



JOGMEC's Role in Securing the Supply of Critical Minerals

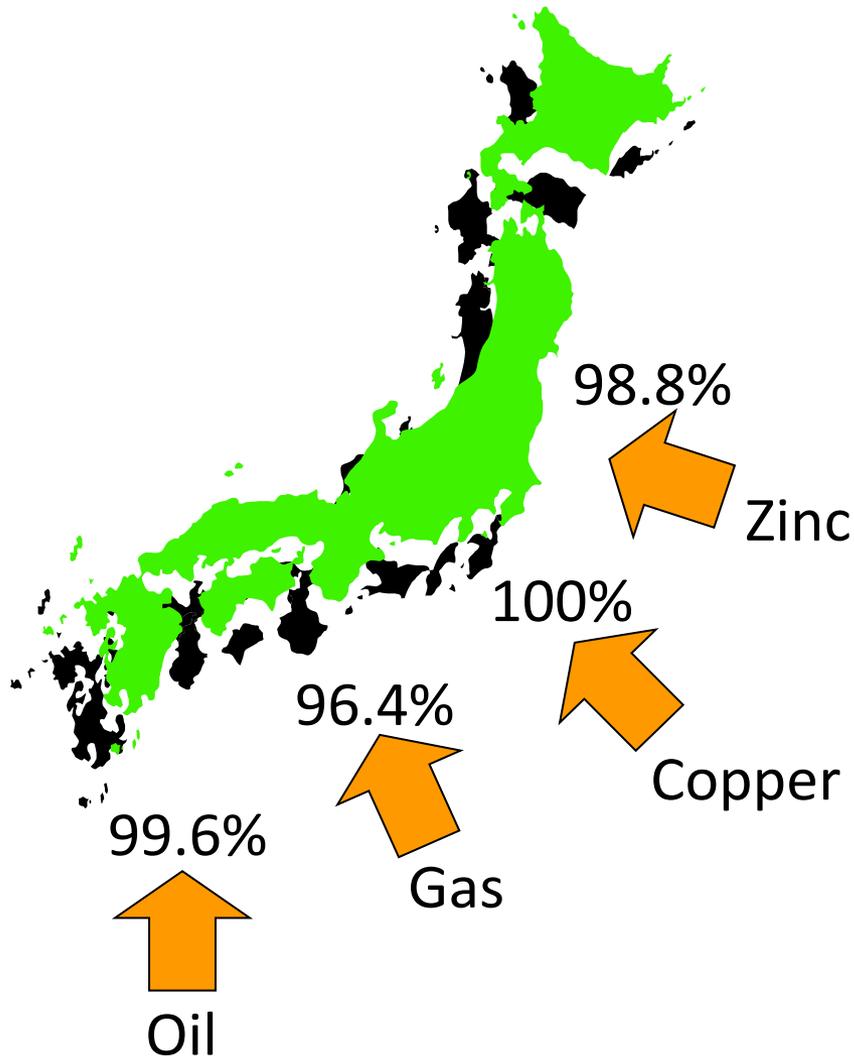
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Alaska Strategic & Critical Minerals Summit 2012
November 30, 2012

Japan Oil, Gas and Metals National Corporation

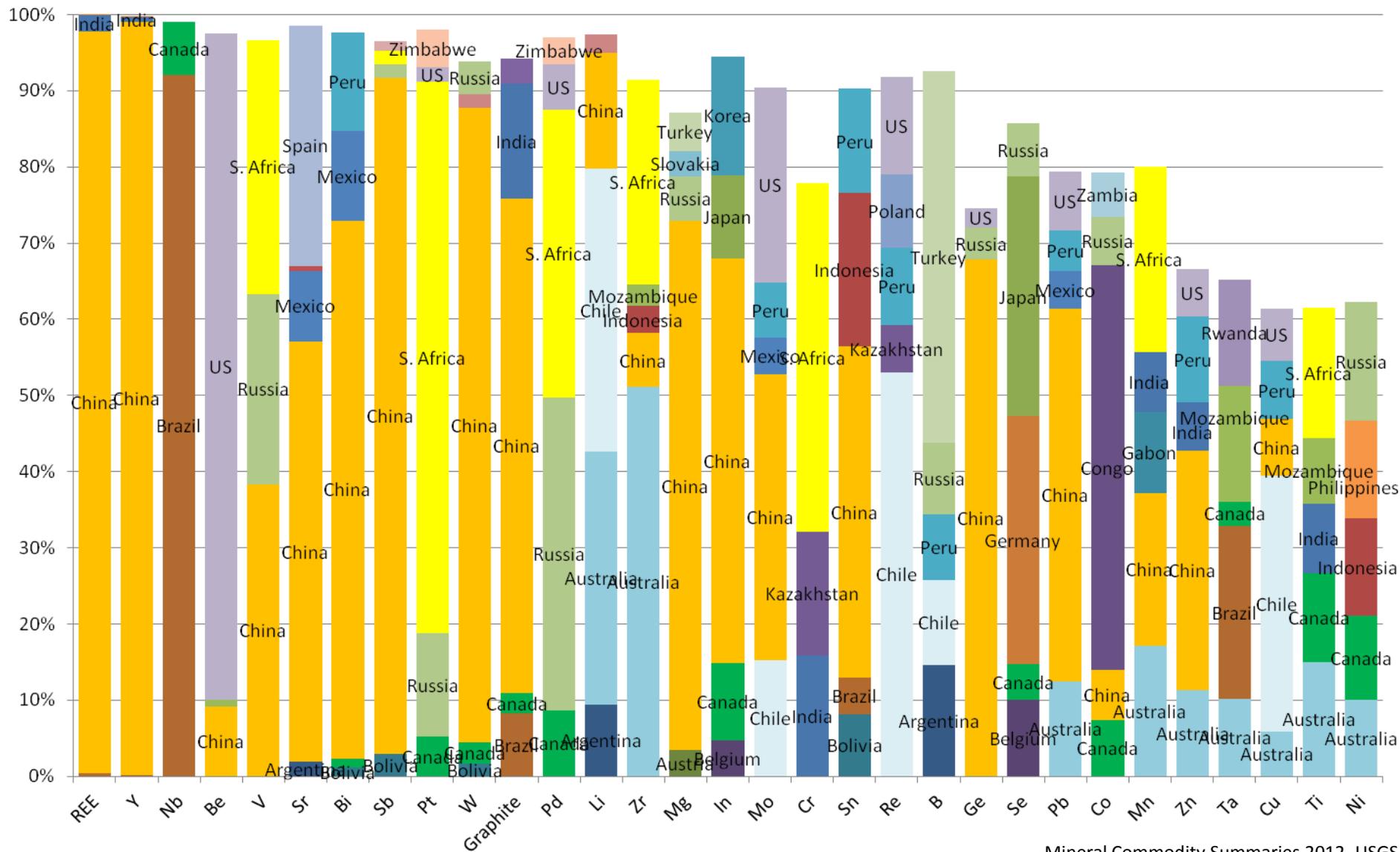
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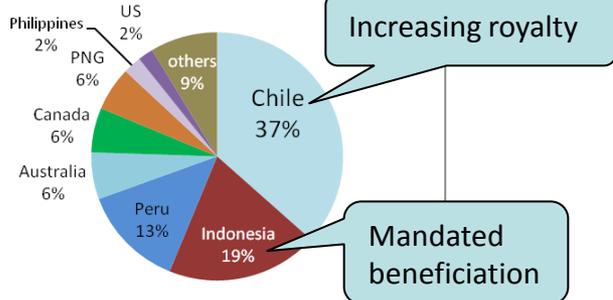
- Since Japan has few domestic natural resources, Japan depends on imports for almost all of its crude oil, natural gas, non-ferrous metals and minerals.

Where do those natural resources come from?

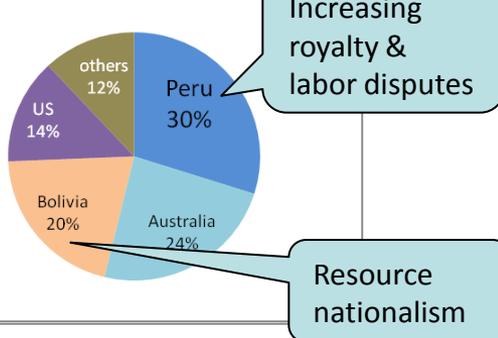
Top 5 World Production Countries



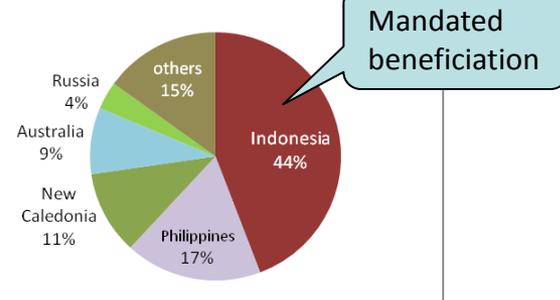
Copper (1,701.8kt)



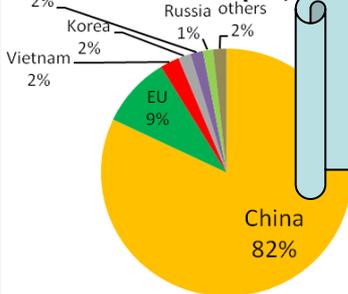
Zinc (541.5kt)



Nickel (248.7kt)



Rare Earth (24,035t)



Antimony (13,158t)



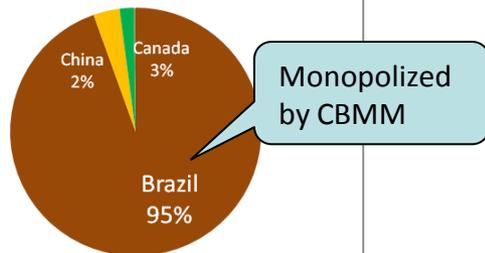
Tungsten (8,927t)



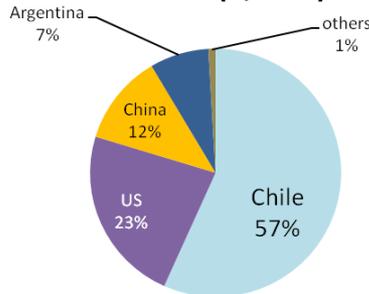
Urgency to diversify stable supply sources for strategic & critical minerals

Export restriction

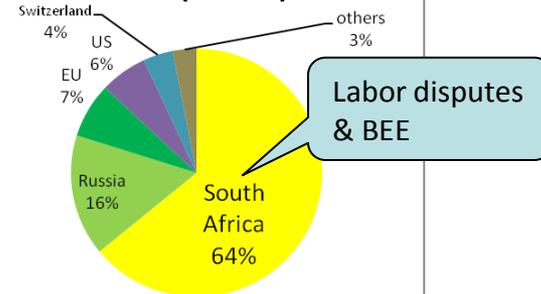
Niobium (5,183t)



Lithium (3,649t)



PGM (138.2t)



Ministry of Economy, Trade and Industry (METI) compiled “**Strategy for Ensuring Stable Supplies of Rare Metals**” in July 2009.

1. Securing Overseas Resources
2. Recycling
3. Development of Alternative Materials
4. Stockpiling

JOGMEC is one of the governmental entities to assume the above strategic principles.

- Japan Oil, Gas and Metals National Corporation (JOGMEC), an incorporated **administrative agency**, is established by the Japanese government.
- The principal role of JOGMEC is to seek a **stable supply of natural resources** for Japanese industry as an agency implementing natural resource policies under jurisdiction of METI.

Since 1963

Metal Mining Agency of Japan
(MMAJ)

Since 1967

Japan National Oil Corporation
(JNOC)

February 2004

**Japan Oil, Gas and Metals National Corporation
(JOGMEC)**

Coal & Geothermal units just added!

Headquarter: Tokyo (600 ft from US Embassy!)

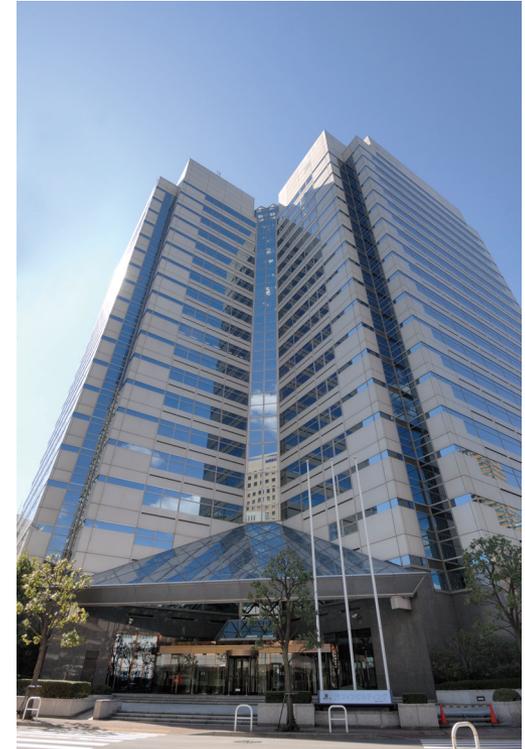
- **Metals Strategy & Exploration Unit**
- **Metals & Coal Financial and Environment Unit**
- **Stockpile Unit**
- Oil & Gas Upstream Business Unit
- Oil & Gas Upstream Technology Unit
- Geothermal Resource Development Dept.

Two research centers in Japan

- **Metals Technology Center**
- Technology & Research Center (oil and gas)

Worldwide network

- 13 overseas offices gathering relevant information
 - **Vancouver office** responsible for metals-related activities in US & Canada



1. Securing Overseas Resources

- Promotion of Early-Stage Exploration
- Support for Advanced-Stage Project

2. Recycling

- Developing Recovering Technologies for Recycling

3. Development of Alternative Materials

4. Stockpiling

- Stockpiling Program of Rare Metals

- Take early-stage risks to promote overseas explorations
- Program
 - Typical joint venture style exploration
 - Farming into an exploration project held by a foreign company, then transferring JOGMEC’s contractual interest to a Japanese company

- Target commodities

- Base metals (Cu, Zn, Pb,...)
- Rare metals (Ni, PGE, Co, REE, Li, W,...)
- Uranium

H																			He
Li	Be										B	C	N	O	F			Ne	
Na	Mg										Al	Si	P	S	Cl			Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br		Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I		Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At		Rn	
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg									

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Ytterby REE project



- Joint venture project with Montreal-based exploration company, **Midland Exploration Inc.**, since February 2010.
- JOGMEC earns a 50% interest of the project.
- The Ytterby project consists of 4 properties, **situated in Quebec, and Newfoundland and Labrador.**
- The property in Quebec lies next to the **Strange Lake deposit** which is **abundant in Heavy Rare Earth Elements (HREE).**
- Project can be expected HREE rich deposits.



- Financial support to **Japanese companies** for overseas mineral explorations or development projects
- Programs
 - Financing for overseas explorations
 - Funding part of the equity capitals
 - Guaranteeing the liabilities
- Target commodities
 - Base metals
 - Rare metals
 - Uranium
 - Iron, Aluminum

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg							

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

- **Financing**
 - MAN PGM exploration project
 - Simbol's geothermal lithium brine project
- **Equity participation**
 - Ivanplats' Platreef PGM-Ni project
 - CBMM's Araxa niobium mine
 - Lynas's Mt. Weld REE project
- **Liability guarantees**
 - Endako molybdenum mine
 - Olaroz salar lithium project



- Metallurgical technologies of rare metals
 - Recovery from low grade ores / mine residues / tailings
 - Bio-leaching
- Recycling technologies from wasted materials
 - Reuse of wasted glass polishing powder
 - Recovery of rare metals from wasted fluorescent lamps
- Technical support on issues of Japanese company's practical operation
- Sea bottom mining technologies
 - Built resource research vessel "HAKUREI" 白嶺

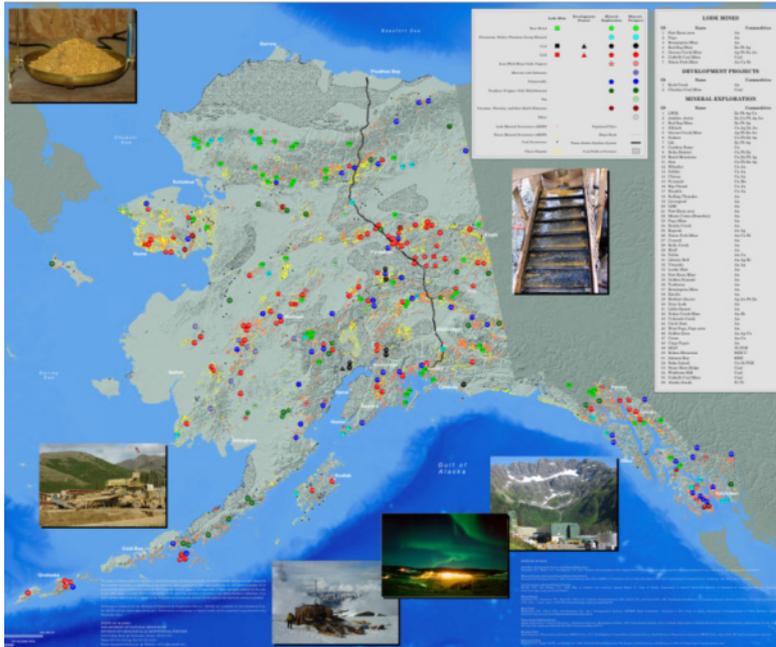
- Research & Analysis
 - Mineral Resources Investment Seminar (co-held by DNR & JOGMEC @ Tokyo, November 2006)
 - Alaska Mining Investment Climate Analysis Report (published in February 2007)
- Support for Japanese companies' activities
 - Regional exploration (1994-2001) incl. Pogo area (developed by Sumitomo later)
 - Loan to Itochu for MAN project (2008-2011)



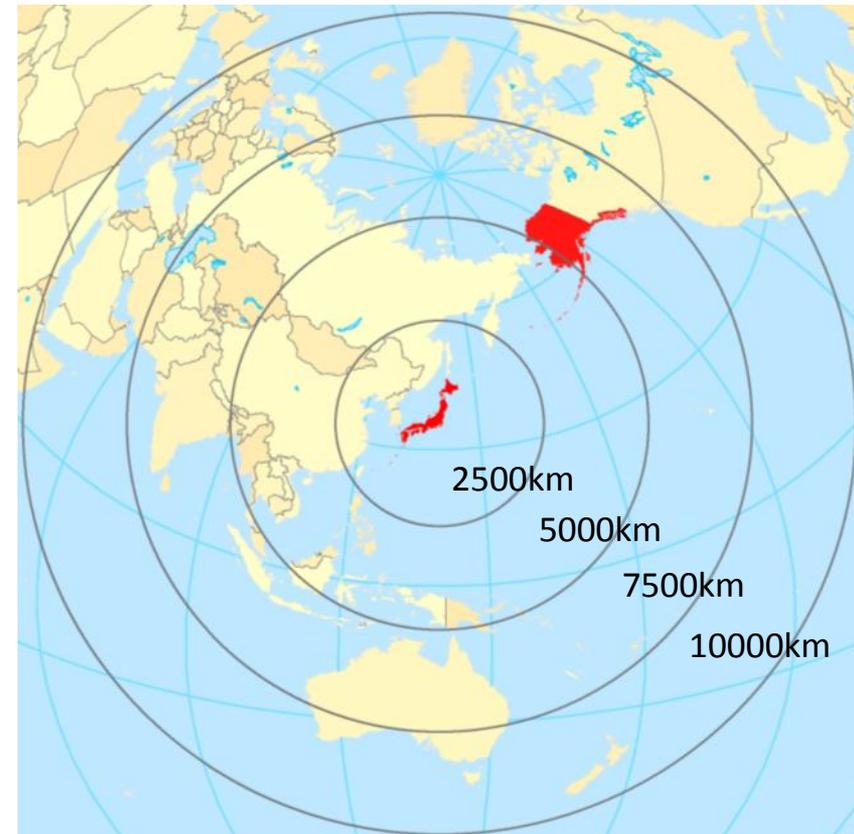
What is next...

- **Attractiveness**

- Significant mineral potential (Cu, Au, Zn, Mo, PGM, REE, Sb, W,...)
- Mining-friendly jurisdiction (Tax incentive, AIDEA, ...)
- Skilled/educated/trained mine workers
- Well-established native land system
- Shorter transportation to Japan

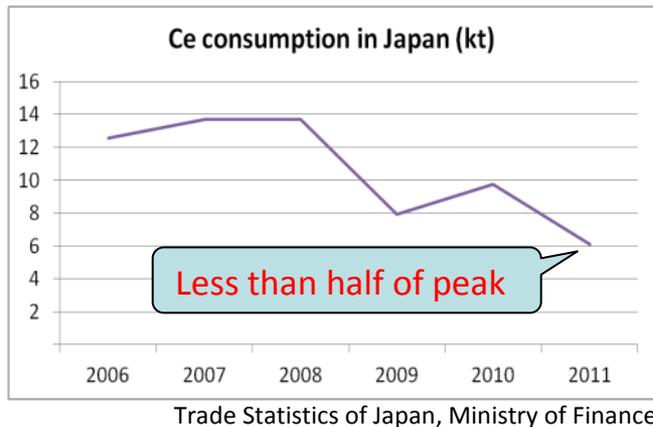


Alaska's Mineral Resources – 2012, DNR DGGs



- Concerns

- Lack of infrastructures (road, power, port)
 - High capex increases investment risks
- Lengthy & unpredictable permitting process
 - Unpredictable process might lose market opportunity since strategic minerals market is changing rapidly



Private Sector's R&D Activities Reducing REE-related Risks

Hitachi Ltd. (News Release - 11 Apr. 2012)
Highly efficient industrial 11kW permanent magnet synchronous motor without rare-earth metals

Toshiba Corp. (News Release - 16 Aug. 2012)
Toshiba Develops Dysprosium-free Samarium-Cobalt Magnet to Replace Heat-resistant Neodymium Magnet in Essential Applications
and **More ...**

- EPA's pre-empt action towards Pebble Cu-Au project
 - Hampering in pre-application incurs depression of mining investment



- Climate change may commercialize arctic shipping routes in far future.
- Both Northwest Passage & Northern Sea Route pass Bering Strait.
- Alaska lies in strategic location of the arctic shipping routes.

- JOGMEC is a governmental agency seeking to ***stable supplies of natural resources*** for Japan.
- In order to secure the supply of mineral resources, our activities related to non-ferrous metals are:
 - Overseas explorations,
 - Enforcement of R&D related to recycling, and
 - Rare metals stockpiling.
- JOGMEC's support programs can contribute to the diversification of supply sources of critical minerals.
- Alaska is one such attractive mining investment venue, despite of several concerns.



*Thank you for your
attention*

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