



Pacific Carbon Trust

# CARBON NEUTRAL GOVERNMENT OFFSET PORTFOLIO

2011





Pacific Carbon Trust



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# Pacific Carbon Trust

## Pacific Carbon Trust's standards

All offsets purchased by Pacific Carbon Trust must meet the BC emission offsets regulation to ensure our offsets are additional, credible, made in BC, and of the highest quality.



"Carbon neutrality is a demonstration of commitment and leadership on climate action that we hope will take hold within homes and business here in BC and in other jurisdictions around the world."

The Honourable Dr. Terry Lake,  
Minister of Environment

## Message from Pacific Carbon Trust

The 2011 Carbon Neutral Government offset portfolio represents a continued focus on innovative projects across major sectors and every region of the province. To date, we have invested in nearly 1.5 million tonnes of emissions offsets to support the Province's carbon neutral commitment. These investments have leveraged an estimated \$300 million dollars of private sector investment in communities across BC, with approximately \$8 in private funds spent for every \$1 contributed from offset purchases.

To achieve this second year of carbon neutrality in the BC public sector, we continued to work with municipalities, businesses and industry to acquire BC-based projects that reduced emissions by creating energy from a low-carbon fuel supply, increasing energy efficiency, or sequestering carbon from the atmosphere.

By supporting a more efficient, greener economy, we are positioning British Columbia to successfully compete in an increasingly carbon-constrained world. We look forward to greater involvement this year from our public sector partners as we continue to build a diverse offset portfolio that strengthens the low-carbon economy.

You are our valued partners in this ongoing commitment to climate action. And British Columbians stand behind you, with eighty per cent supporting BC's leadership in reducing greenhouse gas emissions.

On behalf of everyone at Pacific Carbon Trust, congratulations to all of you on the second year of carbon neutral government in British Columbia.

Sincerely,

D. Scott MacDonald  
CEO, Pacific Carbon Trust



### Working together

We're pleased to be bringing a valuable group aboard Pacific Carbon Trust this year: the Carbon Offset Advisory Panel (COAP). After speaking with many of you in the fall of 2011, it was clear public sector organizations were interested in being more involved in the decisions we make around our carbon offsets.

Pacific Carbon Trust has asked PSOs to nominate representatives from the K-12 sector, post-secondary institutions, public health authorities, Crown corporations, core ministries and the Climate Action Secretariat to join the COAP. Rounding out the panel will be a private offset client, an offset specialist and a member of the Pacific Carbon Trust board of directors. We look forward to your valuable input as we work together to build the low-carbon economy.

**775,988**  
tonnes of CO<sub>2</sub>e retired  
= 331,476,466 litres of gasoline

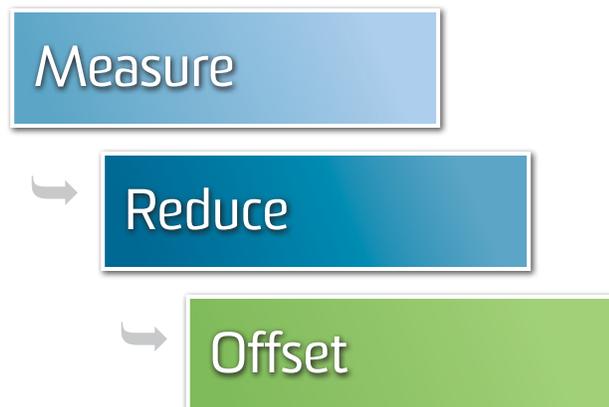
## 2011 Carbon Neutral Government

This is the second year that the Province of British Columbia has achieved carbon neutrality, building on last year's historic milestone as North America's first carbon neutral senior government. This commitment, enshrined in the Greenhouse Gas Reduction Targets Act, applies to all provincial public sector organizations (PSOs), including government ministries and agencies, schools, colleges, universities, health authorities and Crown corporations.

To become carbon neutral, BC's public sector organizations first measured, then reduced, reported, and offset their emissions. Pacific Carbon Trust facilitated this final step through investments in high quality BC-based offsets that reduce greenhouse gas emissions or sequester carbon.

To qualify as offsets, projects must meet the BC emission offsets regulation, based on international standards that ensures the emissions reductions are real, additional to business-as-usual practices, permanent, verifiable and counted only once. Pacific Carbon Trust is very selective in its acquisitions; of the more than 120 project ideas presented to Pacific Carbon Trust to date, only 27 were included in our 2011 Carbon Neutral Government portfolio.

From a community landfill gas project that will capture methane to the adoption of a new process that will help a BC cement manufacturer phase out higher-emissions cement, Pacific Carbon Trust's 2011 Carbon Neutral Government Offset Portfolio is supporting a more efficient, competitive and cleaner future for BC.





### Learn more about our portfolio projects

Details about all our projects are posted on Markit, our online registry. You can view official project documentation and see when the offsets from each project were retired. This year, Environmental Finance named Markit “Best Registry Provider” for a third consecutive year.



Eight in ten British Columbians support the provincial government and public organizations leading by example by reducing their energy costs and carbon emissions.

*Source: Ipsos Reid*

“People around the world are changing the way they live in order to reduce their carbon footprint – and consumers are demanding that businesses and industries change too.”

Scott MacDonald,  
CEO, Pacific Carbon Trust

## Offset project types

To achieve carbon neutrality for the 2011 calendar year, 775,988 tonnes of emissions offsets will be retired by Pacific Carbon Trust on behalf of BC’s public sector organizations.

Pacific Carbon Trust balances its portfolio with three types of projects:

**Energy Efficiency** – These projects involve eliminating waste and improving productivity. Examples include flaring and venting reductions (oil and gas sector), methane capture and thermal insulation.

**Fuel Switching** – These projects involve switching from high carbon fuels to lower-carbon fuels such as biomass and electricity. Examples include burning wood waste, switching from coal to natural gas and replacing fossil fuels with electricity.

**Sequestration** – These projects involve the sequestration of carbon in the atmosphere, either through capture and storage or through establishing natural carbon sinks (forests / soils). Examples include improved forest management (IFM) and conservation initiatives.

## Carbon offsets: a cost-effective way to reduce emissions

Besides supporting innovative, cleaner technologies, carbon offsets provide a cost-effective way to immediately reduce large quantities of GHGs. For example, Pacific Carbon Trust delivered close to 730,000 tonnes of offsets for \$18.2 million last year.

In comparison, the Public Sector Energy Conservation Agreement will reduce GHGs by 35,600 tonnes per year – taking twenty years to achieve the same quantity of reductions. Clearly both types of reductions lead to cleaner air and other co-benefits like jobs, support for innovative technologies and economic investment across BC. And in the case of PSECA, an investment in energy efficiency saves energy and reduces ongoing operating costs for schools and hospitals.

Offsets are an immediate way to achieve significant reductions while the public sector continues to focus on energy efficiency over the long-term.



### What happens in an offset project audit?

The auditing team first checks that the methodologies used to quantify emissions reductions are correctly applied and that the project plan contains proper system checks and controls. The auditor also ensures that the project is “additional”, or above and beyond business as usual practices. That is to say, project developers must prove that the potential recognition of offsets helped overcome financial, technological and other barriers to the implementation of the project. This ensures the project will provide a net environmental benefit that would not otherwise occur.

Once the project has been implemented, the resulting emissions reductions must be verified by a second independent auditor. During this process, the verifier will ensure that the project was carried out according to the plan, and that all controls, data and calculations were in place. As needed, auditors will visit the project site, talk to staff in the field, examine measurement and data capturing systems and verify records.

Only after the project has passed two sets of independent audits will Pacific Carbon Trust take ownership of the carbon offsets.

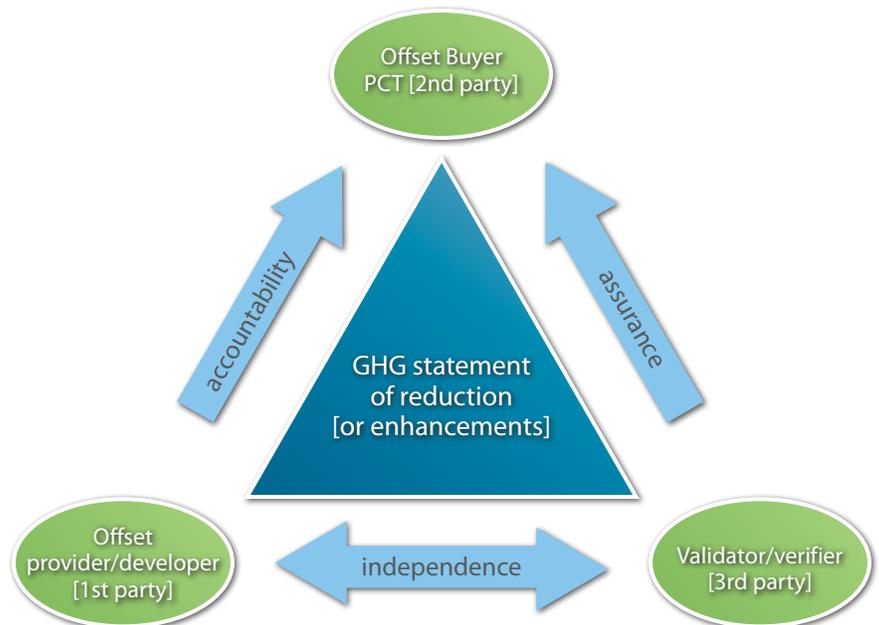
## What makes a credible offset?

There are several characteristics accepted worldwide that describe offsets of sound environmental integrity – additionality, verification, permanence, no leakage and counted once.

To ensure the credibility of the carbon offsets in our portfolio, each offset project is double audited to international standards by accredited independent third party validators and verifiers. These auditing firms complete a systematic investigation of the projects, applying a level of rigour equivalent to that of a financial audit.

The American National Standards Institute (ANSI) – the accrediting body for Greenhouse Gas Validation and Verification – oversees the professional conduct of these third parties.

For a full list of our portfolio project validators and verifiers, please visit our Third Party Auditors page on our website. Validators and verifiers are also identified on each of the projects listed in our Offset Showcase.





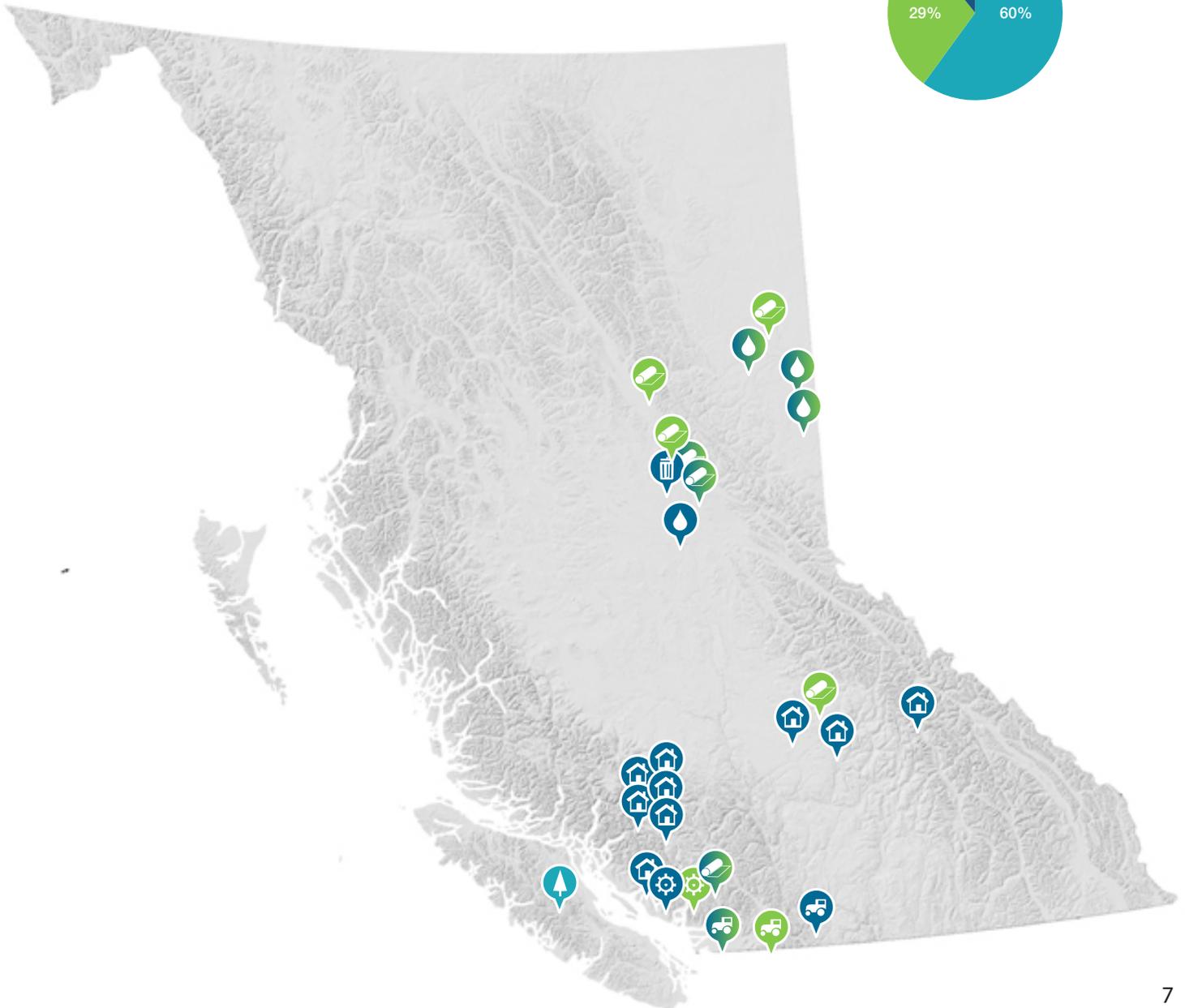
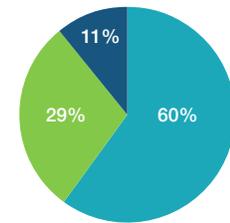
## 2011 Offset Project Map

### Sectors

- Agriculture
- Buildings
- Forestry-Land
- Forestry-Industrial
- Industrial
- Landfill
- Oil and Gas

### Project Types

- Energy Efficiency (EE)
- Fuel Switching (FS)
- Sequestration (SQ)





## 2011 Offset portfolio summary

Project	Validator	Verifier	Sector	Project Type	Project Tonnes*
Katatheon Farms, Langley	Stantec	Ernst & Young	Agricultural	Fuel switching	2,552
Sun Select Farms, Delta	Stantec	Ernst & Young	Agricultural	Energy efficiency / fuel switching	19,097
Randhawa Farms, Abbotsford	Williams Engineering Canada Inc.	Ernst & Young	Agricultural	Energy efficiency	1,474
ENBALA	Envirochem	KPMG	Buildings	Energy efficiency	2,764
TimberWest, Vancouver Island	KPMG	Scientific Certification Systems	Forestry	Sequestration	468,139
Canfor Pulp RB #1, Prince George	Ernst & Young	KPMG	Forestry	Energy efficiency / fuel switching	7,484
Canfor Pulp PB #4, Prince George	Ernst & Young	KPMG	Forestry	Energy efficiency / fuel switching	15,039
Interfor, Adams Lake	KPMG	Conestoga-Rovers & Associates	Forestry	Fuel switching	15,211
Canfor, Fort St. John	KPMG	Ernst & Young	Forestry	Fuel switching	11,884
Canfor, Mackenzie	KPMG	PricewaterhouseCoopers	Forestry	Fuel switching	6,483
Canfor, Prince George	KPMG	PricewaterhouseCoopers	Forestry	Fuel switching	15,494
Kruger Products, New Westminster	Ernst & Young	Ruby Canyon Engineering	Forestry	Energy efficiency / fuel switching	17,423
Lafarge, Richmond	Conestoga-Rovers & Associates	KPMG	Industrial	Fuel switching	18,825
Lafarge PLC, Richmond	Conestoga-Rovers & Associates	KPMG	Industrial	Energy efficiency	4,368
Foothills Boulevard Regional Landfill, Prince George	Ruby Canyon Engineering	NSF International Strategic Registrations	Landfill	Energy efficiency	36,896
ARC Resources, Dawson Creek	Ruby Canyon Engineering	KPMG	Oil and Gas	Energy efficiency / fuel switching	61,314
Canadian Natural Resources Limited, Taylor	Stantec	Ruby Canyon Engineering	Oil and Gas	Energy efficiency / fuel switching	15,358
Apache, Dawson Creek	Stantec	Ruby Canyon Engineering	Oil and Gas	Energy efficiency / fuel switching	16,488
Spectra Energy, Northeastern BC	Stantec	Ernst & Young	Oil and Gas	Energy efficiency	39,695
<b>Total offsets:</b>					<b>775,988 tonnes</b>

\* In 2011, BC's public sector emitted 775,509 tonnes of CO<sub>2</sub>e. The final step to become carbon neutral is the retirement of an equivalent quantity of offsets. As a result of minor adjustments to the 2010 public sector emissions as well as to previous years' travel emissions, Pacific Carbon Trust has retired an additional 479 tonnes.



## 2011 Portfolio of offset projects

### Agricultural

Pacific Carbon Trust has invested in a number of projects that reduce GHG emissions through fuel-switching and energy efficiency upgrades, particularly at greenhouses in the Fraser Valley. Greenhouses are critical to the region’s economy, and with Pacific Carbon Trust’s help, owners are able to produce local food using less fossil fuels.

Number of offsets to be retired for 2011:	23,123 tonnes
Equivalent # of cars off the road for one year:	4,534
Project validator:	Stantec; Williams Engineering Canada Inc. (formerly A.D. Williams)
Project verifier:	Ernst & Young

**Benefits in brief:**

- Reduction in greenhouse gases
- Use of mountain pine beetle-damaged wood
- Reduced reliance on heating systems through passive heat (insulating curtains)
- A more competitive local food system

### Sustainable events

Pacific Carbon Trust provides offsets to many clients – not just businesses, but also for special events and conferences.

Pacific Carbon Trust provided carbon offsets for many events this year – including the 2012 Carbon Neutral Government conference, Small Business BC’s Successful You Business Awards, PricewaterhouseCoopers’ 25th Annual Global Forestry and Paper Conference, the International Bioenergy Conference in Prince George, and Corporate Knights’ The 2012 Best 50 Corporate Citizens gala in Toronto. You’re in good company!

### Greenhouse fuel switch (Katatheon Farms, Langley)

Katatheon Farms has reduced its natural gas consumption and associated GHG emissions by installing a biomass boiler. This upgrade is another component of the company’s sustainability initiatives, which include using integrated pest management instead of pesticides and herbicides, and incorporating innovative water and heat conservation technology into its everyday operations.



**Greenhouse energy efficiency and fuel switch  
(Sun Select Farms, Delta)**

The owners of Sun Select Delta installed a biomass boiler and insulating curtains to help heat the greenhouse and reduce their dependency on natural gas. These offset activities have significantly reduced their annual greenhouse gas emissions relative to the natural gas baseline, their business-as-usual practice.

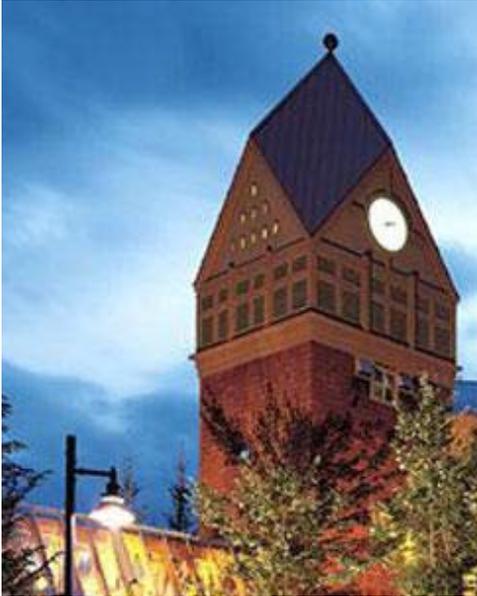
**Greenhouse energy efficiency (Randhawa Farms, Abbotsford)**

Randhawa Farms installed insulating curtains at its three greenhouse locations in Abbotsford to reduce the amount of natural gas used as a heat source. The energy curtains are deployed at night and during overcast conditions to help insulate the building. These offset activities have reduced the farms' annual operating greenhouse gas emissions relative to the natural gas baseline.

"In addition to the direct emissions reduction, this project [Sun Select Farms] makes local food production more feasible, boosts the regional economy, and reduces the need to import food."

Phil Cull,  
Director, Sourcing, Offsetters





72% of British Columbians believe the government should continue to take an active role in reducing greenhouse gas emissions and fighting climate change.

Source: Ipsos Reid

“ENBALA created the Hybrid Heating system with the primary goals of reducing carbon emissions, reducing energy costs and reducing energy use. The system was successfully implemented, with some sites reducing annual emissions by almost 1,000 tonnes.”

Malcolm Metcalfe,  
Founder and CTO, ENBALA

## Buildings

Industrial and residential stationary combustion is responsible for 34 per cent, or more than a third, of British Columbia’s total greenhouse gas emissions.<sup>1</sup> This significant carbon liability can become an opportunity as the price attached to carbon is used to incent innovative energy efficiency and fuel switching projects in buildings across the province.

### Hybrid heating systems (ENBALA, nine locations in Vancouver, Whistler, Sun Peaks and Revelstoke)

The intelligent software used in this offset project monitors the consumption of electricity and automatically adjusts its heating output according to the thermal and electrical needs of a building. The result? More efficient energy consumption and a reduction in greenhouse gas emissions. In fact, fossil fuel use has been reduced in nine commercial buildings, resulting in facility-level emissions reductions of as much as 54 per cent.

Number of offsets to be retired for 2011:	2,764 tonnes
Equivalent # of cars off the road for one year:	542
Project validator:	Envirochem Services Inc.
Project verifier:	KPMG
Benefits in brief:	
<ul style="list-style-type: none"> <li>• Reduced reliance on fossil fuels</li> <li>• Use of made-in-BC technology</li> </ul>	



1 British Columbia Greenhouse Gas Inventory Report 2008, Ministry of Environment



“As a sustainability leader in the cultural sector, we are delighted to be working with PCT to further reduce our organizational footprint by purchasing offsets. The Aquarium’s mobile classroom-in-a-truck, Aquavan, is now carbon neutral – a terrific message to schools across BC and into Alberta. “Walking the walk” is, after all, the best way of teaching.”

Dr. John Nightingale,  
President, Vancouver Aquarium

## Forestry

Families in communities across the province rely on BC’s forest sector. As the direct provider of 55,000 jobs across BC, our forest sector must continue to find new ways to be competitive without compromising sustainability and stewardship. Pacific Carbon Trust has purchased offsets from a range of forestry projects, both land-based and industrial, that reduce emissions and take advantage of the forest’s ability to absorb and store carbon dioxide.

### Improved forest management (TimberWest, Vancouver Island)

Number of offsets to be retired for 2011:	468,139 tonnes
Equivalent # of cars off the road for one year:	91,792
Project validator:	KPMG
Project verifier:	Scientific Certification Systems

#### Benefits in brief:

- Improved forest management
- First use of BC Forest Carbon Offset Protocol (FCOP) that will lay the groundwork for future projects and export to the international voluntary carbon markets
- Creation of a new export commodity for British Columbia

Pacific Carbon Trust has purchased offsets from an Improved Forest Management project with TimberWest that will result in the conservation of select old growth stands on TimberWest’s private land. This is the first forest project to use FCOP and is enabled by BC standards, creating a model for others to use and laying the groundwork for offset sales in international markets.





**Boiler upgrades to increase thermal efficiency  
(Canfor Pulp, Prince George)**

Number of offsets to be retired for 2011:	7,484 tonnes
Equivalent # of cars off the road for one year:	1,468
Project validator:	Ernst & Young
Project verifier:	KPMG

Benefits in brief:

- Increased competitive advantage
- Reduced greenhouse gas emissions

Canfor has undertaken several energy-efficiency upgrades and innovations at its pulp mills in Prince George. In this project, Canfor Pulp upgraded the recovery boiler at the Northwood Plant in Prince George to decrease natural gas consumption and increase steam generation. The project reduces emissions by substantially reducing the amount of natural gas and biomass burned at the mill site.

**Side stream scrubber and hog system upgrade  
(Canfor Pulp, Prince George)**

Number of offsets to be retired for 2011:	15,039 tonnes
Equivalent # of cars off the road for one year:	2,949
Project validator:	Ernst & Young
Project verifier:	KPMG

Benefits in brief:

- Increased competitive advantage
- Reduced greenhouse gas emissions

In this fuel-switching project, Canfor Pulp made upgrades at its Northwood Plant that led to a decrease in greenhouse gas emissions. The pulp mill uses natural gas and biomass in its power boilers to generate steam for the pulping process. This project is based on installing upgrades on the boiler and hog fuel system to allow an increase in the consumption of hog fuel and a corresponding reduction in the use of natural gas.

79% of BC residents believe the BC government should be working to stimulate jobs and investment in the clean-tech sector.

*Source: Ipsos Reid*

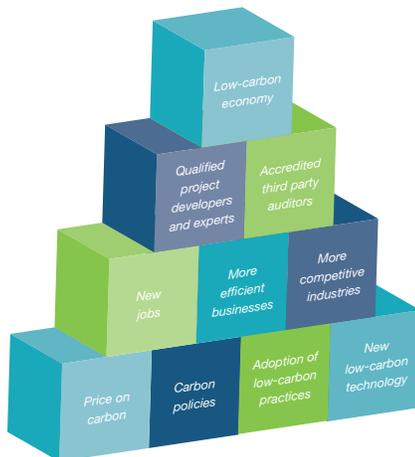


# Pacific Carbon Trust

## What does “building the low-carbon economy” really mean?

Building the low-carbon economy in BC means encouraging the adoption of low-carbon practices and technologies throughout BC’s economic sectors. Through the incentive of carbon offsets, businesses are finding new ways to reduce their impact on the environment. That means new jobs and more efficient, more competitive industries. That, in turn, creates a need for qualified carbon project developers and other carbon experts. And we never purchase an offset without the assurance of accredited third party auditors. Finally, Pacific Carbon Trust retires the offsets on behalf of its clients, who are able to meet their carbon neutral goals through BC-based offsets that support the low-carbon economy.

Everyone in this chain is connected to the low-carbon economy. And it strengthens with every new project made possible through carbon offsets.



## Biomass fuel switch (Interfor, Adams Lake)

Number of offsets to be retired for 2011:	15,211 tonnes
Equivalent # of cars off the road for one year:	2,983
Project validator:	KPMG
Project verifier:	Conestoga-Rovers & Associates

### Benefits in brief:

- Use of residual wood waste
- Eliminates regular 750km round trip to truck in natural gas
- Greater efficiency and competitiveness
- Better air quality

International Forest Products (Interfor) relied on liquefied natural gas to fuel its Adams Lake sawmill. But using large quantities of this fossil fuel not only meant a 750km round trip to transport the fuel, but also greenhouse gas emissions at the mill. Interfor found an innovative yet practical solution, turning to wood waste from its own operations to provide fuel to the sawmill. The highly efficient energy system is used to dry lumber and provide heat for the mill during cold winter months. The project not only diverts wood waste from landfills, but also results in better air quality. This, in turn, boosts tourism and environmental values in this popular recreation destination and important salmon-spawning area.

“PCT’s involvement in the carbon market in BC is an exciting new opportunity for the forest sector to enhance their sustainability goals.”

Ric Slaco,  
Chief Forester and Vice-President, Interfor



“Our Best 50 Corporate Citizens gala showcases leaders in Canada’s clean capitalist economy. We were delighted to make the event carbon neutral through Pacific Carbon Trust, another low carbon leader.”

Toby Heaps,  
President, Corporate Knights

**Utilizing wood residuals (Offsetters-Canfor, Fort St. John)**

Number of offsets to be retired for 2011:	11,884 tonnes
Equivalent # of cars off the road for one year:	2,330
Project validator:	KPMG
Project verifier:	Ernst & Young

Benefits in brief:

- Reduced greenhouse gas emissions
- Economic opportunities in Fort St. John, Vanderhoof and Prince George
- Efficiencies leading to better competitive advantage

A new system at Canfor’s Fort St. John mill distributes heat to dry lumber through a heat energy system that is fuelled by wood residues generated by the lumber manufacturing process. Developed by Offsetters, a Vancouver-based carbon management solutions provider, this project is a model for reducing BC’s industrial emissions in a way that supports clean technologies and creates new economic opportunities for surrounding communities. Not only has Fort St. John benefitted economically, but so have Vanderhoof and Prince George, where many of the heat energy system components were manufactured.

**Utilizing wood residuals (Canfor, Mackenzie)**

Number of offsets to be retired for 2011:	6,483 tonnes
Equivalent # of cars off the road for one year:	1,271
Project validator:	KPMG
Project verifier:	PricewaterhouseCoopers

Benefits in brief:

- Reduced greenhouse gas emissions
- Efficiencies leading to better competitive advantage

The same system installed at Fort St. John was brought online at Canfor’s Mackenzie mill, distributing heat to dry lumber through a heat energy system that is fuelled by wood residues generated by the lumber manufacturing process.



"I cannot quantify which work we won specifically due to our Green Strategy ... but I can guarantee that without it we would not have been VANOC's Official Print Partner for the 2010 Games, or be working with the likes of Fortis BC, the Vancouver Aquarium, Nike Worldwide, Microsoft or Starbucks to name but a few"

Scott Gray,  
Director of Brand, MET Fine Printers

### Utilizing wood residuals (Canfor, Prince George)

Number of offsets to be retired for 2011:	15,494 tonnes
Equivalent # of cars off the road for one year:	3,038
Project validator:	KPMG
Project verifier:	PricewaterhouseCoopers
Benefits in brief:	
<ul style="list-style-type: none"> <li>• Reduced greenhouse gas emissions</li> <li>• Efficiencies leading to better competitive advantage</li> </ul>	

The same system, piloted in Fort St. John, was brought online at Canfor's Prince George mill, distributing heat to dry lumber through a heat energy system that is fuelled by wood residues generated by the lumber manufacturing process.

### Clean tech biomass gasification (Kruger Products, New Westminster)

Number of offsets to be retired for 2011:	17,423 tonnes
Equivalent # of cars off the road for one year:	3,416
Project validator:	Ernst & Young
Project verifier:	Ruby Canyon Engineering
Benefits in brief:	
<ul style="list-style-type: none"> <li>• New clean technology</li> <li>• First biomass gasification application in Canadian pulp and paper industry</li> <li>• Decrease in emissions of up to 50 per cent</li> <li>• Improved competitiveness</li> <li>• Improved air quality</li> </ul>	

Kruger Products Ltd.'s installation of the Canadian pulp and paper industry's first biomass gasification plant has decreased the New Westminster tissue mill's carbon emissions by as much as 50 per cent annually. This new installation, developed by Vancouver's Nexterra Systems Corp., converts local wood waste into clean-burning syngas to provide steam for the mill. Use of this renewable resource provides a competitive advantage for the BC industry and underscores the province's potential to become a world leader in clean energy.



“(The) benefits of strong, early action on climate change far outweigh the costs of not acting.”

Nicholas Stern,  
Former Chief Economist, World Bank

## Industrial

For British Columbia to meet its ambitious greenhouse gas reductions targets, it is imperative to reach out to BC’s industrial base. Putting a price on carbon is an important part of changing the way businesses do business. Through investment in credible offset projects, Pacific Carbon Trust is helping to build the foundation of a low-carbon economy in BC.

### Cement plant fuel-switching (Lafarge, Richmond)

Number of offsets to be retired for 2011:	18,825 tonnes
Equivalent # of cars off the road for one year:	3,691
Project validator:	Conestoga-Rovers & Associates
Project verifier:	KPMG

#### Benefits in brief:

- Creates local jobs
- Diverts construction wood waste that would otherwise emit methane into the atmosphere
- Improves air quality in an urban environment

The Lafarge plant in Richmond reduced its dependency on coal energy, using biomass from construction wood waste to help power the facility. With approximately 2 per cent of BC emissions coming from the creation of cement, this is a significant project for BC. This fuel switch project also stimulates the low-carbon economy by creating local jobs in the sorting and transporting of the wood waste.



## The go-to source

Curious about our new carbon offset projects or want to keep abreast of news and trends in the carbon marketplace? The Pacific Carbon Trust website is an excellent resource, with project profiles in the offset showcase, a robust library of documents and carbon news.

Other features include an explanation of the rigorous validation process which our offset projects go through, and information about additionality, a key criterion for credible offsets.



## Lower carbon cement production (Lafarge PLC, Richmond)

Number of offsets to be retired for 2011:	4,368 tonnes
Equivalent # of cars off the road for one year:	857
Project validator:	Conestoga-Rovers & Associates
Project verifier:	KPMG

### Benefits in brief:

- Reduces the amount of carbon-heavy fuel (coal) typically used in production
- First production of low-carbon cement product in BC

Lafarge’s Richmond plant has also begun to produce a new blended cement product called Portland Limestone cement (PLC). Because PLC requires less fuel to produce than conventional general-use cement, and emits less carbon as a byproduct of the manufacturing process, the plant will reduce its fuel consumption and cut its greenhouse gas emissions by roughly eight per cent by making this switch. The plant, currently the province’s eighth largest emitter of CO<sub>2</sub>e, is showing global leadership in environmental innovation by phasing out production of general-use cement.



“By purchasing carbon offsets for this very important local BC project, Pacific Carbon Trust helped Foothills Boulevard Regional Landfill reduce its municipal GHG emissions and show climate leadership at the local level.”

Brock Carlton,  
CEO, Federation of Canadian Municipalities

## Landfill

Traditionally, municipal landfills have typically emitted tonnes of methane from decomposing waste. Pacific Carbon Trust is working with municipalities and regional districts throughout BC to find efficient ways to capture and use this potent greenhouse gas. Diverting waste from landfills is the first step, but making innovative use of the waste – and effectively turning it into a resource – means local communities can reduce their GHGs and tap into a new source of revenues in the form of carbon offsets.

### Landfill methane capture (Foothills Boulevard Regional Landfill, Prince George)

Number of offsets to be retired for 2011:	36,896 tonnes
Equivalent # of cars off the road for one year:	7,235
Project validator:	Ruby Canyon Engineering
Project verifier:	NSF International Strategic Registrations

#### Benefits in brief:

- Municipality is generating a new source of revenue through the sale of offsets
- Improves local air quality

The Regional District of Fraser-Fort George has built a new, highly efficient landfill gas capture system at Foothills Boulevard Regional Landfill, which receives approximately 93 per cent of the regional solid waste stream. The landfill was capped to prevent methane – a greenhouse gas 21 times more potent than carbon dioxide – from escaping into the atmosphere. Now, the trapped gas is burned under controlled conditions, and in the process is released as CO<sub>2</sub>, resulting in reduced levels of methane emitted at the landfill site.



“Our partnership with Pacific Carbon Trust aligns with our corporate values regarding environmental excellence. The relationship helps us maintain a leadership position in environmental management and promotes the opportunities that exist in our industry for low emission operations.”

Jackson Hegland,  
Coordinator, Environmental Strategies,  
ARC Resources Ltd.

## Oil and Gas

The oil and gas sector has been one of the most ambitious in BC to pursue innovative ways to decrease its GHG emissions. Although these projects often take place in remote locations, their impact on reducing climate change is significant and affects all of us. The technological applications that lead to carbon reductions are often made-in-BC solutions. These projects not only reduce GHG emissions, but support the development and export of clean technologies.

### Low emissions facility (ARC Resources, Dawson Creek)

Number of offsets to be retired for 2011:	61,314 tonnes
Equivalent # of cars off the road for one year:	12,022
Project validator:	Ruby Canyon Engineering
Project verifier:	KPMG

#### Benefits in brief:

- Reduces greenhouse gas emissions
- Creation of construction jobs
- Improves local air quality

ARC Resources has replaced natural gas as the power source at its Dawson Creek Gas Plant with electricity, and replaced natural gas with compressed air for the plant’s pneumatic system.

These two changes mean the company has reduced the amount of natural gas used by the gas processing plant – the equivalent of 338,000 tonnes of carbon dioxide over a six-year period. The result is an overall reduction in greenhouse gas emissions; the plant’s carbon footprint is approximately 60,000 fewer tonnes per year than comparable gas plants in the area.



### Electrification of gas processing plant (Canadian Natural Resources Limited, Taylor)

Number of offsets to be retired for 2011:	15,358 tonnes
Equivalent # of cars off the road for one year:	3,011
Project validator:	Stantec
Project verifier:	Ruby Canyon Engineering

Benefits in brief:

- Reduces greenhouse gas emissions
- Creation of construction jobs
- Improves local air quality

This electrification project is located at the Septimus Gas Processing Plant in northeastern BC. The standard practice at gas plants is to use fossil fuels to drive the compressors that move natural gas from the plant and along the pipeline. This project enabled the production of a new compression system connected to the BC Hydro electricity grid, eliminating the need for fossil fuels and significantly reducing the plant's GHG emissions. In 2012, CNRL received a President's Award from the Canadian Association of Petroleum Producers' for two of its projects – of which the Septimus Electrification project was one.

70% of British Columbians polled are in favor of the government providing business with incentives to grow BC's clean-tech sector.

*Source: Ipsos Reid*



**Renewable power installation (Apache, Dawson Creek)**

Number of offsets to be retired for 2011:	16,488 tonnes
Equivalent # of cars off the road for one year:	3,233
Project validator:	Stantec
Project verifier:	Ruby Canyon Engineering
Benefits in brief:	
<ul style="list-style-type: none"> <li>• Reduces greenhouse gas emissions</li> <li>• Innovative use of solar power</li> <li>• Improves local air quality</li> </ul>	

This natural gas development in northeastern BC has become a model for low-carbon natural gas development. The well-site uses a combination of solar power with small thermal electric generators for backup to operate pumps and controllers that previously relied on natural gas. In addition, three natural gas compressor stations were fully electrified and connected to the BC Hydro grid – which is highly uncommon in northeastern BC because of the remote locations of most gas production facilities and associated high costs of building new transmission lines.

**Natural gas pipeline venting reduction (Spectra Energy, Northeastern BC)**

Number of offsets to be retired for 2011:	39,695 tonnes
Equivalent # of cars off the road for one year:	7,783
Project validator:	Stantec
Project verifier:	Ruby Canyon Engineering
Benefits in brief:	
<ul style="list-style-type: none"> <li>• Reduces greenhouse gas emissions</li> <li>• Improves local air quality</li> </ul>	

Spectra Energy has employed three methods that allow the company to significantly reduce the amount of pressurized natural gas that is released to the atmosphere when working on sections of its natural gas pipelines. Because of this project, Spectra now repressurizes the gas and returns it to a nearby pipeline system, uses a mobile incinerator to combust the natural gas in a safe and controlled manner, and uses the pressurized natural gas to fuel a nearby compressor station. These methods recover or combust the natural gas, which, if vented, is 21 times more potent a greenhouse gas than carbon dioxide.

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## Pacific Carbon Trust

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