B.5 INDUSTRIAL, RESIDENTIAL, COMMERCIAL FUEL COMBUSTION

Sulphur and nitrogen oxide emissions from non-utility fuel combustion in Canada are about 1.1 million tons and 600 000 tons per year respectively. For the United States, these sources account for some 7.3 million tons of SO_2 emissions and 7.1 million tons of NO_x emissions.These numbers include those emissions already identified in the fuel combustion portion of the larger industrial sectors. The vast majority of these emissions are associated with heavy and light oil combustion and as a result are mainly confined to the larger urban and industrial areas.

Control technology in this sector is size specific, with flue gas desulphurization and low-NO_x combustion modifications applicable to the larger-sized combustion units of the industrial sector. Control technology in the commercial and residential sector has not progressed as rapidly as with the larger boilers, primarily because of the smaller emission reduction potential. However, it is known that some emission reduction is economically possible in the commercial and residential sectors.

Oil desulphurization to reduce SO_2 emissions is a well-developed technology although no facilities exist in Canada. Residual (heavy) oil can be readily desulphurized to 0.5%S and light oils to 0.3%S. The cost varies with the type of crude oil and increases with the degree of desulphurization.

The main role for desulphurized oil with respect to the acid deposition problem would be to reduce area emissions from large urban areas.

B.5.1 Industrial Combustion Units

As in the utility boiler sector, a variety of control strategies can be used to reduce sulphur oxide emissions. These strategies include low-sulphur fuel, wet or dry flue gas desulphurization and fluid-bed combustion. Low-sulphur coal and hydro desulphurization of fuel oil can be used to reduce SO_x emissions to about 1.2 lb/10^6 Btu and 0.2 lb/10^6 Btu, respectively. Although flue gas desulphurization can lower potential sulphur oxide emissions by up to 90%, there are no units in operation at present in Canada. Fluid-bed combustion can achieve a 70-85% SO_2 reduction and about a 70% reduction in NO_x at operating costs competitive with flue gas desulphurization. The capital cost of the fluid-bed boiler will exceed that of a conventional coal combustion system.

Combustion modification is the principal method of controlling NO_x emissions. The NO_x emission limits achievable using combustion modification are dependent upon the