The majority of the non-ferrous smelters currently controlling SO_2 emissions produce sulphuric acid as a by-product. It is anticipated that this trend will continue for some time. The disposal of the by-product sulphuric acid is likely to be a problem where a) the smelter is remote from sulphuric acid markets or b) existing sulphuric acid markets are already supplied with lower cost acid. In these cases the smelter acid can only be marketed, at a loss, which increases with the distance from market and the cost of competing acid. Non-market constraints such as international trade agreements, lack of adequate transportation facilities, etc., may prevent sale of acid in some areas. The marketing of the acid may impose costs on the smelter which increase the cost of control to a point where smelter closure is considered.

A related problem is the high cost and environmental problems associated with the neutralization of acid which cannot be marketed because of high cost or other reasons. The costs and environmental factors depend largely on the availability and cost of a reasonable source of limestone (not always close to smelter). The environmental problems of disposal of the neutralized acid are similar to those for the thermal power wastes.

Another factor in marketing smelter sulphuric acid is that the demand cycle for sulphuric acid may not coincide with the demand cycle for metals, raising the issue of the disposal of acid, that is excess to market demand at a time when metal demand is high.

Another waste disposal problem concerns the sludge produced in the cleaning of the SO_2-containing gases for acid production. This sludge often contains toxic metals which can create environmental problems if disposal measures are inadequate.

Energy Consumption

Energy consumption by SO_2 control technology in use varies from smelter to smelter. The increase in energy consumption due to sulphuric acid production is partly dependent on the strength of the SO_2 streams (the higher the SO_2 concentration, the lower the energy requirement) but is a small part of total smelter energy consumption.

Where new smelting processes are used to produce a gas amenable to SO_2 control in an acid plant, a net reduction in energy consumption usually results. For example, replacement of a multi-hearth roaster - reverberatory furnace operation with a flash furnace can lead to a net energy reduction of up to 65% of the roaster smelting system (including the acid plant energy increase).