

Greenhouse Gas Emissions of the Agriculture and Agri-Food Industry

Number 1

November 2004

Greenhouse Gases - Things You Need To Know

What determines the levels of Greenhouse Gases?

Although most greenhouse gases (GHGs) occur naturally, modern industry, and lifestyles have increased GHG emissions and their amounts in the atmosphere. Human activities have raised GHG levels by introducing new sources or interfering with natural sinks. A balance between sources and sinks determines the levels of GHGs in the atmosphere. Sources are processes or activities that release GHGs; whereas sinks are processes, activities or mechanisms that remove GHGs from the atmosphere.

What are the Greenhouse Gas Emissions from Canadian Industry Sectors?

In Canada, the GHGs emitted by the various industry sectors are estimated annually. Environment Canada, based on methods developed by Agriculture and Agri-Food Canada, determined that in 2002, the agriculture sector was responsible for about 8% of the total GHG emissions in Canada (Figure 1).

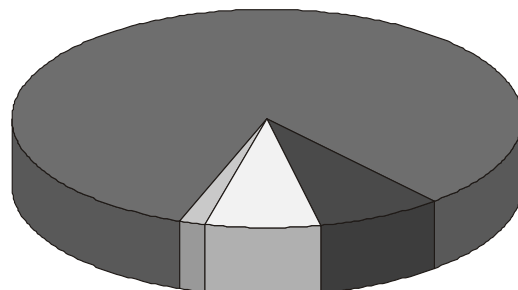


Figure 1. Canada's Greenhouse Gas Emissions by Sector - 2002

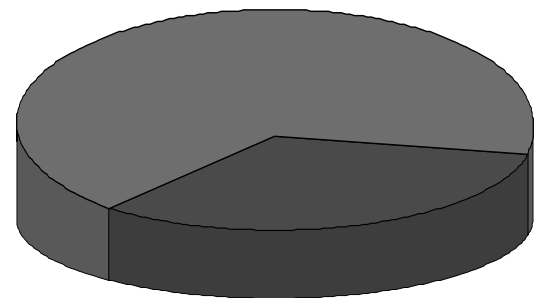


Alberta Environmentally Sustainable Agriculture Council

Appointed by the Minister of Agriculture, Food and Rural Development.

Mandated to (1) identify and evaluate environmental challenges and opportunities facing the agriculture and food processing industry; and (2) encourage the industry to proactively address environmental issues.

Fossil-fuel use in Canada accounts for about 81% of the total amount of GHGs emitted each year. Of Canada's 2002 total agricultural and agri-food industry GHG emissions, 33% were emitted in Alberta (Figure 2).



■ 67% Rest of Canada ■ 33% Alberta

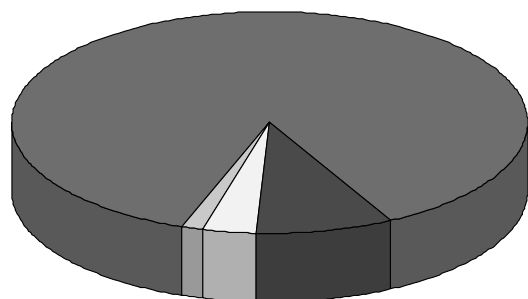
Figure 2. Alberta's contribution to Canada's Greenhouse Gas Emissions from the Agriculture and Agri-Food Industry - 2002

How does Alberta's Agriculture and Agri-Food Industry Compare to Other Alberta Industries?

Comparing Alberta's various industry sectors, the majority of Alberta's GHG emissions originate from the energy sector (Figure 3). Alberta's agricultural industry accounted for about 9% of the province's total GHG emissions in 2002. The agri-food processing industry accounted for about 12% of the total agricultural GHG emissions. The agriculture sector's main GHG emissions are nitrous oxide (N_2O) and methane (CH_4). Whereas, the agri-food sector's major GHG is carbon dioxide.



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■ 86% Energy ■ 9% Agriculture □ 3% Industrial Processes □ 2% Other

Figure 3. Alberta's Greenhouse Gas Emissions by Sector - 2002

What Makes the Agriculture Sector's GHG Emissions So Different?

Although carbon dioxide is the major GHG emitted by other industries, agriculture is a main emitter of methane from livestock enteric fermentation and nitrous oxide from inorganic fertilizer and manure use. In 2002 the agricultural sector contributed about 27% and 65% of the total Canadian methane and nitrous oxide emissions, respectively. As these agricultural sources of GHGs are different from the other sectors, strategies that work in other industries such as reducing fuel consumption and using more efficient light bulbs won't be the entire solution for agriculture. Therefore the agricultural industry will need creative solutions to reduce, remove, or replace GHGs that specifically address agriculture's unique situation.

What Opportunities exist for the Agricultural Sector?

Agriculture is in a unique position because of its ability to 'capture' atmospheric carbon in growing crops and then store a portion of that carbon in soil organic matter. This process is carbon sequestration or carbon storage. Agricultural soils can be a source (by emitting carbon dioxide) or a sink (by storing carbon dioxide) for carbon dioxide depending on soil management practices. As the Canadian

Prairies occupy over 54 million acres of Canada's farmland, agriculture can make a significant contribution to meeting Canada's GHG reduction targets.

Conservation farming practices, such as direct seeding and good fertilizer placement have increased soil organic carbon levels, which helps to 'offset' GHG emissions, thereby reducing the industry's net GHG emissions. Reducing GHG emissions simply means that crops and livestock are raised more efficiently, thus reducing on wasteful losses of inputs such as nitrogen (nitrous oxide) and energy (methane). Adoption of conservation practices will help to reduce GHG emissions.

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