

Mineral Resources Business



Key Strategies

- Achieving greater competitiveness through greater utilization and cost improvements of the Caserones Copper Mine
- Examining and promoting new and existing projects with a view to supplying raw materials to the midstream and downstream businesses

Business Overview

Since acquiring equity at the Caserones Copper Mine in 2006, the Group has taken a central role in its development, with copper concentrate production beginning in May 2014. We have also invested in some of the world's largest copper mines, including Los Pelambres and Escondida. Our equity entitled copper mine production totaled around 210,000 tons in fiscal 2019.

Review of Fiscal 2019

In April of fiscal 2019, we merged the Caserones Division and Resources Development Department, building a system for efficient and unified management of the Mineral Resources Business. At the Caserones Copper Mine, we brought in outside expertise to promote implementation of automatic control programs, and continued to focus on cost improvement efforts. Though production was curtailed due to riots in Chile in October, operations were favorable for the full year of fiscal 2019, and we once again achieved an operating profit this year, following fiscal 2018's profit. In addition, we continued operations at low cost at the Los Pelambres Mine and Escondida Mine, copper mines we have invested in.

Outlook for Fiscal 2020

With the onset of COVID-19, at the Caserones Copper Mine and other mines in which we have invested, we are working to maintain operating levels and production volumes whilst limiting personnel counts to prevent the spread of the virus. In addition to achieving both infection prevention measures and the continuation of stable operations, we will establish operations systems at the Caserones Copper Mine in the COVID and post-COVID eras, using greater utilization and cost improvements in a bid to quickly secure profitability for the full year. In addition, we will examine and promote research and development, including as it pertains to minor metals and silicified ore, for stable supply of raw materials based on future needs in our midstream and downstream businesses. At the Los Pelambres Copper Mine, we continue our work that began in November 2018 to bolster facilities for increased production.

TOPICS

Promoting automation in ore processing at the Caserones Copper Mine

One aspect of our measures to improve operation of the Caserones Copper Mine is our activities promoting automation leveraging AI and IoT technologies. In these activities, we aim to improve operational efficiency by automating various production processes at the mine. In fiscal 2019, we developed and introduced an advanced control program, realizing more stable operation in the fine grinding of ore (SAG mill). In addition, in the (flotation) process of separating copper from ore, optimizing our control of this process contributed to greater copper yields, one of our KPIs in mine operation. We plan to continue these activities going forward, promoting those that will lead to improved mine operations. These may include further evolution and automation of controls of the aforementioned processes, as well as automation of other processes and equipment maintenance.



Advanced control program for the Caserones Copper Mine

Metals & Recycling Business



Key Strategies

- Optimizing raw material composition at the Saganoseki Smelter & Refinery
- Achieving greater differentiation in our industrial waste detoxification business

Business Overview

We are able to efficiently use our smelting processes to take copper concentrate and recycled raw materials and supply high-quality copper, precious metals, and other metals. These products are then provided in a stable fashion in Japan and parts of Asia. In addition, our detoxification business for industrial waste applies incineration and melting technologies cultivated in smelting. This business is unique for its zero-emission treatment that eliminates secondary waste that would otherwise require landfill disposal, contributing to pollution prevention in Japan.

Review of Fiscal 2019

■ **Metals Business:** Sales of various metals products were generally favorable, but international market prices for copper remained on a downward trend due to the effects of U.S.-China trade frictions and the spread of COVID-19. In addition, purchase terms for copper concentrate remained at poor levels with tightening balance of supply and demand, with an ongoing severe business environment overall.

■ **Recycling and Environmental Services Business:** Collection of recycled raw materials trended favorably with Chinese import restrictions and proactive marketing activities overseas.

■ **Transition to new structure:** Amid these circumstances, we newly established the Metals & Recycling Division to collectively manage both businesses in April 2020. At the same time, we transferred the Saganoseki Smelter & Refinery, a core operating location for both of these businesses, from Pan Pacific Copper Co., Ltd. to JX Metals Smelting Co., Ltd., a wholly owned subsidiary of the Company. This response has established a structure where we can pursue a total

maximization of both businesses centered on the Saganoseki Smelter & Refinery and founded in our company strategy.

Outlook for Fiscal 2020

With minor impact on raw material procurement volumes from the spread of COVID-19, we will continue operations smoothly at the Saganoseki Smelter & Refinery and other locations. However, purchase conditions will remain stagnant for copper concentrate as falling demand for metals products becomes evident. Under these circumstances, we are taking measures to elicit positive impact from our transition to the new structure as soon as possible. At the Saganoseki Smelter & Refinery, in order to optimize raw material composition (increase recycled raw materials ratio), we decided to add pretreatment equipment (kiln furnace) and establish a location away from the smelter for receiving recycled raw materials. Furthermore, for greater collection of recycled raw materials, we are increasing the capacity of Nikko Metals Taiwan's Changpin Recycle Center.

TOPICS

Leveraging unique traits of each location to differentiate our industrial waste detoxification business

The Group conducts zero-emissions detoxification treatment of industrial waste materials at five operating locations*. Each location, excluding JX Nippon Takasho Co., Ltd., has different types of treatment equipment (incineration and melting furnaces), and we use the unique traits of each of these to differentiate in the objects we can treat. JX Nippon Tomakomai Chemical Co., Ltd. provides detoxification treatment services for low-concentration PCB waste, which requires proper treatment under the law until 2027. Meanwhile, JX Nippon Environmental Services Co., Ltd. treats asbestos waste, an agent causing lung cancer.

* JX Nippon Tomakomai Chemical (Hokkaido), the Shirakawa Plant of JX Nippon Takasho (Fukushima), JX Nippon Environmental Services (Ibaraki), JX Nippon Mikkaichi Recycle (Toyama), and JX Nippon Tsuruga Recycle (Fukui)



Z furnace at JX Nippon Environmental Services