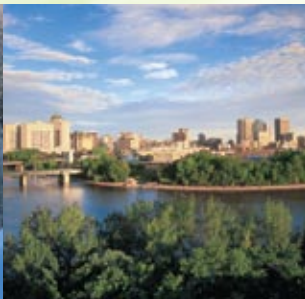


# *Overview :* What climate change means to Manitoba



**“Unless action is taken now to set in motion a worldwide transition to a low carbon economy,**

**some scenarios suggest that by 2040, the world could experience annual economic losses as high as USD \$1 trillion.”<sup>8</sup>**

We are increasingly witnessing the consequences of a warming world: less predictable weather patterns; more frequent and intense extreme weather; and the arrival of new plants and animals in the province. These are all hallmarks of what are expected to be among the most significant economic and environmental challenges of the 21st century: climate change.

Spring is expected to arrive earlier and be wetter; followed by warmer and drier summers. Winters should be milder, with a **“diminished snowpack.”<sup>6</sup> Extreme weather like droughts, heat waves, hailstorms, tornadoes, intense rainstorms and floods are expected to be more frequent and more intense.<sup>7</sup>**

By 2080, average summer temperatures in Manitoba are projected to be 3°C to 4°C higher than today. Even greater warming could take place during the winter months, with average temperatures rising by 5°C to 8°C. This warming trend will bring changes in precipitation, evaporation, humidity and wind patterns.

Rising permafrost temperatures are expected to cause roads, railways and building foundations to buckle and deteriorate. Changing ecological conditions are expected to include grasslands moving further north, edging out the boreal forests.

Forests will also be at risk of increased fires and disease. Warmer temperatures will present health problems through illnesses caused by heat, increased dust in the air and vector-borne diseases such as Hantaviruses, West Nile virus and Lyme disease. Thinning sea ice will make it more difficult for polar bears to hunt for seals.

There will be significant economic costs if nothing is done about the impacts of climate change. We’ve already felt these economic upsets close to home in recent years. The 1997 Flood of the Century, for example, cost the province \$380 million. In 2003, the costs from forest fires across Manitoba totalled \$64,837,155, and the Canadian economy lost \$5 billion due to drought on the Prairies between 2000 and 2003. According to the United Nations Environment Program’s Finance Initiative: **“Unless action is taken now to set in motion a worldwide transition to a low-carbon economy, some scenarios suggest that by 2040, the world could experience annual economic losses as high as USD \$1 trillion.”<sup>8</sup>**

<sup>6</sup> Manitoba Clean Environment Commission and the International Institute for Sustainable Development. Manitoba and Climate Change: A Primer. [http://www.iisd.org/pdf/cc\\_2nd\\_ed\\_wcov.pdf](http://www.iisd.org/pdf/cc_2nd_ed_wcov.pdf)

<sup>7</sup> Canadian Environmental Assessment Agency, Appendix A: Summary of Projected Regional Climate Change Impacts, Water Supply and Demand, [http://www.ceaa-acee.gc.ca/015/0002/0004/appendixA\\_e.htm#Anchor-10501](http://www.ceaa-acee.gc.ca/015/0002/0004/appendixA_e.htm#Anchor-10501)

<sup>8</sup> Adaptation and Vulnerability to Climate Change: The Role of the Finance Sector, UNEP FI Climate Change Working Group, December 2006.

## Manitoba in the Global Context

The climate changes that we are beginning to feel in Manitoba are part of a larger global experience. The Intergovernmental Panel on Climate Change, a body composed of leading scientists from around the world, projects that between 1900 and 2100, average temperatures on the Earth will have risen by 1.4°C to 5.8°C.<sup>9</sup> The consequences of this rise in average temperatures are expected to be profound.

Warming of more than 3°C could result in “serious risk of large scale, irreversible system disruption.” Beyond this threshold, irreversible catastrophic events such as the melting of the Greenland Icecap or the shutting down of the Atlantic Current that warms the North Atlantic countries could take place.<sup>10</sup> Already, the insurance industry has characterized climate change as perhaps the greatest threat in its history.<sup>11</sup> Annual losses just from hurricanes in the United States, typhoons in Japan and windstorms in Europe, are projected to increase to \$27 billion per year by 2080.<sup>12</sup>

To prevent climate change from occurring faster than humanity can adapt, greenhouse gases will need to be reduced by approximately 60 per cent, globally, by 2050. To achieve this critical target, urgent action is needed in the next couple of years. Key actions, such as finding alternatives to burning fossil fuels (coal, oil) that release greenhouse gases, and preserving carbon sinks (forests and grasslands) need to be put in place as soon as possible.

## Manitoba's contribution to Canada's greenhouse gas (GHG) emissions

**Manitoba has one of the lowest rates of greenhouse gas emissions in Canada, and the lowest among the western Canadian provinces.** Past investments in hydroelectric power production and energy efficiency have helped Manitoba maintain the lowest percentage of emissions from its energy sector.

We have succeeded in reducing emissions generated by our energy and industrial sectors. Emissions from residential buildings, pipelines and mineral production are on a downward trend. Manitoba is actively managing emissions from its thermal power production. It has retired four coal units in Brandon and converted two units at Selkirk to lower-emission, natural-gas generation.

As well, the province has been able to limit the growth of its emissions relative to the expansion of its economy. Provincial actions have helped reduce emissions, per billion dollars of Gross Domestic Product (GDP) by 13 per cent between 1990 and 2005 – from 0.70 Mt/\$B GDP to 0.60 Mt/\$B GDP).

### MEGATONNES OF GHG EMISSIONS IN MANITOBA PER \$1 BILLION GDP



<sup>9</sup> The rate of change will be even greater in northern countries. Canada is already warming faster than the global average. While global average temperatures rose by 0.6°C over the past century, the temperature in Canada south of the 60th parallel rose by 0.9°C. Even greater warming took place in the north; in the Mackenzie Basin, average temperatures increased by 2°C.

<sup>10</sup> International Scientific Steering Committee. 2005. Avoiding Dangerous Climate Change: International Symposium on the Stabilization of Greenhouse Gas Concentrations. Exeter, UK, 1 - 3 February.

<sup>11</sup> Ceres. 2006. Dozens of new insurance products emerging to tackle climate change and rising weather losses.

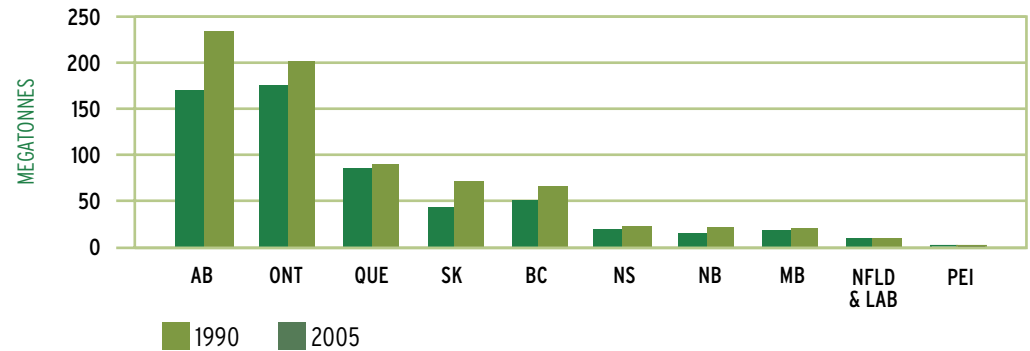
<sup>12</sup> Association of British Insurers. 2005. Financial Risks of Climate Change Summary Report. [http://www.abi.org.uk/Display/default.asp?Menu\\_ID=718&Menu\\_All=714,718,0 &Child\\_1](http://www.abi.org.uk/Display/default.asp?Menu_ID=718&Menu_All=714,718,0 &Child_1)

## Provincial actions have helped reduce emissions

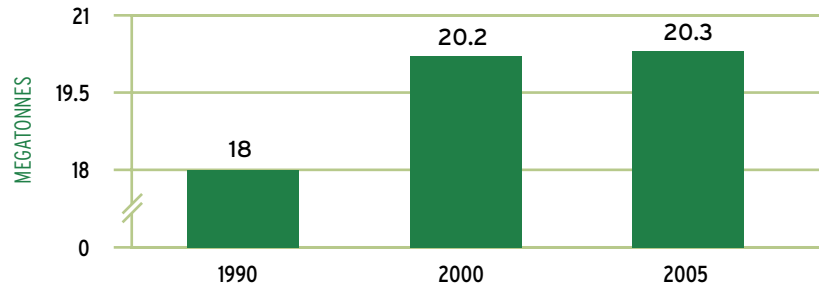
per billion dollars of Gross Domestic Product (GDP) by 13 per cent between 1990 and 2004 (from 0.70 megatonnes (Mt)/\$B GDP to 0.61 Mt/\$B GDP).

Our emissions, however, rose slightly since 1990 – up from 18 Mt of carbon dioxide equivalent (CO<sub>2</sub>e) in 1990 to 20.2 MT CO<sub>2</sub>e in 2000 to 20.3 in 2005.<sup>13</sup> **Between 1990 and 2000, emissions rose by 2.2 Mt, but since 2000, they have risen by only 100,000 tonnes.** Recent Environment Canada reports show a reduction from Manitoba's single-point sources of emissions of 400,000 tonnes, putting current total emissions at 19.9 MTs (pending release of Environment Canada's complete 2006 inventory). **At the national level, Manitoba's net-emission increases since 1990 are much smaller than those of other Canadian provinces.** However, Manitoba remains committed to reducing its contribution to global emissions. New initiatives are needed to help reduce total emissions to six per cent below 1990 levels, or 17 MT CO<sub>2</sub>e.

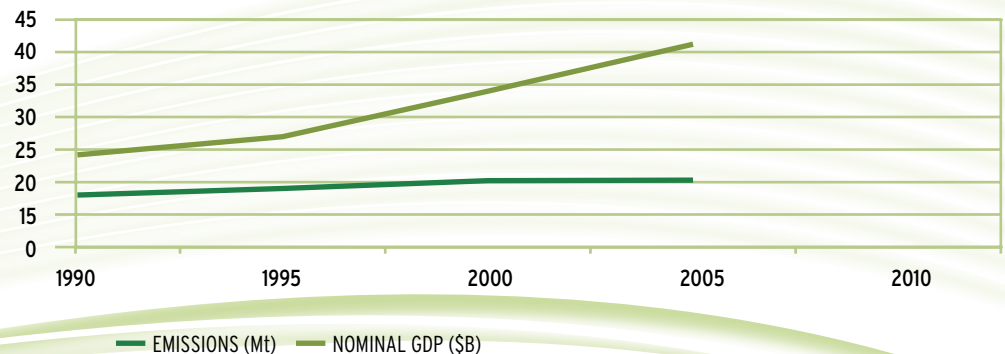
### TRENDS IN GHG EMISSIONS IN CANADA, 1990-2005



### GHG EMISSIONS IN MANITOBA, 1990-2005



### NOMINAL GDP AND GHG EMISSIONS IN MANITOBA, 1990-2000<sup>14</sup>



<sup>13</sup> Environment Canada (2007), National Inventory Report, Greenhouse Gas Sources and Sinks in Canada 1990-2005.

<sup>14</sup> Environment Canada (2007), National Inventory Report, Greenhouse Gas Sources and Sinks in Canada 1990-2005. Manitoba Bureau of Statistics, 2008

Manitoba's updated plan, therefore, includes new initiatives to support emission reductions in our transportation and agriculture sectors.

These programs will once again put

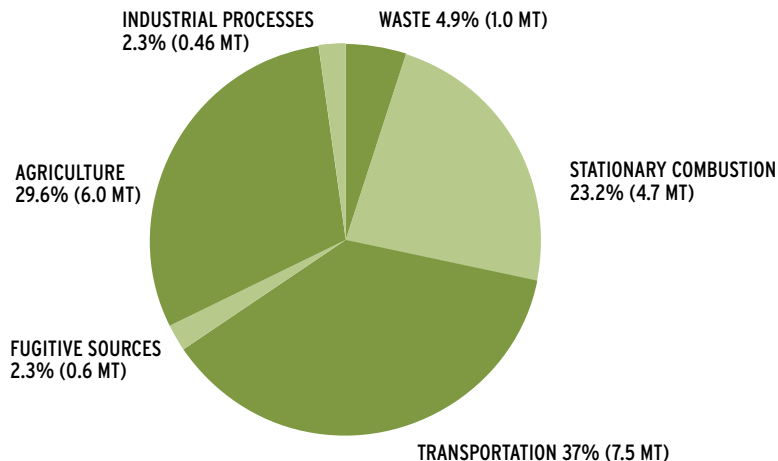
## Manitoba in a leadership position

in reducing emissions here at home and sharing best practices beyond our borders.

Manitoba and Quebec, along with a host of provincial, state and regional governments from around the world, agreed to **expand renewable energy and energy efficiency; find cleaner forms of transportation; reduce waste; and improve sustainable agriculture and forestry practices to reduce global GHGs.**

Transportation and agriculture are the primary sources of greenhouse gas emissions in Manitoba. Emissions from the transportation sector – aviation, vehicles, off-road equipment, railways and pipelines – made up 37 per cent of provincial emissions in 2005. Of the 11-billion vehicle kilometres travelled in Manitoba in 2005, half occurred within the City of Winnipeg.<sup>15</sup>

### MANITOBA GHG EMISSIONS BY CATEGORY, 2005



In 2005, agricultural activities produced 29.6 per cent of Manitoba's emissions (excluding emissions from off-road farm equipment). More than 40 per cent of agriculture emissions come from agriculture soils (with about half of that coming from the application of nitrogen-based fertilizers). The remainder comes through enteric fermentation (41 per cent) and manure management (16 per cent).

Manitoba's updated plan, therefore, includes new initiatives to support emission reductions in our transportation and agriculture sectors. These programs will once again put Manitoba in a leadership position in reducing emissions here at home and sharing best practices beyond our borders.

### A global partner

Manitoba is a leader in the fight against climate change, alongside partners in Canada and around the world.

#### The Declaration of the Federated States and Regional Governments on Climate Change

was a product of the 2005 Climate Leaders Summit, hosted by Quebec and Manitoba. It coincided with the 11th UN Conference of the Parties meeting in Montreal. Manitoba and Quebec, along with a host of provincial, state and regional governments from around the world, agreed to expand renewable energy and energy efficiency; find cleaner forms of transportation; reduce waste; and improve sustainable agriculture and forestry practices to reduce global GHGs. Since that time, all participants have made significant strides in all areas of emission reductions and will report back on these actions at the time of the United Nations Conference of the Parties meeting in 2008.

Since then, Manitoba has entered partnerships with the states of California and South Australia to advance climate change action at the regional level. The province has also partnered with the Province of Quebec to establish a commitment among provincial, state and regional leaders worldwide. They agreed to take decisive action on climate change today.

**By acting today to reduce our emissions, Manitobans are establishing themselves as leaders for tomorrow.**

## Western Climate Initiative

**Manitoba is a member of the Western Climate Initiative (WCI).** As part of its commitment, Manitoba and other WCI members established a western regional GHG emissions reduction goal. Members also agreed to share best practices and design a multi-sector, market-based mechanism to help reach this goal.

## The Climate Registry

WCI members have joined the Climate Registry, a GHG-emissions registry consisting of more than 40 U.S. states, tribes, Mexican states, and all Canadian provinces and territories. The registry is a collaborative effort aimed at developing and managing a common greenhouse gas emissions reporting system. The system will support various greenhouse gas emission reporting and reduction policies for its members and provide a consistent, transparent set of data on greenhouse gas emissions for North America. **Manitoba is developing a first-of-its-kind emissions offsets registry that will link with this North American effort.**

## Midwestern Governors Association (MGA)

**Manitoba has joined mid-western states in setting regional targets for measures such as energy efficiency, renewable energy and biofuels.** Manitoba will pursue initiatives to reduce carbon emissions and promote clean energy production and use. The Energy Security and Climate Stewardship Summit, organized by the MGA, brought together leaders to discuss renewable energy and alternative fuels, energy efficiency and a reliable regional electric grid. The Mid-western Greenhouse Gas Reduction Accord will establish regional targets for reducing greenhouse gases.

## Beyond 2012

The international community has begun to focus on designing a more effective, inclusive, long-term approach to address climate change in the post-2012 period. A number of initiatives are underway, including the implementation of the Kyoto Protocol and a post-2012 process, launched at the November 2005 climate change meetings held in Montreal.

More recently, the 2007 UN conference in Bali produced an international agreement. It was the first confirming that all countries in the world will agree to either targets, or commitments, to reduce greenhouse gas emissions in the post-2012 period. The agreement focused on many areas that Manitoba has been working on for several years. These include using green technology, sustaining our forests and preparing for climate change impacts. **Given Manitoba's early start, the province now has an opportunity to act not only on behalf of our own citizens, but also to share our experiences in addressing climate change with the broader international community.**

More and more nations are beginning to recognize that international action is needed to avoid the serious risk of large scale, irreversible disruption from an ever warming planet. This means very deep emissions reductions will be required by the middle of this century. **By acting today to reduce our emissions, Manitobans are establishing themselves as leaders for tomorrow.**