



RESIDENTIAL LIGHTING - CFL

2006-2008 CFL Program

An Approach by Hydro-Québec

Decembre 11th, 2008



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Le réseau principal



FACILITIES	Number	MW	Net output (GW)
Hydroelectric generating stations	57	33,305	157,477 (97.2%)
Nuclear generating station	1	675	4,322 (2.7%)
Thermal generating station	28	1,665	262 (0.1%)
Wind Farm	1	2	1.3 (0.0%)
TOTAL	87	35,647	162,062 (100%)

TOTAL MARKET
 3.1 M consumer accounts
 770,000 business accounts

Yearly EE Budget
 ± \$200M USD





Hydro-Québec 2006-2008 CFL Program

Market Environment Analysis:

Secondary data:

- A. Market watch for existing program knowledge (North America)
- B. Market watch for market stats (Canada & US)

Primary Data:

- A. Market survey of the Market Demand (consumers)
- B. Market analysis of the Market Offer (retailers/manufacturers)



The Quebec CFL market status in 2005

Quebec Households Market penetration:

- CFL Household penetration in 2005 (at least 1 CFL): 47 %
"Quebec was last in terms of market penetration in Canada"

Average number of bulb sockets:

25 to 30



15 to 20

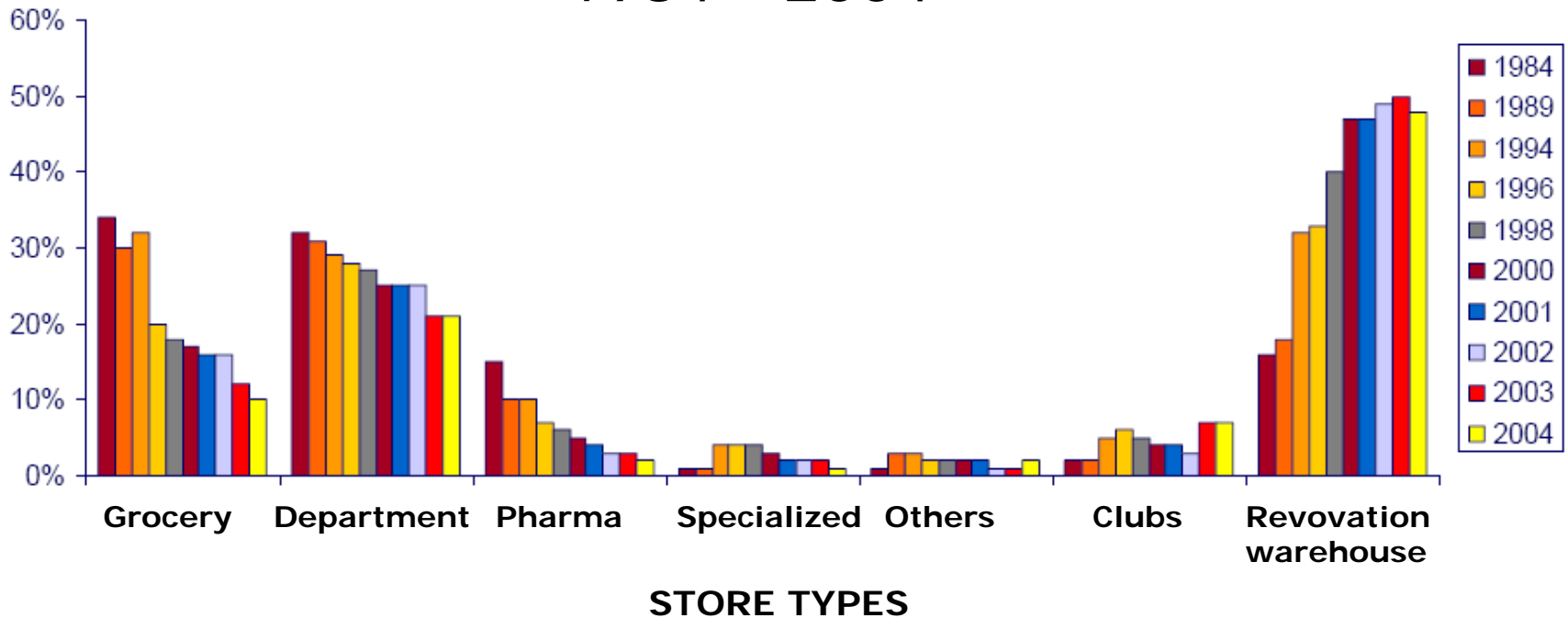




The Quebec CFL market status in 2005

Light Bulb Sales Market Shares in Canada

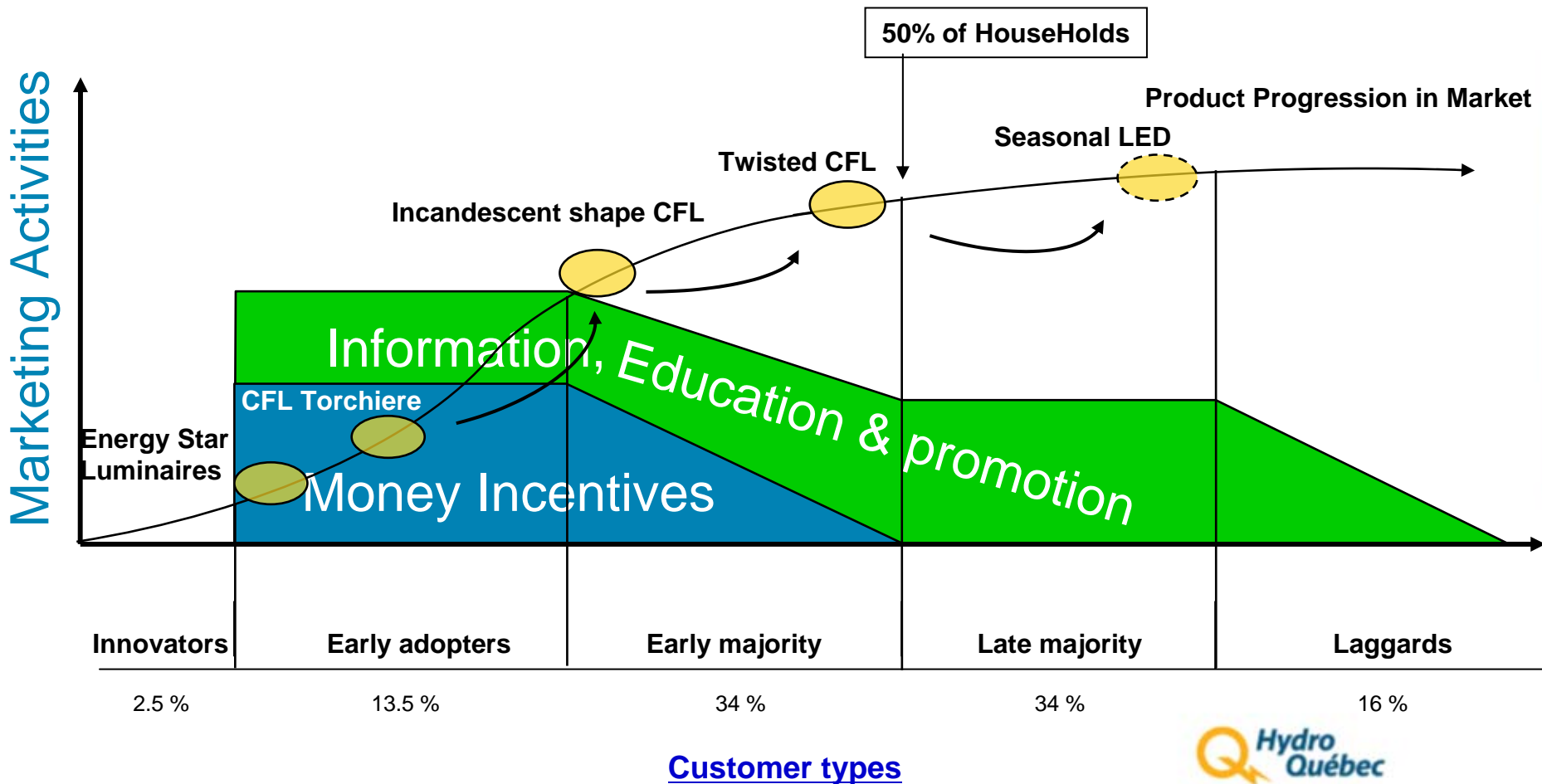
1984 - 2004





The market strategy 2006-2008

Early Model – Key Factors





Consumer behavior and market barriers (2005)

Consumer barriers to CFL purchase :

- **No need for that:** 30 %
- **Lack of information:** 40 % (not appropriate, don't know, no shapes, no choice, no gain)
- **Price:** 12 %
- **Don't know about it :** 6 %
- **Do not like color or size:** 8 %

Total for "missing information/education" on product : 88 %

In 2007, color became more important as a barrier

Consumer sensitivity to environment & energy efficiency:

- **Medium to high; it's an opportunity, let's surf!**



Consumer behavior and market barriers (2005)

Three strikes against the Qc Market that make focusing on price insufficient:

1. No Price signal in the market = no motivation

- Consumer price in Qc @ $\pm 7\text{¢} / \text{kW}$

2. 80% of households in Qc heat their homes with electricity

- Creating higher crossover effects = lower energy gain/CFL
= lower budget margins for incentives

3. For a household with electric heating, the weight of lighting on the bill is minuscule
= lesser interest for consumers

"We had to work on something else than just price & savings; especially if mercury becomes a problem."



The market strategy 2006-2008

Let's also consider the following...

New product adoption: Losses loom larger than gains

(Daniel Kahneman, Nobel prize laureate in economics)

Human beings' responses to the alternatives before them have four distinct characteristics:

- **People evaluate the attractiveness of an alternative**
- **People evaluate new products relative to what they already own/consume**
- **People view relative improvements as gains, and shortcoming as losses**
- **People have loss aversion: Losses have far more impact on people than similar sized gains**

* A temporary price change/saving will not modify an attitude or an old behavior



Objectifs Stratégiques (suite)

The Communication strategy

1. Product notoriety :

- Continue to increase exposure on the CFL... *Hey, they exist !*

2. Education & knowledge:

- Pursue educating people on CFLs... *How does it work? Lumens you say ?*
- Build education package for retails sales and consumers... *No Ma'am, you can't put this 15W CFL on this 50W socket because the CFL is worth 60W,,,*

3. Product understanding :

- Increase consumer understanding of CFL characteristics and **their usage**
- Demonstrate CFL usage in normal life... *Hey, people use it !*
- Work on eliminating myths against products... *No you won't look sick...*

4. Decision making:

- Influence on purchasing behavior in favor of CFLs... *A winning decision !*



The market strategy 2006-2008

The Communication strategy - round 1

CFLs are energy efficient

CFLs are environmentally good

CFLs are available in various sizes, shapes, colors and are as good

The Message on behavior - round 2

CFLs are available for all kind of "ambiance"

Cold white & warm white

Education on lumens



The market strategy 2006-2008

The Communication strategy

Tools:

- Pamphlet on: How-to and where-to use CFL
- Website education on products
- TV ads on behavior of purchasing CFL
 - Available at on CEE web site: http://www.cee1.org/cee/mtg/ask-the-experts/CFL_Program.php
- Newspaper ads
- Increased action in the fall... *the great blackness period*

Budget:

- \$ 7 M yearly
 - \$ 4.2 M in communications/advertising/education
 - \$ 1.1 M in incentive (Mail-in)



Education – POS 4 page purchasing guides CFL 2006



Where do I start?

For greater efficiency, replace incandescent lightbulbs in these locations first:

FREQUENTLY LIT AREAS

Change the bulbs that get the most use to save the most electricity and money.

HARD-TO-REACH FIXTURES

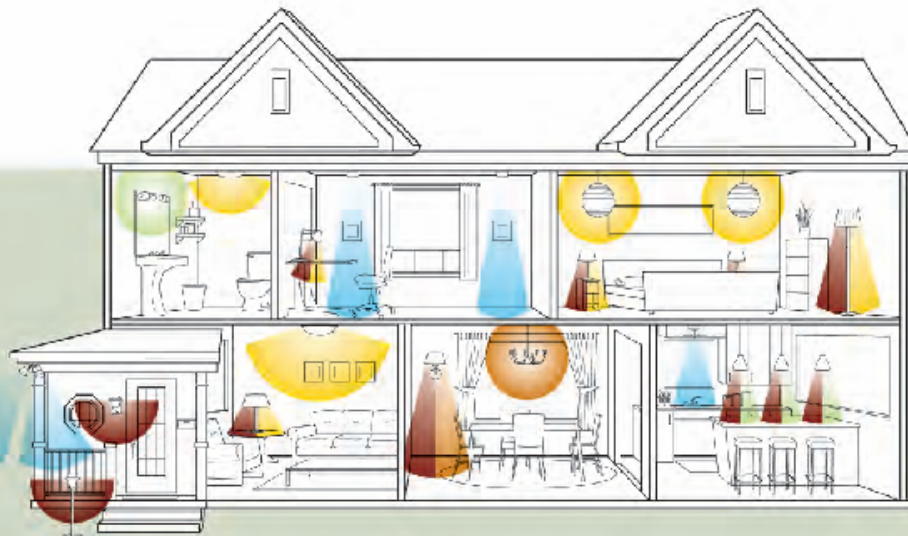
Change the bulbs on high ceilings, in stairwells, and in other hard-to-reach spots. Since CFLs are long-lasting, you won't need to change them as often.

PLACES WHERE HEAT SHOULD BE AVOIDED

Install CFLs in places where heat could cause problems. They give off much less heat than incandescent bulbs, making them a safer choice.



Bulbs for the whole house

Compact fluorescents are now available in a variety of designs to meet most needs, from attic to cellar. You're bound to come out ahead!



☆ Same light, fewer watts!

Many people think that "watts" refers to the amount of light a bulb produces. In fact, watts are a measure of a bulb's power usage, not its brightness. Amount of light is measured in lumens. CFLs use fewer watts (less power) to produce the same light output (lumens).

INCANDESCENT BULB	CFL
60 W	15 W
	
approx. 850 lumens	approx. 850 lumens

How do I choose?

Here's some more information to help you choose the right CFLs for your particular needs.

☆ Decide on the type of light you want, based on the atmosphere you want to create.

- **Warm light:** Choose a soft white CFL that produces a light similar to that of an incandescent bulb.
- **Cool light:** Choose a cool white CFL that produces a brighter light with a bluish tint.

☆ Decide on the amount of light you want.

Choose a CFL that will provide the same amount of light as the incandescent bulb being replaced. Read the packaging and compare the number of lumens produced by each bulb. The table below will help you choose the right rating.

INCANDESCENT BULB	CFL	LUMENS
watts	watts	
40	approx. 10	→ 450-500
60	approx. 15	→ 800-900
75	approx. 19	→ 1,100-1,200
100	approx. 25	→ 1,600-1,700

The values shown in the table are approximate and may vary depending on the CFL manufacturer and model.

☆ Rule of thumb:

A CFL uses about a quarter of the energy of an incandescent bulb to produce the same amount of light. To choose the right CFL for your needs, assume a 4:1 ratio.

☆ Read the packaging carefully, because there are specific models for different uses:

- Lamps and fixtures with dimmers or variable settings
- Outdoor applications
- Timers:
 - all CFLs can be used with mechanical timers.
 - many can be used with electronic timers.
- Motion detectors



Education – POS 4 page purchasing guides CFL 2007



REFLECTOR



SPIRAL
(TWIST)



ROUND
(GLOBE)



REGULAR



MINISPIRAL
(MINI TWIST)



CANDLE



REFLECTOR



2 Are you looking for warm lighting or functional lighting?

Now there are CFLs for any type of atmosphere.

Practical tips

- Packaging generally features terms such as "soft white," "warm white," "cool white" and "daylight."
- To reproduce the atmosphere of incandescent lighting, choose soft white or warm white.
- If you prefer more functional lighting, choose cool white.

COOL LIGHTING	WARM LIGHTING
13 watts — 850 lumens	13 watts — 850 lumens
<ul style="list-style-type: none"> ■ Whiter light with bluish tint ■ Functional lighting 	<ul style="list-style-type: none"> ■ Yellower light, similar to incandescent ■ Warm lighting
☆ Same wattage, same number of lumens, different atmosphere	

3 What type of CFL is right for your light fixture?

TYPE OF FIXTURE	SUGGESTED BULB(S)
Table lamp with harp	
Table lamp with clip adapter	
Hanging lamp	
Ceiling lamp	
Ceiling fan	
Wall sconce	
Recessed lighting	
Track lighting	
Outdoor lighting	
Exposed outdoor lighting	

Practical tips

- **Outdoor use:** Use CFLs in closed fixtures protected from the weather in order to maximize their service life. Check the package to be sure that the bulb can withstand winter temperatures.
- **Dimmer, three-way or timer:** Check the package carefully, because there are specially designed models for these uses.
- Check the height of the bulb (including the ballast) to make sure it will fit your fixture properly.





Education on the web



Residential Customers

Hydro-Québec's Home Page
Residential Customers
Home Page

Lighting - ENERGY STAR® fixtures Overview

Compact Fluorescent Bulbs
[Overview](#)
[Advantages](#)
[How do I choose?](#)

Light Fixtures
Overview
[Advantages](#)

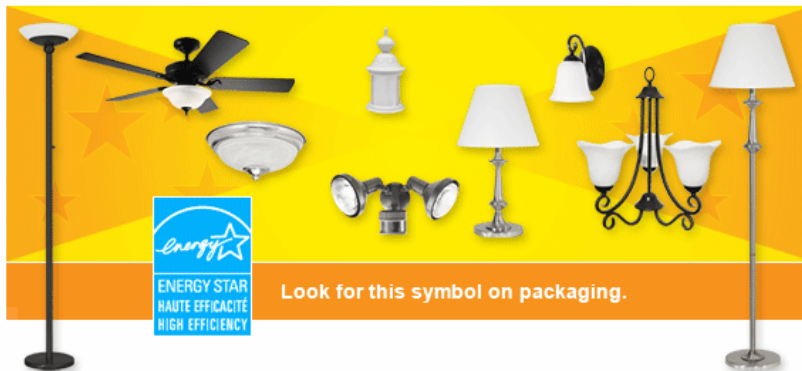
LED Bulbs
[Christmas lights](#)

Environment
[Comparative Life-Cycle Analysis](#)
[Safe disposal](#)
[If you break a compact fluorescent lightbulb](#)

Other Topics
[Energy-Saving Tips](#)
[Our ENERGY WISE partners](#)

Need to replace a fixture? Want to add lighting to a room?

Good news! Now you can choose from ENERGY STAR qualified fixtures in a wide range of styles. Retailers offer models to meet your taste and your needs, for both indoor and outdoor lighting.



Why choose ENERGY STAR qualified fixtures over conventional models?

For their exceptional features and benefits:

Reliability	They come with a two-year warranty, double the industry standard.
Durability	Compact fluorescent lightbulbs (CFLs) last 10,000 hours on average (three hours a day for nine years).
Performance	Light distribution is more even.
Savings	They use up to 75% less power than conventional fixtures.
Convenience	Fixtures usually come with bulbs included.



Fixtures bearing the ENERGY STAR label use only pin-based bulbs.* Screw-in





Education on the web



Close

Comparison for 10,000 hours of lighting at 7.33¢ per kWh

	COMPACT FLUORESCENT LIGHTING  one 15-W CFL	INCANDESCENT LIGHTING  ten 60-W bulbs
Purchase price	\$4.19	\$0.92 each X 10 = \$9.20
Lifespan	10,000 hours	10 x 1,000 = 10,000 hours
Energy consumption	150 kWh	600 kWh
Energy cost at 7.33¢/kWh	\$11.00	\$43.98
Savings for each bulb replaced		
Consumption		\$43.98 - \$11.00 = \$32.98
Purchase price		\$9.20 - \$4.19 = \$5.01
Total, excluding cross-effects*		\$37.99

Handy tool!

[Calculate your potential savings](#)





The market strategy 2006-2008

The Product

Choosing Energy Star as a brand for success

- Although all CFLs can produce about the same savings, using the Energy Star brand is greatly helping the campaign and contributes to a synergy reuniting other product efforts; i.e. appliances, windows, etc.
- No other specific test to create for product eligibility; a quick and simple approach



The market strategy 2006-2008

The incentive

We do not choose the moment a light bulb burns out:

- This aspect indicated the need for a year long program to make sure we could influence as many HH (House Holds) as possible.

Price is not the main barrier:

- Based on survey, price was not a problem for most HHs, but remained a problem for some. Considering this fact, the decision was made to use a mail-in refund incentive to cover the households that would really need it. This approach reduces the number of opportunists since we are asking people to make an effort for a small amount of money...



The market strategy 2006-2008

The incentive

CFLs Mail-in Refund for a certain group of the population:

- \$5 refund for each \$10 purchase with a max of \$25 refund
 - To support the purchase of multiple CFLs
 - To support the purchase of more expensive CFLs (various size and shapes like A-shape, spot lights...)
 - To ensure installation of purchased CFL
 - With this kind of product/price, a mail-in requires an "effort" from the buyer, minimizes the number of opportunists and maximizes the spill.
- \$15 refund for luminaires
 - Start making people aware of CFL fixtures and luminaires



ENERGY
WISE

Mail-in rebate of up to **\$25***

on the purchase of
ENERGY STAR® qualified
**compact
fluorescent lamps**

LOOK FOR THIS SYMBOL ON PACKAGING



Get a \$5 rebate on every \$10 spent (before taxes). Offer good on the purchase of any of these brands of ENERGY STAR qualified compact fluorescent lamps: Canac-Marquis Grenier, Eclipse, Essentials, GE, Globe, Greenlite, Luminus, Noma, Philips, Potvin-Bouchard, PRO, Prolux, Rona, Standard, Sunbeam, Sylvania.

Maximum rebate: \$25. You can combine several purchases to obtain the maximum \$25 mail-in rebate. The offer is valid until December 31, 2007.

*Offered by Hydro-Québec. Certain conditions apply.





The market strategy 2006-2008

The Partners

HQD Partner Alliance

- **All major retailers;**
 1. **Renovation warehouses**
 2. **Major clubs (i.e. Costco)**
 3. **Specialized retailers (to be developed)**
 4. **Large dept. stores (to be developed, especially Wal-Mart & Zellers)**

Partners have to accept POS visual aids & Energy Wise ads



The Results After 2 Years

Households market penetration:

- Increased from 47 % to 75 % = 75% of HH use CFLs

Market sales credited:

- CFLs credits to Hydro-Quebec: 4.8 M CFLs

Energy Savings credited:

- Energy Savings to Hydro-Quebec: 135.5 GWh



The Results After 2 Years

The financial leverage:

A mail-in coupon strategy has been very efficient for our campaign.

The spill was important:

For each CFL purchased and refunded, we had :

3.8 additional CFL credits *

* CFL purchased by people influenced BY HQD but did not ask for the refund



RESULTS

ENERGY STAR® Award Winners for 2008

- ENERGY STAR Promotional Campaign of the Year – Multiple Products (2007 & 2008)
- ENERGY STAR Utility of the Year – Provincial (2007 & 2008)



Mark Saucier, Director of the Energy Efficiency Group, accepts the award from David L. Anderson, Parliamentary Secretary for Natural Resources Canada





Lessons learned on evaluation

The Lessons:

Disappointment on the results ?:

- Our reading of the market tells us that results are superior to what the evaluator has credited to Hydro-Quebec
- The problems resides in a lack of a good logic model that would have helped clarifying the areas of influence from the various Hydro-Quebec actions & investments, for the evaluators

Market lessons:

- Do not assume people know enough about the product
- Focusing on behavior gives more results and is more durable than discounts when price is not the main barrier
- You need a good logic model in your program; why?



Lessons learned on evaluation

A Logic Model for your concept:

Getting gains from an evaluator is like shooting pool; you have to call the shots to get the credit...

A logic model is the evaluator blue print; it is your plan for calling shots...

A logic model should demonstrate:

- The company's inputs like money, tools, people, infrastructure, etc...
- Which will support activities like a promotion, partnerships, taking calls, picking up a fridge, distributing a discount coupon, training sale people, lobbying the gov't ...
- Which will produce short term results like change of attitude, perception, the creation of a regulation, a specific action, etc...
- Which will produce mid term results on behavior, making the right purchase, action, perception, respecting the law,
- Which will result in Energy Economy



LOGIC MODEL – An Example

	PROMOTIONAL ACTIONS	INVESTMENTS	LEGISLATIVE
INPUTS	<p>HQD investments in a promotion & education campaign to create a favorable predisposition to retired unefficient fridge</p> <p>HQD support for recycling partner & municipalities to reinforce existing attitudes through awareness raising campaigns</p> <p>HQD makes efforts to educate the market</p>	<p>HQD investments in the establishment of a unefficient fridge recycling infrastructure</p> <p>HQD offer money incentives (\$60/u) to consumers for retiring their unefficient fridge</p> <p>The market players sponsor programmes to maximize the full capacity use of the plant</p>	<p>HQD offer a technical expertise and support to establish industry legislative controls for unefficient products</p> <p>HQD offer \$\$ incentives (\$60/u) to consumers for retiring their unefficient fridge</p> <p>HQD and the recycling partner support lobbies to reinforce regulations that would oblige the retirement of energy unefficient products</p>
Program Activities	<p>Educational & promotional efforts</p> <p>Support the market in it's conception & use of the recycling infrastructure</p> <p>Recognition of a preoccupation for the environmental issues and energy costs</p>	<p>Financial Support</p> <p>Investments in a recycling plant</p>	<p>Legislative & regulative actions</p>
Results	<p>Perception of "convenience" and ease of use on the action of getting rid of an unefficient fridge</p> <p>Increase of the professional services capacity to work efficiently in the recycling industry</p> <p>Increase of capacity and efficacy in the recycling industry</p>	<p>Construction & implementation of a partner recycling plant</p> <p>Increase in the actual fridge recycling capacity</p> <p>Increased infrastructure to facilitate the hability, for the consumers, to recycle fridges (real convenience/ease of use)</p>	<p>Enforcement of existing environmental regulations</p> <p>Implementation of a legislation to regulate unefficient fridge resale</p> <p>Increase in the efficacy standards</p>
Cognitive & market outputs	<p>Consumer desire to substract energy unefficient fridge from the electrical network</p>	<p>Increased market capacity to retire energy unefficient fridges from the network</p>	<p>Limitation in the aged and unefficient appliance resale</p> <p>Higher quality standards for new appliances</p>
Behaviorial outputs	<p>Retirement of energy unefficient home appliances (fridges-freezers)</p>		
Impacts	non functional appliances	functional appliances	
	Non Energal benefits	Energy Economy Non energetal benefits	



The price for success – mercury

Some of us are now experiencing mercury worries in the press

Our answer:

Study from executed by CIRAIG (center for international research on life cycles for products, processes & services.)

- **Positive study results on a comparative CFL vs. incandescent life cycle impact: from cradle to grave...**
- **Should be publicized in early 2009**



The Next Step

HAVE WE REACHED MARKET TRANSFORMATION YET ?

- Is there place for a continuing increase in HH penetration ?
- How can we push for efficient fixtures / luminaires ?
- How can we increase the number of CFL per HH ?



A lighting program at Hydro-Quebec

Questions ?