

2nd Quarter FY2011

Progress of Business Strategy

November 2011

 **SUMITOMO METAL MINING Co., Ltd.**

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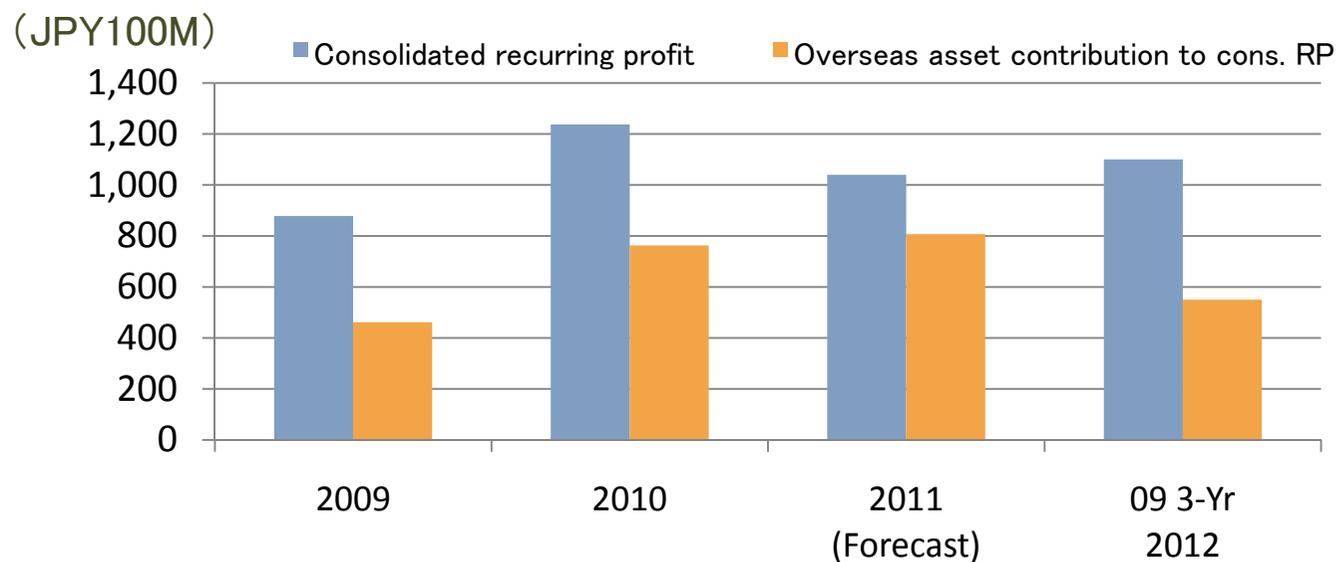
V. Financial Highlights and Information Materials

I . Trend in Business Performance and Asset Components



Electrolytic Copper

1) Consolidated Results



| (JPY100M) | 2009 | 2010 | 2011/1H Result | 2011/2H Forecast | 2011 Forecast | 09 3-Yr 2012 |
|---|-------|-------|----------------|------------------|---------------|--------------|
| Consolidated recurring profit | 878 | 1,237 | 615 | 425 | 1,040 | 1,100 |
| Overseas asset contribution to cons. RP | 461 | 763 | 453 | 354 | 807 | 550 |
| Cu (\$/T) | 6,101 | 8,140 | 9,072 | 8,000 | 8,536 | 6,000 |
| Ni (\$/lb) | 7.7 | 10.7 | 10.52 | 9.00 | 9.76 | 8.0 |
| Au (\$/Toz) | 1,023 | 1,294 | 160.3 | 1,650 | 1,627 | 1,000 |
| Exchange (¥/\$) | 92.9 | 85.7 | 79.82 | 75.00 | 77.41 | 90.0 |

2) FY2011 Consolidated Recurring Profit ~ Forecast in May vs in Nov.

Forecast of FY2011 Recurring Profit

(JPY100M)

Forecast in May 1,240

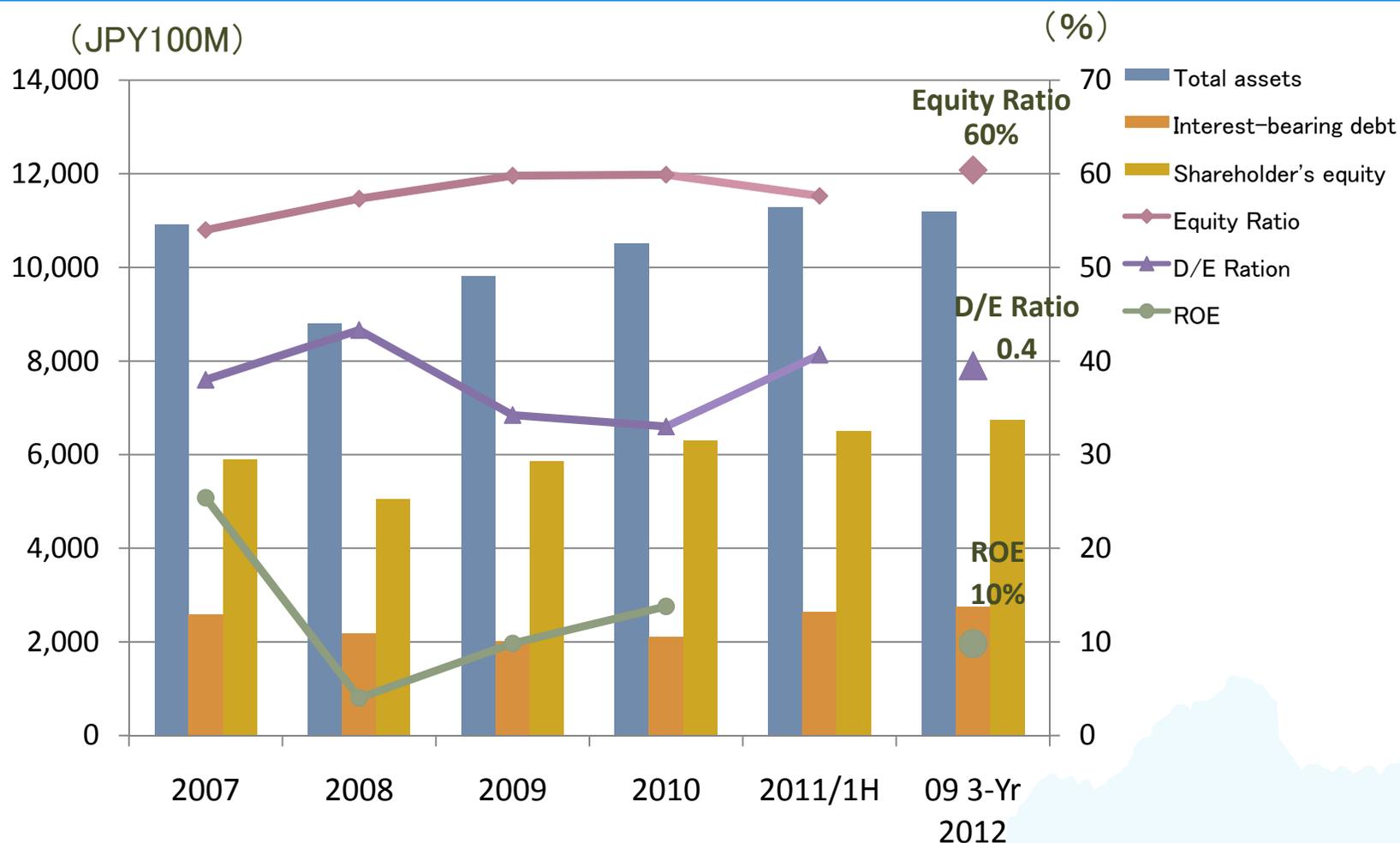
Forecast in Nov. 1,040

−200

Breakdown of Recurring profit -200

| | |
|------------------------|-----|
| ① Metal Prices | +70 |
| ② Inventory evaluation | −50 |
| ③ Cost | −50 |
| ④ Exchange Loss | −70 |
| ⑤ Materials Segment | −90 |

3) Maintenance and utilization of sound finances



SMM issued bonds in the second quarter of FY2011 and continuously maintained a stable equity ratio

II. Circumstances of the Taganito Project

Assault incident ①

Background

At around 11 a.m. Japanese local time on Monday, October 3

We received news that an armed group of approximately 50 persons had attacked and occupied the Taganito Mine.

We were also notified that an armed group had invaded the THPAL Plant site.

At around 6 p.m. Japanese local time on the same date

The armed group withdrew from the Taganito Mine and SMM's plant site. The safety of 65 Japanese staff of SMM and contractor companies was confirmed.

At around 9:30 p.m. Japanese local time on the same date

Approximately 70 Armed Forces of Philippines and Philippine National Police troops were dispatched and stationed to guard the mine.

It was also confirmed that there were no casualties among the non-Japanese workers and the nearby residents.

II. Circumstances of the Taganito Project

Assault incident ②

Damages:

Damages were found in heavy machineries and various facilities under construction.

Damage amount:

An estimate is currently being prepared.

Resumption of construction work:

Construction work will resume after the safety of the site is validated.

SMM's basic stance:

There is no change in the basic policy of aiming to produce 100 thousand tons of nickel.

II. Circumstances of the Taganito Project Construction Progress

30% of total construction work was completed at end of September 2011.

Schedule

March 2010: Construction work started.

April 2011: Port facilities were completed.

August 2011: Accommodation facilities were partially completed.

2013: Construction work to be completed.

Pilot operation to start.

Commercial production to start.



**Plant Site:
Status of work
progress
(June 2011)**

III. Progress of 2009 3-Yr Business Plan



Electrolytic Nickel

1) Mineral Resources

① Progress of SMM exploration—Stone Boy—

Stone Boy Project

Ratio of interests

SMM 95%
Sumitomo Corp. 5%

Target minerals

Gold (Au)
Antimony (Sb)

Current Status

Naosi section in the Monte Cristo area

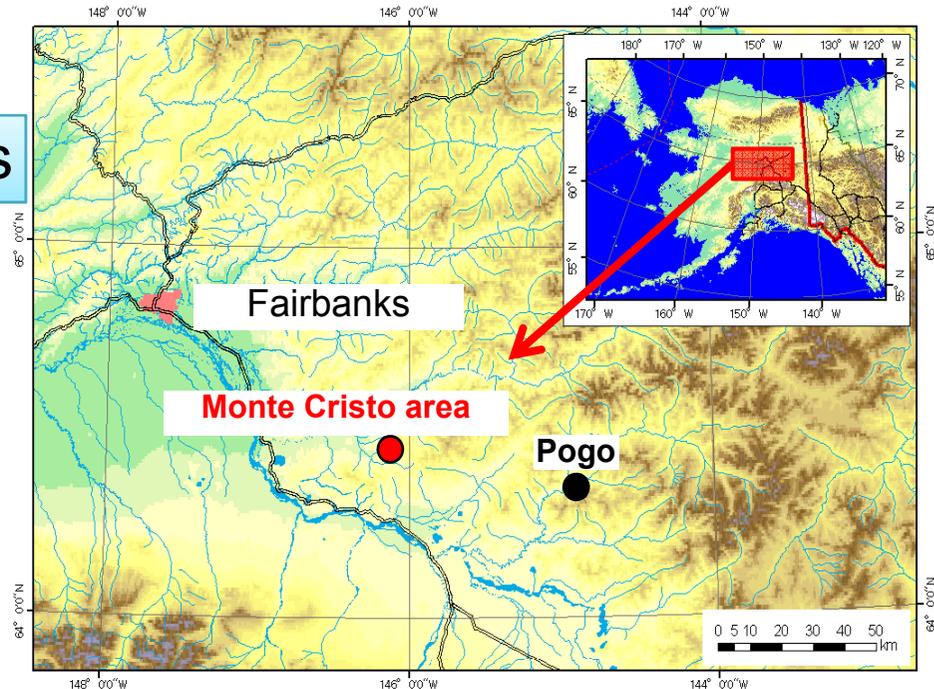
As a result of boring surveys conducted in 2008–2010, the existence of the promising mineralization zones of Au, Ag (silver) and Sb was confirmed within 27 of the 29 pits.

In 2011, 12 pits were explored (results are currently being analyzed).

A concentration experiment is scheduled to be executed for the Naosi ore body.

➡ A further extensive survey will be conducted to ascertain the precise minable reserves.

Mineralization zones outside of the Naosi section will also be investigated.



1) Mineral Resources

① Progress of SMM exploration—Solomon Project—

Solomon Project

Current Status

Mining zones

Choiseul Island: 1 mining zone

Approx. 200 km²

Santa Isabel Island: 3 mining zones

Approx. 150 km²



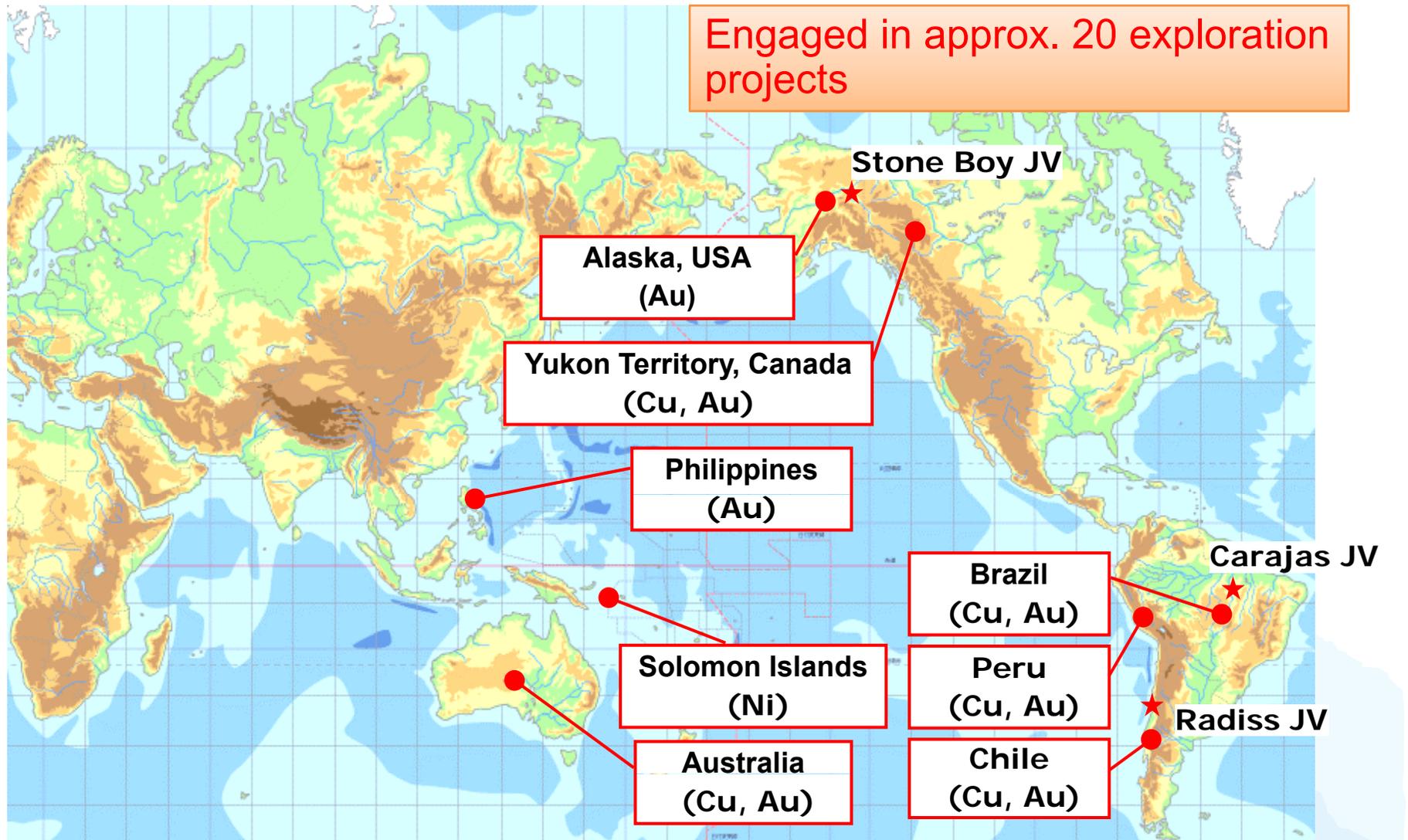
In parallel with the exploration in the above mining zones, applications for permits and approvals have been filed to step up the operating stage toward the mining of minerals.



Pre-FS (feasibility study) is scheduled to be completed by end of FY2011.

1) Mineral Resources

① Progress of SMM exploration – Worldwide Exploration



1) Mineral Resources

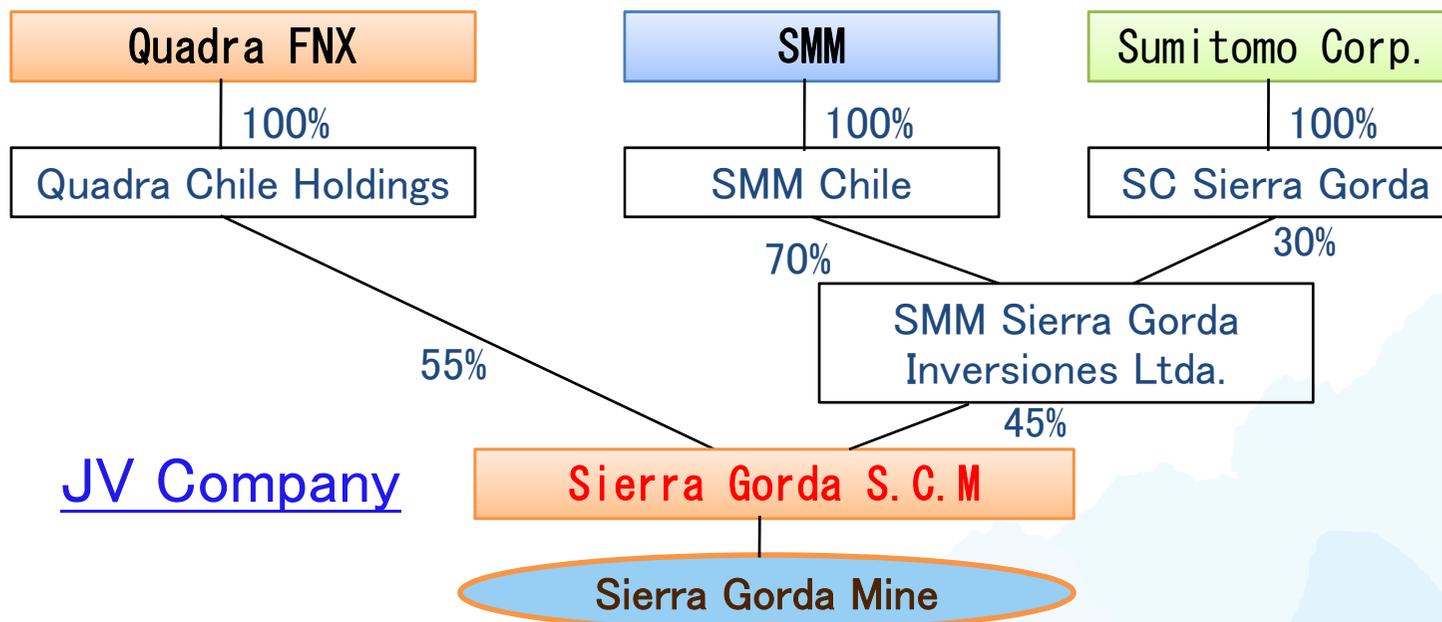
② Participation in new mine development project – Sierra Gorda

Sierra Gorda Project

September 14, 2011

Various procedures in compliance with the relevant investment agreement, which was signed in May 2011, were completed.

- ➔ Establishment of a joint venture company:
Sierra Gorda S.C.M. (Head office: Santiago, Chile)
SMM invested US\$360 million of the total US\$724 million.
Subsequent investments will be executed in stages, as required.



1) Mineral Resources

② Participation in new mine development project – Sierra Gorda

Sierra Gorda Project

Development schedule

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------------------|------|------|------|------|------|------|------|
| Acquisition of required approvals | → | | | | | | |
| Construction | → | → | → | → | | | |
| Operations at 110kt | | | | → | → | → | → |
| Expansion of operations to 190kt | | | | | → | → | → |
| Operations at 190kt | | | | | | | → |

- Environmental permits were acquired in June 2011.
- SMM dispatched personnel (4 staff) in August 2011.
- Accommodation facilities and support facilities are under construction.

1) Mineral Resources

③ Expansion of existing mines—Cerro Verde—

Cerro Verde Mine — Expansion Project

Increase of mining output

Current mining output of 320 kt/day
➡ Aiming to increase to 850 kt/day

Reinforcement of concentration capability

Current volume of concentration process of 120 kt/day
➡ Aiming to triple to 360 kt/day

Production volume of copper

- Mineral concentration: 220 kt/year
- SXEW: 80 kt/year



Aiming to achieve total volume of approx. 500 kt/year after expansion

Schedule:

- Environmental impact assessment will start in the fourth quarter of 2011.
- Procedures for required permits and approvals will be completed by end of 2012.
- Construction work will start in 2013 and be completed by end of 2016.
Cost of operation launch will be up to \$4 billion.

1) Mineral Resources

③ Expansion of existing mines — Morenci —

Morenci Mine — Expansion Project

Increase of mining output

Current mining output of 635 kt/day
➡ Aiming to increase to 816 kt/day

Reinforcement of concentration capability

Current volume of concentration process of 50 kt/day
➡ Aiming to increase to 115 kt/day

Production volume of copper

- Mineral concentration: 70 kt/year
- SXEW: 210 kt/year

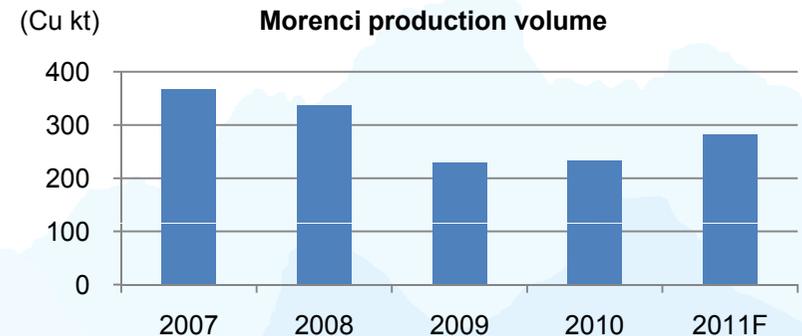


Aiming to achieve total volume of approx. 380 kt/year after the expansion



Schedule

- FS will be completed by early 2012.
 - Procedures for required permits and approvals will start in the second half of 2011.
 - Construction work will be completed by end of 2014 with subsequent full operation.
- Cost of operation launch will be up to \$1.2 billion.



1) Mineral Resources

③ Expansion of existing mines — Northparkes —

Northparkes Mine — Expansion Project

Background

- **“STEP CHANGE PROJECT” started August 2010:**
 - Shift to a pre-FS stage to address the possibility of project expansion.
 - Expansion of production scale is planned by developing the bottom of three existing ore bodies and a new ore body.



Expansion plan

Production volume of copper in 2010: 38 kt

➔ Annual production volume after the expansion: 150 kt (SMM's share: 20 kt)

Schedule

- Shift to FS stage during 4Q of 2012
- Full-scale production in 2016 targeted

1) Mineral Resources

④ Maintaining Au resources of 2 mines

Pogo Mine

Production forecast for 2011:
10.4 tons

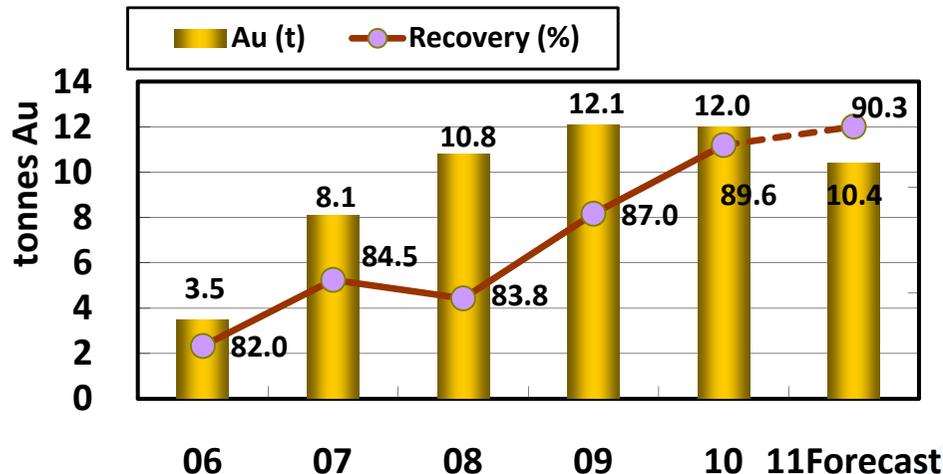
→ Production output decreased due to the mining of low-grade ore.

Reserves(as of end of Dec. 2010): 122t

Conducting field exploration to further reserves.



Pogo Mine production volume and recovery rate



Hishikari Mine

Sales volume in FY2011 (Forecast) :7.5t
Reserves (as of end of Dec. 2010): 149t

Maintaining reserves by carrying on the policy of “Explore the same amount we have mined”

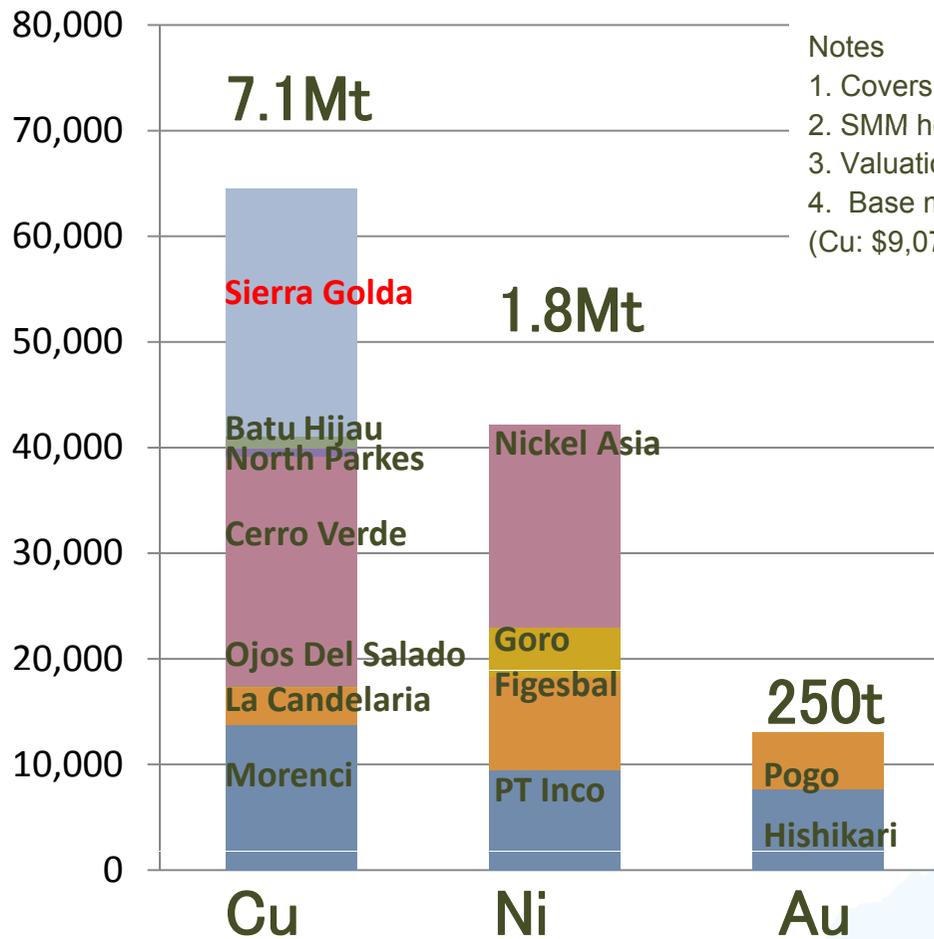
1) Mineral Resources

⑤ Mining interests – Reserves

Valuation
(\$USD million)

Total: 120B\$

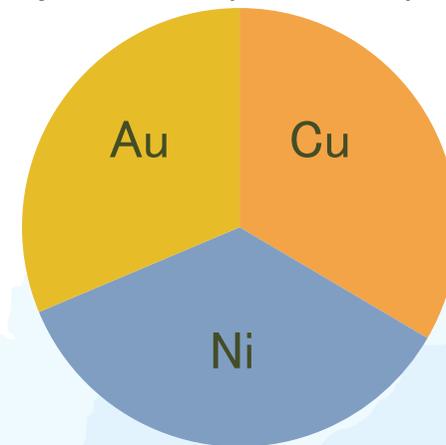
(Calculation based on estimated reserves)



Notes

1. Covers SMM equity interests
2. SMM held reserves = metal reserves x SMM interest ratio (%)
3. Valuation = SMM held reserves x base metal price
4. Base metal price = Avg. price from April to September, 2011
(Cu: \$9,070/t Nickel: \$10.5/lb Au: \$1,600/toz)

SMM equity interest
production amount by metal
portfolio (FY2010)



2) Smelting & Refining

① Preparation for electrolytic Ni 65kt production

Electrolytic Ni production capacity reinforcement

◆ Capacity: 41kt/year
→ 65kt/year

◆ Investment amount: ¥14bln

◆ Schedule

Construction to be completed to enter mass production in 2013

→ In line with Taganito HPAL operation

Status of progress: Construction of the building is in progress.

Manufacturing of outdoor plants has been launched.

Production capacity is to be Ni100kt /year

Facility Reinforcement

Technical Expertise Improvement

Operation in Conjunction with Taganito

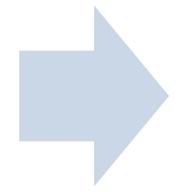
2) Smelting & Refining

② Toyo Smelter & Refinery

*** Flash furnace will undergo complete brickwork renovation during its mandatory shutdown maintenance period**

➔ Expected to be completed almost as scheduled.

- ◆ The first complete brickwork renovation including bottom brick since its inauguration in 1971
- ◆ Strengthening and improving furnace cooling mechanism
- ◆ Improving operation environment



«Effect»

- ◆ Prevention of molten metal leakage
→ **Reduction of operation risk**
- ◆ Improvement of response capabilities to high-load operations
- ◆ Reduction of copper slag loss
→ **Increase profitability**

*** S.O.F (Side-blowing and Oxy-fuel Flash smelting) has been employed**

➔ Upgraded version of Sumitomo method concentrate burner

- ◆ Air for reaction is blasted from the side nozzles on the side walls of the shaft

«Effect»

- ◆ Lower dust generation rate, higher oxygen efficiency, less copper slag loss
→ Operational efficiency and productivity are improved

Operation will start in Feb 2012

| | Apr | May | to Aug | to Oct | to Dec | from Feb |
|---|-----|-----|--------|--------|--------|----------|
| Test operation | ➔ | | | | | |
| Review of test results and study facility improvement | | ➔ | | | | |
| Modification of cooling mechanism | | | | ➔ | | |
| Application to operation | | | | | | ➔ |

2) Smelting & Refining

③ Status of Goro Project

- Apr. 2010 Refining process (solvent extraction)
~~Facilities partially damaged~~
- Aug. 2010 **First Metal Production**
- Dec. 2010 **First shipment of Nickel Hydroxide**
- June.2011- Dispatch one executive level person, two process engineers and one facility engineer from SMM.
→ **Support for fundamental solution on the issue of solvent extraction facilities**
→ **Replaced the damaged facilities**
- Oct.~ Started pilot operation in the whole process.
→ Toward the establishment of the finished product (nickel oxide) production system
- 2012- Large scale production of Nickel Oxide

3) Materials

① Promote 'selection and concentration'

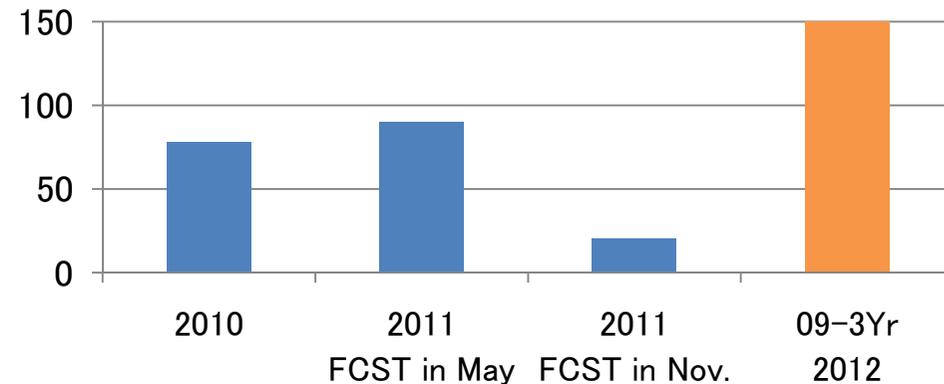
- ◆ Business sectors where SMM aims to promote growth
Materials for environment and energy fields
- ◆ Business sectors where basic operating platforms need to be reinforced
Pursue productivity improvement and cost reduction

- ◆ Business sectors where SMM cannot pursue a growth strategy

Withdraw / Transfer



(JPY100M) Operating income of Materials Segment



3) Materials

② Growth strategy: Battery materials

Business expansion based on existing businesses



Maintain the first vendor position of cathode materials for TOYOTA vehicles (PRIUS, CAMRY)

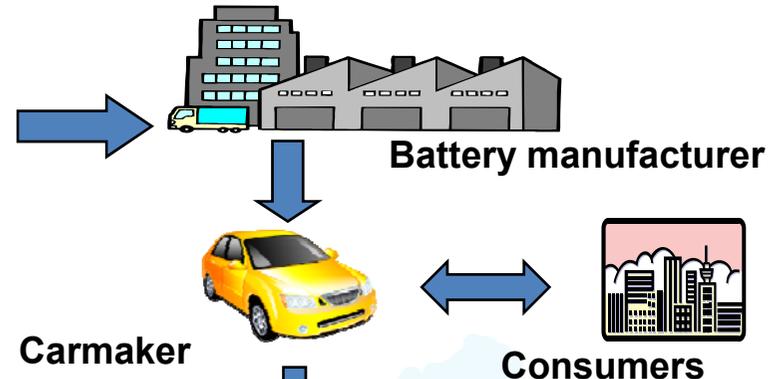
Develop a market-responsive type business.

Establish a new business model between resources, cathode materials and recycling.

Manufacturing and development of battery materials



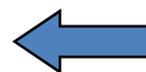
Advanced Materials Div./Battery Research Laboratories



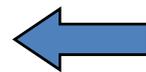
↑ Manufacturing of nickel chemical products



Nickel plant



Resources recycled



Ni/Co resources explored by SMM



Recycling

Recycling plant

3) Materials

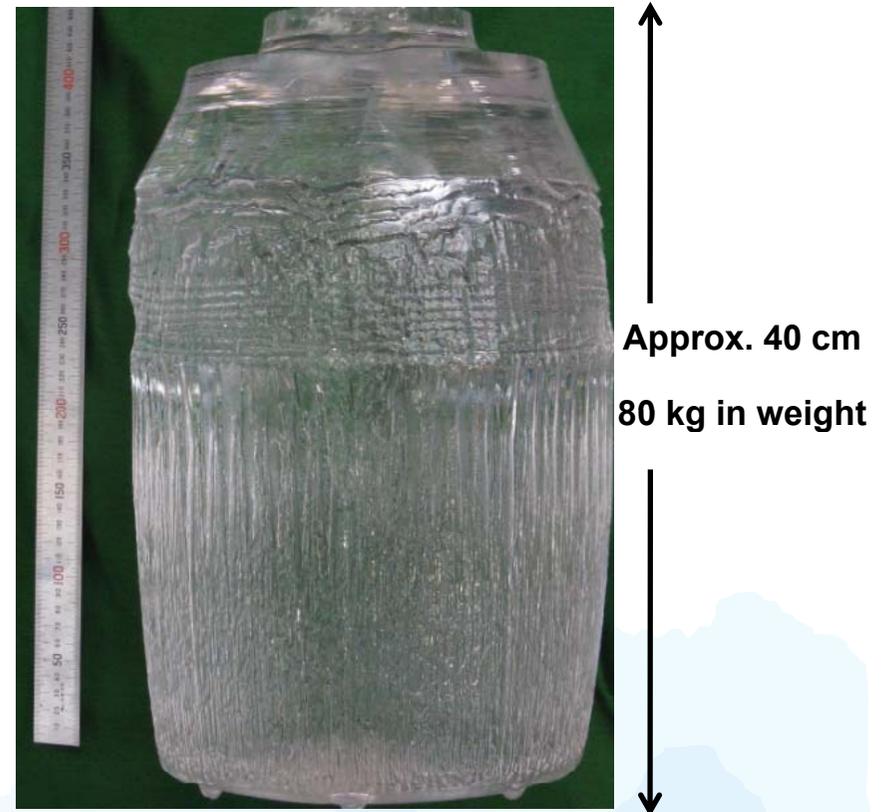
③Growth strategy: Sapphire substrates

In line with the expanding demand for lighting LEDs, there are strong inquiries for large-scale substrates.

- ◆ The mass-production technology of large crystalline sapphire substrates has been established.

Cost reduction achieved by allowing two 6-inch diameter substrate bars to be pulled from a single ingot.

- ◆ The manufacturing process of sapphire substrates was already begun way at Ohkuchi Electronics Co., Ltd.
- ◆ An investment plan for the production increase of 6-inch diameter substrates is in its final stage.



3) Materials

④ Sales Control (China)

SMM Chinese Sales Company

Marketing and sales promotion functions in the Chinese market

- Understanding demand trends and customer needs
- New market exploitation
- Adequate feedback to manufacturing departments
- Primarily targeting materials and base metals

Establishment (scheduled): First half of 2012

Location: Shanghai area

4) Enhancing the Strengths of Ongoing Projects

Projects primarily in the Mineral Resources and Smelting & Refining segments, will each start contributing to business performance from FY2012.

[Status of Progress]

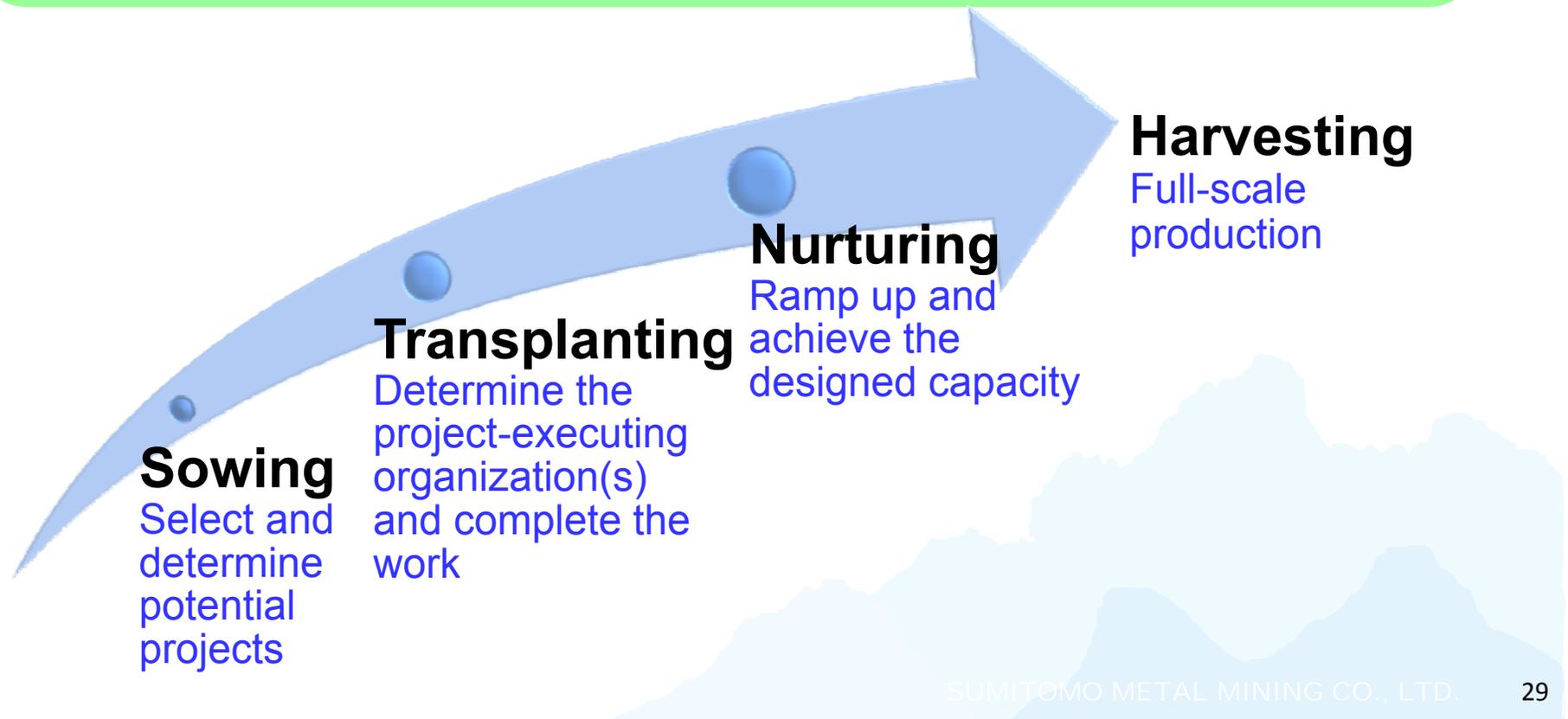
Mineral resources-related projects: Favorable

Taganito project: Under preparation for resuming construction work

| | Project | 09 3-Yr | 12 3-Yr | | | 15 3-Yr | |
|---------------------|---|---------|---------|------|------|---------|------|
| | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Mineral Resources | Sierra Gorda Project | | | ○ | | | ○ |
| | Cerro Verde Expansion | | | | | ○ | |
| | Morenci Expansion | | | ○ | | | |
| | Northparkes Expansion | | | | | ○ | |
| Smelting & Refining | Taganito Project | | ○ | | | | |
| | Electrolytic Ni production capacity reinforcement | | ○ | | | | |
| | Goro Project | ○ | | | | | |

5) Enterprise Value Committee

- ◆ Preparing and overseeing large-scale projects with a long-term vision
- ◆ Screening of appropriate “sowing” projects from among the new large-scale project candidates
- ◆ Confirming progress by project from “sowing” to “harvesting” on an ongoing basis

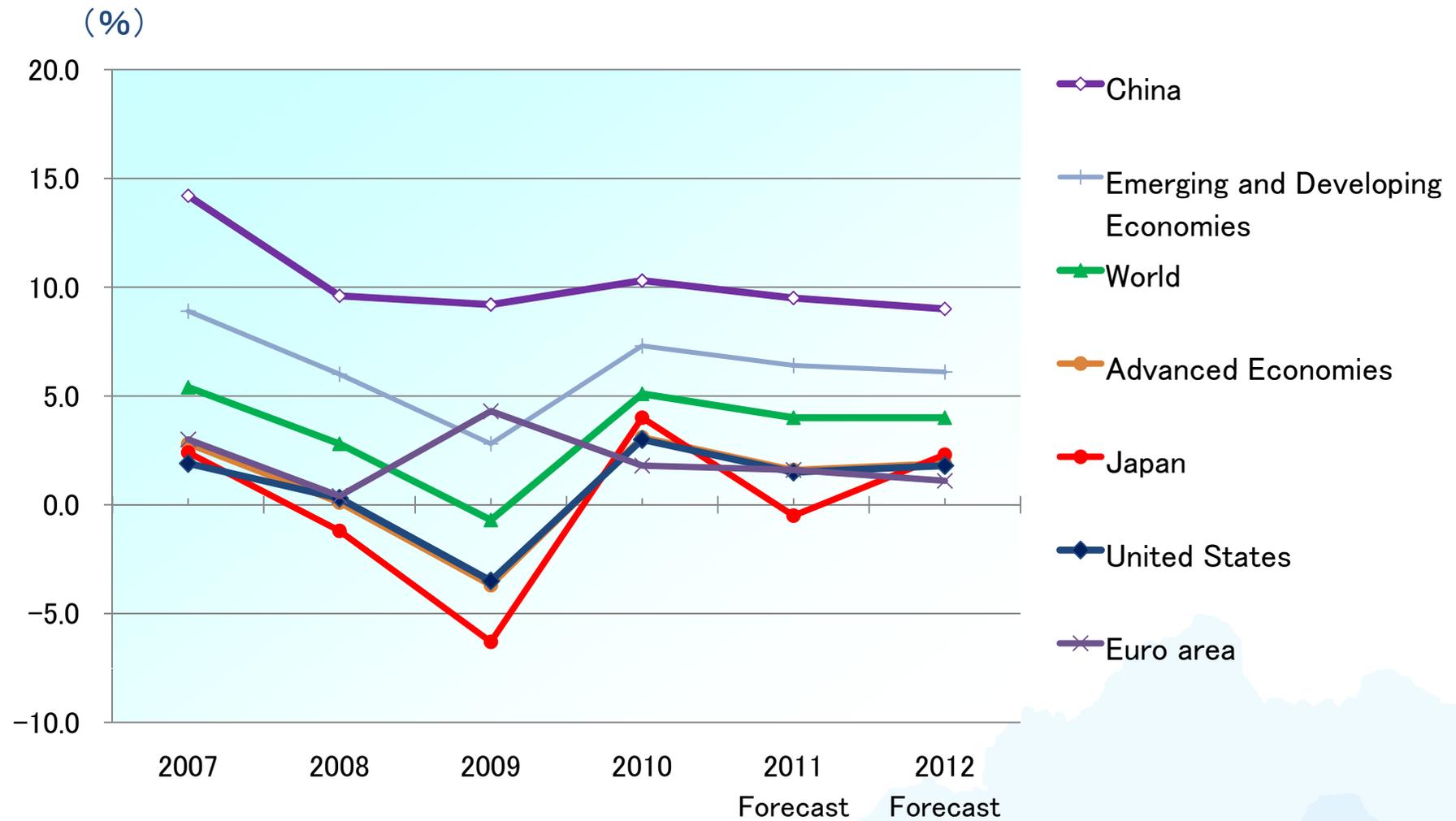


IV. External Environment



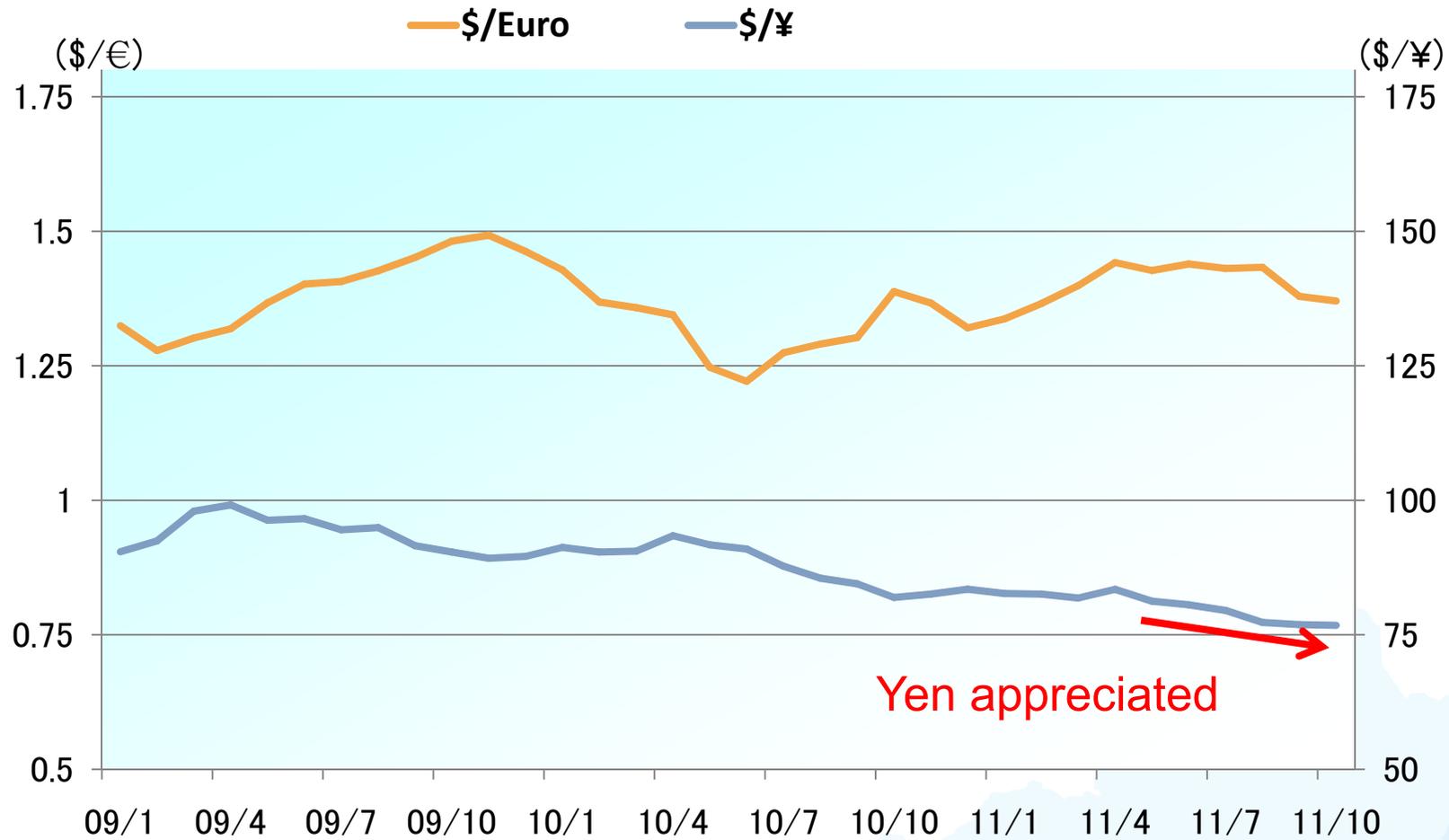
Gold

1) GDP Outlook

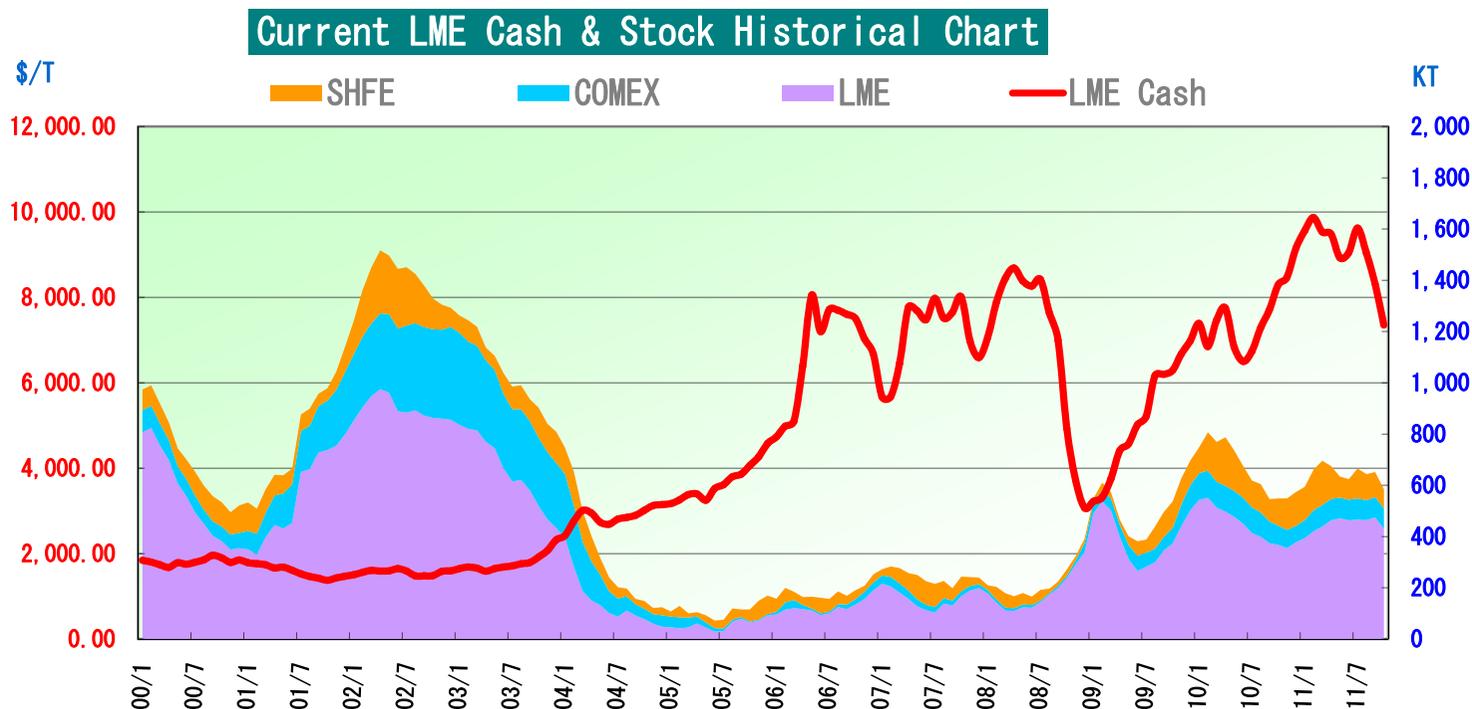


(IMF2011/Sep.)

2) Foreign Exchange trend

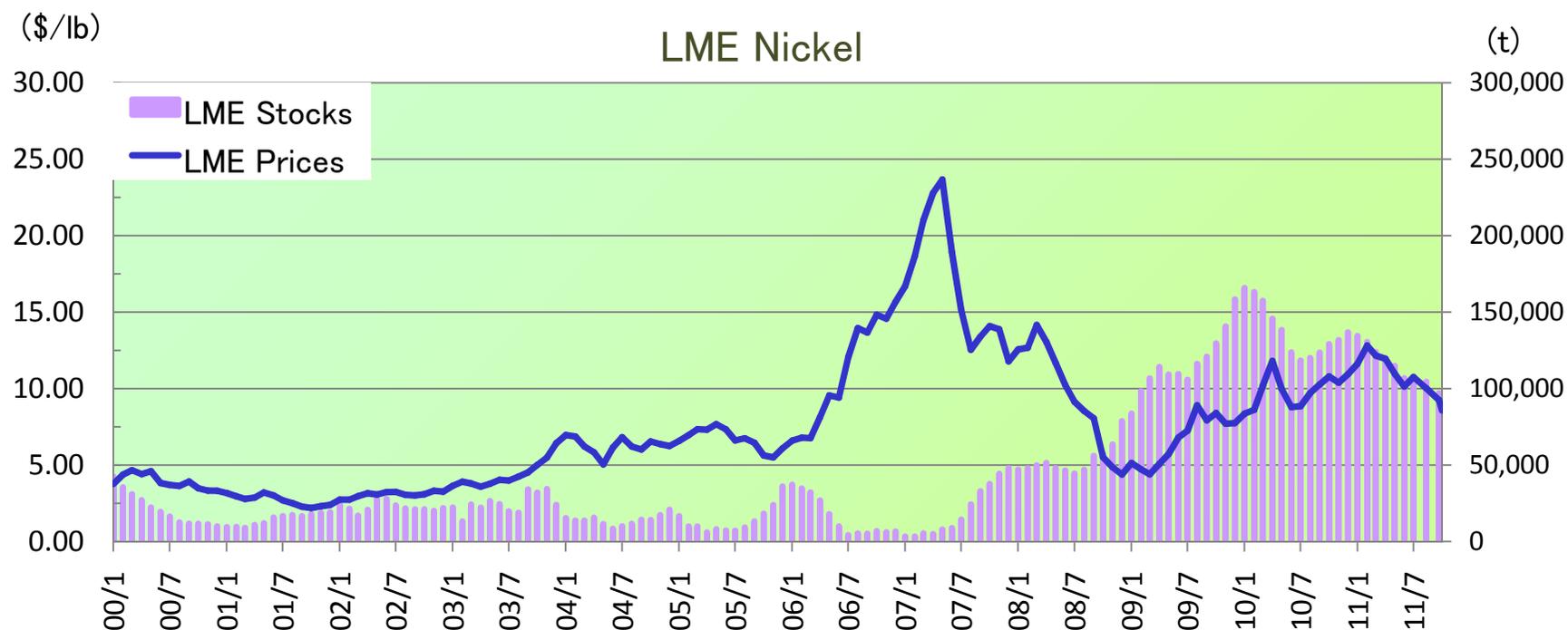


3) Copper – Supply & demand balance



| (kt) | ICSG | | | Macquarie | | |
|------------------|--------|--------|--------|-----------|--------|--------|
| | 2010 | 2011 | 2012 | 2010 | 2011 | 2012 |
| Production | 19,035 | 19,475 | 20,136 | 18,835 | 19,427 | 20,465 |
| Consumption | 19,386 | 19,676 | 20,392 | 19,057 | 19,851 | 20,642 |
| Balance | △ 351 | △ 201 | △ 256 | △ 222 | △ 424 | △ 177 |
| Estimated Timing | 2011.9 | | | 2011.10 | | |

4) Nickel – Supply & demand balance



| (Kt) | SMM | | | INSG | | | Macquarie | | |
|------------------------|--------|--------|--------|--------|-------|-------|-----------|--------|--------|
| | 2010 | 2011 | 2012 | 2010 | 2011 | 2012 | 2010 | 2011 | 2012 |
| Output | 1,425 | 1,577 | 1,692 | 1,439 | 1,596 | 1,740 | 1,434 | 1,603 | 1,732 |
| Consumption | 1,488 | 1,566 | 1,638 | 1,479 | 1,571 | 1,667 | 1,492 | 1,608 | 1,697 |
| Balance | △ 63 | 11 | 54 | △ 40 | 24 | 73 | △ 58 | △ 5 | 35 |
| Estimated Timing | 2011.9 | | | 2011.9 | | | 2011.10 | | |
| Ni Pig Iron (Included) | 170 | 220 | 235 | — | — | — | 159 | 263 | 255 |
| Stainless steel | 31,785 | 32,797 | 34,604 | — | — | — | 32,254 | 34,488 | 36,951 |

5) Au – Price

(\$/Toz)

London Au Prices



Public gold reserves by country
(Aug. 2011)

| | Sectors | Gold reserves (t) | Gold / foreign reserves (%) |
|----|-------------|-------------------|-----------------------------|
| 1 | USA | 8,134 | 74.2% |
| 2 | Germany | 3,401 | 71.4% |
| 3 | IMF | 2,814 | – |
| 4 | Italy | 2,452 | 71.2% |
| 5 | France | 2,435 | 66.2% |
| 6 | China | 1,054 | 1.6% |
| 7 | Switzerland | 1,040 | 17.8% |
| 8 | Russia | 837 | 7.7% |
| 9 | Japan | 765 | 3.3% |
| 10 | Netherlands | 613 | 58.9% |
| 11 | India | 558 | 8.7% |

V. Financial Highlights and Information Materials



Nickel Sulfate



Nickel Chloride



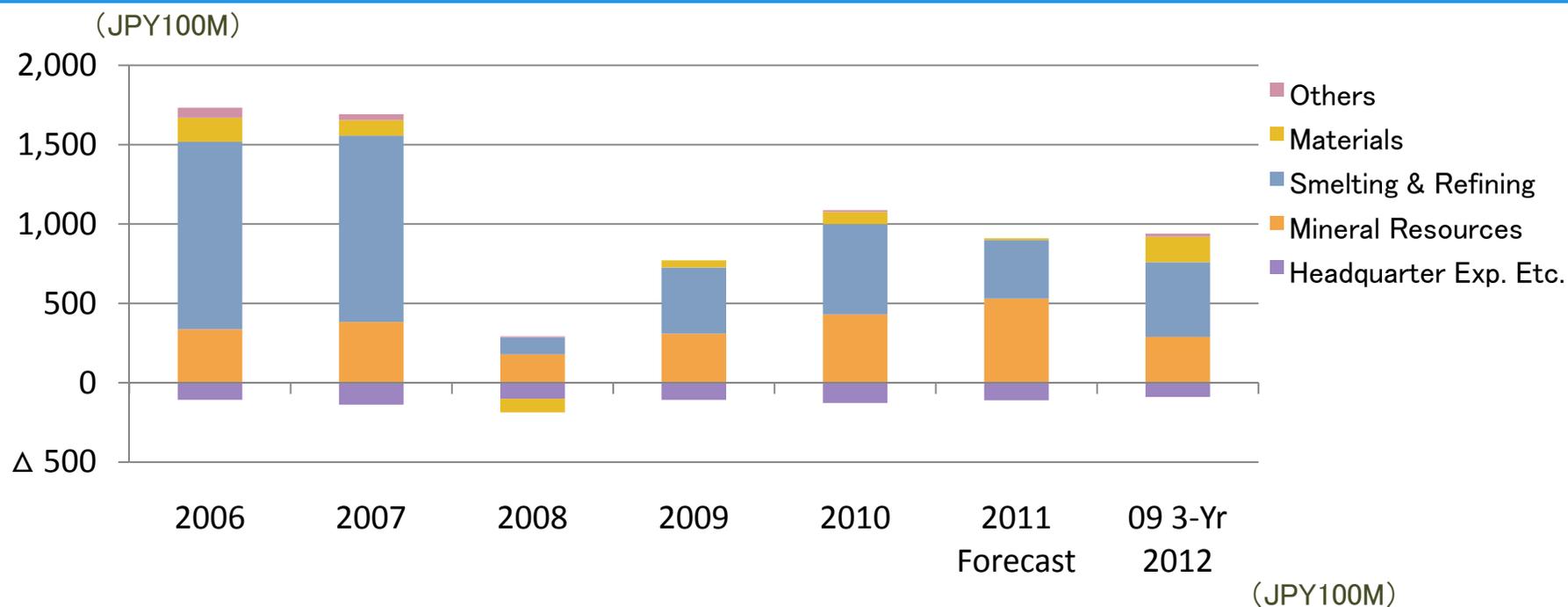
Electrolytic Cobalt

1) Trends of financial summary

(JPY100M)

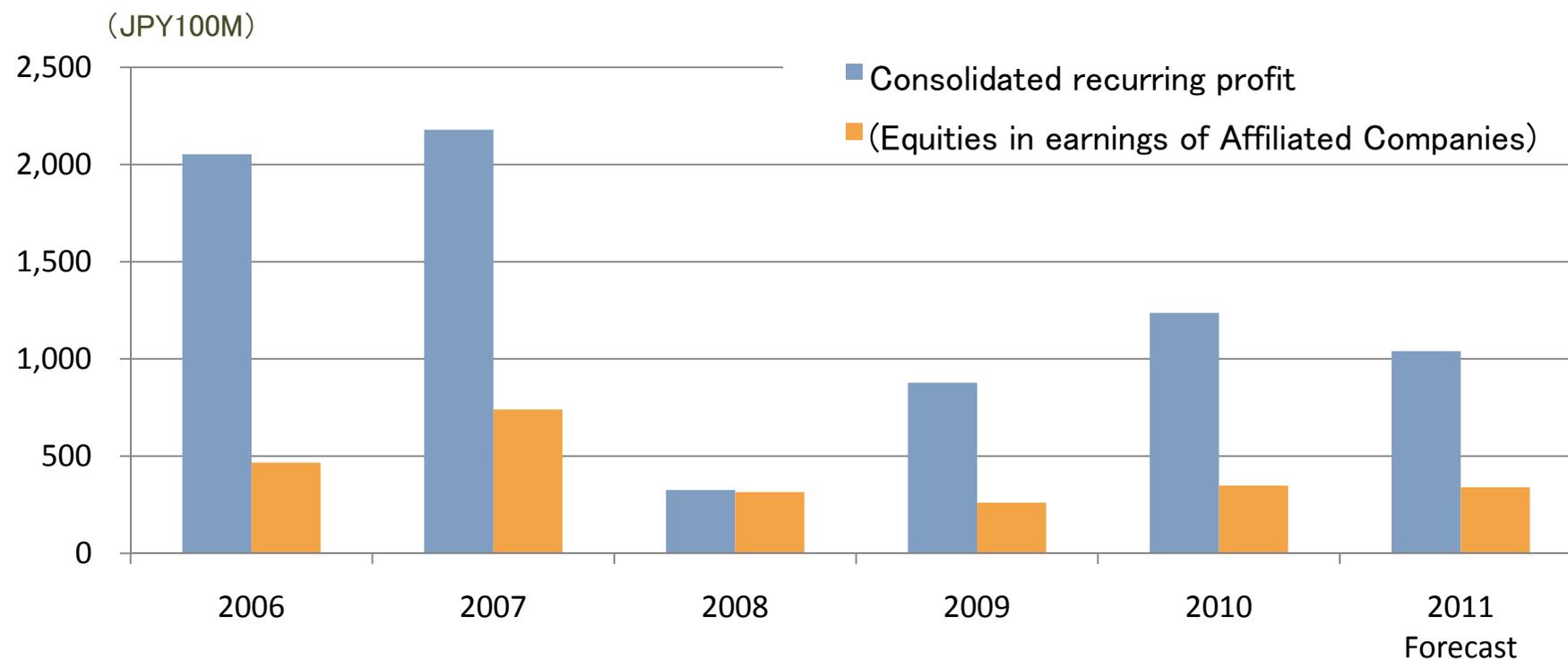
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 Forecast | 09 3-Yr 2012 |
|-----------------------|-------|--------|-------|-------|-------|------------------|-----------------|
| Net Sales | 9,668 | 11,324 | 7,938 | 7,258 | 8,641 | 8,150 | 7,800 |
| Operating Income | 1,626 | 1,554 | 105 | 663 | 960 | 800 | 850 |
| Recurring Profit | 2,053 | 2,179 | 326 | 878 | 1,237 | 1,040 | 1,100 |
| Equity Method profit | 467 | 740 | 315 | 261 | 348 | 330 | 300 |
| Net Income | 1,261 | 1,378 | 220 | 540 | 840 | 670 | 700 |
| ROA(%) | 14.8 | 13.6 | 2.2 | 5.8 | 8.3 | - | 6 |
| ROE(%) | 29.0 | 25.4 | 4.0 | 9.9 | 13.8 | - | 10 |
| Dividend Per Share(¥) | 27.0 | 30.0 | 13.0 | 20.0 | 32.0 | 32.0 | N/A |
| Copper (\$/t) | 6,970 | 7,584 | 5,864 | 6,101 | 8,140 | 8,536 | 6,000 |
| Nickel (\$/lb) | 14 | 15.5 | 7.5 | 7.7 | 10.7 | 9.8 | 8.0 |
| Gold (\$/Toz) | 629 | 766 | 867 | 1,023 | 1,294 | 1,627 | 1,000 |
| Zinc (\$/T) | 3,579 | 2,986 | 1,560 | 1,934 | 2,187 | 2,120 | 2,000 |
| Exchange(¥/\$) | 117.0 | 114.4 | 100.7 | 92.9 | 85.7 | 77.4 | 90.0 |

2) Operating income by segment



| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 Forecast | 09 3-Yr 2012 |
|---------------------|-------|-------|-------|-------|-------|------------------|-----------------|
| Mineral Resources | 337 | 383 | 179 | 309 | 430 | 530 | 290 |
| Smelting & Refining | 1,181 | 1,174 | 107 | 417 | 569 | 370 | 470 |
| Materials | 152 | 98 | Δ 87 | 45 | 78 | 10 | 160 |
| Others | 63 | 37 | 6 | Δ 1 | 10 | 0 | 20 |
| Sub-total | 1,733 | 1,692 | 205 | 770 | 1,087 | 910 | 940 |
| Headquarter Exp.etc | Δ 107 | Δ 138 | Δ 100 | Δ 107 | Δ 127 | Δ 110 | Δ 90 |
| Total | 1,626 | 1,554 | 105 | 663 | 960 | 800 | 850 |

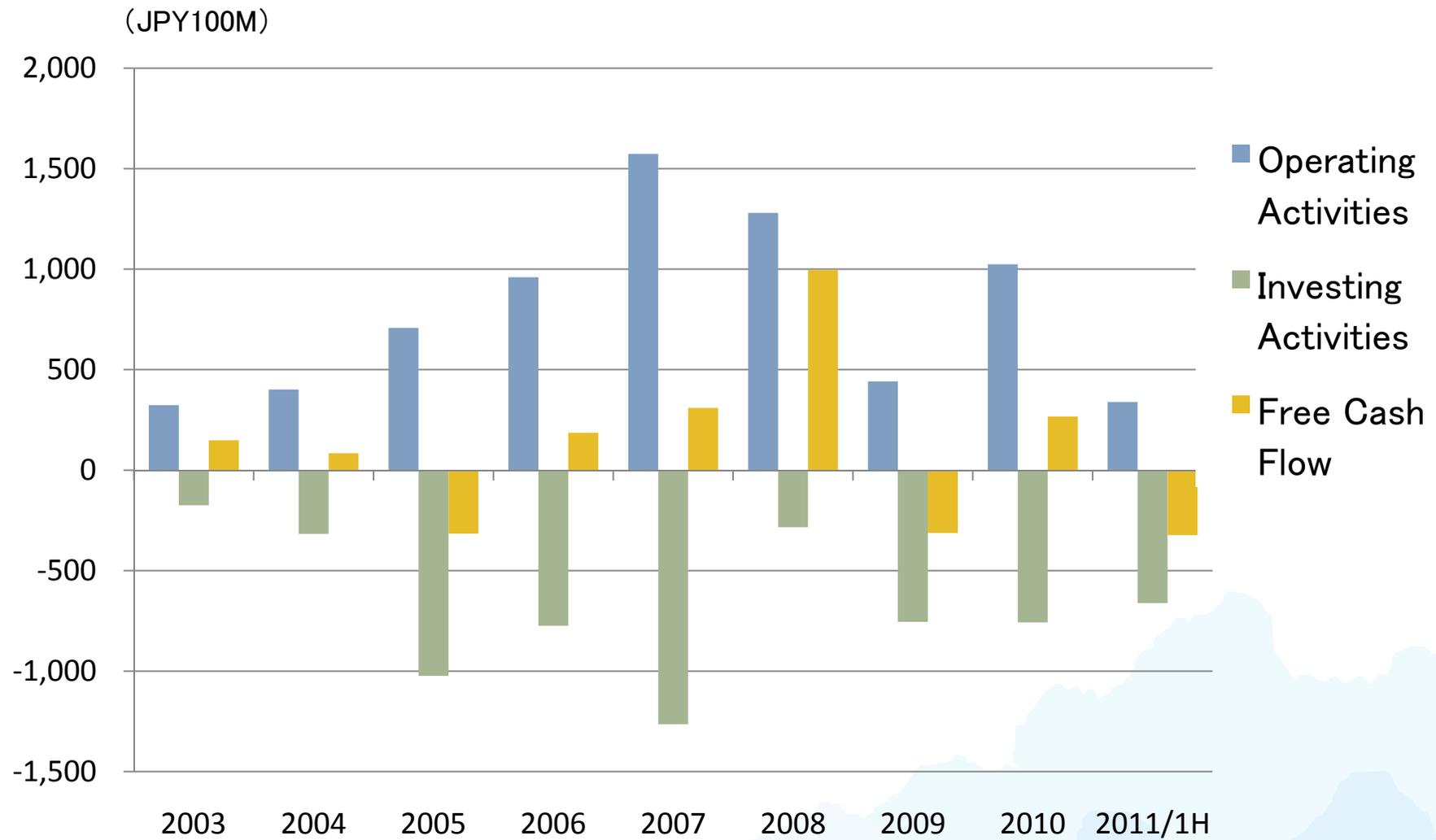
3) Earnings from Equity in affiliated Companies



(JPY100M)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 Forecast |
|--|-------|-------|------|------|-------|---------------|
| Consolidated recurring profit | 2,053 | 2,179 | 326 | 878 | 1,237 | 1,040 |
| (Equities in earnings of Affiliated Companies) | 467 | 740 | 315 | 261 | 348 | 330 |

4) FCF



5) Sensitivity

JPY100M/Year

| | Fluctuation | FY2011 Profit up/down |
|--------|-------------|--------------------------|
| Cu | ±100 \$ /t | 5/10 |
| Ni | ±10 ¢ /lb | 7/9 |
| Au | ±10 \$ /Toz | 4/4 |
| ¥ / \$ | ±1 ¥/\$ | 12/12 |

(Remarks)

Operating income/Recurring profit

USD/JPY translation applied to RC-related only.

(Overseas profit effects excluded).

6) Glossary

Mineral resources and metals

1) Metal trading

London Metal Exchange (LME)

The LME specializes in trading of non-ferrous metals such as copper, nickel, aluminum, lead and zinc. The LME trading prices for metals are used as the international pricing benchmarks for sales of refined metal and purchases of refining ores.

TC/RC

Treatment Charge (TC) and Refining Charge (RC) are commonly used in the terms of purchase for copper concentrate or nickel ore for refining. They are amounts designed to cover refining costs. For example, copper concentrate contracts may define a purchase price based on the LME price at a certain date, minus the TC or RC being used at the time.

London fixing

Gold is not traded on the LME. Its price is determined for each transaction between market participants. The financial institutions in the London Bullion Market Association (LBMA) agree a standard price for gold based on these transactions and publish it on the morning and afternoon of each trading day. This "London fixing" price is the benchmark for trading in gold.

Pound (lb)

Part of the imperial system of measures, the pound is the standard unit of weight used in measuring and pricing base metals such as copper and nickel, and in TC/RC calculations. One pound is equal to 453.59 grams; an imperial ton equals 2,204.62lb.

Troy ounce (toz)

The troy ounce is the standard unit of weight for precious metals such as gold and silver. It equals approximately 31.1 grams. It is named after Troyes, a city in the Champagne region of central France that was the site of a major market in Europe in medieval times. Originally used as a unit of exchange for valuing goods in terms of gold or silver weights, the troy ounce is still used today in gold trading.

2) Metal refining

Smelting and refining

Refining processes extract valuable metals from ores or other raw materials. They fall into two basic types: hydrometallurgical (wet) and pyrometallurgical (dry). At SMM's Toyo facilities in Ehime Prefecture, the copper concentrate pre-processing undertaken at Saijo uses pyrometallurgical processes and the nickel refining at the Niihama site uses hydrometallurgical processes entirely. The term 'smelting' is used for the extraction of metal from ores using melting and heating (pyrometallurgy). The term 'refining' refers to any process that increases the grade or purity of a metal.

Pyrometallurgical refining

The precursor ore is melted at high temperature in a furnace, and refining techniques are applied to separate the metal in a molten state. Although large amounts of ore can be processed at one time, the equipment needs periodic maintenance for heat proofing.

Hydrometallurgical refining

The ore and impurities are dissolved in a solution, and chemical reactions are used to separate out the metal. This approach allows continuous and stable refining, but incurs additional costs due to the refining chemicals consumed.

3) Metal ores

Sulfide ores

These ores contain copper, nickel or other metals chemically bonded to sulfur. Since the application of heat breaks these bonds, releasing the sulfur, such ores are generally refined using pyrometallurgical techniques.

Oxide ores

These ores contain metals in oxidized forms. Unlike sulfide ores, oxides need much more energy to achieve melting. For this reason, the hydrometallurgical approach is generally used to refine these ores.

Copper concentrates

Used as raw materials in copper smelting, copper concentrates have a copper content of about 30% by weight. The remainder consists mostly of sulfur and iron. Copper concentrates are made mostly from sulfide ores. Ores extracted from overseas mines have a typical grade of about 1%. The ores are then "dressed" at the mine to increase the purity and produce concentrate. Most of the copper ores imported by SMM for smelting in Japan are concentrates.

Nickel oxide ores

Whilst the higher-grade sulfide ores are used predominantly in nickel refining, nickel oxide ores are more prevalent than nickel sulfides. The sulfide-oxide ratio in current nickel reserves is believed to be about 3:7. High refining costs and technical issues have limited use of oxide ores in nickel refining to date, but SMM has succeeded in refining nickel from low-grade oxide ores based on HPAL technology.

Mixed sulfide (MS) ores

CBNC produces a mixed nickel-cobalt sulfide intermediate containing about 60% nickel by weight. This is used as a raw material in electrolytic nickel production.

Matte

A matte is another term for metal sulfides. For raw material, electrolytic nickel production at SMM also uses a nickel matte (of about 75-80% purity) sourced from PT Inco.

Proprietary ore ratio

This ratio is the proportion by volume of ore procured from overseas mining interests relative to the overall volume of smelting ores used as raw materials. Typically, off-take rights are proportional to the equity interest in a mine. In the case of Cerro Verde, SMM has secured 50% off-take rights for the first ten years of production from 2006, based on a 21% equity interest.

6) Glossary

4) Nickel production process

Coral Bay Nickel Corporation (CBNC)

Based in the Philippines, this SMM subsidiary produces mixed nickel-cobalt sulfides using HPAL technology and exports the raw materials to the SMM Group's nickel refining facilities in Niihama, Ehime Prefecture.

High Pressure Acid Leach (HPAL)

HPAL technology enables the recovery of nickel from nickel oxide ores that traditionally were difficult to process. SMM was the first company in the world to apply it successfully on a commercial scale. The oxide ores are subjected to high temperature and pressure and reacted under stable conditions with sulfuric acid to produce a nickel-rich refining intermediate.

Matte Chlorine Leach Electrowinning (MCLE)

MCLE is the technology used in the manufacturing process at SMM's nickel refinery. The matte and mixed sulfide ores are dissolved in chlorine at high pressure to produce high-grade nickel using electrolysis. MCLE is competitive in cost terms, but poses significant operational challenges. Other than SMM, only two companies are producing nickel based on this kind of technology.

5) Main applications for metals

Copper

Copper is fabricated into wires, pipes and other forms. Besides power cables, copper is used widely in consumer applications such as wiring in vehicles or houses, and in air conditioning systems.

Electrolytic nickel

This form of nickel, which has a purity of at least 99.99%, is used in specialty steels, electronics materials and electroplating, among other applications. SMM is the only producer of electrolytic nickel in Japan.

Ferronickel

Ferronickel is an alloy containing nickel (about 20%) and iron. Its main use is in the manufacture of stainless steel, which is about 10% nickel by weight. Based in Hyuga, Miyazaki Prefecture, SMM Group firm Hyuga Smelting produces ferronickel.

Gold

Gold is in demand worldwide for investment and decorative purposes. Gold is widely used in Japanese industry within the electronics sector because of its high malleability and ductility. Part of SMM's gold production goes to SMM Group companies engaged in fabricating and selling bonding wire.

Semiconductor and advanced materials

Copper-clad polyimide film (CCPF)

CCPF is a polyimide film that is coated using a copper base. It is used as a material for making COF substrates. SMM commands a global market share of over 70% of the CCPF supplied for use in large liquid crystal displays.

Chip-on-film (COF) substrates

COF substrates are electronic packaging materials used to make integrated circuits for LCD drivers. They connect these circuits to the LCD panel.

Lead frames (L/F)

Lead frames are electronic packaging materials used to form connections in semiconductor chips and printed circuit boards. They contain thin strips of a metal alloy containing mostly nickel or copper.

Bonding wire

Composed of gold wire that is just a few micrometers thick, bonding wire is used to make electrical connections between lead frames and the electrodes on semiconductor chips.

Secondary batteries

Secondary batteries are ones that can be recharged and used again. SMM supplies battery materials that are used in the anodes of nickel metal hydride batteries and lithium-ion rechargeable batteries, which supply power for hybrid vehicles or notebook computers, among other consumer applications.

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