

**ELECTRICITY SUPPLY PLAN 2008-2017  
INTEGRATED SYSTEM**



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## 1. CONTEXT OF THE SUPPLY PLAN

The presentation of the Electricity Supply Plan 2008-2017 (the Plan) is composed of a main document and several annexes (the latter are all grouped under Exhibit HQD-1, document 2). Annex 1A in particular, facilitates the retrieval of information found in the *Distributor's Guide*. Annex 1B is comprised of a glossary of technical terms as well as a list of acronyms used in the Plan and in its annexes.

Since the Electricity Supply Plan 2005-2014 was filed, demand has exceeded the maximum heritage pool volume. This occurred for the first time in 2005. Electricity deliveries from long-term contracts resulting from tendering processes have begun and the Distributor has initiated its supply management activities.

In addition, systems for the daily management of the Distributor's supply have been implemented. A team was trained to carry out transactions in short-term markets. Follow-up, control, reporting, payment, billing and collection systems have also been implemented.

From the time contracts are signed, the Distributor coordinates the activity required to integrate them with his supply portfolio, namely by implementing systems to access operating data in real-time and ensuring that integration with the transmission system is carried out at the right time. Finally, the integration of wind power generation requires the implementation of a system for power generation projections, which was completed before the commercial operation of the Baie-des-Sables farm began in November 2006.

Among the key features of managing the balance between supply and demand, it is relevant to note the successive decreases in demand forecasts over the last three years. For example, energy requirements for 2008, initially projected at 191.1 TWh in the Electricity Supply Plan 2005-2014, were reduced to 190.3 TWh in the Status Report of October 2005. These decreased again to 188.1 in October 2006, then to 183.8 TWh in the current Plan. Compared with the

Electricity Supply Plan 2005-2014, this constitutes a decrease in energy requirements of 7.3 TWh. These decreases are attributable to the combination of several factors including the relative weakness of some industrial sectors that are large electricity consumers, the increase in energy efficiency targets and consideration of revised normal temperature conditions. As a result, in the first few years, the Distributor's energy balance shows excesses then balance is restored.

Moreover, the recent evolution of the capacity balance is quite different, particularly since the last status report was submitted. For example, for 2010-2011, the additional capacity required to achieve balance is 430 MW higher than last year's projections. The increase for 2013-2014 is 680 MW.

Annex 1C provides a detailed history of events that have influenced the balance between electricity requirements and the resources used to meet them since the last supply plan was submitted.

## **2. DEMAND FORECAST**

Demand forecasts rely on the information available in August 2007. These thereby differ from the projections included in the Distributor's 2008-2009 rate application.<sup>1</sup> Moreover, exceptionally, more recent information has been included in the medium forecast scenario for 2008. The current section only includes the highlights of demand forecasts. Annexes 2A to 2C provide all the details. The latter namely include projections differentiated by use, framework scenarios, and comparisons with the last status report and with the Electricity Supply Plan 2005-2014. Moreover, historical data concerning demand can be found in annex 2D, while methodological data can be found in annex 2E.

### **2.1 Presentation of the Medium Scenario**

#### ***2.1.1 Demographic, Economic and Energy Hypotheses***

##### ***2.1.1.1 Demographic Variables***

In the coming years, the population of Quebec will continue to increase, albeit at a slower rate than in the past. By 2017, it will reach 8 090 million people, which represents a growth of 386 000 people in 10 years. The aging structure of the population and a relatively weak fertility index (1.5 children per woman) will lead to a deceleration of the natural increase in population. However, over the Plan period, the positive migratory balance will contribute to sustaining limited population growth.

The creation of new households will also slow down, albeit less rapidly than population growth due to an offset in time between births and the creation of new households. The number of households will go from 3 326 million in 2007 to 3 673 million in 2017, equivalent to 346 000 new households.

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<sup>1</sup> Application R-3644-2007.

**2.1.1.2 Economic Variables**

In 2007, consumption in Quebec was stimulated by a strong labour market and a marked increase in revenues. Investments were supported by residential construction, spending for public infrastructure, and the purchase of machinery and equipment. However, the strong appreciation of the Canadian dollar should lead to another deterioration of Quebec's balance of trade. The Distributor projects an increase in Quebec's GDP of 1.4% in 2007 and 2% in 2008.

Several large investment projects are expected in Quebec in the coming years. The significance of the economic impacts they will generate should lead to maintaining the increase in GDP at approximately 2.5% between 2009 and 2011.

In the longer term, the aging structure of the population will begin to have more pronounced effects on Quebec's economy, translating into labour shortages and less dynamic interior demand. GDP growth will tend to be closer to 2% between 2012 and 2017.

**2.1.1.3 Fuel Prices*****Natural Gas***

The high level of natural gas stocks coupled with a marked appreciation of the Canadian dollar compared with the American dollar should lead to a decrease in the price of natural gas at the Alberta border even if the North American gas market remains relatively tense. On the one hand, the evolution of North American production remains uncertain. On the other, gas consumption will continue to accelerate with the development of oil sands in Canada and with increasing requirements in the electricity sector. Starting in 2009, LNG imports should lead to a certain easing of the market. The price of natural gas at the Alberta border would thereby decrease between 2009 and 2012, at which time it would be set at \$7.91CAN/MCF.

Following this quiet period, the rapid increase in production costs in North America will exert upward pressure on the price of natural gas. In the selected hypothesis, the price at the Alberta border would reach \$8.90 CAN/MCF in 2017.

### ***Crude Oil***

In 2008, the average annual price of crude oil should continue to increase. Market supply for the winter period 2007-2008 is a primary concern while oil stocks and OECD petroleum products are below the latest five-year average.

In the medium term, OPEC's excess production capacities will remain low but non-OPEC production will increase as will international refining capacity. Upward pressure on prices will slow down despite sustained increase in demand. The annual average price per barrel of WTI crude oil should return to \$67US/barrel by 2012.

In the longer term, physical constraints that restrain growth in supply will lead to an increase in production costs. Moreover, an increase in the relative share of OPEC countries to global production and reduced access to petroleum resources will also contribute to a price hike. The price should increase to \$75 US/barrel by 2017.

### **2.1.2 Average Temperature**

In 2007, Hydro Quebec Distribution collaborated with Ouranos (a consortium focusing on regional climatology and adaptation to climate change) which has led to the introduction of a new average temperature in the Distributor's forecasts based on the average climate conditions between 1971 and 2006, adjusted to account for a warming of 0.30°C per decade since 1971.

The temperature average used in the previous supply plan corresponded instead to the average temperature between 1971 and 2000 adjusted to account for a warming of 0.31°C per decade starting in 2001.

For 2007, the introduction of a new temperature average leads to a decrease in normalised sales of almost 0.8 TWh. As for capacity requirements during the winter peak, the introduction of the new temperature average leads to a decrease of approximately 360 MW in 2007. However, as explained in section 2.2, the revised average temperature is coupled with an increase in weather variances for capacity.

### **2.1.3 Energy Efficiency**

The demand forecasts presented in section 2.1.4 take into account the impact of energy savings on sales and capacity requirements, which are divided into three categories:

- Natural energy efficiency trends, which are already taken into account in forecasting models;
- Programs implemented by Hydro-Quebec in the 1990's;
- Programs that fall within the Global Energy Efficiency Plan for which annual energy efficiency objectives are 4.7 TWh until 2010 then 8.0 TWh until 2015.

Table 2.1 summarizes energy savings that were taken into account in sales forecasts and Table 2.2 shows the impact of energy efficiency on capacity requirements during the winter peak.

**TABLE 2.1**  
**Energy Savings Taken into Account in Sales Forecasts (TWh)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Économies d'énergies tendanciennes	0,7	1,3	1,9	2,6	3,2	3,8	4,3	4,9	5,5	6,1	6,7
Programmes d'HQ déjà mis en œuvre *	2,2	2,2	2,1	2,1	2,0	2,0	1,9	1,9	1,9	1,8	1,8
Plan global en efficacité énergétique *	1,6	2,3	3,2	4,2	5,0	5,8	6,4	7,1	7,6	8,0	8,0
<b>Total</b>	<b>4,5</b>	<b>5,8</b>	<b>7,2</b>	<b>8,9</b>	<b>10,2</b>	<b>11,5</b>	<b>12,7</b>	<b>13,9</b>	<b>15,0</b>	<b>15,9</b>	<b>16,5</b>

\* Économies d'énergie mensualisées.

**TABLE 2.2**  
**Energy Savings Considered in Projected Capacity Requirements during Winter Peak (MW)**

	2006- 2007	2007- 2008	2008- 2009	2009- 2010	2010- 2011	2011- 2012	2012- 2013	2013- 2014	2014- 2015	2015- 2016	2016- 2017
<b>Total</b>	<b>670</b>	<b>890</b>	<b>1 130</b>	<b>1 390</b>	<b>1 680</b>	<b>1 950</b>	<b>2 190</b>	<b>2 420</b>	<b>2 660</b>	<b>2 910</b>	<b>2 990</b>

Projections also take into account load-shaving resulting from residential dual-energy systems. This management tool, which is not under the Distributor's direct control, is dealt with in the same fashion as energy savings, i.e. in demand forecasts. Projected load-shaving is approximately 800 MW over the Plan period and its impact is additional to the energy savings presented in Table 2.2.

**2.1.4 Electricity Sales Forecasts by Sector**

In 2017, electricity sales should reach 186.9 TWh. Growth over the period 2007-2017 is 15.1 TWh and it corresponds to an annual growth rate of 0.8%. Compared with the growth observed over the 1997-2007 period, this represents a net slowdown. In fact, during that ten-year period, the total growth of normalised sales in Quebec was 26.0 TWh, corresponding to an average annual rate of 1.7%. Several phenomena can explain this slowdown, particularly demographic evolution which is concomitant with lesser economic growth (despite greater productivity in the workplace), and the implementation of the Global Energy Efficiency Plan.

**2.1.4.1 Domestic and Farm**

In the Domestic and Farm sector (34% of sales), projected growth over the 2007-2017 period is 4.5 TWh. This corresponds to an average annual growth rate of 0.7%. Growth in this sector stems mainly from the creation of new households and, to a lesser extent, an increase in personal disposable income.

**2.1.4.2 General and Institutional**

In the General and Institutional sector (20% of sales), projected growth over the 2007-2017 period is 3.9 TWh, equivalent to an average annual increase of 1.1%. Growth in sales in this sector is essentially attributable population growth and the resulting service needs, growth in the service industry GDP, and the increase in personal disposable income. To these factors are added the prices of electricity and other energy sources that influence electricity's competitive advantage.

**2.1.4.3 Small & Medium Business**

In the small- and medium-business sector (5% of sales), electricity sales over the 2007-2017 period will increase by 0.6 TWh (or 0.7% per year on average). In the short term, businesses in this sector are strongly influenced by the appreciation of the Canadian dollar compared with the American dollar, as well as competition

from emerging states. The result is stagnating electricity sales. Over the longer-term, growth in manufacturing industry GDP leads to an increase in electricity sales in the small- and medium- business sector.

#### ***2.1.4.4 Large Industrial***

In the large Industrial sector (37% of sales) the projected growth in sales is 5.7 TWh over the 2007-2017 period, equivalent to an average annual growth rate of 0.9%. Growth in sales is primarily attributable to the smelting and refining sector, which benefits from the addition of a 225 MW block at Alcan. This sector and the mining industry are also stimulated by strong global demand. Conversely, the pulp and paper sector will be subject to considerable cutbacks which translate into the permanent closure of machines and decreases in production, mainly for newspaper.

#### ***2.1.4.5 Other***

The Other sector (3% of sales) is comprised of municipal distribution systems, public lighting, Sentinel lighting and public transport. In 2007, municipal systems account for 4.2 TWh or 83% of the Other sector total. For this sector, projected growth in sales is 0.4 TWh between 2007 and 2017 or 0.7% per year on average.

**TABLE 2.3**  
**Projection of Regular Sales in Quebec and Energy Requirements**  
**Medium Scenario (TWh)**

	2007 <sup>1</sup>	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Croissance TWh	2007-17 tx annuel moyen
Domestique et Agricole	59,2	60,3	60,1	60,5	61,0	61,7	61,9	62,3	62,7	63,4	63,6	4,5	0,7%
Général et Institutionnel	34,2	34,9	35,2	35,7	36,0	36,5	36,7	37,0	37,3	37,8	38,1	3,9	1,1%
Industriel PME	9,2	9,2	9,2	9,2	9,3	9,4	9,4	9,5	9,6	9,8	9,9	0,6	0,7%
Industriel Grandes entreprises	64,1	61,4	63,8	66,1	66,5	67,4	67,9	68,4	68,9	69,5	69,8	5,7	0,9%
Autres	5,1	5,2	5,2	5,3	5,3	5,4	5,4	5,4	5,4	5,5	5,5	0,4	0,7%
<b>VENTES RÉGULIÈRES AU QUÉBEC</b>	<b>171,8</b>	<b>170,9</b>	<b>173,6</b>	<b>176,8</b>	<b>178,0</b>	<b>180,3</b>	<b>181,3</b>	<b>182,6</b>	<b>184,0</b>	<b>185,9</b>	<b>186,9</b>	<b>15,1</b>	<b>0,8%</b>
Pertes de distribution et de transport et autres éléments	13,5	12,9	13,1	13,4	13,4	13,5	13,6	13,7	13,7	13,9	14,0	0,5	0,3%
<b>BESOINS VISÉS PAR LE PLAN</b>	<b>185,3</b>	<b>183,8</b>	<b>186,7</b>	<b>190,2</b>	<b>191,5</b>	<b>193,8</b>	<b>194,9</b>	<b>196,3</b>	<b>197,7</b>	<b>199,8</b>	<b>200,8</b>	<b>15,5</b>	<b>0,8%</b>
Incluant l'impact des conditions climatiques au 31 juillet 2007	186,2												

<sup>1</sup> Incluant les ventes publiées de janvier à juillet 2007, normalisées pour les conditions climatiques.

## 2.1.5 Projected Energy and Capacity Requirements

### 2.1.5.1 Projected Energy Requirements

Energy requirements in the Plan are essentially composed up of electricity sales and distribution and transmission losses. The percentage of losses that is taken into account between 2008 and 2017 is 7.5%. The latter is documented in section 3 of Annex 2A. Table 2.3 shows projections of energy requirements. In 2017, these requirements will reach 200.8 TWh, representing an increase of 15.5 TWh compared with 2007.

### 2.1.5.2 Projected Capacity Requirements

The projection of capacity requirements during the winter peak is based on the projection of energy requirements. Table 2.4 shows that capacity requirements during the winter peak will reach 38 681 MW in the winter 2016-2017. Compared with the winter 2006-2007, this represents an increase of 3 581MW.

Approximately half of this increase comes from captive uses in the Domestic and Farm sector and in the General and Institutional sector.

**TABLE 2.4**  
**Projected Capacity Requirements during the Winter Peak**  
**Medium Scenario (MW)**

	2006- 2007 <sup>1</sup>	2007- 2008	2008- 2009	2009- 2010	2010- 2011	2011- 2012	2012- 2013	2013- 2014	2014- 2015	2015- 2016	2016- 2017	Croissance MW	2006-2016 tx annuel moyen
<b>Besoins réguliers du Distributeur</b> <i>(Besoins visés par le Plan)</i>	35 100	35 968	36 219	36 851	37 129	37 418	37 701	37 948	38 193	38 380	38 681	3 581	1,0%

<sup>1</sup> Pointe normalisée pour les conditions climatiques et les autres conditions d'occurrence de la pointe d'hiver que sont la date, le jour de la semaine et l'heure.

## 2.1.6 Comparison with the Last Status Report of the 2005-2014 Plan

### 2.1.6.1 Projection of Sales by Sector

The projection of electricity sales has been reduced compared with the last status report until 2013. The initially considerable variance (-4.0 TWh for 2008) lessens throughout the years and becomes positive in 2014. This situation stems from the closure of the Norsk Hydro plant, difficulties in the pulp and paper sector, and the decreased performance of small and medium businesses in the industrial sector. Nonetheless, sales projections for all other sectors, which are superior to those indicated in the last status report over the period covered, and a growth in sales in the industrial sector gradually overturn the negative variance.

### 2.1.6.2 Projection of Energy and Capacity Requirements

Due to changes in sales projections, energy requirements projected in the Plan are inferior to those found in the last Status Report until 2013 and they ultimately achieve a positive variance of 0.2 TWh in 2014.

However, capacity requirements are superior to those found in the last Status Report beginning in the winter period 2009-2010. The increase reaches 70 MW in winter period 2010-2011 and 280 MW in the winter period 2013-2014 in spite of the revised temperature average which, taken in isolation, reduces requirements by 370 MW.

This result stems mainly from the change in the allocation of projected sales: fewer sales in the industrial sector and, especially, more sales in other sectors, namely to meet heating needs that are very present during peak periods. The following Table makes it possible to identify the sectors to which the increase in requirements can be attributed, while isolating the impact of the change in the average temperature.

TABLE 2.5

## Evolution of Sales and Capacity Requirements since the Last Status Report

	Année 2011		Année 2014	
	Ventes (TWh)	Besoins en puissance à la pointe d'hiver <sup>1</sup> (MW)	Ventes (TWh)	Besoins en puissance à la pointe d'hiver <sup>1</sup> (MW)
Normale climatique	-0,8	-370	-0,8	-370
Industriel <sup>2</sup>	-3,0	-300	-1,6	-130
Autres secteurs	2,3	730	2,7	780
<b>TOTAL<sup>3</sup></b>	<b>-1,5</b>	<b>70</b>	<b>0,3</b>	<b>280</b>

<sup>1</sup> Winter peak ending on the year indicated.

<sup>2</sup> Includes a revision of the projected consumption profile for a customer in the smelting and refining sector. This revision contributes, for equal amounts of energy, to an increase in capacity requirements of 80 MW. Without this modification, the reduction in the industrial sector would have been 380 MW in 2010-2011 and 210 MW in 2013-2014.

<sup>3</sup> Totals are calculated from non-rounded numbers to the tenth TWh or to the tenth MW and they cannot correspond to the sum of rounded values presented in the Table.

## 2.2 Demand Variances

The analysis of demand forecasts presented in the previous sections dealt with energy requirements according to the average scenario under normal climate conditions. However, these requirements are subject to significant variances that can be divided into two types:

- Variances resulting from weather conditions;
- Projected demand variances (under normal weather conditions).

Since the energy reliability criterion is applied over a five-year period, variances regarding energy requirements are shown until 2012 (see Table 2.6). For similar reasons, variances in capacity requirements are shown until the winter period 2010-2011, since the capacity reliability criterion uses a four-year period (see Table 2.7).

The detailed results regarding the evaluation of variances are presented in section 2 of annex 2B.

**Weather variances** represent the impact of climate conditions on electricity requirements compared to the scenario based on normal climate conditions.

For 2012, weather variances for energy lead to a typical variance of 1.9 TWh. As for capacity, the impact of climate conditions on requirements during the winter peak 2010-2011 leads to a typical variance of 1 570 MW. Results are roughly the same over the Plan period.

**Projected demand variance** stem from the impossibility of perfectly projecting the evolution of economic, demographic and energy variables as well as from the intrinsic errors of modeling the impact of these variables on electricity demand forecasts.

The overall variance is defined by the independent combination of weather variances and the projected demand variance.

**TABLE 2.6**  
**Variances in Energy Requirements**  
**Typical Case in TWh**

	2008	2009	2010	2011	2012
Aléa climatique	1,9	1,9	1,9	1,9	1,9
Aléa sur la demande prévue (à conditions climatiques normales)	2,9	4,0	5,3	6,2	7,1
Aléa global	3,4	4,4	5,7	6,5	7,3

**TABLE 2.7**  
**Variances in Capacity Requirements during Winter Peak**  
**Typical Case in MW**

	2007- 2008	2008- 2009	2009- 2010	2010- 2011
Aléa climatique	1 540	1 540	1 560	1 570
Aléa sur la demande prévue (à conditions climatiques normales)	640	880	1 120	1 330
Aléa global	1 660	1 770	1 920	2 060

The overall variance in capacity requirements in the Plan is superior by approximately 240 MW to the one indicated in the last status report. This is essentially due to greater weather variances. The increase in this variance is mainly the result of adding the winter periods 2000-2001 to 2005-2006 (new

temperature average) to the previous climate reference period. In fact, the peaks resulting from the climate conditions of these six additional winter periods leads to weather variances that are clearly superior to the winter peaks over the period 1971-2000. Moreover, the upward revision of total heating consumption also contributes, to a certain extent, to the increase in weather variances.

As stated in section 3.2, the revision of variances on peak requirements directly affects the capacity requirements that must be met to respect the reliability criterion. Therefore, when the impact of the revision of power demand is coupled with the impact of the variance, the increase in capacity requirements is 300 MW in 2010-2011 and 520 MW in 2013-2014.

### 3. DISTRIBUTOR'S RELIABILITY AND REQUIREMENTS

#### 3.1 Regulatory Context of reliability in Quebec

In August 2005, a new act respecting energy came into effect in the United States, the *U.S. Energy Policy Act of 2005*. Its adoption followed up on, among other things, recommendations made by a Canadian-American working group that was formed following the blackout of August 14, 2003. In general, the new legislation seeks the implementation of reliability standards and compulsory control measures for all the inter-connected networks in North America. The recent modifications to the *Act respecting the Régie de l'énergie*<sup>2</sup>, adopted in December 2006, give the Régie the necessary powers to monitor the application of new reliability standards in Quebec. Finally, on August 14, 2007, the Régie rendered a decision<sup>3</sup> designating Hydro-Québec TransÉnergie's System Control as Quebec's reliability coordinator. The responsibilities of the reliability coordinator include submitting reliability standards to the Régie, identifying the organizations that are subject to the standards and developing criteria for corrective action.

More specifically, in terms of respecting the capacity reliability criterion, it is the Distributor's responsibility to demonstrate to the Régie that it has sufficient resources to meet its requirements. To this end, it must also provide the necessary certification of the reliability of supply of heritage electricity. Since 2005, it must also report to the NPCC on the reliability of supply in the control area of Quebec.

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<sup>2</sup> *Act concerning the implementation of Quebec's energy strategy and modification to several legislative provisions*, L.Q. 2006, c46.

<sup>3</sup> Decision D-2007-95.

### 3.2 Capacity Reliability Criterion

To ensure its capacity reliability, the Distributor must keep a reserve to face demand variations and the potential deficiency of its resources. The reserve must be sufficient to respect the capacity reliability criterion of the Northeast Power Coordinating Council (NPCC), which requires that the loss of load probability in a control area does not exceed one day in ten years,<sup>4</sup> which is equivalent to a load shedding probability of 0.1 day per year.

Since the Electricity Supply Plan 2005-2014, the Distributor revised its reserve margins<sup>5</sup> to take into account: changes in its capacity requirements, the revision of variances that affect those requirements, as well as new resources deployed.

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<sup>4</sup> The NPCC criterion is stated as follows :

Resource Adequacy – Design Criteria

Each Area's probability (or risk) of disconnecting any firm load due to resource deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation (LOLE) of disconnecting firm load due to resource deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and derating, forced outages and deratings, assistance over interconnections with neighbouring Areas and Regions, transmission transfer capabilities, and capacity and/or load relief from available operating procedures.

Source: NPCC Document A-2 «Basic Criteria for Design and Operation of Interconnected Power Systems», revised: May 6, 2004.

<sup>5</sup> Reserve margins are defined by the quotient of the reserve requirements by the Distributor's capacity requirements.

**TABLE 3.1**  
**Evolution of Reserve Margins Requirements to**  
**Respect the Capacity Reliability Criterion**

	Année courante	+ 1 an	+ 2 ans	+ 3 ans
Plan d'approvisionnement 2005-2014 (Électricité patrimoniale)	8,8%	9,2%	9,5%	10,1%
État d'avancement 2006 (Distributeur)	8,8%	8,9%	9,2%	9,7%
Plan d'approvisionnement 2008-2017 (Distributeur)	9,8%	10,2%	10,6%	11,0%

Table 3.1 shows the evolution of the reserve margins since the Electricity Supply Plan 2005-2014 was submitted. The reserve margins used at the time ensured the reliability of heritage electricity for up to four years. These reserve margins were obtained following work that was carried out jointly with Hydro-Quebec Production. At the time, the results indicated that reserve requirements associated with heritage electricity were 3 100 MW. In the 2005 Status Report, the Distributor used a reserve margin that was identical to the one used for heritage electricity and applied it to all its requirements.

In its 2006 Status Report, the Distributor had undertaken its own work in view of setting reserve margins that reflect its specific situation, particularly in regards to the characteristics of heritage and post-heritage resources that are at its disposal.

In the current Plan, the Distributor uses a similar approach to the one used in the 2006 Status Report. However, reserve margins are now higher than those found in the 2006 Status Report. Expressed as percentages, the increase ranges from between 1.0% to 1.4%, while in megawatts the increase is between 310 and 515

MW, in accordance with the period covered. Two significant changes explain the primary reasons for this increase: the revision of variances in capacity requirements and a change in the treatment of the reserve associated with the interruptible power option.

### **Revision of Variances on Capacity Requirements**

Compared to the 2006 Status Report and in compliance with the information provided in section 2.2, the overall capacity variance is higher by approximately 240 MW. This increase in the capacity variance has a direct impact on reserve requirements. It leads to a 0.6% increase of the reserve margin.

### **Changes in the Treatment of the Reserve Associated with Interruptible Power**

The Distributor has made a change to its treatment of the reserve associated with the interruptible power option in order to harmonize its practices with those used in the reliability exercises presented to the NPCC. From now on, the reserve applied to the interruptible power option will be calculated into the reserve requirements whereas it was formerly taken into account by subtracting this option's contribution from the capacity balance.<sup>6</sup>

This change does not have any impact, neither in terms of reliability nor in terms of additional supply requirements. One megawatt of interruptible power has the same value in the capacity balance than it did in the 2006 Status Report. The change only affects the way the balance is presented: the increase in reserve margins is directly compensated by an increase in the value of the electricity option included in the capacity balance.

The impact of this change on the reserve margin varies from 0.5% to 0.7%, depending on the period covered. It is lesser during the winter period 2007-2008

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<sup>6</sup> Given the constraints linked to the use of interruptible power, a reserve of 30 % is applied to the capacity the Distributor can interrupt.

because the Distributor requires less interruptible power than in subsequent years to balance its capacity balance.

### Required Capacity Including Reserve

Finally, total capacity requirements are obtained by adding the reserve requirements to the Distributor's capacity requirements. Total capacity requirements including reserve requirements are shown in table 3.2.

**TABLE 3.2**  
**Total Capacity Requirements to Respect the Capacity Reliability Criterion**  
**(in MW)**

	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017
Besoins à la pointe visés par le plan	35 968	36 219	36 851	37 129	37 418	37 701	37 948	38 193	38 380	38 681
+ Réserve pour respecter le critère de fiabilité	3 538	3 705	3 900	4 083	4 118	4 147	4 174	4 201	4 222	4 255
Taux de réserve requis	10%	10,2%	10,6%	11,0%	11,0%	11,0%	11,0%	11,0%	11,0%	11,0%
= Puissance requise incluant la réserve	39 506	39 924	40 757	41 212	41 534	41 848	42 123	42 394	42 602	42 936

### 3.3 Energy Reliability Criterion

The largest portion of the Distributor's supply comes from heritage electricity supplied by Hydro-Quebec Production, whose generating facilities are almost only hydraulic. The Distributor must therefore ensure that its main supplier is able to meet its obligations while respecting the reliability standards approved by the Régie.

Moreover, the use of an energy reliability criterion is a singularity of Quebec's generating facilities and it is related to the almost exclusive use of hydroelectric means of power generation whose energy inflows are subject to variances.

This issue does not arise for networks in which a large proportion of means of power generation use fossil fuels. Those networks can increase their fuel supply as needed and thereby generate all the energy required. In those cases,

compliance with the capacity reliability criterion is sufficient to meet both energy and capacity requirements by assuming that fuel supply is ensured.

### **3.3.1 Energy Reliability Criterion Applicable to Hydro-Quebec Production**

The reliability criterion currently used by Hydro-Quebec Production consists of having the required means to face energy inflow deficits with a probability of occurrence of at least 2%, meaning cumulative deficits of 64 TWh over two (2) years or 98 TWh over four (4) years.

In decision D-2005-178 pertaining to the Electricity Supply Plan 2005-2014, the Régie ordered the Distributor to complete the information provided regarding the energy reliability criterion that applies to Hydro-Quebec Production's supply. This information is provided in annex 3B.

Finally, the administrative follow-up required that a demonstration of the respect of the 2% criterion be filed and made public in November, in May and in August of every year. The one filed in August 2007 is provided in annex 3C and the one for November will be submitted to the Régie shortly.

### **3.3.2 Energy Reliability Criterion Applicable to the Distributor**

The Distributor's energy reliability criterion, as approved by the Régie, is the following:

*“Respecting a scenario of requirements that falls within a typical variance beyond the average five-year horizon (including demand and weather variances) without entailing a dependence on short-term markets outside Quebec exceeding 5 TWh per annum.”*

As mentioned in section 2.2, the overall variance on energy requirements totals 7.3 TWh over a five-year period. To cover this variance, dependence on short-term markets outside Quebec is limited to 5 TWh.<sup>7</sup> In order for the Distributor to achieve balance, a variance of 2.3 TWh must be met primarily by turning to the

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<sup>7</sup> On this subject see annex 3A pertaining to import capacity from interconnections.

short-term market in Quebec. As shown in Table 3.3, over a five-year period, the need to turn to short-term markets in Quebec reaches a maximum of 2.5 TWh.

**Table 3.3**  
**Means Employed to Respect**  
**the Energy Reliability Criterion**  
**(in TWh)**

	2007	2008	2009	2010	2011	2012
Approvisionnement <sup>1</sup> additionnels requis en énergie (réf. Tableau 6.1)	(2,1)	(5,8)	(2,8)	(0,3)	(0,1)	0,2
+ Ajés d'un écart-type (réf. Tableau 2.6) <sup>1</sup>		3,4	4,4	5,7	6,5	7,3
Approvisionnement <sup>1</sup> additionnels requis en énergie + 1 écart-type	(2,1)	(2,2)	1,6	6,4	6,4	7,6
- Contribution des marchés de court terme hors-Québec	-	-	1,5	5,0	5,0	5,0
= Achats requis sur les marchés québécois de court terme	-	-	-	0,4	1,4	2,5

<sup>1</sup> including demand and weather variances

The potential contribution of Quebec markets is linked to the availability of power generation that is not bound by long-term contracts. This power generation exists and two power generators are able to supply the Distributor in case of need. On the one hand, Hydro-Quebec production projects a leverage of over 15 TWh beyond its firm commitments<sup>8</sup> once new generating projects are completed. On the other hand, Énergie Brookfield also has generating facilities in Quebec and can potentially contribute to meeting the Distributor's requirements.

Moreover, it is worth noting that previous experience has also demonstrated the significant ability of markets outside of Quebec to meet energy requirements.

<sup>8</sup> Hydro-Québec Strategic Plan 2006-2010, page 16.

### **3.4 Reliability of the Transmission Network**

#### **3.4.1 Justification for the Network Design Criterion**

The transmission system is designed to ensure it has the capacity to transmit the required electricity under the average demand scenario, in addition to 4 000 MW. This additional capacity corresponds to the impact of the overall (weather and projected) variance on peak capacity requirements, in which two typical variances are considered. The application of this criterion also implies that up to 1 000 MW can be supplied by interconnections or interruptible power.

It is also important to specify that this criterion only applies to native load supply and any commitment on behalf of Hydro-Québec TransÉnergie to render a firm point-to-point service is additional to the projected capacity for peak native load.

#### **3.4.2 Means Used by Hydro-Quebec TransÉnergie to Respect the Criterion**

In 2004, Hydro-Québec TransÉnergie began the updating processes and projects required to ensure compliance with the design criterion. These projects have made it possible to increase the reliability of the transmission system by adding a limited number of shunt capacitor banks. Henceforth, the costs of maintaining that level of system reliability are allocated to the new integrated resources for which a firm transmission service is required.

## **4. EXISTING SUPPLY OR SUPPLY IN PROCESS OF ACQUISITION**

### **4.1 Supply Under Contract**

The maximum contribution of heritage electricity to the energy balance is 178.9 TWh. The delivery of heritage electricity is characterized by an established annual profile of hourly values for capacity, classified in descending order. Maximum power for the profile is set at 34 342 MW. Heritage electricity includes all the services required and generally recognized to ensure security and reliability. A detailed description of these services is included in annex 4A. These services namely include provisions concerning resource planning for capacity. These provisions make it possible to determine that Hydro-Quebec Production will maintain a planning reserve of 3 100 MW, beyond the maximum value set out in the profile for delivery of heritage electricity. The Distributor has also concluded a framework agreement with Hydro-Quebec Production in order to set prices for electricity volumes that are mobilized in excess of heritage electricity.

To date, the Distributor has also signed 14 long-term supply contracts for an installed capacity of more than 2 150 MW. All these contracts were achieved through tendering processes. Table 4.1 summarily shows the contribution of contracts that were signed, grouped according to the call for tenders by which they were concluded. Annex 4B provides the main characteristics of each contract and their contribution to the energy and capacity balance over the Plan period.

**TABLE 4.1**  
**Signed Long-Term Contracts , Grouped By Call for Tenders**

	Nombre de contrats	Puissance contractuelle totale (MW)	Puissance à la pointe <sup>1</sup> (MW)	--- Livraisons prévues d'énergie (TWh) ---					
				2008	2009	2010	2011	2012	2013 et suivantes
A/O 2002-01 - Toutes sources d'énergie	3	1107 + 40 en pointe	1147	9,8	9,3	9,3	9,1	9,0	9,3
A/O 2003-01 - Biomasse	2	entre 33 et 36 selon les mois	36	0,3	0,3	0,3	0,3	0,3	0,3
A/O 2003-02 - Éolienne	8	990	347	0,7	1,1	1,9	2,2	2,7	3,0
A/O 2004-02 - Cogénération	1	8	8	0,0	0,1	0,1	0,1	0,1	0,1
<b>TOTAL</b>	<b>14</b>		<b>1538</b>	<b>10,5</b>	<b>10,7</b>	<b>11,6</b>	<b>11,7</b>	<b>12,1</b>	<b>12,7</b>

1- The capacity values reflect the contribution of contracts when deliveries will have begun. In addition, peak capacity available coming from wind power includes the contribution of the integration agreement.

The Distributor also has a five-year wind power integration agreement, which will reach its term in 2011, which is made up of two parts: a balancing service and a firming-up capacity service. This agreement will make it possible to transform wind power deliveries into a uniform source of supply, at an hourly delivery rate corresponding to 35% of the contractual capacity of commissioned wind farms. It will also make it possible to count on equivalent firm capacity and to protect itself against the eventual cost of increasing reserve requirements. The capacity balance in section 5 accounts for the contribution of the wind power integration agreement.

### **Commencement of Projects from the First Call for Tenders for Wind Power and their Integration with the Local Transmission Network**

In Gaspésie, the construction of the eight wind farms that resulted from call for tenders CT 2003-02 for 990 MW continues.

The Baie-des-Sables wind farm came into service at the end of November 2006. In November 2007, the Anse-à-Valleau will be added to the projects that have commenced operation, bringing the capacity of wind farms that are in operation

to 210 MW. Nonetheless, the second wind farm, from the promoter Cartier Énergie, is behind schedule by one year.

The construction work for the Carleton wind farm will begin in the fall of 2007, once the required authorization is obtained. According to the schedule provided in the contract, it will come into service in December 2008.

Moreover, the St-Ulric/Saint-Léandre wind farm, which was originally scheduled to come into service in the fall of 2007, is instead expected to come into service in December 2009. As the promoter, Northland Power, had difficulty obtaining the required authorizations, the schedule must be revised.

The Transmission Provider concurrently carries out work to reinforce the transmission system and connect the wind farms commissioned in stages over 7 years. Investments will be made according to the construction schedule of the wind farms. Work will be carried out gradually until December 2012, when phase 2 of the wind farm Gros-Morne comes into service.

The plan for the integration of 990 MW of wind power in Gaspésie with the transmission system led to an agreement between the Transmission Provider and the Distributor aimed at harmonizing investments for transmission and the effective implementation of wind farms by promoters. Namely, this agreement sets deadlines for major investments in the regional network of Gaspésie in order to ensure that start-up dates for the work that will be carried out are as close as possible to the effective dates of delivery.

#### **4.2 Call for Tenders that are in Progress**

Only one long-term call for tenders is in progress: the one aimed at purchasing 2 000 MW of wind power. It was launched in October 2005 and corresponds to the second block of wind power ordered by decree by the Government of Quebec. Submissions began on September 19, 2007 and the Distributor received 66 offers totalling 7 724 MW.

The Distributor will announce the tenders selected in the coming months and it expects to sign contracts in the spring of 2008.

The energy balance and the capacity balance show a contribution of these projects based on a guaranteed delivery rate of 30% of installed power capacity, and an equivalent contribution in capacity. The contribution in capacity could come from either a balancing agreement or the individual contribution of windmills.

### **4.3 Upcoming Calls for Tenders**

The Government announced its intention to go ahead with a block of energy from biomass cogeneration.<sup>9</sup> This entails the delivery of 100 MW generated from the cogeneration of biomass, with a delivery start date that is no later than the end of 2011. Furthermore, in the Quebec energy strategy, released in 2006, “the Government has also announced a further call for bids for the supply of 500 MW...”.<sup>10</sup> The wording of the policy indicates that this call for tenders will be aimed at wind projects developed by regional county municipalities and First Nations. Deliveries could begin in December 2011 and increase at a rate of 100 MW per year until the objective is met. For planning purposes, energy and power quantities resulting from this call for tenders were added to the Distributor’s balance, as shown in section 5.1.

Moreover, the Distributor excludes any contribution stemming from eventual tendering processes that fall within the *Regulation respecting the energy generated from cogeneration*.<sup>11</sup>

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<sup>9</sup> Ref.: <http://communiqués.gouv.qc.ca/gouvqc/communiqués/GPQF/Mai2007/10/c7424.html>

<sup>10</sup> Government of Quebec, ministère des Ressources naturelles et de la Faune, *Using Energy to Build the Quebec of Tomorrow*, Quebec energy strategy, 2006, page 32.

<sup>11</sup> *Règlement sur l'énergie produite par cogénération*, (2003), G.O. II, 5666

**Micro-Generation**

Following the entry into force of recent modifications made to the *Act respecting the Régie de l'énergie*,<sup>12</sup> the Distributor, within a program to purchase electricity generated from a renewable source for which the terms have been approved by the Régie, can purchase electricity from a power generator without being subject to the tendering process.

The maximum size of eligible projects must be determined by government regulation. Therefore, once the regulation is adopted, the Distributor will propose the terms applicable to this purchase program to the Régie.

Given the uncertainty of this type of project, no contribution has been included in the Distributor's balance.

**4.4 Revenues from the federal program EcoENERGY given to wind power producers**

The Canadian government's "EcoENERGY for Renewable Power Program"<sup>13</sup> announced on January 19, 2007, offers eligible projects, namely wind power projects, an incentive premium of 1 cent per kilowatt hour of power generation for 10 years. Projects must be commissioned before March 31, 2011.

In compliance with the long-term supply contracts signed by the distributor with wind power producers and approved by the Régie,<sup>14</sup> suppliers have committed to give the distributor 75% of all grants received within government incentive programs for renewable energy.

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<sup>12</sup> *Loi concernant la mise en oeuvre de la stratégie énergétique du Québec et modifiant diverses dispositions législatives*, L.Q. 2006, c.46.

<sup>13</sup> For further details go to <http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/power-electricite/conditions-eng.cfm>

<sup>14</sup> Decision D-2005-129.

Given the projected commissioning schedule of wind farms under contract as a result of call for tenders CT 2003-02 (Wind 990 MW) and the delivery start date associated with call for tenders CT 2005-03 (Wind 2 000 MW), it is expected that almost 900 MW will be admissible to grants within this program. The granting of 31 million dollars over 10 years, to Cartier Énergie Éolienne, has already been announced for the Baie-des-Sables wind farm. In compliance with the contract provisions signed with the promoter, the Distributor will receive 23 million dollars, which will reduce the cost of supply in coming years.

#### **4.5 Means to Meet Peak Requirements**

##### ***4.5.1 Interruptible Power***

Interruptible power contracts signed for load supply during the winter period 2007-2008 make it possible for the Distributor to interrupt loads up to 550 MW. This amount of capacity is lower to the one proposed by customers because it has been adjusted according to projected requirements for the winter period 2007-2008. However, on the longer term the Distributor assumes a contribution of 800 MW, which corresponds to the capacity proposed by customers.

##### ***4.5.2 Emergency Generators***

The current experience with emergency generators is, for now, not very conclusive. The program has generated little interest among owners of emergency generators and its contribution is insufficient to appear in the capacity balance. Depending on how the interest in this program evolves, and the amount of capacity the Distributor can mobilize, the future of this option or its terms may be re-examined.

#### ***4.5.3 Step-Down Voltage***

Since the last supply plan was filed, an initial set of trials have made it possible to perform a diagnostic regarding the state of step-down voltage equipment installed in the Transmission Provider's stations. Initiatives have been implemented jointly by the Distributor and the Transmission Provider in order to make some changes to existing step-down voltage equipment and to add new equipment. Trials conducted during the winter periods 2005-2006 and 2006-2007 were conclusive and they have made it possible for the Distributor to include a contribution of 250 MW in its capacity balance, as a result of step-down voltage. This currently makes it possible for the Distributor to ensure persistence over a period of approximately two hours. Joint tests and follow-ups by the Distributor and the Transmission Provider will be carried out in order to increase the persistence of this means.

#### ***4.5.4 Sharing Capacity Reserve and Contribution of Short-Term Markets to Capacity***

Beyond long-term transactions and programs requiring customer participation such as interruptible power and emergency generators, the Distributor can purchase capacity in short-term markets. Some suppliers of this service are located in Quebec (Hydro-Quebec Production or Énergie Brookfield), while other potential suppliers are located outside Quebec.

Depending on the leverage in neighbouring control areas during the winter months, it is possible to count on a portion of the installed capacity outside Quebec in case of need.

For planning purposes, the Distributor uses a contribution based on sharing capacity reserve for 500 MW. This evaluation can be considered prudent since the Distributor can also count on the installed capacity in Quebec that is not

bound by contractual agreement. A more detailed justification of this potential can be found in annex 4D.

## 5. ADDITIONAL SUPPLY AND STRATEGY

### 5.1 Evaluation of Additional Supply Requirements

The balances presented in sections 5.1.1 and 5.1.2 are derived from requirements presented in sections 2 and 3 and the means that are reserved at present are described in section 4.

#### 5.1.1 Energy Balance

**TABLE 5.1**  
**Energy Balance**  
**in TWh**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Besoins visés par le plan - après Efficacité énergétique	198,2	183,8	188,7	190,2	191,5	193,0	194,9	195,3	197,7	199,0	200,8
- Volume d'électricité patrimoniale	178,9	178,9	178,9	178,9	178,9	178,9	178,9	178,9	178,9	178,9	178,9
= Approvisionnements additionnels requis au-delà du volume d'électricité patrimoniale	7,4	5,0	7,0	11,3	12,6	16,0	16,0	17,4	18,9	21,0	22,0
- Approvisionnements non patrimoniaux	0,8	10,5	10,7	11,7	12,7	14,7	16,5	17,7	18,9	20,0	20,0
• Contrats signés :											
- Contrats Éoliens 600 MW	0,4	0,7	1,1	1,9	2,2	2,7	3,0	3,0	3,0	3,0	3,0
- Contrats Autres sources d'énergie	9,0	9,9	9,7	9,7	9,5	9,4	9,7	9,7	9,7	9,7	9,7
• Appel d'offres éolien en cours - 2000 MW	-	-	-	0,1	0,9	1,7	2,8	3,5	4,4	5,3	5,3
• Appels d'offres à venir											
- Cogénération - Biomasse (100 MW - Dec. 2011)	-	-	-	-	0,1	0,7	0,7	0,7	0,7	0,7	0,7
- Éolien (500 MW - Municipalités & Communautés)	-	-	-	-	0,0	0,3	0,5	0,5	1,1	1,3	1,3
= Approvisionnements additionnels requis/Surplus	(2,1)	(5,6)	(2,9)	(0,3)	(0,1)	0,2	(0,5)	(0,3)	(0,0)	0,9	2,0

The main observations that can be derived from the analysis of the energy balance are:

- Significant surpluses are projected for 2008 and 2009
- Starting in 2010, the balance is, by and large, balanced.

Moreover, the comparison with the Electricity Supply Plan 2005-2014 and the most recent status reports shows that the provision for “management of supply in real time” was removed. The Distributor recognizes that, in a situation in which annual energy requirements are exactly equivalent to long-term means that are in place, it is difficult to balance, hour by hour, customer requirements with available means. A portion of the 8 760 values that make up heritage electricity could remain unused, thereby creating a reduction in available means.

However, the experience acquired by the Distributor demonstrates that planning to secure long-term contracts for such requirements is undesirable, as these are very volatile. Moreover, given the context in which demand is greater than expected and more intensive use of very flexible means such as purchases on the hourly market, the quantity of heritage electricity that is not consumed is negligible and flexibility can be provided by the short-term purchases required to restore equilibrium in the balance.

## 5.1.2 Capacity Balance

**TABLE 5.2**  
**Capacity Balance**  
**in MW**

	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015- 2016	2016- 2017
Besoins à la pointe visés par le plan	35 968	36 219	36 851	37 129	37 418	37 701	37 948	38 193	38 380	38 681
+ Réserve pour respecter le critère de fiabilité <i>Taux de réserve requise</i>	3 538 9,8%	3 705 10,2%	3 906 10,6%	4 083 11,0%	4 116 11,0%	4 147 11,0%	4 174 11,0%	4 201 11,0%	4 222 11,0%	4 255 11,0%
- Électricité patrimoniale (incluant réserve)	37 442	37 442	37 442	37 442	37 442	37 442	37 442	37 442	37 442	37 442
= Puissance requise au-delà de l'électricité patrimoniale	2 064	2 482	3 315	3 770	4 092	4 406	4 681	4 952	5 160	5 494
- Approvisionnements non patrimoniaux	2 057	2 353	2 458	2 583	2 859	3 033	3 168	3 303	3 438	3 438
• Contrats signés <sup>(1)(2)</sup>	1 257	1 303	1 408	1 443	1 499	1 538	1 538	1 538	1 538	1 538
• Appel d'offres éolien en cours - 2000 MW <sup>(2)</sup>	0	0	0	90	180	285	390	495	600	600
• Appels d'offres à venir										
- Cogénération-Biomasse (100 MW - Déc. 2011)	0	0	0	0	100	100	100	100	100	100
- Éolien (500 MW - Municipalités & Communautés)	0	0	0	0	30	60	90	120	150	150
• Électricité interruptible <sup>(3)</sup>	550	800	800	800	800	800	800	800	800	800
• Abaissement de tension	250	250	250	250	250	250	250	250	250	250
= Puissance additionnelle requise	0	130	860	1 190	1 230	1 370	1 510	1 650	1 720	2 060
• Contribution des marchés de court terme (Partage de réserve)	0	130	500	500	500	500	500	500	500	500
= Puissance additionnelle requise	0	0	360	690	730	870	1 010	1 150	1 220	1 560

- (1) including additional capacity for 40 MW during the winter period due to contract with TCE  
(2) according to hypotheses of contribution of 35% for Wind (990 MW) and 30% Wind (2000 MW)  
(3) For the next peak, quantities were reduced to avoid exceeding requirements

The main observations that can be derived from the analysis of the capacity balance are:

- Significant additional requirements appear for the first time in 2009-2010;
- The contribution of the 2000 MW of wind power to the capacity under discussion and the upcoming call for tenders for an additional 500 MW of wind power is set at 30% of installed capacity. It may come from a wind power integration agreement, comparable to the one in effect, from the contribution of windmills, or a combination of both;

- Despite the contribution to capacity of wind power integration services, additional supply requirements for capacity exceed 1 000 MW in 2010-2011 and 1 500 MW in 2013-2014.

Detailed information regarding the profile of additional supply requirements, such as classified capacity curves and monthly volumes, is provided in annex 5A.

## **5.2 Projected Short-Term Strategy**

### ***5.2.1 Energy Requirements***

Given the surpluses anticipated for 2008-2009, the Distributor took measures to dispose of some quantities of electricity that are currently under contract and not required to meet load requirements in Quebec.

Therefore, at the time of publication of the Plan, the Distributor had concluded an agreement in principle with TransCanada Énergie (TCE) to suspend deliveries from the cogeneration plant in Bécancour. Suspending deliveries makes it possible to attenuate the market risks associated with resale and facilitates the disposal of remaining excess energy.

This agreement is conditional to the Régie's approval and is applicable throughout 2008. It makes it possible to reduce the Distributor's surpluses by 4.3 TWh and to limit anticipated resale in 2008 to 1.3 TWh.

Resale activities may rely on different means such as:

- Tendering processes with counterparties who have concluded a Master Agreement with Hydro-Quebec Distribution;
- Mutual agreements concluded with the latter.

As a last resort, the Distributor can also use the option of not programming the contract for cycling deliveries signed with Hydro-Quebec Production or to resell remaining quantities in electricity markets of neighbouring control areas.

For 2009, the Distributor will analyze the situation according to the prevailing market parameters. It may renew the agreement concluded with TCE or proceed to the resale of excess quantities in short-term markets.

In all cases, among all means at the Distributor's disposal priority will be given to actions that are most likely to reduce the total annual cost of supply.

### ***5.2.2 Capacity Requirements***

The supply of new capacity requirements in the short-term essentially relies on the use of interruptible power and capacity purchases in short-term markets.

The contribution of short-term markets, for the purpose of planning required means, is 500 MW. This contribution is essentially linked to sharing capacity reserve and it would mainly come from the New York market.

In compliance with previously detailed practices, the Distributor ensures access to these resources by purchasing firm-capacity products on short-term markets. In that way, capacity requirements are re-evaluated for each year according to the projected capacity balance for the upcoming peak. Moreover, it is important the Distributor preserve guaranteed access to the New York network, the only one to have implemented a competitive market for this type of service and with an interconnection capacity that is currently maintained during peak periods. Therefore, Hydro-Québec Distribution specified a capacity of 500 MW to Hydro-Québec TransÉnergie for imports on the interconnection with New York as the resource required to supply native load. It did this to ensure that the export capacity remains available in the long-term for supply during the system's peak.

### **5.3 Projected Long-Term Strategy**

#### **5.3.1 Energy Requirements**

After launching the tendering process for the block of energy determined by government regulation, the energy balance will have achieved equilibrium and no additional call for tenders will be required over the planning period.

#### **5.3.2 Capacity Requirements**

The means currently deployed to meet capacity requirements during peak periods are generally used for a limited number of hours per year. This is particularly the case for interruptible power and step-down voltage. However, to meet requirements that are superior by 1 000 MW to 1 500 MW to those of peak periods, it is necessary to turn to other means that can be used over a large number of hours and that are able to produce large amounts of energy during the winter period. It is therefore important that the next capacity supplies have few restrictions in terms of the numbers of hours of use.

To restore capacity balance in the long-term, the Distributor intends to take a series of actions in the following order of priority:

##### **1. Increasing the use of currently used means**

In particular, the Distributor intends to explore the possibility of increasing the contribution of two means that are currently favoured. These are the interruptible power option and the potential for purchases on short-term markets.

Year after year, the **interruptible power** program generates a considerable amount of interest among targeted customers. Interruptible power quantities proposed to the Distributor are in the range of 800 MW. Every year, some customers abandon the program while others subscribe. The Distributor concludes that the technical means for interruptions are in

place in the industry and it would be possible, if needed, to increase the contribution of this kind of program. The possibility of counting on 1 000 MW - that is, 200 MW more than at present – will be explored.

The purchase potential for firm capacity on **short-term markets** that is included in the balance is conservative (see explanations in annex 4D). This conclusion is based on the Distributor's previous experience, particularly given that a total of 1 259 MW of capacity was purchased in January 2006. However, the Distributor must be cautious in its evaluation of the potential contribution of this type of means for the following reasons:

- It appears imprudent to depend too strongly on control areas outside Quebec, especially in a situation in which only one or two interconnections grant access to markets in which this type of product is transited on a commercial basis;
- Even if the new interconnection with Ontario gives access to an additional market, the capacity balance and the objectives of the Ontario Power authority leave little leverage so that a portion of installed capacity, in this market, can contribute to meeting requirements in Quebec.

## **2. Exploring consumption management options**

The issue is to define the available potential in terms of consumption management including, in particular, the cost of available means, the effects of load pick-up, if applicable, as well as the penetration potential for each measure.

Based on preliminary evaluations, the primary potential is related to the installation of electric thermal storage equipment among customers in the commercial and institutional sector. Preliminary evaluations indicate that the theoretical potential is approximately 200 MW. However, further

analyses will be carried out in the coming months in order to evaluate the portion that can be developed for commercial purposes over a 3 to 5 year horizon as well as to estimate the impact of this measure on the Distributor's capacity balance.

### **3. Launching a tendering process**

Once the Distributor has evaluated the previously mentioned means and has reinforced the projected capacity requirements in the last demand forecast, it will begin to prepare a tendering process for deliveries during the hours in which Quebec consumption is strongest. Available information currently indicates that the load factor of the means that are considered could be high. Considering the extent of requirements and based on the information that is available at present, a tendering process appears inevitable.

The steps that precede the launch of a tendering process will begin with the characterization of residual requirements to be met. Then, once this exercise is carried out, the following activities can take place:

- Precisely defining the product that is sought, in terms of the monthly load factor, the time of year during which the product must be available, the start-date of deliveries, duration of contracts, etc.;
- Developing a list of criteria that is specific to the product sought and submitting a grid of the criteria for the analysis of proposals to the Régie for its approval.

### **5.3.3 Conducting long-term tendering processes**

In its decision on the Electricity Supply Plan 2005-2014,<sup>15</sup> the Régie ordered the Distributor to submit bid-selection criteria as well as the methodology used to calculate transmission costs. For the time being, to develop selection criteria is a premature exercise and it would be advantageous to carry it out at the appropriate time, at the time of launch for each tendering process. On the one hand, it is not expected that a long-term tendering process, that is open to all sources of supply, will be launched to meet energy requirements (see section 5.3.1). Moreover, when the legislator defines blocks of energy and expresses environmental and social concerns in a regulation, it becomes necessary to develop an analysis grid and selection criteria that are appropriate to the circumstances.

On the other hand, the Distributor will have to launch a tendering process for new capacity supplies. The singular nature of requirements should entail the development of an appropriate analysis grid. It appears premature to proceed with this development at present, or at least until the additional potential of means presently favoured by the Distributor is explored and an exact profile of residual requirements is defined.

Moreover, the presentation of the methodology used for the evaluation of transmission costs remains relevant since this method would apply equally to a tendering process which follows the adoption of a regulation that determines a block of energy and to a call for tenders aimed at purchasing capacity.

Furthermore, the Régie had ordered the Distributor to examine (see D-2005-178, pages 30-31) the “application of the methodology used to evaluate the cost of connecting new power generating stations with low capacities”. Since the Electricity Supply Plan 2005-2014 was submitted, the Distributor examined the

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<sup>15</sup> Decision D-2005-178.

problems related to the integration of small generating stations and has adopted new frameworks applicable to generating stations that are connected to the distribution network. All the analyses pertaining to transmission costs are provided in annex 5C.

#### **5.4 The Distributor's Short-Term Supply Practices**

In light of the experience acquired in the first years of operational management, the Distributor considers that the efficient management of its supplies is made possible by the contribution of short-term markets. In order to perfect its supply practices, the Distributor will carry out the following actions:

- It will attempt to increase the number of counterparties with which it deals on short-term markets;
- It will harmonize its practices, in terms of conducting tendering processes, with the common practices in the industry;
- It will improve performance of requirement forecasts over the period that covers the current year.

Moreover, current circumstances are such that the Distributor is required to pay particularly close attention to the resale of surpluses.

The Distributor is concerned about maximizing the value of electricity surpluses in its energy balance. It must offer products that are likely to interest the greatest number of counterparties possible. Therefore, Hydro-Quebec TransÉnergie has introduced a new delivery point located within its network. In the same spirit, to counterparties who purchase its energy, Hydro-Quebec Distribution offers the possibility of redirecting deliveries to a point other than the one projected in the initial transaction, under the condition that the new delivery point is located within or borders with Hydro-Québec TransÉnergie's network.

#### **5.4.1 Redefining the Notion of Short-Term**

The Régie ordered the Distributor to revise the definition of short-term.<sup>16</sup>

In accordance with the Régie's comments, transactions carried out by the Distributor under the exemption fall well below the maximum duration that is authorised for this procedure, which is three months. However, the Régie's assertion reflects the Distributor's requirements as they have been manifested recently, but the situation could evolve. These circumstances lead the Distributor to request that the existing terms used to define the application of the exemption from the tendering process be upheld. Supply acquired under the exemption will in fact continue to correspond to the standard products that are generally traded in short-term markets. These are listed in annex 5B.

Moreover, short-term tendering processes for transactions exceeding three months, as defined by the procedure that is in effect at present, differ from common practices in the industry. In order to generate more interest from counterparties, the Distributor will try to streamline its practices while respecting the set procedure, namely by reducing the period between the launch of a tendering process and the time at which quantities are awarded through a contract.

#### **5.4.2 Electronic Platform for the Distributor's Transactions**

In application R-3629-2007, one intervenor reiterated its request for the implementation of an electronic platform for the Distributor's short-term purchases. This platform would be used for all of the Distributor's short-term purchases, including DAM and HAM purchases. Its main characteristics are the following:

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<sup>16</sup> See D-2007-44, pages 7 to 9.

- Posting the Distributor's requirements 36 hours ahead of time;
- Posting the ceiling price the Distributor is willing to pay;
- HQT delivery point;
- Allocation of contracts within 15 minutes.

The characteristics of the electronic platform, as they were suggested, leave significant gaps.

On the one hand, when the Distributor acquires quantities on the New York or New England markets, it already participates in a trading platform. The implementation of another platform would lead to duplication with no added value. In addition, platforms such as those implemented in New York or in New England differ from the model that was recently suggested to the Régie. Each participant must supply information regarding what it is willing to offer and under which conditions, and no other counterparty has access to it. No seller or buyer is required to publicly divulge its marketing or supply strategies.

On the other hand, the Distributor's purchase requirements are the result of an inter-annual arrangement of the 8760 hourly values associated with heritage electricity. Therefore, the Distributor has no interest in being tied to the results of an electronic auction that can have a more or less limited depth. At present, depending on the prices offered by some counterparties, the Distributor could instead choose to increase or reduce the use of heritage electricity during the period in question.

The Distributor wishes to note that nothing in the current rules prevents counterparties that have concluded a Master Agreement with Hydro-Quebec Distribution from offering, without solicitation, quantities of electricity at any given time. The Distributor will take into account these spontaneous offers among the supply options that arise. Before accepting these offers, it will nonetheless consult with other registered counterparties.

In conclusion, given the particular context of Quebec, the implementation of an electronic trading platform would be of no benefit for purchases that fall under the exemption. Also, the nature of such platform does not favour the lowest price to the benefit of consumers.

## 6. INTEGRATING WIND POWER

The integration of 4 000 MW of wind power generation with Hydro-Quebec's network by 2015 is a considerable challenge which Hydro-Quebec intends to overcome. The complementary development of hydroelectricity and wind power is in fact one of the three objectives identified in Hydro-Québec's Strategic Plan 2006-2010. From this objective, specific objectives and strategies are derived and attributed to each division: Hydro-Quebec Distribution, Hydro-Quebec Production and Hydro-Quebec TransÉnergie.

Hydro Quebec has begun to reflect on paths toward integrating, in the most efficient possible way, wind power with its network. A committee involving Hydro-Quebec Distribution, Hydro-Quebec Production and Hydro-Quebec TransÉnergie as well as the *Institut de recherche en électricité du Québec* (IREQ) was created (hereafter the Committee). Its mandate consists of identifying the different issues associated with the integration of wind power and coordinating the variety of activities that seek to minimize their impacts.

The issues associated with the integration of wind power arise from its significant and partially unpredictable fluctuations. This constitutes a variance that is additional to demand variances, variances in hydraulic inflow and equipment failures, all of which the network must already face.

The issues identified by the Committee deal with the impacts of the variability of wind power generation:

- The electrical behaviour of the network;
- The amount of operating reserves and provisions for variances;
- The use of generating equipment to ensure balancing services for wind power;

- The contribution of wind power to reliable supply of capacity.

Moreover, the Committee took note of the Régie's requests, included in its decision approving the Wind Power Integration Agreement concluded between Hydro-Quebec Distribution and Hydro-Quebec Production (hereafter Integration Agreement). The Régie ordered that a benchmarking study on the balancing of wind power be conducted as well as studies on the contribution of wind power to capacity. Essentially, the Régie wanted the Distributor to re-examine the relevance of this kind of agreement.

In order to begin its work, the Committee gave IREQ the mandate to conduct a benchmarking study on the issues associated with integrating significant quantities of wind power generation to networks. This study seeks to identify the methods used to evaluate the impacts of integrating wind power generation as well as the balancing tools implemented in other parts of the world.

For this benchmarking study, a review of the literature is in progress and key personnel have participated in relevant congresses, conferences and working groups. Seminars with recognized experts were also organized. In annex 6C a bibliography of relevant articles on the integration of wind power generation is provided.

Although the benchmarking activity is not completed, some conclusions may be drawn. The following section includes the key findings of the benchmarking study for each of the issues as well as the work that has been or will be completed by Hydro-Quebec. Section 6.2 provides clarifications on the Integration Agreement as well as a work program that seeks to evaluate the Distributor's long-term interest in such agreements. The results of the studies can later be used to define the terms of future agreements, if applicable.

## **6.1 Preliminary Results of the Benchmarking Study**

The benchmarking study confirmed the exhaustive nature of the issues identified by the Committee. These issues cover all the problems faced by different networks around the world to integrate significant quantities of wind power generation. Each of the four issues identified is described in annex 6A. The description includes an outline of the initial findings of the benchmarking study and of the evaluation of costs of wind power integration, as well as the best practices to integrate wind power generation as efficiently as possible. The key findings are the following:

- Operating reserve requirements increase according to the quantity of wind power generation that is integrated to the network. This relationship is observed even when small quantities of wind power generation are integrated and within interconnected networks;
- The geographical dispersion of wind farms tends to reduce the fluctuations of wind power generation, and thereby the impact on additional reserve requirements;
- The costs associated with additional reserve requirements and with provisions for variances, are highly variable since they depend on power generating equipment that provides balancing, and on the contribution of interconnections with neighbouring networks;
- Hydraulic or fuel generating equipment that provide balancing services are subject to losses in efficiency due to the lack of precision associated with forecasts for wind power generation;
- The main tool to assuage the impact of wind power integration on the operation of a network is the availability of a precise projection of wind power generation;

- No study carried out regarding the capacity contribution takes into account the coincidence between a peak in demand on the network and low temperatures (below  $-30^{\circ}\text{C}$ ) which require the suspension of wind power generation.

The benchmarking study also brought out the fact that the quantification of the impacts of wind power integration requires the acquisition of in-depth knowledge of the wind resource, based on reliable and detailed data that uses a sufficiently long time-frame to capture a variety of weather events that affect power generation. This data must make it possible to evaluate the variances in wind power generation (multi-annual, seasonal, monthly, intra-daily as well as over periods between 10 minutes and 24 hours) and the concomitance between winds and electricity consumption profiles. These are useful to the analyses that deal with each of the issues identified.

For the time-being, little data on power generation that has been measured in wind farms is available. At the end of October 2007, only one of the wind power farms that is under contract with the Distributor had entered into service. Hydro-Québec Distribution has implemented a computer system to acquire and archive data from wind farms in order to make it possible to create a complete historical database of measured and reliable data. This system has been in operation since the Baie-des-Sables wind farm entered into service. However, because only one wind farm has entered into service at present, the data accumulated and available to carry out the studies do not provide an effective evaluation of the effects of diversity of power generating sites.

Much work has been and will be carried out to estimate the hourly chronicle of wind power generation over a sufficiently long period to capture the impact of a variety of meteorological events. This chronicle must take into account the effects of local geography and climatology, such as those that lead to sea and land breezes, local changes in the direction of winds, frost or ice formation, as well as the effect of cold fronts over a few hours, or of geographic dispersion on the

territory. To this end, Hydro-Quebec has given the firm Hélimax the mandate to refine and prolong its estimates of the power generation chronicle for wind farms that fall within the first tendering process. At present, 36 years of series (from 1971 to 2006) exist for hourly wind power generation, which coincide with the meteorological history. For the time being, this data constitutes the basic information that will be used to assess the impacts of the integration of wind power stemming from the first tendering process. The 36-year period covered by the chronicle also corresponds to the period used to establish the average temperature and weather variances in the demand forecast.

## **6.2 Wind Power Integration Agreement**

In other parts of the world, few integration or balancing agreements, such as those concluded between Hydro-Quebec Distribution and Hydro-Quebec Production, exist. BPA's "standard offer", which is the only example cited, was seldom used.

In a majority of networks, the market plays a preponderant role in energy exchange. In order to support the development of renewable energy and to decrease fossil fuel production, wind power generators may sell all their generation without a firm commitment for the quantities delivered, all the while being permitted to receive 100% of the market price. The manager of the electric network ("ISO") manages the variability of wind power generation and also manages the other variances. Therefore, there is no distinction between wind power balancing costs and costs to ensure the balance between electricity supply and demand. These costs are paid by all the users of a network in compliance with the rates and conditions that apply to them.

In the absence of a market in Quebec, the Integration Agreement defines the responsibilities of each actor. However, regardless of the wind power integration model (whether it calls on the market or is subject to a bilateral integration agreement), the actual costs associated with the integration of wind power

generation are related to the issues identified in the benchmarking exercise: the impact on the electrical behaviour of the network; the impact on the amounts of operating reserves and provisions for variances as well as on the use of generating equipment to ensure balancing services for wind power; and finally, the contribution of wind power to reliable supply of capacity.

Based on benchmarking exercise, it appears that the Integration Agreement covers all the issues pertaining to the integration of wind power, with the exception of the impact on the electrical behaviour of the network which is supported by the technical requirements for connections to the network and by agreements between Hydro-Quebec TransÉnergie and wind power suppliers. It must be noted that most studies pertaining to balancing costs only cover the impact on required quantities of operating reserves and provisions for variances, and impacts on the use of power generating equipment that provides balancing.

The benchmarking exercise has highlighted the services that are required to integrate wind power generation. As such, the Distributor would have to acquire these services in the absence of the Integration Agreement. In fact, the level of reserves in the agreement, for services that are required and generally recognized to ensure the security and reliability of heritage supply,<sup>17</sup> are aimed at ensuring the security and reliability of that supply and Hydro-Quebec Distribution bears the costs associated with any increase in these quantities. In addition, the unexpected fluctuations of wind power generation are compensated by equivalent variations in hydraulic power generation causing efficiency or other losses that would be charged to the Distributor by the supplier of the service.

Finally, the Distributor would have to purchase the amount of firm capacity required to compensate for the difference between wind farms' capacity contribution and the firm capacity included in the wind power integration agreement. As a result, the Distributor would have to bear these costs since they are not included among the ancillary services associated with heritage electricity.

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<sup>17</sup> See annex 4A.

Therefore, for the time being the Distributor holds an agreement that accounts for all the impacts associated with integrating large amounts of wind power generation with the network. The issues cited, also constitute quantifiable aspects that are necessary to evaluate the Distributor's interest in wind power integration agreements like the one concluded with Hydro-Quebec Production.

Therefore, the work required to clearly define the Distributor's position toward wind power integration agreements are the following:

- Complete the benchmarking exercise;
- Evaluate the required operating reserves and provisions for variances;
- Evaluate wind farms' capacity contribution.

These studies will be submitted to the Régie at the same time as the status reports upon completion. They will make it possible, when the information is available, to include the impact of the wind farms resulting from the tendering process for the 2 000 MW of additional wind power.

## **7. RISK MANAGEMENT**

The issue of risk management is delineated by parameters that evolve outside the control of Hydro-Quebec Distribution.

### **7.1 Main Risks**

The main risks that are specific to the supply activities of Hydro-Quebec Distribution can be summarized in the five following categories:

- Uncertainty about required and delivered quantities;
- Fluctuation in electricity prices;
- Default of a counterparty or credit risk;
- Operational risks ;
- Foreign exchange risks.

#### ***7.1.1 Uncertainty about Required and Delivered Quantities***

Supply planning entails uncertainties in terms of demand – mainly weather variances and variances related to increases in consumption – and supply, which can be limited (few counterparties) or insufficient relative to required quantities. For example, some bids could be non-compliant with requirements in terms of guarantees or delivery points. Moreover, after a contract is concluded a risk of default in delivery exists (not respecting dates, inferior quantities...).

Risk management related to variances in quantity is detailed in section 5.

#### ***7.1.2 Fluctuation in Electricity Prices***

Electricity prices in Northeastern United States markets are characterized by very strong volatility. However, the major part of the Distributor's supply comes

from heritage electricity (95% of the total in 2008), constituting a low-cost source of supply and one that is independent from the fluctuations of market prices.

Tendering processes make it possible to meet requirements exceeding heritage electricity. These tendering processes can apply to short- or long-term contracts.

The majority of short-term supply contracts include a set price. The price of these contracts reflects prevailing market conditions at the time of their signature. As contracts for short-term supply are awarded, the exposure to risks of price fluctuations within the year is lessened.

Moreover, the price of long-term contracts is adjusted according to various indexes such as the consumer price index (CPI) or the price of natural gas. A contract that is indexed to the price of natural gas is subject to fluctuations because the price of this commodity is volatile and correlated to the price of electricity. A significant part of the price in the long-term contract concluded with TCE is therefore indexed. Energy quantities included in this agreement is low compared to all supply combined (2% in 2008).

A possible approach for the active management of risks related to the fluctuating price of commodities is to use financial derivatives (for example, electricity or natural gas term contracts) to set the cost of supply in advance and thereby eliminate the risk of price fluctuations. However, the Distributor has a deferred charges account at its disposal to absorb supply cost fluctuations.

Moreover, the period between the planning of a long-term call for tenders and the delivery of electricity related to that call for tenders constitutes a risk because it leads to uncertainty in projections of supply costs. In practice, reducing these periods is the only effective coverage.

### ***7.1.3 Default by a Counterparty***

In the Distributor's supply context, the risk of default by a counterparty that does not respect contractual obligations corresponds to the difference between the contractual price of electricity and the market value for its replacement.

In order to minimize credit risks, short-term physical electricity transactions carried out by Hydro-Québec Distribution are subject to EEI (Edison Electric Institute) framework agreements. The EEI contract constitutes a standard that is accepted by all counterparties in the energy sector. In particular, it includes clauses that allow Hydro-Quebec Distribution to protect itself in case of default (eg.: not respecting a delivery obligation, insolvency...).

Contrary to short-term agreements, long-term transactions are negotiated according to the framework set in the tendering process approved by the Régie. For example, the amount of insurance coverage (guarantee or letter de credit) is specified in the documentation of the call for tenders.

A counterparty's risk level, financial capacity and credit rating determine the upper limit of the credit risk that the Distributor could assume for that counterparty. The risk limit that is actually granted, which is equal or below the upper limit, is determined according to the Distributor's requirements and the transaction volume it anticipates with that counterparty.

The upper credit limits authorised by counterparty category as a function of the risk they represent are included in annex 7A.

### ***7.1.4 Operational Risks***

Hydro-Quebec Distribution has adopted several measures in order to guard against operational risks, particularly in terms of security and confidentiality. Practices were implemented to ensure the application of the Distributor's code of ethics, particularly with the continued training of employees on the subject. Moreover, control measures have been implemented to ensure that the selection

of suppliers, the tools and procedures in place to manage supply, respect set parameters.

### **7.1.5 Foreign Exchange Risks**

A significant portion of supply transactions (the totality for short-term contracts) is carried out in US dollars. To manage foreign exchange risks, Hydro-Quebec Distribution signed an agreement with the Treasury of Hydro-Quebec. In compliance with the agreement, foreign exchange risk coverage operations are carried out for transactions that require definite disbursements. Therefore, a hedging transaction is carried out when a basic contract is awarded (disbursements are definite because quantity is determined in advance). As for flexible contracts, the hedging transaction is carried out at the time of billing, when quantities are known. This approach was implemented in compliance with Régie decision D-2005-34 and it seeks to protect the Distributor's supply cost from future foreign exchange rate fluctuations.

## **7.2 Implication of the Groupe Finance - Hydro-Quebec**

The Distributor's energy supply activity entails credit and market risks. To that effect, the evaluation of market and credit risks by personnel that are independent from those directly responsible for commercial activity is a healthy and prudent practice.

The Distributor had the choice between exercising this function on its own or to give the mandate to another group, as long as functional separation requirements between Hydro-Quebec's divisions were respected. Because Hydro-Quebec *Groupe Finances* already holds the expertise in market and credit risk assessment via a team of specialists, it was granted this mandate.

This approach has allowed the Distributor to benefit from existing expertise and information systems. It also made it possible to limit resource requirements (less than four people per year) and implementation periods. It also ensures independent reporting.

The team specialized in risk management, in place since the beginning of 2007, has the mandate to assess and follow-up on market and credit risks pertaining to the Distributor's supply activities. In collaboration with the Distributor, it is currently working to design a risk management program and adopt follow-up indicators.