ENERGY CONSERVATION AT A STORE NEAR YOU – THE COOL SHOPS PROGRAM FOR THE SMALL COMMERCIAL SECTOR

Corey Diamond, Summerhill Group[1]
and
Ersilia Serafini, Clean Air Foundation[2]

ABSTRACT

The Cool Shops program is the first program of its kind in Canada to deliver energy conservation advice, tips, and solutions to the small commercial sector. Cool Shops program delivery occurs during the summer months and involves "street teams" going door-to-door visiting businesses to engage owners one-on-one. Street teams install energy efficient technologies (2 free CFLs and LED exit sign bulb) as an educational tool and conduct a free Palm Pilot assisted energy audit. A discounted product offer sheet is provided which allows the businesses to purchase additional energy efficient, Energy Star qualified products. Total results for 2006 show a striking improvement over previous years – energy savings totaling 1,047.2 kW, 4,190.6 MWh and a reduction of 1,265.6 tonnes of GHGs. In addition to the program delivery methods listed above, the Cool Shops program has established a unique branding and marketing strategy to promote the program and its results – for example, a Cool Shops window sticker that designates a store as a participating Cool Shop. The Cool Shops program has resulted in measurable and sustained outcomes – transforming the market to sustainability, one 'cool shop' at a time. This paper discusses how the Clean Air Foundation partnered with 6 electric utilities and one gas utility as well as the provincial government to deliver Cool Shops in 2005; expanding to 9 electric utilities in 2006. This partnership reached over 7,000 small commercial customers in 2006. This paper also outlines some key research findings from both primary "street team" data collection, as well as the authoring of 2 papers on priority-setting for small commercial energy efficiency programs.

BACKGROUND

Cool Shops is a program of the Clean Air Foundation, a national not-for-profit organization dedicated to developing, implementing and managing public engagement programs and other strategic approaches that lead to measurable emission reductions, to improve air quality and protect the climate.

PROGRAM GOALS

The increased vulnerability on Ontario's electricity grid, declining air quality and accelerated climate change have led to the necessity of the Clean Air Foundation's Cool Shops program. The Cool Shops program is designed to target one of the most hard to reach sectors – the *small commercial sector* – and has four main goals:

1. to educate business owners about energy efficiency and energy conservation
2. to deliver cost effective energy audits
3. to collect energy consumption and market research data

[1] Corey Diamond, Director, Utility Programs, Summerhill Group, cdiamond@summerhillgroup.ca
[2].Ersilia Serafini, Executive Director, Clean Air Foundation, eserafini@cleanairfoundation.org

4. to encourage the small commercial sector to purchase energy efficient products via easy access to financial incentives.

Cool Shops provides one-to-one public engagement/outreach and education on the importance of energy efficiency. Several techniques have been employed to reach this difficult sector, and are outlined briefly below. Understanding the small commercial sector has also been a key goal, and through market research collected via Palm Pilot, the Cool Shops program has provided valuable energy consumption data to its utility partners. The program has collected and analyzed data in each participating city in order to understand where the greatest energy reduction opportunities are for the future.

EVOLUTION

In 2000, Cool Shops started as a program that encouraged small commercial businesses to close their doors during the summer months when their air conditioner was on. A window sticker let the community know this business was "open for business", but "closed" in order to save energy. The program evolved into a broader energy management program that included providing free energy audits to businesses who requested them. There were focused campaigns in specific areas and partnerships with local Business Improvement Associations (BIAs) and Chambers of Commerce.

To improve capacity and grow the program, Cool Shops was moved to the Clean Air Foundation in 2004. The program strives to make it as easy as possible for small businesses to participate in energy conservation and generate measurable energy savings. Over the past three years, a significant amount of market research data has been collected from delivering the program to over 11,000 small businesses in Ontario. Cool Shops has become a successful conservation and demand management program for Ontario utilities to engage this extremely hard-to-reach sector.

In addition to the program delivery methods that have evolved, the Cool Shops program has established unique branding and marketing strategies to promote the program and its results. The Cool Shops program has resulted in measurable and sustained outcomes – transforming the market to sustainability, one 'cool shop' at a time.

PROGRAM ELEMENTS

In 2006, the program included the delivery of a free Palm Pilot assisted energy audit (targeted towards lighting) and the installation of two free compact fluorescent bulbs (CFL) and a free LED exit sign retrofit kit. Within two weeks, businesses were sent audit results. In addition, businesses were provided with direct access to significant discounts off energy efficient products such as CFLs, PAR and BR fluorescents, T8 bulbs and ballasts (in some participating cities) and LED exit sign bulbs. These products were made available by The Home Depot Supply and Nedco Canada.

In addition, restaurants were offered free pre-rinse spray valve replacements, and businesses also benefited from coupons on programmable thermostats through partnerships with Enbridge Gas Distribution and Union Gas.

Cool Shops launch events were held in seven cities in 2006, and attracted significant media attention. Businesses that had upgraded their energy efficiency levels were showcased in media events, which also included local mayors, councilors, and federal and provincial elected representatives.

As with the Clean Air Foundation's other programs, Cool Shops' strength lies in its partners. In 2006, the Cool Shops program partnered with 9 electric utilities and two gas utilities, the government of Ontario, and two lighting wholesalers.

The following is a list of the strategic tactics used to accomplish 2006 goals:

- Deliver simple, turnkey, on-the-spot energy audit advice through Palm Pilot assisted software targeted at lighting
- Increase the amount of immediate kW reductions through program delivery by installing two free CFLs and a Free LED exit sign retrofit kit at each store audited
- Increase the amount of natural gas savings by promoting the uptake of pre-rinse spray valve technology to restaurant owners (the Cool Shops team was equipped with sample valve for demonstration purposes)
- Increase the number of energy efficient products purchased by the small commercial sector by providing significant financial incentives off these products and making them easier for businesses to obtain
- Partner with Business Improvement Areas, Chambers of Commerce and community organizations to promote the program through direct mail, membership newsletters, websites and speaking events
- As much as possible, pre-book appointments with business owners for audit activities in addition to cold calling and drop-in visits
- Develop marketing materials that promote and demonstrate local case studies of businesses who have undertaken energy efficient changes
- Generate a larger presence in the media for the Cool Shops program through a large media launch event in each city
- Hire and train a Cool Shops Coordinator and Street Team for each city
- Work with private and public sector partners to grow and expand the program across the province of Ontario.
- Collect primary data on the small commercial sector to improve program delivery

MARKETING MATERIALS

In 2006, the Clean Air Foundation developed four main marketing pieces to promote the Cool Shops program.

1. An updated version of the popular "25 Cheap and Easy Ways to Save Energy" booklet included estimated percent energy savings from undertaking various Energy Saving Tips, top 5 instant energy savings recommendations, and a coupon pocket in the back of the booklet.

2. The Cool Shops program flyer was used to promote the program when visiting businesses door-to-door and at events and conferences. These flyers were unique to each city and the

back side included information on a local case study store. This case study detailed various energy efficient changes that the business had undertaken and the resulting energy and money savings. These case studies were created in order to highlight local champions in the community and to promote a local example of how easy it is to undertake retrofits and also to demonstrate that the savings incurred are real and significant for a small business' bottom line.

3. Utilities provided discounted product offer sheets which advertised significant discounts off the purchase of CFLs, LED exit sign bulbs, and, in some cities, T8 bulbs and ballasts. They were distributed to every Cool Shop participant and the products were available through the Home Depot Supply Canada or Nedco Canada with free delivery within 48 hours. Both channels of distribution allowed the Clean Air Foundation to track the numbers of products purchased through the overall program and also to identify who, in each community, purchased these products.

4. The Cool Shops branding sticker – stating "Shopping Here Supports Clean Air" – was placed on the window/door of participating retailers. The purpose of this sticker, and the broader Cool Shops marketing program, is to let the community know that the participating business is doing its part to improve the local environment and to provide a market niche for their business.

The Cool Shops website – www.coolshops.ca – was also an educational resource to provide energy conservation tips to the small commercial sector. The website includes pages that give details about case studies in each city, as well as a directory promoting official Cool Shops in their city.

News releases, media launch events and matte stories for newspapers also attracted a great deal of attention for the Cool Shops program.

Examples of the marketing material and the discounted product offer sheet can be found at www.cleanairfoundation.org or www.coolshops.ca.

RESULTS

As a result of the free product installations (CFLs and LEDs) and product offer sheet uptake during the 2006 program, Cool Shops participants will collectively save over **$419,000 per year** in energy costs. This will also reduce energy consumption by **over 4,190 MWh** and a reduction in **peak demand of 1.04 MW per year.** [3] A peak coincidence factor of 90.5% was used to calculate peak demand for the small commercial customer.[4] In addition to the electricity savings, through the installation of 30 pre-rinse spray valves in small commercial buildings, businesses

---

[3] Dollar Savings/year (including the cost of the product) = Quantity x hours/year x (CDC/CDL +CDW x rate/1000 - EDC/EDL – EDW x rate/1000) as calculated by the firm BizInSync Inc. and reviewed and verified by Keen Engineering firm.
Peak demand savings = quantity x differential in watts x peak coincidence factor; Energy savings/year = kW x hours/day x days/year. Please see **Appendix A** for full calculation details

[4] http://www.aepressop.com/2005_AppendixD.pdf

will collectively save approximately **$16,380 in natural gas costs** and **$18,900 in water** and sewage costs. This also translates into approximately **36,960 m^3** of natural gas savings per year and approximately **7,449 m^3** of water savings per year. In total, all Cool Shops efforts through the summer 2006 program have resulted in over **1,265 tonnes of greenhouse gas (GHG)** emission reductions.[5]

In 2005, approximately 1.5% of the participating businesses purchased energy efficient products from the program's discounted product offer sheet. Through the 2006 program, this participation level increased to 4% of participating businesses purchasing at least one energy efficient product through the program. Two cities – **Woodstock and Waterloo** – experienced a product uptake rate of 18% and 14% respectively, which demonstrates the impact utilities and local organizations can make when they embrace the Cool Shops program and work collectively to make it a success.

LESSONS LEARNED

Through three years of Cool Shops program delivery, the following important lessons have been learned about the small commercial sector and energy efficiency:

1. Small businesses need significantly more assistance, incentives, and "hand-holding" in order to accomplish energy efficient changes and retrofits, relative to other market sectors.

2. Providing full-scale energy audits for small businesses is ***not*** the most effective way to encourage energy efficient product uptake and retrofits.

3. Businesses are interested in doing T12 > T8 lighting retrofits but incentives and/or financing options were not available.

4. A large proportion of the businesses do not have the authority to change lighting fixtures within their building due to lack of ownership and/or poor landlord-tenant relationships.

5. Through specific contractor partnerships, we learned that larger technology changes can be achieved through the involvement of technology specific contractors.

6. There are technologies specific to certain sub-sectors that require targeted incentives and marketing approaches. For example, convenience stores should focus on refrigeration/freezing and retail offices should focus on lighting.

[5] Greenhouse Gases (CO_2e) kg = kWh x 0.302.
(VCR Inc. Challenge Registry Guide to Entity & Facility-Based Reporting. Emissions Factors, 2003. 2001 figures except NB - 1999, SK - 2000. Section 9, Table 4 - Indirect Emissions Resulting from Electric Energy Consumption in kg CO2e/kWh.)

RESEARCH

In addition to generating tangible energy saving results from the program, the Cool Shops program is adding to the burgeoning growth of research on best practices for the small commercial sector. The following are three research projects that have been undertaken in 2006:

i) ***Palm Pilot audit surveys***[6]

In total, 4,265 businesses were audited and questioned on their energy use, business type, and attitudes towards energy conservation. Some results include:

- 81.6% of businesses pay for electricity bills; 69% pay for natural gas bills
- 45% of businesses use electric hot water heaters
- 67.7% of businesses use central air conditioning
- 72% of businesses use natural gas heating
- 19.9% own the building they occupy
- 41% of businesses reside in buildings that are more than 50 years old
- 33.2% of businesses want a 1 year payback on energy efficiency investments

ii) ***Ontario Convenience Store Association Report***[7]

In 2006, the Clean Air Foundation undertook a research study with the Ontario Convenience Store Association to determine priorities to reach out to this sector. Some key research findings include:

- Lighting and refrigeration are priority technologies
- 61% of refrigeration is supplied directly from manufacturers
- A wholesaler retrofit/replacement program needs to be developed in conjunction with a pickup and replace technology swap program

iii) ***Market Profile and Conservation Opportunity Assessment for Small Businesses in Ontario***[8]

A study was undertaken to determine baseload information on the small commercial sector, with respect to energy efficiency. The research revealed the following:

- 73 to 94 MW of peak demand reduction opportunity
- Small commercial sector should be split into four sub-sectors – food services, shopping malls, food retail, offices – with distinct programming and contractor-led initiatives for each sub-sector

[6] "2006 Cool Shops Final Report", Clean Air Foundation, October 2006, p70
[7] "OCSA Convenience Store Pilot Project Final Report"; Clean Air Foundation; October 2006
[8] "Market Profile and Conservation Opportunity Assessment for Small Businesses in Ontario"; Marbek Resource Consultants Ltd.; May 30, 2006

CONCLUSION

The Clean Air Foundation is using its experience from the 2006 Cool Shops program, together with the above three research projects to continue to evolve the program to have a more targeted approach for 2007. From visiting more than 7,000 small commercial businesses in Summer 2006, the Clean Air Foundation has a lot of primary research data to work with. As a bonus, while collecting this research, actual energy savings were yielded through installation of energy efficient technologies – mainly representing the low-hanging fruit of lighting upgrades. Clearly, the future of Cool Shops will include the incorporation of technology-specific contractor networks, to help small commercial businesses achieve even greater energy savings. It is the intention of the Clean Air Foundation to share its expertise gained in its work with the small commercial sector to prevent the need to "re-invent the wheel" on future projects in other jurisdictions.

APPENDIX A: ENERGY CALCULATIONS

This section details the energy calculations that were used to report the results of the Cool Shops program for 2006.

This chart details the types of lighting products that were assessed through the program along with associated specifications and averaged prices.

Identifier	Description	Total Watts	Life (hrs)	Unit Cost	Install $	Type
CFL011	Compact Flor. 11W	11	10000	$ 0.99		ED
CFL015	Compact Flor. 15W	15	10000	$ 0.50		ED
CFL027	Compact Flor. 27W	27	10000	$ 1.99		ED
CFLBR30	Compact Flor. Globe 16W	16	8000	$ 3.45		ED
CFLPAR38	Compact Flor. PAR 38 20W	20	8000	$ 3.45		ED
FL32T8 1X1	T8 32 4ft tube 1x1	33	25000	$ 1.50	$ 45.00	ED
FL32T8 1X2	T8 32 4ft tube 1x2	51	25000	$ 3.00	$ 50.00	ED
FL32T8 1X4	T8 32 4ft tube 1x4	98	25000	$ 6.00	$ 55.00	ED
FL32T8 8ft retro 1X2	T8 32 4ft tube 8ft retro 1X2	51	25000	$ 3.00	$ 83.50	ED
FL32T8 8ft retro 1X4	T8 32 4ft tube 8ft retro 1X4	98	25000	$ 6.00	$ 86.90	ED
FL34T12 1X1	T12 34 4ft tube 1X1	43	20000	$ 0.75		CD
FL34T12 1X2	T12 34 4ft tube 1X2	72	20000	$ 1.50		CD
FL34T12 1X4	T12 34 4ft tube 1X4	144	20000	$ 3.00		CD
FL40T12 1X1	T12 40 4ft tube 1x1	50	20000	$ 0.75		CD
FL40T12 1X2	T12 40 4ft tube 1x2	86	20000	$ 1.50		CD
FL40T12 1X4	T12 40 4ft tube 1x4	172	20000	$ 3.00		CD
FL60T12 1X1	T12 60 8ft tube 1X1	74	12,000	$ 4.00		CD
FL60T12 1X2	T12 60 8ft tube 1X2	126	12,000	$ 8.00		CD
FL75T12 1X1	T12 75 8ft tube 1X1	92	12,000	$ 9.00		CD
FL75T12 1X2	T12 75 8ft tube 1X2	158	12,000	$ 18.00		CD
IR HAL037	IR MR16 Halogen 37W	37	4,000	$ 5.90		ED
HAL025	Halogen 25W	25	2500	$ 4.00		CD
HAL050	Halogen 50W	50	2500	$ 5.00		CD
HAL075	Halogen 75W	75	2500	$ 6.00		CD
HAL090	Halogen 90W	90	2500	$ 6.00		CD
HAL095	Halogen 95W	95	2500	$ 6.00		CD
HAL100	Halogen 100W	100	2500	$ 7.00		CD
HAL150	Halogen 150W	150	2500	$ 7.00		CD
INC030EXIT	Incandescent Exit 30W	30	21000	$ 1.50		CD
LEDEXIT	LED Exit 2.4W	2	100000	$ 8.75		ED
INC040	Incandescent 40W	40	1000	$ 0.50		CD

INC060	Incandescent 60W	60	1000	$ 0.50		CD
INC065	Incandescent 65W	65	2000	$ 3.00		CD
INC075	Incandescent 75W	75	2000	$ 3.00		CD
INC090	Incandescent 90W	90	2000	$ 3.00		CD
INC100	Incandescent 100W	100	1000	$ 0.50		CD
NC-CFL015	Free Compact Flor. 15W	15	10000	$ 0.50		ED
NC-HAL025	Halogen 25W	25	2500	$ 4.00		CD
NC-HAL050	Halogen 50W	50	2500	$ 5.00		CD
NC-HAL075	Halogen 75W	75	2500	$ 6.00		CD
NC-HAL090	Halogen 90W	90	2500	$ 7.00		CD
NC-INC030EXIT	Incandescent Exit 30W	30	21000	$ 1.50		CD
NC-INC040	Incandescent 40W	40	1000	$ 0.50		CD
NC-INC060	Incandescent 60W	60	1000	$ 0.50		CD
NC-INC100	Incandescent 100W	100	1000	$ 0.50		CD
NC-LEDEXIT	Free LED two pack 2.4W	2	100000	$ 8.75		ED

- Install includes price of ballast and labour
- CD – current device
- ED – efficient device

Lifetime Calculation Note:

- For reporting purposes, the lifetime for the energy saving products, CFL13 and CFL23, is considered to be 3 years. The CFLs are estimated to have a lifetime of 10,000 hours and each store is open roughly 6.5 days /week, 50 weeks a year, an average of 10 hours for a total of 3250 hours:
    - 6.5*10*50= 3250 hours/year
    - 10,000 hours (lifetime)/ 3250 hours = 3 years
- For reporting purposes, the lifetime for the T8 bulb is considered to be 7.7 years. It is estimated to have a lifetime of 25,000 hours.
    - 6.5*10*50= 3250 hours/year
    - 25,000 hours (lifetime)/ 3250 hours= 7.7 years

Calculations

1. **Dollar savings** to the customer (including the cost of the product throughout the estimated product lifetime) is calculated as follows (referencing Table 1):

   Dollar savings = Quantity x hours/year x (CDC/CDL +CDW xrate/1000 -EDC/EDL – EDW xrate/1000) where
   - Quantity –the number of bulbs
   - Hours/year –the estimated number of hours/year of operation (ie. 3250 hours)
   - CDC – current device cost (dollars)
   - CDL – current device lifetime in hours
   - CDW – current device watts
   - EDC – efficient device cost (dollars)

- EDL – efficient device lifetime
- EDW – efficient device watts
- Rate – where rate is assumed to be $0.10/hour

The above is calculated and designed by BizInSync Inc.

2. **Peak demand savings** is the energy saved during the highest hourly measured energy demand for a customer.
   Peak demand savings = quantity x differential in watts x peak coincidence factor where

   - Quantity – is the number of bulbs
   - Differential in watts – is the difference in watts between the two devices (e.g. incandescent 60w – CFL13w = 47w differential)

Peak coincidence factor – is the ratio of the maximum demand of a group, class or system as a whole to the sum of the individual maximum demands of the several components of the group, class or system (see Appendix 4 for coincidence calculations). A peak coincidence factor of 90.5% was used.

3. **Energy savings (kWh)/year** is the amount of energy saved by all customers as a result of the efficient devices.
   Energy savings (kWh) /year = quantity x differential in watts x hours/year where

   - Quantity – is the number of bulbs
   - Differential in watts – is the difference in watts between the two devices
   - Hours/year – is the number of hours per year that the bulbs are used (ie. 3250 hours/year, see Lifetime Calculation Note)

4. **Cost to Business** is the Energy Savings (kW/year) savings multiplied by a $0.10/kWh cost of energy. Since we are looking at a minimum product life of 3 years, $0.10/kWh was used as a projected assumption of the cost per kWh over the next three years. The above calculation represents the energy savings to businesses.