

The SMM Group's Business Process

Through the collaboration of our three core businesses, we contribute to the stable supply of goods from basic materials to high-quality products

"Excavating ore, a natural resource, making it into metal materials by smelting and refining, and adding new value to those materials." The materials we handle and the value we add vary through the ages, but the essence of this business process remains unchanged over the years.

Inputs

Earth resources
Seven nurtured strengths

Businesses

SMM Group

Mineral Resources

Cu
Copper mines
Morenci, Cerro Verde, Sierra Gorda, Candelaria, Ojos del Salado, Northparkes

Au
Gold mines
Hishikari, Pogo, Cote (development planned)
Copper concentrates
Hishikari ore

Smelting & Refining

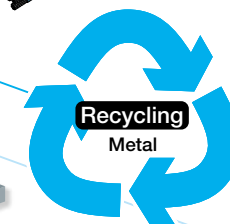
Ni
Nickel mines
Rio Tuba Nickel Mining Corporation, Taganito Mining Corporation

Overseas HPAL plants
Nickel intermediate materials

Suppliers

Raw materials & other materials

Market



Outputs

Domestic smelters and refineries
Electrolytic copper, electrolytic nickel, gold, ferro-nickel, nickel sulfate, electrolytic cobalt
High-quality metals

Battery materials, crystal materials, catalysts, thick film materials

Materials

Created value

Outcomes

Continuous growth through the securing of mineral resources and the stable supply of basic materials and high-functionality materials
Contribution to sustainable society through global environmental preservation, development of products with low environmental impact, and co-existence with local communities



Materials Business

Contributing to the realization of a sustainable society by supplying products in growth areas, such as materials for secondary batteries used in vehicles

The materials business produces and supplies advanced materials and the like by applying core technologies to add a range of values to metals and materials procured by the smelting and refining business and others. We work with nickel and various other metals to supply products focused on environment and energy,

and information communications related areas. In recent years, we have collaborated with customers to aggressively respond to the vigorous demand for cathode materials used in secondary batteries for hybrid and electric vehicles, and LT/LN materials for SAW filters used in smart phones and other devices.



Mineral Resources Business

Stably supplying mineral resources by expanding interests globally as a professional mine developer and operator

The mineral resources business takes the first step towards extracting the natural mineral resources that have lain dormant underground over the ages, and turning them into metals. The skills accumulated through 283 years of operating the Besshi Copper Mine, from 1691 to 1973, and other businesses, are incorporated in the operations of the Hishikari Mine and the Pogo Gold Mine, which started production in 1985 and 2006, respectively. Additionally, we participate in mining operations as a professional mine developer and operator in regions around the world, while pursuing myriad exploration projects, and proceeding with surveys to develop new mines.



Smelting & Refining Business

Contributing to the realization of a prosperous society by applying world-class smelting and refining technology to effectively utilize limited resources

The smelting and refining business produces metals, particularly copper, nickel, and gold, from ores procured by our mineral resources business and overseas mining companies. Over the 420 years since 1596, when Soga Riemon perfected the *Nanban-buki* method of separating silver from copper, the business has continuously passed down and developed smelting and refining technologies. The result is that

now the company possesses world-class smelting and refining technology, as demonstrated by successes such as becoming the world's first company to commercialize the HPAL* technology for the recovery of nickel from low-grade nickel oxide ores, which had been difficult with conventional technologies. We are also the only company in Japan to produce electrolytic nickel and electrolytic cobalt.

* HPAL (High Pressure Acid Leach): A technology to extract nickel and cobalt from low-grade nickel oxide ores. CBNC was the first in the world to succeed at large-scale commercial production in 2005; Taganito HPAL began operations in 2013 as the second production facility.