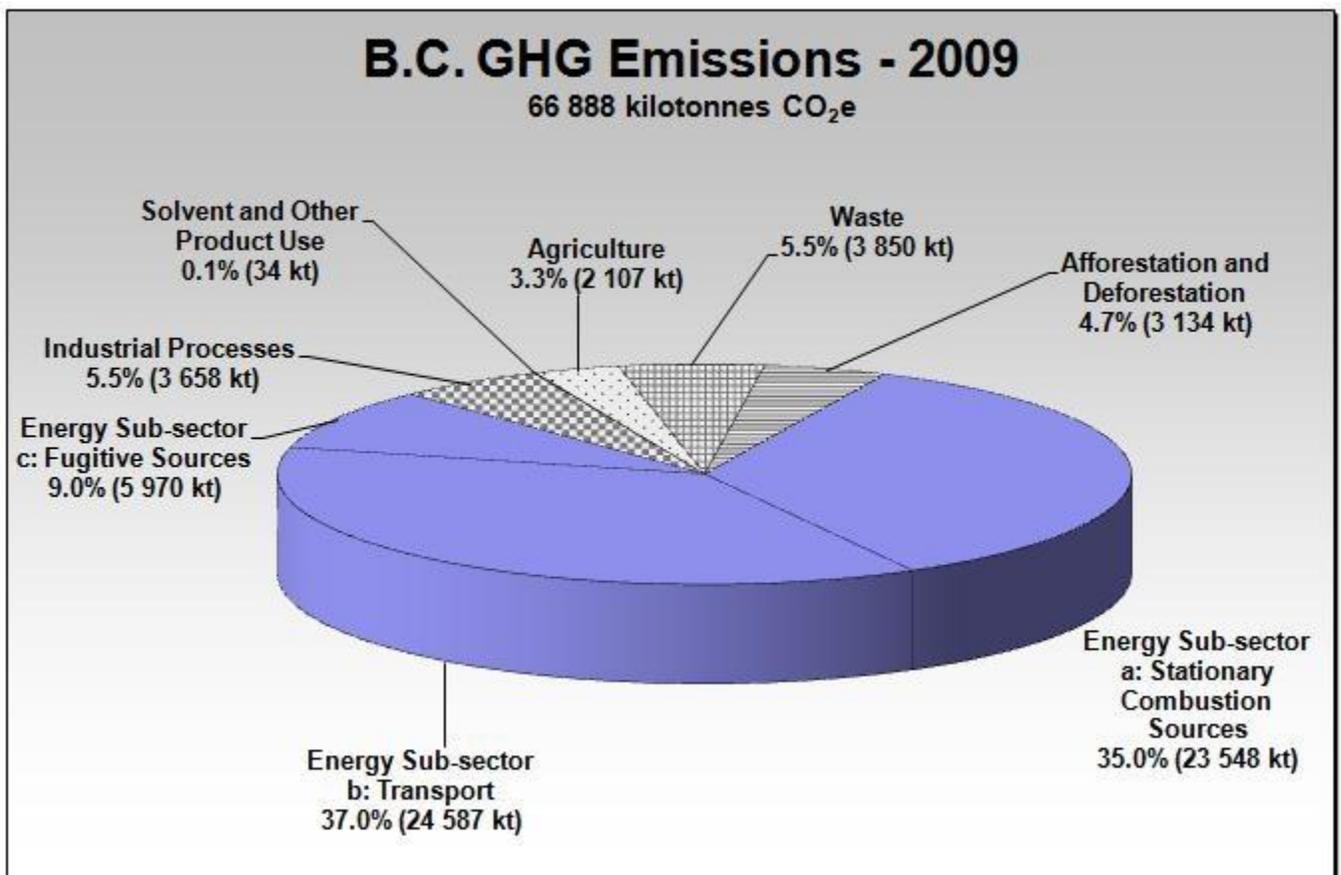


## B.C. Greenhouse Gas Emissions 2009

Total GHG emissions in British Columbia in 2009 were 66.9 megatonnes carbon dioxide equivalent (Mt CO<sub>2</sub>e).

GHG emissions are attributed to six defined sectors — energy (with three sub-sectors), industrial processes, solvents and other product use, agriculture, waste and afforestation and deforestation — following national and international reporting protocols. These sectors, and energy sub-sectors, are shown in the pie graph and described in the table below.



SECTOR	DESCRIPTION
<b>ENERGY</b>	Emissions from stationary and transport fuel combustion and fugitive emissions from the fossil fuel industry.
Sub-sector a: Stationary Combustion	Emissions from stationary devices that combust solid, liquid or gaseous fuel in order to generate useful heat or electricity (excluding devices used in pipeline transport). Emissions are broken down by the following industrial sectors: electricity and heat generation; fossil fuel industries; mining and oil and gas extraction; manufacturing; construction; commercial and institutional; and residential.
Sub-sector b: Transport	Emissions from mobile devices that combust liquid or gaseous fuels for the purpose of generating useful energy (including stationary devices used in pipeline transport). Emissions are broken down by the following vehicle categories: domestic aviation; road transportation; railways; domestic marine; off-road transportation; and pipelines.
Sub-sector c: Fugitive Emissions	Intentional or unintentional emissions from: the production, processing, transmission, storage and delivery of fossil fuels; and the combustion of fossil fuels not used to generate useful heat or electricity.
<b>INDUSTRIAL PROCESSES</b>	Emissions from chemical reactions used in industry that physically or chemically transform materials (occurring during the production of cement, lime, aluminum, other base metals and hydrogen) and fugitive emissions from the use of halocarbons and sulphur hexafluoride in various applications.
<b>SOLVENT &amp; OTHER PRODUCT USE</b>	Fugitive emissions of nitrous oxide when the gas is used as an anaesthetic or propellant.
<b>AGRICULTURE</b>	Emissions from enteric fermentation (digestive processes of ruminant animals such as cattle), manure management and agricultural soils.
<b>WASTE</b>	Emissions from solid waste decomposition at landfills, wastewater treatment and waste incineration.
<b>AFFORESTATION &amp; DEFORESTATION</b>	Emissions from deforestation (i.e., releases at the time of deforestation and the residual decay of dead organic matter) and removals from afforestation (i.e., new trees absorbing and storing CO <sub>2</sub> from the atmosphere).

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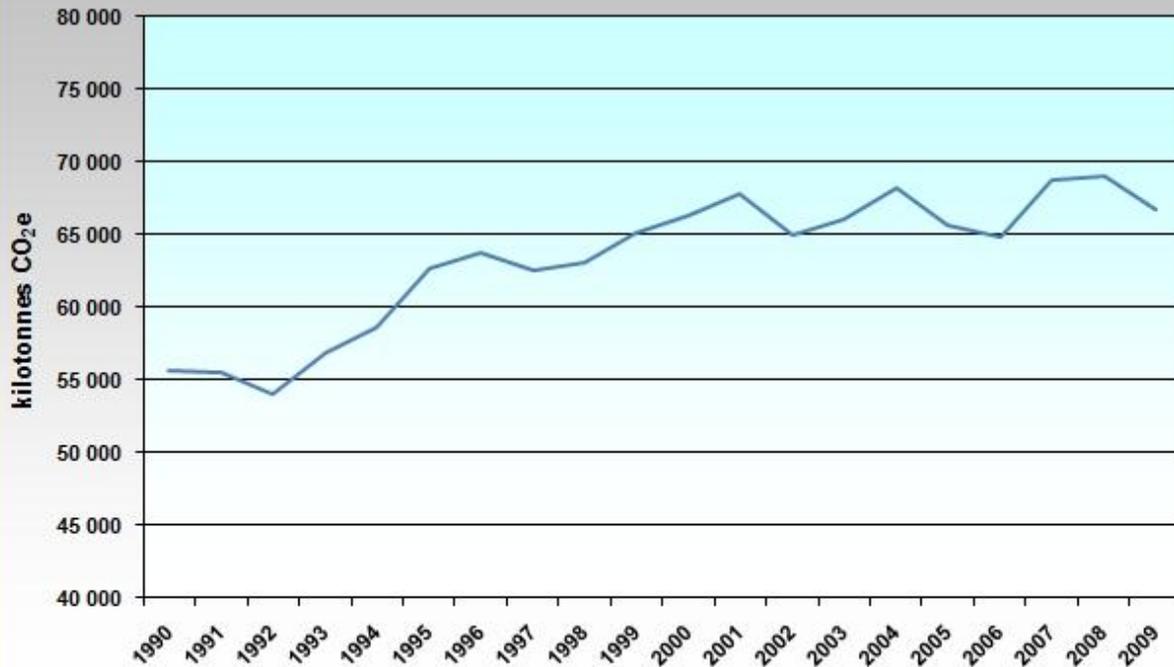
## **B.C. GHG Emissions by Sector - 1990 to 2009**

The [Summary of GHG Emissions, 1990 - 2009](#) (XLS, 65 KB) provides a summary of GHG emissions for B.C. by category for the 1990 to 2009 years. Note that the table includes “Other Land Use” emissions categories. These memo items are reported for transparency and GHG accounting purposes but are not included in total British Columbia GHG emissions. Refer to Chapter 1 of the BC Provincial GHG Inventory Report 2008 for additional information regarding GHG emissions accounting and reporting protocols and procedures.

### **Trends in Emissions**

Total annual GHG emissions in British Columbia increased by 3.1 per cent between 2006 and 2009 (from 64.9 Mt in 2006) and also by 3.1 per cent (from 64.9 Mt) over the ten year period from 1999 to 2009. From 2008 to 2009 GHG emissions decreased by 3.3 per cent (from 69.2 Mt to 66.9 Mt CO<sub>2</sub>e). Note that annual emissions estimates are revised to incorporate data and methodology improvements, hence reported emissions for previous years will change in each inventory report.

## B.C. GHG Emissions 1990 - 2009



SECTOR	2009 GHG Emissions (kt CO <sub>2</sub> e)	3-Year Change (2006-2009)	10-Year Change (1999-2009)
ENERGY	54,105	+4.5%	+7.6%
INDUSTRIAL PROCESSES	3,658	+0.4%	-15.4%
SOLVENT & OTHER PRODUCT USE	34	-19.7%	+18.4%
AGRICULTURE	2,107	-9.3%	-11.2%
WASTE	3,850	+1.4%	+0.9%
AFFORESTATION & DEFORESTATION	3,134	-6.3%	-22.4%

## Sector Trends

**Energy Sector** – Annual energy sector emissions increased by 4.5 per cent between 2006 and 2009 and by 7.6 per cent over the ten year period from 1999 to 2009. A short-term (2008-2009) decrease can be attributed to reduced energy use from stationary combustion sources such as manufacturing, and from transport such as off-road diesel equipment. The economic recession that occurred throughout 2009 affected economic activity levels in various British Columbia sectors. Within the energy sector over the three-year period between 2006 and 2009, transport emissions increased at the lowest rate (+0.6 per cent) while emissions from fugitive sources increased by 12.4 per cent and emissions from stationary combustion sources increased by 7.0 per cent.

**Industrial Process Sector** – Emissions reported under the industrial process category increased by 0.4 per cent between 2006 and 2009 and decreased by 15.4 per cent between 1999 and 2009. Factors influencing these changes include an annual decrease from 2008 to 2009 in process emissions from the production of mineral products, balanced by increased emissions from the production of aluminum and the consumption of Halocarbons and SF<sub>6</sub>.

**Solvent and Other Product Use Sector** – Emissions for this sector decreased by 19.7 per cent between 2006 and 2009 and increased by 18.4 per cent between 1999 and 2009. Regular changes in emissions trends in this sector can be expected as the sector only represents 0.1 per cent of the overall emissions for British Columbia.

**Agriculture Sector** – Annual agriculture sector emissions decreased by 9.3 per cent between 2006 and 2009, and by 11.2 per cent between 1999 and 2009. Changes can be attributed for the most part to methane (CH<sub>4</sub>) emissions from enteric fermentation (the largest source of agriculture sector emissions).

**Waste Sector** – Waste sector emissions increased by 1.4 per cent between 2006 and 2009 and by 0.9 per cent between 1999 and 2009. Increases in the quantity of waste generated and sent to landfills have to this point overshadowed the emissions reductions associated with diversion of wastes and the capture, flaring and beneficial use of CH<sub>4</sub> at landfills.

**Afforestation and Deforestation** – Net emissions in the afforestation and deforestation sector were approximately 3.1 Mt CO<sub>2</sub>e in 2009, 4.7 per cent of total B.C. emissions. This included 3.2 Mt CO<sub>2</sub>e of emissions from deforestation and 0.016 Mt CO<sub>2</sub>e of removals from afforestation. Net GHG emissions from afforestation and deforestation decreased 6.3 per cent between 2006 and 2009 and 22.4 per

cent between 1999 and 2009. Net emissions are influenced primarily by the size of deforested area and forest characteristics (i.e., geographic location, growing conditions, tree species, density and age). Decreases in emissions can be attributed to decreases in the area of deforestation from year to year, particularly in the agricultural sector.

**Other Land Use ([Memo items](#) not included in total B.C. GHG emissions)** – Emissions associated with “other land use” categories increased by 10.5 per cent between 2006 and 2009. From 1999 to 2009, “other land use” categories collectively changed from a net sink of GHGs (approximately 30.7 Mt CO<sub>2</sub>e removed from the atmosphere in 1999) to a net source in 2009 (approximately 63.7 Mt CO<sub>2</sub>e emitted to the atmosphere). This transition can be attributed in large part to the impacts of the mountain pine beetle (MPB) outbreak – which attacked living forests that act as a sink for GHGs and resulted in large areas of dead and decomposing trees. Net emissions associated with these categories are also influenced by wildfires, slash burning and wood harvesting. The large area affected by forested fires in 2009 caused reported emissions to jump by 43.3 Mt from 2008.