Sumitomo Metal Mining IR-Day 2020 | Smelting & Refining Business, Nickel Business Expansion with Advanced Smelting and Refining Technology and Achieving World's First Commercial Production of HPAL

This is a transcription of the contents of Sumitomo Metal Mining IR-Day 2020, a business briefing session held on December 21, 2020.

<Speaker>

Director Managing Executive Officer, General Manager of Non-Ferrous Metals Division, Nobuhiro Matsumoto

Overview of Non-Ferrous Metals Div. 1) Main Product Electrolytic copper / Gold / Silver

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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.

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Nobuhiro Matsumoto (hereinafter, Matsumoto): I'm Matsumoto, Director Managing Executive Officer, General Manager of Non-Ferrous Metals Division. Today, I will first give an overview of the Smelting and Refining Division, then explain the changing business environment and its responses, and finally, explain the business strategies and major initiatives based on our 2018 3-Year Business Plan.

First, the outline of the Non-Ferrous Metals Division. This section introduces major products, the sales ratio by product category, bases, and features of our company's nickel business.

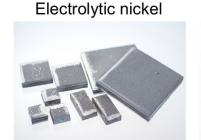
First, the main products. Electrolytic copper is used in electric wires, copper pipes, and other products. In recent years, particularly with the rapid growth of EVs, demand for electrolytic copper has been increasing for such products as wire harnesses and electric coil cables. Our company currently produces 450,000 tonnes of electrolytic copper annually. On the other hand, the world's supply is 25 million tonnes, which means that our company supplies approximately 1.6 percent of the world's supply.

Gold is used for ornaments and electronic parts. Demand for silver, which is used in electronic materials and electrodes for photovoltaic power generation, is also increasing.

Overview of Non-Ferrous Metals Division 1) Main Product Nickel

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



Applications: Specialty steels, etc.

Ferronickel



Applications: Stainless steels

Nickel sulfate



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

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Next, I will explain about nickel products. Electric nickel is mainly used in specialty steels, and our company currently has a production capacity of 65,000 tonnes.

Ferronickel is mainly used in stainless steel, and the Hyuga Smelting Co., Ltd. (a group company) currently produces about 14,000 tonnes of nickel per year.

Nickel sulfate is used in our company as a positive electrode material for batteries, and in particular as a plating material for hard disks, etc.

In total, we produce about 91,000 tonnes of nickel annually. The world's supply of nickel is about 2.4 million tonnes, so our 91,000 tonnes represents about 3.8 percent of the world's production.

Overview of Non-Ferrous Metals Division 1) Main Product Platinum / Palladium / Scandium oxide

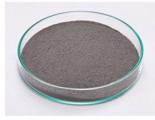
Overview of Non-Ferrous Metals Div. 1) Main Product Platinum / Palladium / Scandium oxide

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



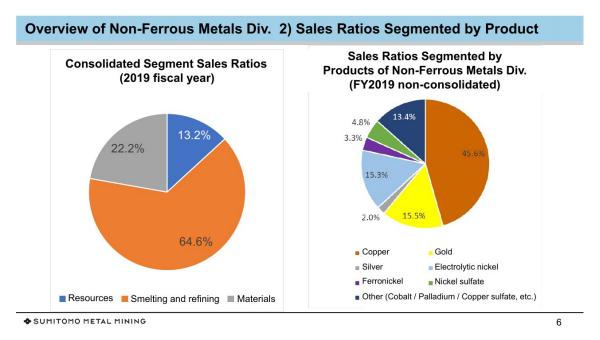
Applications: Solid oxide fuel cell batteries /
Aluminum alloy, etc.

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Next, I would like to introduce precious metals and scandium oxide, whose demand has been growing rapidly in recent years. The use of platinum and palladium as catalysts for automobiles is rapidly increasing. Palladium prices, in particular, have soared due to the small supply.

Scandium oxide is used in solid oxide fuel cells and sometimes in aluminum alloys called aluminum scandium alloys. In particular, the demand for solid oxide fuel cells has been increasing rapidly in recent years.

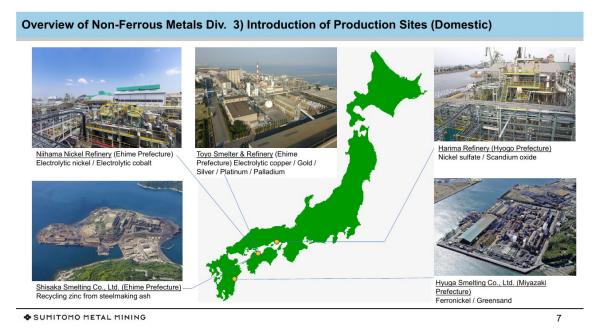
Overview of Non-Ferrous Metals Division 2) Sales Ratios Segmented by Product



Next, we introduce sales as an indicator of the business scale. Our company has 3 major businesses: Mineral Resources, Smelting and Refining, and Materials. Smelting and refining account for approximately 65% of net sales or 2/3 of total net sales.

Take a look at the pie chart on the right side of the slide. Each metal product is shown. Copper has the largest share, accounting for nearly 46% of sales. Gold accounts for about 16% of the total, and electric nickel, ferronickel, and nickel sulfate account for about 24% of the total.

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



Next, I will introduce our production bases. Our company's metal smelting plant is located mainly in Niihama City, Ehime Prefecture. The three photos on the left side of the slide are the key locations.

The middle of the upper slide shows the Toyo Smelter & Refinery. We produce products such as electrolytic copper, gold, silver, platinum, and palladium.

The upper left of the slide shows the Niihama Nickel Refinery. We produce electrolytic nickel, electrolytic cobalt, and nickel sulfate.

The photo at the bottom left of the slide shows Shisaka Smelting Co., Ltd., an affiliated company of our company. We recycle zinc from steelmaking ash.

The upper right of the slide shows the Harima Refinery in Harima-cho, Hyogo Prefecture. In the past, we used to smelt lead and zinc, but in recent years, we have shifted to refining plants for products such as nickel sulfate and scandium oxide.

The bottom right of the slide is the Hyuga Smelting Co., Ltd. in Hyuga City, Miyazaki Prefecture in Kyushu. This is a plant that produces ferronickel, etc., which I introduced earlier.

Overview of Non-Ferrous Metals Division 3) Introduction of Production Sites (Philippine HPAL)

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

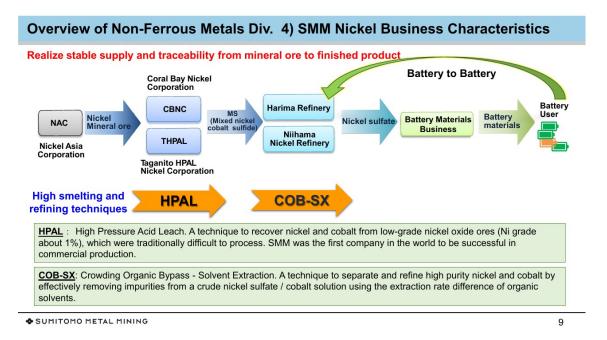
Business base in the Philippines Sumitomo Metal Mining Philippine Holding (Regional headquarters) Manila Coral Bay Nickel Corporation (CNBC) Palawan Taganito HPAL Nickel Corporation (THPAL) Surigao Del Norte

These are our main oversea bases. One example is the Philippines, where we develop nickel business. In the Philippines, in addition to the two production bases shown in blue on the slide, one management company shown in red runs a total of three companies.

Coral Bay Nickel Corporation, located on the island of Palawan, has been in production since 2005 and produces an intermediate nickel product called Mixed Sulfide containing approximately 57% nickel.

Like Coral Bay Nickel, Taganito HPAL Nickel Corporation is also a facility to produce mixed-sulfide.

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



At the end of the overview, we will explain the characteristics of our company's nickel business. Our company's nickel business is a business scheme that provides a stable supply of nickel from ores to final products and achieves traceability.

Please look from the left side of the slide. Nickel Asia Corporation, our business partner in the Philippines, supplies nickel ore as raw material, and after smelting into intermediate products at Coral Bay and Taganito HPAL, which we introduced earlier, we process nickel into nickel sulfate at our Harima Refinery and Niihama Nickel Refinery in Japan. Subsequently, the Battery Materials Division processes and supplies battery materials such as precursors and NCA to customers.

The role of the Non-Ferrous Metals Division is to efficiently refine high-purity nickel using advanced smelting technology. As shown on the slide, we have two advanced technologies, HPAL and COB-SX.

HPAL stands for "High-Pressure Acid Leach". In the past, it was considered very difficult to recover oxide ore with low nickel content, so it was not used in the past, but our company succeeded in the world's first commercial production of HPAL, technology that efficiently recovers nickel and cobalt.

COB-SX stands for "Crowding Organic Bypass - Solvent Extraction". This technology efficiently extracts nickel and cobalt using an organic solvent to separate nickel and cobalt and remove impurities to produce high-purity nickel and cobalt. Our company uses these technologies to develop its nickel business.

Also, we have begun developing the "Battery to Battery" business, which collects used batteries from customers and recycles them into materials for batteries by reprocessing them at a metal smelting plant in our company. We'll discuss this in more detail later.

Business Environment and Response 1) Impact of COVID-19

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	• 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.	• 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	 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	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	We are compensating for reduced domestic sales by exporting to China. Recently, the domestic stainless market has started to recover.

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Next, we will introduce changes in the business environment and how to respond to them. This section describes the impact of the COVID-19, securing raw materials, and responding to heightened environmental awareness.

First, the effect of the COVID-19. As you can see on the slide, there were minor effects in some areas, but we are continuing operations at each site while taking measures to prevent infection.

In terms of production, the suspension of operations from March to April, which was originally scheduled for the Philippines' Taganito HPAL, had the effect of slightly extending the suspension period, for example by limiting the number of subcontractors to be mobilized and

setting a waiting period at the site to reduce the risk of infection among employees. This has resulted in a reduction in the production of approximately 2,000 tonnes.

Also, at the Hyuga Smelting Co., Ltd., which manufactures ferronickel, the spread of the COVID-19 infection in New Caledonia caused a delay in the arrival of 1 ship in April, which resulted in a reduction in ferronickel production by approximately 500 tonnes.

In terms of sales, domestic demand for both electrolytic copper, electric nickel, and ferronickel has declined significantly, and we are responding by increasing exports, particularly to China.

Business Environment and Response 2) Securing Raw Materials ①Volume

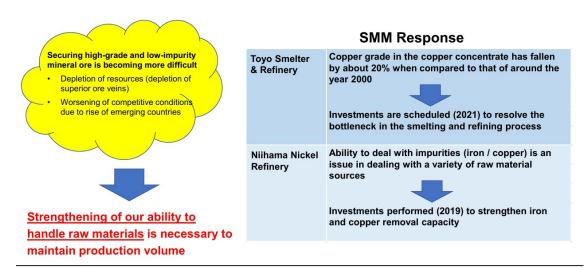
Business Environment and Response 2) Securing Raw Materials @Volume SMM Response Difficulties in mineral ore supply from overseas are gradually increasing With the cooperation of the Mineral Resource Business Division, we will increase attributable production of copper concentrate Rise of emerging countries (worsening buying conditions / (Toyo Capacity 450kt, FY2019 actual results 250kt, goal is 300kt) increasing difficulties in securing volume) Strengthening relationships with existing partners Rise of resource nationalism (increasing difficulties in new developments, strengthening of · Nickel Asia Corporation (SMM Investment 25%) environmental restrictions) Nickel · PT Vale Indonesia (SMM Investment 15%) · Figesbal (New Caledonia ferronickel raw material supply destination. SMM Investment 26%) ed from 2014. SUMITOMO METAL MINING

Next, it is about securing raw materials. From the viewpoint of quantity, the supply of raw material ores purchased from overseas is becoming increasingly difficult. Accordingly, we are working to secure raw materials for copper by increasing our ownership interest in copper mines supplying concentrates. The ratio of our company's electrolytic copper production in fiscal 2019 to that of 450,000 tonnes was 250,000 tonnes.

As for nickel, we are strengthening relationships with business partners. We are strengthening our relationship with Nickel Asia, which has a 25% stake in the Philippines, with PT Vale Indonesia, which has a 15% stake in Indonesia, and with Figesbal, which has a 26% stake in New Caledonia.

Business Environment and Response 2) Securing Raw Materials @Quality

Business Environment and Response 2) Securing Raw Materials @Quality



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In terms of quality, it has become difficult to secure raw materials with high grade and low impurities, and the ability to handle to impurities in smelting and regining is required. In recent years, the Toyo and nickel plants have made investments to improve their ability to deal with such impurities.

Business Environment and Response 3) Rising Environmental Awareness ①Overseas

Business Environment and Response 3) Rising Environmental Awareness ©Overseas

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

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)





After rehabilitation



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Next is our response to growing environmental awareness. Here are some examples of our overseas initiatives. As part of our efforts to achieve carbon neutrality in the nickel business in the Philippines, we are promoting the rehabilitation of the tailing dam.

Look at the two pictures on the left side of the slide. The photo on the left shows a tailing dam with leachate residues collected before rehabilitation, but after rehabilitation, it looks like the photo on the right. In this way, we are promoting rehabilitation by planting trees, starting with the tailing dam that is no longer in use. Last year, Coral Bay Nickel in the Philippines was awarded the "ASEAN Mineral Award" in recognition of these efforts.

Business Environment and Response 3) Rising Environmental Awareness @Domestic

Business Environment and Response 3) Rising Environmental Awareness @Domestic

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.



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At the same time, environmental awareness is growing in Japan as well. The Toyo Smelter & Refinery, which is mainly engaged in the pyrometallurgical process on the left side of the slide, has been working to enhance its environmental dust collection capacity to strengthen its measures against dust generation. Also, the nickel plant, which is mainly engaged in the pyrometallurgical process on the right side of the slide, has strengthened measures to treat rainwater that has accumulated in various areas due to the recent torrential rain.

Business Strategy and Major Initiatives 1) Pomalaa Project

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.



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Next, we will discuss our business strategy and major initiatives. We will explain the following 4 points: "Pomalaa project", the supply of nickel and cobalt for in-house battery materials, strengthening recycling, and strengthening manufacturing capabilities.

First of all, "Pomalaa Project". "Pomalaa Project" is one of the milestones toward a 150,000-tonne nickel business. I explained earlier that "We're currently making over 90,000 tonnes of nickel." Additionally, we are currently promoting this "Pomalaa Project".

The site is Sorowako, an area on Sulawesi Island, Indonesia, located south of PT Vale Indonesia's plant, which is currently operating with business partners. The plant is scheduled to produce 40,000 tonnes of mixed sulfide annually. The mixed sulfide produced here will be supplied to a smelting plant in our company for processing nickel products such as battery materials.

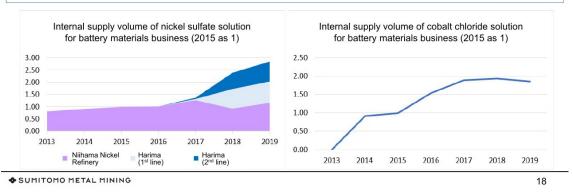
At present, due to the impact of the COVID-19 infection, it takes time to obtain necessary approvals and to consult with business partners, and we are currently assessing the schedule.

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

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)
- 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)

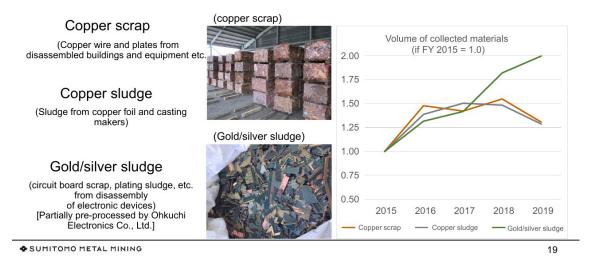


Next is the supply of nickel and cobalt for in-house battery materials. Concerning the supply of nickel sulfate on the left side of the slide, assuming the supply in 2015 to be 1, the supply in 2019 rapidly increased by approximately 2.8 times. The supply of cobalt on the right side of the slide was 1 in 2015 and doubled in 2019.

Business Strategy and Major Initiatives 3) Strengthening Recycling ①Toyo Smelter & Refinery

Business Strategy and Major Initiatives 3) Strengthening Recycling @Toyo Smelter & Refinery

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

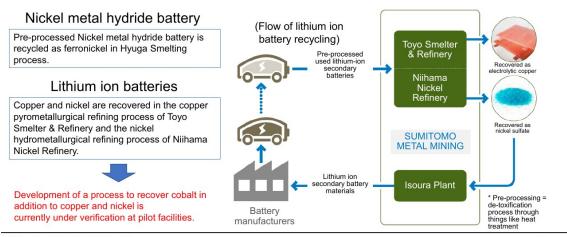


The Toyo Smelter & Refinery collects and recycles scrap such as copper, copper sludge, and gold and silver sludge. In the graph on the right side of the slide, the green line indicates that the amount of gold and silver lees has been increased to 2 times that of 2015. The volume of waste copper and copper sludge has also been increased from 2015 to about 1.5 times.

Business Strategy and Major Initiatives 3) Strengthening Recycling ②Secondary batteries

Business Strategy and Major Initiatives 3) Strengthening Recycling @Secondary batteries

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

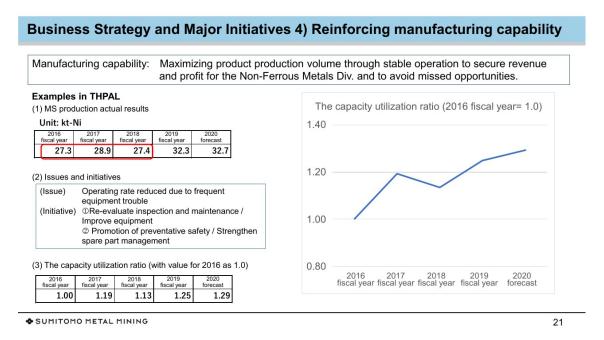


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This is about strengthening nickel recycling, mainly batteries. The Non-Ferrous Metals Division is currently recycling and processing two types of batteries: nickel-metal hydride batteries and lithium-ion batteries. Nickel-metal hydride batteries are processed at the Hyuga Smelting Co., Ltd. and reused as ferronickel. Also, lithium-ion batteries containing cobalt and copper combine the dry process at the Toyo Smelter & Refinery with the wet process at the Nickel Plant to recover copper and nickel.

However, at present, the cobalt contained in the lithium-ion battery cannot be recovered, so we are currently developing the process. We are currently verifying the process developed in the pilot facility. If this is established, a process that can recover cobalt in addition to copper and nickel will be set up.

Business Strategy and Major Initiatives 4) Reinforcing manufacturing capability



Lastly, I would like to introduce the case of THPAL (Taganito HPAL) concerning the restrengthening of manufacturing capabilities. The figure in the red frame shows the production volume of Taganito HPAL during the first three years of production, which was only about 27,000 tonnes compared to the production capacity of 31,000 to 36,000 tonnes, most of which was due to a decline in facility operation rate. In recent years, we have been working hard to prevent equipment problems.

The relationship between the utilization rates is shown in the graph on the right side of this slide. If the capacity utilization rate in 2016, when Taganito HPAL began operations, is set at 1, the current forecast for 2019 and 2020 shows that the rate has increased to 1.28. As a result, we are now on track to produce 33,000 tonnes of nickel per year. This concludes the explanation of the Smelting and Refining Business Division. Thank you very much for your time.

Q & A 1: Class 1 Nickel Production

Moderator: Now, let's begin the Q & A session. We have received the first question. Plans are in full swing to increase the production of lithium-ion batteries for electric vehicles. Indonesia's Chinese-owned projects also seem to be lagging, but will the entire industry be in time for class 1 nickel production?

Matsumoto: You are asking if the rapid growth of EVs will allow nickel to be supplied in time. For Class 1 nickel used in EVs, electric nickel is rarely used. On the other hand, the nickel used for EVs is mainly briquettes and nickel sulfate. As I mentioned earlier, our company is planning to increase the supply of nickel by promoting the "Pomalaa Project" and so on, and to produce nickel sulfate targeting EVs as the amount increases.

If you look at the world, projects are supposed to be launched in various places such as Indonesia and Australia. However, our company does not have detailed information about this, so we do not have a sufficient grasp of how fast it will be, how big it will be, and in what year. However, we have no choice but to supply enough nickel in time, so we are working to make up for this by recycling batteries as soon as possible.

Q & A 2: Battery recycling costs

Moderator: The second question. Will battery recycling be profitable under the current market conditions? If recycling spreads worldwide, can the supply shortage of nickel and others be avoided?

Matsumoto: This is a question about the cost of recycling batteries. There are various processes here, so the cost will change depending on how you combine them. Batteries cannot be recycled as they are, so we first detoxify them, crush them, and collect valuable metals separately.

Our company's strength is that it can recycle metals while utilizing its existing metal smelting and refining plant, so I think it is cost-effective. However, as we are going to examine how much it will cost to improve the accuracy of the battery-grade in the future, we will proceed with the examination depending on the results. Also, the supply is as I told you earlier.

Question and Answer 3: "Pomalaa Project" Nickel Sulfate, COB-SX

Moderator: Let's move on to the next question. I received three questions. An increasing number of companies in Indonesia are working on HPAL involving nickel, but what are the advantages of the 'Pomara Project' over other Indonesian HPAL projects?

What are the benefits to the smelting and refining business of increasing the supply of nickel sulfate to the company? Does the cost go down? Is COB-SX different from MCLE?

Matsumoto: First, our company's HPAL advantages require combining processes according to the ore being processed. Although it is called HPAL, it is composed of a combination of various processes.

Our company has accumulated technical know-how on what kind of ore must be processed and what kind of process must be established, as it has accumulated experience in Coral Bay Nickel and Taganito HPAL.

We believe that such technological know-how will be utilized as our company's strengths in the "Pomalaa Project" that we will develop in Indonesia in the future. As a matter of course, we have experienced engineers working here, and we intend to make use of them for production. One of the advantages of using nickel sulfate for in-house production, which was mentioned in the second question, is that it provides a stable supply. Although in the case of sales to customers are subject to considerable fluctuations depending on market conditions, our company's battery business is seen as a growth area, enabling stable supply.

Another advantage is that it can be shared within our company. When supplying to customers, for example, nickel sulfate is necessary to be processed into crystals to deliver. However, when using within our company, there is no need to processed to crystals, and efficient supply is possible.

For the 3rd question, "Is MCLE the same as COB-SX?" this is a completely different technology. MCLE is a process to produce electric nickel. It uses chlorine to efficiently dissolve valuable metals in raw materials and uses electrowinning to refine metals.

COB-SX, on the other hand, is a technology for separating and refining solutions containing nickel, cobalt and impurities using a technology called solvent extraction and is used to produce nickel sulfate. So these are very different processes.

Q & A 4: About Electrolytic Copper and Cobalt Recycling

Moderator: Let's move on to the next question. The first one is about electrolytic copper. With the emergence of modern smelters in China using a variety of new smelting methods, how do you rate your company's global competitiveness in copper smelting?

As for the second issue, could you tell us more about the technical issues and progress of cobalt recycling, dividing them into pre-treatment such as heat treatment and grinding, and post-treatment of cobalt extraction?

Matsumoto: As for Chinese copper smelting, you are probably referring to Bath Smelting. In other words, your question concerns the cost competitiveness of this and our company's flash furnace process. Bath Smelting is much faster and simpler, so I think it's cost-competitive.

However, since this is a new technology, I believe that the operating rate of the plant has yet to be fully assessed. We do not have any information on the actual operating rate of Chinese smelters or what kind of trouble has occurred, so we will answer only in the form of fragmentary information.

Currently, the process for recycling cobalt has been almost established and is moving to a pilot study, but we cannot explain the details of this process outside the company, so we would like to ask for your forgiveness.

Q & A 5: Image of material flow balance

Moderator: Let's move on to the next question. In the battery materials business, Sumitomo Metal Mining is aiming to increase our monthly production capacity to 10,000 tonnes. Will the supply of materials by the Non-Ferrous Metals Division be a bottleneck? What image do you have of the balance of material flow, including the launch of the 'Pomalaa Project'?

Matsumoto: I can't explain the details, but we are currently making 90,000 tonnes of nickel, 14,000 tonnes of which are ferronickel, so we are making about 77,000 tonnes of nickel sulfate and electric nickel. As for electric nickel, we have some allowances to cover the relationship with our customers, so we are thinking of covering our company's supply of nickel sulfate by flexibly changing such allowances.

On the other hand, we believe that the production capacity of 10,000 tonnes per month can be covered by producing nickel sulfate from Pomalaa.