

BC Pavilion Corporation 2011 Carbon Neutral Action Report



Executive Summary

BC Pavilion Corporation (PavCo), a Provincial Crown Corporation reporting to the Ministry of Jobs, Tourism and Innovation, is a leader in the meetings and events industry. Committed to excellence from our values to our execution, PavCo operates two of BC's top public assembly facilities: BC Place and Vancouver Convention Centre (VCC).

From hosting global summit meetings to world class sporting and entertainment events, PavCo performs on its mandate of generating economic and community benefit for the people of BC through the prudent management of public facilities. PavCo attracts customers internationally and continuously strives to optimize the financial performance of its facilities, which generate significant economic benefit for the Province of British Columbia.

The Vancouver Convention Centre's unique building features and best practices contribute to maintaining a strong environmental program as they work with clients to ensure sustainability in all events. VCC continues to take steps to manage and mitigate its carbon emissions in both East and West buildings. The completion of the East building sails replacement project precluded the use of two thirds of its exhibit space during the first two months of 2011 impacting emissions data for this period. Initiatives have focused on adding metering to both buildings to monitor and report on the efficiency of major building systems, enhancing procurement practices to include sustainable criteria, and continued educational awareness for staff and partners on promoting green meetings, travel requirements (carpooling/cycling/transit) and other green business practices (reduction in paper usage).



BC Place continues to move forward towards meeting its carbon neutral and sustainability goals as set out in the Sustainability Master Plan for BC Place that was developed in 2009. BC Place re-opened on September 30, 2011 after an 18 month closure for its major revitalization program. The revitalization program, which included major construction upgrades to all levels of the facility including a new retractable roof, was an environmentally responsible alternative to rebuilding an entire new facility, as it resulted in saving construction resources and massive amounts of non-recyclable demolition waste from being made. Sustainability reporting was provided by the general contractor throughout the project identifying tonnes of waste removed and recycled. BC Place is now focusing on establishing baselines for energy usage and efficiency for the upgraded facility, and continues to promote its sustainable initiatives through its Green Committee in the areas of mobile equipment major maintenance programs, enhanced procurement practices, and daily business operations.

A handwritten signature in blue ink, appearing to read "John Harsanyi", is written over a horizontal line.

Chief Financial Officer

John Harsanyi



2011 Greenhouse Gas Emissions

Source	Tonnes CO ₂
Buildings	6,493
Vehicles	124
Office Supplies	6
Total 2011 Emissions	6,623
Less: emissions which do not require offsets ⁽¹⁾	(3)
Total 2011 Offset Requirement	6,620

(1) Includes rounding variance

Offsets Applied to Become Carbon Neutral in 2011

BC Pavilion Corporation purchased 6,620 tonnes of carbon offset, worth \$165,500 to become carbon neutral for the 2011 calendar year.

Actions Taken to Reduce Greenhouse Gas Emissions in 2011

At the Vancouver Convention Centre actions completed this year include: continuing the evaluation of an energy dashboard for improved measurement and communication of energy use and energy savings; continued marketing of the Centre and its best practices for holding sustainable events; integration of lighting/heating controls with the event business management system for improved timing of lights & HVAC with the start and finish of event activities, ongoing internal communication and awareness building with staff and suppliers.

As part of the revitalization and construction program at BC Place, a concerted effort was enforced to maintain as small a carbon footprint as possible. Through the construction contractor, the project managed to recycle 95% of the construction waste which included such items as metal, cardboard, wood, drywall and aluminum. BC Place introduced the following actions upon re-opening: enhanced training for staff on the facility's green initiatives, including its increased waste and recycling programs, using green products for housekeeping and cleaning, and establishing ongoing major maintenance programs on the building's mechanical and lighting systems, and mobile equipment fleet.

Operational Changes in 2011

The sails replacement project at the Vancouver Convention Centre's East building impacted emissions data for the first two months of 2011. Commencing in March 2011, the Vancouver Convention Centre was able to utilize both buildings to their full extent.

BC Place reopened for operations on September 30, 2011, and the facility's functionality transitions from an indoor to an outdoor facility. Monitoring utility consumption continues, and baseline benchmarking will be established with respect to utility usage during event days (reflecting indoor/outdoor situations) as well as non event days. The change in the type of operating roof structure has already resulted in significant savings in energy costs for heating the building.



Plans to Continue Reducing Greenhouse Gas Emissions 2012 – 2014

At the Vancouver Convention Centre, full implementation of measurement tools will allow increasingly refined steps towards the facility's targeted goal of 3% annual decreases. The facility will focus on improved client and supplier engagement to help reach emissions reduction goals. Completion of an energy management dashboard and the establishment and assessment of baselines, as well as scheduling regular energy conservation updates for each department and in-house suppliers will also assist in reaching reduction goals.

BC Place's Green Committee continues to develop strategies on sustainability, including an employee/guest awareness program and an enhanced procurement program continues to investigate sources of new and improved environmentally friendly products. Once baseline utility benchmarks are established at the facility given its unique indoor/outdoor abilities, BC Place will look for efficiencies and enhancements to ensure that utility usage is optimized. The most significant change has been the transition from an air supported roof operation to a cable supported structure. This is resulting in lower heating costs and the elimination of the need for the electrical fans used to sustain the air pressure within the building. Replacement of field lighting and modernization of electrical systems throughout the building have resulted in more efficient use of power. Replacement of water mains outside the building has resulted in less water wastage and damage to environment. In some areas of the stadium, substitution of steam to gas heating has resulted in the ability to better target areas that require heat as required, upon demand. The target for the facility continues to be an annual 3% decrease in energy use, following the BC Provincial Government reduction target of 33% by 2020.

Both the Vancouver Convention Centre and BC Place are researching and evaluating performance certifications for operations and maintenance (e.g. LEED).



BC PAVILION CORPORATION - 2011 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*.

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Mobile Fuel Combustion (Fleet and other mobile equipment)							
Vehicle fuel efficiency							
Replace vehicles with more fuel-efficient models	Ongoing/In Progress	40	% of vehicles are fuel- efficient models	Ongoing process of assessment when vehicles need replacement at Vancouver Convention Centre; Additional equipment at BC Place is being assessed.	BC Place has developed a five year replacement program for the fleet and will be implemented when funds become available; At Vancouver Convention Centre, an ongoing process of assessment when vehicles need replacement	2011	No End Date (Continuous)
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress	50	% of vehicles down-sized since start year indicated	Ongoing process of assessment when vehicles need replacement at Vancouver Convention Centre; Additional equipment at BC Place is being assessed.	BC Place has developed a five year replacement program for the fleet and will be implemented when funds become available; At Vancouver Convention Centre, an ongoing process of assessment when vehicles need replacement	2011	No End Date (Continuous)
Perform regular fleet maintenance specifically to improve fuel-efficiency	Ongoing/In Progress	100	% of vehicles are subject to regular maintenance for fuel efficiency	Proper and regular maintenance continues to ensure continued operating efficiency during operating months	Mobile fleet data entry is worked on continuously and regular maintenance scheduled	2011	No End Date (Continuous)
Behaviour change program							
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	100	% of current drivers are trained	All staff that drive the equipment are trained and carry a valid competency certificate	Training is ongoing with respect to staff turn over and when equipment is replaced	2011	No End Date (Continuous)
Other Mobile Fuel Combustion Actions							
The mobile fleet is currently be added to our preventative maintenance program to ensure that maintenance is conducted on a timely and more efficient manner, with proper records and documentation on what was performed, parts installed if any, labour involved and when service was completed	Ongoing/In Progress	50	Equipment name plate data is being entered into our Event Business Management System which tracks our preventative maintenance programs	The program is in progress and data is being entered as time permits and is 50% complete	The program will be continued as we will be upgrading some of our equipment over the next few years	2011	No End Date (Continuous)
Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)							
Planning/management							
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	In Development	100	% of buildings have a real time metering system installed	At Vancouver Convention Centre, additional meters installed to meter specific space; BC Place was closed for construction during 2011	The Vancouver Convention Centre is planning for additional meters for coming year/s; BC Place reopened in Fall 2011 and new baselines will need to be developed for when the building is occupied for events and non event days (dark days).	2011	No End Date (Continuous)
Owned buildings							
Establish energy performance baseline for owned buildings	Ongoing/In Progress	0	% of owned buildings have an established energy performance baseline	BC Place waiting for construction to be completed	Vancouver Convention Centre will evaluate and assess baseline energy performance once all metering is in place; At BC Place, in process of developing a Work Plan in preparation to support an application for a LEED Silver certificate for operations	2010	2012
Register for performance labelling/certification for operations and maintenance of owned buildings (e.g., LEED EB:O&M)	In Development	0	% of owned buildings have operations and maintenance labelling/certification	Vancouver Convention Centre performed preliminary investigations into certification for operations.	BC Place is in process of developing a Work Plan in preparation to support an application for a LEED Silver certificate	2012	2014

BC PAVILION CORPORATION - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Perform energy retrofits on existing, owned buildings	Ongoing/In Progress	100	% of owned buildings have undergone energy retrofits since start year indicated	Ongoing process to reduce energy consumption by retrofitting mechanical systems, lighting systems, building envelope	Additional flux drives, lighting sensors, metering	2010	No End Date (Continuous)
Retrofitting owned buildings							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	30	% of retrofits since start year indicated had heating, cooling, and ventilation systems upgrades	Vancouver Convention Centre installed flux drives minimize fan usage; BC Place's mechanical systems were overhauled during revitalization project/construction of new roof	Additional flux drives to be installed when budget allows at Vancouver Convention Centre; BC Place to evaluate new systems now that facility has reopened, and continues upgrades to old plumbing systems	2011	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress	40	% of retrofits since start year indicated had lighting systems upgrades	Lighting control refinements at Vancouver Convention Centre identified and integration plan developed; BC Place's field of play lighting was completely replaced with a more energy efficient system, and energy efficient LED lighting was added to the ETFE siding and roof including cable lights	Vancouver Convention Centre to integrate East facility thru EBMS and additional daylight sensors to be installed; BC Place to continually replace lighting fixtures with more energy efficient lighting	2011	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	100	% of retrofits since start year indicated had control system upgrades or adjustments	A new master building control system is being installed with today's technology. It will be added to control our 32 different sub-systems primarily during events. In addition, our building automation system has been upgraded to add the new equipment that was installed during the last phase of construction	Additional refinements are being tested to our building automation system	2011	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Completed in 2011	80	% of retrofits since start year indicated had insulation improvements	Upgrades to exterior doors and glazing was completed as part of overall Stadium upgrade project		2010	2011
Leased buildings							
Establish energy performance baseline for leased buildings	In Development	100	% of leased buildings have an established energy performance baseline	Identification of required baseline needed	Additional meters to be installed in Vancouver Convention Centre East facility	2011	2012
IT power management							
Implement server virtualization	Ongoing/In Progress	80	% of servers have been virtualized since start year indicated	Hardware and software were purchased to enable the project to proceed. Begun to migrate old server services into the new systems.	Complete remainder of implementation.	2007	No End Date (Continuous)
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress	75	% reduction in printers, copiers, and/or fax machines since start year indicated	Completed full replacement of outdated and inefficient office equipment with multi-function devices, auto-sleep, high capacity toners and Energy Star equipment where applicable and cost effective	Continue with the replacement program where applicable. New equipment will be installed for additional staff being anticipated for 2011	2010	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Completed in 2011	100	% of devices have auto-sleep settings applied	Completed full replacement of outdated and inefficient office equipment with multi-function devices, auto-sleep, high capacity toners and Energy Star equipment where applicable and cost effective		2011	2011
Appliances and electronic devices							
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Ongoing progress when appliances need replacement	Purchase of in-house washer/dryer at Vancouver Convention Centre will be energy star rated	2011	No End Date (Continuous)

BC PAVILION CORPORATION - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)	Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Replace desk lamp incandescent bulbs with compact fluorescent (CFL) bulbs or source more efficient desk lamps for future purchases	Ongoing/In Progress		Ensure CFL's for all new purchases	Ensure CFL's or high efficiency desk lamps for new purchases	2009	No End Date (Continuous)
Behaviour change program						
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress		Regular reminders for user groups	Regular reminders for user groups	2011	No End Date (Continuous)
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress		Part of the regular evening routine	Part of the regular evening routine	2011	No End Date (Continuous)
Encourage staff to use air dry setting on dishwashers	Ongoing/In Progress		Regular reminders for user groups	Regular reminders for user groups	2011	No End Date (Continuous)
Encourage use of stairs instead of elevators	Ongoing/In Progress		Regular reminders for user groups	Regular reminders for user groups	2011	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress		Part of the regular evening routine	Part of the regular evening routine	2011	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress		Regular reminders for user groups	Regular reminders for user groups	2011	No End Date (Continuous)
Supplies (Paper)						
Electronic media in place of paper						
Use electronic document library for filing common documents	Ongoing/In Progress		Extensive use of designated drives at facilities for file sharing	Continued use of shared drives for common docs/file sharing	2011	No End Date (Continuous)
Post materials online that were previously printed	In Development		Evaluating an online ordering system so exhibitors can order/pay online for upcoming events; evaluating a user based scheduling system that will eliminate paper emails and printed schedules.	Continue the development of the initiatives started.	2011	2013
Switch to an electronic payroll notification system in place of paper pay stubs	Completed in 2011		A Paperless pay-stub system is in place for all employees		2011	2012

BC PAVILION CORPORATION - 2011 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

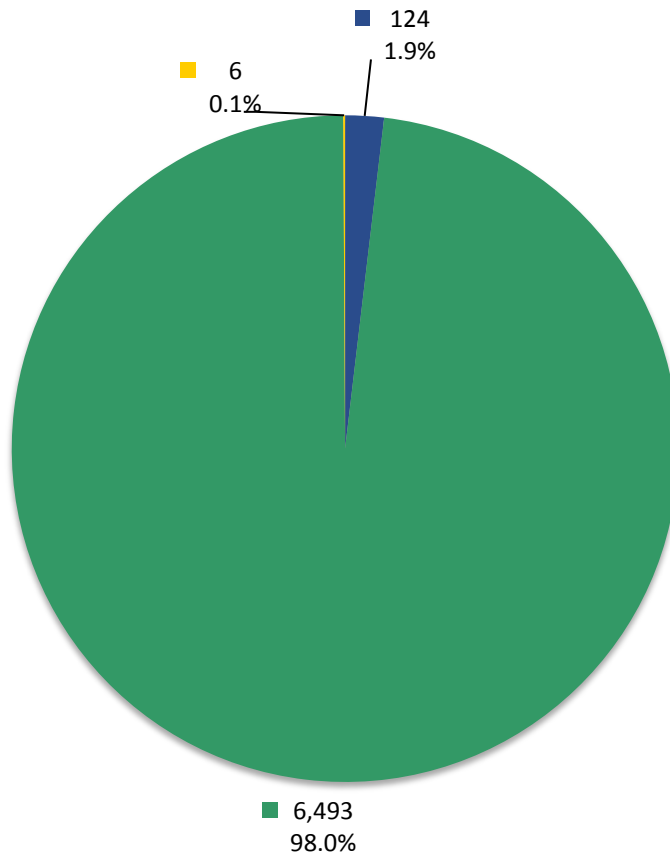
The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*. Public sector organizations can optionally use this section to report on actions that will help British Columbia meet its provincial greenhouse gas reduction targets, engage the public, and improve environmental sustainability across all aspects of their organization.

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)	Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Business Travel						
Virtual meeting technology						
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Ongoing/In Progress	20 % of computers have web-conferencing software installed	Vancouver Convention Centre implemented Live meetings at desk tops as well as on boardroom 'Smart Board' in East Facility.	Continued use of Live Meetings when required; Encourage use at other facility	2010	No End Date (Continuous)
Behaviour change program						
Encourage staff to consider virtual attendance/presentation at events where possible	Ongoing/In Progress		Additional staff trained to use 'Smart Board' conferencing.	Continue awareness program through meetings and staff communications	2011	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress		PavCo staff encouraged to carpool, take transit or alternate means of transportation	Continue program through daily/weekly safety and crew talks; facility intranets	2010	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress		PavCo staff encouraged to carpool, take transit or alternate means of transportation	Continue program through daily/weekly safety and crew talks; facility intranets	2010	No End Date (Continuous)
Education, Awareness, and Engagement						
Team-building						
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Periodic staff briefings and reminders of sustainability initiatives at the Vancouver Convention Centre	Continuation of briefings & reminders and improved engagement with Sustainability Committee at the Vancouver Convention Centre	2011	No End Date (Continuous)
Awards/Recognition						
Establish a sustainability/green awards or recognition program	In Development			Mandates for Green/Sustainability Committee will be to establish awards and recognition programs	2010	No End Date (Continuous)
Staff Professional Development						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		Active support and participation in Green Meetings Industry Council at the Vancouver Convention Centre in past	Encourage designated green staff on professional development and other training	2009	No End Date (Continuous)
Staff awareness/education						
Provide green tips on staff website or in newsletters	Ongoing/In Progress		Facilities are using intranet to communicate green tips to facility staff	Continue to enhance the program via intranet, and keep current via Green/Sustainability Committee	2010	No End Date (Continuous)
Client/public awareness/education						
Provide green tips on client/public website or in newsletters	In Development			Investigating implementation of green tips to facility websites	2012	No End Date (Continuous)
Other Sustainability Actions						
Water conservation						
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress		When fixtures warrant replacement, low flow fixtures are selected	Continue replacement program	2011	No End Date (Continuous)

BC PAVILION CORPORATION - 2011 Carbon Neutral Action Report

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Waste reduction/diversion						
Put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Ongoing/In Progress		Clients and staff are encouraged to recycle waste into proper waste streams available at the Vancouver Convention Centre. Policy under development by BC Place Green Committee	Continued education and encouragement at Vancouver Convention Centre; BC Place to implement in conjunction with LEED Silver Work Plan	2011	No End Date (Continuous)
Procurement (non-paper supplies)						
Incorporate minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	Ongoing/In Progress		At BC Place, under development by the Green Committee. At the Vancouver Convention Centre a Green Purchasing Policy was established and rolled out.	BC Place to implement as part of LEED Silver work plan	2010	2012
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	Ongoing/In Progress		At BC Place, under development by the Green Committee. At the Vancouver Convention Centre a Green Purchasing Policy was established and rolled out.	BC Place to implement as part of LEED Silver work plan	2010	2012
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress		At BC Place, under development by the Green Committee	BC Place to implement as part of LEED Silver work plan	2009	2012
Building construction, renovation, and leasing						
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	Completed in 2011		General contractor on Stadium upgrade project tracked total construction waste recycled		2010	2011

**BC Pavilion Corporation
Greenhouse Gas Emissions by Source
for the 2011 Calendar Year (tCO₂e*)**



Total Emissions: 6,623

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

Offsets Applied to Become Carbon Neutral in 2011 (Generated May 18, 2012 10:15 AM)

Total offsets required: **6,620**. Total offset investment: **\$165,500**. Emissions which do not require offsets: **2** **

*Tonnes of carbon dioxide equivalent (tCO₂e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.