

Evaluating the Market Transformation Impacts of a DSM Programme in the Province of Québec

Pierre Baillargeon, P. Eng., CEM, CMVP, Econoler, Québec, Canada

Bernard Schmitt, Hydro-Québec, Québec, Canada

Normand Michaud, P. Eng., MBA, Econoler, Québec, Canada

Lori Megdal, Ph.D., Megdal & Associates, Acton, Massachusetts

INTRODUCTION

In 2006, Hydro-Québec introduced a large DSM programme on the market to promote the adoption of compact fluorescent lamps (CFLs) in Québec households. This programme included a rebate component based on a mail-back coupon scheme together with an intensive promotional campaign. After three years of programme implementation, there was significant indication on the part of market actors that the promotional campaign component was quite effective in transforming the Québec market. Hydro-Québec therefore decided to modify its approach to programme evaluation to include the quantification of the market effects. Econoler lead a consortium of US and Canadian firms to conduct an evaluation of the market transformation impacts of the programme.

THE CONTEXT AND UNIQUE CONDITIONS IN QUÉBEC

Before the launch of the Hydro-Québec Energy Wise programme, the province of Québec was lagging behind the rest of Canada in terms of the penetration rate of the CFL technology as it was demonstrated in a national survey undertaken by Natural Resources Canada's Office of Energy Efficiency. The low uptake of the CFL technology in Québec was assumed to be a result of several important barriers including a lack of customer knowledge about the technology, the low cost of electricity in the province (thanks to its intensive hydroelectric infrastructure) and a general lack of interest on the part of manufacturers and distributors that was a direct result of low customer demand. With such a low demand for CFLs, it is understood that CFL prices were relatively high in Québec versus the rest of Canada, which was an additional barrier to the penetration of these efficient products. The market therefore presented significant barriers to the penetration of the technology and there was little evidence of a natural trend towards adopting CFLs in Québec households.

The cultural context in Québec is also very unique compared to the rest of North America. Seventy percent of Québec's population is French-speaking and this portion of the population has a natural tendency to use French media like TV, radio, newspaper and French publications and journals. North American mainstream media therefore have less of an influence in Québec than in the rest of Canada or in the US where a multitude of companies and organizations support publicity campaigns promoting energy efficiency in general and the CFL technology in particular. This relative isolation of the Québec market from other influences was thought to be an additional reason why Hydro-Québec's promotional programme seemed to be successful in transforming the market. The evaluation process that was put in place was designed to confirm or infirm these hypotheses on the market mechanisms in the province of Québec.

HYDRO-QUÉBEC'S ENERGY WISE PROGRAMME

Some years ago, Hydro-Québec launched its Energy Wise portfolio of energy efficiency programmes including several components targeting the residential sector. The efficient lighting component was launched in 2006 to promote the CFL technology and one type of fixture, the CFL torchiere. Surveys were conducted on the market prior to the launch of the programme and during the programme itself to identify the main market barriers. The promotional campaign was designed to address those barriers by providing focused information to consumers about the availability of CFLs, how to select the different wattages and different shapes and colours available. By designing the communication campaign to remove some of the market barriers, the Energy Wise programme had all the characteristics of a market transformation activity.

The rebate component of the programme was designed as a traditional resource acquisition scheme based on mail-back rebate coupons. Payment of the rebates was outsourced by Hydro-Québec to a payment agency that processed the coupons and issued the rebates to the customers. The agency also maintained a programme database for progress tracking. The rebate scheme covered 50% of the purchase price of the efficient lighting products up to a maximum rebate of CAN\$25. The same customer could mail in multiple submissions until the maximum limit of CAN\$25 was reached. The customer had to return the coupon, the original invoice and the bar code on the lamp package to be eligible for the rebate. When the programme was designed, it was expected that many customers would not bother to return the coupon, especially if the purchase price of a set of lamps was less than CAN\$15. In its initial design, the programme therefore already took into consideration that there could be a significant external spillover effect resulting from the programme design (people who would be influenced by the offer, would take the coupon but would ultimately not mail it in). However, no formal evaluation mechanism or strategy was put in place to measure its effect.

An unusual aspect of this programme was the large extent of its promotional campaign. Even if the programme was not initially designed to be monitored as a market transformation activity, the communication campaign was much broader than the type of campaign normally found in a resource acquisition programme. The campaign extensively made use of all forms of media to promote CFLs and the ENERGY STAR label on the market. This included TV and radio spots, exterior publicity panels, advertising in newspapers and specialized journals as well as a booklet mailed to all households in the province and a website devoted to the CFL technology. Point of sale material and in-store promotional activities were also introduced at retailer and manufacturer facilities to promote the programme, the ENERGY STAR label and the usage of CFLs and energy efficient fixtures. Over the years 2007 and 2008, Hydro-Québec invested over CAN\$7 million on the promotion of CFLs, which represented approximately half of the overall programme budget. Despite this significant investment towards increasing consumer awareness and interest and addressing the main barriers identified on the market, no special methodology was envisioned to track the market's progress and conduct a true evaluation of the market transformation. In 2008, Hydro-Québec was just starting to explore how to integrate a quantitative evaluation of the market transformation resulting from its programmes. The initial evaluation approach for the Energy Wise lighting programme was designed to use a simple non-participant self-reporting method to evaluate the spillover effects as the main market transformation indicators. The results of a general population survey conducted at the end of 2008 indicated indeed the strong impact Hydro-Québec had on the programme and how rapidly the market was progressing.

The province of Québec had evolved over a three-year period from the last position in Canada in terms of CFL market share to one of the first positions among the ten provinces. In fact, the results obtained from the self-reported spillover effects were so large compared to the participants' gross savings that it was obvious that the self-reporting method was no more appropriate as a way to evaluate the market effects because of the limited understanding of the market mechanisms on the part of the respondents to the non-participant survey. Another method had to be developed to evaluate the programme impacts based on a true market transformation approach.

METHODOLOGY

At the beginning of 2008, Hydro-Québec requested that Econoler and its American partners, Opinion Dynamics Inc. and Megdal & Associates, design an evaluation process that would confirm and quantify the impact of the Energy Wise programme on the market. The main challenge with this approach was to design an ex ante evaluation covering years 2006 and 2007 of the programme considering that no survey or market tracking activity had been put in place over this period to measure the market's progress and determine to what extent the progress could be attributed to the Hydro-Québec programme.

Due to the fact that no market indicators had been put in place over the 2006 — 2007 period, it was decided to design an evaluation strategy where different research tools would be integrated to determine the market evolution over the two previous years. Each research method was used to determine an estimate of the programme impacts, then triangulated with other approaches to determine the most appropriate evaluation of the impact of Hydro-Québec's programme. The four approaches used in this effort included:

- A non-participant survey with a self-declared spillover analysis.
- Interviews at manufacturer headquarters across Canada.
- Interviews with banner distributor representatives across Canada.
- The collection of sales and market share data from manufacturers and retailers.
- Secondary research to identify other players that could influence the market.

All these activities were aimed at determining the evolution of the market size in terms of the CFLs and torchieres sold over the 2 years evaluated and a percentage of the market growth that could be attributed to Hydro-Québec's Energy Wise programme.

Database analyses, engineering methods and literature reviews were also included to determine the reduction in watts for each CFL lamp installed and the average number of hours of operation. A review of literature was also conducted to identify the cross effects and, in particular, the effect of the lamps' power reduction and associated heat rejection on electrically heated houses, which constitute a large percentage of the housing stock in Québec.

EVALUATION ACTIVITIES AND FINDINGS

Non-Participant Survey

The non-participant self-declared spillover approach was based on a survey as is often applied in an evaluation process. In this particular case, it was designed with special features to better evaluate the market effects on consumers. This survey included different questions about customer knowledge, sources of information, influences, purchasing and storage behaviour during the two previous years of the programme. The methodology acknowledged the fact that non-participants were not the most reliable sources of information on the market effects because of memory lapses and the lack of a general view and understanding of the various market influences at work in a market transformation programme. The various marketing activities conducted by Hydro-Québec were tested in the survey construct against other market influences to determine their relative impact on customer decisions. The relative cultural isolation of the Québec market allowed being specific about the main market actors that could have played a role in the ongoing market transformation. Open questions about the decision factors to purchase CFLs were included as well as other questions later in the same survey using range scores to compare the relative importance of different influences. In their answers about their decision factors, the respondents could mention direct sources of information (Hydro-Québec or other) or the technical characteristics of a product (energy savings, longer life, etc.). If the respondent mentioned a technical characteristic as one of his or her main decision factors, then additional questions were asked to identify through what source of information he or she had learned about the characteristic. In some cases, respondents simply mentioned that they had been influenced by the salesman or by point of sale materials. In order to determine if the salesman training component of the programme and the point of sale materials were instrumental in conveying the information to the customer, a set of statistical analyses were conducted to compare the behaviour of customers purchasing at participating stores with the behaviour of customers purchasing CFLs in non-participating stores. An initial simple statistical analysis revealed that there was a difference in the purchasing behaviour of customers shopping at participating stores but, to confirm the statistical significance of the results, five additional statistical tests were conducted as shown in Table 1.

Table 1: Tests to Confirm Statistical Significance of Customers Shopping at Participating Stores

| Tested Element | Statistical Test Used | Result |
|--|--|----------|
| Percentage of sales attributed to the Hydro-Québec programme | Analysis of the difference between proportions (Z-Score) | Positive |
| Percentage of respondents who directly identify Hydro-Québec or the Energy Wise programme in questions AC1a, AC1b, AC1c et AC3 | Analysis of the difference between proportions (Z-Score) | Positive |
| Percentage of respondents who purchased CFLs in the last year | Analysis of the difference between proportions (Z-Score) | Positive |
| Percentage of respondents who purchased CFLs in the last three years | Analysis of the difference between proportions (Z-Score) | Positive |
| Average CFLs purchased per household in the last year (for households that purchase them) | Difference between averages (t-test) | Negative |
| Average CFLs purchased per household in the last three years (for households that purchase them) | Difference between averages (t-test) | Negative |

The social desirability effect was also considered as one of the potential influences that could cause an overestimate in the self-declared quantity of purchased CFLs.

Interviews with Manufacturers

The second approach used to assess the market changes and Hydro-Québec's influence was to conduct a series of one-on-one interviews with the main manufacturers distributing CFLs and torchieres on the Québec market. Several of those players had been visited at their headquarters in Toronto. The fact that most manufacturers covered all Canadian provinces was an interesting aspect explored in these meetings as it allowed determining the manufacturers' vision of the evolution of the Québec market compared to other provinces. During the interviews, we also inquired about the main forces driving the market changes in Canada and about what was specific to the province of Québec compared to the other provinces as well as their perceptions about these differences. We also discussed their perceptions of Hydro-Québec's influence on the market. To confirm their appreciation of Hydro-Québec's importance, we also probed them with a different question, asking them to represent what they thought the market evolution in Québec would have been without the Hydro-Québec programme. The interviews also provided an opportunity to discuss the market evolution in Québec compared to other provinces where CFL programmes have been in existence for some time, like in British Columbia and other provinces, with little support for this technology. Finally, we inquired about the media campaign and marketing activities they had conducted in Québec focusing on energy efficiency in general or on the CFL technology in particular. These series of meetings allowed us to obtain a good picture of the market dynamics, evolution and influences between 2003 and 2007 as well as the manufacturers' perceptions of the effect of the Hydro-Québec programme on the market evolution.

Interviews with Retailers

A third activity was launched in parallel with the manufacturers meetings to conduct one-on-one in-depth interviews with representatives of banners and large retailers operating in the province of Québec or across Canada (e.g. Home Depot, Rona, Réno Dépôt, Canadian Tire, etc.). The researched topics were somewhat similar to those used for the manufacturers as far as market dynamics and the influence of Hydro-Québec on the market were concerned. However, there was an additional focus on discussing the market barriers and the evolution of customer demand experienced on the market from 2005 to the end of 2007. These interviews provided insight about the numerous market barriers in Québec and confirmed the strong influence of the Hydro-Québec programme on the sales of CFLs. The retailers provided the evaluation team with data and information about dynamics of the market. During the interviews, we also discussed the promotional campaign run in Québec that focused on CFLs or energy efficiency in general. The retailers were then asked to quantify the influence of Hydro-Québec on the market by comparing the growth in sales with the programme to what they were expecting without the programme.

Sales and Market Share Data

As part of the market survey activities, Hydro-Québec requested that its partners (manufacturers, distributors) provide their sales data as well as their estimate of their market share for the period between 2003 and 2007. This kind of data is essential for an accurate evaluation of the market and it is also one of the most delicate and time consuming ones to assemble. In general, manufacturers and distributors are not very keen to disclose strategic information about their sales and market share and it is therefore necessary to make contact with high level individuals and hold several follow-up meetings with these organizations to obtain the necessary authorization and then the needed data. Even when the company's authorization is granted, there is an intensive activity related to analyzing the data and requesting clarifications when some of the data seems to be incompatible with other information received from other market actors. One classic example is when the market share data of all the actors exceeds 100%, which is obviously impossible. Requesting both sales volume and market share data allows having different perspectives of the market and finally determining realistic figures for the overall sales. Market share information is particularly important as it allows filling in the blanks when some of the market actors decide not to participate in the data collection process.

It is essential to compare information from different sources when trying to finalize the overall market size and the attribution of impact to the programme. To determine the influence of Hydro-Québec on the market, the results of the customer survey, the manufacturer and distributor interviews and the sales data collected were compared. Each data source was assigned a level of reliability based on the characteristics of the respondent. For instance, the general population survey was given an “average” reliability index as the people in the population would have difficulty comparing their buying patterns in 2006 — 2007 to what they would have been without the Hydro-Québec programme. The manufacturers were given a higher reliability index due to their broader vision of the evolution of the markets in different Canadian provinces with different levels of DSM support to promote the products. The retailers were also given a higher reliability index because of their intimate knowledge of the customer demand for CFL products that they had in their stores in limited quantities for several years.

Based on the reliability of each source, a low estimate and a high estimate were determined by the evaluator and compared to finalize the estimate of the quantity of CFLs sold in Québec.

Secondary Research

In terms of attribution, it was important to confirm that Hydro-Québec was the most or one of the most important market players promoting the usage of CFLs or the concept of energy efficiency in general in the Province of Québec. There was anecdotic evidence that no major actors were promoting CFLs in the main French media channels and, considering the relative isolation of the Québec market from the mainstream media in North America, the prevailing assumption was that Hydro-Québec was the only important source of information about CFLs. To confirm this assumption, questions were added to the general population survey to determine the main sources of influence among the population. Another activity was conducted that involved visiting the other agencies that could have promoted energy efficiency in general or the CFL technology in particular on the market during the evaluation period. The Québec agency for energy efficiency as well as Natural Resources Canada's Office of Energy Efficiency were contacted and interviewed to determine the level of public promotion undertaken during the year under evaluation. These interviews confirmed that no other agency was active in the sector except for the federal government that conducted a very short two-week campaign in 2005.

Market Size and Attribution to Hydro-Québec

After the completion of the data collection process, all the information collected from the various sources were analyzed to construct a 5-year market model covering 2003 to 2007. The analysis confirmed that the communication campaign of the Energy Wise programme was one of the major drivers of the ongoing market transformation in the province. It has created a major shift in customer attitudes despite the relatively low economic returns of the measure considering the low cost of electricity in Québec.

Once the non-participant market effect had been determined, it was necessary to add the number of lamps purchased by participants (with care to avoid double counting) to obtain the total number of lamps sold on the market. This task was performed using a database analysis combined with an exhaustive list of products approved by the programme. In the case of participants, free ridership and internal spillover effects had to be taken into consideration and were obtained based on a series of questions in the participant survey. This allowed determining that 31% of the lamps were purchased by free riders. Those lamps were subtracted from the gross quantity to obtain the portion attributed to the programme. An additional 7% of lamps were purchased due to internal spillover effects.

As discussed before, a triangulation of the various sources of information was used to determine the most probable market size for CFLs as well as the market evolution for the period from 2003 to 2007 as shown in Table 2.

Table 2: Market Size Estimate from the Triangulation of Various Sources

| CFLs Sales | 2003 | 2004 | 2005 | 2006 | 2007 | Total |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Participants | - | - | - | 489 000 | 549 000 | 1 036 100 |
| Non-Participants | 994 300 | 2 408 300 | 4 482 800 | 8 531 000 | 7 689 000 | 23 843 850 |
| Total Market | 994 300 | 2 408 300 | 4 482 800 | 7 916 450 | 9 080 100 | 24 861 950 |

As shown on Table 2, participants represent only a very small percentage of the total CFL sales in Québec during the evaluation period (2006 — 2007).

Once the final market size was determined, the portion of the market evolution attributed to Hydro-Québec had to be finalized. This represented a significant challenge considering that this exercise was realized ex post. To determine the attribution, it was necessary to triangulate different sources of information including data from manufacturers, distributors and non-participants in the population using an appropriate research method for each group (in-depth interviews, telephone surveys). The manufacturers and distributors confirmed that the Energy Wise programme had a strong influence and they estimated that, on average, 70% of the market growth in 2006 and 2007 was due to the Energy Wise programme and, in particular, to its extensive promotional campaign. With this information in hand, it was ultimately possible to reconstruct the market evolution scenario since 2003 and without the Hydro-Québec programme in 2006 — 2007 thus creating a proper baseline to measure Hydro-Québec's attribution level. The evaluation activities launched allowed the Econoler team to confirm a market size of 17 million CFLs sold in the province over the 2006 — 2007 period. This represented a fast progression from Québec's initial market of less than one million units observed in 2003.

Figure 1 shows that a large proportion of the CFLs purchased by non-participants could be attributed with a high level of confidence to the programme.

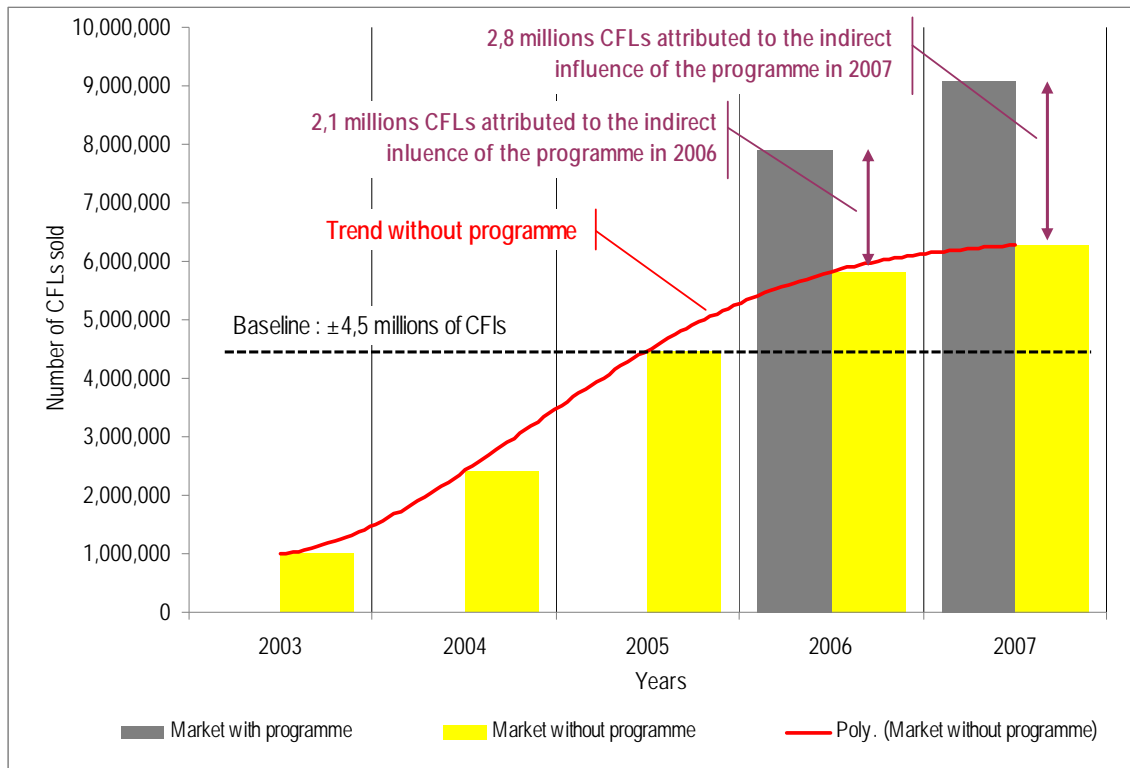


Figure 1: Market Evolution from 2003 to 2007 with Attribution to the Programme

A simple evaluation of the direct and spillover effects using a simple method used in resource acquisition programmes would not have been appropriate in this particular case considering the initial programme design and theory. In this particular programme, the rebate component was not considered to be a major driver due to the small quantity of lamps involved in the rebate of each package purchased and the maximum of CAN\$25 allowed for CFL purchases. During the programme design, it was hypothesized that the trouble of returning the coupons for a relatively small amount of money would discourage many households but that the possibility of receiving a rebate could nevertheless be part of the consumer's decision to act. This is a very good example of the spillover induced by a programme's design. In this case, the selected programme process, combined with a small unitary reimbursement, do not constitute strong incentives for participation. However, at the same time, an intensive communication campaign was run to support a market transformation and had a demonstrated impact on the customer's purchasing behaviour. The market effect of the programme represented 2.1 and 2.8 million CFLs sold in 2006 and 2007 respectively for a total of 4.9 million units over the evaluated period.

IMPACT OF THE ENERGY WISE PROGRAMME

Once the quantity of CFLs sold attributed to the Energy Wise programme was found, it was multiplied by the gross savings per unit obtained from the identification of the average wattage of the replaced lamps and type of technology replaced as found in the database analysis. Survey questions to the general population and participants confirmed that most people follow the manufacturer's recommendations when choosing a lamp so the baseline replacement unit was determined to be an equivalent incandescent or halogen lamp providing the same level of illumination. The average

weighted savings per lamp installed was found to be 59.84 W in the baseline, then 14.3 W per average CFL for a unitary savings of 45.5 W.

The average CFL lamp wattage and an estimated 2.7 hours of operation per lamp were based on a review of literature as shown in Table 3. Five programmes were retained after a literature review to only retain the hours of operation figures derived from field measured studies.

Table 3: Literature Review of CFL Operating Hours

| Studies | Number of Households Surveyed | Measuring Campaign Duration | Average Hours of Operation |
|---------------------------------------|-------------------------------|-----------------------------|----------------------------|
| KEMA–California 2005 ¹ | 752 | 6 — 12 months | 2.34 |
| Northeast Utilities 2001 ² | 400 | 1 month | 2.16 |
| NSTAR 2003 ³ | 330 | 1 month | 2.39 |
| MA-RI-VT Study 2005 ⁴ | 97 | 2 weeks to 9 months | 3.4 |
| Northeast Utilities 2003 ⁵ | 72 sites | 1 month (minimum) | 3 |
| Average | | | 2.7 |

Using the estimated hours of operation, the average gross saving per lamp was calculated as being 44.88 kWh. A similar approach was followed for torchieres to determine an average gross saving of 142.90 kWh.

The cross effect of lighting on heating systems is an important issue to consider since, in Québec, about 70% of the 3.1 million households are electrically heated (a direct effect of low hydroelectricity rates). This important housing stock of electrically heated buildings combined with the long winter season create an important cross effect since a large portion of the heat emitted by lighting systems provide useful energy during the heating season. The cooling cross effect was found to be quite moderate since only 5% of the households in Québec have central cooling systems. The evaluation of the cross effects was mainly based on the results of a large study undertaken by external consultants on behalf of Hydro-Québec some years ago where residential buildings were simulated using the DOE-2.1E hourly building analysis programme. A weighted average of 35.7% of cross effect was retained from this study and was deducted from the gross unitary savings.

¹ CFL Metering Study Final Report. Prepared for PG&E, SDG&E, and SCE by KEMA, Inc. February 25, 2005.

² Impact Evaluation of the Spectrum Smart Living Catalog and Retail Lighting Programs by XENERGY, Inc.

³ NSTAR Residential High Use Program Operating Hours Realization Rate Study by XENERGY, Inc. January 27, 2003

⁴ Impact Evaluation of the Massachusetts, Rhode Island, and Vermont 2003 Residential Lighting Programs Final Report by Nexus Market Research, Inc. and RLW Analytics, Inc. October 1, 2004.

⁵ Northeast Utilities and United Illuminating Company Lighting Catalog/Smart Living™ Program Impact Evaluation Final Report by RLW Analytics, April 2003.

Table 4: Impact of Hydro-Québec's Energy Wise Programme in 2006 — 2007

| Net Energy Impact (GWh) | 2006 | 2007 | Total |
|--------------------------------|-------------|-------------|--------------|
| • Participants (1) (2) | 13.8 | 13 | 26.8 |
| • Non-participants (1) | 60.3 | 80.8 | 141.1 |
| • Total energy savings | 74.1 | 93.8 | 167.9 |

(1) Less cross effects in lighting;

(2) Including participant spillover and less free riders.

CONCLUSION AND RECOMMENDATION FOR FUTURE EVALUATIONS

It was demonstrated that it was possible to conduct a market impact quantification analysis based on an ex ante research tool provided that:

- A significant market research effort is conducted.
- All significant market players are included in the market quantification and attribution efforts.
- A triangulation of several methods is used to determine the most probable impact of the programme.

The evaluation of the Energy Wise programme for the 2006 — 2007 period shows without a doubt that it is possible to reconstruct the baseline of a market transformation programme even if no specific tracking activities were conducted prior to or during the programme marketing period. In this context and considering the relative isolation of the Québec market, it was possible to realize an ex post evaluation using a combination of different research methods using traditional tools and with proper attention to crosschecking the information from different sources. This approach is not necessarily the easiest to implement but it should be considered carefully when evaluating a programme with large market effects reported by market actors even when formal market tracking methods were not initially planned for programme monitoring. It is important to note that a market transformation process is a complex mechanism and that it is not easy to make a priori predictions of what the market reaction will be when an intensive communication campaign is launched. However, it is not because the size and the importance of the market effects were not fully anticipated during programme design that the utility's efforts should not be recognized and that a "do nothing" approach to evaluation is justified. The evaluation of Hydro-Québec's Energy Wise programme demonstrates that, by using the right tools for data collection and an innovative approach for market evaluation, it is possible to evaluate the total programme impact more accurately than when only a simple direct effect combined with a net-to-gross ratio evaluation is used.

In today's context where the energy efficiency targets mandated by the government or regulatory agency are more and more ambitious, it becomes absolutely essential to evaluate the indirect effects or market transformation effects of programmes. This approach is all the more necessary in that it involves measuring the true potential impacts of any commercial intervention to promote energy efficient products or energy efficient behaviour. If one considers that energy efficiency involves an incremental process developed over several years, not to say decades, a broader and more innovative evaluation approach is absolutely necessary. At the core of this approach, the triangulation of the results must be a priority along with the deployment of several methods that are complex or not

so complex in order to ensure that all the impacts of a programme are measured or, on the long term, the deployment of a programme portfolio for a specific type of client (residential, commercial, residential, etc.)

The 2006 — 2007 evaluation process for CFLs is now completed and an adapted method of project tracking and evaluation was put in place for the years 2007 — 2010 using an improved market tracking approach including:

- A larger quantity of distributors and manufacturers to be included in the research effort allowing a better representation of the smaller market players and a more accurate appreciation of the overall market change.
- Starting in 2010, market surveys will be conducted every six months for the participants and the general population to measure the growth in CFL purchases, consumer appreciation of the programme, the intention and the influence of the promotional campaign using a tracker method.
- Surveys for participants and non-participants will be increased in quantity to allow more accurate results as well as the possibility of analyzing the results by market sub-segment.
- The hours of operation of the CFLs in households will be verified through an eight-month measurement campaign in 200 Québec households (on going).
- Several new fixtures were added to the programme and will be added to the impact analysis process conducted in 2008.
- Regular visits to stores are conducted by a market research firm to scan the various products offered and measure the evolution of the shelf space devoted to CFLs.
- Another source of information will be added to confirm the buying patterns and the total volume of sales of CFLs on the market. This activity is based on the usage of a pool of 2000 households scanning all their purchases including energy efficient lamps and fixtures. The Energy Wise programme maintains a database of all CUP codes of CFLs and efficient fixtures (ENERGY STAR) sold in Québec and this database will be combined with the household scan log to confirm the market size. This information will be triangulated with other information gathered from manufacturers and distributors.
- In 2010, a new and innovative activity is planned to introduce a statistical method to quantify the influence of the Energy Wise programme on consumer purchasing habits. A model of influence will be established using a Structured Equation Modelling approach. This approach offers an innovative way to analyze the programme by providing a method to test a model representing the purchasing behaviour of consumers on the market.

Following this first effort of market effect quantification, Hydro-Québec is now considering adding market effect impact quantification to other programmes with activities targeted at removing market imperfections and barriers in order to support market transformation.