

Second Quarter Energy Manager Report January 8, 2009



Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

RBCM 2008 SECOND QUARTER REPORT

CONTENTS

1. Organizational Review
2. Energy Performance
3. Energy Projects
4. Critical Action Areas

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

RBCM 2008 SECOND QUARTER REPORT

ORGANIZATIONAL REVIEW

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

RBCM Environmental Sustainability Policy

- Obtain cost savings over 2007 levels by year 2012 by implementing cost-effective energy management initiatives on its site.
- Reduce energy consumption over 2007 levels by the year 2012
- Reduce green house gas emissions to 'carbon neutral' by 2010 and incur an overall reduction of 33% by 2020.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

RBCM Sustainability Policy Goals

“The Royal BC Museum is committed to work in partnership with BC Hydro to adopt the principles of energy efficiency into our ongoing business management practices.”

. . . Pauline Rafferty, CEO

- from Sustainability Policy

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BC Hydro 

RBCM Energy Team Resources

Role	Name of Individual
Executive Sponsor	Angela Williams, <i>Director Business and Operational Services</i>
Senior Management	Pam Lowings, <i>Manager, Property Management and Operations</i>
Technical Implementer	Jon Roodbol, <i>Facilities Supervisor</i>
Energy Manager	Avalon Energy Management

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

Snapshot Of Organization

Organization Profile		
P E O P L E	Sector	Government
	Number of Employees	130 Plus 13-14 Volunteers per day
	Number of Sites	3
	Executive Sponsor	Angela Williams, Director Business and Operational Services

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

Snapshot Of Organization

Organization Profile		
P E O P L E	Energy Champions	Angela Williams Pam Lowings
	Energy Committee (Sustainability)	Angela Williams, Pam Lowings, Kelly Sendall, Melaina Haas, Sean Rodman, Carolyn Webber, Kate Kerr, Avalon Mechanical
	Energy Volunteers	To Be Determined

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Snapshot Of Organization

Organization Profile				
O P E R A T I O N S	EM Issues/Obstacles	<ul style="list-style-type: none"> •Old equipment (1969) •Central Plant Distribution •Increasingly Stringent Interior Design Conditions With Energy Increases 		
	Business Year	Start	Apr.	End Mar.
	Budget Cycle	Start	Apr.	End Mar.
	Maintenance Cycle	Start	Apr.	End Mar.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Snapshot Of Organization

Organization Profile			
O P E R A T I O N S	O&M Budget	Year 1, 07/08:	\$1,193,000
	Capital Budget	Year 1, 07/08:	
		HVAC & Lighting:	\$2,300,000
		Elevator:	\$740,000
		Envelope:	\$750,000 +
		TOTAL:	\$3,800,000

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Facility Profile

Facility Profile			
	Sq. Ft.	Annual kWh	E. Intensity kWh/Sq. Ft.
Museum	127,900		
Archives	23,950		
Fannin	62,075		
Totals	213,953	4,445,600 2,079,600 E+	30.5

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

RBCM 2008 SECOND QUARTER REPORT

OVERVIEW OF RBCM's ENERGY PERFORMANCE

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

Energy Consumption and Costs

Breakdown of Overall Electrical Energy Use

Rank	End Use	End Use Percent	Electricity Use (kWh/yr)
1	Mechanical	66%	4,081,157
2	Lighting	11%	706,163
3	Plug	10%	606,462
	Imax (tenant, charged actual kWh)	13%	800,000

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BC Hydro 

RBCM Baseline Energy Use 2007

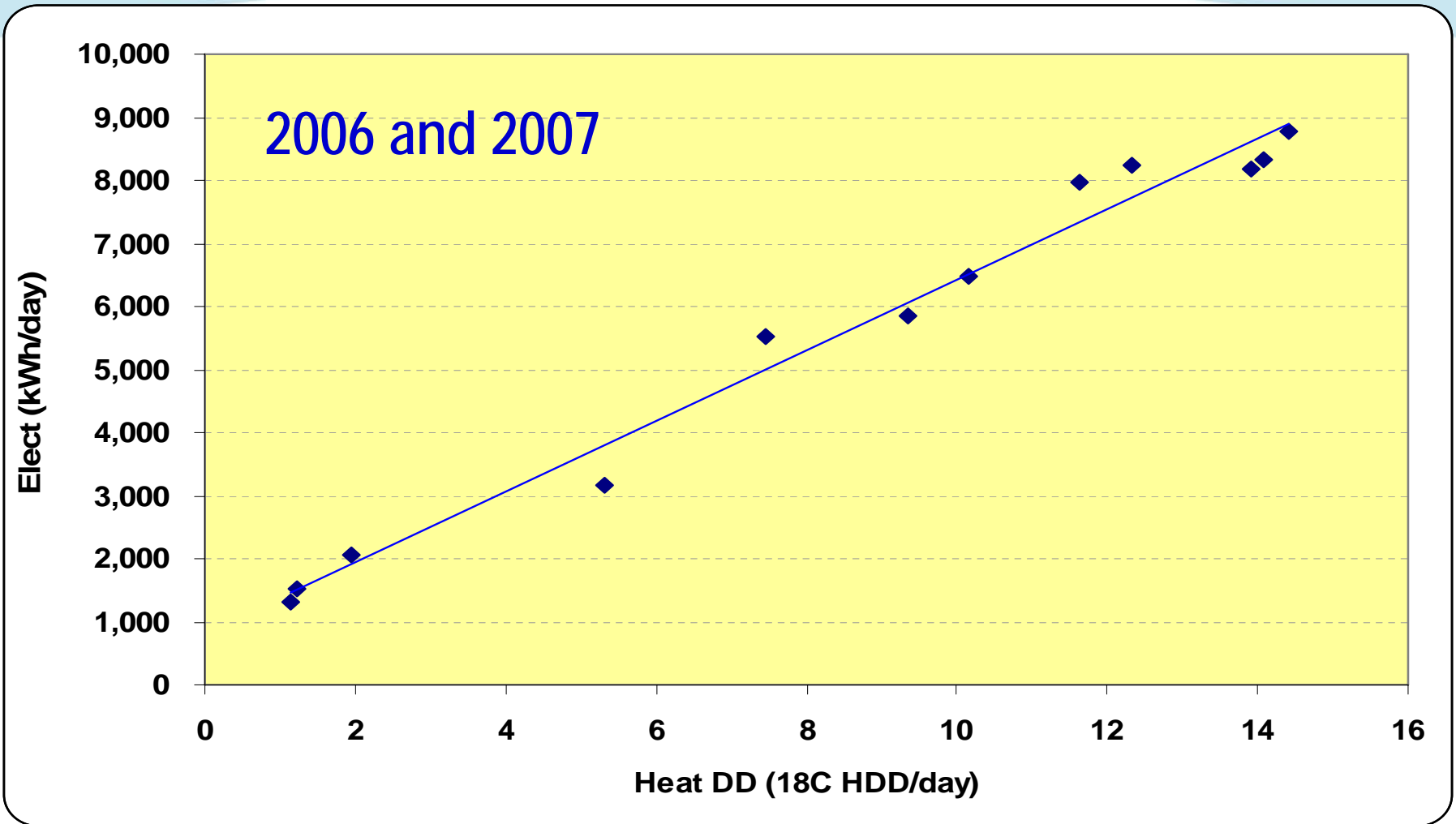
Source	Energy Charge \$	Demand Charge \$	Power Factor Charge \$	Taxes \$	Total Charges \$
Elec Firm	135,948	42,545	0	12,494	190,987
E+	47,019	0	0	3,291	50,310
TOTAL	182,967	42,545	0	15,785	241,297

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

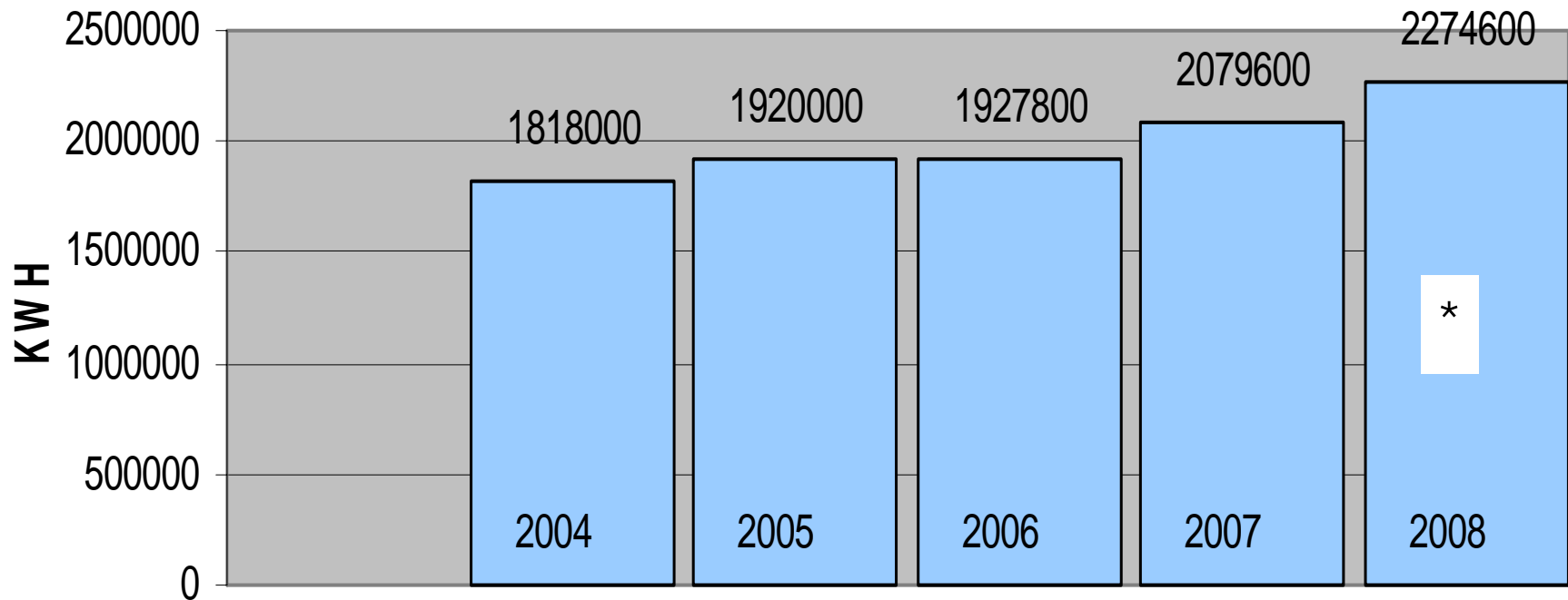
E + Consumption & Weather



Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

E + CONSUMPTION

RBCM ELECTRIC +



* Dec. 2008 Estimated

9% Increase from 2007 to 2008

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

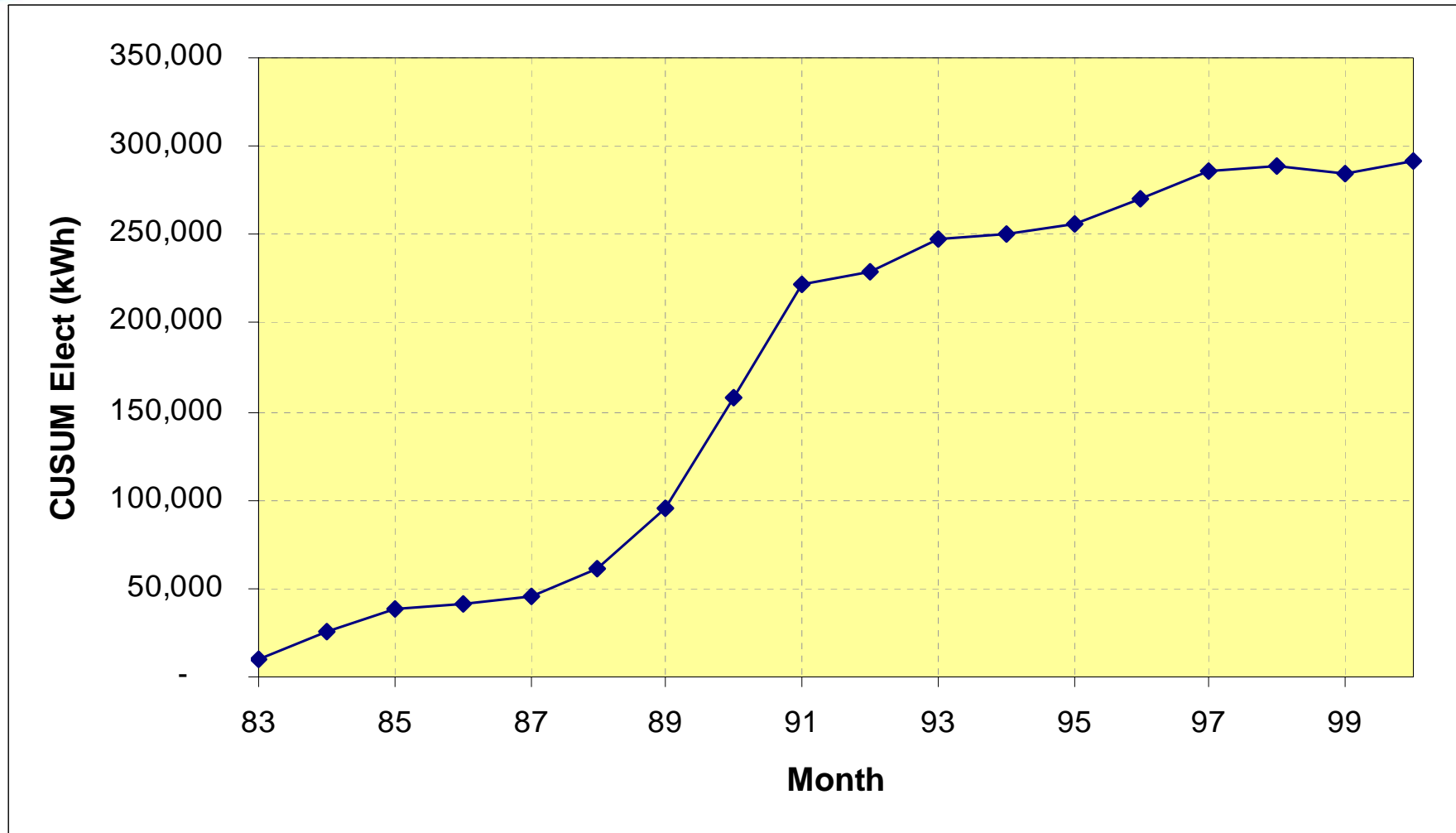
Energy Manager Program

BChydro 

Negative E+ Savings Since 2007

Month 83 = July 07

99 = November 2008

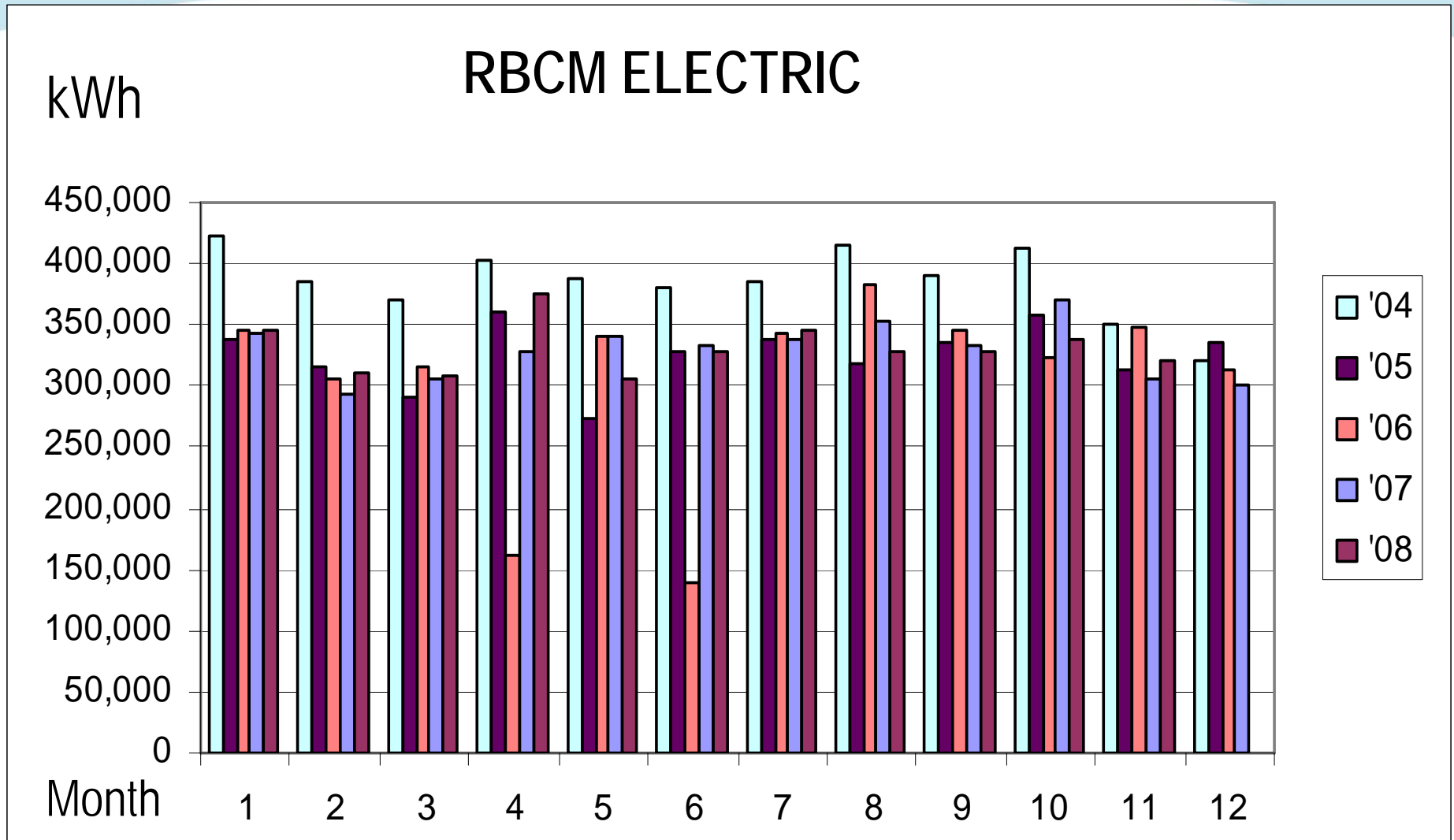


Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BC Hydro 

RBCM FIRM ELECTRIC

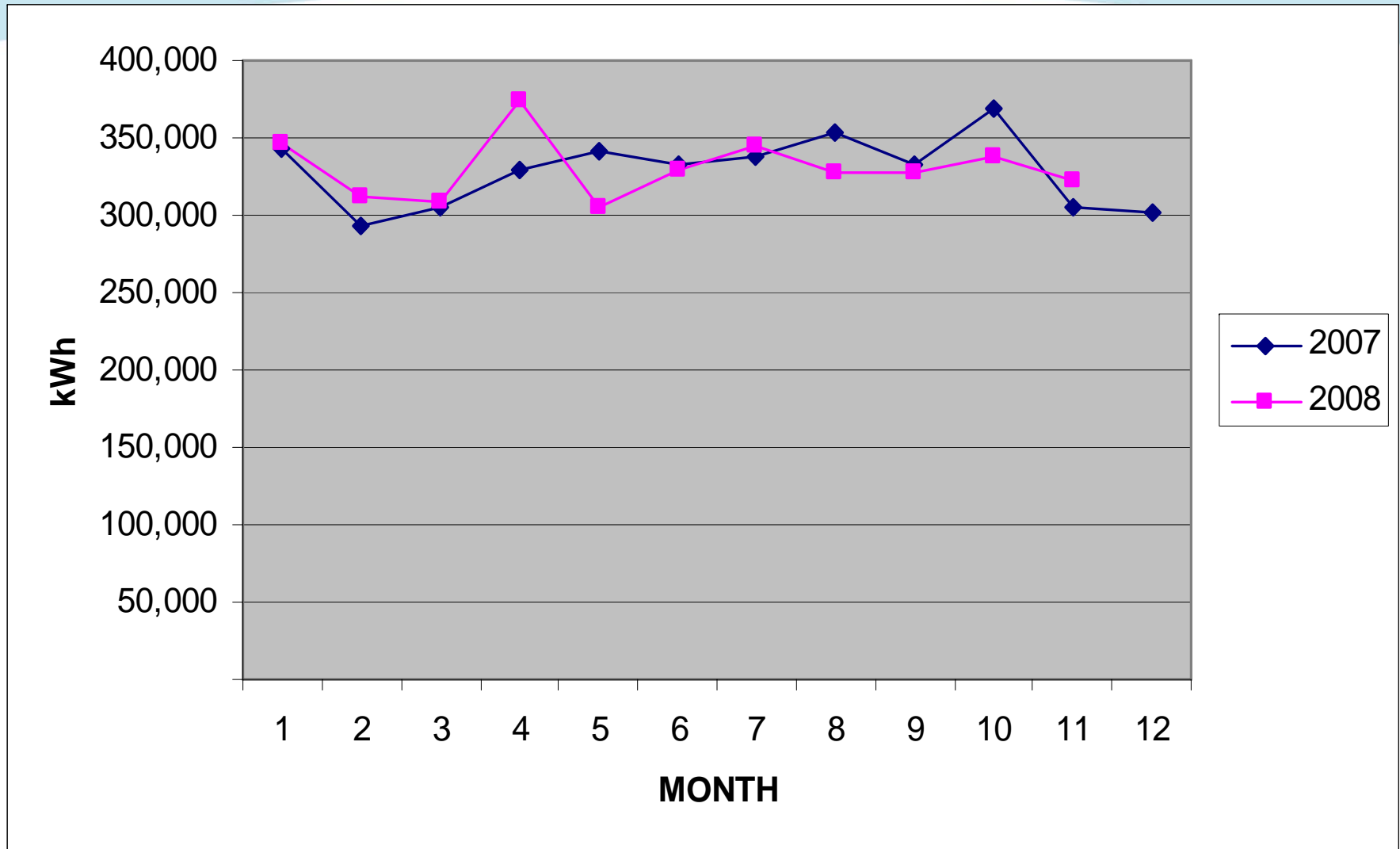


Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

FIRM ELECTRIC 2007-2008

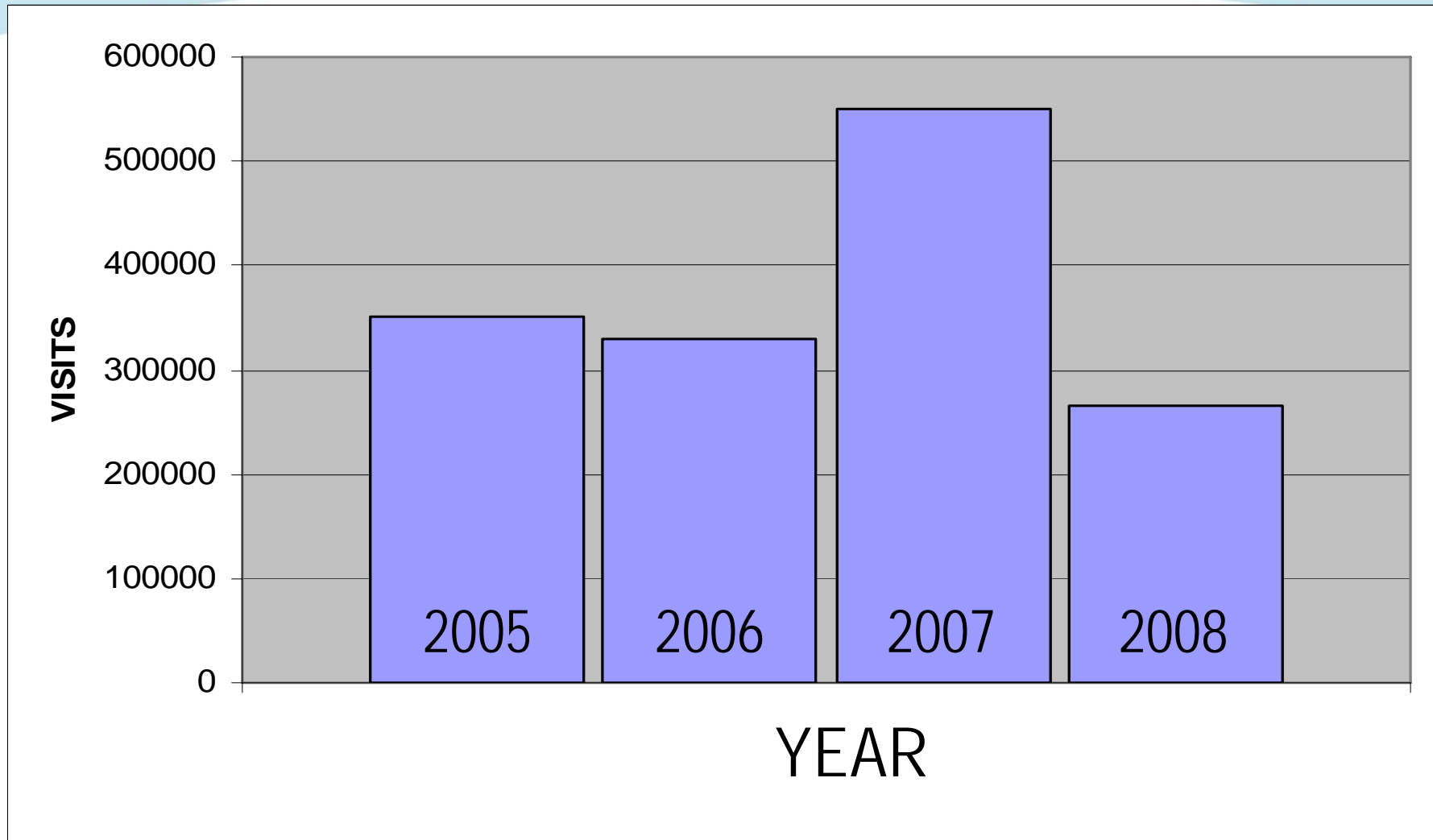


Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BC Hydro 

RBCM VISITORS



Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

RBCM 2008 SECOND QUARTER REPORT

ENERGY PROJECTS

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

COMPUTER POWER CONTROL

PROJECT:

Install Software to power down computers when not in use and allow periodic software updates. Project under the direction of Anita DiMaio Technical Services Manager Royal BC Museum following report from Jessica Vreeswijk of Green IT Tools.

Currently being implemented.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

COMPUTER SERVER UPDATE

PROJECT:

Implement Server Virtualization:

Project Completed September 2008.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

GREEN I.T. PROJECTED SAVINGS

The following table shows high-level statistics, the baseline figures resulting from the assessment and the project results if the highest impact recommendations are implemented.

High-Level Statistics	Baseline (2006/2007)	Projected
Annual IT Energy Consumption	192,000 kWh	82,800 kWh
Annual Total Energy Consumption	2,234,400 kWh	2,164,400 kWh ²
Percentage of Total Energy Consumption	9%	4%
Annual IT Energy Consumption per Workstation Deployed	985 kWh	425 kWh
Annual IT CO ₂ e Emissions ³	2.9 metric tonnes	1.25 metric tonnes
Annual Copy Paper Consumption	790,000 sheets	592,000 sheets Saving: ~\$1300 and 21,000 lbs of CO ₂ e emissions ⁴

GREEN I.T. PROJECTED SAVINGS



Overall Assessment

Based on the analysis conducted over a two-week period and with some information collected through other projects, the following scorecard provides a high-level view of the RBCM's current performance. There are many areas of opportunity especially around energy consumption for workstations and servers.

Highest Impact Recommendations

1. Implement Network Power Management – reduce workstation energy consumption by up to 69%
2. Implement 'Shut off printers' program – reduce printer and photocopier energy consumption by up to 35%
3. Complete Virtualization Project (already underway) – reduce server energy consumption by up to 60%
4. Complete Retirement of Old Servers Project (already underway)

GREEN I.T. SAVINGS

Future IT Programs To Be Implemented:

- ✓ Configure Printers and MFD's For Optimal Power (Spring 2009)
- ✓ Formalize Green IT Purchasing Policy (February 2009)

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

EXTERIOR LIGHT REPLACEMENT

Exhibits Ledge Exterior Lights 8 fixtures

Carrillon Tower - Base of Tower

Carrillon Tower – 4 Bell Lights

Replace with reduced power lights and turn off the Exhibits building lighting between 1 AM and 6 AM.

Turn off 2 of 4 lights at the base of the Carrillon each night (and rotate between them).

Projected Savings: 9800kWh/YR

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

NEW ENERGY STAR DOMESTIC REFRIGERATORS

PROJECT:

Replace 8 old refrigerators with improved efficiency models.

Archives coffee room - 19 cu ft new fridge

Wet lab Exhibits - 19 cu ft new fridge

Lab main floor Fannin - 19 cu ft new fridge

EATS basement Exhibits - 19 cu ft new fridge

Bug room breezeway - two (2) new 15 cu ft freezers

Lab main floor Fannin - two (2) new 15 cu ft freezers

Project Scheduled for January 2009.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

RBCM 2008 SECOND QUARTER REPORT

CRITICAL ACTION AREAS

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

Energy Manager Program

BChydro 

Critical Action Areas

Progress on Five Critical Areas In Second Quarter:

- **Plans**
 - > **All Activities Completed as Scheduled**
- **Demonstrated Corporate Commitment**
 - > **All Tasks Completed As Scheduled**
- **Reporting and Feedback Loops**
 - > **Departmental Reports Pending.**
- **Understanding of Performance and Opportunities**
 - > **All Items Completed**
- **Targets, Performance Indicators, Motivation**
 - > **Reports Pending.**

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.

RBCM Q2 ENERGY REPORT SUMMARY

- One-2-Five program is moving smoothly with many tasks ahead of schedule.
- Sustainability Committee is well organized and moving rapidly to institute energy initiatives.
- Energy programs are maturing and progressing rapidly to becoming part of regular business activity throughout the organization.

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.