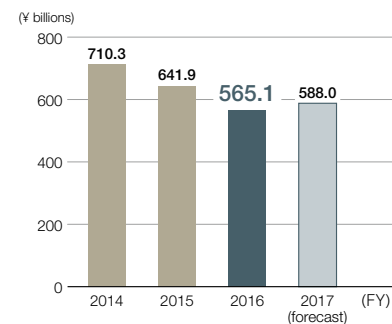


Smelting & Refining Business

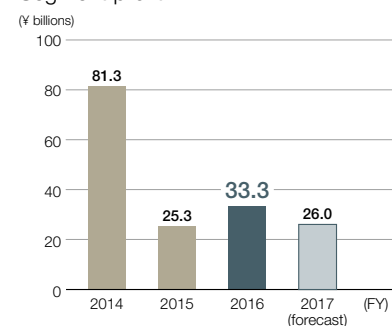
SMM smelts and refines raw materials procured from a variety of sources, mainly from mines where we have an interest, into such metals as copper, nickel, and gold. SMM possesses world-class smelting and refining technology; we were the first in the world to commercialize recovery of nickel from low-grade nickel oxide ore, which had been difficult with conventional technologies. We are working on polishing this technology and on strengthening our sales and other capabilities through cooperation between the three businesses.

Net sales



Production levels and sales volume of copper increased year-on-year. However, production levels and sales volume of nickel and gold declined year-on-year. CBNC and THPAL changed from a December-end closing to a March-end closing in the previous fiscal year, making it a 15-month period, so production levels and sales volume decreased compared to that year.

Segment profit



Segment profit grew year-on-year, due mainly to cost reductions by CBNC and THPAL, despite the impact of a drop in nickel prices, lower nickel sales volume and other factors.

Business environment and priority measures for the 2015 3-Year Business Plan

In the FY2016 business environment, although there were changes to be concerned about, for example increased protectionism and antiforeignism, primarily in the United States, the prices for non-ferrous metals were firm, overall. One notable change was the relaxation of export restrictions on unprocessed ores, such as nickel, in Indonesia in January 2017. Going forward, the prices of non-ferrous metals are expected to increase along with improvement in demand over the medium- to long-term. Also, we are expecting demand for the high-purity nickel material that we produce to get even stronger going forward as the expansion of the market for secondary batteries for eco-friendly cars increases.

In our smelting and refining business, we are promoting the expansion of Taganito HPAL, advancing growth strategies using peripheral HPAL technologies, and enhancing competitiveness of the copper smelting business as priority measures of our 15 3-Yr Business Plan.

FY2016 initiatives

Production levels and sales volume of copper increased year-on-year. However, with regard to nickel, there was a decrease in production and sales due to reduced production of intermediate at both Coral Bay Nickel Corporation and Taganito HPAL Nickel Corporation. Also, the accounting period for Coral Bay Nickel Corporation and Taganito HPAL Nickel Corporation for FY2015 covered a 15-month period to match the consolidated closing date of SMM, March 31. As a result, production levels and sales volume declined year-on-year.

As for major initiatives, copper smelting and refining at the Toyo Smelter & Refinery reached an all-time high of 450,000 tons for the year. Also, as part of strengthening competitiveness, we are also recovering copper and nickel from secondary materials such as metal scrap. At the Harima Refinery, we proceeded with the transitioning of operations and built a 45,000-ton nickel sulfate production structure. Aiming to enhance the

competitiveness of HPAL, we also started building a new scandium production structure. As a result of these initiatives, the smelting and refining segment's net sales were ¥565.1 billion (down 12% compared to FY2015) and profits were ¥33.3 billion (up 32% compared to FY2015).

FY2017 priority measures and the outlook going forward

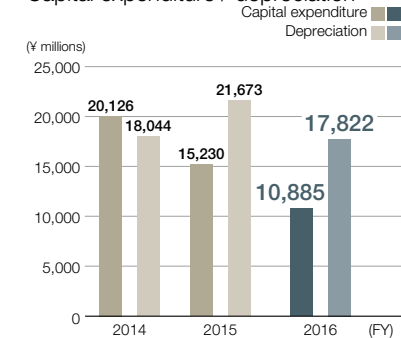
We will continue to promote measures implemented in FY2016. At the Toyo Smelter & Refinery, in addition to maintaining full production of 450,000 tons, we will proceed with further production efficiencies and cost reductions, strengthening competitiveness. At the Harima Refinery, we will make investments aiming for a 49,000-ton production structure, strengthening our ability to supply battery materials. At Hyuga Smelting Co., Ltd., we will maintain a production structure optimized for ferro-nickel.

As for Coral Bay Nickel Corporation and Taganito HPAL Nickel Corporation, we are aiming for a 60,000-ton combined production structure from the second half of 2017. We will also proceed with considering commercialization of the HPAL plant at Pomalaa in Indonesia.

With regard to scandium, we are planning to start commercial production in FY2018 and, aiming to make HPAL high value added, we are also proceeding with considering the commercialization of chromite. At SMM, we promote a business of synergies from the three businesses of mineral resources, smelting and refining, and materials. Going forward we will work to strengthen supply and sales of non-ferrous metals through cooperation with the materials business.

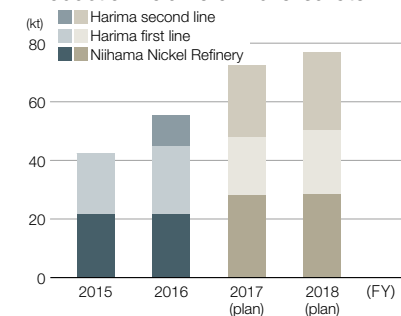
With respect to FY2017 segment performance, we are expecting net sales of ¥588.0 billion (up 4% compared to FY2016) and profits of ¥26.0 billion (down 22% compared to FY2016) due to the worsening of raw material conditions for copper concentrates and the effects of inventory valuation of electrolytic copper and others.

Capital expenditure / depreciation

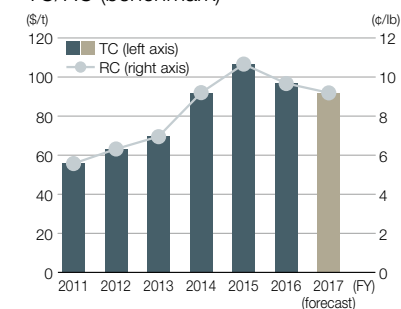


Nickel sulfate production facilities were increased at the Harima Refinery. Overseas, investments were made in THPAL and elsewhere.

Production volume of nickel sulfate



TC/RC (benchmark)



Akira Nozaki

Director,
Managing Executive Officer,
General Manager of
Non-Ferrous Metals Div.

Topic Start of mass production of scandium for use in fuel cells

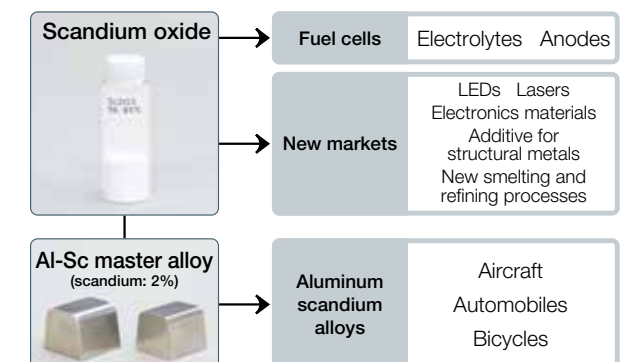
SMM is proceeding with plans for the first Western commercial production of scandium. This scandium is produced as a by-product of HPAL technology, which SMM was the first in the world to successfully commercialize. The scandium will be recovered and a plant will be established at Taganito HPAL Nickel Corporation to manufacture an intermediate product from it. Further, a process to turn the intermediate into the final product, scandium oxide, will be established at the Harima Refinery.

Scandium is one of the rare earth elements and it is expected to be used in applications such as fuel cells. Currently, annual

world-wide production is low, at 10–15 tons (scandium oxide equivalent) so demand is limited. However, with SMM's commercial production, long-term and stable supply will be possible. SMM has already concluded a long-term sales agreement with a major US-based fuel cell manufacturer and going forward will expand into new applications, with fuel cells at the core, and develop the market along with potential customers.

By proceeding to efficiently recover resources, such as scandium, SMM will increase the added value of HPAL technology and further improve the competitiveness of its nickel business.

Potential of scandium



Strengths of the smelting and refining business and activities that support growth potential

Strength 1 Refineries with robust cost competitiveness

We have achieved world class cost competitiveness in copper smelting and refining at our Toyo Smelter & Refinery, our flagship smelter and refinery, through policies to improve production efficiency implemented over more than 40 years of operations, and also in nickel smelting and refining by combining HPAL technology and the MCLE process of the Niihama Nickel Refinery.

Strength 2 Use of low-grade nickel oxide ore with HPAL technology

SMM has moved ahead of its global peers by succeeding in the commercial production of nickel intermediates from low-grade nickel oxide ore using HPAL technology. Converting low-grade nickel oxide ore into a resource allows for the efficient use of limited nickel resources and the stable supply of cost-competitive nickel raw material.

Strength 3 Co-existence with local communities

While carrying out dialogue with stakeholders, we listen to the needs and concerns of local communities, leading to operation of our smelters and refineries that is in harmony with these groups and has responsible environmental management, as we strive to stably supply our products.

Moving Taganito HPAL Nickel Corporation to a 36,000-ton annual nickel production structure to keep up with the rapid increase in demand for automobile-use secondary battery cathode materials

Securing resources from low-grade nickel oxide ore with HPAL technology

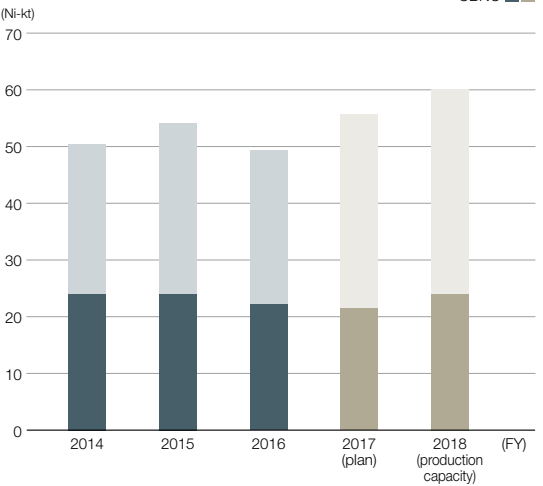
Taganito HPAL Nickel Corporation (THPAL) is a new project started because of the success of the Coral Bay Nickel Corporation's HPAL (High Pressure Acid Leach) commercial production. Construction started in 2010 and it has been producing commercially since 2014. Ore is supplied by our partner investor, NAC, which owns the neighboring Taganito Mine, and a mixed nickel-cobalt sulfide called mixed sulfide (MS) is produced. After this, the Niihama Nickel Refinery and Harima Refinery in Japan refine this MS, producing electrolytic nickel, electrolytic cobalt, nickel sulfate, etc. This HPAL process is a process that makes possible the recovery of nickel and cobalt from low-grade nickel oxide ore, which couldn't be smelted and refined with traditional technology. It is contributing greatly to the securing and effective use of precious resources.

Procure nickel and cobalt ourselves and stably supply battery materials

THPAL's commercial production started with an annual nickel production of 30,000 tons, but from the beginning of the project's planning, it was intended to have a final annual nickel production capacity of 36,000 tons. THPAL's major facilities were designed and built to meet that production target and the plan called for increasing capacity while making small investments. However, with the rapid expansion of automobile manufacturers' plans to manufacture electric vehicles, expected demand for the secondary battery cathode materials our Materials Division produces also rapidly increased, making it necessary to hastily procure the nickel and cobalt which are the raw materials. With this, plans to increase production were pulled in and efforts made to secure the materials. Investments for increased production have proceeded according to plan and we expect to have the 36,000-ton annual nickel production structure in place from the second half of 2017. Also, the enhancement of the nickel sulfate plant at the Harima Refinery, for processing the increased amount of MS produced into raw material for battery material, was completed in the second half of 2016.

Currently, nickel and cobalt are essential materials for the secondary batteries used in automobiles. SMM is able to procure these by itself and it has proven that a manufacturing process centered on HPAL technology can stably produce high quality products at low cost. We are aware that being able to manufacture

MS production volume



and stably provide nickel and cobalt, for which supply and demand and prices vary widely, is an SMM strength as a battery material manufacturer that other companies do not have.

SMM Group refineries and their main products

Refinery name	Products
Toyo Smelter & Refinery	Electrolytic copper
	Copper sulfate
	Slag sand
	Gold ingot, gold shot
	Silver shot
Niihama Nickel Refinery	Electrolytic nickel
	Electrolytic cobalt
	Nickel sulfate
	Nickel chloride
Harima Refinery	Nickel sulfate
Hyuga Smelting Co., Ltd.	Ferronickel shot
	Green sand
Shisaka Smelting Co., Ltd.	Zinc oxide pellet
	Iron containing pellet
CBNC	MS (mixed nickel-cobalt sulfides)
THPAL	MS (mixed nickel-cobalt sulfides)
Jinlong Copper Co., Ltd.	Electrolytic copper



The nickel supply chain

