

【Smelting and Refining Business】 Non-Ferrous Metals Div.

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Director

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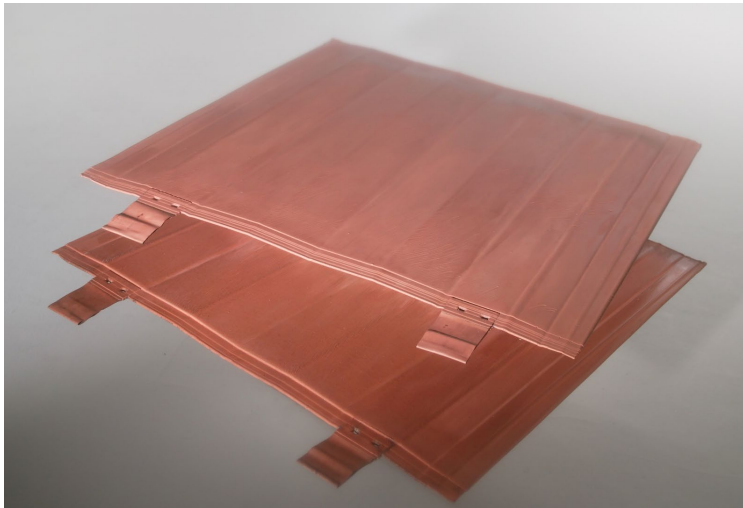
- 1. Overview of Non-Ferrous Metals Division**
- 2. Business Environment and Response**
- 3. Business Strategy and Major Initiatives**

1. Overview of Non-Ferrous Metals Division

- 1) Main Products
- 2) Sales Ratios Segmented by Product
- 3) Introduction of Production Sites
- 4) SMM Nickel Business Characteristics

Producing high quality metals with world-class smelting and refining techniques

Electrolytic copper



Applications: Electric cable
(Electric vehicles, etc.) /
Copper pipe (Air conditioners, etc.)
/ Coins, etc.

Gold



Applications: Ornamentation /
Electronic industry material, etc.

Silver

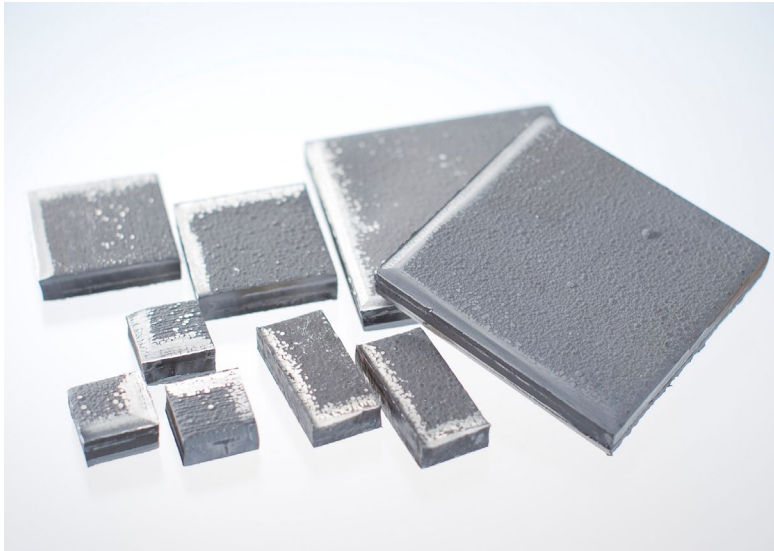


Applications: Plating /
Electronic industry material /
Electrodes for solar power
generation, etc.

Overview of Non-Ferrous Metals Div. 1) Main Product Nickel

Producing high quality metals with world-class
smelting and refining techniques

Electrolytic nickel



Applications: Specialty steels, etc.

Ferronickel



Applications: Stainless steels

Nickel sulfate



Applications: Battery cathode material / Plating material (hard disks, etc.)

Producing high quality metals with world-class
smelting and refining techniques

Platinum



Applications: Catalysts for automobiles, etc.

Palladium



Applications: Catalysts for automobiles, etc.

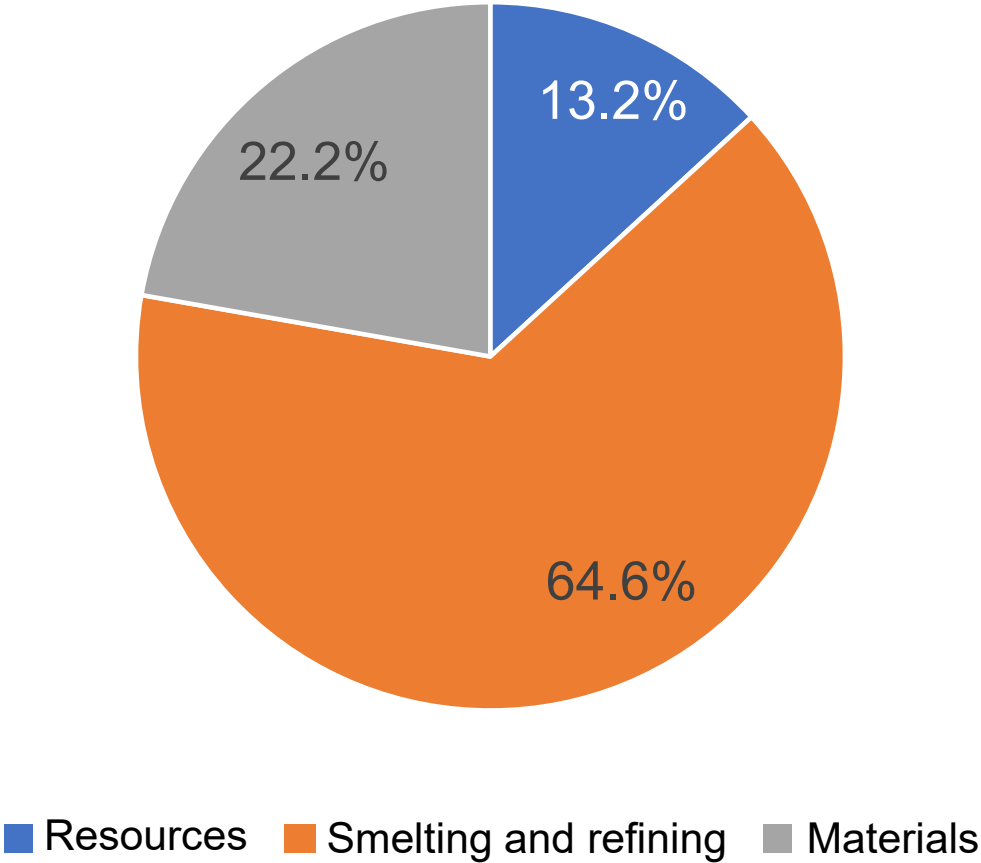
Scandium oxide



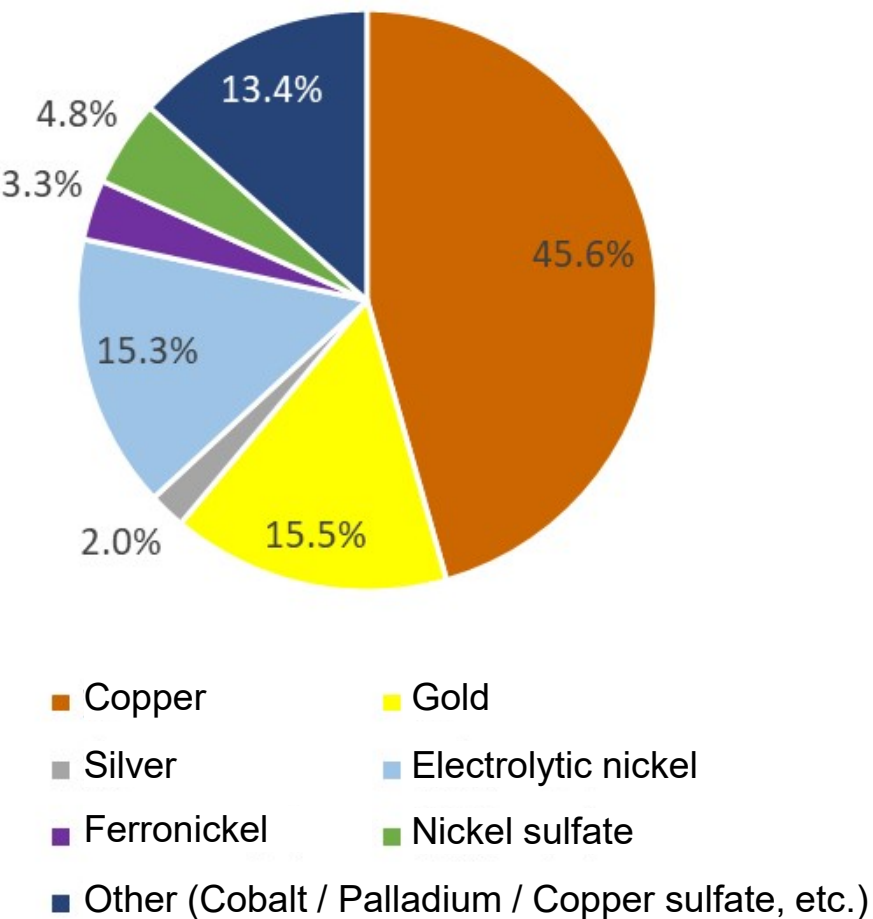
Applications: Solid oxide fuel cell
batteries /
Aluminum alloy, etc.

Overview of Non-Ferrous Metals Div. 2) Sales Ratios Segmented by Product

Consolidated Segment Sales Ratios
(2019 fiscal year)



Sales Ratios Segmented by
Products of Non-Ferrous Metals Div.
(FY2019 non-consolidated)



Overview of Non-Ferrous Metals Div. 3) Introduction of Production Sites (Domestic)



Niihama Nickel Refinery (Ehime Prefecture)
Electrolytic nickel / Electrolytic cobalt



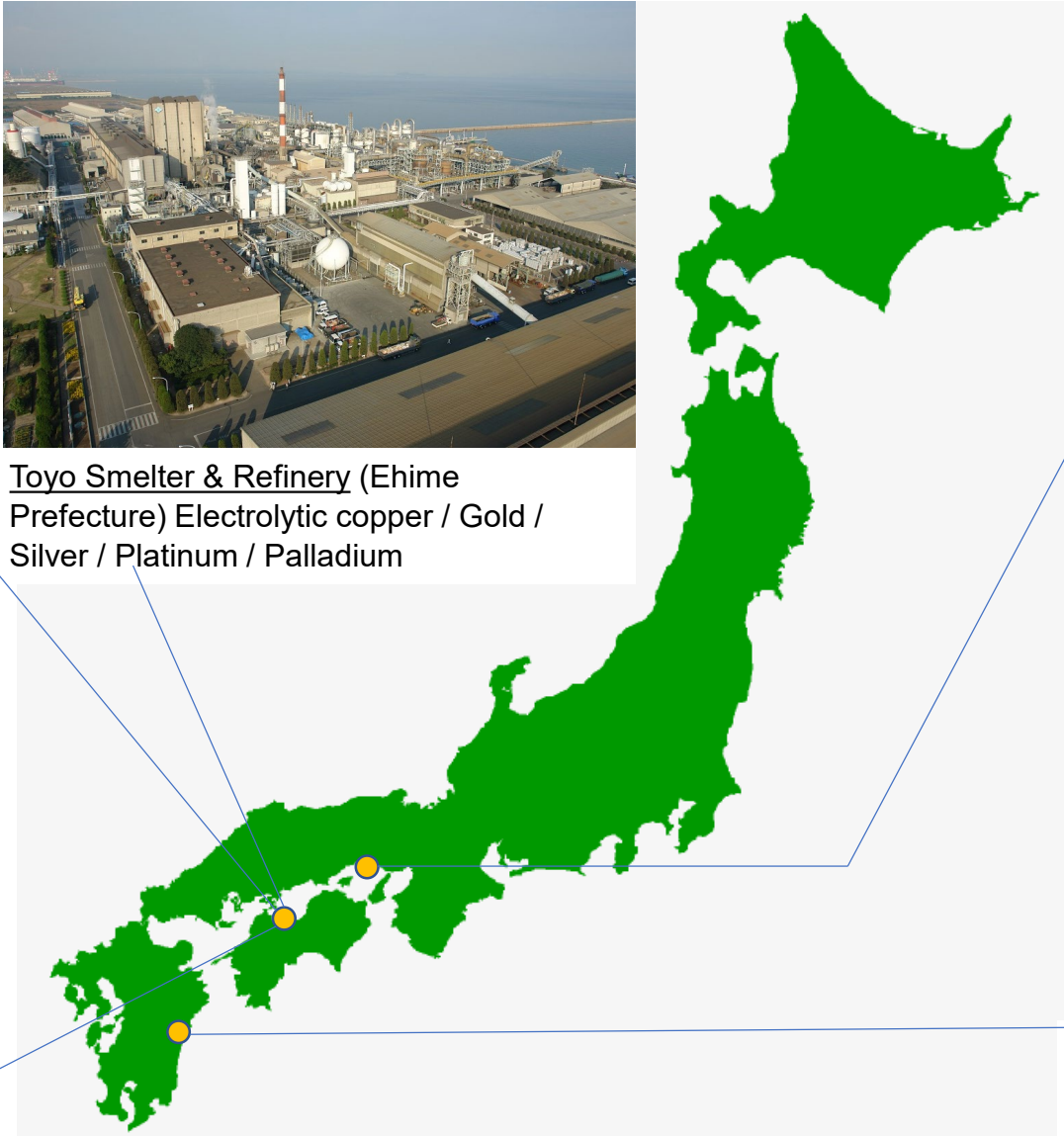
Toyo Smelter & Refinery (Ehime Prefecture) Electrolytic copper / Gold / Silver / Platinum / Palladium



Harima Refinery (Hyogo Prefecture)
Nickel sulfate / Scandium oxide



Shisaka Smelting Co., Ltd. (Ehime Prefecture)
Recycling zinc from steelmaking ash



Hyuga Smelting Co., Ltd. (Miyazaki Prefecture)
Ferronickel / Greensand

Business base in the Philippines



Sumitomo Metal Mining
Philippine Holding
(Regional headquarters) Manila

Coral Bay Nickel Corporation
(CNBC) Palawan

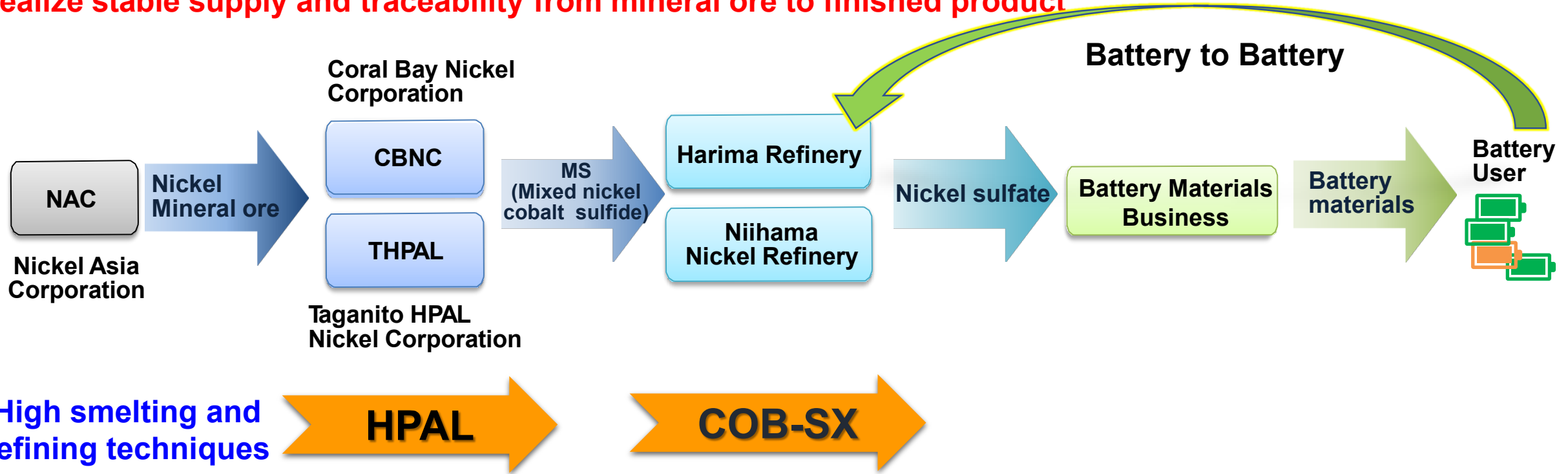
Taganito HPAL Nickel Corporation
(THPAL) Surigao Del Norte

Bird's eye view of THPAL Plant



Overview of Non-Ferrous Metals Div. 4) SMM Nickel Business Characteristics

Realize stable supply and traceability from mineral ore to finished product



HPAL : High Pressure Acid Leach. A technique to recover nickel and cobalt from low-grade nickel oxide ores (Ni grade about 1%), which were traditionally difficult to process. SMM was the first company in the world to be successful in commercial production.

COB-SX: Crowding Organic Bypass - Solvent Extraction. A technique to separate and refine high purity nickel and cobalt by effectively removing impurities from a crude nickel sulfate / cobalt solution using the extraction rate difference of organic solvents.

2. Business Environment and Response

- 1) Impact of COVID-19
- 2) Securing Raw Materials
- 3) Rising Environmental Awareness

Business Environment and Response 1) Impact of COVID-19

While there were a number of negligible effects, each production site continues operations while taking infection prevention countermeasures

	Base name / Product name	Effect
Production	THPAL	<ul style="list-style-type: none"> • The scheduled shut-down that took place from March to April was extended as we limited deployment numbers for employees from cooperating companies and had restrictions placed on their activities for the 14 days following their arrival to reduce the risk of employee infection. (Effect MS production volume approx. 2kt-Ni)
	Hyuga Smelting Co., Ltd.	<ul style="list-style-type: none"> • We cancelled one ship in April shipment after consulting with the mine as infections appeared in New Caledonia. (Effect Ferronickel production volume approx. 500t-Ni)
Sales	Electrolytic copper	<ul style="list-style-type: none"> • As the conditions of the market for electric cable and copper and brass deteriorated domestically, we responded by raising our ratio of exports to countries such as China. Domestic demand has recovered with automobile production, but overall recovery is on-going and we will respond by increasing exports.
	Electrolytic nickel	<ul style="list-style-type: none"> • The difficult domestic sales environment continues, and we are conducting spot sales in China, India and Southeast Asia. We will continue to conduct favorable selling as much as is possible.
	Ferronickel	<ul style="list-style-type: none"> • We are compensating for reduced domestic sales by exporting to China. Recently, the domestic stainless market has started to recover.

Difficulties in mineral ore supply from overseas are gradually increasing

- Rise of emerging countries (worsening buying conditions / increasing difficulties in securing volume)
- Rise of resource nationalism (increasing difficulties in new developments, strengthening of environmental restrictions)

Indonesian export ban of unprocessed nickel ore (Enforced from 2014. Temporarily eased partially before being fully enforced from 2020.)

SMM Response

Copper	With the cooperation of the Mineral Resource Business Division, we will increase attributable production of copper concentrate. (Toyo Capacity 450kt, FY2019 actual results 250kt, goal is 300kt)
Nickel	Strengthening relationships with existing partners <ul style="list-style-type: none">• Nickel Asia Corporation (SMM Investment 25%)• PT Vale Indonesia (SMM Investment 15%)• Figesbal (New Caledonia ferronickel raw material supply destination. SMM Investment 26%)

Business Environment and Response 2) Securing Raw Materials ②Quality

Securing high-grade and low-impurity mineral ore is becoming more difficult

- Depletion of resources (depletion of superior ore veins)
- Worsening of competitive conditions due to rise of emerging countries



Strengthening of our ability to handle raw materials is necessary to maintain production volume

SMM Response

Toyo Smelter & Refinery

Copper grade in the copper concentrate has fallen by about 20% when compared to that of around the year 2000



Investments are scheduled (2021) to resolve the bottleneck in the smelting and refining process

Niihama Nickel Refinery

Ability to deal with impurities (iron / copper) is an issue in dealing with a variety of raw material sources



Investments performed (2019) to strengthen iron and copper removal capacity

1. HPAL Initiative Examples

1) Rehabilitation of tailings dams

Rehabilitation and greening of tailings dams (dams where sludge is de-toxified and accumulated) that are no longer in use

Before rehabilitation



After rehabilitation



2) Receipt of ASEAN Mineral Award

Each of our initiatives were evaluated in the Philippine HPAL and CBNC received the FY2019 ASEAN Mineral Award (First place out of 11 countries)



2. Strengthening of Toyo Smelter & Refinery environmental dust collection capacity

We realized an operational environment that is even cleaner and safer through installing a large bag filter and strengthening the dust collection capacity. (FY2019)



3. Installation of water tank for Niihama Nickel Refinery

We strengthened our response to torrential rain through installing a large storage tank to act as a reservoir for water that collects on facility grounds.



3. Business Strategy and Major Initiatives

- 1) Pomalaa Project
- 2) Internal supply of Ni/Co for battery materials
- 3) Strengthening Recycling
- 4) Reinforcing manufacturing capability

Business Strategy and Major Initiatives 1) Pomalaa Project

Pomalaa PJ: Milestones towards a 150kt system

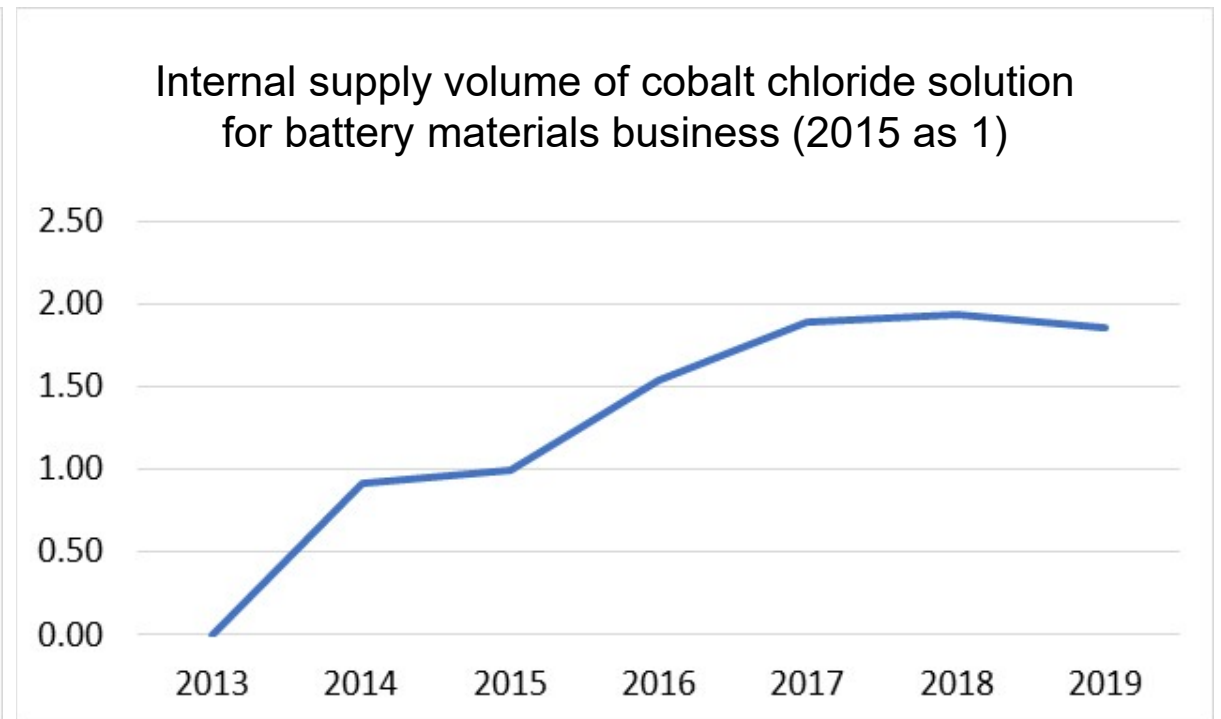
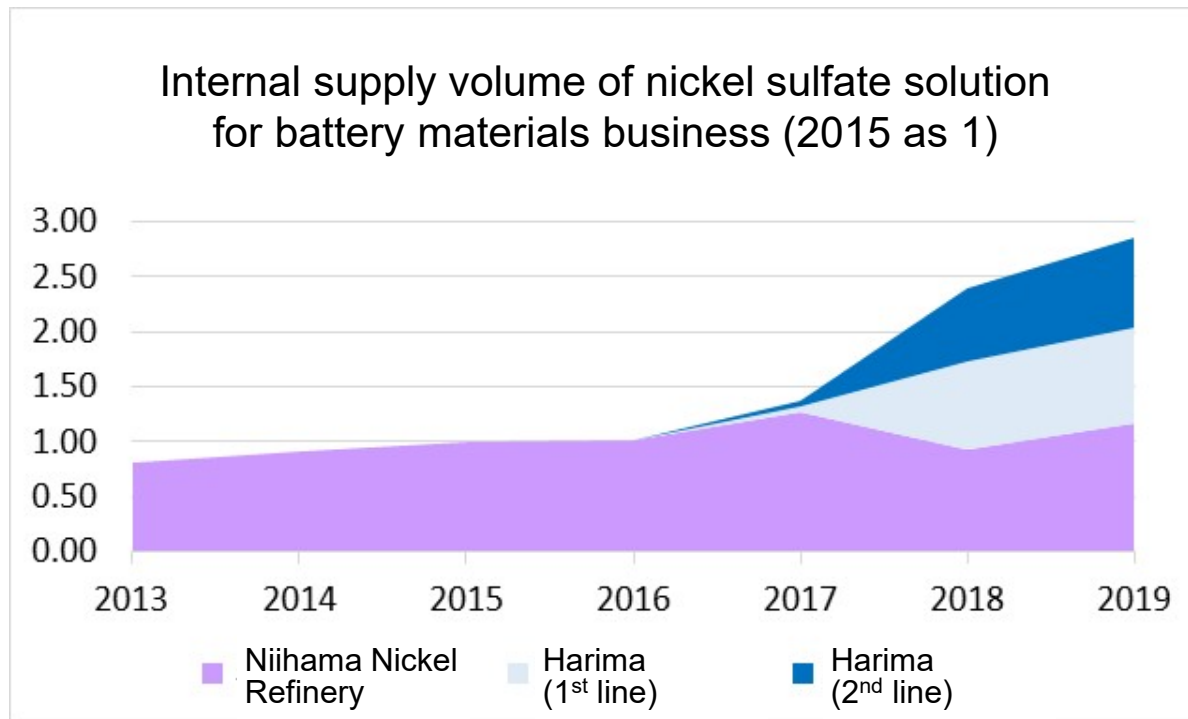
- SMM's third HPAL project, following the Philippine's CBNC and THPAL. Planned production is 40kt-Ni/year.
- Mixed Sulfide (MS) will be produced. Will serve as raw material supply source for Class 1 Nickel production, which is expected to expand through demand for xEV.
- It is taking some time to obtain the necessary permits and consult with partners due to the impact of COVID-19. We are currently ascertaining the schedule moving forward.



Business Strategy and Major Initiatives 2) Internal supply of Ni/Co for battery materials

Increase of internal raw material supply for battery material business: Ni 2.8x in this 4 years

- 1) Start of supply of all nickel sulfate produced by Niihama Nickel Refinery to batteries (FY2014)
- 2) Start of nickel sulfate production at the first line of Harima Refinery (FY 2013)
- 3) Start of nickel sulfate production at the second line of Harima Refinery (FY 2016), solution supply for batteries from FY2017
- 4) Start of supply of cobalt chloride solution produced by Niihama Nickel Refinery to batteries (FY2013)



Strengthening of recycling system for copper and precious metals at Toyo Smelter & Refinery

Copper scrap

(Copper wire and plates from disassembled buildings and equipment etc.)

(copper scrap)



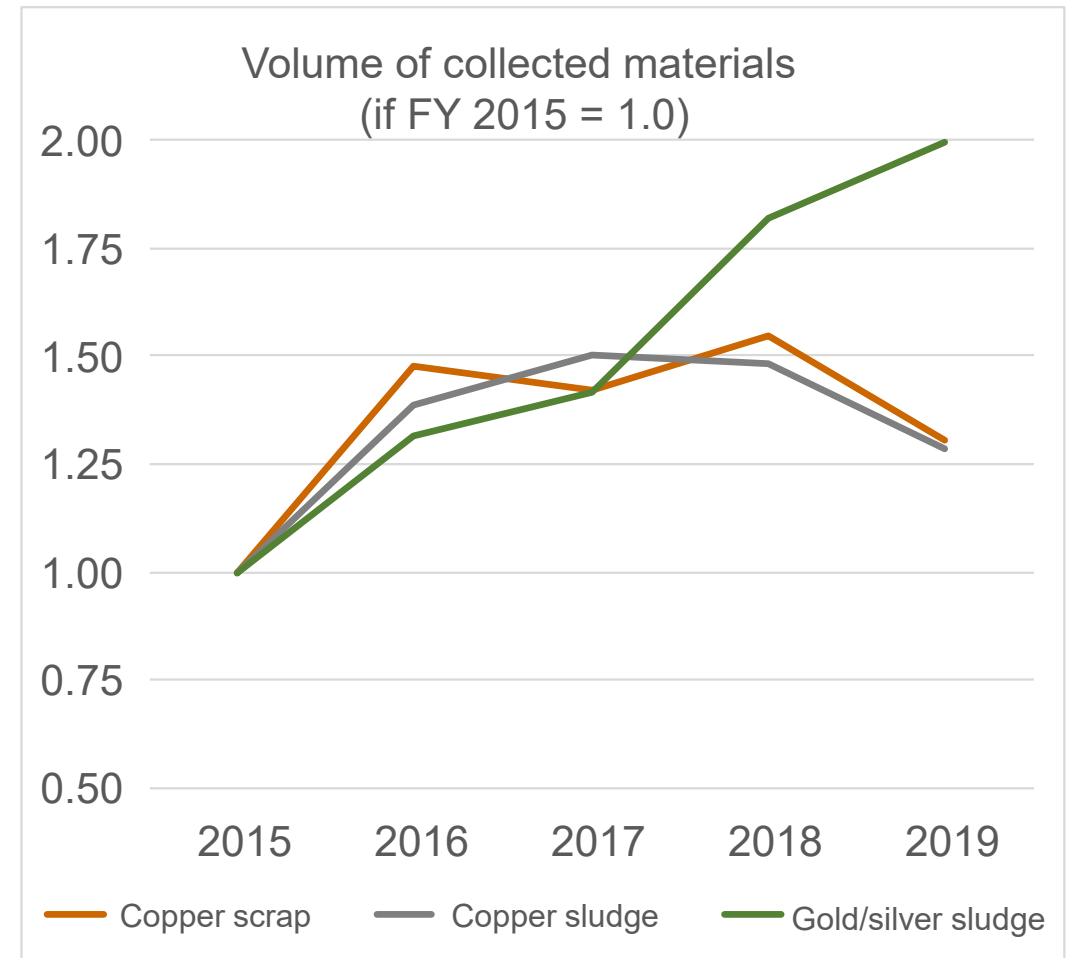
Copper sludge

(Sludge from copper foil and casting makers)

Gold/silver sludge

(circuit board scrap, plating sludge, etc. from disassembly of electronic devices)
[Partially pre-processed by Ohkuchi Electronics Co., Ltd.]

(Gold/silver sludge)



Secondary battery recovery at production sites of Non-Ferrous Metals Div.

Nickel metal hydride battery

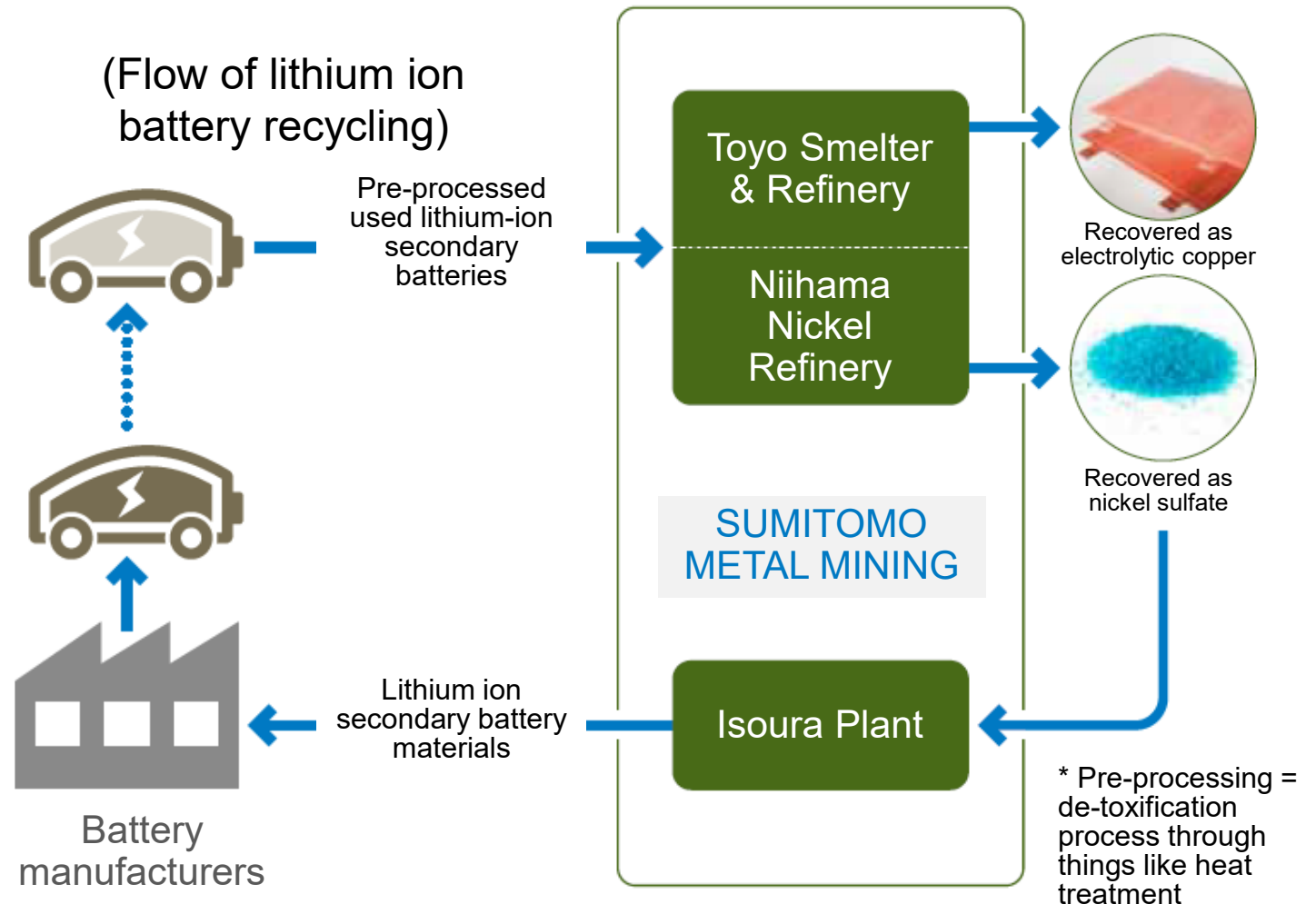
Pre-processed Nickel metal hydride battery is recycled as ferronickel in Hyuga Smelting process.

Lithium ion batteries

Copper and nickel are recovered in the copper pyrometallurgical refining process of Toyo Smelter & Refinery and the nickel hydrometallurgical refining process of Niihama Nickel Refinery.



Development of a process to recover cobalt in addition to copper and nickel is currently under verification at pilot facilities.



Business Strategy and Major Initiatives 4) Reinforcing manufacturing capability

Manufacturing capability: Maximizing product production volume through stable operation to secure revenue and profit for the Non-Ferrous Metals Div. and to avoid missed opportunities.

Examples in THPAL

(1) MS production actual results

Unit: kt-Ni

2016 fiscal year	2017 fiscal year	2018 fiscal year	2019 fiscal year	2020 forecast
27.3	28.9	27.4	32.3	32.7

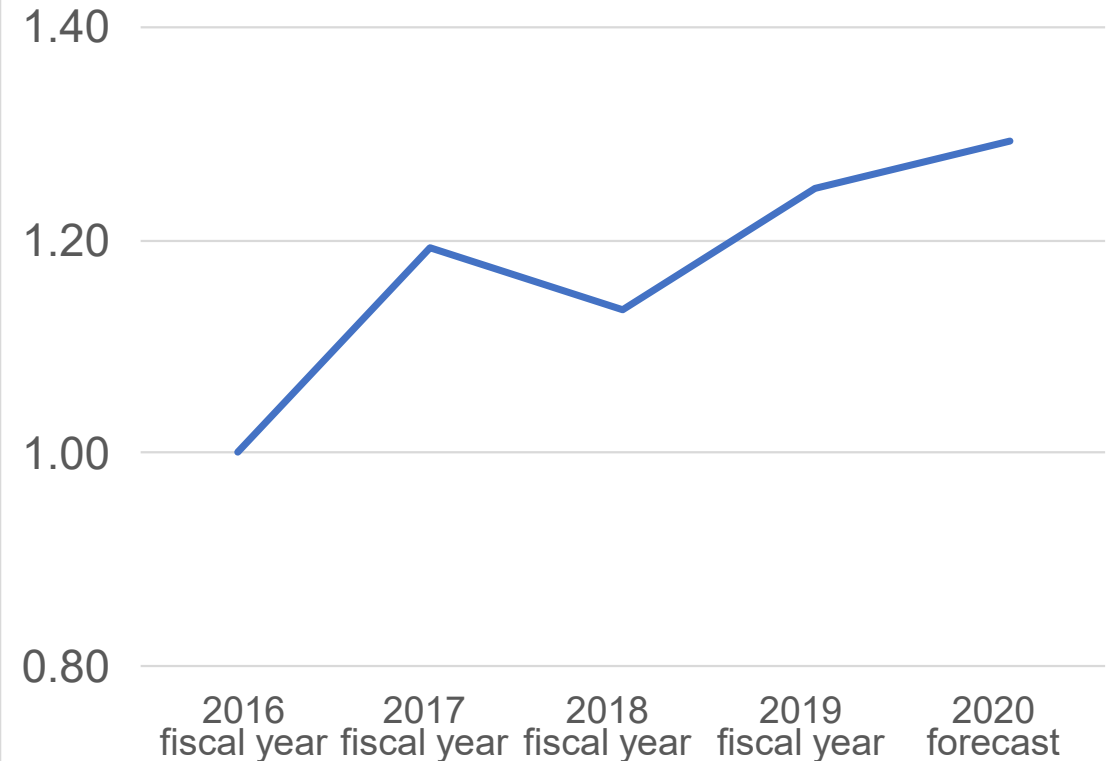
(2) Issues and initiatives

- (Issue) Operating rate reduced due to frequent equipment trouble
- (Initiative) ① Re-evaluate inspection and maintenance / Improve equipment
② Promotion of preventative safety / Strengthen spare part management

(3) The capacity utilization ratio (with value for 2016 as 1.0)

2016 fiscal year	2017 fiscal year	2018 fiscal year	2019 fiscal year	2020 forecast
1.00	1.19	1.13	1.25	1.29

The capacity utilization ratio (2016 fiscal year= 1.0)



Note

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