Alberta

Climate Change in Alberta

There is broad scientific consensus on the reality of climate change. It is happening, and it has serious implications–for our health, our economy, and our future.

Human activities, including the heavy use of fossil fuels for heating, transportation and electricity, release greenhouse gases that are accumulating and causing global warming. Average global temperatures are rising–the 20th century was the warmest the world has seen in 1,000 years, and the 1980s and 1990s were the warmest decades on record. As a northern country, Canada will feel the impacts of climate change more than most countries.

The Prairies are likely to experience increased temperatures with climate change. Recent models suggest that summer temperatures in Alberta could warm by 3 to 5°C by 2080. Such changes would be the largest and most rapid of the last 10,000 years and would have impacts on ecosystems and quality of life.

Rivers, glaciers and water demand

Alberta is seeing rapid industrial, agricultural and municipal growth, which is putting more pressures on existing water supplies and potentially affecting the quality of surface water and groundwater.

The risk of flooding is expected to increase in the small rivers of the interior Cordillera and on the southeastern slopes of the Rocky Mountains. With annual evaporation exceeding precipitation on the prairies, water supply is dependent on snowmelt runoff from the prairie and mountain regions to replenish lakes, reservoirs, wetlands and groundwater. Any alteration to the critical balance of this cycle could have a significant impact. Climate change may, for example, affect the timing of runoff and precipitation, the form or amount of precipitation, or the amount of evaporation. Over time, flows may decrease in the Bow and the North Saskatchewan Rivers during the late summer and fall months. This could cause water shortages in communities that depend on rivers for their water supply.

Climate change could result in the significant retreat of large glaciers, such as the Athabasca glacier. Over the last century, drastic reductions in the surface area of glaciers have resulted in reduced downstream water flows. Glacial melt waters are necessary to maintain water levels, and to sustain the habitat that enables trout to migrate and spawn in the late summer and autumn in the Bow River. Reduced flows from glaciers may already be having a serious impact on the Bull Trout. The Alberta hydroelectric industry would also be affected by lower water flows.

Urban centres

Nearly 60 percent of Albertans, almost 2 million people, live in either Calgary or

Edmonton, and the area around Calgary is the fastest growing region in the Prairies. Climate change is expected to affect life in the city in several different ways. Warmer summers are expected to increase the number of very hot days, decrease air quality, and increase energy demands, due to greater air conditioner usage. On the other hand, warmer, shorter winters mean that heating demands would decline and the need for snow removal would be reduced.

In the summer, campers and hikers could enjoy a longer season. However, water-based activities, such as boating and fishing, could be negatively affected. People who enjoy winter activities would find their season shortened.

Forests and grasslands

In a warmer climate, the boreal forest, aspen parkland and open grassland, may shift northward. Some scientists predict that much of the boreal forest in the province will be replaced by aspen parkland. Similarly, large regions of aspen parkland are expected to become grasslands. In the northern regions, forest growth may benefit from warmer temperatures and longer growing seasons. However, forest fires and insect outbreaks are expected to increase throughout the province.

Changing weather patterns

Extreme events, such as thunderstorms, tornadoes, hailstorms, and heat waves, may become more common on the Prairies due to climate change. Warmer winters may increase the likelihood of both intense winter storms and rainstorms. In the summer, local flooding may increase as rains become more intense. The pattern of other weather conditions, such as droughts, may also change.

Taking Action

Given the potentially serious and long-term nature of the risks associated with these impacts, the only prudent course is to take action now to reduce the emissions that contribute to climate change. Analysis shows that the impact on Canadian jobs and economic growth associated with reducing greenhouse gas reductions can be kept modest and manageable relative to the strong growth expected over the next decade.

To give a sense of the possible order of magnitude of the impacts on industry, the estimated economic impact of implementing steps one and two in the Climate Change Plan for Canada to meet Canada's Kyoto commitments ranges from -0.4 percent to -1.6 percent of Canada's gross domestic product, dependent on various assumptions.

This is a modest impact relative to the strong economic growth expected over this period. Analysis shows job growth of 1.08 to almost 1.26 million jobs by 2010, compared to just over 1.32 million in a business as usual scenario. That means a delay in job creation of about 62,000 jobs across Canada in the year 2010. By comparison, the Canadian economy is currently creating new jobs at a rate of about 46,000 per month.

Estimates indicate that with the implementation of actions to reduce greenhouse gas emissions, Alberta's provincial gross domestic product in the year 2010 would grow to a level that would be about 0.39 percent less than in a business as usual scenario. Growth in new jobs would slow by approximately 0.4 percent, or a delay in job creation over the next eight years of about 5,900 new jobs. To put this into context, Alberta's economy created approximately 42,400 jobs over the past year.

These economic forecasts do not reflect the significant environmental and health benefits to be gained by addressing climate change. Taking action will provide broader benefits including cleaner air, reduced health costs and other environmental and social benefits for Canadians.

The impact on personal disposable income by 2010 would be approximately 0.05 percent less than business as usual. Relative to what they would otherwise be, electricity prices could drop by approximately 0.32 cents/KWh. Gasoline prices are expected to remain at their business as usual level in 2010.

An illustrative example of production increases for major industrial emitters in the province as a result of measures to reduce greenhouse gases (national averages) is as follows:

- **conventional oil** would rise by 3 cents per barrel, or by 0.09 percent

- **heavy crude oil** would rise by 1.5 cents per barrel, or by 0.05 percent
- **natural gas** would rise by 0.5 cents per million cubic feet, or 0.14 percent
- **pipelines** would rise by 0.14 cents per million cubic feet
- **oil sands** – bitumen would rise by 10 cents per barrel, or 0.34 percent
- **oil sands** – synthetic would rise by 12 cents per barrel, or by 0.31 percent
- **electricity** – coal would rise by 0.14 cents per KWH, or by 1.94 percent
- **electricity** – gas would rise by 0.04 cents per KWH or 0.60 percent

Canada's approach to reducing greenhouse gas emissions is designed to minimize costs and maximize opportunities for Canadian technology. It envisions an economy that is based on cleaner sources of energy, using leading edge technologies. The Plan proposes strategic investments in innovative climate change proposals and the creation of a Partnership Fund that will cost-share well as municipalities, Aboriginal communities and the private sector.

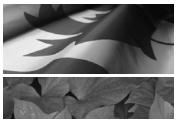
By drawing on Canadian innovation, and by ensuring that different sectors of the economy, regions and consumers play a role in taking action on climate change, the impact is more manageable for all. Working together, Canada can position itself as a strong competitor as the world moves to a new, less carbon-intensive economy.

Alberta-based companies and communities are already showing leadership in meeting the challenges of climate change[1]:

- Shell Canada met its target to reduce emissions to 1990 levels by the end of 2000. The company plans to further reduce GHG emissions to six percent below 1990 levels in the period 2001 to 2008.
- TransAlta has reduced its Canadian net carbon dioxide emissions by 18 percent (nearly 5 million tonnes annually) since 1990, and has tabled an aggressive plan to reduce its Canadian net carbon dioxide emissions from existing operations to zero by 2024.
- Other Alberta companies, including Vision Quest Inc, Enmax Corporation and the City of Calgary, are leaders in developing and promoting wind-generated, environmentally friendly power.
- Syncrude Canada Ltd. is the world's largest producer of crude oil from oil sands and it is one of Canada's leading energy companies when it comes to putting energy efficiency to work. From 1988 to the end of 1999, Syncrude cut carbon dioxide emissions per barrel of oil produced by 26 percent, and it estimates that by 2008 the total reduction will improve to 42 percent.
- At its Joffre, Alberta, plant, NOVA Chemicals' new cogeneration power plant, which produces electricity and usable heat at the same time, is now in operation. The $380-million plant generates enough power to supply all of the newly expanded plant's electricity and steam needs. In addition, the power plant adds more than four percent to the amount of electricity generated in Alberta by selling excess power to the Alberta Interconnected System, the area's electricity provider. This move not only saves on operating costs, but also reduces the number of greenhouse gas emissions.

[1] Examples are taken from the public record.

To find out more about what the Government of Canada is doing and what you can do,
please call 1 800 O-Canada (1 800 622-6232), TTY 1 800 465-7735
or visit www.climatechange.gc.ca
www.gc.ca



www.climatechange.gc.ca