TABLE B.2.6 COPPER/NICKEL SMELTER SO_2 CONTROL SYSTEMS

Smelter Process				SO_2 Control System						
Technology	Cost	Technology Availability	Energy Consumption	Technology	SO_2 Control %	Cost	Availability Technology	Operating Reliability	Energy Consumption	By-Product
Multi-hearth roaster, reverb., converter	Med.	High	High	Non-regenerative FGD	To 85%	High	Low	Low	High	Sulphur compound for waste disposal
Multi-hearth roaster, reverb., converter	Med.	High	High	Regenerative FGD + Acid	To 85%	High	Low	Low	High	Sulphuric acid
Fluid-bed roaster, reverb., converter	Med.	High	High	Acid plant on roaster	To 45%	Low	High	High	Low	Sulphuric acid
Fluid-bed roaster, reverb., converter	Med.	High	High	Acid plant on roaster & non-regenerative FGD on weak gas streams	To 90%	High	Low	Low	High	Sulphuric acid and sulphur compound for waste disposal
Fluid-bed roaster, reverb., converter	Med.	High	High	Acid plant on roaster & regenerative FGD on weak gas streams & acid plant	To 90%	High	Low	Low	High	Sulphuric acid
Fluid-bed roaster, electric furnace, converter	High	High	Very High	Acid plant on roaster, electric furnace, converter	To 90%	Low	High	High	Low-Med.	Sulphuric acid
Fluid-bed roaster, electric furnace, converter	High	High	Very High	Acid plant on roaster, electric furnace, converter plus FGD system on weak gas streams	To 95%	Med.	Med.	Med.	Med.	Sulphuric acid and sulphur compound for waste disposal
Direct furnace smelting, converter (Inco, Outokumpu, Noranda)	Low	High[1]	Low	Acid plant on flash furnace & converter	To 90%	Low	High	High	Low	Sulphuric acid
Direct furnace smelting, converter (Inco, Outokumpu, Noranda)	Low	High	Low	Acid plant on flash furnace plus FGD system on weak gas streams	To 95%	Med.	Med.	Med.	Med.	Sulphuric acid and sulphur compound for waste disposal
Continuous smelting (Mitsubishi, Noranda)	Low+	Med.[2]	Low	Acid plant	To 98%	Low	High	High	Low	Sulphuric acid
Hydrometallurgy	High	Low[3]	High to Very High	?	To 99.5%	?	?	?	?	Elemental sulphur

1 Unknown
2 Can be used only for clean copper concentrates.
3 Problems with precious metals recovery, limited operating experience; could be considered for some special cases
Source: Background document in preparation