

Children's and Women's Health Centre

Administrators, employees, and the ESCO work to save more than \$400,000 in annual utility costs

Participants:

- Children's and Women's Health Centre of British Columbia (building owner and occupant)
- Honeywell Limited (energy service company or "ESCO")
- B.C. Hydro (PowerSmart funding)

Hospital:

- B.C. Children's Hospital: 198 bed capacity
- B.C. Women's Hospital: 102 bed and 57 bassinet capacity
- Two buildings, 44,450 square metres of floor space
- Baseline (adjusted) energy consumption of \$1,483,037 in 1993

Building Improvements:

- Retrofits performed on two buildings
- Lighting upgrade and redesign
- 31 variable speed drives installed in two buildings
- Installation of zone dampers and motion detectors to reduce air flow to unoccupied spaces
- Changes to operating procedures, duty cycling, and re-balancing of mechanical systems
- Installation of automated building control systems

Contract/Financing:

- Performance guarantee period: July 1995 through June 2000
- Guaranteed annual savings: \$433,992 in operating costs (includes annual energy cost escalation and equipment replacement and maintenance savings)
- \$2,840,000 project cost (less financing and GST), financed through ESCO and a PowerSmart incentive (\$438,949)
- Six-year simple payback

Project Process:

- Contract signed in 1993, retrofits installed December 1993 through April 1994 (lighting) and August 1994 through June 1995 (mechanical)
- ESCO's Technical Resource Manager worked with hospital staff to optimize building operation and develop additional self-funding measures

Education and Training:

- ESCO provided training for facilities staff in automated building control system
- Employees established an Energy Management Committee to promote awareness

Results:

- Annual electricity use reduced by 33%, fuel use by 28%
- Achieved 93% of projected cost savings for year four of the guarantee
- Greenhouse gas (carbon dioxide) emissions reduced by 1,075 tonnes (28%)
- Received a PowerSmart award in 1995
- 21,455 hours of labour created for local contractors

Annual Utility Use	Pre-retrofit	Post-retrofit	Saving
Electricity kilowatt-hours	14,077,197	9,393,334	4,683,863 (33%)
Electricity cost	\$759,430	\$510,880	\$248,550 (33%)
Steam 000 lbs	67,564	48,862	18,702 (28%)
Steam cost	\$659,917	\$477,120	\$182,797 (28%)
Water (m ³)	159,080	132,250	26,830 (17%)
Water cost	\$63,690	\$52,942	\$10,748 (17%)
Total utility cost	\$1,483,037	\$1,040,942	\$442,095 (30%)

Note: Pre-retrofit energy use is an adjusted baseline, including a 3% annual cost escalator and building/equipment changes. Post-retrofit energy use refers to July 1998 – June 1999 (year four).

Points of Interest:

third-party financing preferred option

- 1 Hospital administrators looked at various options for funding the retrofits, including internal financing, external borrowing, installment purchase agreements with equipment suppliers, leasing arrangements, and energy performance contracting. It was decided to pursue a performance contract with a commercial bank loan (third party financing).

comprehensive retrofits exploited interdependencies

- 2 The retrofits were installed in two phases in order to make the project economical. The lighting retrofit (Phase I) would not have generated an adequate payback on its own. The mechanical retrofit (Phase II) brought the payback down, but would not have been feasible without the reduction in cooling load produced by the lighting improvements.

Employee Committee generated awareness

- 3 The Energy Management Committee created for the project arranged a number of awareness activities, including pins, posters, display booths, and a PowerSmart award presentation. Project results were reported by e-mail and in hospital newsletters.

ESCO paying for savings shortfall

- 4 Since actual cost savings have been less than their guaranteed level, the ESCO has been paying the Health Centre for the shortfall. According to Honeywell's Ken Sharpe, the project had originally been packaged together with the UBC Hospital energy retrofit, and a detailed engineering study had not been conducted for the joint project. If the retrofitting had remained as one project, the savings would have been on target, since UBC Hospital overachieved on its savings performance. "Today, we would not make a savings guarantee without first completing an engineering study," said Sharpe.

monitoring baseline changes a challenge

- 5 Current Director of Plant Services Paul Lukkarinen pointed out that monitoring baseline changes, such as the addition of new equipment and computers, is one of the challenges of these kinds of contracts. "We have to negotiate which changes in energy use are the ESCO's responsibility and which ones are our own."

control system upgrade a key component

- 6 In the first year of the guarantee period, there were some area-specific lighting and air quality requirements to be ironed out. These issues were addressed and Lukkarinen has been pleased with the retrofit results. "The upgrade to the automated building control system has been a major driver in the energy savings achieved," he noted.