

The material that realizes a wide range of possibilities by making the most of its excellent properties

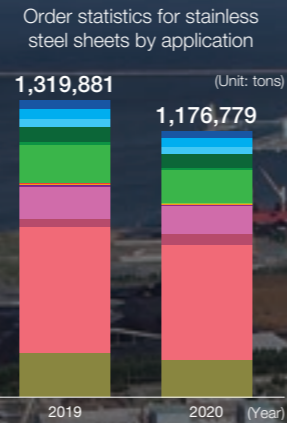
Features of ferronickel

Excellent material properties

Made of stainless steel and alloy steel, it can realize high heat resistance and high corrosion resistance. It is used as an alloy material that requires resistance to high temperatures, fresh water, sea water, and alkaline aqueous solutions.

Wide range of uses

Stainless steel has excellent corrosion resistance and heat resistance, and has a beautiful luster, so it is used in large quantities in household goods such as spoons and forks, automobiles, building materials such as buildings and housing, and various industrial fields such as chemicals, foods, and brewing.



* Referred to application examples and order statistics by application from Japan Stainless Steel Association (JSSA)

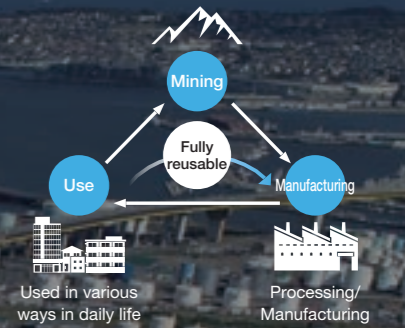
Nickel ore is smelted in one of the world's largest electric furnaces using the ELKEM method and is transformed into ferronickel, an alloy of iron and nickel that is the main raw material of stainless steel. PACIFIC METALS' ferronickel is put to use in lifestyle equipment and helps to enrich people's lives in invisible ways.

High recyclability

Nickel is one of the most recycled materials in the world. It is often recovered and recycled as an alloy. Today, about half of the nickel content in stainless steel products comes from recycling.

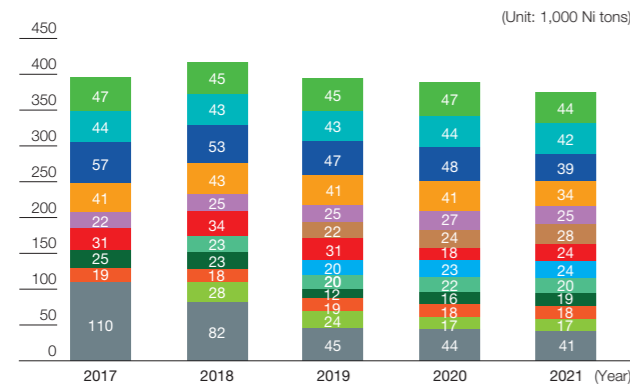
Growth potential

Due to its diverse performance, ferronickel is widely used from the dining table to the industry. It can be considered a useful material as the need for sustainable materials is expected to increase around the world.

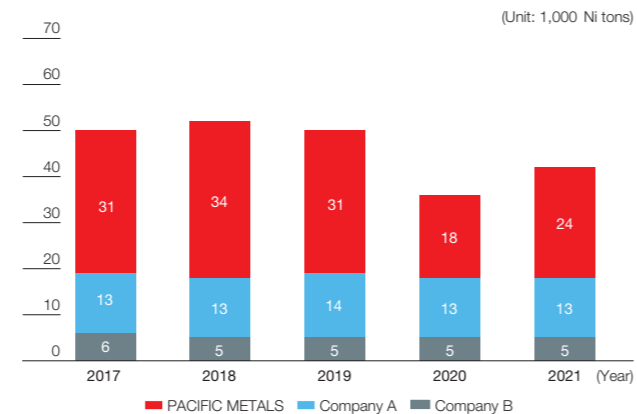


Information Relating to Production

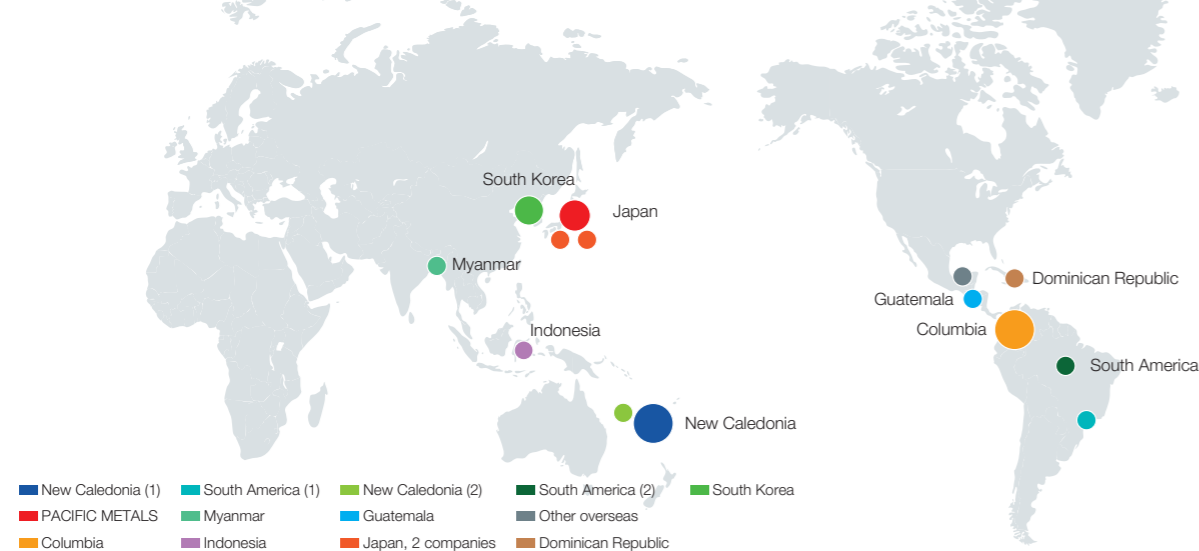
Global ferronickel production



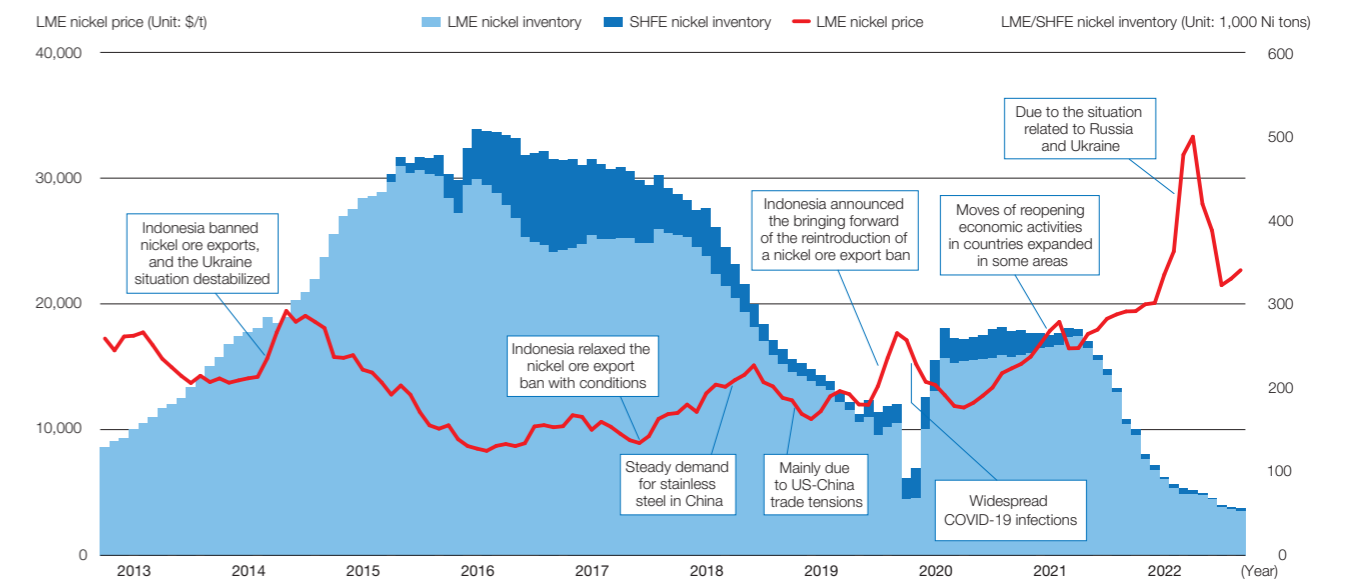
Japan's ferronickel production



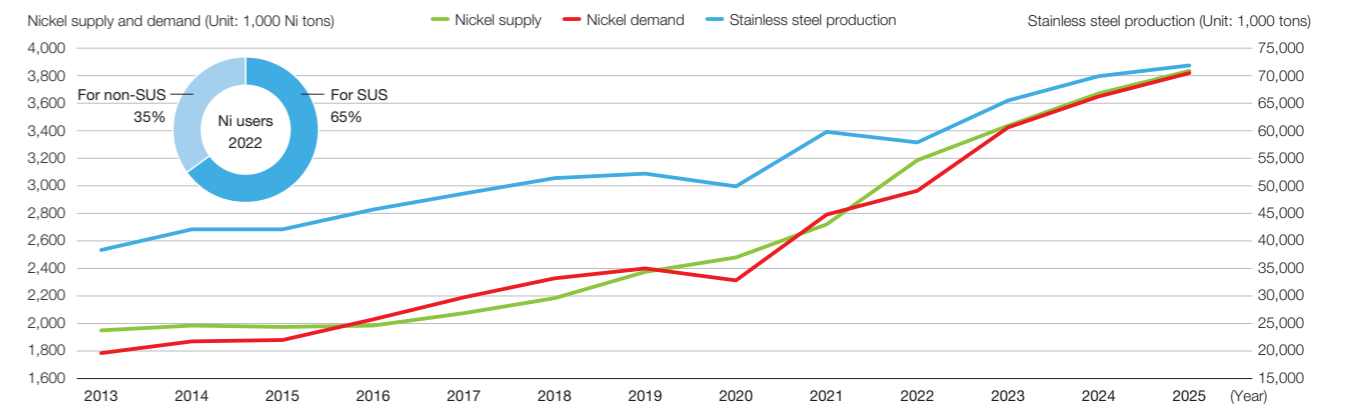
Global ferronickel production bases



Trends in LME nickel prices and nickel inventory volumes



Outlook for stainless steel production and nickel supply and demand



Growth as a Top Ferronickel Manufacturer

Since our founding, we have devoted all our efforts to meet the diverse needs of our customers. By developing new technologies and new products and working on quality control, we have overcome numerous economic crises and expanded our business. Today, we have established ourselves as one of the world's top manufacturers of ferronickel.

1949-

1949

The steel division of Nippon Soda Co., Ltd., spun off under the Corporate Reconstruction and Reorganization Act, and became Nisso Steel Co., Ltd. To utilize domestic resources, the Company started production of pig iron from iron sand through the electric furnace process.



1952

Listed on both the Tokyo and Osaka Stock Exchanges.

1954

Set sights on the future potential of ferroalloys, particularly ferronickel, the Company converted pig iron smelting facilities at the Shibata Plant into facilities for ferronickel production.

1957

Completed construction of the Hachinohe Plant, production of pig iron from iron sand started.



1959

Pacific Nickel Co., Ltd. was established to specialize in ferronickel smelting and Shibata Plant was separated to become part of Pacific Nickel.

Indicates environmental initiatives

1960-

1965

Some of Hachinohe Plant's pig iron production facilities converted for the smelting of ferroalloys and ferronickel. Ferromanganese and ferronickel production launched in 1965 and 1966 respectively, followed by the commencement in 1968 of integrated production of stainless steel starting with nickel ore. Ferronickel production capacity increased with two large electric furnaces (a 25,000 kVA unit installed in 1969 and a 40,000 kVA unit in 1970).



1970

The Company absorbed Pacific Nickel Co., Ltd. through merger and changed its name to PACIFIC METALS CO., LTD. and established a foundation as the top manufacturer of ferronickel.



40,000 KVA closed nickel furnace (Hachinohe 45.9)

1970

Opened Philippines Office.

1972

Concluded a technological support agreement with Indonesian company PT Aneka Tambang for construction of a ferronickel smelting plant (Antam Plan).

1973

Acquired an equity stake in Rio Tuba Nickel Mining Corporation of the Philippines and started to involve development of nickel mines.

1975

Telemeter system
Installed SOx monitoring equipment (compliance with agreement)

1979

Completed construction of Niigata Plant and departments of electromagnetic materials and activated carbon of Shibata Plant moved to Niigata Plant.

1970-

1980-

1983

Separated and transferred Iwase Plant to Pacific Rundum Co., Ltd., along with its abrasives business operation.



No.2 Mannesmann curved continuous casting machine (Hachinohe 56.10)

1984

Separated and transferred Naoetsu, Toyama and Narashino Plants to Pacific Special Alloy Castings Co., Ltd., Pacific Steel Mfg. Co., Ltd. and Pacific Machinery & Engineering Co., Ltd., respectively, along with its casting, forging and machinery business operations.

1985

The name Hachinohe Plant was renamed to Hachinohe Works.

1988

Developed a nickel mine by taking an equity stake in Taganito Mining Corporation in the Philippines.

1995

Installed a 60,000 kVA electric furnace. Three electric furnaces system established at Hachinohe Works.

1996

Completion of Kawaragi Wharf No.2 at Hachinohe Harbor (public).

1997

Completed installation of raw material transport conveyor line (Kawaragi).



1998

Acquired ISO9002.

1999

Transferred headquarter functions to Hachinohe to become a specialized manufacturer for ferronickel.

1990-

2000-

2000

Registered as environmental measurement certification business.

2003

Construction completed "Incinerated ash and scallop shell recycling facility" for recycling business.

2003

Transitioned to ISO9001:2000.

2005

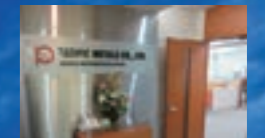
Achieved 1 million tons of ferronickel production.

2007

Installed drainage monitors (compliance with agreement).

2008

Opened Jakarta Office.



2009

Acquired ISO 14001:2004.

2011

Installed monitoring cameras for drainage and chimneys (drainage and dust control).

2012

Acquired OHSAS 18001:2007.
Transitioned to ISO 45001:2018.

2013

Installed wastewater treatment system (compliance with agreement).

2014

Started operation of Integrated Management System.

2016

Formulated a new "company philosophy" and "long-term vision."

1949-

Started production of pig iron from iron sand before the period of rapid economic growth

Japan's industrial production recovered to pre-war levels, and Japan entered a period of rapid economic growth. Demand for steel products grew, especially in the manufacturing and construction industries, but air pollution also grew due to the strong industrial recovery, and became a major social problem.

In these circumstances, the Company started operations as Nisso Steel Co., Ltd. We focused on the refining of iron sand as a way to make use of Japan's domestic resources and started producing pig iron from iron sand with an electric furnace using iron sand as a raw material.

1960-

Started production of ferronickel

The first Tokyo Olympics were held in 1964, contributing greatly to the modernization of Japan. Due to continued rapid economic growth, demand for energy steadily increased, air pollution and natural destruction progressed, and pollution-related diseases became commonplace due to these factors.

Around that time, the Company focused on the future potential of ferronickel and installed an electric furnace. We started production of ferronickel. We have adopted more environmentally friendly production methods, adopting electric furnaces, which are more energy efficient than blast furnaces, and using the high-temperature exhaust gas emitted from electric furnaces in the ore drying process.

1970-

Established a foundation as a top ferronickel manufacturer

In 1970, the Company absorbed Pacific Nickel and changed its name to PACIFIC METALS CO., LTD. In 1973, we started developing nickel mines. We have established a stable supply of raw materials and a high-quality production system.

Pollution countermeasures and regulations have been strengthened due to factors such as the spread of pollution-related diseases, so we have also accelerated the promotion of environmentally friendly business activities, such as concluding pollution prevention agreements.

2000-

Aiming to realize a sustainable society

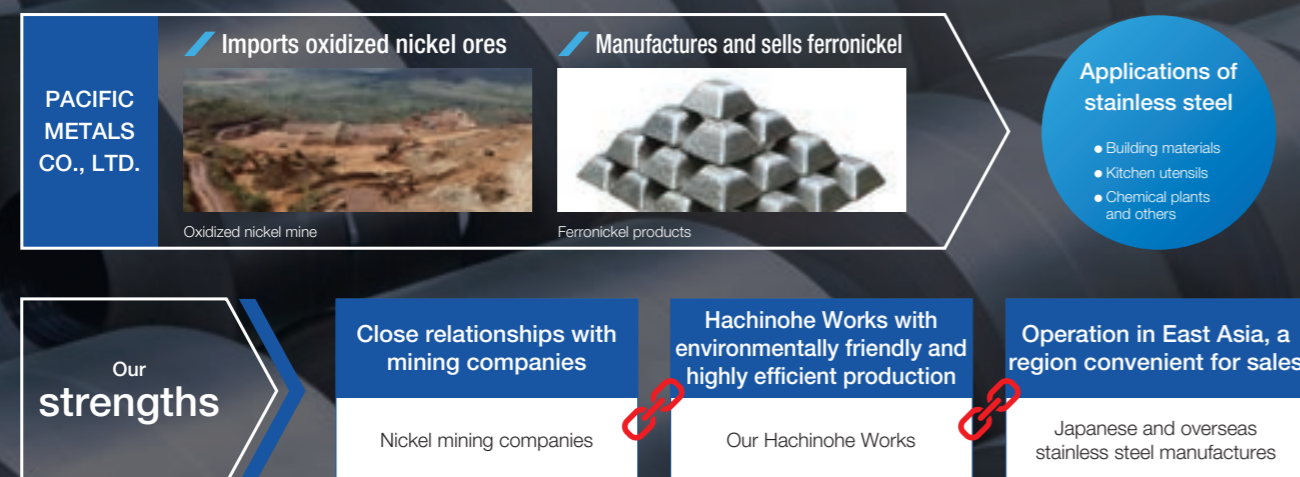
In 1999, we moved our head office organization to Aomori and became a specialized manufacturer for ferronickel. In 2005, our production reached 1 million tons. We have also worked to solve social issues through our business, such as by starting a recycling business.

Now, when the whole world is working on climate change countermeasures, we are also promoting the use of carbon-free energy and other environmentally friendly manufacturing technologies and methods, as well as expanding sales of eco products.

We will continue to contribute to the realization of a sustainable society by responding to all environmental risks and promoting initiatives to achieve carbon neutrality by FY2050.

As One of the World's Top Ferronickel Manufacturers

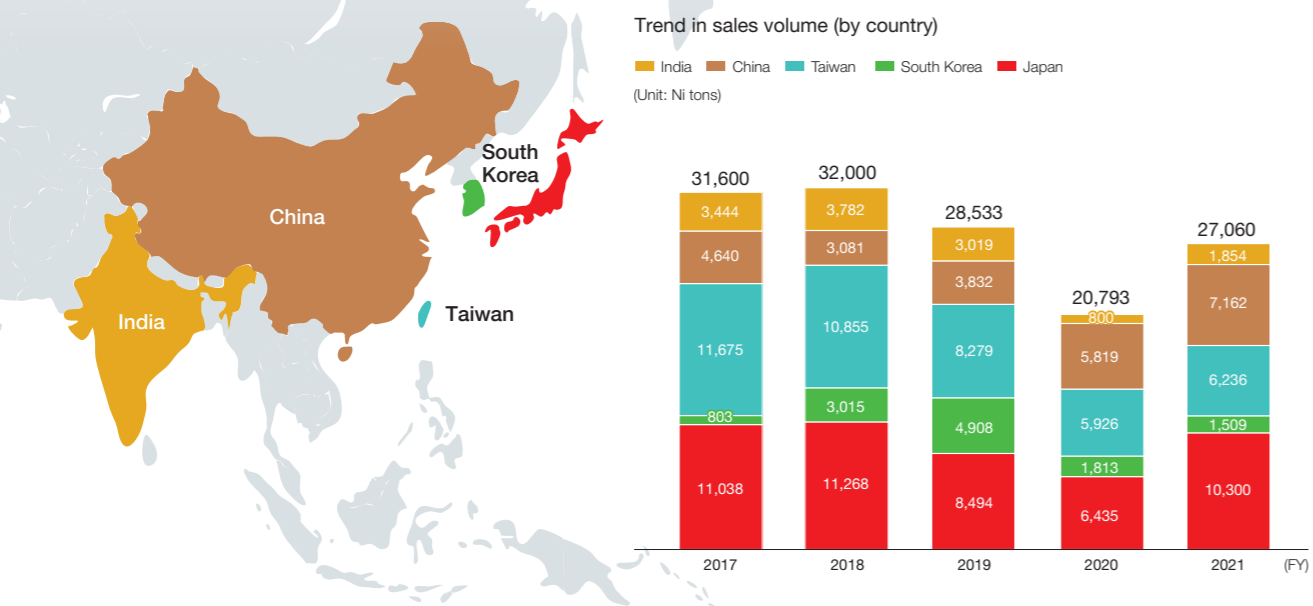
From procurement of ferronickel raw materials to product sales



Strength 1 Operation in East Asia, a Region Convenient for Sales

Currently, about 60% of our sales are made overseas, supported by our network centered on East Asia. Through our carefully cultivated information network, we collect information on the market and technology, and use it effectively for future business development.

As one of the world's top manufacturers of ferronickel, the Company has also actively ventured into overseas businesses, working with local companies in the Philippines, Indonesia, and other countries to develop resources. In order to comply with international rules and local laws and regulations and conduct corporate activities that contribute to the development of each country, we give due consideration to local traditions, culture, business practices, and labor-management practices, based on international goals related to human rights such as the SDGs.



We sell ferronickel not only to Japan but the rest of the world as well. Our strengths are in our production capacity made possible with some of the world's largest electric furnaces, our connections with mining companies supporting that production, and our sales network that supports overseas expansion. By combining these strengths, we have realized the production and supply of high-quality, stable products that are valued around the world.

Strength 2 Hachinohe Works with Environmentally Friendly and Highly Efficient Production

We own three of the world's largest electric furnaces, and we use world-class smelting technology to carry out efficient manufacturing.

Achieving highly efficient production

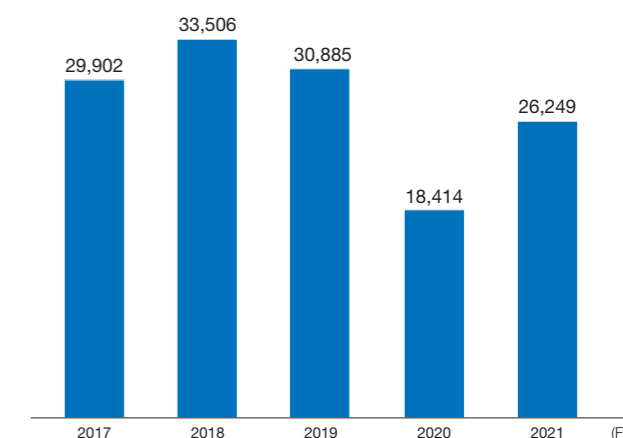
Our Hachinohe Head Office (Manufacturing Works) is located in Hachinohe Port, which is a cornerstone of the coastal industrial zone facing the Pacific Ocean, making it easy to import nickel ore from overseas. In terms of product sales, this also enables us to expand into the Asian region, starting with major domestic stainless steel manufacturers. Our raw materials are transported efficiently from Hachinohe Port on a large conveyor with a belt width of 3.2m and a total length of 2.4km, saving energy and costs compared to truck transportation. We extract nickel efficiently from the transported nickel ore using our proprietary smelting technology and some of the world's largest electric furnaces.



Environmentally friendly technology

We are making innovations to reduce our environmental impact, such as reducing our energy consumption by using the high-temperature exhaust gas emitted from electric furnaces in the ore drying process, and partially replacing nickel ore with recycled raw materials that contain nickel.

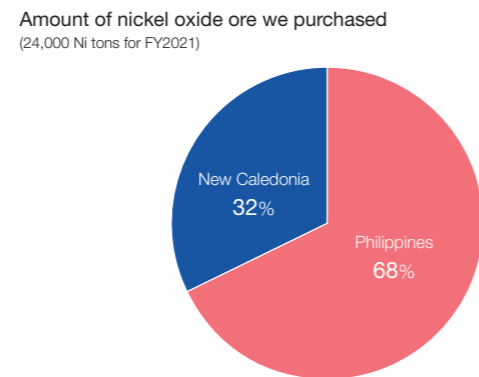
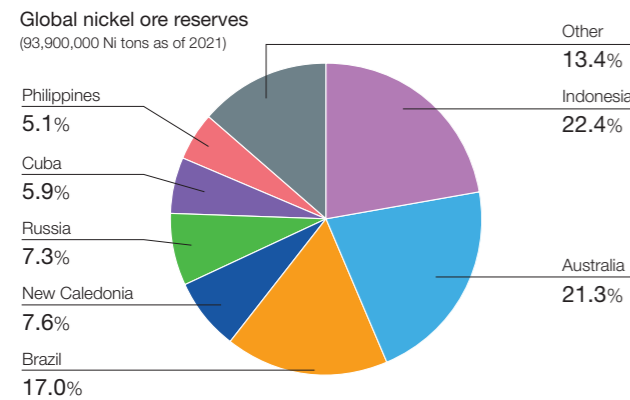
Production volume
(Unit: Ni tons)



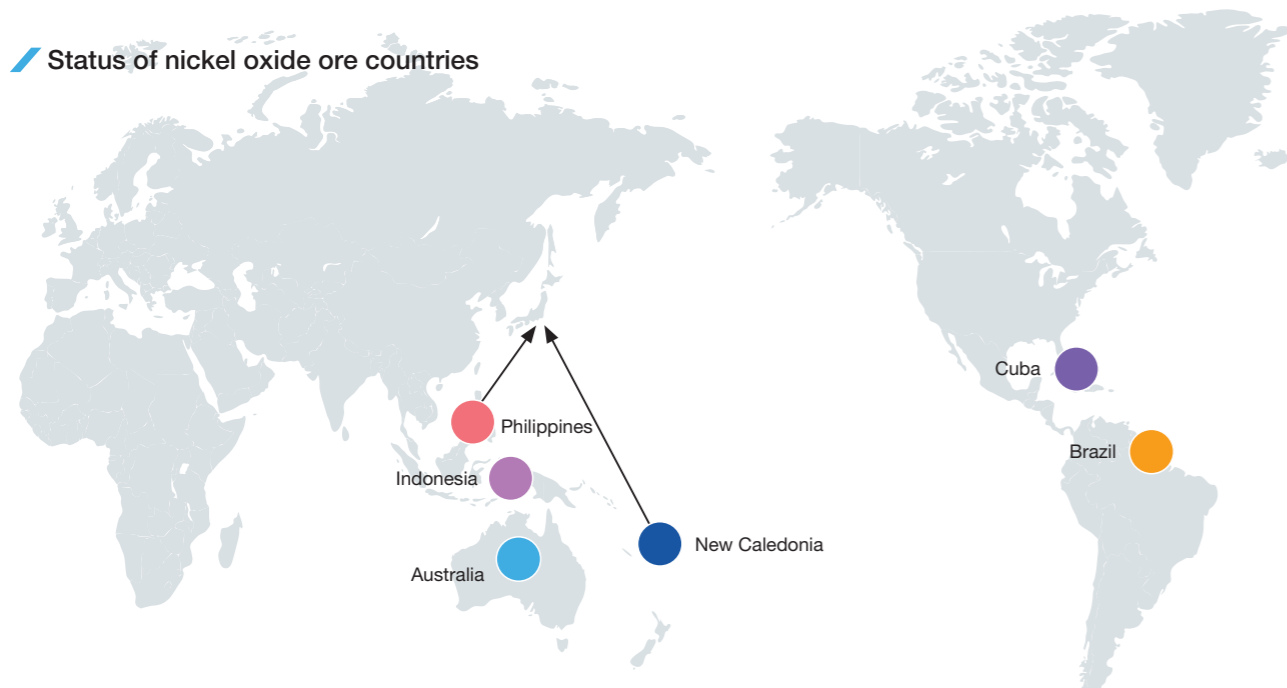
Strength 3 Close Relationships with Mining Companies

As one of the world's top manufacturers of ferronickel, the Company has also actively ventured into overseas businesses, working with local companies in the Philippines, Indonesia, and other countries to develop resources. The nickel mine development businesses of Philippines-based Rio Tuba Nickel Mining Corporation and Taganito Mining Corporation, which were formed through joint ventures with local capital, support our production of high-quality products through the stable supply of raw materials. We have built up a network of trust that transcends the oceans in addition to technological assistance and resources development.

Information relating to purchasing



Status of nickel oxide ore countries



Philippines Both the Rio Tuba Nickel Mining Corporation and the Taganito Mining Corporation are joint ventures in which we have contributed 36% and 33.5% of the capital, respectively. We have continuously provided the mutual exchange of technical and human support since the mines first opened.

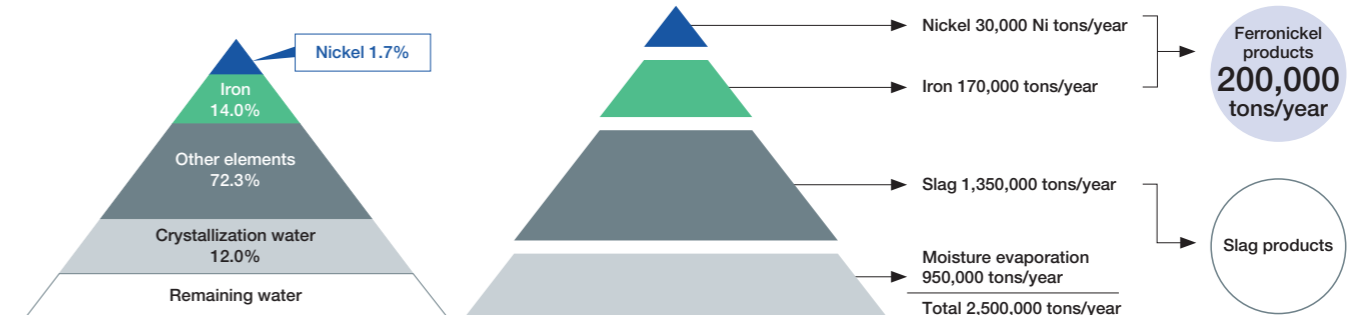
New Caledonia We procure ore from Société Minière Georges Montagnat SARL and Mai Kouaoua Mines on a stable basis under 10-year long-term contracts.

Indonesia In 1975, we provided technical assistance to PT Antam Tbk as a general supervisor involved in the construction of Indonesia's first ferronickel smelting plant and operational guidance, and we still provide advice on exploration and mine development and technical assistance, such as furnace repairs.

*In January 2014, a policy to ban exportation of unprocessed ore came into effect. From January 2017 to December 2019, that policy was partially eased. *A policy to ban exportation is being implemented again since January 2020

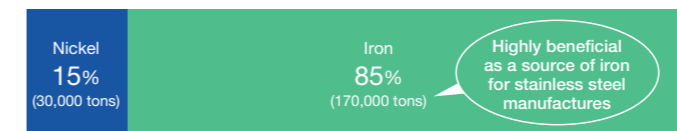
Raw Material Information of Ferronickel

Composition of nickel ore



*Reference figures on the assumption that nickel ore grade is 1.7% (on a dry-basis) and annual nickel production is 30,000 tons.

Composition of ferronickel (on the assumption of nickel sales volume of 30,000 Ni tons/year)



What is the Ni ton (net nickel weight)?

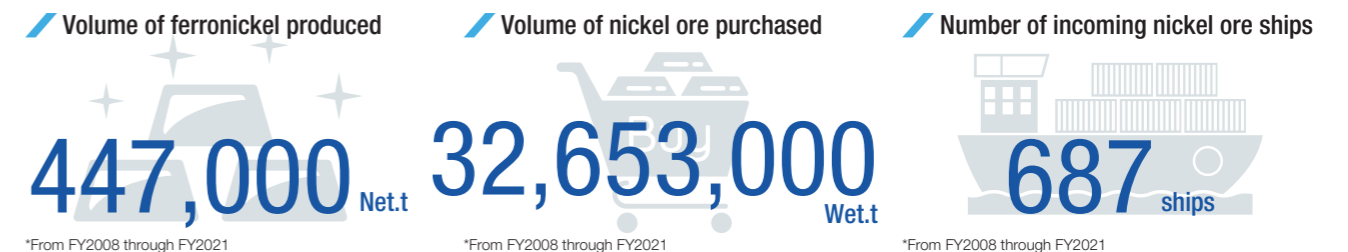
① Ferronickel is an alloy of 15% nickel and 85% iron.
 ② In the nickel industry, the production and sales quantity is expressed in net nickel weight.
 Sales quantity of 30,000 Ni tons in the form of ferronickel means:
 Net nickel sales quantity of **30,000 Ni tons**
 Gross sales quantity (as ferronickel) is **200,000 tons**

All Slag Generated in the Ferronickel Manufacturing Process Is Recycled

Ferronickel slag is a by-product of the ferronickel smelting process. Molten slag is poured into cooling pits, where it is cooled by atmospheric cooling and moderate sprinkling with water, to turn it into a solid, rock-like state. This rock-like slag is crushed and mechanically stabilized before being recycled. This resource is attracting attention as an environmentally friendly recycled material.



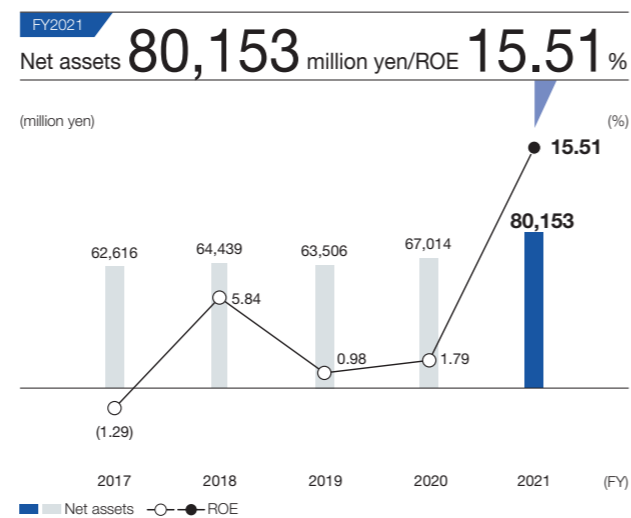
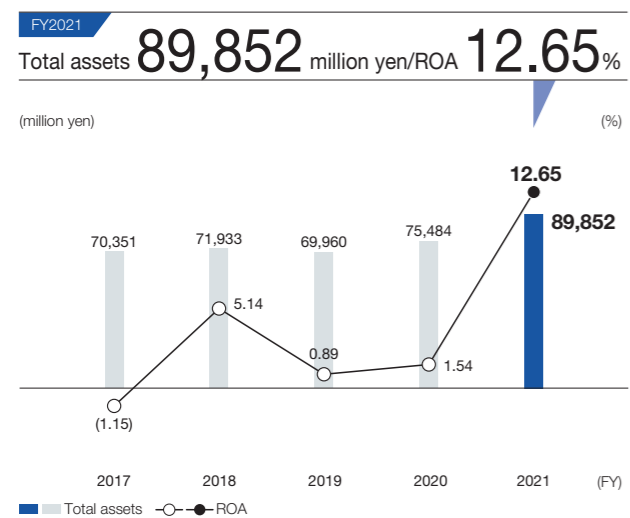
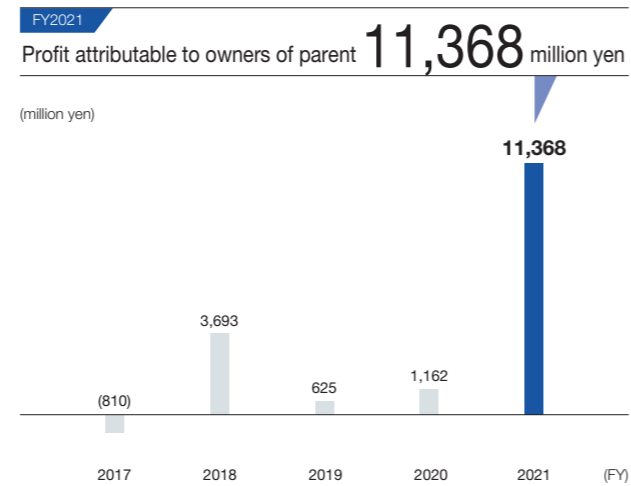
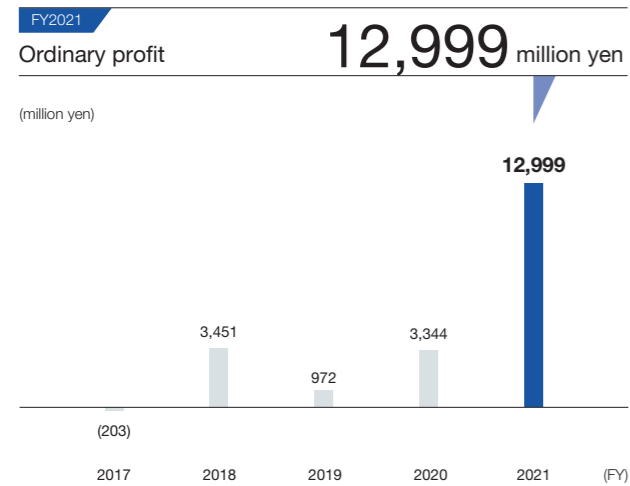
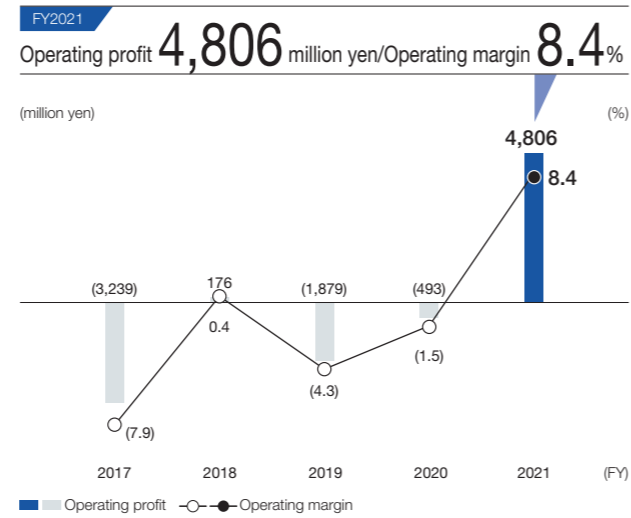
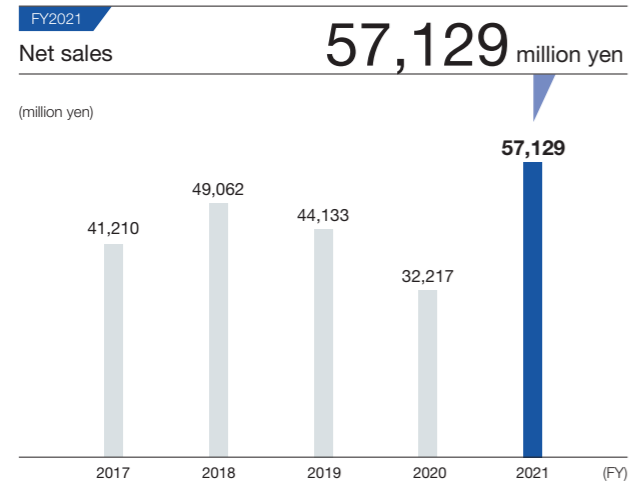
PACIFIC METALS by the Numbers



Volume of slag products produced (processed products) and Volume of melting treatments by the recycling business



Financial Data (Consolidated)



Non-financial Data (Non-consolidated)

