. The project is a key element in re-establishing a balance in Québec's energy situation.

- The environmental studies, as well as the concerns expressed by the Cree Nation and James Bay residents, have influenced the design of the project to ensure that the impact is kept to a minimum.

The Eastmain-1-A/Rupert River diversion/La Sarcelle project is currently undergoing a major environmental assessment that involves all the stakeholders and is in compliance with the provisions of the James Bay and Northern

3. A person-year equivalent is the number of full-time jobs created for one year. Therefore, the equivalent of 70,000 person-years may be 10,000 jobs for seven years, or 7,000 jobs for ten years

Québec Agreement which, in Chapter 22, defines an assessment process that is different from the environmental impact assessment and review required elsewhere in Québec and carried out by the BAPE.

In all, Hydro-Québec will have spent \$400 million on various environmental and technical studies to obtain government authorization. The studies have been approved, and the project is now at the public hearing stage. Hydro-Québec intends to spend a further \$260 million on work to eliminate or mitigate the environmental impacts of the project.

Hydro-Québec has considerable expertise in this area, and this recent process is part of a long tradition of environmentally respectful hydroelectric development.

### The main hydroelectric power station projects currently in production or undergoing environmental assessment

TABLE 1

Installed capacity, annual production and cost of hydroelectric projects under construction or undergoing environmental assessment

	Installed capacity (MW)	Average annual production (TWh)	Project cost (\$ million)	Planned date of coming into service
<b>Under construction</b>				
Eastmain-1	480	2.7	2 200	2006
Mercier	51	0.3	140	2006
Péribonka	385	2.2	1 400	2008
Chute Allard/Rapide-des-Coeurs	138	0.9	680	2008
<b>Total</b>	<b>1 054</b>	<b>6.1</b>	<b>4 420</b>	
<b>Undergoing environmental assessment</b>				
Eastmain-1-A/Rupert River diversion/La Sarcelle	888	8,5	3 946	2009-2012*

\* Assuming all the authorizations are obtained on schedule:

- Rupert River diversion brought into service in 2009;
- Eastmain-1-A and La Sarcelle stations brought into service gradually, beginning in late 2011.

## MOVING FORWARD AND PREPARING FOR THE FUTURE

These hydroelectric projects will help ensure Québec's energy security, and will re-establish the extra production capacity that Hydro-Québec Production has lost through the slowdown in hydroelectric development in recent years. Hydro-Québec Production has shown, to the satisfaction of the Régie de l'Énergie, that it needs to have sufficient excess capacity to increase the reliability of its supplies in low rainfall years.

However, we must move forward and foresee events beyond 2015. Hydro-Québec Distribution will need new supplies to meet the growth in demand after 2015 and to have excess capacity available to respond to calls for bids issued by the distributor. Up to ten years are needed to complete a major hydroelectric project. This means that decisions made today will only begin to have an impact in ten years' time. For example, it is now that the youth of today – and the workforce of tomorrow – must make its career choices. Preparing for the future also means looking at ways to take full advantage of our hydroelectric potential.

With its new energy strategy, the Government is taking action immediately to prepare for the future, turning resolutely towards further development of our hydroelectric potential for the greater benefit of Québec as a whole.

## PRIORITY ACTIONS

The Government's actions will focus on the following priority areas:

- 1) Launch **new major hydroelectric projects totalling 4 500 MW**;
- 2) **Increase electricity exports**, once needs have been met in Québec;
- 3) Use our **rate advantage to benefit Québec**;
- 4) **Limit the role played by nuclear energy in Québec** by developing hydroelectric resources.

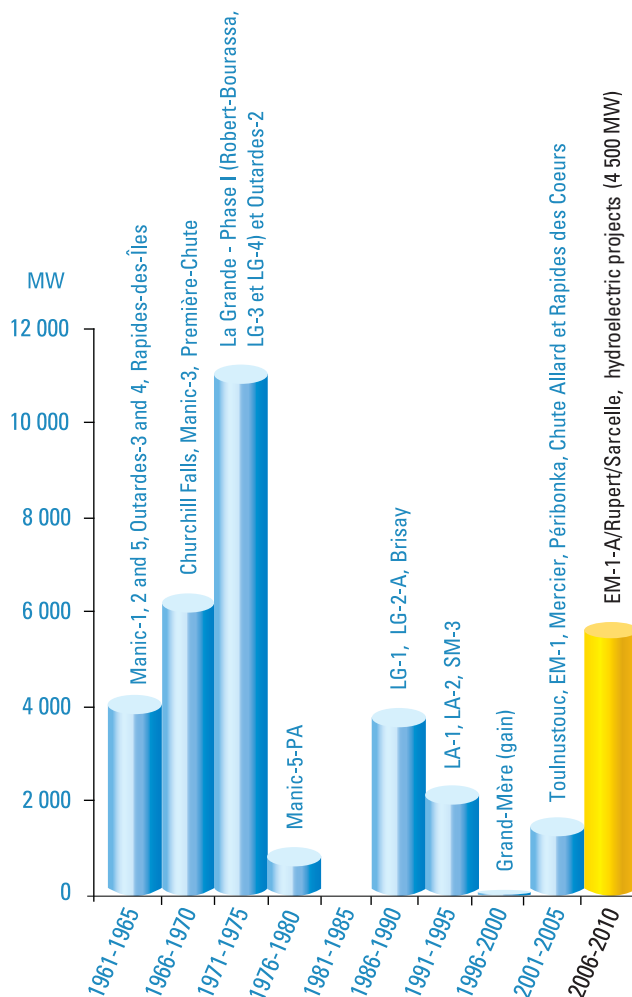
## 1) LAUNCH MAJOR HYDROELECTRIC PROJECTS TOTALLING 4 500 MW

The Government intends to launch major hydroelectric projects totalling 4,500 MW between now and 2010. Québec has enough remaining hydroelectric potential to meet this objective, and the projects will help to fully secure the electricity supply of the Québec population. They will also create significant extra capacity to attract new wealth-creating industries and increase the volume of electricity exports. The Government has defined a new approach that will reduce the total time needed to complete all the projects by at least five years compared to the conventional approach, giving new impetus to the development of Québec's hydroelectric resources. The new development will serve, primarily, to meet energy needs in Québec and stimulate the establishment and growth of wealth-creating industries. It will also increase Québec's ability to export clean, renewable energy to neighbouring markets.

Overall, these major projects will represent an investment of around \$25 billion and will create the equivalent of 70,000 person/years of employment. Québec will experience a level of hydroelectric development that has not been seen since the first phase of the James Bay project in the early 1970s. The activities will generate benefits for all regions of Québec, but primarily the resource regions.

GRAPH 1

Major hydroelectric power station projects by year of authorization of construction work (1961-2010)



N.B. The year in which construction began is deemed to be the year of authorization prior to 1971.

## THE RESUMPTION OF MAJOR HYDRO-ELECTRIC PROJECTS: LONG TERM ELECTRICITY DEMAND, ECONOMIC DEVELOPMENT AND ELECTRICITY EXPORTS

- A central element in the work to secure energy supplies in Québec is the identification of foreseeable trends in electricity demand, which responds to changes in the population and economy.
- The development of new hydroelectric projects will help ensure Québec's energy security and re-establish the excess production capacity needed by Hydro-Québec Production to ensure a reliable supply in low rainfall years. This excess capacity must be rebuilt following the slowdown in hydroelectric development in recent years.
- Furthermore, to meet the growth in electricity demand within Québec after 2015, Hydro-Québec Distribution will have to issue new calls for bids. To respond to these bids and meet energy needs in Québec, Hydro-Québec Production will need extra capacity.
- However, given the fact that it takes ten years to complete a hydroelectric project, supply security for the period 2015-2025 must be prepared now.
- Of course, it is a challenge to foresee the demand for electricity in Québec ten to twenty years into the future. Nevertheless, it is expected that the demand for electricity in Québec will grow over this period at around 250 MW per year on average.

Over ten years, demand is therefore expected to increase by about 2,500 MW.

- Extra demand could be created by the arrival or expansion of wealth-creating industries

that come to Québec to take advantage of the availability and competitive pricing of its electricity. Once again, forecasting is difficult. As an example, the completion of only twenty projects of 50 MW each on average over ten years would generate an extra demand of 1,000 MW. More projects or larger-scale projects would create a greater demand for energy.

- With regard to outside markets, our exports will depend primarily on how much electricity is produced in excess of demand in Québec, including industrial demand. Surplus electricity could be sold at market prices or under agreement with neighbouring jurisdictions. The agreements would be signed before the construction of the new hydroelectric facilities.

The “portfolio” approach described in the strategy will help harmonize the pace of construction of major hydroelectric projects with demand in Québec and opportunities on export markets.

- Overall, the “portfolio” of 4,500 MW is expected to exceed the forecast growth in demand in Québec. There will be enough energy to attract new wealth-creating industries and to increase our presence on electricity export markets.

#### AN INNOVATIVE APPROACH: A “PORTFOLIO” OF PROJECTS

The completion of a major hydroelectric project takes around ten years, from the time the initial decision is made to the production of the first kilowatt-hour of electricity. To meet needs solely in Québec, the development of major projects to supply an extra 4,500 MW could be spread over twenty years. However, the Government wishes to move ahead more quickly, so that our hydroelectric resources can be used as a lever to create wealth in Québec.

- The Government is ready to begin the first phase of this ten-year program, a four to five year preparatory period for all the projects in the “portfolio”. This phase includes negotiations with the nations, communities and partners involved, preliminary engineering studies, and the environmental assessments needed to obtain various permits.
- By 2010, once the negotiations, studies and assessments have been completed, Hydro-Québec will be in a position to begin detailed engineering work and actual construction.

By 2010, Hydro-Québec will have in its possession the agreements and environmental authorizations needed to complete projects totalling 4,500 MW. This will give Québec a “portfolio” of hydroelectric projects to meet increased demand in Québec as well as in neighbouring jurisdictions. If the market conditions are favourable, as early as 2010, Québec could begin the construction of major hydroelectric projects totalling 4,500 MW, or construct only some projects if conditions are less favourable – for example, if the export market has changed. This approach allows for the development of more resources at a faster pace, while managing the risks associated with projects of this scope.

#### DIFFERENCES COMPARED TO THE TRADITIONAL APPROACH

This process differs from the traditional approach, which involved Hydro-Québec launching a project every few years based on the foreseeable demand in Québec. It takes into account the increasingly stringent requirements governing the negotiations and environmental assessments for a major project, but does not compromise the quality of the assessments or the solidity of the agreements made with our partners.

- Presently, a decision to launch a hydroelectric project is based on an evaluation of the market conditions that will prevail when the project is completed, around ten years later. This means that demand and price must be estimated over a ten-year timeframe, which introduces a level of risk and uncertainty into the calculations.

- Once the decision has been made, the implementation of the project can encounter various obstacles, especially during the preparatory period. Pre-project studies, environmental assessments and negotiations with the communities and partners involved may require extra time that was not part of the schedule.

The “portfolio” approach will eliminate some of the delays inherent in the current process for major projects, while creating the flexibility that has gradually disappeared over time.

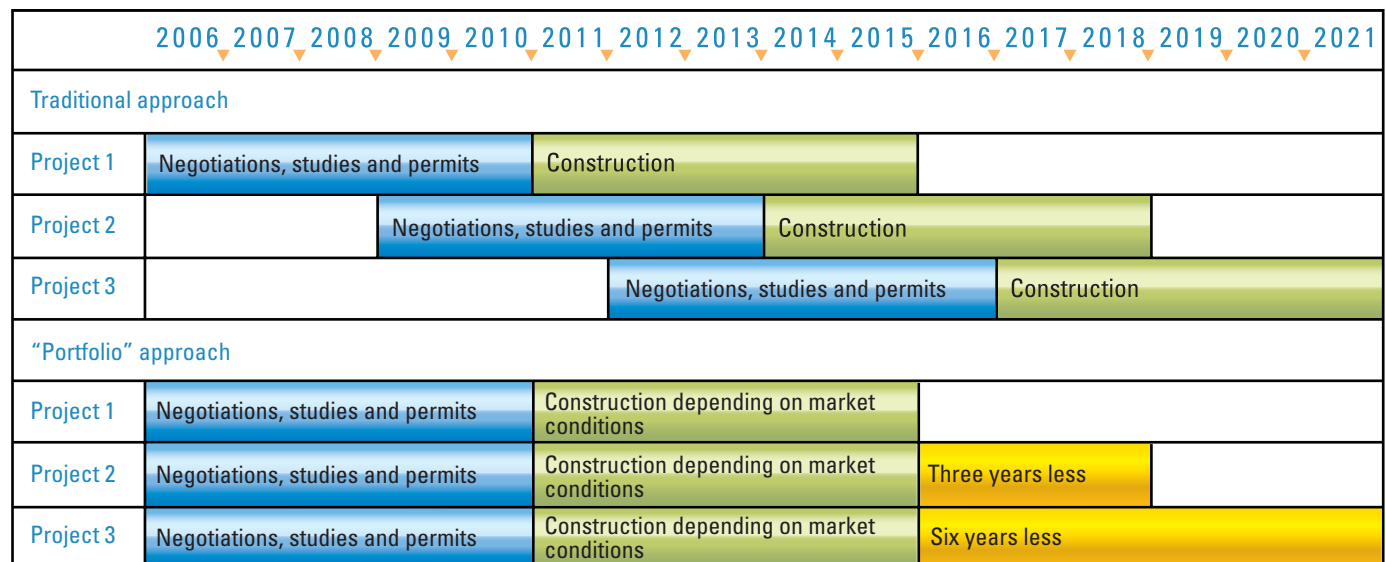
- The new approach makes it possible to adapt the implementation schedule for each project to some of the unforeseen events that may affect it. For example, the schedule may be modified in response to the ongoing situation with communities and partners, the results of environmental assessments, and market conditions.

- The “portfolio” approach will also give Hydro-Québec alternative solutions if the implementation of a project is compromised. The projects identified as part of the 4,500 MW “portfolio” will, in some ways, be in competition with each other, and Hydro-Québec will be able to replace a project that is difficult to implement with one or more alternative projects.

By starting the first phase of projects totalling 4,500 MW immediately, the Government will place Québec in an advantageous position.

By 2010, Hydro-Québec will be able to begin construction on the projects for which the necessary agreements and environmental assessments have been obtained, depending on the prevalent market conditions inside and outside Québec. The delay between the final decision to launch construction and the production of the planned total of 4,500 MW will be reduced from ten to five years.

GRAPH 2 Developing hydroelectric potential: comparison of the traditional and “portfolio” approaches



◀ Advantage of the “portfolio” approach ▶

N.B. The timeframes indicated in the graph are given for information purposes only and may vary from one project to another. The number of projects in the portfolio is also variable, and will not necessarily be limited to three.

## MAJOR HYDROELECTRIC PROJECTS: MEETING INCREASINGLY STRINGENT RULES

The context for the completion of major hydroelectric projects has become more complex over time.

- Québec has taken steps to provide better protection for the environment and natural heritage, to comply with new values and the expectations of the population. What was considered satisfactory in the 1970s is no longer acceptable, and extra environmental requirements have been defined.
- Québec has chosen to strengthen its partnership with Native communities. Major hydroelectric projects often have a huge impact on their traditional territories. Once again, the approach applied during the 1970s is no longer valid.

The first phase in a major hydroelectric project therefore has to meet an increasingly stringent set of rules.

The most recent example of this situation is the Eastmain-1-A/Rupert River diversion/La Sarcelle project.

- In February 2002, the negotiations begun the previous year between Québec and the Cree Nation led to the signing of the Peace of the Brave. Consent from the Cree Nation for the construction of the project was a central element in the agreement.
- Four years later, the environmental assessment process entered its final phase when Hydro-Québec invested \$400 million in a series of technical and environmental studies.
- If the current schedule is upheld, the environmental authorizations should be obtained by

the end of 2006 and work should commence in early 2007, in other words six years after the start of negotiations with the Cree Nation.

## PROJECTS FOR LOCAL AND NATIVE COMMUNITIES

The Government does not intend to promote the development of small, privately-owned hydro projects. These projects of 50 MW or less are not essential to our energy security and no block of electricity from this type of hydro projects has been included in the Strategy.

Some local and Aboriginal communities see small hydro projects as an opportunity for social and economic development in their region. The Government feels that the best approach is to leave local and Aboriginal communities free to develop projects provided they have the support of the local population, generate benefits for the region, and are under the control of the community concerned.

In other words, the development of small hydro projects (50 MW or less) will be pursued by, and for, local communities.

Each project will be subject to an environmental assessment by the BAPE, and an agreement concerning the purchase price of the electricity produced must be signed with Hydro-Québec before the project is presented to the Government.

## STRENGTHENING THE ELECTRICITY INDUSTRY

The major projects completed since the early 1970s have led to the emergence, in Québec, of a dynamic sector of activity that is also active at the international level.

- The sector includes firms specializing in the construction of large-scale works, and also manufacturers who provide the components, equipment and tools needed for powerhouses and transmission and distribution grids.
- Engineering consultants and firms providing other professional services directly connected to this type of investment are also part of the sector.

In 2003, around one thousand firms in Québec were estimated to be active in the hydroelectric field, providing almost 25,000 generally well-paid jobs.

Québec businesses are present at all stages in the completion of a hydroelectric project, from research and development to design, engineering, construction and the fabrication and marketing of equipment, and also for the production, transmission, distribution and use of electrical energy. According to the Association de l'industrie électrique du Québec, 90% of the total investment for a hydroelectric project is spent in Québec.

## 2) INCREASE ELECTRICITY EXPORTS ONCE NEEDS HAVE BEEN MET IN QUÉBEC

Our hydroelectric resources must be developed primarily in response to needs in Québec and to create jobs in Québec. Once these needs have been met, we must take advantage of current and foreseeable opportunities on export markets – another way to support our economic development.

Québec can apply the same logic to the development of its natural resources as Alberta. When it develops its oil and gas resources, Alberta does not limit production to demand within Alberta. Instead, it targets the development of its natural wealth, and its ability to satisfy demand whether in Alberta, the rest of Canada or the United States. The Government intends to apply

the same kind of logic to the development of Québec's hydroelectric resources. Unlike Alberta, however, Québec can provide clean, renewable energy, which strengthens our position on outside markets.

By targeting the needs of neighbouring jurisdictions, Québec is not just able to develop its own natural wealth. Its exports of clean, renewable energy also make a direct contribution to the fight against climate change and the achievement of *Kyoto Protocol* objectives in northeastern North America, as well as helping improve air quality in the region - especially since several of Québec's existing and potential partners have defined objectives and guidelines that give priority to renewable energy.

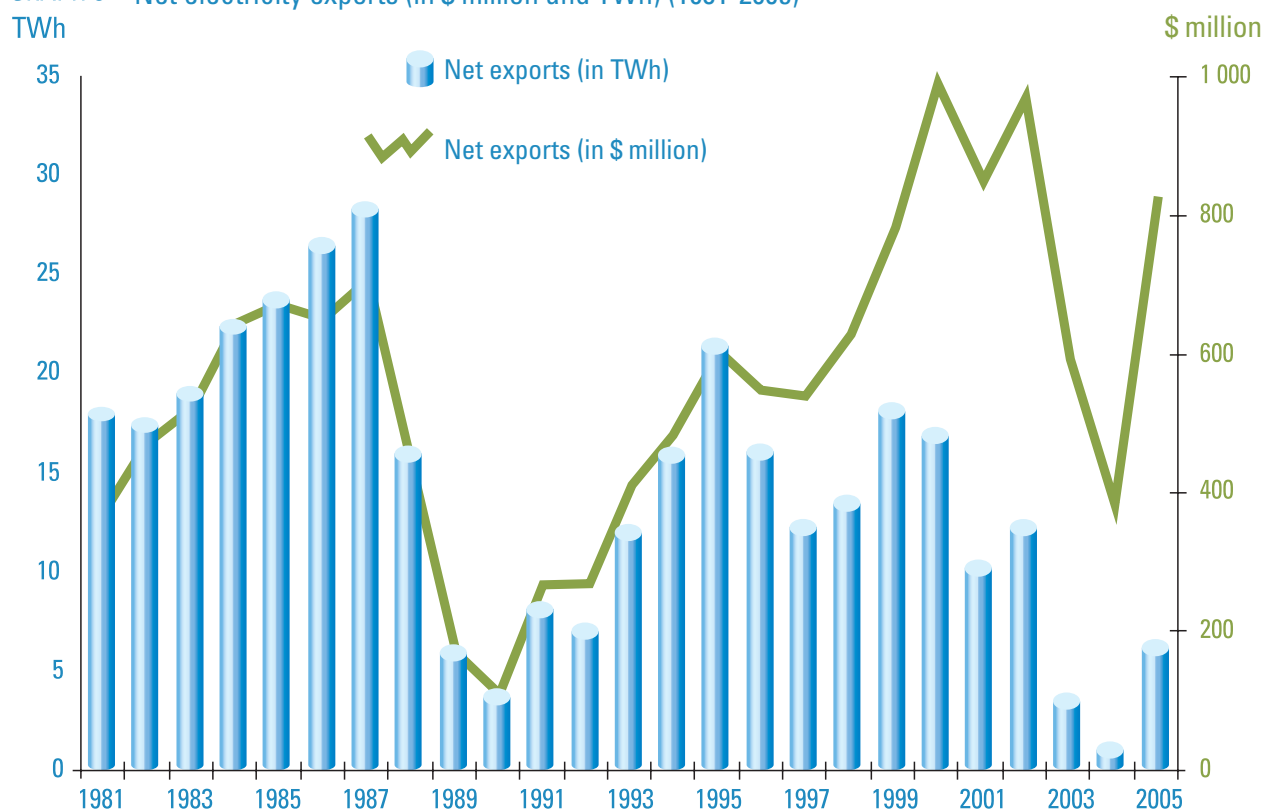
### REVERSING THE TREND OF RECENT YEARS

In the export field, the Government intends to reverse the trend of recent years – one that has led to the loss of major potential earnings. The slowdown in hydroelectric development has resulted in a significant decrease in net electricity sales outside Québec.

- Between 1995 and 2004, Hydro-Québec net electricity exports – total exports minus imports – dropped from 22 TWh to 1.5 TWh. In 2005, more rainfall allowed net exports to increase to 6.7 TWh. Net exports peaked in 1987, at 28 TWh.
- Over the same period, the net revenue generated by export sales increased gradually to over \$1 billion in 2000. It then began to drop, but not as significantly as the actual quantity of electricity exported. In 2004, net export revenue was \$384 million, rising to \$830 million in 2005. Although export sales constituted less than 4% of Hydro-Québec's total sales, they generated over 30% of its profits. Net export revenue has decreased less than the actual quantity of electricity exported, because Hydro-Québec has been able to sell its electricity on export markets at a higher price than it has had to pay for its imports.

The decline observed until 2004 is regrettable, especially since the demand in neighbouring jurisdictions has continued to climb and market prices are increasing.

GRAPH 3 Net electricity exports (in \$ million and TWh) (1981-2005)



In Ontario, New England and New York State, the current and foreseeable demand for electricity is growing strongly. Electricity from Québec can be used to meet this demand while offering a substantial decrease in greenhouse gas emissions. As part of the effort to limit climate change, Québec can offer its neighbours a clean, renewable form of energy to replace electricity generated in thermal power stations that pollute the atmosphere and emit greenhouse gases.

### ELECTRICITY DEMAND IN NEIGHBOURING MARKETS

In recent months, several public documents have confirmed the extent of the demand for electricity in markets bordering on Québec.

- In a report submitted on December 9, 2005 to the Ontario Energy Minister, the Ontario Power Authority assessed the need for new capacity at 24,000 MW by 2025.
- According to the Energy Information Administration (a division of the Department of Energy of the United States federal government), the northeastern United States will require 12 400 MW of additional capacity by 2025.

**INCREASING EXPORTS TO REDUCE THE DEBT AND PREPARE FOR THE FUTURE**

The Government has strengthened the intergenerational logic of electricity exports by making a key decision about the way net revenue from exports will be allocated.

As announced by the Minister of Finance in the *2006-2007 Budget Speech*, the Generations Fund whose creation has just been announced by the Government will receive some of the profits from exports.

This decision by the Government means that future generations will benefit from our hydroelectric resources and the value they represent on outside markets because of the current energy context.

To increase the volume of exports and the revenue generated, the Government will take three steps to prepare for the future.

- First, the extra capacity that no longer exists because of the slowdown in hydroelectric development must be re-established. The resumption of major projects will provide this extra capacity.
- Second, the Government would like to enter into immediate discussions with possible partners to define export possibilities, especially over the long term, and the conditions of sale. It is important for neighbouring jurisdictions to integrate potential purchases from Hydro-Québec immediately into their own forecasts of available power.
- Third, the Government will instruct Hydro-Québec to examine the interconnections between Québec and neighbouring grids to determine the existing potential for exchanges of power and the investment required to increase that capacity.
  - Specifically, the Government would like to see more interconnections with Ontario in order to increase the volume of transactions between Québec and Ontario.

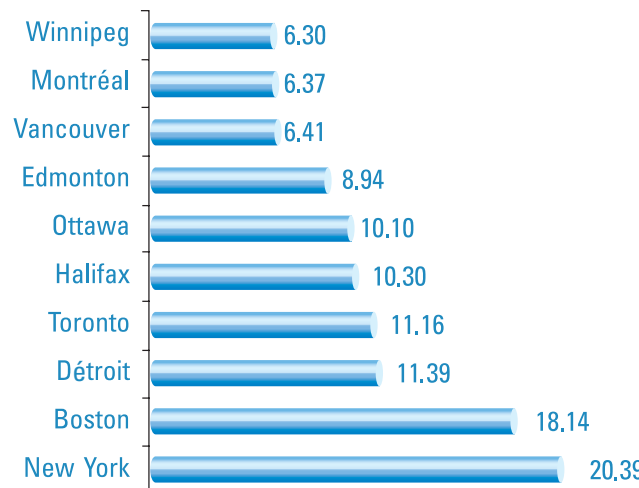
**3) USE OUR RATE ADVANTAGE TO BENEFIT QUÉBEC**

The Government intends to maintain the rate advantage enjoyed by Québec's electricity consumers – whether households or businesses – and to use it to strengthen our economic structure and enrich our society.

- To ensure that electricity consumers continue to enjoy their current rate advantage, the Government intends to maintain the legislative provisions in force concerning the "heritage block" of electricity. Households, businesses and institutions in Québec will continue to benefit fully from the advantages of Québec's water generating capacity.

The supply price of this 165 TWh block is set by law at 2.79 cents per kilowatt-hour, and the Government does not intend to change this. Québec consumers – whether households or businesses – will continue to benefit from a highly advantageous fixed price for most of the electricity they consume that is produced in Québec. Since the provisions concerning the "heritage block" of electricity will not change, consumers will continue to have access to a source of low-priced energy. In 2006-2007, the heritage block will account for 95% of the electricity distributed by Hydro-Québec, and the cost of the remaining 5% will reflect market prices.

**GRAPH 4**  
Electricity rates for residential customers in certain North American cities (cents per kWh) (2005)



Note: Data published annually (in October) showing the prices in effect on April 1, 2005, for typical customers using 1,000 kWh per month.

Source: Hydro-Québec

Hydro-Québec's residential rate is one of the lowest in North America, and Montreal ranks second among major North American cities for low-priced electricity. The average Montreal customer using 1,000 kWh per month saves \$574 each year compared to a customer in Toronto, and \$1,683 compared to a customer in New York.

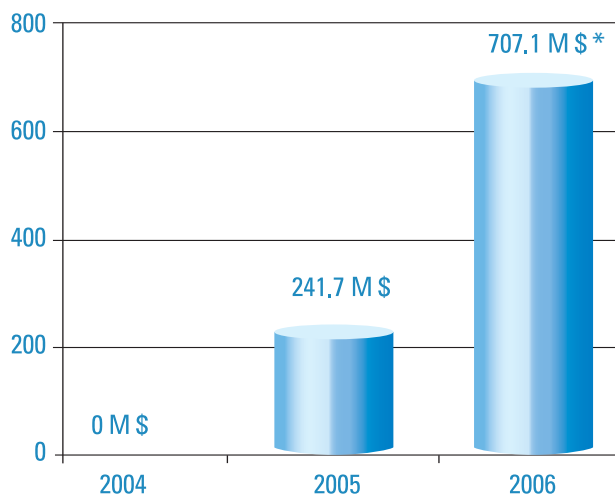
For industrial users, we rank at least in the top four major cities for a subscribed load over 1,000 kW, and at least in the top three for a subscribed load of over 5,000 kW.

- Changes in electricity rates in Québec will continue to reflect the cost of acquiring new, "non-heritage" supplies. The additional supplies acquired by Hydro-Québec are increasingly expensive. In accordance with the regulations in effect and the decisions made by the Régie de l'énergie, their cost will be factored into the electricity bills of customers, to ensure that Hydro-Québec has the financial resources it needs to obtain supplies and develop new facilities.

The Régie de l'énergie applied this policy in its decision dated February 28, 2006 concerning electricity rates after April 1, 2006. The average rate increase of 5.3% is mainly caused by the cost of the new supplies that Hydro-Québec requires in addition to the heritage block.

To meet consumer demand, Hydro-Québec expects to purchase 8.6 TWh of additional electricity at a total cost of \$707.1 million and an average supply cost of over 8.0 cents per kilowatt-hour – almost three times the supply cost of heritage block electricity. The Régie de l'énergie considers that this additional cost represents around 75% of the 5.3% rate increase. The remainder represents other cost increases incurred by Hydro-Québec in distributing electricity to customers in Québec.

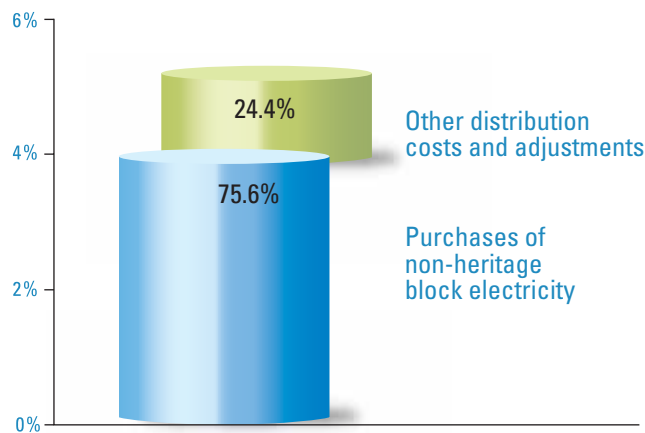
**GRAPH 5**  
Changes in the purchase cost of "non-heritage" electricity (in \$ million) (2004-2006)



\* Estimated data for 2006-2007

GRAPH 6

Components of the electricity rate increase in effect from April 1, 2006



## RULES FOR SETTING ELECTRICITY RATES IN QUÉBEC

Until 1996, electricity rates were set by the Government after an application submitted by Hydro-Québec was examined at a parliamentary committee hearing. Since 1997, however, the Régie de l'énergie has been responsible for setting electricity rates, using the same open, transparent process as for natural gas prices.

The decisions of the Régie de l'énergie are made following a process that includes public hearings, during which individuals and groups that have given notice before the deadline can present their point of view. The Régie takes their comments and suggestions into account and refers regularly to them in its decisions.

The decisions made by the Régie are final and without appeal. The Government has no power to amend a decision made by the Régie. Under the *Act respecting the Régie de l'énergie*, the Régie may revise, review or revoke one of its own decisions only if a substantive or procedural defect is discovered.

A change in electricity rates is only decided after a long process divided into three main stages.

- First, Hydro-Québec submits an application to the Régie asking for a change in rates, generally in late summer. In support of its application, Hydro-Québec submits various types of information (an assessment of demand, a forecast of its own expenditure and the revenues needed to generate a certain rate of return for the shareholder – in this case, the Québec government). The forecast of expenditure mainly includes an evaluation of the purchase, transmission and distribution costs for electricity (operating expenses and amortization of capital expenditure).
- Next, during the fall, the Régie de l'énergie organizes public hearings to allow all interested parties to comment on the application filed by Hydro-Québec and the information presented in support. The hearings are held as a quasi-judicial process (lawyers are present, and testimony is submitted).
- The Régie de l'énergie issues its decision in the months that follow. To establish the authorized rate, the Régie rules on the evidence and arguments presented to it. The final rate reflects the amount of revenue required to cover the authorized expenditure and provide an acceptable rate of return.

## RATE POLICY FOR MAJOR INDUSTRIAL CONSUMERS OF ELECTRICITY

The new energy strategy gives the Government an opportunity to define more clearly the policy used to allocate large blocks of electricity to major industrial consumers.

In the past, the allocation of large blocks of electricity has enabled Québec to attract major investment projects and to earn itself an enviable position in sectors such as metal smelting and refining, the petrochemical industry and pulp and paper production. Historically, Québec has relied on the presence of major industry to create jobs and wealth, especially in outlying regions, and it is important for our advantages to contribute even more to a dynamic economy. The electricity allocated to major industrial consumers continues to play a leading role in the development of Québec's regions – it underlies almost 2% of all jobs in Québec and almost 22% of all exports. Economic growth in the resource regions is largely linked to the presence of these industries and their expansion – and therefore to the electricity rates made available to them. The Government will continue to use hydroelectricity to attract and support wealth-creating industries. However, the policy applied must be clear, and it must maximize economic benefits for the regions concerned and for Québec as a whole.

Given the cost of "non-heritage" supplies and their impact on electricity rates, it is also important to control and limit the effect on consumers of the allocation of large blocks of power.

Given the context, the following rules will apply:

- The Government will reduce the limit below which Hydro-Québec is required to serve customers at the "L" rate from 175 MW to 50 MW, for new or additional requests for power;
- Above the 50 MW limit, access to the "L" rate will no longer be guaranteed. The Government undertakes to respond to requests for electricity justified by new industrial development projects or for the renewal of electricity contracts, but only if the projects concerned are likely to create jobs and wealth. The rates offered will be subject to guarantees concerning the economic benefits generated – in particular for outlying regions. The rate set may be equivalent to the "L" rate or higher, depending on the scope of the economic benefits generated by the project.

With this new approach, the Government will ensure that low electricity rates effectively result in the economic benefits that justify them.

By maintaining the heritage block provisions, the Government is sending the message that electricity prices will remain stable for major electricity consumers. Because a large percentage of the electricity distributed in Québec continues to be drawn from the fixed-price heritage block, companies, like other consumers in Québec, will enjoy stable electricity rates.

### HYDRO-QUÉBEC'S "L" RATE

The "L" rate applies in general to customers with a load of 5 MW or over.

It takes into account the lower distribution costs for large quantities of electricity. It is therefore not a preferential rate, and helps increase the competitiveness of businesses in Québec.

The "L" rate has two main components: \$11.85/kW per month for the subscribed load, and 2.74 ¢/kWh for the energy used, with various credits and adjustments. The result is a rate that varies between 4 and 5 ¢/kWh, depending on the consumption pattern of the business concerned.

Hydro-Québec currently has 279 "L" rate customers. Of this number, 53 have a load of over 50 MW each, and use 79% of all the electricity consumed in this rate category. Most are companies working in the primary metal processing, petrochemicals or pulp and paper sectors.

Since 1999, only one new enterprise with a load over 50 MW has been given access exclusively to the "L" rate – an investment project by Interquisa Canada in November 2003 in the petrochemical sector. Most of the customers with an additional load of over 50 MW are aluminium refiners. In these cases, the rate is subject to special conditions, in addition to those governing the "L" rate.

**WATER POWER CHARGES**

The users of private or public water power are required to pay charges, or royalties, on the electricity they produce. The charges allow all Quebecers to benefit from the joint wealth that our water resources represent.

- The Government confirms that the current system of charges for the private sector will be maintained, and existing contracts will be honoured. The allocation of water power in the domain of the State to industrial self-generators is a powerful lever for economic development in the regions. Self-generators can rely on stable, foreseeable production costs, and the message sent out by the Government concerning water power charges helps reinforce this stability.
- Self-generators must, however, respect their commitments to society. If they reduce or terminate the industrial activities based on the use of the electricity they generate, the Government will re-assess the conditions on which they use public water power. In particular, the Government will not tolerate self-generators selling or exporting, outside Québec, any quantity of electricity made available by reducing their industrial activities in Québec.
- The Government will re-assess the conditions on which self-generators use public water power if they cease to supply their customers at the regulatory rate in order to sell the electricity concerned on the open market.
- During the public hearings that preceded the drafting of the energy strategy, many participants stressed the need to ensure that the collective wealth represented by our water resources benefits society as a whole.

In response to this recommendation, the Government recently announced its intention to implement three measures:

—first, as indicated in the *2006-2007 Budget Speech*, the Government will require Hydro-Québec to pay the same royalties as private producers, namely the statutory and contractual royalties prescribed by the *Watercourses Act*. The royalties will come into effect gradually over a two-year period, beginning on January 1, 2007, and will be index-linked, like those for private producers.

Hydro-Québec will be asked to absorb the additional cost through efficiency gains and increased export revenues;

—second, the new revenue for the Québec state – estimated at around \$500 million per year – will be entirely paid into the Generations Fund, whose creation was announced by the Minister of Finance in the *2006-2007 Budget Speech*. The Generations Fund is a tool created by the Government to reduce the burden of the public debt;

—third, the Government will pay into the Generations Fund all the royalties currently paid by private hydroelectric producers. This amount of \$80 million per year will be allocated to the Fund, beginning on January 1, 2007.

#### **4) LIMIT THE ROLE PLAYED BY NUCLEAR ENERGY IN QUÉBEC BY DEVELOPING HYDROELECTRIC RESOURCES**

By making a clear choice in favour of hydroelectricity, Québec has not had to invest massively in nuclear generation, unlike Ontario and certain European countries. Gentilly-2, with an installed capacity of 675 MW,<sup>4</sup> is the only operating nuclear power station in Québec, whereas Ontario, to meet its electricity needs, currently relies on three nuclear power stations with a total capacity of 11,400 MW.

4. Gentilly-2 produces 5.2 TWh, with a usage factor of 90 % (2004 data).

Nuclear generation appears to have returned to favour in some countries and provinces, not least because of the challenges they face in terms of their energy supply. For example, Ontario is assessing the possibility of investing \$80 billion in an energy plan mainly based on nuclear generation.

Thanks to its hydroelectric resources, Québec is able to avoid this choice. The new energy strategy will allow the Government to eliminate the possibility of any new construction of nuclear facilities in Québec.

However, a decision must still be made concerning ongoing production at the Gentilly-2 station. Like several power stations in Ontario and the Pointe-LePREAU station in New Brunswick, Gentilly-2 will need major investment if its useful life is to be extended beyond 2011. Any decision concerning this power station must take into account the replacement energy that will be needed if the station closes.

The Government considers that it is still too soon to make a definitive decision, since not all the required technical, economic and environmental information is currently available. In particular, the issue of permanent radioactive waste storage has yet to be settled. It is better to wait until all the information is available before making a decision concerning the future of this power station.

- The renovation of the Pointe-LePREAU nuclear power station in New Brunswick will provide input for future decisions. The station is identical to Gentilly-2, but was built two years before; we therefore have more time to make a decision than the New Brunswick government.

## **HYDROELECTRIC DEVELOPMENT: A VISION BASED ON SUSTAINABLE DEVELOPMENT**

By launching new hydroelectric projects totalling 4,500 MW, the Government has implemented a vision of hydroelectric development based on sustainable development.

- The strategy is ambitious. With projects representing 4,500 MW and investments of \$25 billion, Québec will enter an era of development unequalled since the first phase of the James Bay project.
- The strategy will benefit all regions of Québec. It will be implemented in partnership with the First Nations.
- The approach chosen for major hydroelectric projects is both daring and innovative. It will lead to the definition of a broad "portfolio" of projects, and reduce the overall time needed to complete the projects without compromising the depth of the analyses required or the need to conduct well-grounded negotiations.
- The strategy to resume and accelerate the pace of hydroelectric development will make a key contribution to reducing greenhouse gas emissions, and will contribute to the sustainable development of the northeastern portion of the continent.

### **QUÉBEC HYDROELECTRICITY AND THE KYOTO PROTOCOL**

The Government wishes to stress the considerable contribution made by Québec to the prevention of greenhouse gas emissions and the implementation of the Kyoto Protocol, thanks to its investments in the development of its hydroelectric resources.

The investments are paid for by the Québec population alone. They help ensure that Canada is able to meet its commitments concerning greenhouse gas emissions. It is important that this contribution be fully recognized by the federal government – as a question of fairness, and as a realistic way to achieve the Kyoto objectives at the lowest possible cost.



With its new energy strategy, Québec is taking a resolute step to harness wind energy.



## DEVELOP WIND ENERGY AS AN ENERGY SOURCE FOR THE FUTURE

### USING WIND ENERGY AS A GUARANTEE FOR THE FUTURE

Québec's wind generation potential is enormous, partly because of the size of its territory. A report released in June 2005 assessed the potential that could be technically and economically connected to the Hydro-Québec grid at 3,600 MW, using current technologies and the constraints of long-distance power transmission. With the same technology, the potential could rise to 4,000 MW by 2015. The study also pointed out that the capacity to integrate wind energy will increase as new hydroelectric facilities come on line.

This is the potential that Québec must develop.

- Wind energy will allow Québec to generate considerable quantities of electricity, within a relatively short time frame, and at a competitive price. This, alone, justifies the rapid development of existing potential.
- Wind generation, however, has other benefits. It is a renewable energy source that is socially accepted and that produces a very limited quantity of greenhouse gas emissions. The installation of wind turbines will contribute to sustainable development.

### PRIORITY ACTIONS

- 1) Complete the process **launched by the two existing calls for bids** and consolidate the structured development of wind energy
- 2) Launch **a call for bids for the supply of a further 500 MW**, reserved for regions and First Nations
- 3) Give a mandate for Hydro-Québec to strengthen **the complementary use of hydro-electricity** and wind-generated electricity
- 4) Establish **combined wind/diesel generation for isolated network supply systems**
- 5) Continue to invest in **research and innovation**

- Wind generation technology is progressing rapidly. The installed capacity of a single wind turbine has increased four-fold over the last few years. As a result, electricity production costs have decreased significantly, and it is now possible to obtain the same amount of electricity using a much smaller area of land.
- Wind energy is a natural complement to hydroelectricity, since hydro reservoirs and power stations can, if certain conditions are respected, compensate for the intermittent nature of wind generation. In return, the use of wind turbines ensures that water levels remain high in reservoirs.
- The rapid growth of the wind generation industry around the world has led to the emergence of a dynamic sector of activity, in which Québec could quickly earn its place.

Wind energy development is thus a sound investment in terms of energy, the economy and the environment. The 4,000 MW objective is ambitious but achievable, given Québec's potential and the progress made in production technology. The investments made will benefit the resource regions directly. The priority placed by the Government on wind energy is a concrete illustration of the move towards sustainable development.

## PRIORITY ACTIONS

The Government will promote the **development of the existing potential for wind generation** that can be connected to the Hydro-Québec grid, with an objective of **4,000 MW by 2015**. Development in the wind energy sector will be based on the following actions:

- 1) Complete the process **launched by the two existing calls for bids** and **consolidate the structured development of wind energy**;
- 2) Launch a **call for bids for the supply of a further 500 MW**, reserved for regions and First Nations;
- 3) Give a mandate for Hydro-Québec to **strengthen the complementary use of hydroelectricity and wind-generated electricity**;
- 4) Establish **combined wind/diesel generation for isolated network supply systems**;
- 5) Continue to invest in **research and innovation**.

### 1) COMPLETE THE PROCESS LAUNCHED BY THE TWO EXISTING CALLS FOR BIDS

Hydro-Québec issued two calls for bids, in 2003 and 2005, for the supply of a total of 3,000 MW of wind-generated electricity. The Government's priority is to bring the process to a successful conclusion.

- The first call for bids, for the supply of 1,000 MW of electricity, was issued in May 2003, and the winning bidders were selected in October 2004. The electricity will be generated at a cost of 8.3 cents per kilowatt-hour, including the cost of connection to the grid and "balancing" (compensating for the intermittent nature of wind-generated electricity and result to a excellent performance). The first electricity delivery is scheduled for December 2006, and the rest of this block of electricity will come on-line gradually, for finish in 2012.

In all, the process will require the investment of \$1.9 billion, including \$430 million for the changes needed to the Hydro-Québec transmission grid. All the investments made to build wind farms must have a 60% Québec content, and steps have been taken to maximize economic benefits within Québec, especially in the Gaspésie-Îles-de-la-Madeleine region and the Matane regional county municipality, where the wind turbines will be built. This approach has already produced results in terms of industrial development – the Québec firm Marmen has built two factories to construct towers and assemble wind generator nacelles at Matane, and the Danish firm LM Glass Fiber has built a blade production plant in Gaspé.

- A second call for bids for the supply of twice as much electricity was issued by Hydro-Québec on October 31, 2005.
  - The call for bids concerns a total of 2,000 MW of electricity. Bids must be submitted by April 17, 2007, with delivery to begin in 2009 and will spread to finish in 2013.
  - The call for bids will lead to the investment of \$3 billion, in addition to the cost of connecting to the Hydro-Québec transmission grid. It is important for the Government that the process generate a maximum of economic benefits, for as many regions as possible. For this reason, the call for bids set conditions concerning Québec content, with special reference to the Gaspésie-Îles-de-la-Madeleine region and the Matane regional county municipality. The fact that the activities generated by the call for bids will take place over a number of years will help to consolidate the sector of activities currently in development on the Gaspé peninsula and at Matane.
  - According to the rules for the call for bids, projects that include participation by a regional county municipality or First Nation will receive extra points when the bids are assessed.

As one of its orientations, the Government will instruct Hydro-Québec to launch additional calls for bids for wind energy projects as the development of the 4,500 MW of new hydroelectric generation proposed in the strategy progresses. This additional energy will take the form of 100 MW of wind energy for every 1,000 MW of hydraulic-generated energy

#### STRUCTURED DEVELOPMENT OF WIND ENERGY

Wind energy in Québec will be developed using a transparent, fair and ordered process applicable to the entire territory. The Government has enacted orders-in-council and regulations governing the development of wind energy in accordance with economic, social and environmental concerns.

A bidding process approved by the Régie de l'énergie and implemented by Hydro-Québec is used to select the best projects using criteria that reflect the Government's concerns. The two calls for bids currently underway will allow for the development and consolidation of a new wind energy manufacturing industry in Gaspésie and Matane.

The Government is taking action to ensure regional benefits and to promote the direct involvement of regions and First Nations. In the hydroelectric sector, Québec firms will be able to build up their expertise and then position themselves on outside markets, which are experiencing strong growth.

In addition, to promote competition and ensure that the private sector participates fully in the current bidding process for 2,000 MW and the future process for 500 MW, the Government wishes that Hydro-Québec Production will elect not to take part.

The Government has also established a program to allocate public land for wind farm construction, to regulate the granting of the rights in land needed to develop the wind energy industry. To ensure harmonious development, a regional public land development plan has been drafted specifically for wind energy projects in the Matane regional county municipality and for the Gaspésie-Îles-de-la-Madeleine administrative region. In addition, wind farms must be in compliance with the land use plans of each regional county municipality.

As wind energy potential is developed in Québec, the Government will pay particular attention to certain wildlife areas, especially those used by outfitting operations with exclusive rights, controlled zones and small wildlife reserves. It has introduced a new framework for analysis based on the joint use of public land, similar to that used in the regional public land use plan, wind energy component, for the Gaspésie region and the Matane regional county municipality.

In the same vein, and to ensure that the process is structured from start to finish, the Government will include a condition in the authorization certificates issued to wind energy promoters, stating that the promoters must, at their own expense, completely dismantle the wind farm within two years of the cessation of its activities. In addition, promoters must provide the Government with evidence that they have sufficient funding for this, either by depositing an amount in trust, or by giving a firm guarantee that they are able to obtain the funds required to dismantle the wind farm.

To ensure the responsible management of natural resources, the Government has passed legislation governing electricity exports. Currently, any lease, sale or concession of water power owned by Québec must contain a clause prohibiting the export of the electricity produced. Similarly, a prohibitive clause is compulsory in any contract, permit or concession authorizing the installation on public land of power transmission lines. However, despite these clauses, the Québec government may, on the conditions it determines, authorize specific contracts for the export of electricity.

The recent and rapid emergence of wind as an energy source, and the focus on the responsible management of natural resources, explain the Government's intention of extending the spirit of the Act respecting the exportation of electric power. The Government will amend the Act to ensure that any contract, permit or concession authorizing the construction of a wind farm on public land contains a clause prohibiting the exportation of the electricity produced. However, as it is currently the case, the Government will be able to authorize electricity exportation contracts on a case-by-case basis.

## A HIGH-PERFORMANCE BUSINESS MODEL

For the Québec government, the current context supports further development of wind energy in the private, rather than the public, sector. The nationalization of the hydroelectric sector in the 1960s had other objectives, the most important being the establishment of uniform rates across Québec and service throughout the province. These objectives have, today, been met.

- Several specialized companies are already firmly established in the market and have mastered the technologies used in wind generation.
- Competition remains the best way to obtain supplies at the lowest price for Québec consumers. Reliance on the private sector allows consumers to benefit indirectly from the various fiscal incentives made available in the wind energy sector only to private promoters.
- Contracts between Hydro-Québec and private promoters ensure that the inherent risks – such as wind variability – are borne by the promoter, protecting consumers from their effects.

However, under this approach the Government has still imposed clear conditions as part of the call for bids, to maximize the spin-offs for Québec's economy, promote the emergence of a wind energy manufacturing sector, and structure the development of various forms of partnerships with communities.

This is a winning approach for electricity consumers, the Québec economy, host communities and the environment. It creates direct involvement in the projects by the communities concerned, and avoids the trap of a single

model imposed without modification throughout Québec. Although it will not own the wind farms, Hydro-Québec will remain the sole purchaser of the electricity produced under contracts with a possible lifespan of 25 years.

## 2) LAUNCH A CALL FOR BIDS FOR THE SUPPLY OF A FURTHER 500 MW, RESERVED FOR REGIONS AND FIRST NATIONS

The Government has also announced a further call for bids for the supply of 500 MW, in addition to the two other calls for bids.

- Hydro-Québec Distribution will launch a call for bids including two separate blocks of 250 MW each, reserved for the regions – in other words, for regional county municipalities – and First Nations, in partnership with the private sector. Electricity deliveries will begin in 2010, and all work under the call for bids must be completed by 2015.
- For both blocks, individual projects are limited to 25 MW each – once again, to promote the direct involvement of small communities.
- The Government will determine the economic, social and environmental concerns that must be taken into account for the call for bids. This will make it possible to reconcile optimal development of wind potential with maximum local and regional spin-offs.
- The Government will ask the Régie de l'énergie, when it approves contracts for projects selected for the supply of part of the 500 MW block of wind energy, to give priority to wind energy parameters, including the price of electricity supplies.

- Hydro-Québec will submit to the Régie de l'énergie, for approval, its assessment grid for the projects. The criteria will form part of each call for bids. Appendix 1 outlines the main elements that the Government would like to see taken into consideration.

The call for bids should trigger investment of \$700 to \$750 million. It will have a major effect on small communities, where the economy is vulnerable, while making a significant contribution to meeting Québec's energy needs.

## 3) GIVE A MANDATE FOR HYDRO-QUÉBEC TO STRENGTHEN THE COMPLEMENTARY USE OF HYDROELECTRICITY AND WIND-GENERATED ELECTRICITY

Hydro-Québec is already introducing ways to balance the grid with simultaneous input from water-generated and wind-generated sources. In the United States, the Federal Energy Regulatory Commission has already highlighted Hydro-Québec's leading expertise in this area within the electrical industry sector.

One of the challenges is to obtain operational forecasts of upcoming wind and water conditions in order to optimize their combined use. At the Government's request, Hydro-Québec will focus on three specific subjects:

- Hydro-Québec will continue to develop its know-how, methods and management tools to ensure that wind farms make an optimal, reliable contribution to supplying the grid.
- Hydro-Québec will attempt to improve the precision of its wind forecasts in the very short term – in other words, on an hourly basis.
- Hydro-Québec will invest in very short term hydraulics forecasts that will help to precise the conditions for a better head bay management.<sup>5</sup>

5. A head bay is a body of water created to direct flow to a dam, lock or generating station. Unlike a reservoir, a diversion bay is not used to stock water.

## CONNECTING WIND-GENERATED ELECTRICITY TO THE HYDRO-QUÉBEC GRID

Electricity generated by wind energy naturally fluctuates over time, depending on wind speed. Similarly, water-generated electricity fluctuates over time, depending on rainfall. The main difference, however, is that water can be stored in reservoirs for use when needed, whereas wind energy cannot be stored.

For this reason, supplying wind-generated electricity to a transmission grid raises various difficulties. To stabilize the grid and ensure its reliability, the intermittent nature of the wind generation must be compensated by another, more easily-controlled source – whether hydro-electricity, by adjusting the amount of water drawn from a reservoir, or thermally-generated electricity, by adjusting the output of a power station. The compensation is referred to a “balancing”.

In Europe, the countries that rely most on wind energy to meet their electricity needs must import thermally-generated electricity to balance their supply. For example, Germany and Denmark use electricity from other countries to balance the grid. Wind energy cannot be used as the foundation of an electricity supply. In North America, the rules governing network reliability exclude wind-generated electricity from the calculation of available capacity.

Québec has the advantage of having access to an abundant and adjustable supply of basic energy – hydroelectricity – that can be combined with wind-generated electricity to meet its needs via a reliable, balanced grid. In return, the use of wind-generated electricity simplifies the management of the water stored behind dams in reservoirs. Wind energy is therefore not a substitute for, but rather a complement to, hydroelectricity.

## 4) ESTABLISH COMBINED WIND/DIESEL GENERATION FOR ISOLATED NETWORK SUPPLY SYSTEMS

Hydro-Québec has almost 14,000 customers in forty different communities who are not supplied from the main grid. Each community has its own, self supply network, most often based on generators that use diesel fuel to produce electricity. The use of wind turbines could improve the energy situation for this type of system.

### A COSTLY, POLLUTING SOURCE OF ELECTRICITY

The economic and environmental conditions in which the independent supply system generators operate could be improved.

- Diesel generators are expensive to run, with an average electricity production cost, in 2004, of 50 cents per kilowatt-hour for the self supply networks, compared to an average retail price of around 6 cents per kilowatt-hour, as in the rest of Québec.

The cost borne by Québec society as a whole is substantial, given the total consumption of the self supply systems. In 2004, the self supply systems together had a total installed capacity of 144 MW, and their customers consumed 0.3 TWh of electric energy. Hydro-Québec estimates that it loses around \$133 million each year, an amount that reflects the difference between the high cost of using diesel fuel to produce electricity in these areas and the standard cost of electricity.

- The use of diesel generators also has a significant environmental impact, producing large quantities of greenhouse gas emissions. In total, it is estimated that 140,000 tonnes of greenhouse gases are emitted by the diesel generators used to supply the customers of the independent systems, about the same amount as 35,000 automobiles in a year.

### THE WIND SOLUTION

Wind energy now makes it possible to offer an alternative solution. The diesel generators of the self supply systems could be coupled with wind turbines, reducing their running time and fuel consumption. Greenhouse gas emissions would also be lower, along with electricity production costs.

However, pilot projects must be implemented first to verify the technical feasibility of combined wind/diesel generation and ascertain its cost. Based on the pilot projects, Hydro-Québec could move quickly to introduce combined wind/diesel generation as the general solution for self network systems.

- Hydro-Québec is already working in the Magdalene Islands to have a combined wind/diesel project in operation by the summer of 2007. This is a major initiative given the number of customers concerned and the major economic and environmental costs of the current system.
- The Government wants to take a further step and has instructed Hydro-Québec to launch another combined wind/diesel project in Nunavik, to determine whether the solution could be applied to all communities in Nunavik.

- Nunavik is especially suitable for the introduction of combined wind/diesel generation. Diesel-powered generation is particularly expensive, and wind potential is high.

The Government expects the first project to be operational no later than 2008. The main challenges are linked to the northern climate and remote location: the wind turbines will have to resist harsh weather conditions, and an economic way to transport the necessary equipment over large distances will have to be found.

- Based on the results obtained, Hydro-Québec will be asked to define a plan for the introduction of combined wind/diesel generation for all self network systems. It is important, from the Government's point of view, that the possibilities of wind energy be explored quickly. The plan must be drawn up with input from local communities and the Inuit.

### Areas not connected to the main Hydro-Québec grid

At the end of 2003, almost over 14,000 customers were supplied by a self network system, in five distinct areas comprising 37 communities, with a total installed generating capacity of 144 MW. According to current forecasts, the needs of these communities will reach 155 MW in 2014.

TABLE 2 Areas not connected to the main Hydro-Québec grid (2003)

Area	Number of customers	Installed capacity (MW)
Îles-de-la-Madeleine	6,832	68
Nunavik	4,097	27
Basse-Côte-Nord	2,503	38
Haute-Mauricie	776	8
Île d'Anticosti	187	3
<b>Total</b>	<b>14,395</b>	<b>144</b>

## 5) CONTINUE TO INVEST IN RESEARCH AND INNOVATION

Wind generation is a good example of an energy source that, ten years ago, was still considered non-conventional, but that is now expected to make a significant contribution to meeting energy needs. Such swift and spectacular results could not have been obtained without the research and development work conducted throughout the world – thanks to which it has been possible to reduce production costs and improve the technologies used.

It is important for Québec to continue this work, to adapt wind generation methods to our geographic location and climatic conditions, and to overcome the technological constraints that set a limit on our potential. As soon as these obstacles have been lifted, it will be possible to develop our wind resources further. Hydro-Québec has been instructed to examine other possible development, as soon as the economic and technical situation sufficiently evolves.

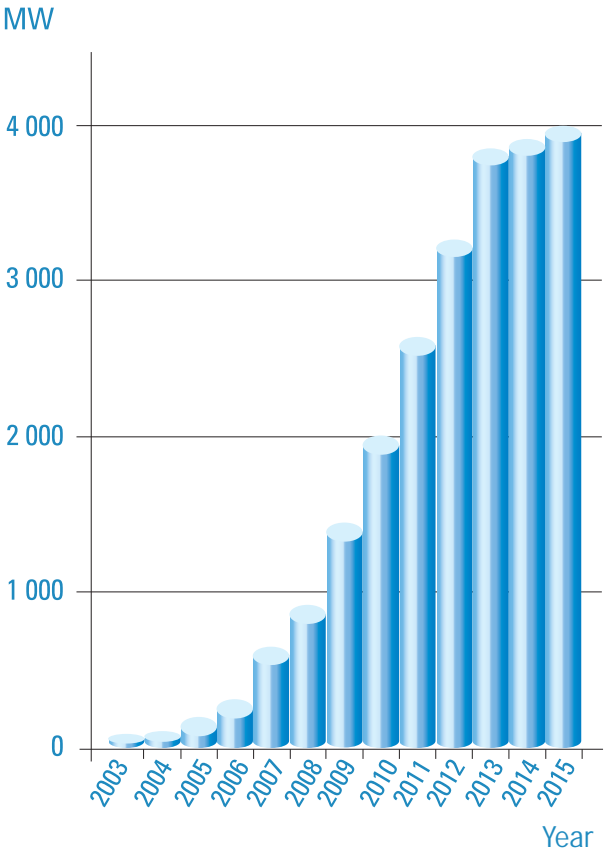
- The instructions given to Hydro-Québec by the Government to strengthen the complementary use of water and wind generation are part of this approach.
- The Government expects private-sector firms to invest in innovation, especially to adapt wind turbines to the northern climate and to improve knowledge of aerodynamics. This is a necessary step if Québec is to occupy its chosen place in an expanding sector. Any investment should quickly generate a return, thanks to the calls for major bids issued by Hydro-Québec for the supply of wind-generated electricity.

## AN AMBITIOUS PROGRAM TO DEVELOP WIND ENERGY POTENTIAL

Thanks to the new energy strategy, the Government will launch an ambitious program to harness wind potential.

- By 2015, all the wind potential currently identified will have been harnessed.
  - Between 2003 and 2015, the installed capacity for wind generation will have increased by a factor of forty, from 100 MW to 4,000 MW.
  - By 2015, wind generation alone will account for roughly 10% of the total installed capacity in Québec.
- Hydro-Québec will have confirmed its leading position for the connection of wind-generated electricity to a modern electricity distribution system.
- A vigorous, competitive wind energy industry will have staked out a position on the North American market, thanks to expertise acquired gradually through developments in Québec.
- Other development will take place as new hydro-electric projects come on line and new technological progress is made.

GRAPH 7  
Change in installed wind generating capacity (in MW)  
(2003-2015)





The actions taken by the Government under the new energy strategy are intended to place energy efficiency at the heart of its approach.



## USE ENERGY MORE EFFICIENTLY

Once again, the Government demonstrates its initiative and vision by mobilizing the resources needed to ensure that we use energy more effectively, whether as individuals or as a society.

### ENERGY EFFICIENCY – AT THE HEART OF THE GOVERNMENT'S STRATEGY

Over the last decade, Québec, has obtained encouraging results through the promotion of energy savings in the energy efficiency strategy adopted a little over ten years ago. The work has accelerated since 2003, and by building on this new foundation we can go even further.

### A STRONG PERFORMANCE IN THE CANADIAN CONTEXT

Within Canada, Québec is one of the provinces with a relatively low level of per-capita energy consumption.

- In 2003, calculated in TOE (tonnes of oil equivalent), Québec's energy consumption was a little over 5 tonnes (TOE)<sup>6</sup> per capita, compared to almost 6 TOE per capita in Canada as a whole, and 10 TOE in Alberta.

#### PRIORITY ACTIONS

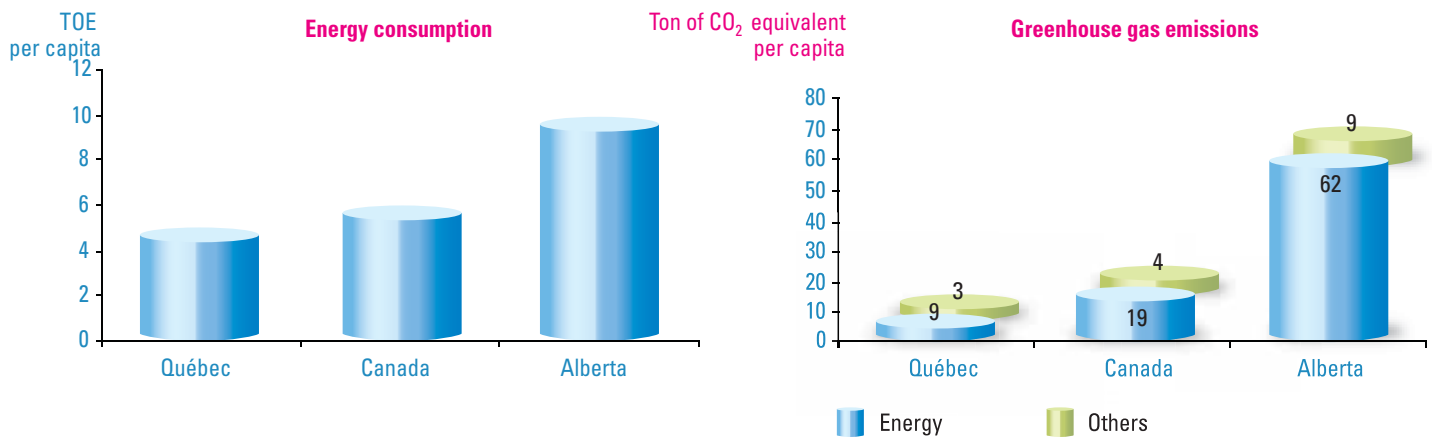
- 1) Set higher efficiency targets for all forms of energy including, for the first time, petroleum products
- 2) Draw up a comprehensive plan for all forms of energy and establish the measures needed to implement the plan
- 3) Reduce consumption of petroleum products by specific actions
- 4) Make better use of electricity
- 5) Extend the scope of energy efficiency initiatives for natural gas
- 6) Strengthen leadership in the public sector

- Québec's energy efficiency programs, added to the decisions made in the past to focus on hydroelectric development, have confirmed its strong position in the area of greenhouse gas emissions. In 2003, the level of greenhouse gas emissions was only 12 tonnes per capita, 9 of which were energy-related, compared to 23 tonnes per capita in Canada as a whole and 71 tonnes per capita in Alberta.

6. Total energy consumption, including all forms of energy, is generally measured in Tonnes Petroleum Equivalent (TOE). One TOE is equal to 10<sup>7</sup> kilocalories (kcal). One kilocalorie is the amount of heat needed to raise the temperature of one kilogramme of water by one degree Celsius.

GRAPH 8

Per capita energy consumption and greenhouse gas emissions, Québec, Canada and Alberta (2003)



## IMPROVING QUÉBEC'S PERFORMANCE

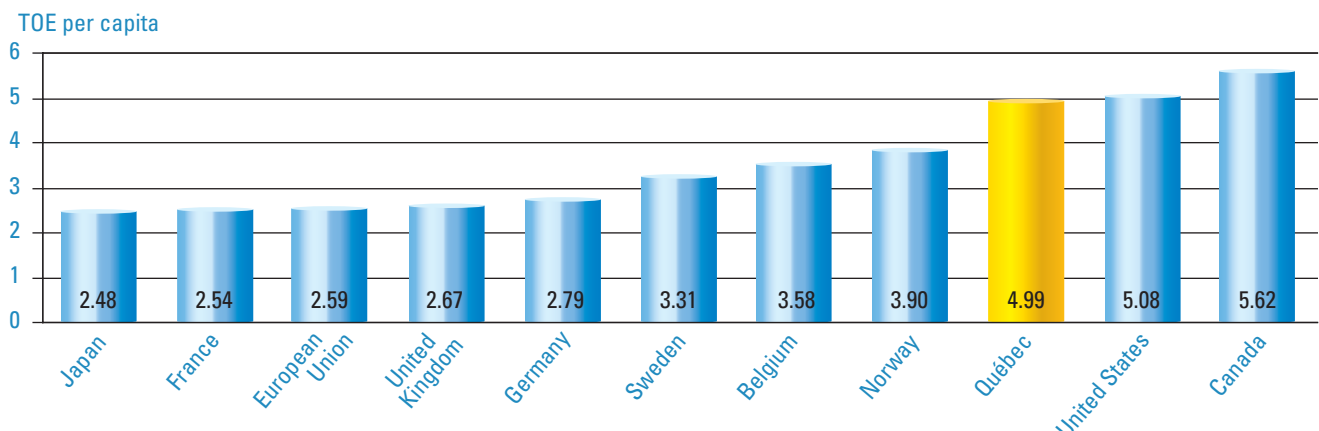
The results obtained by Québec are encouraging, but remain insufficient. Québec can, and must, improve its performance.

Québec is still a major energy consumer compared to other areas around the world. In 2002, its per capita energy consumption was below that of Canada and

the United States, but twice that of the European Union and Japan. Some of the difference is obviously caused by our climate and industrial structure, but by comparing our results with those of Sweden or Norway, it is clear that Québec can do better.

GRAPH 9

Per capita energy consumption – Québec and main industrialized nations (2002)



We must improve this result and use energy more effectively, for at least two reasons.

- On the environmental side, the solutions to climate change relate mainly to the energy sector, and especially to energy efficiency. In Québec, energy-related activities generate over 70% of greenhouse gas emissions. The promotion of energy efficiency is the key to reducing greenhouse gas emissions, whether under a plan for Québec, Canada, or the entire northeast region, to meet the objectives of the *Kyoto Protocol*.
- On the economic side, energy efficiency is an excellent way to improve our quality of life and competitiveness. By learning to use energy more efficiently, individuals can release resources for other priorities, and businesses can become more competitive on the markets on which they sell their products and services.

Energy efficiency is a winning option in several different ways. In addition, investments in the field of energy savings have led to the emergence of a major sector of activity in all regions of Québec. Every step taken to improve energy efficiency has an immediate impact on Québec's economy in terms of wealth creation.

## INCREASED EFFORTS SINCE 2003

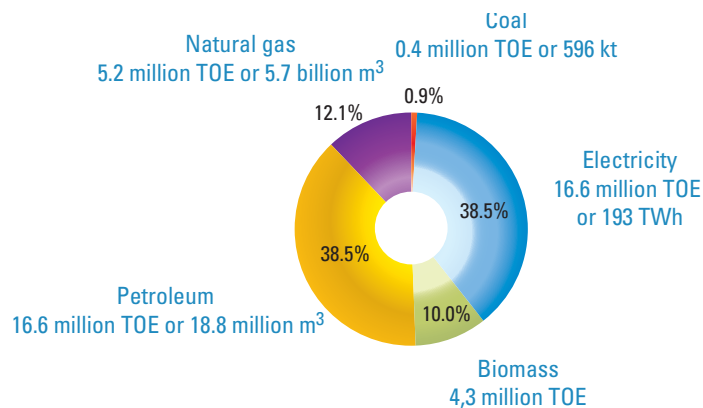
Since 2003, a major effort has been made to promote the more effective use of energy.

- Between 2003-2004 and 2005-2006, the money allocated by the Agence de l'efficacité énergétique for financial assistance for consumers has quadrupled, from \$3.4 million to \$14.6 million.
- Over the same period, Hydro-Québec reviewed its promotional plan for energy efficiency and increased its target for recurrent savings from 0.75 TWh for 2006 to 4.1 TWh for 2010 – with an overall investment of almost \$2 billion.
- Gaz Métro filed its energy efficiency plan in June 2005, targeting an energy savings objective of 95.8 million cubic metres by 2008 – four times higher than the target set in 2001 for the year 2004.

In the fall of 2004, the Canadian Energy Efficiency Alliance once again ranked Québec as a leading jurisdiction, within Canada, for the quality of the programs it has established.

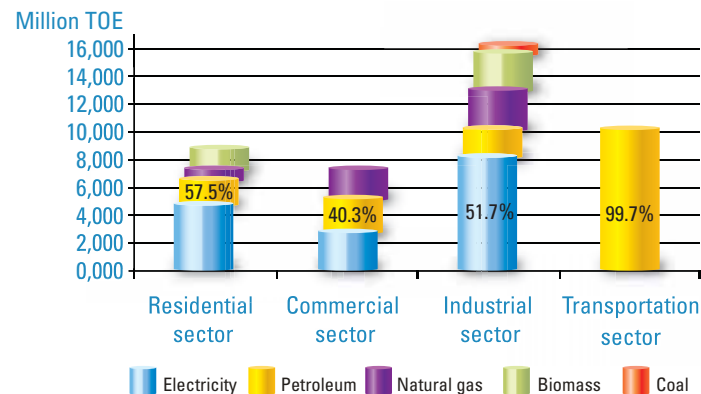
Until now, these programs have focused mainly on electricity and natural gas. It is of the utmost importance to turn now to the petroleum products sector, where the most significant gains in terms of greenhouse gas emissions will be achieved.

GRAPH 10  
Energy consumption in Québec (2003)  
Energy consumption by source



Source: Ministère des ressources naturelles and Statistics Canada

Energy consumption by sector and source



Oil represents a large part of Québec's energy consumption – as much as electricity. In addition, it is practically the only energy source used in the transportation sector. Any actions taken to improve energy efficiency for petroleum products must necessarily target the transportation sector.

All the actions taken to improve energy efficiency must be coordinated in a comprehensive plan, whose results can be monitored year by year.

All the orientations defined by the Government are designed to support this objective.

## PRIORITY ACTIONS

To meet the objective of making Québec more energy-efficient, the Government will focus on:

- 1) adopting **more ambitious energy savings targets for all forms of energy**, including petroleum products;
- 2) drawing up a **comprehensive plan** for all forms of energy, and taking steps to implement it;
- 3) **reducing the consumption of petroleum products** by taking specific action;

- 4) making better **use of electricity**;
- 5) extending the scope of energy efficiency measures for **natural gas**;
- 6) strengthening leadership in the public sector.

### 1) MORE AMBITIOUS ENERGY SAVINGS TARGETS FOR ALL FORMS OF ENERGY

The Government expects all energy distributors to launch a significant review of their energy efficiency targets.

- The energy savings target of Hydro-Québec will be increased from 4.1 to 8.0 TWh – in other words, from 355,000 TOE to 690,000 TOE – and the period covered by its energy efficiency plan will be extended from 2010 to 2015. The additional energy savings resulting from the new target will represent the annual consumption of 200,000 households with electric heating.

The Government will ask Gaz Métro and Gazifère to increase their energy savings target from 96.9 to 350 million cubic metres – in other words, from 90,000 TOE to 310,000 TOE – and to extend the period covered by their energy efficiency plan from 2008 to 2015. The increase in the target represents an annual saving of around \$100 million for consumers, at current rates.

- For the first time, a target will be set for the petroleum products sector – 2 million tonnes TOE, for 2015. The target is equivalent to 13.5 million barrels of oil, or 10% of our annual consumption of petroleum products.

The Government has set ambitious targets for energy efficiency, by increasing the current targets for electricity and natural gas distributors by a factor of two and three, respectively.

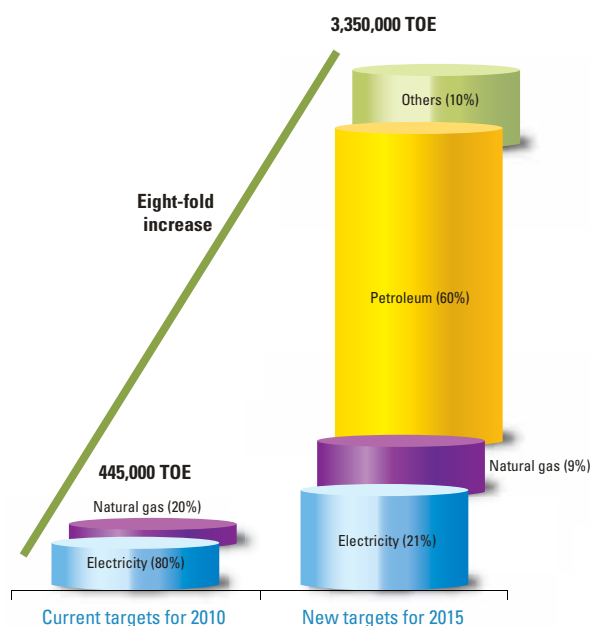
Until now, there were no specific energy efficiency programs for petroleum products – and no specific targets. However, it is in the petroleum products sector that Québec can make the most significant gains, in terms of reducing greenhouse gas emissions from energy-related activities, and also in terms of reducing the cost of imported energy. The Government has decided to set energy efficiency targets for the petroleum products sector, something that has never been attempted. The Government has set an objective that is proportionately two times and three times higher than those set for the electricity and natural gas sectors, to take into account the gap to be bridged and the importance of the issues at stake.

In all, converted into a single measurement – tonnes of oil equivalent – the energy savings objectives for all energy distributors are increased from 445,000 TOE to 3,350,000 TOE. In other words, they are increased by a factor of eight.

This means that by 2015, Québec will save \$2.5 billion on its annual energy bill, and will reduce by 9.4 million tonnes the quantity of greenhouse gases it emits or whose production is avoided.<sup>8</sup>

Petroleum products alone represent 60% of the expected energy savings.

**GRAPH 11**  
Energy savings: the overall target set by the Government for 2015

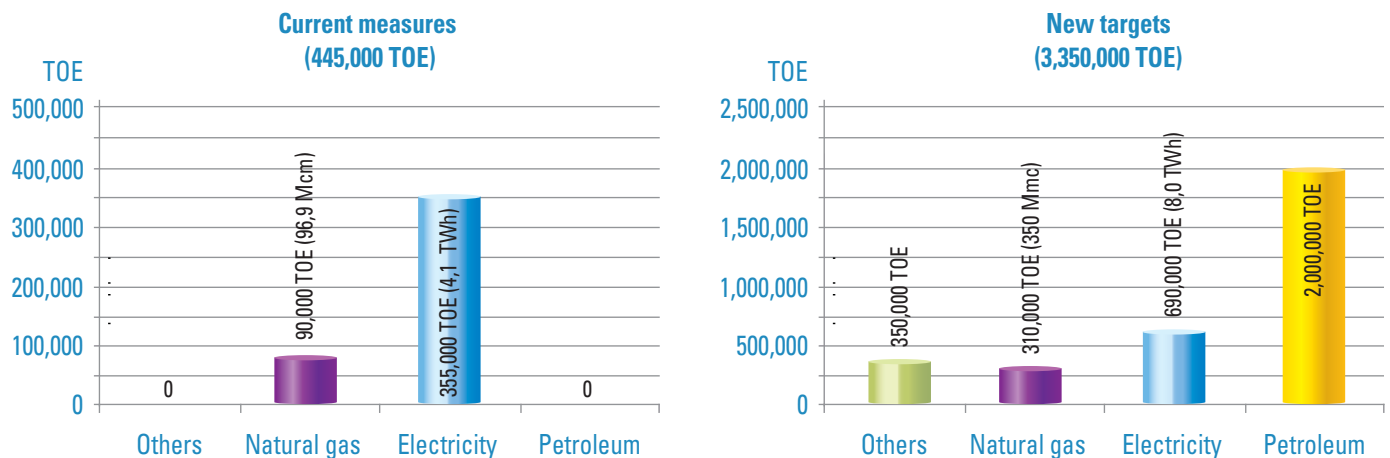


The energy strategy will make a substantial contribution to the Government's actions on climate change and will be complementary to its other actions.

7. This total includes the target included in Gaz Métro's energy efficiency plan (79.7 million cubic), the energy savings funded by Gaz Métro's energy efficiency fund (16.1 million cubic metres) and the target set by Gazifère (1.1 million cubic metres).

8. Lower consumption in Québec will allow more electricity to be exported, replacing the thermally-generated electricity used in neighbouring jurisdictions and avoiding emissions of greenhouse gases.

GRAPH 12  
Energy efficiency: targets set by the Government for 2015



## 2) A COMPREHENSIVE PLAN FOR ALL MARKETS AND ALL FORMS OF ENERGY, WITH IMPLEMENTATION MEASURES

The Government will instruct the Agence de l'efficacité énergétique to draw up a comprehensive plan for more effective use of energy, in collaboration with the distributors and sectors concerned. In doing this, the Government is responding to a demand made by many participants in the consultation process held in recent months, and to the opinion submitted by the Régie de l'énergie in the summer of 2004.

- The comprehensive energy efficiency plan will ensure that the actions taken are coherent and concern all forms of energy.
- The Agency will be subject to a strict approval and accountability process.
- The terms of reference and intervention powers of the Agency will be strengthened.

### COHERENT ACTION THAT CONCERN ALL FORMS OF ENERGY

The Government will instruct the Agence de l'efficacité énergétique, over the coming months, to prepare a comprehensive plan to ensure the more effective use of energy, based on close consultation with the distributors and sectors concerned – including Hydro-Québec, Gaz Métro, Gazifère, representatives from the petroleum products sector, representatives of residential, commercial, institutional and industrial consumers, and various groups involved in promoting energy efficiency.

The comprehensive energy efficiency plan will reflect the Government's overall vision for energy efficiency and ensure that coherent actions are taken concerning all forms of energy. It will not replace the plans implemented by Hydro-Québec, Gaz Métro, the Fonds en efficacité énergétique and Gazifère. Instead, it will complete them and create a general framework. To ensure the overall consistency of actions taken in the field of energy efficiency, the plan will also take into account the structural action that the Government will undertake, for example specific actions in the transportation sector.

The Government has decided to focus on energy efficiency in the petroleum products sector, because this is where the most significant gains can be made in Québec, whether in terms of reducing greenhouse gas emissions from energy-related activities, or in terms of the cost of imported energy.

While preparing its plan, the Agence de l'efficacité énergétique will identify the most sustainable, cost-effective savings measures that can be implemented through simple programs aimed at consumers and delivered on contract out basis. The goal is not for the Agence de l'efficacité énergétique to deliver its own programs; instead, the programs it designs with energy distributors will be delivered by the private sector, under an accreditation system.

#### **A STRICT PROCESS FOR APPROVAL AND ACCOUNTABILITY**

The Agency will submit its comprehensive plan to the Government for approval. The Government's goal is for the plan to be adopted no later than early 2007, as soon as the Agency has completed its work and the necessary consultations have taken place. Appendix 2 shows the approval and accountability process for the comprehensive energy efficiency plan in more detail.

Once the energy efficiency plan has been adopted, the Régie de l'énergie will determine the funding required. In accordance with current practice, the Régie will hold public hearings and the various stakeholders will present their points of view concerning the planned energy efficiency measures and their funding.

A performance contract will be signed by the Agency and the Government on the basis of the amounts approved by the Régie for implementation of the plan. The Agency will report to the Government each year on its management of the contract.

- Every year, all regulated distributors will submit to the Régie the portion of the energy efficiency plan that concerns them exclusively, as is currently the case.
- Every year, the Agency will submit to the Régie the measures targeting non-regulated forms of energy,

such as heating oil, fuels and firewood, and the measures that do not depend on a single form of energy, such as those relating to building insulation.

The sources of funding for the comprehensive plan will ensure the stability and continuity of actions. The funding authorized by the Régie will be used solely for the implementation and administration of programs included in the plan, and may be increased in the future by the inclusion of monies set aside by the federal government for energy efficiency initiatives.

#### **A STRONGER AGENCY**

The powers of the Agency and its governance will both be strengthened to enable it to perform its new duties. The Agency must demonstrate its leadership in the field, for both the design of the comprehensive energy efficiency plan and its supervision of the plan's implementation and innovation support initiatives.

### **3) ACTIONS TO SIGNIFICANTLY REDUCE CONSUMPTION OF PETROLEUM PRODUCTS**

Energy use accounts for over 70% of greenhouse gas emissions in Québec, in particular because of our reliance on petroleum products. The transportation sector alone – where petroleum products are virtually the only energy sources – represents over half of all emissions. All petroleum products are currently imported, and they account for most of Québec's energy bill from outside sources.

Québec therefore has environmental, social and economic incentives to rationalize its consumption of petroleum products.

The Government has set itself the objective of reducing petroleum product consumption by 2 million TOE by 2015, compared to the consumption forecast if no measures are implemented. This target will be met through the implementation of programs drawn up by the Agence de l'efficacité énergétique and petroleum product distributors, as well as government initiatives in the transportation sector. The Agence d'efficacité énergétique will propose the programs in question to

the Régie de l'énergie, along with the funding required for their implementation and administration. In examining the program and funding proposals, the Régie must ensure that they will have the effect of reducing the overall consumption and invoice of petroleum product consumers.

In addition, the programs must reflect the special energy efficiency needs of low-income households using petroleum products. The Régie, as it does in other similar cases, will be responsible for gathering and considering the views of consumers and other stakeholders when making decisions in this respect. Once the level of funding has been set by the Régie, the necessary monies will be collected from the oil companies proportionally to their respective sales of petroleum products. In this way, it will be possible to ensure continuous action in the area of energy efficiency.

## Actions to reduce petroleum product consumption

### Passenger transportation

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Renewable fuels</li> </ul>   | <ul style="list-style-type: none"> <li>• 5% ethanol content by 2012</li> <li>• Increased biodiesel market penetration</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Enhanced vehicle performance</li> </ul>                                    | <ul style="list-style-type: none"> <li>• Tax refund for hybrid vehicles (up to \$1,000)</li> <li>• Financial incentives for vehicles with low fuel consumption</li> <li>• Measures to encourage new diesel (clean diesel) vehicles</li> <li>• Fuel consumption standards for motor vehicles that approach the California standards</li> </ul> |
| <ul style="list-style-type: none"> <li>• More efficient driving techniques</li> </ul>                               | <ul style="list-style-type: none"> <li>• Information campaign for drivers</li> <li>• Energy efficiency component in examinations for a driver's licence</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Promote the use of public transit: future public transit policy</li> </ul> | <ul style="list-style-type: none"> <li>• Improvements to infrastructures</li> <li>• Incentives for car-pooling and alternatives to one-person car use</li> <li>• Tax deduction for employers who pay for their employees' public transit passes</li> <li>• Reimbursement of all fuel taxes for public transit authorities</li> </ul>          |

### Freight transportation

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• More efficient driving techniques</li> </ul> | <ul style="list-style-type: none"> <li>• Energy efficiency component in compulsory heavy vehicle inspections</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Route optimization</li> </ul>                | <ul style="list-style-type: none"> <li>• Promotion of coastal shipping and rail transportation</li> </ul>                 |
| <ul style="list-style-type: none"> <li>• Technology</li> </ul>                        | <ul style="list-style-type: none"> <li>• Support for the marketing of technology to improve energy performance</li> </ul> |

### Water and space heating, industrial processes

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• More energy-efficient space heating and buildings</li> </ul> | <ul style="list-style-type: none"> <li>• Energy savings programs for individuals and companies</li> <li>• Revision of the Regulation respecting <i>energy conservation</i> in new buildings and inclusion in the Québec <i>Construction Code</i>.</li> </ul> |
| <ul style="list-style-type: none"> <li>• Energy-efficient equipment</li> </ul>                        | <ul style="list-style-type: none"> <li>• Program for high-performance equipment purchases</li> <li>• Update of the <i>Act respecting the energy efficiency of electrical or hydrocarbon-fuelled appliances</i></li> </ul>                                    |

### Agro-food sector

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Performance enhancements</li> </ul> | <ul style="list-style-type: none"> <li>• Specific program to be developed by the Agence de l'efficacité énergétique in collaboration with stakeholders in the field</li> </ul> |
|--|--|

## THE TRANSPORTATION SECTOR

The Government will target and give priority to measures in the transportation sector, where petroleum products are virtually the only source of energy. Although the average fuel consumption of the vehicle fleet in Québec is lower than that in Canada as a whole, in particular because Quebecers favour smaller cars, the Government wants to go further by using several levers simultaneously in the passenger and freight transportation sectors.

With regard to **passenger transportation**, the Government will act in four specific areas:

- support for the use of renewable fuels;
  - enhanced vehicle performance;
  - promotion of more efficient driving techniques;
  - promotion of public transit – including alternatives to one-person car use.
- The measures to support the use of renewable fuels target ethanol-based fuels and biodiesel:
    - The Government's objective is to ensure that, by 2012, gasoline distributors will include an average of 5% of ethanol in all fuel sales. This measure will help reduce reliance on petroleum-derived fuels, representing an annual reduction of almost \$200 million at current prices on the imported fuel bill.

As discussed below, ethanol is one of the most promising forms of new energy. The first ethanol production plant, using grain corn, is under construction in Varennes. Once completed, it will produce 120 million litres of ethanol each year that will be marketed under agreement by Petro-Canada. Starting in early 2007, almost 30% of the gasoline sold in Québec will contain at least 5% ethanol, reducing reliance on petroleum products.

To improve the market penetration of ethanol, the Government intends to promote the use of forest biomass rather than grain corn. It also hopes to promote the use of the agricultural residue and

waste that currently ends up in landfill sites. Before this can be done, however, a number of technological challenges must be overcome.

The innovations that the Government intends to introduce in the renewable fuels field will support these objectives.

- Biodiesel is another promising renewable fuel for Québec. It is generally produced using waste vegetable oils or recovered animal fats. Used as a fuel, biodiesel helps fight smog and reduce our reliance on petroleum products.

In the *2005-2006 Budget Speech*, the Government announced a refund of the fuel tax paid on biodiesel fuel by public transit authorities. On March 23, 2006, the Minister of Finance announced that the credit would be extended to all consumers who purchase biodiesel for transportation purposes.

- The Government will introduce various initiatives to improve vehicle performance.
  - The first measure was announced by the Minister of Finance in the *2006-2007 Budget Speech*. The purchasers or long-term leasers of new hybrid vehicles will be able to apply for a QST refund of up to \$1,000.
  - The Government will evaluate the possibility of introducing **financial incentives** to encourage purchasers to opt for more fuel-efficient vehicles.
  - The Government will also evaluate the more widespread use of **diesel-powered vehicles** by encouraging the replacement of gasoline-powered vehicles. The Agence de l'efficacité énergétique will assess how such an initiative could be introduced. Diesel engines are more efficient than gasoline engines, using 25% to 40% less fuel to supply an equivalent amount of power.

This energy advantage is made even more attractive by the fact that new types of diesel fuel will soon become available that emit far fewer atmospheric pollutants than current fuels. Beginning in

October 2006, new diesel fuels will have a sulphur content of 15 parts per million, compared to 500 parts per million for current fuels, and the pollutant emission standards will be the same as for gasoline-powered engines by 2008.

- The Government intends to use all available levers to ensure that the **standards governing vehicles sold in Québec** are made stricter with regard to greenhouse gas emissions and energy consumption. The Government hopes that the new standards will be similar, as far as energy consumption is concerned, to the new standards introduced by the State of California to limit automobile greenhouse gas emissions. This process follows on from an initiative taken by eleven US states, including New York and the New England states, to adopt the California standards.
- To encourage more efficient driving techniques, the Government will announce the following initiatives.
  - An information campaign will be launched to make drivers aware of the benefits of driving in a more energy-conscious way. The campaign will focus on the links between speed and fuel consumption, the energy gain from having properly inflated tires, and the benefits of a “greener” driving approach.
  - The awareness-raising campaign will begin with learner drivers. Already, the Société de l’assurance automobile du Québec (SAAQ) has introduced tips on energy-conscious driving in its new guide, *Driving a Passenger Vehicle*. The Government will ask the SAAQ to include an energy efficiency component in the examinations required to obtain a driver’s licence. In this way, future drivers will have all the information they need to drive more efficiently before they obtain their licence.

## ENVIRONMENTALLY-FRIENDLY DIESEL-POWERED VEHICLES

In the diesel engine, invented over one hundred years ago by German engineer Rudolph Diesel, the fuel is ignited without the assistance of spark plugs. Thanks to its higher compression rates, a diesel engine is more efficient than a gasoline-powered engine, and uses from 25% to 40% less fuel to produce a similar amount of power.

After attracting renewed interest during the energy crisis of the 1970s, diesel-powered passenger vehicles fell from popularity once the threat of a fuel shortage disappeared – at least in North America. Current diesel engines are noisier and dirtier than conventional engines, and today make up only 3% of the vehicle fleet in North America. The introduction of cleaner diesel fuels, along with several major innovations in diesel engine technology, will focus attention once again on diesel-powered vehicles.

In Europe, the environmental standards for diesel fuel are already more stringent, and most governments encourage the use of diesel fuel by reducing the tax rate compared to conventional gasoline. Diesel-powered vehicles now account for around 50% of all passenger vehicles sold in Europe.

Although diesel engines produce less greenhouse gases than gasoline engines, the current models in North America release more nitrogen oxide, unburned hydrocarbons and soot particles. The situation will change radically, however, in 2006.

Beginning in October 2006, all diesel fuel sold for use in road vehicles will be replaced, throughout Canada and North America, by a

new low-sulphur fuel (15 PPM compared to 500 PPM). This new fuel will allow the use of high-performance catalytic converters and filters, reducing nitrogen oxide emissions by 80% and soot particle and hydrocarbon particle emissions by 95%.

Beginning in 2008, the pollutant emission standards for diesel engines will be equivalent to, or more stringent than, the standards for gasoline engines. The carbon monoxide emissions of a diesel engine are 10% to 30% lower than for a gasoline engine, depending on the model.

Several automobile manufacturers will take advantage of the introduction of the new fuels to launch new vehicles based on "clean diesel" technology. According to the research firm J.D. Power & Associates, the number of diesel-powered vehicles sold on the American market will quadruple over the next decade.

- As announced in the *2006-2007 Budget Speech*, employers will benefit from an additional 100% deduction if they pay for all or part of their employees' public transit passes.

In addition, employees who benefit from this measure will not be required to declare the benefit as taxable income, like other benefits they receive from their employer.

These two measures will constitute a key incentive for businesses and employees to rely more on the public transit system.

In the *2006-2007 Budget Speech*, the Minister of Finance also announced a full refund of the fuel tax paid by public transit authorities. The Government already refunds one third of this tax, and the whole amount for purchases of biodiesel. By extending the tax advantage to all fuels, the Government has sent a clear signal concerning the importance of public transit.

- Improved energy efficiency in the passenger transportation sector obviously requires that support be provided for public transit systems to make them more attractive for new users. The Government will launch a series of initiatives to promote the use of public transit or other alternatives to individual car use.
  - In its upcoming public transit policy, the Government will mobilize new resources to finance the improvement and development of public transit infrastructures. In the *2006-2007 Budget Speech*, the Minister of Finance announced that \$1.5 billion would be allocated over the next three years to maintain or renew public transit infrastructures and equipment.
  - The policy will include measures to promote car pooling and alternative transportation modes.

## PUBLIC TRANSIT: A KEY TO SUSTAINABLE DEVELOPMENT

Increased use of the public transit system is one of the best ways to combat climate change while improving the quality of life in urban centres.

- One full passenger bus can replace 40 automobiles on the road during rush hour. Forty automobiles emit approximately 160 tonnes of greenhouse gases per year.
- The use of public transit reduces highway traffic loads, especially in urban environments.

To promote the use of public transit, the Government will act simultaneously in several areas.

- The Government will invest in infrastructure and equipment to improve access to public transit systems and make them more comfortable.
- The Government will increase the financial capacity of public transit authorities to allow them to improve the services they offer.
- The Government will use fiscal tools to promote the regular use of public transit as a means of travelling to work.

- The government initiatives will also target improved energy efficiency in the **freight transportation sector**.
  - The Government will ask the SAAQ to add an energy efficiency component to mandatory heavy vehicle inspections.
  - Measures will be introduced to promote coastal shipping and rail transportation as an alternative to trucking, where possible.
  - New technologies have recently been introduced to reduce the consumption of petroleum products by the trucking industry, specifically the “Frigy-Cube” and “Novacab” systems, which offer fuel savings in a sector where the demand for energy is very high.
  - The “Frigy-Cube” system produces and stores cold air for the reefer trailers used to deliver frozen food products. “Novacab” technology eliminates the need to idle diesel truck engines to heat or cool the cab.<sup>9</sup>
  - The Government will support the marketing of new technologies of this kind to improve energy performance in the freight trucking sector. Various initiatives will be included in the comprehensive plan defined by the Agence de l’efficacité énergétique.

## WATER AND SPACE HEATING, AND INDUSTRIAL EQUIPMENT AND PROCESSES

The Agence de l’efficacité énergétique will draft programs for water and space heating using petroleum products and propose amendments to the Government concerning various regulations on heating systems for buildings and equipment use.

Currently, the programs implemented by Hydro-Québec and the natural gas distributors have no equivalent in the petroleum products sector. The Agency will ensure that this gap is bridged.

9. Information on “Frigy-Cube” and “Novacab” are available at the website of the Agence de l’efficacité énergétique at [www.aee.gouv.qc.ca](http://www.aee.gouv.qc.ca).

- The Government will ask the Agency and the petroleum product distributors to work with the other stakeholders to set up specific programs for **heating and industrial processes**.
  - The programs must be open to all consumers – individuals, businesses and institutions.
  - They must give petroleum product consumers access to assistance and support, similar to those available for electricity and natural gas consumers.
- More specifically, the Government will require that
  - the Agence de l'efficacité énergétique and petroleum product distributors set up an energy savings program for existing residential housing, in particular targeting **thermal improvements to the building envelope** during renovation work, and the installation of more efficient heating systems. The program will give assistance to households using oil for heating in addition to the financial assistance available from the federal government, in the same way as households using gas or electric heating;<sup>10</sup>
  - a similar program be introduced for thermal improvements to the building envelope of non-residential buildings;
  - the Agency support efforts to improve the **performance of oil- and wood-fired heating systems**;
  - the Agency define assistance measures for the purchase of more energy-efficient equipment by industrial, institutional and commercial users of petroleum products, as part of a program defined in the energy efficiency plan;
- the Agency offer a specific program for the agro-food sector to improve the energy performance of businesses in this sector.
- The Agency will draft a new regulatory framework for energy efficiency in all types of new buildings, in collaboration with the Régie du bâtiment, by amending the Regulation respecting energy conservation in new buildings that will be integrated into the *Québec Construction Code*. The new framework will apply to all new buildings, whether heated by petroleum products, natural gas, electricity or any other form of energy. It will include new energy performance requirements for buildings and dwellings built starting in 2008 to improve energy efficiency by 20% to 25%. The new requirements will concern the building envelope – insulation, airtightness, windows and doors – and mechanical and electrical systems – ventilation, air conditioning, heating, lighting, etc.
- The Agence de l'efficacité énergétique will draft amendments to the *Act respecting the energy efficiency of electrical or hydrocarbon-fuelled appliances* and related regulations to harmonize it with federal regulations, and where necessary, to provisions governing new technologies or characteristics specific to Québec.

10. In the case of electric heating, Hydro-Québec will double the grant paid by the federal government. In the case of natural gas heating, the energy efficiency fund set up by Gaz Métro will offer \$1 per cubic metre saved through energy efficiency measures applied to the building envelope, and \$5 per square foot of glazing replaced by an "Energy Star" certified window, up to \$500 per dwelling. In addition, Gaz Métro will provide a grant of \$450 for the installation of a third-generation hot-air furnace and \$700 for the replacement of a boiler by equipment that performs above the current energy efficiency standards.

### EXAMPLE OF A PROGRAM DIRECTED BY THE AGENCE DE L'EFFICACITÉ ÉNERGÉTIQUE: NOVOCLIMAT HOUSING

The Agence de l'efficacité énergétique offers the purchasers of new houses the option of taking advantage of the Novoclimat program, which is also available to construction industry professionals.

The Novoclimat program has four components:

- training and certification of construction industry professionals (building designers, general contractors, ventilation specialists);
- technical support for entrepreneurs;
- free assessments of the energy performance of a house under construction, in particular an infiltrometry test, and final certification;
- information for consumers and the construction industry about the importance of energy efficiency in new housing.

The technical requirements of the Novoclimat program reduce the energy needed for heating by at least 25%, increase comfort and ensure indoor air quality. The increased construction costs, in terms of increased monthly mortgage payments, are more than offset by the reduced energy bill and the financial assistance provided – beginning in the first year. In practice, the purchasers of a Novoclimat house benefit from an immediate net saving in their personal budget.

On December 31, 2005, over 400 contractors were certified by the Agence de l'efficacité énergétique, including 33 contractors forming the "Groupe Sélect Novoclimat", who had made Novoclimat their basic standard for single-family dwellings.

Since January 2004, the Agence de l'efficacité énergétique has extended the scope of the Novoclimat program to include new rental housing. The new program was designed and is funded jointly by the Société d'habitation du Québec, the federal government, the city of Montréal, Hydro-Québec and Gaz Métro's energy efficiency fund.

### 4) MAKING BETTER USE OF ELECTRICITY

Hydro-Québec is currently investing massively to ensure that electricity is used more effectively. Its last energy efficiency plan, released on September 26, 2005, targets annual savings of 4.1 TWh by 2010, and involves a total investment of almost \$2 billion over six years.

These ambitious objectives are part of a vision based on sustainable development. Québec's electricity is generated from sources that cause little environmental damage and suit the climate, and by using it more effectively, among other things, by increasing exports to neighbouring jurisdictions, the environmental record of the northeastern North American continent can be therefore improved.

The upcoming energy efficiency plan will incorporate the Hydro-Québec plan in the set of initiatives affecting energy use, extending the timeframe to 2015.

The annual target for energy savings in the electricity sector will double as a result, from a final figure of 4.1 TWh to 8.0 TWh annually. This figure represents twice the electricity consumption of the greater Québec City area. The Régie de l'énergie will continue to be responsible for structuring both the programs and their funding, to ensure that they are in the best interests of consumers and society as a whole.

In addition to the Hydro-Québec energy efficiency plan, the Government will launch another major initiative to ensure that electricity is used more effectively,

amending the provisions of the Act respecting the Régie de l'énergie with regard to the supply plan, to ensure that energy efficiency projects can compete with new electricity supply projects in calls for bids issued by Hydro-Québec Distribution.

In Québec, the energy efficiency projects presented under a call for bids must meet the same requirements for stability, longevity and reliability as projects for conventional supplies, and must be consistent with the orientations of the energy efficiency plan. However, to reassure consumers that the winning bid is the one that offers the lowest prices, the projects must not be part of, or benefit from support under, the comprehensive energy efficiency plan of Hydro-Québec Distribution or another of the distributor's programs. In addition, a project to terminate a load subscription will not be admissible.

#### CURRENT ELECTRICITY RATES: A LIMIT PLACED ON ENERGY EFFICIENCY

Any examination of how to use electricity more effectively raises the question of electricity rates. As mentioned above, the Government intends to maintain the rate advantage enjoyed by Québec electricity consumers – whether households or businesses – and use it to strengthen our economic structure and enrich our society.

At the same time, however, it is clear that the specific rate structure of the electricity market limits the efforts of consumers in the field of energy efficiency.

- Ideally, a better price signal would improve the use of resources by ensuring that each kilowatthour saved was as valuable for the consumer as for the distributor. In other words, a decision to consume or not to consume should be based as far as possible on the price paid by the distributor for new supplies.
- In Québec this is not currently the case. The gap between the historical average supply cost and the marginal cost, in other words the cost of each new supply block, is growing steadily.

- The supply cost of the heritage block of 165 TWh is 2.79 cents per kilowatthour, but the cost of new supplies is three times higher. Since the price at which electricity is sold is based on the average supply cost, the impact of new, more costly supplies is hidden in the lower average price. The average price mainly reflects the cost of the heritage block, and so the price signal generally associated with a growth in consumption is not transmitted clearly to electricity users.

#### IMPROVING THE PRICE SIGNAL

As mentioned above, the Government does not intend to call into question the price of the heritage block, or the advantages it procures for individuals and businesses in Québec. However, this does not mean that nothing can be done to improve the price signal on the electricity market, with the goal of increasing energy efficiency.

The Government will ask Hydro-Québec to make a series of changes to its rate structure, while ensuring that the changes do not increase its overall revenue and the energy bill paid by consumers.

- The Government will ask Hydro-Québec to submit proposals to the Régie de l'énergie concerning ways of making residential electricity rates more progressive, so that the last kilowatthours consumed are billed at a price that is closer to the actual cost of new supplies.

In Québec, residential users pay for their electricity at two rates. For the first 30 kilowatthours each day, they currently pay 5.22 cents per kilowatthour. For the rest of their electricity, they pay 6.83 cents per kilowatthour.

The Government will ask Hydro-Québec to submit a new pricing structure to the Régie de l'énergie with a wider gap between the two prices, possibly by increasing the current daily threshold of 30 kilowatthours or introducing a third rate – without changing the total revenue generated for Hydro-Québec. In the new pricing structure, the price for

the first 30 kilowatthours per day would drop, reducing electricity bills for small consumers and increasing those for large consumers who fail to change their pattern of use.

Measures will be introduced to ensure that the new rate structure does not affect some low-income, high-use consumers. The measures will be defined once the Régie de l'énergie has selected a new rate scenario.

### ENERGY EFFICIENCY PROGRAMS FOR LOW-INCOME HOUSEHOLDS

Since 1999, the Agence de l'efficacité énergétique has offered an "energy efficiency program" for low-income households aimed at providing help for low-income consumers of electricity. The program is provided free of charge, and has been significantly improved since 2003.

- The Agency offers free personalized guidance and services to improve the energy efficiency of the housing occupied by low-income households, such as the installation of weather-stripping and energy-saving devices.
- The program is available throughout Québec to households with an annual income below the threshold level, which varies depending on the number of people in the household (from \$20,337 for one person to \$53,821 for seven or more people). In 2005-2006, over 6,000 households in Québec took advantage of the program.
- The program includes the free installation of electronic thermostats in housing heated by baseboard heaters with wall-mounted thermostats.

- The program applies to all forms of energy. For households that heat with both electricity and natural gas, the program is partly funded by Hydro-Québec and the natural gas distributors.
- Further improvements will be made to the program in the coming months, in collaboration with family economy cooperative associations (associations coopératives d'économie familiale, or ACEFs).
- The Agency is currently in discussions with the federal government and Hydro-Québec to improve the existing program. The federal government and Hydro-Québec have stated their intention of intervening to assist low-income households.
- The Agency intends to extend the actions currently supported by Hydro-Québec and the natural gas distributors to cover all low-income households, whatever form of energy they use for heating.

- Also in relation to electricity rates, the Government will ask Hydro-Québec to gradually implement tiered rates in Québec based on the season and time of use, by submitting a request to the Régie de l'énergie in 2007. The proposal must not cause the total price paid by all consumers to increase.

Differential rates are already applied elsewhere in the world, and allow consumers to make choices to control their electricity bills. They offer an effective way of reducing peak demand.

## TIERED RATES BY SEASON AND TIME OF USE, AS APPLIED IN BRITISH COLUMBIA AND ONTARIO

On August 29, 2005, the British Columbia Utilities Commission (BCUC) approved a rate application from BC Hydro concerning the introduction of tiered rates, available only to large industrial consumers of electricity in the province.

- The rate structure is designed to be neutral in terms of the overall revenue generated for BC Hydro.
- It sends a clear price message to consumers and encourages them to take steps to reduce their consumption, and therefore their electricity bill.
- BC Hydro will offer its large customers a hybrid seasonal rate that varies by time of use, based on a tiered rate structure.

Ontario has also introduced tiered rates. In March 2005, the Ontario Energy Board announced new rates for electricity supplies for customers in the province who pay regulated prices.

- Customers who use less than 250,000 kWh per year (residential and commercial customers, light industry, schools, churches, hospitals and some municipalities) have been subject to the new tiered rates since November 1, 2005.
- The tiered rates will be in effect until the customers concerned obtain new meters that record the time of use. The new meters will be mandatory, and will be installed between 2006 and 2010.

- Once a customer has a new meter, electricity supply rates will change again, using a hybrid formula based on season and time of use, similar to the system used by BC Hydro.

## USING THE "RIGHT ENERGY" FOR THE "RIGHT PURPOSE"

The new, progressive electricity rates will send consumers a clearer price signal when choosing a form of energy to heat their homes, encouraging them to use the "right energy" for the "right purpose". The question becomes whether electricity should be used systematically for space heating.

- The use of other forms of energy, such as natural gas and heating oil, could help reduce the demand for electricity, especially at peak times. In this way, new, more costly generating facilities will not have to be built as quickly, creating a benefit for all consumers.
- In the case of Québec, the electricity made available by a switch to natural gas heating could be exported to Ontario or certain US states that use more environmentally detrimental means to generate their electricity. Several governments in the areas concerned have targeted a reduction in their reliance on the most polluting options, with a corresponding increase in the use of renewable energy.

## 5) NATURAL GAS: BROADENING THE SCOPE OF ENERGY EFFICIENCY PROGRAMS

Natural gas distributors, like distributors in the electricity sector, offer programs to help consumers make better use of energy. In the case of natural gas, the programs cover a three-year period and the current target is to save some 100 million cubic metres by 2008.

The Government considers that further progress is required, and can be made as part of the energy efficiency plan.

- The current Gaz Métro and Gazifère programs will be included in the energy efficiency plan, with targets up to 2015.
- The energy savings target will be increased. It will be tripled, to over 350 million cubic metres.
- The new regulatory framework for energy efficiency in all types of new buildings, outlined above, should have an impact on natural gas consumption in the residential sector.

### GAZ MÉTRO'S 2005-2008 ENERGY EFFICIENCY PLAN AND THE ENERGY EFFICIENCY FUND

Gaz Métro submitted its 2005-2008 energy efficiency plan to the Régie de l'énergie on June 13, 2005. The three-year plan was approved by the Régie in September 2005.

The plan's target figure was significantly higher than those of previous plans. The target for the new plan, by the end of the three-year period (2008), was set at 79.7 cubic metres, compared to 43.9 million cubic metres in the 2003-2006 plan and 25.3 million cubic metres in the 2001-2004 plan.

The new plan sets out Gaz Métro's long-term vision for energy efficiency. It specifies four priority areas:

- making energy efficiency part of all the company's activities;
- targeting market transformation over the long term;
- targeting the durability of energy efficiency actions, in collaboration with other stakeholders;
- specifying energy efficiency objectives over the medium and long terms where the data is available.

In 2000, Gaz Métro introduced its innovative Energy Efficiency Fund with approval from the Régie. The Fund provides support for various initiatives, in addition to those included in the energy efficiency plan. The money in the Fund represents a fraction of the profit generated by Gaz Métro over a given year over and above the profits authorized by the Régie. The money is reinvested in energy efficiency, according to a plan of action drawn up in partnership with nine representatives from social, economic and environmental groups.

Since 2003, the activities of the Fund have been established using three-year periods. For 2005-2008, the target for the end of the period – 2008 – is 16.1 million cubic metres.

## 6) STRENGTHENING PUBLIC SECTOR LEADERSHIP

The Québec government is the largest consumer of petroleum products in Québec, because it must meet needs in all public buildings – including those in the education and health sectors – and operates a large public vehicle fleet.

The energy bill for the State's 5,000 buildings was over \$700 million in 2005, representing nearly 3% of all energy spending in Québec.

The Government believes it is important for the public sector to set an example of sound management and behaviour in the public interest. As part of the energy strategy, the Government will announce the following initiatives directly affecting the public sector:

- The Government will launch an immediate plan to improve energy efficiency in public buildings, including a series of measures that will lead to major energy savings by 2010. The goal of the measures will be to reduce energy consumption by 10% in every building managed by the Société immobilière du Québec or by a school board. The target will be set at 14% for colleges, universities and the health and social services sector, and at 12% for other government departments and bodies;
- The Société immobilière du Québec will be instructed to suggest appropriate measures to allow government departments and bodies to use energy more effectively, and those measures will be included in the energy efficiency plan drawn up by the Agence de l'efficacité énergétique. Among other things, the Société immobilière du Québec will be required to identify ways for the government departments and bodies concerned to benefit from some of the savings generated;
- The Government will implement the plan to improve energy performance in the transportation sector, which is already available. Its objective is to reduce fuel consumption in government departments and bodies by 20% between now and 2010.

The measures announced will strengthen the energy efficiency plan. Two of the measures will be implemented immediately, before the plan itself.

The Government will also intervene directly with municipalities. Several municipalities in Québec have already adopted policies and strategies aimed at using energy more effectively. This approach must be generalized, especially since municipalities are the administrative level closest to the general public and are present throughout Québec.

- The Agence de l'efficacité énergétique will help municipalities to draw up actions plans for energy efficiency, similar to those established by the Government for public sector bodies under its direct authority. The plans will target efficient management of buildings and equipment, better use of vehicle fleets, and information for the general public about the benefits of a more energy-conscious approach.
- The Government intends to encourage regional county municipalities and municipalities to make energy costs a key factor in the definition of land use plans and zoning plans. Once again, the Agence de l'efficacité énergétique will offer the assistance they require.

## GOVERNMENT PLAN OF ACTION FOR THE PUBLIC SECTOR

In the field of energy efficiency, the Government intends to set an example by implementing a plan to improve energy performance in the public sector. The plan will have three components: public buildings, government transportation and purchases of goods and services. The Agence de l'efficacité énergétique will report annually on the progress made in a report tabled in the National Assembly.

- For public buildings, the plan will have two priority areas:
  - For existing buildings, the Agence de l'efficacité énergétique will work with the Société immobilière du Québec, public networks and government departments and bodies to define a comprehensive approach combining short and long term measures to reduce energy costs through targeted investments.

Unitary consumption reduction targets have been defined, based on the effort required (the targets are to be met by 2010, based on 2003 figures), as follows:

- Société immobilière du Québec – 10%
- School boards – 10%
- Higher education (colleges and universities) – 14%
- Health and social services network – 14%
- Other government departments and bodies – 12%;
- For new buildings (new constructions, or substantial renovations and extensions), the Government will adopt energy performance standards that exceed those defined in the *Model National Energy Code for Buildings*.

- For government transportation, the Government will require all departments and bodies to reduce their overall fuel consumption by 20% between now and 2010, based on 2003 figures. The Agence de l'efficacité énergétique will establish targets for each department and publish a government transportation handbook of energy and environmental good practice for vehicle purchases and use.
- The plan to improve energy performance will also cover the Government's procurement policy. The Government will prioritize the purchase of "Energy Star" products and the use of equipment and facilities that offer the best energy performance levels. For more sophisticated equipment, energy cost/benefit analyses will be systematically conducted.

### INITIATIVES TO IMPROVE ENERGY PERFORMANCE: SUPPORT AND RECOGNITION

To support and encourage initiatives taken by managers and elected officials in Québec's public sector, the Government will support projects to improve the energy performance of buildings and facilities owned by

- educational institutions, and
- health and social services establishments.

Innovative initiatives and actions to improve energy efficiency will be targeted by a program with two components in each sector.

The projects will be approved by the Government, in collaboration with the Agence de l'efficacité énergétique. To set up the energy savings program, a total of \$20 million per year will be allocated for a 10-year period, in addition to the budget allocated under the government asset maintenance policy.

The funding formula will allow building managers in the education and health and social services sectors to show leadership in the field of energy efficiency. The Government will pay the interest on any money borrowed to implement the projects. The savings generated by the investments will be retained by the network's institutions and establishments.

In the education sector, an award will be made to the schools that involve their students. The schools selected will receive public recognition for their work as energy-responsible, socially committed organizations.

tonnes of greenhouse gas emissions.

## COHERENCY AND WILLINGNESS TO ACT

As outlined above, the Government will launch initiatives that demonstrate coherency and a willingness to act, in order to improve the ways in which we use energy.

- The overall process and individual measures reflect the demands made during the consultation process.
- They will represent a major step towards meeting the goals of Québec's climate change strategy and the objectives of the Kyoto Protocol in northeastern North America
- They will confirm Québec's leadership in the field of sustainable development, while strengthening its competitiveness.

The energy savings targets are ambitious. For the first time, specific targets have been set for energy savings in the petroleum products sector.

The measures defined are as ambitious as the objectives. They will be implemented in keeping with the principle of accountability and will not involve the creation of any new structures.

Overall, the Government will launch actions for the next decade, to encourage decision-makers to make the right choices and adjust their behaviour. By 2015, Québec should be in a position to save \$2.5 billion per year on its energy bill, and to prevent 9.4 million

Innovation is the key to addressing the energy issues of the future



## INTRODUCE INNOVATIONS IN THE FIELD OF ENERGY

### NEW ENERGY TECHNOLOGIES TO PREPARE THE FUTURE

In many respects, innovation is the key to improving our performance in the energy sector. The role played by innovation is even more crucial for new energy technologies: in this case, it is the condition for success and future development.

New energy technologies are the focus of extensive, innovative research and development work in Québec and around the world. These new technologies, known as “emerging” technologies, are already starting to help meet energy needs. Over time, their performance will gradually improve and their cost will drop, making them increasingly attractive as alternatives to traditional energy sources.

New energy technologies will be important in the future; at some point, they will replace traditional energy sources, which are increasingly scarce and costly. It is in Québec's interest to invest in the development and promotion of new technologies, to support the energy sectors in which we have a genuine comparative advantage and to derive as much value as possible from our key assets.

In the new energy strategy, the Government places strong emphasis on innovation and R&D in the energy field to increase the pace at which the most attractive technologies are implemented. Once again, the Government gives priority to renewable energy.

The technologies referred to here mainly concern the development of renewable fuels, geothermal energy, passive and active solar energy and hydrogen fuels. In each case, the technology concerned is of particular interest for Québec.

### PRIORITY ACTIONS

- 1) Establish a new financial and institutional framework to increase support for innovation
- 2) Develop a renewable fuel industry in Québec
- 3) Support the development of geothermal and solar energy
- 4) Prepare for the future use of hydrogen fuels
- 5) Promote private initiatives through regulatory incentives

The challenge is the same regardless of the technology under consideration. Progress and results can only be achieved if a sufficient level of investment is devoted to innovation, R&D and experimental application, in a sustained way, and in keeping with a clear vision of the priorities.

## PRIORITY ACTIONS

To increase the pace at which new energy technologies are developed and take full advantage of existing potential, the Government has defined the five following priority actions:

- 1) establish a new financial and institutional framework to build an overall plan and strengthen support for innovation;
- 2) take specific action to develop a renewable fuel industry in Québec;
- 3) support the development of geothermal and solar energy;
- 4) prepare for the future use of hydrogen fuels;
- 5) modernize the current regulations to allow individuals and businesses to invest in new technologies.

### 1) AN OVERALL PLAN AND NEW SUPPORT FOR INNOVATION

Québec is already in the forefront of new energy technologies. World-renowned research centres devote part of their effort to the development of technologies adapted to our needs and resources. Private enterprise also invests in the development of new energy technologies. All this work is supported by tax and R&D support measures that are among the most generous in the world.

It is estimated that around \$10 million is spent annually in Québec on new energy technologies – a figure that does not include the amounts invested in established energy forms. This is a large amount, but it only represents a tiny portion of all energy spending in Québec, which is estimated at \$25 billion each year.

The money devoted to the development of new energy technologies must be increased if we are to obtain significant and rapid results in the most promising areas. In particular, funding for innovation and R&D in the area of new energy technologies must be guaranteed and constant, and must reflect an overall vision of the directions in which the work should be directed.

To move further ahead and prepare for the future, the Government has defined a new financial and institutional framework for the support of new energy technologies:

- the Government will broaden the terms of reference and mission of the Agence de l'efficacité énergétique;
- the Agency will be instructed to design and implement support programs for new energy technologies;
- the Government will improve joint actions and networking in the field of R&D activities.

### A BROADER MISSION FOR THE AGENCE DE L'EFFICACITÉ ÉNERGÉTIQUE

The Government will broaden the mission of the Agence de l'efficacité énergétique to include new energy technologies. The new mission will be specified in the Act that governs the Agency.

From now on, the mission of the Agence de l'efficacité énergétique – whose name may change – will be to ensure the promotion and development of new energy technologies, in addition to its current duties. As is the case with energy efficiency, the new responsibilities will cover all forms of energy in all sectors of activity, for the benefit of all regions in Québec.

The work of the Agency will involve three types of actions:

- it will provide financial assistance for businesses and research groups that invest in innovation and technological development in the energy field;
- it will design and implement information and promotion programs for new energy technologies;

- it will identify regulatory and tax obstacles to the dissemination of new energy technologies, and suggest ways for the Government to overcome the obstacles.

The new terms of reference of the Agency will bring it closer to its New York counterpart, the New York State Energy Research and Development Authority (NYSERDA), which is active in the fields of energy efficiency and new energy technologies. The two agencies already collaborate, and their collaborative efforts may increase in the future.

### THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

The New York State Energy Research and Development Authority (NYSERDA) is an agency whose mission is to promote energy efficiency and new energy technologies. It was set up in 1975 by the State of New York.

The NYSEDA uses innovation and technology to solve particularly difficult energy-related and environmental problems, with the objective of improving the economic performance of New York State.

- One of the main tasks of NYSEDA is to manage the “New York Energy \$mart” program, which provides assistance for initiatives in the fields of energy efficiency, research and development and environment protection. The program also provides assistance for low-income households.
- NYSEDA offers financial help to businesses and research centres that invest in new energy technologies, mainly connected with renewable energy –solar, biomass, geothermal or hydrogen-based.

NYSERDA is mainly funded by a levy on sales to electricity consumers, as decided by the New York State Public Service Commission.

### SUPPORT PROGRAMS FOR NEW ENERGY TECHNOLOGIES

The Government believes it is important that any assistance provided for new energy technologies should be part of a coherent, integrated vision, funded and applied according to the same principles as defined for the energy efficiency plan.

The Agence de l'efficacité énergétique will be instructed to design technological innovation support programs as part of its comprehensive energy efficiency plan, and submit them to the Régie de l'énergie.

- Once adopted, the programs will be implemented by the Agency, under the supervision of the Régie de l'énergie.
- The amount and source of the funding will be decided by the Régie de l'énergie during a review of the comprehensive energy efficiency plan.

The Government expects the plan to provide support for new energy technologies to permit the implementation of programs and initiatives representing extra annual assistance of around \$10 million – including the assistance provided for innovation in the energy efficiency sector. Taking into account the leverage created by this type of assistance, the resulting investment could be as high as \$40 million, or quadruple its present level.

In accordance with the instructions given to the Agency, the plan will include financial support for businesses and research groups, and information and promotional programs for new energy technologies.

- When providing support for businesses and research groups, the Agence de l'efficacité énergétique will give priority to development and demonstration projects.

- Support for new energy technologies will include a component to publicize the technologies in order to increase their use.

The use of new energy technologies is often hindered by a lack of information: consumers have little or no access to information about the existing possibilities of new energy sources and the gains that would allow them to reduce their energy bills.

- As is the case for energy efficiency, the Agency will identify regulatory changes that could increase the contribution made by new energy technologies to the satisfaction of energy needs in Québec.

#### JOINT ACTION AND RESEARCH NETWORKS

In Québec, several research groups and research centres already devote some or all of their activities to the development of new energy technologies. However, these activities are often conducted in isolation.

The Government would like to strengthen the research and innovation work already underway by setting up a network to link the various groups. The network, supported by the Agence de l'efficacité énergétique, will have the mission of facilitating the circulation of information between the main research organizations and firms in the public and private sectors that are involved in innovation and the development of new energy technologies.

- Unlike traditional research centres, the network will require no capital expenditure. Its existence and mission will be based on coordination, and not on actual projects.
- The network will facilitate the transfer of technology to businesses, and will provide the university/business links that are currently lacking.

## 2) DEVELOPING A RENEWABLE FUEL INDUSTRY IN QUÉBEC

The role that renewable fuels will play in the coming years, reducing our reliance on petroleum products, has already been mentioned. Québec has access to two renewable fuels, ethanol and biodiesel. In both cases, the possibilities are exciting, but the challenges involved are different.

- In the case of ethanol, some production technologies are already fully developed and operational – for example, the transformation of sugar cane in Brazil and grain corn in North America. When the production plant in Varennes is brought on line in 2007, Québec will become a major producer of grain corn-based ethanol.

However, the possibilities for this type of ethanol production are limited in Québec, mainly due to the lack of surplus grain corn. The Government therefore hopes to support the development of a new approach specific to Québec, using forest and agricultural residue and urban waste.

- In the case of biodiesel, the challenge is mainly to increase distribution and market penetration in Québec.

#### FUEL ETHANOL: POTENTIAL FOR FUTURE DEVELOPMENT

The use of ethanol in automobiles is not new. In the early 20th century, Henry Ford designed the famous Model T to run on ethanol, which is a clean, high-performance fuel that is well adapted to use in cars. As a businessman, however, Henry Ford quickly understood that the emergent oil industry would offer a far cheaper source of fuel, although not as clean or powerful as ethanol. And so the relationship between cars and gasoline was forged.

A century later, petroleum products remain the fuel of choice for automobiles. Rising oil prices and growing environmental concerns have, however, created a context conducive to the use of ethanol as a fuel.

Ethanol is a form of alcohol. It is made from various types of biomass, and may be mixed with conventional gasoline in proportions varying from 5% to 85%, replacing an equivalent amount of gasoline. It may be used in conventional engines without modification up to a concentration of 10%; above 22%, the mixture may only be used in specially-designed engines. In terms of technology, the obstacles to the distribution and use of ethanol are gradually being overcome.

Modern ethanol production technologies are widely used in a number of countries. In 2005, Brazil and the United States respectively produced 16.0 and 16.2 billion litres of ethanol, made from sugar cane in Brazil and cereal crops – mainly grain corn – in the United States. Depending on the raw material and technology used, between 300 and 500 litres of ethanol can be processed from one dry tonne of biomass.

In Québec, around 10 million litres of ethanol are already used each year as a fuel additive, reducing our consumption of petroleum products by an equivalent amount. Between now and 2007, consumption of ethanol in Québec will increase by a factor of twelve, once the new production plant in Varennes is operational. The ethanol it produces will be combined with conventional gasoline in a proportion of around 5%. By 2007, the Varennes plant will be producing enough ethanol for 2.4 billion litres of “ethanolized” gasoline, or 30% of the total annual consumption in Québec.

## ETHANOL AND THE CARBON CYCLE

### A renewable fuel

Like petroleum, natural gas and coal, which are formed deep underground over hundreds of millions of years, ethanol draws its energy from biomass whose growth is originally fuelled by the sun. An ethanol production plant, however, works more quickly than the geological machine. Ethanol can be considered

a renewable fuel, since it is made from biomass that can be harvested sustainably over time.

### Using ethanol to reduce greenhouse gas emissions in the transportation sector

The production of biomass for processing into ethanol has benefits in terms of greenhouse gas emissions. The process of photosynthesis that allows plants to capture and accumulate solar energy in the form of organic matter also requires them to absorb carbon dioxide from the atmosphere. Despite the gases emitted when biomass is processed into ethanol and then burned as a fuel, the overall process results in lower greenhouse gas emissions than the burning of fossil fuels such as gasoline.

The result is less positive when ethanol is produced from grain corn, which requires intensive cultivation using chemical fertilizers with high energy content. More recent technologies will, however, allow ethanol to be produced efficiently from the cellulose contained in some agricultural residues (such as straw), as well as woodchips and other forest residues. This new production process uses fewer hydrocarbons than grain corn, and offers a more positive greenhouse gas balance.

### TWO CHALLENGES TO MEETING THE 5% ETHANOL TARGET BY 2012

From 2007 onwards, the ethanol produced in Québec will cover 1.5% of the total demand for gasoline. The Government wants to improve this performance by a factor of three by the year 2012, requiring all gasoline sold in Québec to have an ethanol content of 5%. However, it does not want to base this development on ethanol produced from grain corn; instead, it will be relying on other technology that allows ethanol to be produced from forest and agricultural residues and urban waste.

- The opening of the Varennes plant is a major step forward in the production of ethanol, since it will lead to the establishment of a distribution network for renewable fuel while replacing 1.5% of the petroleum-derived fuels used in Québec by 2007.
- The Government wants to continue on to the next stage by increasing the percentage of ethanol in all gasoline sales to 5%.
- This objective can only be met by introducing another production technology, which uses the cellulose from forest and agricultural residues and urban waste as a raw material.
- The first major challenge is to perfect the technologies used and to process forest and agricultural residues and urban waste. British Columbia and New York State are working in the same area, and technological partnerships are a possibility.
- The second challenge is to identify potential sources of supply by determining what cellulosic materials are available, along with their price and conditions.

#### MEETING THE TECHNOLOGICAL CHALLENGE

The potential and advantages of a Québec-based industry to produce ethanol from cellulose waste are exciting, but the technological challenges must not be underestimated. Support for ethanol and the development of a Québec production process will be at the heart of the new technology support plan prepared by the Agence de l'efficacité énergétique.

- Teams in Québec are already working on ways of using biomass to produce ethanol. They will be given assistance and support.

The Québec government has provided substantial support for this research, and it will soon be sufficiently advanced to move on from laboratory experiments to a pre-commercial demonstration project.

The Government intends to ensure that construction of a demonstration plant begins in 2007, with activities scheduled to start in 2008, meaning that the biomass processing technology could be viable by 2010, with plants in full operation by 2012.

- It is important to continue and broaden the research work on the Québec ethanol production industry. Another step will involve the creation of a university research chair to work specifically on this issue. The Government will instruct the Agence de l'efficacité énergétique to begin discussions with the universities concerned. Funding may be provided jointly with the federal government, and Québec's support will be defined in the new technology assistance plan.

#### WESTERN CANADA AND THE AMERICAN MIDWEST OPT FOR ETHANOL PRODUCED FROM GRAIN CORN

Several states in the Midwest and several provinces in Western Canada have introduced regulations requiring all gasoline sold to contain an average of 5% ethanol, between now and 2007 to 2010.

The target is same as that set by the Québec government, but will be achieved sooner because it relies on existing technology. The states and provinces concerned will produce ethanol from surplus cereal crops such as corn, wheat and barley.

The technologies concerned are already operational. In Québec, it is more economically and environmentally beneficial to use forest and agricultural residues and urban waste to produce ethanol, even though more technological developments are needed before the process becomes viable.

The situation differs from one region of Canada to another, and a pan-Canadian solution based on a uniform standard would be unacceptable.

#### IDENTIFYING POTENTIAL SOURCES OF SUPPLY

- In addition to overcoming the technological obstacles, it is clear that if an ethanol production industry is to develop in Québec, a stable, competitive supply of raw materials must be found.
- The theoretical potential is considerable. For example, it is estimated that 5 million tonnes of biomass are produced each year in the form of forest residue from harvesting zones and unusable timber. If all this potential were to be recovered, it could in theory be used to produce up to 1.6 billion litres of ethanol, enough to satisfy 20% of Québec's total annual gasoline consumption.
- The use of only a fraction of this potential would generate new revenues for forestry companies, reinforce a strategic sector of activity for Québec as a whole, and create wealth and jobs in outlying regions.
- Municipal waste is another potential source of supply, since it contains an average of 60% of organic materials that could be used to produce ethanol. Recovery of this waste potential would reduce the pressure on landfill sites, which are increasingly expensive to run and have less capacity.
- The Government will therefore set up a working committee to assess and identify potential supplies of raw materials, along with the most suitable business models for maximizing the economic spin-offs of the new industry. The committee will be made up of representatives from the Agence de l'efficacité énergétique, the forest industry, municipalities and agriculture, as well as specialists and stakeholders in the field – including researchers from the new bio-fuel research chair.

It is already clear that the creation of several ethanol plants throughout Québec will reduce transportation costs while maximizing spin-offs in outlying regions. The plants could be built gradually, beginning in 2010, once the results of the pilot project are known.

- To ensure a supply of raw material, some research teams in Québec are assessing the possibility of farming trees on a short rotation cycle to produce wood fibre for pulp production and biomass for energy production, including ethanol. The two main teams are l'*Institut de recherche en biologie végétale (IRBV)* at the Université de Montréal and *Resource Efficient Agricultural Production (REAP)* at Sainte-Anne-de-Bellevue. The quick-growth species currently being tested are poplar, hybrid willow and switchgrass.

The Government is observing these technological developments closely to see if it will be economically feasible to use this type biomass instead of grains or cereals to produce bioethanol and promote the development of the industry in Québec.

#### THE NEXT STAGE: THE "BIO-REFINERY"

Some of the bio-technology research projects underway in Québec may take the process one step further than the production of ethanol, by integrating the concept of "bio-refinery".

A "bio-refinery" would be located close to a pulp and paper plant, and would use the supply of raw materials to produce ethanol and a full range of by-products, for use in the pharmaceutical and chemical industries.

Conventional refineries use petroleum to produce gasoline, diesel and fuel oil, but also other products that are used in the petrochemical industry and increase the value derived from crude oil. Similarly, a "bio-refinery" could produce ethanol and also other high-value "by-products" that would increase the value derived from cellulose waste, reducing the cost price of the ethanol.

Building "bio-refineries" in outlying regions would create wealth and jobs. Québec's know-how could be exported to other countries around the world to help them recover value from their forest and agricultural residues and urban waste.

**BIODIESEL: INCREASING MARKET PENETRATION**

Biodiesel is the other renewable fuel that the Government will promote as a replacement for petroleum products.

Biodiesel is generally produced from waste vegetable oils and recovered animal fats – products that are normally sent to a landfill site where they decompose and produce methane, a greenhouse gas. Used as a fuel, biodiesel offers better combustion than the type of diesel fuel produced from petroleum. It releases fewer organic compounds, small particles and unburned hydrocarbons than regular diesel, helping to reduce urban smog.

Like all fuels containing carbon, biodiesel produces greenhouse gases when burned. However, under the Kyoto Protocol, greenhouse gases produced by burning biodiesel instead of fossil fuels are not counted because they are from a renewable resource.

The technology used to produce biodiesel is currently operational. A plant in Ville-Sainte-Catherine, the first of its kind in Canada, has produced 35 million litres of biodiesel per year since 2005, for export to the United States and Ontario. In Québec, the city and school bus sector is an ideal market for this type of fuel.

However, a number of difficulties must be overcome before biodiesel can be made available throughout Québec.

- The use of biodiesel on the Québec market is hindered by a lack of coordination between producers and users. There is no company in Québec that prepares the mixes that public transit authorities would be likely to buy.
- At a technical level, the use of biodiesel in a cold climate requires particular care for storage and distribution. Additives must also be developed to guarantee that biodiesel engines remain efficient and reliable even in extremely cold weather.

- Another technical challenge is product standardization. If the product is to be widely marketed, its quality must be comparable to that of the diesel fuel currently used in vehicles. The broad range of vegetable and animal oils used to produce biodiesel is currently a major obstacle.
- In economic terms, biodiesel use would be made more cost-effective by developing new markets for glycerine, a by-product of the current biodiesel production process.

To improve the technical processes used in biodiesel production, the Agence de l'efficacité énergétique will define appropriate programs as part of the new technology support program.

The following tax measures will also be introduced by the Government.

- The refundable tax credit for ethanol production and distribution in Québec has been available since April 1, 2006. As indicated in March 2005, the tax credit is calculated from the average monthly price of crude oil. It will be available for a maximum period of ten years to eligible companies producing and distributing ethanol in Québec. This confirms the Government's support for the production of ethanol in Québec.
- In the 2005-2006 Budget Speech, the Government announced that the fuel tax paid by public transit authorities on biodiesel fuel would be reimbursed. On March 23, 2006, the Minister of Finance announced that the reimbursement would be extended to all users of biodiesel for transportation purposes.

**USING RENEWABLE FUELS TO PROMOTE QUÉBEC'S INTERESTS**

Many key issues are at stake for Québec.

- By increasing the use of ethanol, we could reduce our dependency on imported petroleum products while creating jobs in Québec.

- Some of the conventional fuels currently in use, such as gasoline and diesel, could be replaced by a renewable fuel with lower greenhouse gas emissions, improving our performance in terms of sustainable development and helping to meet the objectives of the Kyoto Protocol.
- The production of ethanol from biomass available in Québec will help strengthen the forestry and agricultural sectors, and will help solve some municipal waste management problems while stimulating the economy in the resource regions.

### 3) SUPPORTING GEOTHERMAL AND SOLAR ENERGY

The technology used to extract geothermal and solar energy is well-known and generally operational, although there are still some economic obstacles preventing its widespread use. However, the programs offered by the Agence de l'efficacité énergétique in its new energy technology support plan should help speed up its adoption.

#### GEOTHERMAL ENERGY: INVEST AND INFORM

The field of geothermal energy covers a broad range of technologies that use heat from the ground or from a body of water to produce energy.

- In Québec, the most easily-accessible geothermic source is the natural heat contained in the upper layers of the soil, the water table and bodies of water.

Just a few metres below the surface, soil temperatures remain relatively constant throughout the year, at between 5 and 10° C. The same applies to bodies of water, which maintain a year-round temperature of 4° C in their deeper zones. It is therefore possible to use the differences between the ambient air temperature and the water or soil temperatures to recover usable energy for heating or cooling.

- Because this particular form of energy is fairly diffuse, it must be concentrated by means of a heat pump. Geothermal technologies are similar in many respects to the heating and air conditioning systems used in homes and other buildings that operate via exchanges of heat with the ambient air.

In Québec, and despite the potential savings available, the use of geothermal heat pumps is hindered by a problem of viability – the installation costs are relatively high, double those for a central heating unit. Because energy is still relatively inexpensive, the vast majority of consumers believe it would take too long for them to recover their investment.

However, geothermal technologies offer a significant energy saving potential for public buildings. Some large public buildings already benefit from geothermal energy. The *École du Tournant*, a school in Saint-Constant, is a striking example of how a geothermal system can be designed for use in a public building. It has a closed underground loop almost 5 km long that provides heating in winter and cooling in summer. The school is considered to be one of the most energy-efficient in Canada. Another example is the *Centre intégré de mécanique industrielle de la Chaudière (CIMIC)* in St-Georges de Beauce, which uses geo-thermal pumps to heat and cool the building via a 4.4 km underground loop. The system has been in use for ten years, and provides a low-cost source of energy for this vocational and technical education centre.

Research is currently underway to try to reduce the cost of geothermal technology by cutting equipment installation expenses. In the short term, geothermal technology could also be promoted by providing better information on the immediate gains and other available possibilities.

## A SUPPORT PROGRAM FOR GEOTHERMAL ENERGY

Although the cost of installing a geothermal system is fairly high, hindering its widespread use, the system can actually cut heating and air conditioning costs by up to 60%. It is therefore important to find ways of encouraging its use.

- The Government will instruct the Agence de l'efficacité énergétique to develop an incentive program for the residential and commercial sectors.

### INCREASED USE OF GEOTHERMAL ENERGY IN THE PUBLIC AND PARAPUBLIC SECTORS

The Québec government wants the technical and economic potential of geothermal energy as a source of heating and air conditioning to be systematically assessed for every new government or paragonment building construction project, and for every heating system renovation project.

- The Agency has been asked to work with the Société immobilière du Québec (SIQ) to produce an analysis and selection criteria for project evaluation.

The Government will assess the potential role of geothermal energy in reducing energy costs at the new CHUM and CUSM hospitals.

### PASSIVE SOLAR HEATING: EXPLOITABLE POTENTIAL

Despite its harsh climate, Québec enjoys a good sunlight rate even in winter. There is therefore considerable potential for solar energy that could easily be exploited if an economic method were identified. In the case of passive solar heating, however, the methods are already well-known and easily accessible.

- Passive solar heating involves adjusting the building's geometrics and position to capture winter sunlight and avoid overheating in the summer. Well-placed windows designed to capture sunlight can reduce home heating costs by up to 50%.
- Heat capture can also be improved by using solid or liquid coolants to accumulate energy during the day and distribute it by radiation during the night, and in rooms without good exposure to sunlight.

As is the case for geothermal energy, passive solar techniques are fairly accessible, but people are often unaware of the potential gains. Better information on the advantages of passive solar techniques would help bring them to the attention of more people, especially at the design phase for new buildings and during renovations to existing buildings.

### A SUPPORT PROGRAM FOR THE PRODUCTION OF SOLAR ENERGY

The technologies known as active solar technologies go much further than their passive solar counterparts. Active solar technologies capture and concentrate solar energy using specially designed equipment – such as solar heat or photovoltaic collectors – to constitute an additional energy source that supplements conventional heating and cooling systems.

In Québec, thermal solar systems are already used to heat domestic water, buildings and swimming pools. They are fairly expensive, and a special effort is required to adjust the equipment to the demands of our harsher climate.

However, technologies and methods are changing rapidly. Also, Québec is well represented in the solar energy industry, with companies that manufacture solar heating systems.

A growing number of facilities not connected to the network are now using photovoltaic systems for all or some of their electricity needs. New technologies involving the use of electrochemical components are currently being developed by the Université du Québec à Montréal among others. These developments are promising, since they would help reduce costs and enable photovoltaic collectors to be incorporated more easily into building infrastructures. Here again, the technology is changing rapidly, and significant developments are to be expected in the future.

Vision will be required to develop active solar heating in Québec to the extent that it can play a large role on the market. A proactive approach is needed, so that appropriate means can be identified to support its development.

Some jurisdictions are already strongly committed to active solar development. Recently, for example, California and Ontario both undertook to develop their active solar potential by creating a purchase program for solar energy.

- In January 2006, California launched an ambitious program to develop 3,000 MW of active solar energy by subsidizing the installation of new equipment. The US\$2.9 billion program offers subsidies for the installation of equipment under 5 MW. In addition, consumers who install equipment under 1 MW have access to a net billing system. This means that, where solar energy producers consume less energy than they produce in any given month, a credit is applied to the following month's invoice, and so on, for up to 12 months.
- Ontario adopted a different approach to foster the development of solar energy, when it decided in March 2006 to purchase electricity generated by solar technology at a viable price. Solar energy projects cannot, however, exceed 10 MW.

Québec also intends to foster the development of solar energy by asking Hydro-Québec to submit a program to the Régie de l'énergie for the development of active solar technology in Québec, based on the approaches used by other jurisdictions and adjusted to reflect the situation in Québec.

The Agence de l'efficacité énergétique, in its new energy technology support program, will also support the development of active solar energy.

#### 4) PREPARING FOR THE FUTURE WITH HYDROGEN

In addition to biomass, geothermal and solar energy, there are a number of other new energy technologies that will come into their own in the more distant future. Significant progress will be needed before they are ready for widespread use. However, their energy production potential is sufficient to justify investment in research and development, even if the

production timeframe is fairly long. In many cases, one-off applications have been sufficient to reveal their future potential.

Hydrogen as an energy source is not, of itself, available in the environment like other sources. It is, however, an "energy vector" like steam and compressed air. Hydrogen must be produced from a real source of energy, such as water or wind power, natural gas or nuclear energy. The hydrogen obtained from these sources is a fuel that can be used, for example, in a conventional motor or in a fuel cell to produce electricity and heat. In both cases, the only product of combustion is water.

- The process most commonly used to produce hydrogen is natural gas reforming (steam separation). However, this process also produces a greenhouse gas, carbon dioxide (CO<sub>2</sub>), which reduces its desirability from an environmental standpoint. In addition, the process consumes a non-renewable resource. At the present time, reforming is heat-induced, but thanks to recent technological progress there are signs that a new cold-induced reforming process will soon be available, which would considerably improve performance levels.
- Hydrogen can also be produced by water electrolysis, using electricity-induced dissociation. This process is more costly, especially in countries where electricity is already expensive to produce. However, water electrolysis has the advantage of producing only hydrogen and oxygen, making it a good environmental choice, when the electricity comes from a renewable energy source.

Québec, with its extensive hydroelectric resources and the development of its wind energy potential, would be able to produce hydrogen using renewable energy sources, and would thus become a model for environmentally friendly development in the hydrogen energy sector.

Hydrogen offers a number of advantages as an energy source – hence the significant research effort currently underway.

- First, hydrogen is an excellent fuel that burns well, with water vapour as its only combustion by-product.
- Hydrogen can be stored and used to fuel pollution-free vehicles.

Hydrogen as a clean fuel has attracted a great deal of interest and has been the subject of several demonstrator projects in Québec and the United States, Europe and Japan. Hydrogen technologies are being developed at a rapid pace in many countries.

- In the last ten years, Québec has been involved in an extensive international hydrogen research initiative known as Euro-Québec Hydro-Hydrogène, a scientific and technical cooperation project concerned with the production and use of hydrogen for energy purposes.
- Research centres in Québec are also attempting to use Québec's hydroelectric resources to produce hydrogen. Specialists from the Institut de recherche d'Hydro-Québec (IREQ) and the Institut de recherche sur l'hydrogène are currently improving hydrogen electrolysis technologies and developing some of the world's most advanced hydrogen storage systems.

A number of problems must be solved, however, before the hydrogen energy market can develop properly.

- Equipment costs must be reduced.
- Production process performance must be improved, and the question of storage and distribution infrastructures must be solved.
- Standards are also required to ensure system reliability and user safety.

Extensive work is required in all these areas to foster the future development of this promising energy form.

### A NEW GROUP WORKING ON HYDROGEN'S INDUSTRIAL SPIN-OFFS

The Université du Québec à Trois-Rivières, to which the Institut de recherche sur l'hydrogène (Hydrogen Research Institute) is attached, has taken steps to extend the Institute's activities by involving a group of researchers from the National Research Council of Canada.

The new entity's activities will encompass the entire innovation chain from research to marketing.

The National Research Council of Canada will be a partner in the initiative, through its Institute for Fuel Cell Innovation.

Québec has acknowledged expertise in the production and use of hydrogen. The new energy technology support plan will include assistance for hydrogen energy research and innovation. Specialist firms and research centres will therefore be better positioned internationally to solve hydrogen storage and distribution problems and to speed up the development of equipment using this reliable and economic form of energy.

### CONTROLLED NUCLEAR FUSION

In the very long term, other areas of research may well produce significant results for the energy sector. For example, controlled nuclear fusion offers some extremely interesting prospects in this respect. However, a considerable research, development and demonstration effort will be required over a period of several decades to bring these prospects to fruition.

The Government would like to institute a technology watch in this field, to ensure that Québec develops a pool of knowledge around its energy potential for the 21st century.

## 5) INCENTIVE REGULATIONS TO ENCOURAGE PRIVATE INITIATIVE

The Government believes it is important for individuals and businesses alike to invest in new energy technology, and for the entire community to benefit from energy initiatives.

The Government therefore announces two major initiatives.

- First, the Government intends to facilitate the decentralized production of electricity.

The Government believes that, when promoting new energy technologies, attention should be given to the initiatives of private citizens and businesses. In doing this, it hopes to encourage the decentralized production of electricity, including auto-production and small-scale production.

- The Régie de l'énergie has recently examined a request for approval of tariff and service conditions submitted by Hydro-Québec for self-generated electricity. In its decision of February 9, 2006, the Régie approved a number of provisions designed to encourage auto-production. The chosen formula is based on invoice deductions, and allows certain clients to give their surplus self-generated energy to Hydro-Québec and receive a reduction of their electricity invoice in return. Acceptable renewable energy sources include hydroelectricity, wind energy, photovoltaics, biogas, forest biomass and geothermal energy – for electricity production only.

The Government hopes to go even further by allowing individuals and businesses to sell their surplus production to Hydro-Québec. Based on guidelines to be established by the Régie, Hydro-Québec has therefore been asked to move forward quickly and offer this new possibility to its customers, to help meet our collective energy needs in a highly decentralized way.

- The Government also hopes to open the door to small-scale electricity production using equipment with a capacity of less than 1 MW. The purpose of this is to allow small firms and cooperatives to implement small-scale energy production projects without having to go through a Hydro-Québec call for bids.

Hydro-Québec has been asked to submit a program to the Régie de l'énergie by 2007 for the purchase of electricity from small producers. The Government expects small-scale electricity production to trigger the development of new energy technologies, including those using biomass. Small quantities of forest residues and biogas produced by small landfill sites or farms are ideal sources of energy for this type of decentralized production.

- Second, the Government intends to deregulate the distribution of biogas from sanitary landfill sites in Québec. Currently, biogas distribution is subject to exclusive rights in given areas, in the same way as natural gas. Biogas production and sale prices are not regulated.

In the future, all firms will be able to build and operate biogas distribution systems, and this will facilitate the development of biomass processes and reduce methane emissions. Biogas could be used to produce heat or electricity, or to fuel cogeneration facilities.

## BIOGAS

Biogas is a gassy mixture released during decomposition of organic matter in an oxygen-free environment. It can be captured by the appropriate technology and used as fuel. It is therefore good value as an energy product, and also reduces the greenhouse effect associated with the release of methane into the environment. Biogas use is therefore another way of developing biomass.

The challenge is to separate the methane – which has energy value – from the carbon dioxide and other trace gases. It is true that some boilers burn biogas directly, but it is better to obtain the methane in as pure a state as possible so that it can be mixed with natural gas, thereby reducing our dependency on fossil fuels.

In Québec, the Montreal company Biothermica operates a biogas power station known as Gazmont, with a capacity of 25 MW. It sells the electricity it produces by recovering biogas from the Miron quarry to Hydro-Québec. Some of the heat produced by the process is used to heat the TOHU building and the National Circus School, both located nearby.

## A STRATEGY FOR INNOVATION

Québec has acquired expertise and know-how in the energy technology sector that will enable it to develop and make better use of the numerous and relatively abundant sources of energy within its borders. Given the progress of new energy technology, it is reasonable to think that Québec will be able to ensure that these various sectors can play a significant role in meeting our energy needs in the coming decades. Ethanol fuel and biodiesel are already used extensively, and offer excellent prospects for the future.

However, it will first be necessary to invest in the development and dissemination of new technology. Innovation in the energy sector is more important than ever before, at a time when the growing world demand is placing additional pressure on traditional energy sources.

Québec intends to take up the challenge of technological innovation in the energy sector by making greater use of the new energy sources available to it and investing in present and future research. The means proposed in the energy strategy should enable it to do this.

Innovation is the key to solving the energy issues of the future. The new energy strategy promotes innovation as a means of speeding up the use of new energy technologies.

Diversify our supplies  
by developing our  
oil and gas potential



## CONSOLIDATE AND DIVERSIFY OIL AND NATURAL GAS SUPPLIES

Together, oil and natural gas account for slightly over half our energy balance sheet.

These supplies are crucial for the development of our economy and the well-being of the population. Oil and natural gas can also be sources of growth and wealth creation, provided we are able to take advantage of our assets. Through its energy strategy, the Government hopes both to secure our supplies and develop Québec's advantages.

### OUTSIDE DEPENDENCY, BUT SOME ASSETS TOO

There is clearly no need to emphasize the importance of stable, secure fossil fuel supplies for all Quebecers.

In 2003, oil and natural gas met 38.4% and 12.0% of our end energy needs respectively. Oil alone accounted for 99.7% of all energy consumed in the transportation sector. The petrochemical sector, for its part, is entirely dependent on oil and natural gas products for its supplies of raw materials. Natural gas plays a strategic role in every field that requires precisely-controlled heat, and also accounts for 8% of all energy used by residential consumers, as well as nearly 26% of the energy consumed by the tertiary sector. The manufacturing industry alone consumes more than 50% of Québec's entire natural gas supply, fulfilling 16% of its energy needs. For many firms, the availability of natural gas is a significant factor when selecting a location.

### PRIORITY ACTIONS

- 1) Create the conditions required to develop Québec's oil and gas resources
- 2) Diversify natural gas supply sources
- 3) Give priority to guaranteed supplies at competitive prices for refined petroleum products

Oil, like natural gas, is imported entirely from outside the province. It creates a strategic dependency, and has a direct impact on our balance of trade.

- As far as crude oil is concerned, Québec's three refineries are supplied mainly from Norway, the United Kingdom, Algeria, Venezuela, Mexico and Eastern Canada.
- In the case of natural gas, all our supplies come from Western Canada, via a single transportation system – the network owned by TransCanada Pipelines. The only gas reserves to which we have direct access appear to have reached their peak, since known reserves have declined by 40% in 20 years. New discoveries will respond primarily to needs deriving from the operation of oil sands in Alberta. We must therefore diversify our supply sources in order to strengthen our energy security in the longer term.

Economically, this dependency on outside sources is expensive; in 2005, for example, oil and natural gas imports cost some \$10 billion, up by more than 30% from 2003.

#### A SITUATION THAT MUST BE ADDRESSED

As noted earlier, our basic response to the challenges we face will be to focus on energy efficiency and investments in new energy technologies.

Alone, however, they are insufficient, and we must also work to develop the oil and natural gas assets available to us within Québec.

#### MAP 1

Québec's crude oil supplies (2004)



We can consolidate and diversify our oil and natural gas supplies by developing the potential in our own subsoil, and by using the advantages of our geographical location.

It is especially important to respond to these challenges because, at the global level, traditional fossil fuel reserves are declining while demand is growing steadily.

The price increases of 2005 gave us a foretaste of the situation that will be faced by all fossil fuel-dependent economies at some point in the future. We must expect increasingly fierce international competition for access to reliable, secure supply sources. This will, of course, reflect on the price, which is likely to increase over time. All fossil fuel importing countries are currently adjusting their policies to reflect this situation.

Although our oil supplies are already fairly diversified, the same cannot be said of natural gas, in respect of which we are entirely dependent on Western Canada. However, thanks to our geographical location, we also have easy access to a market that is currently expanding, namely the liquefied natural gas (LNG) market.

There are presently five active LNG terminals in North America. Given the foreseeable supply situation for the continent as a whole, however, approximately fifty other projects are at different stages of consideration or development. Three of these projects are situated in Québec, two along the St. Lawrence River in Lévis and Gros-Cacouna. The former is the *Rabaska* project led by a consortium composed of Gaz Métro, Gaz de France and Enbridge, while the latter is the *Énergie-Cacouna* project put together by a different consortium including TransCanada Pipelines and Petro-Canada. The third project, *Énergie Grande Anse*, is located along the Saguenay River.

Projects such as this offer a number of strategic advantages for the future.

- An LGN terminal costs an estimated \$700 million to \$1 billion. Investments in new LNG terminals in Québec would therefore be of great benefit to the economy.
- Access to liquefied natural gas would allow Québec to diversify its supply sources. Instead of depending solely on natural gas brought in by pipeline from Western Canada – where proven reserves are declining – Québec would have access to gas from Africa, the Middle East and Russia.
- Québec could also benefit from competition between supply sources, which would help keep costs down.
- It could also avoid shifts by its major industries towards more pollutant energy sources, and even prevent them from leaving the province altogether.

To be successful, however, the projects would have to respond to safety and environmental concerns.

Projects such as these are subject to environmental review and the other regulatory processes applicable to large-scale undertakings. In particular, they would probably be examined at public hearings organized by the BAPE.

#### POTENTIAL TO BE DEVELOPED IN QUÉBEC

Diversification of our outside supplies would clearly help improve our energy security, but should not cause us to neglect our own fossil fuel potential.

The geological context of Québec is conducive to the presence of oil and gas deposits.

The St. Lawrence Valley is located along the axis of a former coastline whose origins can be traced back some 480 million years.

#### MAP 2

Québec's potential liquefied natural gas supplies



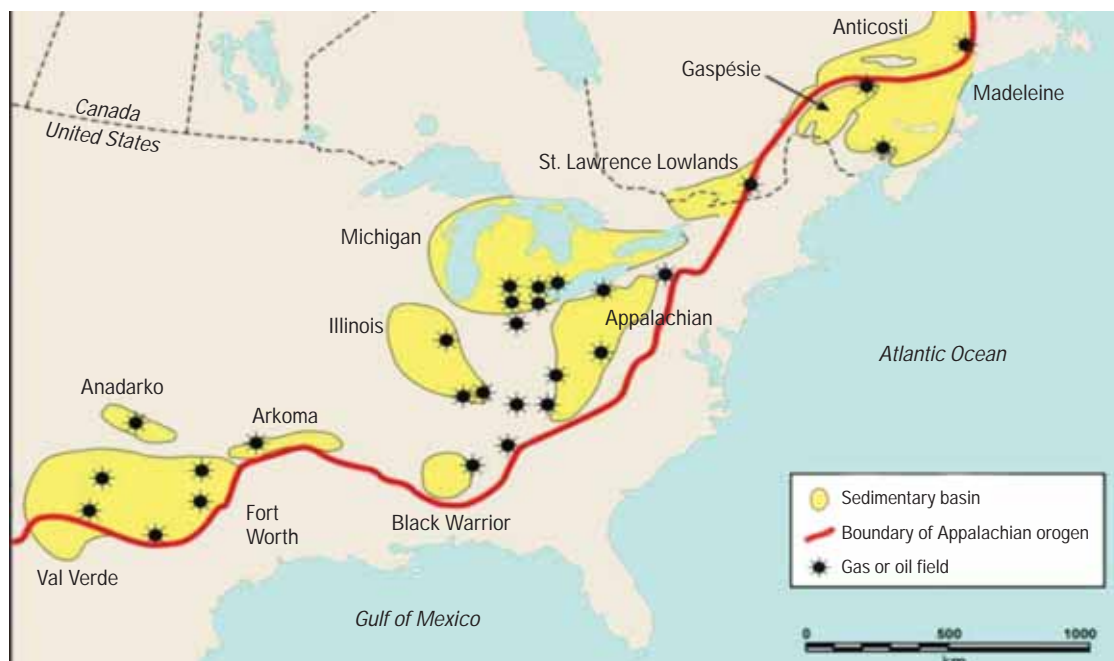
Significant deposits of oil and natural gas have been discovered in the sedimentary basins located along this axis, which extends from Texas to Newfoundland. The portion of Québec most likely to contain oil and natural gas covers an area of approximately 200,000 km<sup>2</sup>, both onshore (Gaspésie and the St. Lawrence Lowlands) and offshore (the St. Lawrence Gulf and Estuary).

A number of major onshore investments have been announced or are currently underway in Québec.

- In 2006, Talisman will begin an oil and gas exploration program in the St. Lawrence Lowlands, in the Centre-du-Québec region. In 2004, a subsidiary of Talisman began operating one of the United States' most productive natural gas wells from a geological formation located in New York State and similar to the one found in the St. Lawrence Lowlands sedimentary basin.

- On the Gaspé peninsula, licences have been issued to several companies in the last few years.
  - In June 2005, Junex announced that it had completed conclusive production tests on one of its exploration wells, 20 kilometres from Gaspé.
  - In March 2006, Petrolia, in partnership with Junex and Gastem, announced the preliminary results of tests carried out on the Haldiman well, which revealed the presence of oil showings. The well may be commercially operated once production testing is complete.

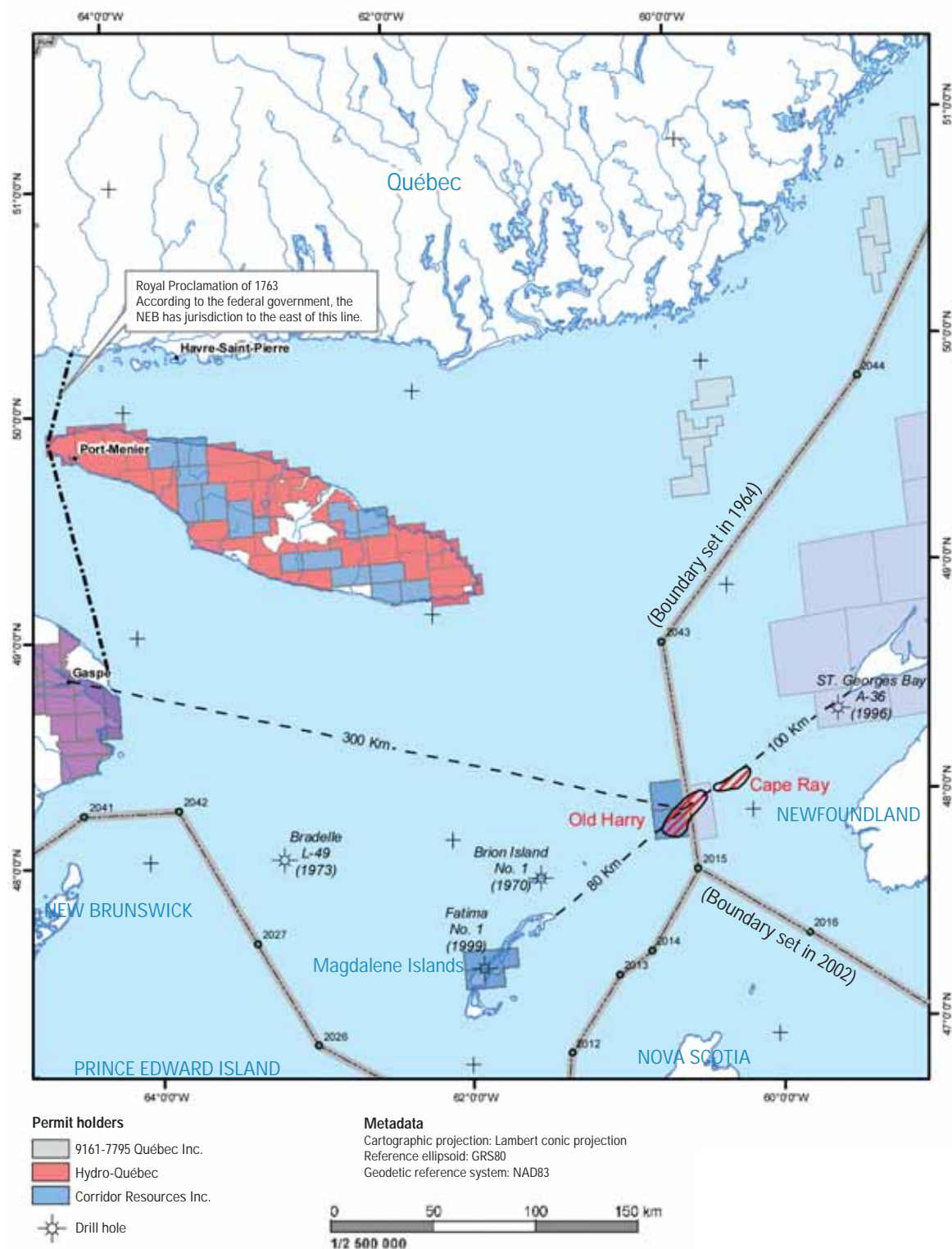
MAP 3  
Sedimentary basins in Eastern North America



The hydrocarbon potential of the St. Lawrence Gulf and Estuary is by far the most interesting, although it remains virtually unexplored so far, for economic, territorial and environmental reasons.

- The Old Harry structure, located 80 kilometres north-east of the Magdalen Islands, could contain between four and five billion ( $10^{12}$ ) cubic feet of natural gas – enough to satisfy Québec's entire natural gas consumption for 25 years – or around two billion barrels of oil. This structure belongs to the Magdalen basin, which is geologically similar to the southern Gulf of Mexico region, where significant natural gas fields have been discovered. Old Harry is currently the largest undrilled marine structure in Canada, with twice the potential of the Hibernia field off the Newfoundland coast, and three times the potential of the Sable Island gas field off the coast of Nova Scotia.
- A number of other geological structures also offer significant oil and gas potential in the offshore zone located west of the boundary between Québec and Newfoundland-and-Labrador.

MAP 4  
Current prospecting permits in the Gulf of St. Lawrence (2005)



However, exploration work in the Gulf and St. Lawrence Estuary is subject to three sets of problems that must be solved before the available potential can be fully exploited.

- Financially, given the level of investment required for sustained offshore exploratory programs and the financial risks associated with the development of a relatively unexplored area, an environment conducive to investment must be created.
- Environmentally, concerns have been expressed about the possible impacts of seismic surveys on marine mammal populations.
- At the territorial level, ownership of resources located in the Gulf and St. Lawrence Estuary is currently the subject of a disagreement between the Québec and Canadian governments.

## PRIORITY ACTIONS

To secure our fossil fuel supplies and develop the advantages available to us, the government has selected the following three priority areas:

- 1) Create **the necessary conditions for the development of Québec's oil and gas resources**;
- 2) **Diversify natural gas supply sources**;
- 3) For refined petroleum products, **give priority to secure supplies at competitive prices**.

### 1) DEVELOP QUEBEC'S OIL AND GAS RESOURCES

Exploration efforts in the Gulf and St. Lawrence Estuary are currently at a standstill. Prospecting for offshore fields requires significant investment, mainly due to the cost of offshore drilling; every bore-hole costs between \$30 and \$50 million, compared with \$2 to \$3 million for onshore wells. Several bore-holes may be required before a field is discovered.

Investments such as these can only be made by large corporations with the expertise and financial flexibility for projects of this nature. The Government therefore hopes to encourage these firms to invest in the exploration and development of our offshore resources. For this to be possible, however, satisfactory solutions will be needed to the environmental and territorial issues mentioned earlier. The Government believes it is a priority for these conditions to be fulfilled as quickly as possible so that development work can begin on the oil and gas potential of the Gulf and St. Lawrence Estuary.

### THE ENVIRONMENTAL ISSUE: PROTECTING THE MARINE ENVIRONMENT

Seismic surveys must be resumed if exploration work is to continue. The surveys will be carried out with full guarantees that marine wildlife and the marine environment will be adequately protected.

It was with this in mind that the Government, in early 2004, asked the Bureau d'audiences publiques sur l'environnement (BAPE) to investigate the impacts of offshore seismic surveys. The BAPE's report was published by the Minister of the Environment in October 2004.

Basically, the BAPE made three recommendations:

- It recommended that the Québec, federal and Maritimes provincial governments should harmonize their environmental assessment procedures;
- It asked for restrictions to be placed on seismic acquisition activities in certain areas, for protection purposes;
- It recommended that a legal environmental structure should be established to authorize seismic survey projects.

To follow up on these recommendations, the Government has committed to the following initiatives.

- Québec is collaborating with British Columbia, Nova Scotia, Newfoundland-and-Labrador and the federal government to produce a guide of good practice for offshore seismic surveys.

Consultations are currently being carried out on a draft guide that includes a monitoring program for marine mammals. It sets standards for safety perimeters between seismic survey boats and marine mammal populations, as well as rules governing the period of the year when surveys are permitted.

When the final version of the guide is available, its provisions will be incorporated into the *Regulation respecting petroleum, natural gas, brine and underground reservoirs*, enacted pursuant to the *Mining Act*.

- The Government is taking steps to reconcile seismic survey work with commercial fishing and observation tourism activities. Proposals for seismic surveys will be examined as soon as they are submitted by exploration companies, and will be implemented in collaboration with the commercial fishing and observation tourism sectors.

All seismic surveys will have to include a scientific component allowing the acquisition of new data on the features of the marine environment and potential protection methods.

- The Government has announced its intention to harmonize the legislative and regulatory framework for environmental assessments with current federal and other provincial provisions.
  - As is the case elsewhere in Canada, Québec will carry out a strategic environmental assessment of the Gulf and St. Lawrence Estuary. The assessment will help establish the conditions required to ensure that future development is respectful of the marine environment.

- All seismic surveys will be subject to section 22 of the *Environment Quality Act*. Certificates of authorization will list the restrictions and concerns identified by the strategic assessment.
- The provisions of the *Environment Quality Act* will also be amended to bring Québec's environmental assessment procedure into line with the procedures introduced by the Canada-Newfoundland and Canada-Nova Scotia offshore petroleum boards.

These initiatives address the concerns raised by the BAPE, and will allow seismic surveys to be carried out in the Gulf and St. Lawrence Estuary while protecting the environment.

#### REMOVE OBSTACLES TO RESOURCE OWNERSHIP

The Québec government will work with the federal government to settle the territorial disagreement concerning exploration and drilling in offshore portions of the Gulf located east of the line resulting from the Royal Proclamation of 1763. The situation needs to be settled so that private investors can be given an absolute assurance that they will be allowed to produce the resource once it has been discovered.

Administrative agreements aimed at settling similar disagreement were signed in 1985 and 1986 by the federal government and Newfoundland-and-Labrador, and by the federal government and Nova Scotia.

- The agreements allowed for joint provincial and federal government management of exploration and production licenses for offshore resources. They also set out a formula for sharing royalties, and without prejudice to resource ownership.

These two agreements were completed by special agreements on oil and gas royalties that were signed in January 2005 by Canada and Newfoundland-and-Labrador on the one hand, and by Canada and Nova Scotia on the other. Their purpose was to compensate the two provinces for the reduction in equalization amounts resulting from the royalties paid by the federal government.

- If such agreements cannot be signed by the federal and Québec governments, it is difficult to see how it would be possible to attract private investors for exploration work in the contested portion of the Gulf.

The agreements signed by the federal government with Newfoundland-and-Labrador and Nova Scotia constitute precedents that Québec would like to benefit.

The Québec government has therefore appointed an agent to be responsible for negotiating with the federal government, with a view to establishing the conditions for a similar administrative agreement to those already signed with Newfoundland-and-Labrador and Nova Scotia. It hopes such an agreement can in fact be signed in 2006.

#### THE ROLE OF HYDRO-QUÉBEC AS A CATALYST FOR PROSPECTING WORK

Hydro-Québec has been asked by the Government to evaluate Eastern Québec's oil and gas potential. In April 2006, Hydro-Québec held 39 oil and gas exploration licences for territories located in Gaspésie and on Anticosti Island, covering a total area of more than 7,200 square kilometres.

To increase investments and stimulate new oil and gas exploration activities in Québec, the Government has asked Hydro-Québec to enter into partnerships with the private sector in order to pursue the development of all its oil and gas activities.

- The Government believes private sector partnerships are an essential condition for Hydro-Québec's continued activity in this sector.
- The partnership approach sends a clear and positive signal to the industry concerning the Government's real desire to promote the discovery and eventual oil and gas production within its territory.

Among other things, the partnership approach will allow for:

- The continuation of work already begun in Gaspésie, Anticosti Island and the Old Harry prospect in the Gulf of St. Lawrence;
- Development of the geoscientific data held by Hydro-Québec;
- The completion of oil and gas development work in new offshore areas;
- Ongoing acquisition of knowledge on the potential impacts of oil and gas activities on the marine ecosystem.

The new energy strategy will provide the Government with an excellent opportunity to confirm its intentions concerning exploration and production of hydrocarbons resources in Québec. It must be clear that, if economically viable reserves are found, the Government will fully respect market and free enterprise rules, as well as rules concerning the environment.

## 2) DIVERSIFY NATURAL GAS SUPPLY SOURCES

Proposals for LNG terminals could be of considerable interest to Québec. The creation of new terminals would help diversify our supplies and would have a very positive impact on regional economies, due to the jobs created at the construction phase and the spillover effect on other industrial investments.

For the Government, it is important to emphasize that the analyses and assessments currently underway will be carried out as rigorously as possible, to ensure that the final decisions concerning the projects are made with full knowledge of the facts.

This type of project triggers a host of federal and provincial assessment and review procedures. Security and environmental impacts obviously receive special attention, and both expert opinions and public concerns are taken into consideration. The Government will obviously respect these processes and does not intend to interfere in any way.

The Government will also ensure that every concerned member of the general public is able to obtain all available and relevant information on the risks associated with these projects, and on their potential benefits. The general public will have an opportunity to express its concerns and obtain detailed answers to its questions.

### LNG TERMINALS –ASSESSMENT AND REVIEW PROCEDURES

Environmental assessments must be carried out for all LNG terminal projects, at both the Québec and federal levels.

- LNG terminal projects are subject to the processes stipulated in the Canadian *Environmental Assessment Act* and the provisions of the *Regulation Respecting Environmental Impact Assessment and Review*, adopted pursuant to Québec's *Environment Quality Act*.
- An LNG terminal project is also subject to the TERMPOL review process administered by Transport Canada, which calls on the expertise of Parks Canada, the National Defence, the Québec Port Authority, the Corporation of the Lower St. Lawrence Pilots and Québec's Ministère de la Sécurité publique. The review covers all maritime operations and everything connected with navigational safety.

Each of these processes requires the promoter to draw up and submit a rigorous and exhaustive study of the project's impacts on the environment.

- The study must be prepared in accordance with instructions issued by Québec's Minister of Sustainable Development, the Environment

and Parks, and by the Canadian Environmental Assessment Agency after consultation with the federal authorities concerned (the National Energy Board, Fisheries and Oceans Canada, Transport Canada).

- All the processes provide for full participation by members of the general public, who can obtain the information they need and attend public hearings.

As far as the public hearings are concerned, the processes call for joint sessions organized by the Bureau d'audiences publiques sur l'environnement and the Canadian Environmental Assessment Agency, under the Canada/Québec Agreement for Environmental Assessment Cooperation. Federal departments and agencies (Environment Canada, Natural Resources Canada and Health Canada), as well as provincial departments (Ministère du Développement durable, de l'Environnement et des Parcs, Ministère de la Sécurité publique, Ministère du Développement économique, des exportations et de l'Innovation, Ministère des Ressources naturelles et de la Faune, etc.) will attend the hearings as expert resources.

### 3) GIVE PRIORITY TO SECURE, COMPETITIVELY PRICED SUPPLIES OF REFINED PETROLEUM PRODUCTS

#### INVEST IN REFINING AND TRANSPORTATION INFRASTRUCTURES

Significant investments have been made in Québec's three refineries in the last few years. Since 2001, total investments in the refinery sector are estimated at nearly \$2 billion. More than half this amount was used to add desulfurization units for gasoline and diesel fuel, in order to comply with current or future sulphur content standards. Two of the three refiners – Petro-Canada and Ultramar – have announced new plans to extend their facilities.

## REFINERY SECTOR INVESTMENTS IN QUÉBEC 2001-2006

TABLE 3  
Refinery sector investments – Québec (2001-2006) (in \$ million)

ULTRAMAR		
2001-2002	Facilities for refining light Saharan blend; increase in the combined distillation capacity with additional capacity to produce gasoline at 150 ppm (intermediate 2002 standard).	154
	Management of residual water and recovery of hydrocarbon and other vapours	25
2003-2004	Additional gasoline desulphurization capacity	300
2004-2006	Diesel fuel desulphurization processes	350
2006	Increase in total refinery capacity	100
SUB-TOTAL		929
PETRO CANADA		
2002-2006	Addition of new desulphurization processes for gasoline and diesel vehicle fuel	350
2002	Construction of a tunnel between the refinery and the wharf	27
2004-2005	Increase in refining capacity to 133 750 bpd and related equipment	155
2004	Purchase of Coastal facilities in East Montréal	92
SUB-TOTAL		624
SHELL		
2002	Gasoline desulphurization processes	150
2004-2006	Diesel desulphurization processes	200
SUB-TOTAL		350
2001-2006	TOTAL INVESTMENTS	1 903

Québec's economy benefits enormously from these investments. The direct spin-offs are significant, and the refinery facilities are better able to face up to international competition. Thanks to these investments, Québec now has modern refineries that comply fully with environmental protection requirements.

#### ENSURE THAT COMPETITION PLAYS ITS ROLE IN THE GASOLINE MARKET

Québec's retail gasoline market is obviously affected by the repercussions of fluctuating oil prices and worldwide supply costs. This factor is, of course, completely outside the control of any government, whether in Québec or elsewhere.

However, competition should be able to play its intended role on the wholesale and retail markets. Québec benefits in this respect from the presence, in its market, a significant number of petroleum product importers and independent retailers that are able to compete with the major oil companies. It is for this reason that current regulations at both the federal and provincial levels establish a set of conditions conducive to the maintenance of a firmly-rooted network of independent companies.

The Régie de l'énergie is responsible for overseeing petroleum product prices and informing consumers. It also has the power, once every three years, to set an amount per litre representing the operating costs borne by retailers. It may decide on the expedience of including the amount in or excluding it from the operating costs borne by a gasoline or diesel fuel retailer. In addition, pursuant to section 57 of its constituting Act, the Régie must, on its own initiative or at the Minister's request, advise the Government or the Minister concerning petroleum product prices.

#### MONITOR THE AVAILABILITY OF PETROLEUM PRODUCTS

The geopolitical context in many oil-producing countries is unstable, and Québec must equip itself to deal with situations such as the one that arose in the fall of 2005.

- As a result, the Government intends to order the oil companies to submit a supply security plan including the measures to be implemented in case of problems with petroleum product availability.

#### OIL AND PROPANE HEATING

It is also important to protect consumers and the heating oil industry from the impacts of a weakening distribution network.

In the last two years, the heating oil industry has lost a significant percentage of its client base due to an unfavourable price differential with electricity. The industry is finding it increasingly difficult to maintain a critical mass that will allow it to meet customer needs, especially during the peak winter season.

It is essential that we find a solution to this situation. The heating oil industry helps secure the energy supply for Quebecers, among other things by supplying fuel to dual energy customers or customers whose supplies may be interrupted, thus reducing peak electricity demand.

- The Government intends to work with industry representatives to find the most appropriate solutions.
- A task force has already been set up to examine the difficulties experienced by the heating oil industry. Its mandate will be extended so that it is able to rapidly produce concrete recommendations aimed in particular at consumers in isolated regions.

Propane gas is used for a variety of purposes, both in the regions and in the farming community. One of its advantages is that it is easy to transport and store, and requires less costly distribution infrastructures than electricity or natural gas. Propane is an available, relatively clean, easily accessible and versatile source of energy. In some regions where natural gas is not available, it is essential. It is therefore of considerable economic importance, especially in the regions.

## MORE SECURE, MORE DIVERSIFIED SUPPLIES

In its energy strategy, the Government applies a range of measures to diversify and strengthen the security of our fossil fuel supplies, and to take full advantage of Québec's geological potential and geographical location.

One of its most important assets is the existence of favourable geological conditions in Gaspésie, along the St. Lawrence Valley and in offshore areas of the Gulf and St. Lawrence Estuary. The context has never been more favourable to new and major investments in fossil fuel prospecting. The Government intends to encourage these investments by removing all the obstacles currently standing in their way.

The proposed LNG terminal projects are also designed to take advantage of Québec's beneficial geographical location. It is important for promoters to continue with their efforts while providing detailed answers to the legitimate questions raised by members of the public. Future assessments and public hearings will provide all the information required to make the appropriate decisions.

In its new energy strategy, the Government sets out a path for the next ten years.



## MODERNIZE THE LEGISLATIVE AND REGULATORY FRAMEWORK

The orientations and priority actions described earlier will, in some cases, require legislative and regulatory amendments.

More generally, this will involve ensuring that, in the energy sector, Quebecers are covered by a flexible legislative and regulatory framework that eliminates red tape and needless costs and responds effectively to the challenges they must face.

### MAJOR INITIATIVES

The Government intends to act quickly by implementing the orientations set out in its energy strategy. In doing so, it will pay particular attention to flexibility and efficiency.

At the legislative and regulatory levels, a number of major initiatives will be launched in the coming months, in the following areas.

- As announced by the Premier in his *Inaugural Speech* of March 14, 2006, a bill to create the Generations Fund will establish the new fund's operating conditions and revenue sources. A portion of its revenues will come from the energy sector.
- The Government does not intend to amend the Act that sets the price of "heritage" electricity. However, the Watercourses Act will be amended so that Hydro-Québec must pay royalties.
- The Government will enact an order informing the Régie de l'énergie of the criteria to be considered when assessing the 500 MW wind energy block reserved for the regions and Aboriginal nations.

### PRIORITY ACTIONS

- 1) Provide a more effective response to the situation of **low-income households**
- 2) Define a clearer **analysis process** for energy projects
- 3) Harmonize **electricity transmission reliability standards** with those of our North American partners

- The *Act respecting the Agence de l'efficacité énergétique* will be amended to establish the new mandate, rules of governance and future responsibilities of the Agency.
- The Government will amend the *Act respecting the Régie de l'énergie* to reflect the orientations of the strategy, especially concerning funding for energy efficiency programs.
- The Government will ensure that the standards applicable to vehicles sold in Québec are more demanding in terms of greenhouse gas emission and energy consumption requirements, based on the model established by the State of California.
- The fiscal measures relating to biodiesel and the purchase of hybrid vehicles, announced by the Minister of Finance in the *2006-2007 Budget Speech*, are already in effect. The fuel tax reimbursements for public transit authorities also came into effect immediately following the *2006-2007 Budget Speech*.
- The tax laws will be amended in the near future to include the provisions announced in the *2006-2007 Budget Speech* concerning public transit passes paid for in whole or in part by employers.

- The regulations concerning the heating of buildings and the use of equipment will be amended in line with the recommendations made by the Agence de l'efficacité énergétique.
- Biogas distribution will be deregulated.
- A good practice guide for seismic surveys in marine environments will be incorporated into the *Regulation Respecting Petroleum, Natural Gas, Brine and Underground Reservoirs Enacted pursuant to the Mining Act*.

The new energy strategy will require extensive legislative and regulatory amendments. The Government intends to implement it as quickly as possible, to ensure efficiency and protect the interests of the population.

## PRIORITY ACTIONS

In addition to the legislative and regulatory amendments, the Government has announced two further major initiatives.

- 1) Provide a more effective response to the situation of **low-income households**;
- 2) Define a clearer **analysis process** for energy projects, to further uphold the principles of **sustainable development**;
- 3) Take the necessary legislative and regulatory steps to harmonize standards for the **reliable transmission of electricity with those of our North American partners**.

### 1) PROVIDE A MORE EFFECTIVE RESPONSE TO THE SITUATION OF LOW-INCOME HOUSEHOLDS

The upwards pressure on energy prices and the price volatility of some specific energy products is a major concern for the Québec government, especially with respect to the financial capacity of low-income households.

The Government intends to introduce a series of adjustments, by regulation or otherwise, to help low-income households that find it difficult to pay for energy products,

- By ensuring that companies with an exclusive right to distribute electricity are prohibited, during the winter, from disconnecting residential customers who use electricity for heating, if they fail to pay their bills or to comply with a payment agreement;
- By ensuring that the Régie, when examining requests for rate increases filed by energy distributors, orders studies on their impact on low-income households;
- By asking the Régie to encourage energy distributors to implement innovative pilot projects for support and assistance measures for low-income households that find it difficult to pay energy bills. The projects must target a neutral rate impact over the long term;
- By ensuring that the Régie, when it examines the service conditions of regulated distributors, promotes convergence towards the best commercial practices of the distributors in terms of billing, recovery and disconnection.

## 2) DEFINE A CLEARER ANALYSIS PROCESS FOR ENERGY PROJECTS

The development of energy resources and protection of the environment go hand-in-hand, illustrating the need to ensure sustainable development.

Sustainable development involves ensuring the sustainability of the resource while protecting the environment and considering the opinions of the individuals and communities concerned. At the same time, the project must be economically viable and create jobs.

With its *Bureau d'audiences publiques sur l'environnement* (BAPE), Québec already has a credible, transparent process that allows the general public to express its environmental concerns, which are then forwarded to the Ministère de Développement durable, Environnement et Parcs by the BAPE. For energy projects, the Government intends to ensure that economic concerns, another dimension of sustainable development, are also assessed by an independent body.

Accordingly, the *Act Respecting the Régie de l'énergie* will be amended to entrust the Régie with responsibility for reviewing the energy-related and economic justification for major new energy activities and initiatives (i.e. projects that may be subject to a BAPE hearing) under the *Environment Quality Act*

In its review, the Régie must consider public and private interests, as well as other criteria established by the Government.

The BAPE will continue, as before, to focus on the environmental aspects of energy projects subject to the Environmental Quality Act.

The Government does not want the duties entrusted to the Régie to extend the time currently required to obtain authorization. The new process should be in effect by 2008, meaning that projects for which authorization is currently being sought will not be affected.

## 3) HARMONIZE ELECTRICITY TRANSMISSION RELIABILITY STANDARDS WITH THOSE OF OUR NORTH AMERICAN PARTNERS

The power blackout of August 14, 2003 affected large portions of the Northeastern United States and Ontario. It did not directly affect Québec because our electricity network is technically isolated – in other words, the asynchronous links between our network and neighbouring networks protect us from incidents such as this. In addition, notably after the ice storm in the late 1990s, Hydro-Québec took steps to substantially reinforce its electricity transmission system.

A Canada-United States task force was created in the wake of the August 2003 power blackout, and has since made a number of recommendations, including the introduction of mandatory reliability standards for electricity transmission applicable throughout North America.

Québec supported this recommendation. As a participant in the North American energy market, it is in Québec's interest to help draft and implement mandatory reliability standards for electricity transmission. The new energy strategy provides an opportunity for the Government to confirm its intentions in this respect and to specify the actions that will be taken.

- The Government is currently defining the institutional and regulatory framework required to follow up on the Canada-US task force recommendation. A similar process was launched in the United States in September 2005.
- Québec's initiatives will be brought into line with the initiatives of the federal and other provincial governments. The Canadian Council of Energy Ministers has appointed a federal-provincial-territorial task force for this purpose.
- The Government intends to give the Régie de l'énergie the powers it needs to apply mandatory reliability standards for electricity transmission, as part of a process that reflects Québec's jurisdiction and interests in this area.






Conclusion

# A MORE PROSPEROUS QUÉBEC, A MORE EFFECTIVE USE OF ENERGY





Using energy to  
build the Québec  
of tomorrow

## CONCLUSION: A MORE PROSPEROUS QUÉBEC, A MORE EFFECTIVE USE OF ENERGY

The goals of Québec's new energy strategy are ambitious. They embody the vision of what Québec will be able to achieve over the next ten years.

- With its new energy strategy, the Government wishes first and foremost to strengthen the security of our energy supplies.

We will do this by developing our hydroelectric and wind energy potential, making better use of the energy we have, and consolidating and diversifying our oil and natural gas supplies.

- More than ever before, energy will be a powerful lever for economic development.

The investments made as part of the energy strategy will create jobs and wealth throughout Québec. The advantages we currently enjoy in terms of tariffs and availability will be maximized for individuals and businesses alike. A new upturn in hydroelectrics investments along with ongoing efforts in the wind energy sector will contribute to the development of an internationally effective industry that will benefit every Quebecer.

- Thanks to the initiatives announced in the strategy, local and regional communities as well as Aboriginal nations will have a greater role to play in future developments. This is a question of fairness, and a guarantee of success.
- Québec will make more efficient use of its energy by applying new methods and new approaches.

The energy saved will reduce the energy bills borne by consumers and the cost of our imports. Ecologically, energy savings will allow us to improve our greenhouse gas reduction performance. In terms of quality of life, better energy use will reduce air pollution, make our cities more pleasant places to live in, and release resources for the things we enjoy.

- More than ever before, Québec will support the energy sector as it strives to achieve its ambition of becoming a leader in the field of sustainable development.

This goal will be achieved through investments in the development of renewable energy sources, better use of energy and faster development and dissemination of new energy technologies. In this way, Québec will make a significant contribution to achieving the Kyoto Protocol requirements. Québec has never been in a better position to ensure a development based on economic, environmental and social considerations – a development that will provide future generations with the assets they need to ensure their own development.

- With its new energy strategy, the Government has established an electricity pricing policy that is consistent with our interests and based on proper management of the resource, while maintaining our advantageous electricity rates for individuals and businesses alike.

Through **Using Energy to Build the Québec of Tomorrow**, the Government has introduced the tools it needs to build a more prosperous Québec for the benefit of all citizens – a Québec that is able to draw on assets of great strategic importance, and a Québec that will serve as a model in facing the challenges of climate change and sustainable development.





**WIND ENERGY DEVELOPMENT:  
A FAIR AND TRANSPARENT  
PROCESS**

## WIND ENERGY DEVELOPMENT: A FAIR AND TRANSPARENT PROCESS

The process established by the Government to allocate the development of 500 MW of wind energy to the regions and First Nations, in partnership with the private sector, will be both fair and transparent.

- First, the Government will enact a regulation setting out the terms and conditions for acquisition of two separate blocks of 250 MW of wind energy, one for the regions and one for the First Nations.
- The Government will ask the Régie de l'énergie to consider the development of the 500 MW block of wind energy in light of the parameters set for the wind energy sector, especially concerning the cost of the electricity generated.
- The Government will also adopt an Order-in-Council indicating the economic, social and environmental concerns to be considered by the Régie de l'énergie when approving Hydro-Québec's supply plan and setting Hydro-Québec Distribution's tariffs.
- These concerns will include the following:
  - optimal development of Québec's wind energy potential, taking into account the capacity of Hydro-Québec's network and any related connection constraints;
  - consolidation of the manufacturing base arising from the two calls for bids for wind energy;
  - maximization of the economic spin-offs for the regions and for Québec as a whole;
  - minimization of electricity supply and transmission costs;
  - the economic development of local and Aboriginal communities.
- Hydro-Québec will then submit a project assessment grid to the Régie de l'énergie, for approval. The selected criteria will form part of Hydro-Québec's call for bids.
- Hydro-Québec will launch a call for bids in accordance with the timeframes established by the Government: initial deliveries in 2010, activation of all wind farms by 2015 at the latest.
- The proposals received by Hydro-Québec will be considered on the basis of the following general criteria:
  - price of the electricity offered by the promoters;
  - regional content;
  - Québec content;
  - compliance with the conditions for sustainable development;
  - financial solvency;
  - relevant experience;
  - project's feasibility;
  - distribution of wind turbines throughout Québec.
- When considering the supply plan and setting Hydro-Québec's tariffs, the Régie de l'énergie will assess the contribution of the 500 MW wind energy block by taking into account the economic, social and environmental concerns established by the Government in its Order-in-Council.





**THE APPROVAL AND  
REPORTING PROCESS FOR  
THE COMPREHENSIVE ENERGY  
EFFICIENCY PLAN**

## THE APPROVAL AND REPORTING PROCESS FOR THE COMPREHENSIVE ENERGY EFFICIENCY PLAN

In the coming months, the Agence de l'efficacité énergétique will draw up a comprehensive energy efficiency plan that includes new energy technologies, based on the orientations proposed by the Government in its energy strategy. The Agency will follow a challenging process requiring inputs from stakeholders. Adoption and implementation of the Plan will take place in five principal steps:

1. Preparation of a comprehensive plan
2. Approval by the Government
3. Assessment of funding by the Régie
4. Implementation of programs
5. Auditing and reporting

### 1 - PREPARATION OF A COMPREHENSIVE PLAN

The Plan's content will be established by the Agency on the basis of consultations with energy distributors and representatives of interested communities.

The Plan will address all energy uses, including transportation, and will cover all forms of energy, whether regulated or not. It will therefore apply to electricity and natural gas, as well as to oil products and propane.

The Agency will identify the sustainable and viable savings that can be made through simple interventions based on the "contract out" approach, ranging from innovations to proposals for government regulation, and including awareness, training and financial support.

### 2 - APPROVAL BY THE GOVERNMENT

Once this task has been completed, the Agency will submit the overall plan to the Government for approval. The Government's aim is for the Plan to be adopted by the beginning of 2007, leaving sufficient time for the necessary consultations and allowing the various players to prepare the next steps.

### 3 - ASSESSMENT OF FUNDING BY THE RÉGIE

Once the energy efficiency plan has been adopted by the Government, the Agency will present it to the Régie de l'énergie, which will then approve the amounts required to finance the global Plan.

The amounts authorized by the Régie will be used solely for the programs it authorizes, and their administration.

The Régie de l'énergie will have the necessary authority to ensure that the programs submitted by the various regulated distributors are in compliance with the plan. It will examine the amounts allocated to the various programs via its usual hearing process, thus allowing all stakeholders, and consumers in particular, to make comments.

Every year, the regulated distributors, namely Hydro-Québec, Gaz Métro and Gazifère, will provide the Régie with the portion of the energy efficiency Plan relevant to their organization.

For unregulated distributors – mainly petroleum product distributors – the process is similar, but adjusted to their specific situation. Every year, the Agency will inform the Régie of interventions relating to these energy forms – including fuel oil and gasoline – and will also submit programs to the Régie that are independent of any single energy form, such as home insulation programs.

A performance contract for the implementation of the Plan will be signed by the Agency and the Government on the basis of the amounts approved by the Régie.

During the initial Plan preparation period in 2006-2007, the Régie will ensure that the monies required by the Agency to draw up the Plan are included in the energy efficiency budgets of the regulated distributors.

As is currently the case, the Agence de l'efficacité énergétique may increase the financing for certain initiatives by involving third parties, especially the federal government. A number of federal programs with significant financial resources are available to support energy efficiency initiatives, innovations and technological developments.

Federal government resources are usually available via a cost-sharing arrangement. The Agence de l'efficacité énergétique will use federal funding when it is consistent with the priorities of Québec, with Québec's share being funded under the comprehensive plan.

#### 4 - IMPLEMENTATION OF PROGRAMS

The programs drawn up by the Agency, in collaboration with energy distributors and other stakeholders, will be implemented by specially accredited companies, including the distributors themselves. A one-stop approach will be used for programs involving more than one energy form.

#### 5 – AUDITING AND REPORTING

Reporting will be based on the principle of accountability. Every year, the Agency will report to the Government on the application of its performance contract, following an auditing exercise under the responsibility of the Régie de l'énergie.

- Once a year, the Agence de l'efficacité énergétique will provide the Régie de l'énergie with a progress report on the energy efficiency plan.
- Based on this report, the Régie will issue an audit report, which will be included in its entirety in the annual report submitted by the Agency to the Government.

The reporting process will ensure that energy efficiency funding is used properly. It may eventually cause the Agency and the distributors concerned to review their programs in order to meet their targets.

A new Plan must be submitted for Government approval once every three years. In addition, the Plan will cover a ten-year timeframe and will include short-term, medium-term and longer term actions.



## ENERGY STRATEGY CONSULTATIONS

## ENERGY STRATEGY CONSULTATIONS

The Government felt it was important for the new energy strategy to be subjected to the most extensive consultation possible, so that every interested individual, group and company had an opportunity to state their opinions on the issues and proposed methods.

The Government selected a demanding approach based on transparency, a willingness to listen, and accessibility. Consultations took place over a period of slightly more than a year, from November 2004 to December 2005.

The Government used a range of consultation tools, including consultation of experts, a parliamentary standing committee and online consultations, to reach as many people as possible while providing an opportunity for participants to engage in in-depth discussions on highly complex questions and issues. An information document was published in November 2004 to help participants prepare for the consultations, while the last phase of the process – online consultations – was based on a preliminary statement of the energy strategy's goals and orientations.

The energy strategy consultations were highly successful, in terms of the number of participants and the level of debate, confirming the vitality of Québec's democratic process. They also confirmed the general public's interest in the energy issue.

The new energy strategy is a direct result of these debates. Below is a brief summary of the work done in each of the three consultation phases.

### EXPERT CONSULTATIONS

On November 17, 2004, the Government launched the consultation process by publishing an information document entitled "The Energy Sector in Québec – Context, Issues and Questions".

The document described the situation and issues facing Québec's energy sector, and formulated a certain number of questions concerning the security and future of energy in Québec.

The expert consultations were held on December 1<sup>st</sup> and 2<sup>nd</sup>, 2004, as part of the work of the National Assembly's Committee on Labour and the Economy. Each of the six experts invited by the Minister of Natural Resources, Wildlife and Parks was asked to present an opinion on one or two predetermined questions. The purpose of this was to lay down a well-documented foundation for the debate on the future energy strategy.

### THE EXPERTS CONSULTED

The members of the Committee on Labour and the Economy, and other interested parties, were able to benefit from the expertise of the following people:

- Mr. Pierre Fortin  
(Economic and Regional Development)
- Mr. Joseph A. Doucet  
(Energy Security and Thermal Energy)
- Mr. Alain Webster  
(Sustainable Development)
- Mr. Gaëtan Lafrance  
(Energy Security and Wind Energy)
- Mr. Jean-Marc Carpentier  
(Energy Efficiency)
- Mr. Pierre-André Bourque  
(Fossil Fuel Resources in Québec)

### THE MESSAGE OF THE EXPERTS

The experts presented reports on the issues assigned to them. In some cases they proposed concrete measures to inform the Government about particularly sensitive aspects of Québec's energy sector.

Their principal conclusions and remarks can be summarized as follows.

- With regard to energy security
  - Québec must diversify its energy supply sources to ensure its energy security. It must draw upon its wind energy potential to diversify its electricity supplies, taking advantage of the fact that wind energy complements hydroelectricity.
  - The development of Québec's hydroelectric potential will not only satisfy Québec's electricity needs, but will also enable it to take advantage of profitable business opportunities on the export market.
  - Hydro-Québec must be given greater flexibility; this will improve our own energy security and that of neighbouring jurisdictions.
  - Energy efficiency is an essential element in strengthening energy security since it helps limit growth in the demand for energy.
  - The contribution of thermal energy to our energy security is the result of a social choice and not of economic or technical optimization.
  - It would be appropriate to expand the role of natural gas in meeting heating needs.
- With regard to wind energy
  - Wind energy could help improve our energy security as a complement to hydroelectricity.
  - Wind energy offers significant exploitable potential. It is estimated that some 4,000 MW of wind-generated energy could technically be incorporated into the network by 2015.
  - It is strongly recommended that the energy block development method be maintained.
- It would be preferable to adopt a strategy to optimize the location of sites suitable for wind energy development.
- With regard to energy efficiency
  - More energy efficiency measures would have a beneficial impact on the environment and would also help save money.
  - The benefits of energy efficiency could be improved if energy efficiency measures were both stable and constant.
  - The scope of energy efficiency measures would be extended if the measures were supported by a price that better reflects the cost of energy.
- With regard to economic and regional development
  - New hydroelectric sites should be exploited with a view to exporting electricity, and new connections should be built, especially with Ontario and the United States.
  - Our wind energy resources and fossil fuel potential should be developed with a view to fostering regional economic development.
- With regard to fossil fuels
  - The geological context of Québec is conducive to the discovery and development of fossil fuel resources. The potential appears to be promising.
  - Use of fossil fuel energy would help improve supply security and stimulate economic development.
  - The use of fossil fuels would in no way prevent Québec from making a shift towards renewable, less pollutant energy sources.

- With regard to sustainable development
  - There is a consensus in Québec on the concept of sustainable development, but not on how to apply it.
  - Québec's electricity exports could help improve the performance of northeastern North America by reducing greenhouse gas emissions.
  - Environmental costs must be taken into consideration when establishing and implementing projects.

#### PARLIAMENTARY STANDING COMMITTEE

The second consultation phase took place from January 25 to April 7, 2005, again as part of the work of the National Assembly's Committee on Labour and the Economy. Individuals, groups and companies were invited to express their concerns and their vision of energy security and the future of energy in Québec.

#### BRIEFS

The Committee received 169 briefs. During its sessions, 138 individuals, companies, organizations and groups were able to express their views. The Committee heard all the principal players in the energy community, including producers, distributors, representatives of consumers and environmental groups, and Aboriginal nations, as well as members of the general public wishing to take part in the debate and present their views.

The Committee members were able to question the various stakeholders and obtain clarification of their opinions and recommendations.

#### MESSAGES

The briefs addressed every aspect of energy development. In many cases they expressed conflicting opinions. However, along with the oral statements made to the Committee, they dealt with every issue relating to energy and aired a range of opinions.

Generally speaking, the individuals, companies and groups submitting the briefs wanted to ensure that Québec's energy resources would be developed from the standpoint of sustainability, with due respect for

the environment and the communities concerned. Their expectations were significant, especially in the regions, where economic hopes for the future are based to a large extent on energy development.

The main messages received by the Committee can be summarized as follows:

- Energy savings and energy efficiency should form the basis of the energy strategy;
- It is vital for Québec to have a more efficient, more independent energy efficiency agency;
- To guarantee its energy security, Québec must turn to the development of renewable energy, especially hydroelectricity and wind energy;
- Energy development must be based on environmental protection and should be consistent with efforts to minimize the impacts of climate change;
- A vigorous energy sector is a vital element of Québec's economic development and prosperity, especially in the regions;
- We need to think about the possibility of using the most appropriate forms of energy for the circumstances, and especially for heating;
- Once Québec's own energy needs have been met, any remaining electricity could be exported. The ensuing financial and environmental spin-offs would benefit all citizens.

Other messages were also conveyed:

- It is essential to diversify supply sources;
- Higher electricity prices would encourage people to save energy;
- Low energy prices help improve the competitive capacity of businesses;
- Information needs to be circulated more effectively, to improve the level of public confidence in the Government and Hydro-Québec.

### ONLINE CONSULTATIONS

The third phase of the consultation process began on November 17, 2005, when the Government published a document setting out the goals and orientations of the future energy strategy.

In the document, the Government identifies two primary concerns:

- Energy security and the future of energy in Québec;
- A more prosperous Québec that makes full use of its energy assets.

The Government proposed a number of goals and orientations, based on the challenges it faced.

### PARTICIPANTS

The Government invited all interested parties to react to the document by submitting their views over the Internet. The online consultation took place from November 17 to December 5, 2005.

Nearly 10,000 people read the document on the Internet. The Government received opinions and comments from 1,732 individuals and 148 organizations.

### MESSAGES

Overall, the participants welcomed the Government's emphasis on the development of renewable energy sources, provided, however, that all development is respectful of the environment and the communities concerned.

A consensus emerged on several points:

- The energy strategy should be based on the principles of sustainable development;
- Energy efficiency, energy supply security and the development of clean, renewable energy sources should be the foundations of the energy strategy. Hydroelectricity and wind energy should be given priority;
- It is vital that the clean, renewable energy produced in Québec should be used first and foremost to meet the needs of Quebecers.

However, it should also be possible to export surplus electricity.

The following more specific messages were received.

- The Government should resume hydroelectric development and create wealth.
  - Hydroelectric development should be resumed and accelerated to ensure energy security and foster economic development, especially in the regions.
  - Local communities, by building small generating stations, would be able to take charge of their economic development. However, social acceptance and community involvement are absolute requirements for this type of project.
  - The tariffs granted to major electricity consumers should be competitive, in order to create jobs in the regions.
- Wind energy must be developed, since it offers promise for the future.
  - The opportunities offered by wind energy, in particular for economic development, should be taken up. Wind energy should be seen as a complement to, and not a substitute for, hydroelectricity
  - Installed capacity should be distributed throughout Québec.
  - Some stakeholders proposed that wind energy development be carried out by Hydro-Québec, while others preferred the private sector, as is currently the case.
- It is vital for energy to be used more efficiently.
  - The general public should be more aware of the benefits of saving energy.
  - A new, more progressive electricity tariff structure is desirable. It would encourage more efficient consumption of the resource.

- The Government should intervene to encourage viable energy saving measures, especially in the renovation, construction and transportation sectors.
- The *Construction Code* should be amended to foster energy efficiency.
- Efforts to develop new production capacity should go hand-in-hand with measures to reduce consumption. Energy efficiency cannot replace energy production as a means of meeting our needs.
- We must be innovative in the energy sector.
  - An innovative approach is needed to meet the energy needs of future generations.
  - Concrete measures should be introduced to encourage the use of geothermal, solar energy, hydrogen and biomass technologies.
  - More effort is required to develop efficient transportation methods and renewable fuels.
- We need to consolidate and diversify our oil and natural gas supplies.
  - Construction of a new LNG terminal in Québec could be a useful way of reducing our dependency on our only existing source of natural gas. However, a number of stakeholders were categorically opposed to such a terminal.
  - Québec could develop its hydrocarbon resources, provided this is done in a way that is respectful of the environment and local communities.
  - It may be interesting to encourage the use of renewable fuels, in order to reduce our dependency on hydrocarbons.
- Current regulations governing the retail fuel market must be revised to allow for more competition. However, some stakeholders were concerned that the independent distributors might disappear from the market.
- Sustainable development must be implemented.
  - Renewable energies must be developed immediately, to ensure long-term energy security.
  - Energy development should always be respectful of the environment.





