



Pyro-metallurgical process within the HMC project (copper recovery furnace)

Principal Recovered Metals and Planned Production Volumes under HMC Project

Recovered metal	Planned production volume
Gold	500kg
Silver	50t
PGM	200kg
Indium	6t
Antimony	150t
Bismuth	200t
Nickel	500t
Copper	6,000t
Zinc	700t
Tin	500t
Palladium	800kg

approximately 30 tons of gold (representing approximately one-sixth of Japan's total domestic gold production), of which around 7.5 tons is produced from recycling operations.

The Company Group embarked on the HMC project, which will target the Greater Tokyo metropolitan area—Japan's largest potential urban mine—as a key part of its strategy to expand its recycling business.

Increase of Sales and Income through the HMC Project

Under the HMC project, the HMC plant and Nikko Environmental Services Co., Ltd.—a subsidiary of Nippon Mining & Metals—will efficiently process recyclable materials generated mainly in the Tokyo metropolitan area to recover rare and precious metals, including platinum-group metals (PGM). Also under the HMC project, low-grade recyclable materials currently processed by the Saganoseki Smelter & Refinery and intermediate products generated during the smelting process will be used as inputs for recycling, thereby reducing the smelting process burden to stabilize operations there.

This processing flow will also contribute to an improvement in the quality of refined copper. Another important aspect of the HMC project will be the use of recovered metals as raw materials for the Group's Electronic Materials business. As a result, the HMC plant will play a key role in ensuring a stable supply of raw materials at the Company Group's electronic materials processing operations.

A further advantage of the HMC project will enable us to recover a broad range of valuable metals besides base metals. We have developed this unique process by combination of our expertise on the pyro-metallurgical and hydro-metallurgical processes to achieve zero-emission.

The Recycling and Environmental Services business is positioned as one of our strategic mainstays over the next 100 years with the HMC project. We will continue to pursue longterm sales and income growth in the Recycling and Environmental Services business, while contributing to environmental sustainability.

