CANADA

Case Study: Acid Rain

ACID RAIN CASE STUDY

1. The problem or issue addressed: Acid Rain Case Study

The Canadian Acid Rain Program aims to solve the acid deposition problem in eastern Canada & prevent this problem in western and northern Canada. Acid deposition remains a stubborn problem, affecting humans, their environments and the economy, specifically the productivity & competitiveness of key Canadian industries. Two common air pollutants, SO_2 and NO_X, cause acid deposition. Recent scientific evidence shows that as much as 70% of eastern Canada (1.8 million km^2) receives levels of acid deposition in excess of critical loads. At these levels, forest health and productivity are threatened. Acid deposition is responsible for the loss of millions of cubic metres of wood from eastern Canadian forests and the capacity of eastern Canadian ecosystems to recover is hindered as the buffering capacity of the environment continues to decline. Evidence predicts that the North American Maple is dying at a rate of 2.3% for each 100 exceedance units due to the loss of calcium and other nutrients from soils. Lakes and streams are also remaining too acidic or are not recovering to the point where they cannot support sensitive fish and aquatic biota. The result is aquatic ecosystems that are unable to support a variety of species; therefore, biodiversity continues to remain below pre-acidification levels. Under optimistic emission reduction scenarios, recovery of eastern Canadian ecosystems could take fifty to seventy-five years. More recently, there is growing concern about the potential for an acid deposition problem in western Canada due to the projected increases in acidifying emissions. Although we know little about the impacts on northern and western ecosystems, there is reason to suspect that damage is occurring.

2. Name of the programme: Acid Rain Program
3. Timeframe: 40 years Year started: 1960s
4. Status: Ongoing ☐ Completed in year _____

5. Main objectives:

Canada is currently addressing acidification as a long term problem needing a long term solution that will protect ecosystems from damage due to acidification and enable recovery of ecosystem structure and function affected by acid deposition. Canada will achieve these objectives by working to:

1. aggressively reduce domestic emissions
2. expand science, sustain monitoring and reporting
3. re-engage federal, provincial & territorial partners

4. strengthen cooperation internationally, particularly with the US
5. keep Canadians informed about this problem and educate them on how we can work together to save our lakes and forests from acid deposition

6. Lead institution: Environment Canada

7. Other implementation arrangements and stakeholders involved (public, private, NGOs, CBOs, international support, etc.):

Canada's acid rain program is mainly delivered through the Canadian Council of Minister's of the Environment (CCME) Canada-Wide Acid Rain Strategy for Post-2000. The Strategy provides a framework for federal and provincial governments to work together to resolve the acid rain problem in eastern Canada and prevent one in western and northern Canada.

Stakeholders Involved:

- industry and industry associations, non-government organizations, labour, & aboriginal organisations work collaboratively to set goals and targets that reflect shared responsibilities and will reduce acid deposition;
- Universities educate and encourage science, new technology development and demonstration projects and research new initiatives;
- Non-government organisations partner with Environment Canada to develop outreach materials
- International community allows for exchange of scientific and technical knowledge and a coordinated approach to reducing acidifying pollution

8. The results achieved (if possible, please address the social, economic and environmental impacts of the programme):

Canada has made remarkable progress over four decades in assessing acidification impacts and reducing acidifying emissions:

- important advances in scientific understanding since the 1960s
- broad public support for action from all levels of government and the private sector was key to all parties embracing a policy of emission controls
- industries recognised issue and responded with emission reductions & development of new control technology and demonstration projects that were successfully incorporated into the program without compromising deadlines
- 50% cut in domestic acidifying SO_2 emissions since 1980
- decrease in transboundary flows of acidifying emissions
- significant decrease in the area of eastern North America receiving levels of deposition that are unsustainable to moderately sensitive ecosystems
- reductions in acidifying pollutants (acid aerosols, sulphates, precursors to PM, ozone) have saved lives, reduced illness, increased worker productivity, reduced absenteeism, and lowered health care costs
- emission reductions have benefited Canadian competitiveness in several areas (e.g., forestry, infrastructure, fishing & tourism)

However, ecosystem recovery is proving to be slower and more complicated than expected. Canada has just released its newest acid rain science assessment (http://www.msc-smc.ec.gc.ca/saib/acid/acid_e.html). It provides clear further impetus to more fully address the acid rain issue.

The federal government needs to go further than the current commitments under The Canada-Wide Acid Rain Strategy for Post-2000. Further reductions in domestic and transboundary flows of acidifying air pollutants from the United States and internationally are required.

9. The relationship of the programme to internationally agreed goals and targets:

- 1980, Canada and the US signed a Memorandum of Intent Concerning Transboundary Air Pollution which led to Canadian and American scientists worked together to develop the scientific and technical basis for a bilateral agreement on transboundary air pollution
- In 1984, the Federal and Provincial Environment Ministers agreed to go ahead with a Canadian plan to reduce total national emissions by 30% over the next ten years. The 30% figure came from the UN ECE and had been put forward as a first step. The 30% translated into about 50% of the emissions in eastern Canada, the goal of the 1985 Eastern Canada Acid Rain Program.
- Canada signed the 1st Sulphur Protocol under 1985 UN ECE First Sulphur Protocol requiring a 30% reduction in emissions of transboundary flows by 1993.
- **1988, Canada agreed on a protocol requiring countries to freeze their NO_X emissions and subsequently reduce them to non-damaging levels.**
- Canada adopted a Sulphur Oxides Management Area (SOMA), a smaller area for emission controls, in 1987. The provinces of New Brunswick, Nova Scotia, Québec and Ontario were included and agreed to a further reduction in SO_2 emissions of 50% from their total cap in the 1985 agreement, to be achieved by 2015.
- These reductions were later reflected in the 1994 UN ECE Protocol for Further Reductions of Sulphur Emissions.
- In 1991, Canada and the United States signed the bilateral Air Quality Agreement; the Agreement reflects each country's programs for reducing acid rain emissions in Annex 1.
- A Pollutant Emission Management Area (PEMA) was defined during the negotiation of the Ozone Annex to the Canada-US Air Quality Agreement. The PEMA concept came from the 1999 Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone under the LRTAP Convention. The designated PEMAs are consistent with the emission reduction commitments of both Parties in the Ozone Annex and reflect domestic policy.