

Sustainable architecture and building operation represent a renaissance in one of Vancouver's core economic sectors. Green buildings benefit the economy, create green-collar jobs, and enhance Vancouver's leadership position in the emerging sustainable economy.

Walking the Talk

TOWARD THE EFFICIENT CITY OF THE FUTURE

Traditionally, buildings have used a great deal of energy to provide heat, light, and hot water. However, advances in technology and building standards are making both new and retrofitted structures increasingly efficient. These new green buildings are designed and built for maximum efficiency and comfort – with a lower overall life cycle cost than conventional ones.

Increasing efficiency is an important part of Vancouver's push to become the greenest city in the world by 2020. Our green building program aims to not only educate about green building techniques, but to align regulations and bylaws to make it easier to design and construct green buildings. Municipal buildings serve to test innovative solutions and establish best practices, inspiring and supporting the emerging green building industry.

BRINGING OLD BUILDINGS INTO THE FUTURE

For decades now, the City has worked to improve energy efficiency (and hence greenhouse gas emissions) at municipal facilities, including community centres and City Hall. The upgrades are effective: by the end of 2010 municipal facilities will emit 22 per cent less CO₂ overall than in 1990, and save over \$1 million annually in energy costs.

The retrofitting process involves analyzing energy-saving opportunities, replacing wasteful components with improved equipment, and monitoring the savings. For the retrofits, the City is working with an energy services company that is paid based on the energy savings resulting from their work.



CITY HALL RETROFIT: SAVING ENERGY, SAVES MONEY

Improvements

- New boilers
- Water conservation
- Updated computerized controls for building automation
- New lighting

Annual savings

- \$130,000
- 1.1 megawatt hours of electricity
- 4,200 GJ of natural gas
- 16,000 m³ of water
- 360 tonnes carbon dioxide

These emissions savings are the equivalent of planting over 28 hectares of forest, or taking 60 cars off the road.

The Vancouver Convention Centre's green roof supports native vegetation and beehives, as well as blending the built environment with our natural surroundings.



CHANGES AT CITY HALL SAVE MONEY, REDUCE EMISSIONS AND IMPROVE THE WORK ENVIRONMENT

The historic City Hall was the first facility in the retrofit program, upgraded to use less energy and create a healthier environment for employees and visitors. It set the pattern for a program which has seen 40 facilities analyzed by an energy services company that identified, implemented and monitored energy performance improvements.

The energy services company put in new computerized controls and handled the daunting task of replacing a 100-year-old boiler. Just as important was better lighting, which is over 30 per cent more energy-efficient, does not hum or flicker, and turns on and off instantly, which makes it easier for facility staff to save power when a space is unused for a few hours.

NEW BUILDINGS BRING HOME THE GOLD

The City of Vancouver requires all new municipal facilities to achieve LEED (*Leadership in Energy and Environmental Design*) Gold – the highest standard of any municipality in North America, and in keeping with the City's standing as a world leader in sustainability.

The Sunset Community Centre is a showcase for achievable energy savings. Its many energy saving features include: high-efficiency glazing to prevent heat loss, geothermal heating and cooling, radiant floor heating, light sensors in every room, and dual-flush toilets.

The centre's geothermal system supplies 40 per cent of the heating and cooling required. During warm periods heat is transferred out of the facility and dispersed into the ground. In the winter, the process is reversed: heat is extracted from the ground and pumped back into the building.

The exterior glass must perform a range of functions, admitting light, providing shade, conserving heat. Different types of glass are strategically placed: glass facing the east and west sides of the building is line-etched to provide shade from direct sunlight, while glass on the cooler north and south sides is triple-glazed to conserve heat.

RETROFITTING ENHANCES THE TRIPLE BOTTOM LINE

The City is investing \$15.4 million in retrofits for 164,000 m² of its facilities to improve energy efficiency and reduce greenhouse gas emissions, including:

- lighting upgrades
- heating and cooling system improvements
- building automation upgrades
- water conservation measures

These retrofits will pay off in annual savings over the long term:

- \$950,000 (based on current utility rates)
- Greenhouse gas emissions: 3,290 tonnes CO₂ – down 22%
- Electricity: over 3.9 million kilowatt hours – down 10%
- Natural gas: 55,000 GJ – down by 30%
- Water: 40,000 m³

(Annual reduction percentages are by comparison to 1990, the Kyoto Agreement baseline year.)



SUNSET COMMUNITY CENTRE
Varied glass panels control sunlight and heat entering the building.