

Retrofit Program

North Vancouver School District (SD 44)

Comprehensive retrofit yields 35% reduction in annual utility cost and hands-on education for students and staff

Participants:

- School District 44 – North Vancouver (building owner and occupant)
- Third-party Owner's Representative
- Engineering, lighting and energy system consultants
- BC Hydro (PowerSmart and ePoints)
- NRCan (Energy Innovators Initiative)
- Ministry of Education (Seismic Mitigation Program)

North Vancouver School District:

- 18,122 students, 3,000 staff
- 44 buildings, 209,718 square metres of floor space
- Baseline (adjusted) utility cost of \$1,954,796 in 1999

Building Improvements:

- Comprehensive retrofits performed on 41 buildings
- Lighting system upgrade and redesign
- Mechanical upgrades including HVAC and modification of domestic water systems
- Installation of automated building control systems

Contract/Financing:

- Third-party energy savings insurance policy
- \$5.7 million project cost (less financing and GST), financed through a bank loan, Energy Innovators Initiative (\$250,000), PowerSmart Incentive (\$100,000) and Seismic/Capital Funding (\$1,389,000)
 - \$4.31 million energy/water retrofit
 - \$1.39 million seismic upgrade
- Ten-year simple payback based on target annual utility savings of \$443,000

Project Process:

- RFP issued and engineering firm signed contract for feasibility study and design
- Public tenders for implementation of lighting, mechanical and water efficiency measures
- Retrofit installation from February, 2003 to April, 2004
- RFP issued and engineering firm signed contract for monitoring and verification
- Facilities management and operations staff closely involved in monitoring and maintenance

Education and Training:

- Engineering and energy consultants developed and implemented education and training programs for school staff, including installation, programming, and commissioning of automated building control systems
- BC Hydro worked with the school district to develop a career mentoring program that links students with facilities staff to undertake building inventories and energy audits and increase awareness of the retrofit project

Results:

- Actual performance exceeding target: annual utility cost reduction of \$687,866 vs target of \$443,000
- Project debt will be retired in just over 6 years, originally estimated at 10 years
- Improved lighting and indoor air quality for building students and teachers
- Significant water use reductions through innovative Water Matrix control system on urinals
- Greenhouse gas (carbon dioxide) emissions reduced by 870 tonnes per year
- Improved building safety through seismic upgrades
- Excellent learning tool and career planning resource for students
- Elimination of 20,000 kg PCBs through replacement of lighting ballasts
- PowerSmart Excellence Award

Annual Energy Use	Pre-retrofit	Post-retrofit	Saving
Electricity kilowatt-hours	12,068,688	8,727,605	3,341,083 (28%)
Electricity cost	\$ 663,778	\$ 524,107	\$ 139,671 (22%)
Natural gas gigajoules	111,089	95,098	15,991 (14%)
Natural gas cost	\$ 777,623	\$ 644,510	\$ 133,113 (17%)
Water CCF	177,142	53,142	124,000 (70%)
Water cost	\$ 513,395	\$ 98,313	\$ 415,082 (81%)
Total utility cost	\$ 1,954,796	\$ 1,266,930	\$ 687,866 (35%)

Note: The above is an adjusted baseline. Post-retrofit energy use refers to April 2004 to present.

Points of Interest:

UNBUNDLED APPROACH FOUND TO BE CHALLENGING BUT COST EFFECTIVE

- 1 According to Ian Abercrombie, Facilities Director for the school district, the unbundled approach proved to be cost effective, particularly due to the ability to publicly tender individual build contracts. The school district also appreciated having greater control over the project through the more 'hands-on' approach. Abercrombie notes, however, that the unbundled route requires a fairly high level of in-house knowledge and time commitment. "Overall," says Abercrombie "the time commitment has paid off, and the unbundled approach has definitely been the right choice for our school district."

INNOVATIVE WATER MATRIX SYSTEM

- 2 A significant component of the retrofit involved an innovative Water Matrix system which linked urinal occupancy sensors to the building automation controls, resulting in a 70% decrease in the volume of water used annually. This measure alone accounted for a 81% savings in annual water use costs.

CREATIVE FINANCING AIDS PROJECT FUNDING

- 3 The school district was able to inject capital funds into the project obtained under the Ministry of Education's Seismic Mitigation Program. "Because this project was unbundled," says Jeff Jackson, Maintenance Manager, "we had the flexibility of dovetailing the seismic grant, administered through the school district's capital group, with the retrofit program. As a result, our lighting upgrades resulted in improved lighting, energy savings, elimination of PCB containing ballasts and seismically enhanced lighting fixtures district wide."

STUDENTS INVOLVED AND LEARNING THROUGH RETROFIT PROCESS

- 4 Recognizing the opportunity to link student education with the on-site building retrofit process, a career-mentoring program was developed to allow students to work with facilities staff to undertake building inventories and energy efficiency audits. In addition, schools in the district partnered with BC Hydro to make mini-movies on energy efficiency which were broadcast on local television stations.

TIME COMMITMENT REQUIRES STAFF SUPPORT

- 5 "Managing a retrofit project requires a significant time commitment" says Jeff Jackson, Maintenance Manager for the School District. Jackson stresses the importance of good communication and involvement of staff throughout the retrofit process to ensure support internally for the project.

FINAL ASSESSMENT "IT'S THE RIGHT THING TO DO."

- 6 "Yes, we would absolutely do this project again," says Jeff Jackson, Maintenance Manager, "we have a responsibility as a school district to spend our taxpayers dollars responsibly, and this was simply the right thing to do."

For questions or additional support, please contact:

Brian Miltimore, Client Liaison Manager, Green Buildings BC Retrofit Program

Telephone: (604) 328-0797

Fax: (604) 990-8227