Kwantlen POLYTECHNIC UNIVERSITY

Sustainability Success Story

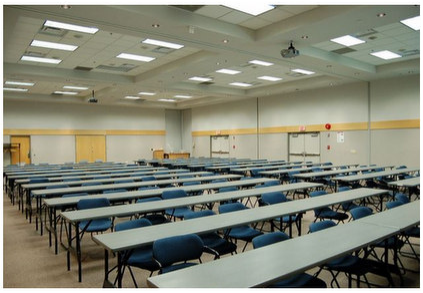
Ventilating Large Spaces When No One Is Home

The Challenge

Kwantlen Polytechnic University has a number of locations on campus that are not occupied continuously during normal daytime hours. These areas tend to be the larger rooms (gymnasiums, conference centers, auditoriums),

Our Solution

In the late 1970's most building owners began to realize the savings possible by reducing heating, cooling or ventilation at night when buildings were unoccupied. Thirty years later, with the increasing use of digital controls, we began to see another potential. In addition to daytime (occupied) and nighttime (unoccupied), we can now potentially save energy in a 3rd period: (daytime unoccupied).



The solution is a Demand-Controlled Ventilation (DCV) system using carbon dioxide sensors. Demand controlled ventilation systems have become increasingly more affordable and versatile with a variety of sensors to handle the variety of air handling systems. These sensors can be mounted anywhere from the room wall to in the air duct.

The first, most cost-effective applications we realized were the large spaces (with the large energy costs). The fact there is a large variance in the number of people occupying these areas (gymnasiums, conference centers, auditoriums, large office or administration areas, etc.) along with unpredictable or irregular occupancy can mean opportunity with a DCV system. Most savings are from reduced heating (150 GJ) and some from reduced (or slower speed) fan operation (6,000 kWh). A minimum level of ventilation during the daytime period is maintained.

Sensors were installed for two areas (a gym and a conference centre). With associated costs for commissioning, graphics & programming to our Direct Digital Controls the total was less than $3,000. This gave an estimated annual Return on Investment of almost 50% per year for 2 years. After that the system will be paid for and generate savings for a number of years. The costs and savings should be typical today, with a large study for the U.S. Government concluding the typical ROI as between 40% to 200%.

Project Cost, Annual Savings and Other Benefits

Cost	$3,000
Savings – Dollars	$250 (Elec.) and $1,200 Gas
Savings – Electricity (kWh)	6,000 Kwh
Savings - Natural Gas (GJ)	150 GJ
Simple Payback (years) / Return on Investment (ROI)	2.1 Years / A Return on Investment of 48%
Environmental Improvement - Greenhouse Gas Reduction	10 Tonnes