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July 6, 2007

Mr. Robert J. Pellatt
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Pellatt:

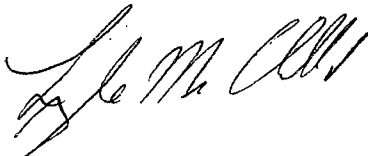
**RE: British Columbia Utilities Commission
British Columbia Hydro and Power Authority (BC Hydro)
2004/05 to 2006/06 Revenue Requirements application
Directive 66 (page 197 of Decision)**

Directive 66 directs BC Hydro to file the executive summaries of its milestone evaluation reports and full final evaluation reports for all its Power Smart programs. Accordingly, BC Hydro attaches the following:

- Power Smart LED Traffic Light Program (Process and Impact Evaluation) – Final Report, dated March 31, 2005 (previously filed as an attachment to BC Hydro's response to BCUC Information Request No. 2.328.2 in the 2006 Integrated Electricity Plan proceeding, yet not formally as a Directive 66 filing); and
- Power Smart Residential Lighting Program Reconciliation dated May 22, 2007.

Please contact Lyle McClelland at 604-623-4306 for further information regarding this submission.

Yours sincerely,



for
Joanna Sofield
Chief Regulatory Officer

Enclosures (2)





LED Traffic Light Program

Process and Impact Evaluation

**Final Report – Reviewed by BC Hydro
Evaluation Oversight Committee**

31 March 2005

**Prepared by:
Fred Liebich
Power Smart Evaluation**

EXECUTIVE SUMMARY

Introduction

Traffic signals based on LED (Light Emitting Diode) technology consume 85-90% less electricity than equivalent signals based on incandescent light bulbs. BC Hydro's Traffic Light Program (TLP) was offered to customers from April 2002 to the end of March 2004. The main purpose of TLP was to reduce the energy consumption of traffic signals by assisting municipalities and the B.C. Ministry of Transportation & Highways (MOTH) to upgrade eligible incandescent traffic signals to LED technology.

The central theme of the TLP offering to customers was that BC Hydro paid for LED traffic signals, including pedestrian control lighting, which were "on" more than 30% of the time. Eligible customers (mostly municipalities) ordered the LEDs from approved suppliers. BC Hydro paid the LED suppliers directly and will recover 50% of the capital cost directly from customers over a 5 year period after installation. Customers had no "up front" capital costs, but they were responsible for installation costs and the entire cost of LEDs that did not meet TLP eligibility criteria. The net result was that customers realised an immediate, significant decrease in the monthly energy bills for each intersection, even with the recovery of half the capital costs.

This report describes the process and impact evaluation of the TLP.

Process Evaluation Findings

Given that this process evaluation comes after the program has been completed, the findings are primarily of interest for future similar programs. For this evaluation one of the key sources of information was an extensive survey of 18 of the 63 total participating customers, representing 73% of the total number of intersections enrolled in the program. In respect of the overall TLP program it is clear that customers were reasonably satisfied. However, the implementation process, which provided good data and justification for BC Hydro, was perhaps difficult to understand, and considered excessive from the customers' perspective.

Three approved LED module suppliers for the program were selected through a competitive bidding process. After conclusion of the program these suppliers view BC Hydro's program as "leading edge" in LED traffic signals. The TLP is being referenced widely as the benchmark model for similar programs in other jurisdictions throughout Canada. Suppliers and customers commented very favourably on the BC Hydro team implementing this program.

A key component of the entire TLP implementation process was a spreadsheet based computer model referred to as the TLP Calculator. Using the Calculator customers developed an accurate inventory of traffic signals and functions for each intersection before and after the LED retrofits. By taking the difference between these before and after configurations energy savings were computed for each intersection.

Technical studies undertaken directly by BC Hydro for TLP were limited, consisting primarily of a metering study of 7 test intersections. In retrospect, it would have been useful to establish a direct correlation or verification between the results of that study and the estimated savings that would have resulted for the same intersections from the TLP

Calculator. Other parties, including the Provincial MOTH (Ministry of Transportation and Highways) and the LED suppliers themselves are responsible for the testing of physical performance characteristics to ensure compliance with applicable codes and standards. For the M&V phase (measurement and verification) detailed physical inspections were done by Power Smart Technical or Sales staff for a sample of about 1% of the completed intersections. Given the detail and accuracy of the TLP Calculator and the high degree of staff review throughout the entire process, this approach to accomplishing the audit inspections is considered reasonable. One issue of note is that although about 63% of total TLP intersections are located in the Lower Mainland only about 14% of the inspection sample were from that region. It would appear that more than 4 of the inspected sample intersections should have been selected from that region.

During the course of this evaluation it became evident that the overall implementation process was well managed, executed and documented. Individual intersection files showed ample evidence of a very high degree of staff review and checking to verify and validate data entries. This careful attention to detail consequentially provided a high level of confidence in the TLP database results.

Impact Evaluation Findings

The program resulted in the conversion of 2984 intersections to predominately LED lighting, with direct "gross" energy savings of 29.8 GWh/yr. After applying a standard discount factor of about 12% to account for free riders, spillover and M&V, these energy savings have been reported to date as 26.3 GWh/yr at completion of the program. These figures include the addition of 1.1 GWh/yr for energy savings derived from adjustments due to an ICBC program which supports more and larger traffic signals for enhanced public safety.

The program exceeded the targeted market penetration of 95% in the business case by achieving in the order of 98-99% penetration of eligible intersections. Analysis of customer estimates indicates that the assumed annual growth rate of 3.5% for new and upgraded intersections from the business case is reasonable, possibly erring on the low side.

Market baseline information indicates that about 6.3% of all traffic signals had already been converted to LEDs at the start of the program, for which the TLP does not claim energy savings.

The rate of free-ridership was estimated by asking customers what LED retrofits they had intended to undertake prior to TLP. Without TLP, customers were intending to install LEDs that would have resulted in energy savings of about 2.5 GWh/yr by the end of the TLP program, increasing to about 4.3 GWh/yr after 5 years from the start of the program and continuing to increase. Therefore net energy savings attributable to TLP at the end of the program are about 27.4 GWh/yr. In future years net energy savings for the program would increase slightly to a maximum of about 29 GWh/yr as new intersections are added before declining gradually as the rate of free ridership increases.

The following table summarizes the gross, reported and net evaluated energy and capacity (demand) savings achieved by TLP, as of the end of the program:

Energy and Capacity Savings	Gross Estimated Program Savings	Reported Program Savings	Evaluated Net Savings
Energy (GWh/yr)	29.8	26.3	27.4
Capacity (MW)	3.4	3.7	3.1

The following table provides a summary of the cost tests for TLP based on the evaluated energy savings in comparison to the cost tests reported to date. Program cost test results were estimated by updating the LED Traffic Light Program financial model to reflect energy and demand savings as evaluated in this report and incorporating actual program expenditures incurred to March 31, 2005 and forecast thereafter.

Cost Test	Unit of Measure	As Reported in Energy Efficiency Plan: 2005 REAP, Appendix A	As Evaluated
Total Resource Cost	\$/kWh	0.048	0.048
	B/C ratio	1.0	1.0
Utility Cost	\$/kWh	0.026	0.026
	B/C ratio	1.8	1.8
Rate Impact Measure	\$/kWh	0.078	0.078
	B/C ratio	0.6	0.6

Recommendations

1. **Reported Energy Savings Attributable to TLP:** Since completion of TLP in March 2004 the energy savings attributable to the program have been reported as 26.3 GWh/yr. Based on this evaluation it is recommended that reported savings be revised to report net energy savings of 27.4 GWh/yr at the program completion (March 2004). In future years net energy savings would increase slightly as new intersections are added or upgraded to a maximum of about 29 GWh/yr in 2007. Thereafter, net energy savings decline gradually as the rate of free ridership increases, as detailed in Figure 6.5.4 or Appendix C.
2. **Customer input:** For programs of this nature a wider range of customer input should be solicited and to the extent possible, be reflected in program design and implementation. Such input will need to be considered in the context of BC Hydro's business needs and objectives for any such programs.

3. **Technical studies:** Ensure that adequate technical studies are done and documented to examine the key variables affecting energy consumption.
4. **Follow-up to support integrity of energy data for intersections:** Steps need to be taken to clarify the disposition of the intersection data, including appropriate follow-up monitoring to ensure the ongoing maintenance and accuracy of that information for billing purposes. Consideration should be given to random annual inspections for a small percentage of intersections to help motivate customers to provide accurate intersection data in a timely manner.



Residential Lighting Program Reconciliation May 2007

May 22, 2007

Prepared by:

**Iris M. Sulyma
Power Smart Evaluation**

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RESIDENTIAL LIGHTING PROGRAM

RECONCILIATION MAY 2007

1.0 Introduction

In 2001, BC Hydro established a ten-year demand-side management (DSM) plan. As part of the plan, Power Smart designed and implemented a residential compact fluorescent lamp (CFL) initiative structured on the long-term transformation of the CFL market in British Columbia. Since 2001, BC Hydro Power Smart has undertaken province-wide consumer promotional campaigns using mail-in and in-store rebate coupons, radio and newspaper promotions, Internet advertising, billboard and transit advertising, point-of-sale materials, home shows, and Power Smart information booths. In the fall of 2004 the initiative expanded to include compact fluorescent torchieres (CFTs), which were incorporated in subsequent residential lighting campaigns.

The residential lighting initiative was launched and evaluated in phases. Evaluation studies have been undertaken to assess the direct impact of the campaigns and on the market as a whole.

This report consolidates and reconciles all previous direct and market evaluations of the Compact Fluorescent Lighting (CFL) and Compact Fluorescent Torchiera (CFT) initiatives. This report covers the period from program initiation to fiscal year end March 2006 (Fielding July 2005) by providing updated energy and demand savings for the fiscal year ending March 2005 and an estimate of savings for the fiscal year ending March 2006.

2.0 Background

2.1 Program History

The CFL and related residential lighting initiatives are an electricity acquisition and market transformation program aimed at motivating residential customers to obtain the best long-term value from their choice of household lighting and to shift customer behaviour and the lighting market so that efficient usage becomes a way of life. In the early stages of this program CFLs were purchased in bulk by BC Hydro and then distributed for free to BC Hydro utility customers through redeemable vouchers at partnering retail outlets (Fielding et al Sept 2002; Sulyma et al Aug 2003). Vouchers were redeemable at Power Smart Outreach Team booths (PS booths) that rotated among participating retailers. The PS booths included knowledgeable staff and interactive displays to help educate customers on the benefits of CFL bulbs, how to choose the right bulb, and the best places to use them. Mail-in and point-of-sale rebate coupons were used in conjunction and in separate campaigns to stimulate the purchase of CFLs.

The program was first launched as a pilot initiative (Phase I) in the small communities of Courtenay-Comox Valley, and Quesnel (CCQ). After a successful pilot stage, the program expanded in several phases to the rest of BC Hydro's 1.5 million residential customers including: Phase II – Vancouver Island (October 2002 to March 2003), Phase III – Lower Mainland (October 2003 to March 2004), and Phase IV – Northern and Southern BC (June to August 2004).

The Fall Lighting Campaign in 2004 (October to December) included mail-in incentive coupons as well as exchange events. The mail-in coupons were available to all BC Hydro customers and covered three technologies; CFLs, seasonal light emitting diodes (LEDs) and compact fluorescent torchieres (CFTs). For the in-store exchange events, customers could bring in their old holiday

light strings & torchieres to a participating retailer for recycling, and receive instant, in-store coupons for energy efficient replacements (seasonal LEDs and CFTs).

The 2005-06 campaign used a two-tier system for offering rebates for CFLs. In-store rebate coupons worth \$4 off the purchase price of a qualifying CFL were available from in-store PS booths which hosted lighting exchange events at select retailers. These events encouraged households to trade in old halogen or incandescent torchieres in exchange for coupons on new compact fluorescent torchieres, and old seasonal lights in exchange for rebate coupons for new seasonal LED lights. As well, mail-in rebate coupons worth \$3 off purchases of qualifying CFLs were available to all BC Hydro residential customers – at shelf level and via BC Hydro's web site.

Energy savings associated with compact fluorescent lamps (CFLs) and compact fluorescent torchieres (CFTs) are included in this reconciliation report. Seasonal LEDs are evaluated separately. Table 1 (page 4) summarizes the Power Smart residential lighting initiatives for fiscal years 2001-02 to 2005-06.

2.2 Evaluation History

Direct program impacts are the energy and demand savings associated directly with program activity, including give-aways and coupons. It also includes participant and non-participant spillover, which occurs when individuals are influenced by the program (e.g., advertising) to purchase CFLs without any assistance from the program. Direct impact evaluations were conducted on the first 3 phases of the CFL program including CCQ, Vancouver Island and the Lower Mainland (Fielding July 2005), and for activities during the fiscal year ending March 2006 (Sampson June 2006).

Direct program impacts for the fiscal year ending March 31 2005, including the Northern and Southern BC (Phase IV) CFL campaign and the Fall 2004 CFL and CFT campaign, were estimated using parameters from the Lower Mainland CFL direct impact evaluation (Longland March 2005) and the CFT direct impact evaluation (Gray July 2006).

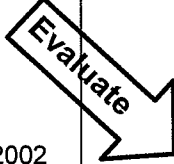
Evaluations of market impacts or effects were completed in 2002, 2004, 2005 and 2006 (Gin November 2002; Sulyma et al August 2003; Sampson March 2004; Sampson May 2005; Sampson June 2006). Market effects are defined as the energy and demand savings associated with the incremental increase in CFL sales attributable to BC Hydro's efforts to transform the BC marketplace for CFLs. Market effects, by definition exclude energy and demand savings from direct program effects. They also, however, include related program spillover. Direct and market effects were calculated independently for fiscal years 2001-02 thru 2004-05, and for these years spillover effects, determined through direct impact evaluations, were removed from the overall market effects in order to avoid double counting.

Starting in fiscal year 2005-06, spillover from participants is captured in direct impacts while spillover in the comparison or non-participant group is captured in market impacts. Table 1 (page 4) summarizes the Power Smart baseline research (Xenergy September 2002; JEM Energy June 2004; Pollara September 2006), direct and market impact evaluations for fiscal years 2001-02 to 2005-06.

2.3 Timeline

Table 1 (page 4) indicates the timing of the CFL/CFT campaigns and the evaluations: both impact (direct) and market evaluations. Note that evaluations are generally completed in the fiscal year following the campaign. To support the evaluations retail shelving data is collected during the fall lighting season (e.g., October and November); participant, non-participant and consumer surveys are fielded early in the new year (e.g., January and February); program activity reports for the fiscal year are received in early summer; and evaluation reports are finalized during the summer months.

**Table 1: Summary of Program & Evaluation Activity
BC Hydro Residential Lighting Initiatives 2001-02 to 2005-06**

Fiscal Year	Description	Timing	Evaluations
2001-02	CFL Mail in Coupon CFL Home Show Give-away CFL Bill Insert Mail-in Coupon CFL Give-away, Courtenay/Comox Valley and Quesnel (CCQ) Direct Install (3)	Spring 2001 Fall 2001 Fall 2001 Spring 2002 Fall 2001/Spring 2002	
2002-03	CFL Bill Insert Mail-in Coupon CFL Give-away, Vancouver Island	Summer 2002 Fall 2002/Spring 2003	
2003-04	CFL Coupons, Vancouver Island CFL Give-away, Lower Mainland CFL Coupons, Lower Mainland CFL Give-away, South Interior and North Interior	Fall 2003/Winter 2004 Fall 2003/Spring 2004 Fall 2003/Spring 2004 Spring/Summer 2004	Direct Van Island 2004 CFL Market Effects 2004
2004-05	CFL Give-away, South Interior and North Interior CFL/CFT In Store Coupon, Lower Mainland, Vancouver Island CFL/CFT Mail in Coupon – All Regions	Spring/Summer 2004 Fall 2004 Fall 2004	Torchiere Baseline 2004 CFL Hours-of-Use 2004 Review Hours-of-Use 2004 Direct Lower Mainland 2005
2005-06	CFL/CFT In-Store Coupon – All Regions CFL/CFT Mail in Coupon – All Regions	Fall 2005/Spring 2006 Fall 2005/Spring 2006	CFL Market Effects 2005 CFL Reconciliation 2005
2006-07	<i>(Not addressed in this report)</i>	<i>(Not Addressed)</i>	CFL Direct & Market Effects 2006 Torchiere Direct 2006 Fixture Baseline 2006

3.0 Results

3.1 Energy Savings

The residential lighting initiatives have saved 323 GWh/year (run rate) of electricity to March 2006. Direct and market energy savings for each fiscal year are listed in Table 2 (page 5) and cumulative energy savings are presented in Figure 3 (page 5). Energy savings numbers for fiscal years 2001-02 to 2003-04 come from the CFL Reconciliation report (Fielding July 2005) and relevant direct or market effects evaluation reports. Although they have not been evaluated, energy savings for the North/South and Fall Campaigns have been verified by the Evaluation Department. In this case, program variables and assumptions were adjusted to reflect evaluated results from previous CFL campaigns (Lower Mainland) or subsequent CFT campaigns, and savings were calculated based on those parameters.

Reconciled market effects estimates for the fiscal year ending March 2005 were taken from the Direct and Market Effects of 2005-06 report (Sampson June 2006) and adjusted by direct impact spillover to avoid double counting of savings. Direct impacts and market effects for fiscal 2004-05

are based on coupons redeemed, while fiscal 2005-06 energy savings are based on an estimate of redeemed coupons (program records¹).

Note, due to changes in methodology, direct and market effects for the fiscal year ending March 2006 are unadjusted as for this fiscal year direct impacts address participant spillover and free ridership, while market effects address spillover in the non-participant group (Sampson June 2006).

Table 2: Reconciled Energy Savings (GWh/yr Run Rate)

	Fiscal 02	Fiscal 03	Fiscal 04	Fiscal 05	Fiscal 06 ⁵	Total
CFL Direct ¹	0	17.0	102.2	22.8	4.2	146.2
CFL Market ²	6.2	15.6	31.8	95.9 ³	19.2	168.7
CFT Direct ⁴	0	0	0	2.9	4.9	7.8
Total	6.2	32.6	134.0	121.6	28.3	322.7

¹Fielding et al September 2002; Gin January 2003. Fielding March 2004; Longland March 2005; Sampson June 2006.

²Gin November 2002 adjusted; Sampson March 2004 adjusted; Sampson June 2006 (2005 only, adjusted). Adjusted Market = (Market – Direct Spillover) to ensure no double counting.

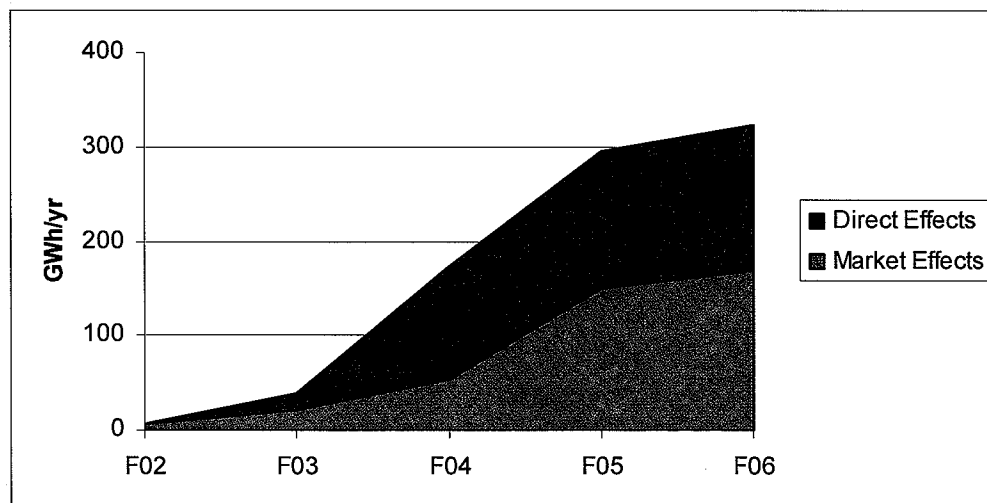
³Previously based on Sampson May 2005 adjusted (see Fielding July 2005).

⁴Gray July 2006.

⁵Estimate based on preliminary program activity numbers.

Figure 3 illustrates the cumulative energy savings for the CFL and CFT initiatives from fiscal 2002 to 2005, with an estimate for 2006 (based on preliminary program activity numbers).

**Figure 3: Residential Lighting Initiatives
Cumulative Reconciled Energy Savings (Run Rate)**



¹ Energy savings for market effects are initially calculated on the acquired volumes of CFLs to January of the relevant fiscal year, and adjusted the following year to reflect actual coupon volumes for the fiscal year.

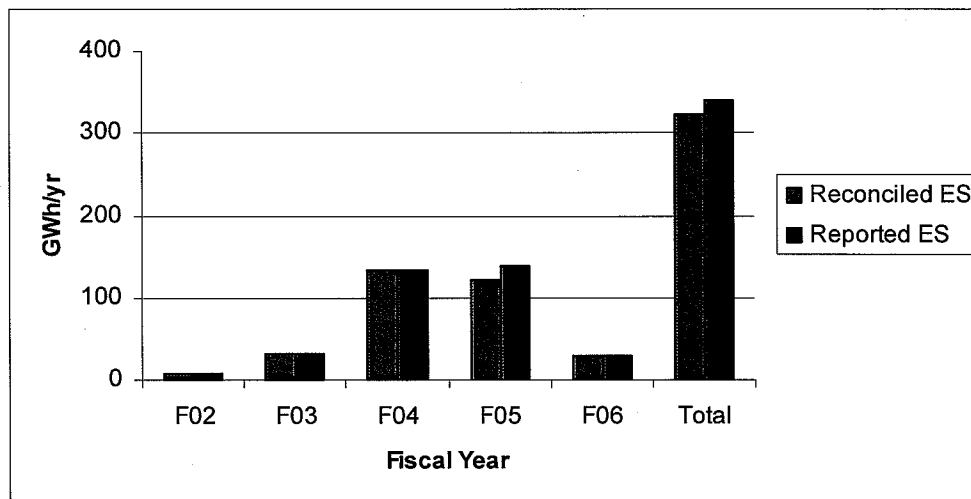
3.1.1 Reconciled Versus Reported

Total reconciled energy savings, 323 GWh/yr, are 5% lower than reported (339 GWh/yr). Direct and market energy savings for fiscal years 2001-02 to 2003-04 are essentially unchanged from the first reconciliation report (Fielding July 2005) and therefore match reported savings for these fiscal years.

The largest variance in the reconciled and reported energy savings is found in fiscal year 2004-05, where reconciled savings are 11% lower than reported, primarily due to lower than expected market effect savings (16%, Sampson June 2006) and somewhat lower per unit savings for CFTs (Gray July 2006). Minor differences between reconciled and reported energy savings are associated with using different residential end-use survey results to calculate cross effects (30%, 32% and 34% of households were electrically heated, see Synovate June 2003; Itron May 2004; and Pedersen August 2006, respectively).

Figure 4 (below) presents reconciled and reported energy savings by fiscal year.

Figure 4: Energy Savings - Reconciled Versus Reported



3.2 Demand Savings

The direct and market peak coincident demand savings associated with the CFL and CFT initiatives are 99 MW to March 2006. Peak coincident demand savings numbers come from relevant direct impact or market effects reports, or were verified by Evaluation (North/South and Fall 2004 campaigns).

Demand savings for fiscal years 2004-05 and 2005-06 have been adjusted based on the CFL load shapes obtained from logging of hours of CFL use (Sampson October 2004, see Appendix A). Consistent with results of related research in the US (KEMA February 2005; Tribwell & Lerman August 1996), the peak coincident demand factor for CFLs is 0.27 and for CFTs, 0.38. Peak coincident demand savings by fiscal year are listed in Table 5 (page 7).

Table 5: Reconciled Demand Savings

	Fiscal 02	Fiscal 03	Fiscal 04	Fiscal 05 ⁵	Fiscal 06 ^{4,5}	Total
CFL Direct¹	0	7.5	29.9	4.5	1.1	43.0
CFL Market²	1.9	4.7	14.3	25.5	7.6	54.0
CFT Direct³	0	0	0	0.8	1.3	2.1
Total	1.9	12.2	44.2	30.8	10.0	99.1

¹Fielding et al September 2002; Gin January 2003. Fielding March 2004; Longland March 2005; Sampson June 2006 adjusted peak.

²Gin November 2002; Sampson March 2004; Sampson June 2006 adjusted peak.

³Gray July 2006 adjusted peak.

⁴Estimate based on preliminary program activity numbers.

⁵Revised based on 0.27 CFL and 0.38 CFT peak coincident.

3.2.1 Reconciled versus Reported

The total reconciled peak coincident demand savings, 99 MW, are 7% lower than reported² (106 MW). Reported peak coincident demand for fiscal years 2001-02 to 2003-04 are consistent with subsequent research in BC and other jurisdictions (Sampson October 2004; KEMA February 2005).

The peak coincident demand factor for fiscal years 2004-05 and 2005-06 for both CFLs and CFTs was initially estimated at 0.48³. Reconciled peak coincident demand factor for these same years is 0.27 for CFLs and 0.38 for CFTs, while the reported peak coincident demand factor is 0.31⁴.

In fiscal year 2004-05 the variance in reconciled and reported demand savings are due to the differences between estimated (Sampson May 2005) and actual (Sampson June 2006) program activity and peak factors. Minor differences between reconciled and reported demand savings are associated with using different residential end-use survey results to calculate cross effects (30%, 32% and 34% of households were electrically heated, see Synovate June 2003; Itron May 2004; Pedersen August 2006, respectively).

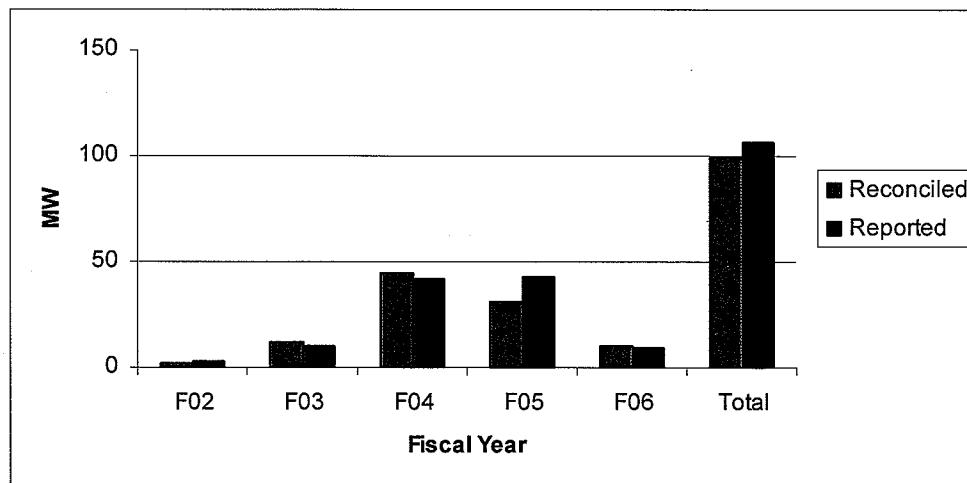
Figure 6 (page 8) presents the reconciled and reported demand savings by fiscal year.

² Reported demand savings are calculated using the following generic formula: GWh/yr * 0.3125 = MW (Power Smart Business Systems, ESTS V9P 200703 Monthend Report V2.xls).

³ Net installed CFL purchases turned on during BC Hydro's peak demand period (85%) multiplied by a household occupancy factor (57%), or 48% (Longland March 2005).

⁴ Power Smart Residential Marketing, Forecast and Actual Residential Mar2007.xls

Figure 6: Demand Savings - Reconciled Versus Reported



3.3 Current CFL Installations

To determine the number of CFLs currently installed and attributable to BC Hydro residential initiatives both a top down and a bottom up approach was adopted.

The top down approach is based on market effects surveys, extrapolated to the population of BC households (number of residential accounts). By January 2006, 90% of BC households were aware of CFLs and 71% were using an average of 6.9 CFLs (Table 7). This works out to an average 4.8 CFLs installed per residential electrical account (i.e., including households with no CFLs installed). In the comparison area, North & South Dakota (Sampson June 2006), 79% of households are aware of CFLs, and 44% of households are using an average of 2.8 CFLs indoors⁵.

**Table 7: Mean Number of Installed CFLs per User Household
May 2002 – January 2006**

	May 2002 ¹	May 2003 ²	Jan 2004 ³	Jan 2005 ⁴	Jan 2006 ⁵
Indoor	2.8	3.9	4.6	5.1	6.0
Outdoor	0.6	0.5	0.6	0.7	0.9
Total	3.4	4.4	5.2	5.8	6.9

Sources: ¹ Market Effects Survey 2002 ² Market Effects Survey 2003 ³ Market Effects Survey 2004

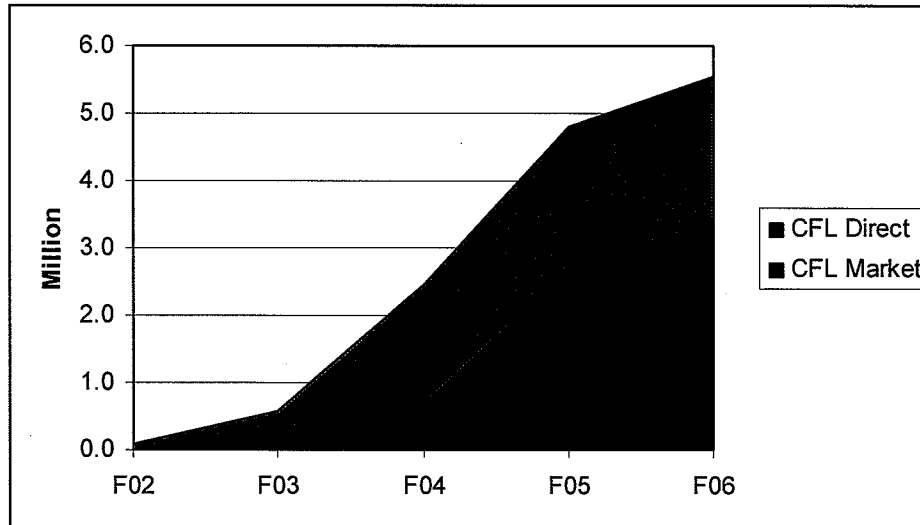
⁴ Consumer Survey 2005 ⁵ Consumer Survey 2006

Using the top down approach, as of March 2006 there are approximately 7.5 million (+/- 400,000) CFLs installed and currently in use by BC Hydro's residential customer base (Sampson June 2006). Based on information from the comparison area (North & South Dakota), approximately 2.1 million CFLs would have been purchased and installed in BC in 2005 if BCH had not undertaken its residential CFL initiatives during the past five years. Based on this top down analysis, approximately 5.4 million CFL installations are attributable to BCH residential lighting initiatives.

⁵ Note, CFLs do not perform well in outdoor installations in cold climates, including Northern & Interior BC, and the North & South Dakotas.

The bottom up approach relies on the direct impact and market effects evaluations completed to date, and provides an estimate of 5.5 million CFLs installed and attributable to BC Hydro residential initiatives (Figure 8, below).

Figure 8: Net CFLs Installed & Attributable to BC Hydro Initiatives



As of March 2006 there are an estimated 7.5 million CFLs installed in BC Hydro's territory and an estimated 5.5 million of these CFL installations are attributable to BC Hydro residential initiatives.

4.0 Conclusions and Recommendations

The Residential CFL program has achieved the following:

- 323 GWh/yr in energy savings to fiscal year end March 2006 (CFLs and CFTs).
- 99 MW in demand savings to fiscal year end March 2006 (CFLs and CFTs).

An estimated 7.5 million CFLs are installed in BC Hydro residential households and some 5.5 million of these are attributable to BC Hydro residential initiatives.

4.1 Recommendations

Reconciled energy savings are within 5% of reported energy savings and reconciled demand savings are within 7% of reported demand savings. While these differences in savings are within measurement error, adjustments to reported savings are recommended to ensure consistency between evaluated and reported energy savings.

1. Revise currently reported run rate energy savings associated with residential CFL and CFT initiatives from 339 GWh/yr to 323 GWh/yr, and peak coincident demand savings from 106 MW to 99 MW.
2. In the future, where appropriate and applicable, demand savings should be calculated based on a peak coincident factor of 0.273 for CFLs and 0.383 for CFTs.

3. In the future, where appropriate and applicable, cross effects for energy and demand savings should be calculated based on the most recent information from the Residential End-Use Studies (REUS).

The most recent REUS indicates 34% of BC households are electrically heated with 31% for the Lower Mainland, 56% for Vancouver Island, 20% for the South Interior and 18% for the North (Pedersen August 2006).

5.0 References

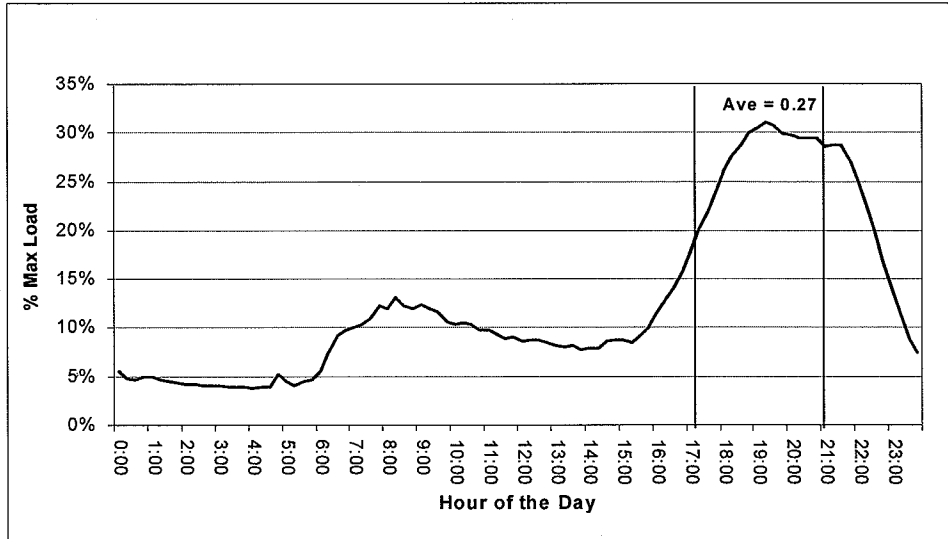
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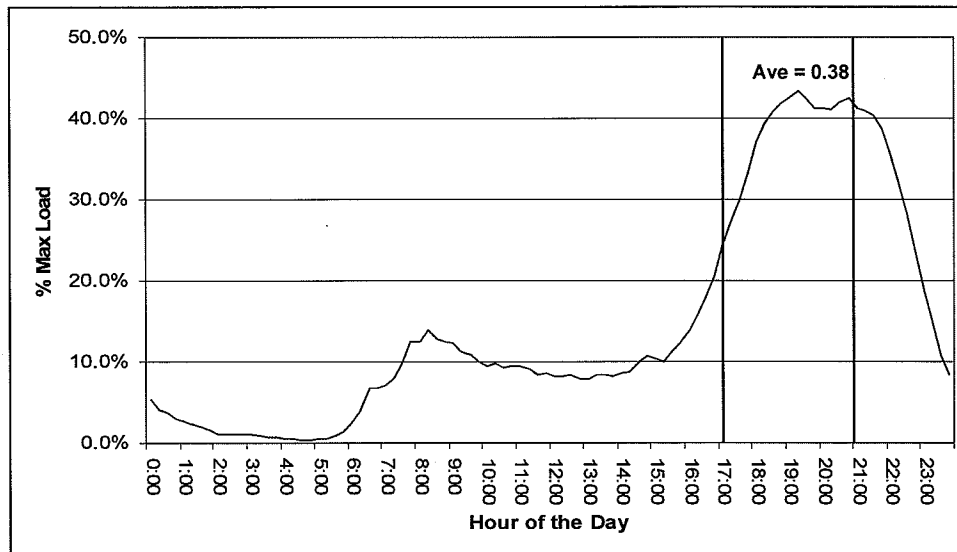
APPENDIX A: CFL & CFT LOAD SHAPES

**Figure A1: CFL Hours-of-Use
All Rooms, Winter Weekday**



Source: Sampson October 2004

**Figure A2: CFT Hours-of-Use
Winter Weekday**



Source: Sampson October 2004
(Dining Room/Kitchen, bedrooms, living room, den/study/family/games room)

APPENDIX B: PROGRAM MANAGER'S RESPONSE

Inter-office memo

To: Iris Sulyma May 23, 2007

From: Patrick Mathot

CC: Ken Tiedemann; Derek Henriques; Alicia Forrester

Subject: Marketing Response to CFL CFT Reconciliation 2007

1. Residential Marketing will revise the currently reported run rate energy savings associated with residential CFL and CFT initiatives from 339 GWh/yr to 323 GWh/yr, and peak coincident demand savings from 106 MW to 99 MW.
2. Where appropriate and applicable Residential Marketing will calculate demand savings should based on a peak coincident factor of 0.273 for CFLs and 0.383 for CFTs.
3. In the future, where appropriate and applicable, cross effects for energy and demand savings will be calculated based on the most recent information from the Residential End-Use Studies (REUS).

APPENDIX C: EVALUATION OVERSIGHT COMMITTEE

SIGN-OFF

This evaluation was prepared for Program Management and the BC Hydro Evaluation Oversight Committee. The Evaluation Oversight Committee (EOC) was established to represent various stakeholders in BC Hydro and in BC Transmission Corp. to ensure that the findings are of value to the corporations.

The evaluation oversight committee is composed of representatives from the following areas.

Engineering, Aboriginal Relations, and Generation (EARG) – Chair
Distribution Finance - Controllers Office or Financial Evaluation
Chief Regulatory Office
Energy Planning - Load Forecasting
Energy Planning – Resource Planning
PS – Evaluation & Measurement
CC – Key Account Management
BCTC – Planning
Distribution - Planning
Generation – Operations
Corporate Finance – Business Strategy
Corporate Sustainability

At the end of each evaluation, the Chair of the EOC will sign the report. The Chair's signature constitutes that the committee reached consensus that:

1. the evaluation complied with the defined scope;
2. methods used for both evaluation of results and analysis are appropriate given available resources at the time of evaluation;
3. results are reasonable given the data and resources available at the time of evaluation, and
4. the recommendations are acceptable

The signature of the Chair indicates that **Residential Lighting Program Reconciliation 2007** has met the criteria for sign-off by the BC Hydro Evaluation Oversight Committee, as outlined above.



EARG LOB (Chair)