

from the combustion of fuels in stationary sources. This latter category of sources is also responsible for about one-third of the total NO_x emissions in Canada. Transportation sources account for more than half of NO_x emissions and close to 50% of this is due to the gasoline-powered motor vehicle alone. From 1976 to 1979-80, there was a reduction of about 10% in total Canadian SO_2 emissions which was largely due to a significant drop in non-ferrous smelter emissions.

Table D.2.2 presents total emissions for eastern Canada only (east of the Manitoba-Saskatchewan border) over the 1976-80 period for the sectors of most concern at this time. Eastern Canada's emissions account for close to 85% of total SO_2 emissions and about two-thirds of NO_x emissions. Close to half (49%) of the SO_2 emissions in eastern Canada are concentrated in six copper-nickel smelters located in Manitoba, Ontario and Quebec. About one quarter of the SO_2 emissions result from the combustion of fuels for industrial, commercial, and residential purposes; the industrial source contributes about 75% of these emissions (1). Power plants are responsible for a little more than 15% of eastern Canada SO_2 emissions and close to three-quarters of such emissions come from power plants located in southern Ontario (1,3). Iron ore processing, i.e., the mining and beneficiation of ores by sintering or pelletizing operations, is responsible for close to 5% of eastern Canada SO_2 emissions.

A large part (55%) of eastern Canada's NO_x emissions is contributed by transportation sources. Here, gasoline-powered motor vehicles, diesel-powered engines and railroads contribute about half, one-third, and 10%, respectively of such emissions (1). The second major sector of NO_x emissions in eastern Canada is the combustion of fuels in industrial, commercial, and residential applications. This sector contributes about one-quarter of NO_x emissions (same contribution as for SO_2 emissions); 59% of the sector's emissions come from industrial fuel combustion sources (1). This is followed by power plants, which generate about 13% of eastern Canada's NO_x emissions, two-thirds of which are from southern Ontario installations (1,3).

The eastern Canada data are further prorated on a grid array of 127 km x 127 km squares, which is the basic dimension for the emissions and meteorological data used in the Atmospheric Environment Service long-range transport model. Total (point and area) emissions of SO_2 and NO_x , for each of the grid cells in eastern Canada, are listed in Appendix 2. Figure D.2.1 and Table D.2.3 present an aggregated version of the SO_2 data found in Appendix 2. Here, the geographical area representing eastern Canada has been divided into 17 defined source regions, delineated by the boundaries of the 127-km grid cells. These source regions have been defined to represent