

# Greenhouse Gas Emissions and Alberta's Agri-food Industry



Bulletin #4

## Why are Greenhouse Gas Emissions Important?

Greenhouse gases trap heat in the Earth's atmosphere. This natural process keeps the planet warm enough to be hospitable to life as we know it. However, modern industry and lifestyles have increased greenhouse gas (GHG) concentrations in the Earth's atmosphere over the last century. Scientists studying this issue say that these increasing concentrations have resulted in climatic changes such as more severe weather events, more forest fires, and reduced availability of quality water resources.

Canada and 180 other countries adopted an international agreement in 1997 called the Kyoto Protocol which committed them to reduce GHG emissions that contribute to climate change. Recent negotiations for global GHG reductions occurred in 2009 in Copenhagen (Denmark). Canada pledged to take action and reduce GHG emissions to 17 percent below 2005 levels by 2020.

In order to achieve significant reductions, all GHG emitters will need to do their part. The agri-food industry has a key role to play in these efforts and has the opportunity to contribute to emissions reductions in response to demands for action. By showing leadership and taking initiative, the industry can remain competitive and efficient, and may be able to capture emerging market opportunities.





## Emissions from the Agri-Food Industry

Carbon dioxide (CO<sub>2</sub>) is the main GHG emitted by the agri-food industry and energy use is the leading source, accounting for at least 80% of emissions followed by organic wastes (12%) and refrigerants. Energy costs have historically made up a small proportion of production costs in the industry so energy use has not received much attention. However, rising energy prices and increasing concerns about GHG emissions are now providing incentives for energy efficiency in the agri-food industry.

From 1990 to 2008, GHG Canada's emissions from energy consumption by food manufacturers increased by about 4% while emissions from energy consumption in the beverage and tobacco industries dropped by 18% (Figure 1).

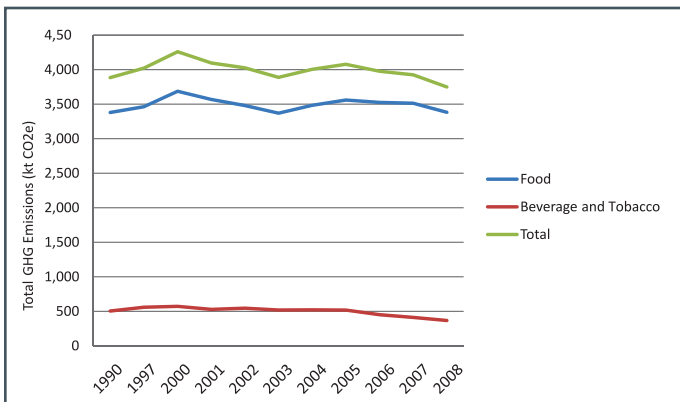


Figure 1. Total Greenhouse Gas Emissions from Energy Consumption by the Canadian Food, Beverage and Tobacco Manufacturing Industries over the period of 1990 to 2008 (in kilotonnes of CO<sub>2</sub>e).

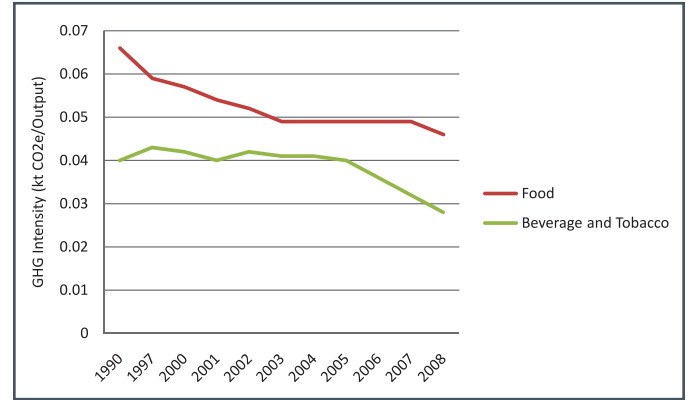


Figure 2. Emissions Intensity for the Food, Beverage, and Tobacco Industries over the period of 1990 to 2008 (in kilotonnes of CO<sub>2</sub>e per unit of output).

Alberta is currently the third largest food and beverage processing province in Canada, contributing 15.4% of the national manufacturing shipments in 2008. The value of Alberta's manufacturing shipments hit a record high of \$11.7 billion in 2008.

Alberta's agri-food processing emissions from fossil fuel use increased by 17% between 1990 and 1996, from 0.6 to 0.7 million tonnes of carbon dioxide equivalents (CO<sub>2</sub>e). With continued growth the industry's emissions from fossil fuel use are projected to increase by 243% from 1996 levels to 2.4 million tonnes of CO<sub>2</sub>e by 2008-12.

## Reducing Emissions- Agri-food Industry

One of the most significant ways in which the agri-food industry can reduce its GHG emissions is by reducing its energy consumption. Reduced energy consumption also means lower input costs. Energy efficient management practices such as process integration (streamlining factory processes) and the use of energy management and control systems (computerizing these systems) can significantly reduce energy consumption. Having a detailed energy audit done will help to identify the specific options that are cost saving and feasible for an individual facility. Energy recovery from processing wastes, including heat recovery, may also help to reduce production costs and improve sustainability.



In 2000, a study was done by the Alberta Food Processors Association (AFPA) that identified some potential opportunities to reduce emissions. Examples of these options and the range of potential cost savings include:

- energy-efficient boilers: 5 to 15% savings
- building envelope: 30 to 60% savings
- chilling and freezing: 10 to 30% savings
- compressed air: 10 to 40% savings
- energy-efficient motors: 3 to 10% savings
- heating, ventilation and air conditioning: 10 to 40% savings
- energy-efficient lighting: 20 to 60% savings
- process energy: 10 to 50% savings
- product storage: 15 to 60% savings
- transportation: 10 to 40% savings

Some other actions that could reduce GHG emissions from the agri-food industry include:

- using renewable energy (wind, solar, hydro, geothermal or biomass) or process waste to power operations
- reducing material use and increasing recycled content in packaging
- enhancing distribution efficiency by choosing more efficient transportation types, using the best technologies, and improving design of distribution channels. For example, water transport is thought to be more energy-efficient than other modes of distribution such as air.



## Summary

Governments and consumers are expecting all industries, including the agri-food industry, to reduce GHG emissions. The adoption of beneficial management practices such as energy efficiency, waste minimization, and distribution optimization could significantly reduce the agri-food industry's emissions. Reducing emissions can help slow climate change but it may also improve the industry's production efficiencies and conserve valuable soil and water resources.

## Sources

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