

**SUSTAINABILITY HIGHLIGHTS**

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Climate change is one of the world's leading sustainability challenges, and the energy sources we rely on play a determining role. Most scientists agree that greenhouse gas (GHG) emissions from human activities are adversely changing the earth's climate. The main sources of these GHGs include the burning of fossil fuels, as well as additional contributions from land use practices, including agriculture, landfills and forestry. This buildup of GHGs is contributing to rising average temperatures, changes in wind and precipitation patterns and increases in the frequency of severe weather events. In addition to lowering our output of GHG emissions, it is imperative that we prepare our communities to be more resilient to face impending climate variation and its impacts-both negative and positive.

- Per capita GHG emissions in BC were 15.9 tonnes in 2004 (2% increase since 1990), compared with the Canadian average of 23.7 tonnes. Levels below the national average are largely due to BC's clean hydroelectric resources and the fact that the majority of the BC population lives in a relatively mild climate.
- Total emissions in BC increased by 30%, due mainly to changing energy consumption patterns and increases in natural gas production.

<b>Greenhouse Gas Emissions</b>		<b>GETTING WORSE</b> - In 2004 both total and per capita GHG emissions were at their highest levels reported since 1990.
<b>Climate Change Impacts</b>		<b>GETTING WORSE</b> -Average freshwater and air temperatures have already warmed over the past 50-100 years, and Fraser River peak flows are occurring earlier than in the past 85 years.
<b>Climate Change Adaptations</b>		<b>GETTING BETTER</b> - Communities are assessing climate risks, initiating plans to adapt, and preparing for climate-related vulnerabilities such as flooding, drought and interface fires.

**ISSUES AND TRENDS**

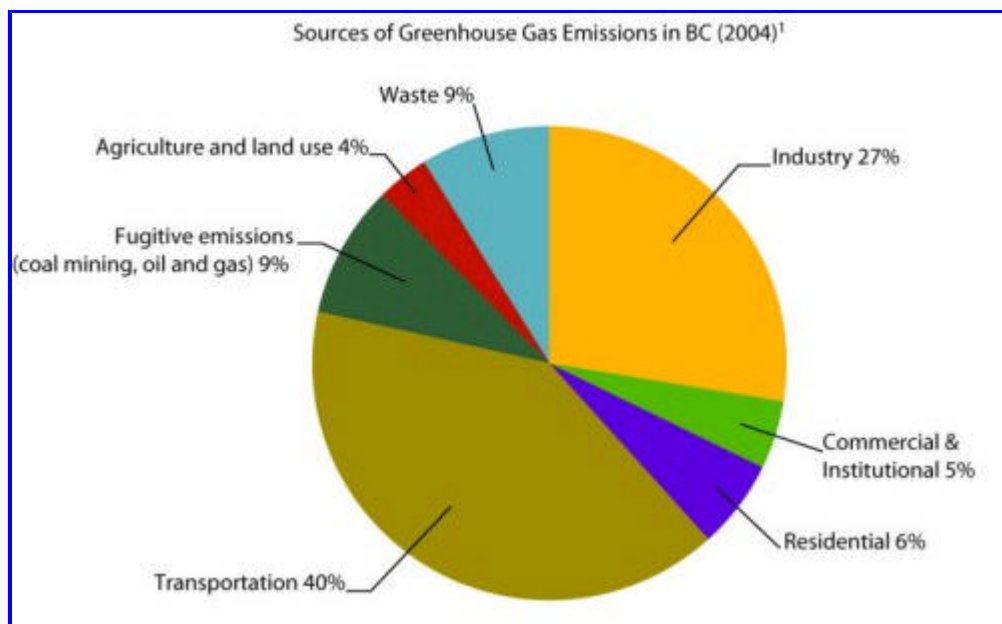
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**Greenhouse Gas Emissions in BC (1990-2004) [1.2](#)**

GHGs originating from human activity include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).

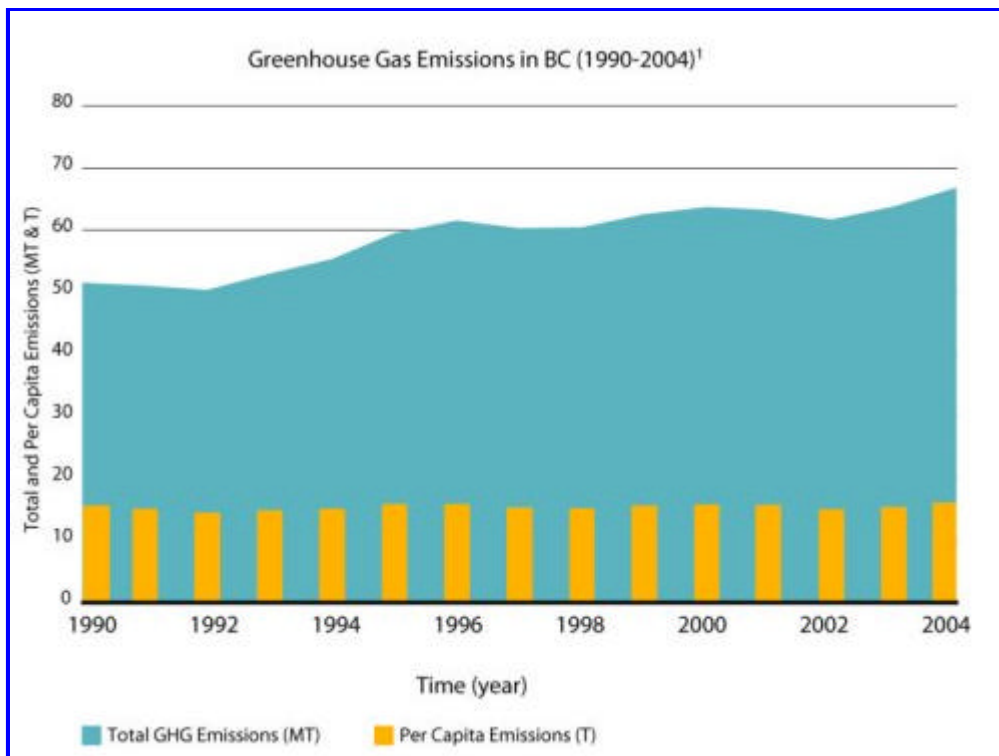
These gases-emitted by a wide range of human activities-enhance the warming capability of the natural greenhouse effect to such a degree that scientists from around the world agree that GHG-emitting human activities are a contributing factor to the climate changes occurring around the globe.

Despite increases in total (30%) and per capita (2%) GHG emissions between 1990 and 2004, the BC economy has become more carbon-efficient, producing 11% fewer emissions per dollar of GDP. Although the economy is becoming more efficient, population growth, rates of economic production, consumer choices (e.g., larger homes and vehicles), and increased use and production of fossil fuels continue to drive GHG emissions upward. **(See Energy)**



**BC's GHG emissions in 2004 and change since 1990. <sup>1,2</sup>**

	% Change (1990-2004)	Total emissions (2004)
Total BC GHG emissions	+ 30%	16.8 megatonnes
Per capita BC emissions	+ 2%	15.9 tonnes
Per \$GDP BC emissions	- 11%	na
SECTOR	% Change (1990-2004)	% of total BC emissions (2004)
Transportation	+ 42%	40%
Industry (excluding fossil fuel production)	+ 22%	27%
Production/mining of oil, gas & coal	+ 83%	9%



### Climate Change and Its Impacts<sup>1,3</sup>

In the Fraser Basin, some observed climatic changes in the past 50-100 years include:

- Average temperatures in the Basin rose by approximately one degree Celsius in the past century, and average precipitation rose as well.
- Summer water temperatures of the Fraser River have warmed over the past 50 years at a rate equivalent to 2.2°C per century, and are increasingly in the upper threshold of what sockeye salmon can tolerate.
- Peak flows on the Fraser River and its tributaries are now occurring earlier in the year than 85 years ago. The Fraser is reaching half of its annual cumulative flow nine days earlier on average compared with a century ago.

The following are some of the predicted impacts in the Fraser Basin that may result from climate change:

- Many of the extreme events to which communities are already vulnerable are predicted to increase in frequency, magnitude and intensity, such as floods, drought, interface fires, pest outbreaks and invasive plants **(See Natural Hazards)**.
- An increased amount of precipitation will be received in the form of rain, rather than snow, which may result in low flows and droughts during the summer in some watersheds.
- Increased distribution of grasslands and transition areas are expected, compared with forests.
- Not all predictions are bad news. There will likely be an enhanced potential for growing agricultural products such as apples, tomatoes, corn, grapes, plums and peaches in the Cariboo-Chilcotin and Upper Fraser regions of the Basin.

## INSPIRED ACTION

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### What is being done?

- 28 local governments in the Basin belong to the Federation of Canadian Municipalities (FCM) Partners in Climate Protection Program, and the number of communities that have developed corporate or community emissions reduction plans has increased from five to nine since 2004. [4](#)
- Biodiesel use in BC is estimated to have grown from near zero to approximately 4 million litres in 2005, reducing emissions by the equivalent of taking 2,500 light-duty cars off the road.
- The number of LEED® certified green buildings in the Fraser Basin has grown from five in 2004 to 17 in 2006, with 63 buildings in the registration process. [5.i](#)
- Adaptation planning-Several communities, including Vanderhoof and Delta, have developed initiatives to better understand their climate risks and begin to plan for changes in sea level rise, precipitation, forest species, forest pests and other factors.
- Communities are better preparing for current climate-related vulnerabilities-like floods, drought, and fires-and these efforts will strengthen resilience to future impacts related to climate change. See [Natural Hazards](#)

### What else can be done?

- Walk, bicycle, carpool, telecommute and take transit where available.
- Reduce energy use through more efficient fleet management. Participate in the E3 Fleet Rating System and be recognized and supported in efforts to green your fleet: [www.e3fleet.com](http://www.e3fleet.com).
- Consider alternative fuels, such as biodiesel, that reduce GHG emissions and other air pollutants: [www.bcbiofleet.ca](http://www.bcbiofleet.ca).
- Join Idle Free BC and reduce unnecessary idling in your community or vehicle fleet. You could save up to 10% of fuel costs: [www.idlefreebc.ca](http://www.idlefreebc.ca).
- Visit [www.bcclimateexchange.ca](http://www.bcclimateexchange.ca) for other ideas on energy efficiency and GHG emission reductions.
- Communities can undertake vulnerability assessments and develop adaptation strategies.
- Reduce transportation emissions by buying locally grown or manufactured products, as well as products that use less packaging.

### E3 Fleet Rating System sets the bar for green fleets

E3 Fleet Rating System is a new program of the Fraser Basin Council to help on-road fleets increase their fuel efficiency, reduce emissions, manage expenses, adopt

new technologies and use alternative fuels. Excellence in fleet management is publicly recognized through Bronze, Silver, Gold and Platinum ratings. For more information, see [www.e3fleet.com](http://www.e3fleet.com) . While on the E3 site, search Canada's first Green Fuels map for nearby stations offering biodiesel, ethanol, hydrogen, natural gas and propane.



PHOTO: John McQueen is fleet manager for Langley Township, one of the municipalities coming on board the E3 program.

## REFERENCES

1. BC Ministry of Environment. Indicators of Climate Change (2002): [www.env.gov.bc.ca/air/climate/index.html](http://www.env.gov.bc.ca/air/climate/index.html).
2. Environment Canada. National Inventory Report 1990-2004 Greenhouse Gas Sources and Sinks in Canada (2006).
3. Royal BC Museum. 2005. Maps prepared for Living Land, Living Sea Gallery: [www.pacificclimate.org](http://www.pacificclimate.org).
4. Federation of Canadian Municipalities. Partners for Climate Protection Program (updated July 6, 2006): [www.sustainablecommunities.ca](http://www.sustainablecommunities.ca).
5. Canadian Green Building Council 2006. LEED Certified Projects in Canada (updated Sept 20, 2006): [www.cagbc.ca](http://www.cagbc.ca).

## FOOTNOTE

i. LEED®, stands for "Leadership in Energy and Environmental Design." It is a green building rating system that recognizes leading-edge buildings that incorporate design, construction and operational practices that combine healthy, high-quality and high-performance advantages with reduced environmental impacts