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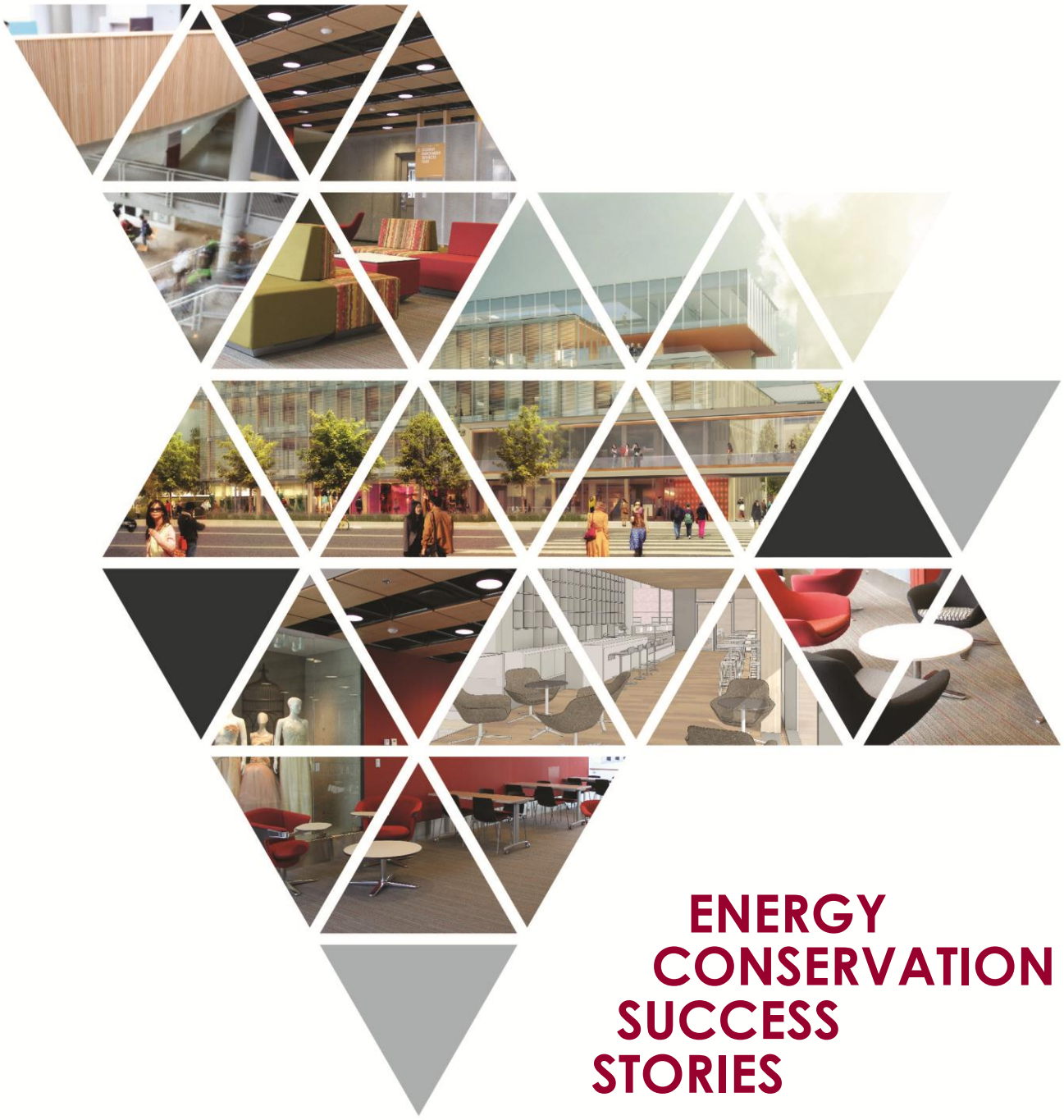

ENERGY CONSERVATION SUCCESS STORIES

FACILITIES SERVICES

Last Revision – Jan 15 2014

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Listing of Success Stories

2014

- Converting 400w Metal Halide to 146W LED saves $4,083 per year.

2013

- Converting 175w Metal Halide to 60W CFL saves $1,489 per year.
- Converting 100w Metal Halide to 20W LED saves $1,259 per year.
- Converting 26w CFL to 20W LED saves $4,824 per year.
- Converting 40w T12 to 25W T8 saves $544 per year
- Stairway lighting "BETA" test area saves $223 per year.
- Loading dock lighting "BETA" test area saves $690 per year.
- Forest and courtyard lighting project savings $1,982 per year.
- Exterior stairs and atrium light control saves $1,563 per year.
- Converting 175 W metal halide to 50w LED saves $1,272 per year.

2011

- Converting MR16 bulbs to LED saves $2,346 per year.

2008

- Master damper control saves $22,517 per year.

2007

- Water conservation saves $6,250 per year.
- Green power certificates.
- Piping insulation savings $1,900 per year.

2005

- Exterior photo cell control of interior lighting saves $2,350 per year.

2004

- Interior incandescent replacement saves $4,000 per year.
- Heating system conversion saves $2,350 per year.
- Converting 32 watt to 30 watt tubes saves $4,000 per year.

2003

- Demand ventilation saves $1,450 per year.
- New atrium lighting saves $4,000 per year.
- Modifications to heating system for summer operation saves $5,050 per year.
- Loading dock door controls saves $1,400 per year.

2002

- Reflectors in cafeteria saves $2,100 per year.
- Exterior incandescent replacement savings $4,900 per year
- Controlling video games saves $800 per year.

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Energy Conservation Success Story

Converting 400w Metal Halide to 146w LED saves $4,083 per year

The Challenge

The parking lot lighting system at our Richmond Campus was installed in 1992 and utilized 400 a watt metal halide lighting system. The fixtures had developed a maintenance issue with the rails that supported the top reflector and parts were no longer available. To repair the maintenance issue we would have needed to custom fabricate parts and install them which would be a significant expense. We evaluated the cost of installing a new LED system instead and determined this would provide the greatest long term benefit.

Our Solution

In 2013 we removed the existing 400 watt metal halide lamp heads and replaced them with 146 watt LED lamp heads.

The Results

- 72% reduction in energy use estimated at 25,402 kWh per year.
- 58% reduction in maintenance costs.
- Estimated reduction of .61 tonnes of GHG emissions per year.
- The new LED lighting does not have mercury
- Lighting levels in the area increased

Project Cost

The project cost was $28,355 and had a 6.95 year payback from energy and maintenance cost avoidance which is estimated to be $4,083 per year when pro-rated over fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $2,393 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $1,690 per year.

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Energy Conservation Success Story

Converting 175w Metal Halide to 80w CFL saves $1,489 per year

The Challenge

We had older pole light fixtures that utilized metal halide lighting located on the main entrance plaza at our Richmond Campus. This lighting system operated reliably but we determined that converting to CFL lighting would reduce energy costs and also maintenance costs as the CFL bulbs do not have an external ballast to replace.

Our Solution

In 2013 we converted these lights from 175 watt metal halide to an 80 watt CFL. The work involved removing the old ballast, rewiring the fixture and having it recertified to meet CSA requirements.

The Results

- 65% reduction in energy use estimated at 13,279 kWh per year.
- 26% reduction in maintenance costs.
- Estimated reduction of .32 tonnes of GHG emissions per year.
- Lighting levels in the area increased

Project Cost

The project cost was $1948 and had a 1.31 year payback from energy and maintenance cost avoidance which is estimated to be $1,489 per year when pro-rated over fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $1,251 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $238 per year.

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Energy Conservation Success Story

Converting 100w MH to 20w LED saves $1,259 per year

The Challenge

We had older wall mounted light fixtures located over exterior doorways at Richmond Campus that utilized metal halide lighting and were not energy efficient. There was a maintenance issue with the lense covers deteriorating and losing transparency reducing light output significantly. The lense covers were no longer available for replacement and could not be repaired to correct this issue. We evaluated the system and determined that installing new LED fixtures would provide the greatest long term benefit.

Our Solution

In 2013 we converted these lights from a 100 watt metal halide to use a 20 watt LED fixture. The work involved removing the old fixtures, modifying the embedded junction boxes and installing the new LED fixtures.

The Results

- 83% reduction in energy use estimated at 11,337 kWh per year.
- 52% reduction in maintenance costs.
- Estimated reduction of .27 tonnes of GHG emissions per year.
- The new LED lighting does not have mercury
- Light output increased.

Project Cost

The project cost was $11,779 and had a 9.36 year payback from the energy and maintenance cost avoidance which is estimated to be $1,259 per year when pro-rated over the fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $1,068 per year.
- Avoided maintenance costs averaged over the life of fixtures estimated to be $1,259 per year.

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Energy Conservation Success Story

Converting 26w CFL to 20w LED saves $4,824 per year

The Challenge

We had older wall light fixtures located around the building perimeter at Langley Campus that utilized CFL lighting. The lighting system was not operating reliably and had issues with pre-mature failure of tubes and ballasts from heat buildup within the fixtures. These fixtures were also identified on an external audit as being at the end of their useful life. We evaluated the system and determined that installing new LED fixtures would provide the greatest long term benefit.

Our Solution

In 2013 we removed the existing 26 watt CFL fixtures and replaced them with 20 watt LED fixtures.

The Results

- 40% reduction in energy use estimated at 6007 kWh per year.
- 86% reduction in maintenance costs.
- Estimated reduction of .14 tonnes of GHG emissions per year.
- The new LED lighting does not have mercury
- Light output increased.

Project Cost

The project cost was $16,095 and had a 3.34 year payback from the energy and maintenance cost avoidance which is estimated to be $4,824 per year when pro-rated over the fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $566 per year.
- Avoided maintenance costs averaged over the life of fixtures estimated to be $4,258 per year.

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Energy Conservation Success Story

Converting 40w T12 to 25w T8 saves $544 per year

The Challenge

We had 40w T12 watt fixtures installed as feature lighting over a main entrance door at our Richmond Campus which were turned on all night and along with other fixtures in the area. We evaluated the system and determined that replacing the T12 fixtures with T8 fixtures on a motion switch so they would turn off when the building was closed would provide the greatest long term benefit.

Our Solution

In 2013 we removed the 40 watt T12 fixtures and replaced them with 25 watt T8 fixtures and installed a motion switch.

The Results

- 71% reduction in energy use estimated at 4,208 kWh per year.
- 50% reduction in maintenance costs.
- Estimated reduction of .1 tonnes of GHG emissions per year.

Project Cost

The project cost was $2,912 and has a 5.35 year payback from the energy and maintenance cost avoidance which is estimated to be $544 per year when pro-rated over the fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $396 per year.
- Avoided maintenance costs averaged over the life of fixtures estimated to be $148 per year.

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Energy Conservation Success Story

Stairway lighting “BETA” test area saves $223 per year

The Challenge

Some of our building inventory dates back to 1992 and must be upgraded from time to time to improve energy efficiency. It seems that for lighting systems the need to upgrade repeats every decade or so as technology improves.

Our Solution

In 2013 we decided to review our back of the house stairway lighting and selected a back stairway at Surrey Campus in the Surrey Main building to conduct a BETA test of a low wattage LED fixture.

The “Beta” test replaced the existing CFL lighting with LED lighting and we went from 26 watts per fixture or 52 watts per landing to two 5 watt LED fixtures or 10 watts per landing. Light levels are essentially the same with the new LED lights but the light is more directional and does have some shadows.

What’s really amazing about these new LED fixtures is that they each use less energy than the old exterior type Christmas light bulbs that people would put on their house at Christmas.

The test area has been left in place for anyone who may wish to come and view the light fixtures that were installed.

The Results

- 60% reduction in energy use estimated at 2437 kWh per year.
- 59% reduction in maintenance costs.
- Estimated reduction of.06 tonnes of GHG emissions per year.
- The new LED lighting does not have mercury.

Project Cost

The project cost was under $825 and had a 3.7 year payback from energy and maintenance cost avoidance which is estimated to be $223 per year when pro-rated over fixture life.

Annual Savings

- Avoided electrical costs estimated to be $87 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $136 per year.

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Energy Conservation Success Story

Loading dock lighting “BETA” test area saves $620 per year

The Challenge

It is difficult choosing efficient light fixtures that meet lighting requirements and are cost effective to install. Ideally we need to identify light fixtures that produce the same or improved levels of light, use less energy and reduce maintenance costs or are maintenance free.

Our Solution

To address this challenge installed a variety of light fixtures to test at the Surrey Campus loading dock to help identify suitable light fixture types for future energy efficiency projects.

We left 1 existing 125w metal halide fixture in place for comparison and installed the following types of light fixtures for evaluation: 1 traditional style 75w LED, 1 new style 10w LED, 1 new style 20w LED and 1 new style LED 30w and 1 traditional style 40w Induction light.

We found that the 20w LED was the best selection for our loading dock areas as it produces more light in the work zone than the original 125w fixtures, uses 84% less electricity and will be maintenance free for over 11 years based on an estimated 4368 hours of use per year.

We also determined that for exterior wall pack style lighting the induction light produces more light in the lighting zone than the existing metal halide type fixtures, uses 68% less electricity and is maintenance free for 23 years based on an estimated 4368 hours of use per year .

The test area has been left in place for anyone who may wish to come and view the light fixtures that were installed. As well, we have provided information signage to share our findings on light output and energy consumption.

The Results

- 31% reduction in energy use estimated at 3126 kWh per year.
- 60% reduction in maintenance costs.
- Estimated reduction of .07 tonnes GHG emissions per year.
- Light output increased

Project Cost

The project cost was under $1,368 and had a 2.21 year payback from energy and maintenance cost avoidance which is estimated to be $620 per year when pro-rated over fixture life.

Annual Savings

- Avoided electrical costs estimated to be $294 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $326 per year.

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Energy Conservation Success Story

Forest and Courtyard lighting project saves $1,982 per year

The Challenge

The lighting system installed along the edge of the forest at Surrey Campus had significant levels of vandalism on an ongoing basis and disrupted the forest habitat while adding a marginal amount of feature lighting. In the courtyard and around buildings we had significantly oversized wall wash lights illuminating the walls that also had considerable waste light to the night sky contributing to light pollution at night.

Our Solution

We removed the forest feature lights and changed the wall wash lights to LED.

The Results

- 97% reduction in energy use estimated at 14,379 kWh per year.
- 69% reduction in maintenance costs.
- Estimated reduction of .35 tonnes GHG emissions per year.

Project Cost

The project cost was under $2.902 and had a 1.46 year payback from energy and maintenance cost avoidance which is estimated to be $1,982 per year when pro-rated over fixture life.

Annual Savings

- Avoided electrical costs estimated to be $1,355 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $627 per year.

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Energy Conservation Success Story

Exterior stairs and atrium light control saves $1,563 per year

The Challenge

We had exterior stairs and a portion of our Atrium lighting system turned on 24x7 every day at Cloverdale Campus.

Our Solution

We installed photocells to turn off the exterior stairway lighting during daylight hours. This reduces energy use and maintenance costs.

The Results

- 50% reduction in energy use estimated at 7649 kWh per year.
- 55% reduction in maintenance costs.
- Estimated reduction of .18 tonnes GHG emissions per year.

Project Cost

The project cost was $2,180 and has a 1.39 year payback from energy and maintenance cost avoidance which is estimated to be $1,563 per year.

Annual Savings

- Avoided electrical costs estimated to be $721 per year.
- Avoided maintenance costs averaged over life of fixtures estimated to be $843 per year.

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Energy Conservation Success Story

Converting 175W metal halide to 50w LED saves $1272 per year

The Challenge

We had older 175 watt metal halide wall pack fixtures installed in the Horticulture area at our Langley Campus. These fixtures were experiencing reliability issues and an external audit identified them as being at the end of their useful life. We measured the lighting levels in this area and determined that an increase would be beneficial. We evaluated our options and determined that installing replacing the 175 watt fixtures with 50 wall LED fixtures would provide the greatest long term benefit.

Our Solution

In 2013 we removed the 175 watt metal halide fixtures and replaced them with 50 watt LED fixtures.

The Results

- 75% reduction in energy use estimated at 8,232 kWh per year.
- 61% reduction in maintenance costs.
- Estimated reduction of .2 tonnes of GHG emissions per year.

Project Cost

The project cost was $5000 and has a 4.05 year payback from the energy and maintenance cost avoidance which is estimated to be $1,272 per year when pro-rated over the fixture life. We applied to BCHydro's "Power Smart Incentive Program", which encourages the implementation of electrical efficiency projects, and BCHydro provided incentive funding to further reduce the project costs and improve the payback period.

Annual Savings

- Avoided electrical costs estimated to be $775 per year.
- Avoided maintenance costs averaged over the life of fixtures estimated to be $497 per year.

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Energy Conservation Success Story

Converting MR16 bulbs to LED saves $2,346 per year

The Challenge

We were using MR16 light bulbs as feature lighting at Surrey Campus which was time consuming to maintain and not energy efficient.

Our Solution

We replaced the MR16 lights with LED lights.

The Results

- 91% reduction in energy use estimated at 13,441 kWh per year.
- 54% reduction in maintenance costs.
- Estimated reduction of .32 tonnes GHG emissions per year.

Project Cost

The project cost was $1,977 and has a 1.1 year payback from energy and maintenance cost avoidance which is estimated to be $2,346 per year.

Annual Savings

- Avoided electrical costs estimated to be $1,266 in 2013.
- Avoided maintenance costs averaged over life of fixtures estimated to be $450 per year.

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Energy Conservation Success Story

Master damper control saves $22,517 per year

The Challenge

Normally during cold weather Air Handling Unit (AHU) heating systems must start several hours before the buildings open so the buildings are a comfortable temperature when they open in the morning. During this warm up period the AHU heating systems bring in and heat up the same amount of cold outside air as they do when the buildings are open and fully occupied. This uses a lot of energy when it is cold and as an example if the temperature is -5 degree C outside the AHU system brings in air at this temperature and heats it to the building space temperature of 22 degrees C which is an increase in temperature of 27 degrees C. To put this in context in terms of how much cold air we are dealing with at maximum capacity our fan systems can move over 500,000 cubic feet of air per minute.

Our Solution

We separated the ventilation control of our AHU systems to allow us to control outside ventilation separately from when the AHU system starts to heat the buildings. This means we do not ventilate the buildings until they are occupied as we schedule the ventilation to match the hours we are open. With our new system when the AHU systems start before we are open to heat the buildings they recirculate and heat the air already in the building instead of bringing in cold air from outside. As an example they would heat and recirculate air in the building that is already about 18 degrees C to 22 degrees C which is an increase in temperature of only about 4 degrees C.

The Results

- Estimated reduction of 203,601 kWh per year.
- Estimated reduction of 949 GJ per year.
- Estimated reduction of 51.99 tonnes GHG emissions per year.

Project Cost

The project cost was under $10,000 and had less than a one year payback from energy cost avoidance which is estimated to be $22,517 per year.

Annual Savings

- Avoided electrical costs estimated to be $10,180 in 2008.
- Avoided natural gas costs estimated to be $12,337 in 2008.

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Energy Conservation Success Story

Water conservation saves $6,250 per year

The Challenge

While water for hand washing is extremely important, when we consider the number of times people wash their hands over the course of a day, it is also important we use the minimum amount required. With less water used there is also less natural gas or electricity to heat it. We were also aware that typical problems that may result from reducing the flow are insufficient water to actually remove soap, and potential scale buildup blocking the typically smaller diameter holes in low-flow faucets.

Our Solution

We found some faucet aerators for retrofitting to existing faucets addressed both problems. An earlier project indicated there were at least 600 daily users of one of our busy central washrooms, or 200 uses per day for each aerator. In this analysis we considered 140 uses per day as an average of the 260 washrooms. The savings also consider natural gas savings from heating an estimated 25% of the water to a comfortable hand washing temperature. These aerators increase the velocity of the water which means improved flow impact or flushing ability and reduced scalding.

The savings would provide enough drinking and cooking water for 2,000 families each year and also reduces municipal infrastructure costs in piping, pumping, delivery, purification and filtering.

The Results

- The reduced water flow decreases the electricity and natural gas consumption as some hot water tanks are heated by natural gas and some by electricity.
- Estimated reduction of 25,000 kWh per year
- Estimated reduction of 360 GJ per year.
- Estimated reduction of 17.9 tonnes of GHG emissions per year.
- Estimated reduction of 7,300 cubic meters of water per year.

Project Cost

The project cost was under $6,000 and had a payback of less than a year from energy cost avoidance which is estimated to be $6250 per year.

Annual Savings

- Avoided natural gas costs estimated to be $5,040 per year in 2007.
- Avoided electricity costs estimated to be $1,500 per year in 2007.

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Energy Conservation Success Story

Green power certificates

The Challenge

Kwantlen has long had a strong commitment to environmental sustainability. We became a BC Hydro Power Smart Partner in 2002 and have since made energy improvements that save over a million dollars in energy costs every three years, and reduce our greenhouse gas emissions by 30%. We received a Power Smart Certified Customer designation from BC Hydro in 2004 for demonstrating exceptional energy and environmental leadership in the educational sector. In the past 5 years, we have received a national leadership award for being the top Canadian post-secondary institution in the "Going Green" program; designation as a 'Gold' Champion Level Reporter for Canada's Climate Change Registry; and recognition by Natural Resources Canada's 'Energy Innovators Initiative' for our commitment to sustainability.

However, using less has its limits, particularly with steady economic growth in the province. "We believe that one responsibility of Kwantlen University is to demonstrate environmental stewardship in our communities. Our first action is to be efficient and use less, but after that we want energy from the cleanest sources. Purchasing Green Power Certificates is a good way to follow through in this commitment." said Skip Triplett, past President, Kwantlen Polytechnic University.

"We know to sustain Kwantlen and support the local and world communities; we must continually pursue fiscally and environmentally sustainable policies and practices."

Our Solution

Kwantlen saw Green Power Certificates (GPC's) as one way to encourage sustainable energy production.

The Results

- Purchased enough GPC's for 50% of the power for the Cloverdale and Surrey construction and expansion projects for a two year term.
- The purchase also provided LEED credits for these projects.

Project Cost

The project cost was about $15,000.

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Energy Conservation Success Story

Piping insulation saves $1,900 per year

The Challenge

In our Institute of Sustainable Horticulture field labs we have a number of different types of heating systems serving a variety of areas including classroom, shop (equipment and propagation), greenhouses, and office. The result was a number of glass greenhouses and plant propagation workshops are heated by hot water from boilers about 30 meters away. The area itself had significant amounts of uninsulated piping. This resulted in this area overheating in warm weather, with overhead windows needing to be opened to compensate. This combination meant uncomfortable people and plants were wasting energy.

Our Solution

We insulated almost 200 Meters of piping in the main work area and in the gallery. The gallery was a separate heating zone and had different temperature requirements from the greenhouses. Independent control of heating in this area was achieved by installing 2 new thermostatically controlled fan forced heaters and a thermostat.

The Results

- Improved temperature control and less potential for overheating during warm weather.
- Estimated reduction of 180 GJ per year.
- Estimated reduction of 8.95 tonnes of GHG emissions per year.

Project Cost

The project cost was under $5,600 and had a payback of less than 4 years from energy cost avoidance which is estimated to be $1,900 per year.

Annual Savings

- Avoided natural gas costs estimated to be $1,900 per year in 2007.

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Energy Conservation Success Story

Exterior photo cell control of interior lighting saves $2350 per year

The Challenge

Our campuses have many areas with many different purposes, from atriums to parkades. These areas have one thing in common, a lot of natural lighting from nearby windows and open areas. The typical solution is installation of an interior photocell controller to turn off lights in a relatively small area according to natural lighting levels in that area. The problem is that ten different areas need ten controllers, with an associated increase in capital and ongoing maintenance costs. While we had another concept we were not able to find other examples that would validate the idea, nor could we get agreement from outside resources.

Our Solution

In 2005 we committed to experimenting using outside light levels to control interior on/off switching. We installed two slightly unconventional (analogue) photocells, and averaged the readings from the two to our Building Management System (BMS) computer. We then set up temporary trend logs for the photocells to record their output and time of day and walked around the building, noting when we felt lighting could be off in various areas. By looking back at the trend log records for those dates and times, we knew the photocell values to use in programming lights off and on.

The Results

- Annual maintenance cost reduced as lights are operating fewer hours per year.
- Estimated reduction of 47,000 kWh per year.
- Estimated reduction of 1.13 tonnes of GHG emissions per year.

Project Cost

The project cost was under $10,500 and had a 3 1/2 year payback from electrical cost avoidance which is estimated to be $3,230 per year.

Annual Savings

- Avoided electrical costs estimated to be $2,350 per year in 2005.
- Avoided maintenance costs estimated to be $800 per year in 2005.

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Energy Conservation Success Story

Interior incandescent replacement saves $4,000 per year

The Challenge

At Kwantlen we have long appreciated the advantages of using compact fluorescent lighting instead of incandescent lights, and by early 2002 had changed out all incandescent lamps in our external fixtures. Yet we had never reviewed the 'miscellaneous' incandescent lamps we knew were still in many desk lamps, hall ceiling fixtures, mechanical rooms, etc.

Our Solution

By mid-2004 we undertook an audit to find how many remaining incandescent we had in total on our campuses. The big surprise came when we realized we had over 450 incandescents in various locations, at an average 70 watts per lamp.

The audit included a short questionnaire given randomly in about 20% of locations where an individual had direct control over the lighting in their area. We learned that if there was opposition to compact fluorescent lamps most was caused by the lamps being too bright. We began specifying replacements that were one size less than the typical recommendations. The result? Happier staff and even lower operating costs.

Considering the extended life of the Compact Fluorescent, the lamp premium (project cost) was very little (i.e. 6 incandescents cost about the same as 1 Compact Fluorescent) and we could consider this a no-cost ECM (Energy Conservation Measure).

The Results

- Reduced future maintenance costs as compact fluorescent bulbs last at least 5 times longer than incandescent bulbs.
- Estimated reduction of 80,000 kWh per year.
- Estimated reduction of 1.92 tonnes of GHG emissions per year.

Project Cost

The project cost was considered no cost as it was a change of practice in which bulbs to use.

Annual Savings

- Avoided electrical costs estimated to be $4000 per year in 2004.

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Energy Conservation Success Story

Heating system conversion saves $2350 per year

The Challenge

A 300 M2 work shed at the Langley Horticulture field labs was heated with hot water piped underground to radiant fin and fan-forced heating units. The piping was underground for almost 100 M and required significant maintenance associated with underground cathodic protection, as well as substantial energy loss in pumping costs and heat loss through the pipes. On average it cost $3,300 a year for annual testing and heat loss through the piping. There was also a potential environmental hazard of treated boiler water leaking into the ground water if we ever had a leak, regardless of how well we maintained the system.

Our Solution

We installed electric fan forced heaters (either wall or ceiling hung units (photo) and disconnected the piping from the boiler. While developing the project, we included temperature setback thermostats and improved operation of an exhaust fan that meant less energy use, and better air quality.

The Results

- Estimated reduction of 3,000 kWh per year.
- Estimated reduction of 32 GJ per year.
- Estimated reduction of 1.66 tonnes of GHG emissions per year.

Project Cost

The project cost was under $4,000 and had a payback of just over 1 year from energy and maintenance cost avoidance which is estimated to be $3,300 per year.

Annual Savings

- Avoided electrical costs estimated to be $150 per year in 2004.
- Avoided natural gas costs estimated to be $350 per year in 2004.
- Avoided maintenance costs estimated to be $2,800 per year in 2004.

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Energy Conservation Success Story

Converting 32 watt to 30 watt tubes saves $4000 per year

The Challenge

A number of our lighting fixtures operate long hours every day by necessity. These areas include egress or transit task areas (hallways), and areas with 24 hour a day safety or security lighting. Reducing the hours of operation, while ideal, is not practical at this point. About 15 to 20% of our lamps are in these categories.

Our Solution

We evaluated new T8 lamps that use only 30 Watts, compared to a typical 32 Watts. Light output was slightly lower and average lighting levels were reduced by less than one-half per-cent. In hallways and washroom where all or most of the lamps are on long hours, the task requirements were low, and a minor reduction in light levels is not a concern. We purchased over 6,000 - 30 Watt tubes and received $17,000 in funding from BCHydro.

The Results

- Estimated reduction of 80,000 kWh per year.
- Estimated reduction of 32 GJ per year.
- Estimated reduction of 1.59 tonnes of GHG emissions per year.

Project Cost

The project cost was under $17,000 and had a payback of 4.25 years from energy cost avoidance which is estimated to be $4,000 per year.

Annual Savings

- Avoided electrical costs estimated to be $4000 per year in 2004.

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Energy Conservation Success Story

Demand ventilation saves $1,450 per year

The Challenge

Kwantlen had a number of locations on campus that may not be fully occupied to maximum room capacity during business hours. These areas tend to be the larger rooms such as classrooms, gymnasiums, conference centers, and auditoriums.

Our Solution

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 greater energy costs. The fact there is a large variance in the number of people occupying these areas along with unpredictable or irregular occupancy can mean opportunity with a DCV system. Most savings are from reduced heating and some from reduced fan operation. This was a small project and sensors were installed in two areas, a gym, and a conference centre.

The Results

- Estimated reduction of 6,000 kWh per year
- Estimated reduction of 150 GJ per year.
- Estimated reduction of 7.59 tonnes of GHG emissions per year.

Project Cost

The project cost was under $3,000 and had a payback of just over 2 years from energy cost avoidance which is estimated to be $1,450 per year.

Annual Savings

- Avoided electrical costs estimated to be $250 per year in 2003.
- Avoided natural gas costs estimated to be $1,200 per year in 2003.

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Energy Conservation Success Story

New atrium lighting saves $4,000 per year

The Challenge

A lighting system in a 330 square meter atrium at our Richmond Campus provided very low light levels at night for students and employees in the area. As well, this system was expensive to operate and maintain due to the type of lighting (incandescent), the number of fixtures (36), and their mounting height of 6 meters elevation.

Our Solution

We evaluated our light level requirements and determined optimum fixture locations based on space use and ease of access for maintenance. Next, we selected light fixtures that would fit in well with our existing building finishes. A lighting layout was designed to find the optimum number of fixtures, mounting locations, and angle adjustment. The proposed project was forwarded to BCHydro and approved from their EPoints funding. Once approval was granted, the project was implemented and entirely paid for entirely by BCHydro.

The Results

- Estimated reduction of 28,000 kWh per year.
- Estimated reduction of 1.07 tonnes of GHG emissions per year.

Project Cost

The project cost was under $15,000 and had a payback of just over 2 years from energy cost avoidance which is estimated to be $4,000 per year.

Annual Savings

- Avoided electricity costs estimated to be $2,200 per year in 2003.
- Avoided electricity costs estimated to be $1,800 per year in 2003.

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Energy Conservation Success Story

Modifications to heating system for summer operation saves $5,050 per year

The Challenge

Domestic hot water for the Richmond campus has always been provided by pumping hot water from the large heating boilers through a small storage tank.

This approach meant the boiler had to be on all the time, even during very hot weather in the summer when heating is not required. Since the energy demand to provide hot water is only about 10% of the energy needed for heating, it was a little like taking a large semi-trailer to the grocery store just to get a litre of milk. The boiler would fire to operating temperature, and then almost immediately shut down. This resulted in both a low efficiency and an operating environment that shortened the life of the boiler.

Our Solution

A separate small boiler was installed that provides only domestic hot water. This hot water boiler is operated during the summer months and the large boiler is turned completely off. This project was completed the spring of 2003.

The Results

- The main boiler plant will have an estimated 25% reduction in operating hours which will increase the life of this equipment.
- Maintenance costs will be reduced with pumps and boilers turned off.
- Estimated reduction of 26,000 kWh per year.
- Estimated reduction of 355 GJ per year.
- Estimated reduction of 18.27 tonnes of GHG emissions per year.

Project Cost

The project cost was under $19,800 and had a payback of less than 4 years from energy cost avoidance which is estimated to be $5,050 per year.

Annual Savings

- Avoided electrical costs estimated to be $1,300 per year in 2003.
- Avoided natural gas costs estimated to be $3,750 per year in 2003.

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Energy Conservation Success Story

Loading dock door controls saves $1,400 per year

The Challenge

Loading dock areas at many of our campuses suffered an energy loss problem common to many similar facilities. These work spaces involve a lot of physical activity, and people are relatively warmly dressed. As a result doors are often left open, and as a consequence heating systems operate much longer than needed. Since heating is enabled all the time and the area is relatively warm there is little incentive to close the doors. It is a particular problem in the spring and fall months. Clear plastic curtains may be used, but these are expensive and awkward to pass through, and sometimes present safety problems. Air curtains are another option, but these are even more expensive to install and maintain than plastic curtains.

Our Solution

We had contact switches installed turn off power to the heating units when the contacts are separated by the doors being opened. In order to warm up the area, the doors must be closed. Contact switches were put on five doors located at different campuses that were included in this project.

The Results

- Estimated reduction of 28,000 kWh per year.
- Estimated reduction of .67 tonnes of GHG emissions per year.

Project Cost

The project cost was under $3,000 and had a payback of just over 2 years from energy cost avoidance which is estimated to be $1,400 per year.

Annual Savings

- Avoided electricity costs estimated to be $1,400 per year in 2003.

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Energy Conservation Success Story

Reflectors in Cafeteria saves $2,100 per year

The Challenge

The cafeteria and kitchen area of one of our campuses required a lighting improvement to provide a bright and warm environment.

Our Solution

The solution was to convert the existing T12 lighting to T8 technology with reflectors that improve light output enough to result in using fewer lamps to achieve the same light levels. The change improved light quality (T8's are generally better colour rendering index than T12's), while lowering energy and maintenance costs due to fewer lamps and ballasts.

The proposed project was forwarded to BCHydro for approval from their EPoints funding. Once approval was granted, the project was implemented and entirely paid for by BCHydro.

The Results

- Improved colour rendering of the lighting.
- Reduced number of ballasts by 81 units reducing future maintenance costs.
- Estimated reduction of 32,000 kWh per year.
- Estimated reduction of .76 tonnes in GHG emissions per year.

Project Cost

The project cost was $6,400 and had a 3 year payback from energy and maintenance cost avoidance which is estimated to be $2,100 per year.

Annual Savings

- Avoided electrical costs estimated to be $1,600 per year in 2002.
- Avoided maintenance costs of estimated to be $500 per year in 2002.

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Energy Conservation Success Story

Exterior incandescent replacement saves $4,900 per year

The Challenge

A number of locations on one of our campuses had incandescent lamps installed in fixtures over exterior doors and covered walkways connecting some of the buildings. These lights were not efficient (resulting in high utility costs), and since incandescent lights have a very short life, there were also high maintenance costs with frequent replacements.

Our Solution

A compact fluorescent bulb was selected that would fit into the existing light fixtures. A preliminary installation of 16 fixtures was operated for one year prior to retrofitting the entire stock to confirm the solution worked as planned.

The proposed project was forwarded to BCHydro for approval from their EPoints funding. Once approval was granted, the project was implemented and entirely paid for by BCHydro.

The Results

- Reduced future maintenance costs as compact fluorescent bulbs last at least 5 times longer than incandescent bulbs.
- Estimated reduction of 32,000 kWh per year.
- Estimated reduction of .76 tonnes of GHG emissions per year.

Project Cost

The project cost was $10,000 which was paid for by BCHydro and provided future energy and maintenance cost avoidance which is estimated to be $4,900 per year.

Annual Savings

- Avoided electrical costs estimated to be $1,400 per year in 2002.
- Avoided maintenance costs estimated to be $3,500 per year in 2002.

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Energy Conservation Success Story

Controlling video games saves $800 per year

The Challenge

An energy audit determined 13 video machines were on 24 hours a day at two campus locations. The machines had no easy means of turning them off when campuses were closed.

Our Solution

The solution was wiring alterations, and adding relays to allow our existing building automation system to automatically turn off the video machines when campuses are closed. The proposed project was forwarded to BCHydro for approval from their EPoints funding. Once approval was granted, the project was implemented and entirely paid for by BCHydro.

The Results

- Estimated reduction of 16,000 kWh per year.
- Estimated reduction of .38 tonnes of GHG emissions per year.

Project Cost

The project cost was $3,500 and had less than a 4.4 year payback from energy cost avoidance which is estimated to be $800 per year.

Annual Savings

- Avoided electrical costs estimated to be $800 per year in 2002.