

WHY HAS JAPAN REVISED THE MINING ACT? — HISTORICAL AND CONTEMPORARY BACKGROUND —

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I. *Introduction*

This paper examines why the Japanese government made an overall revision of the Mining Act in 2011 for the first time since World War II.

In Japan, the original Mining Act was enacted in 1950. Under the original law, there was no regulation to check whether applicants have adequate technology, financing, track records and exploration and development plans. Projects were automatically approved on a first-come-first-served basis, resulting in companies receiving approval before better-qualified firms could apply. By the end of March 2010, the Japanese government had granted 8,179 exploration rights. Of the total, 81% remained undeveloped.

Total recoverable natural resources in sea-floor hydrothermal deposits within Japan's exclusive economic zone (EEZ) are estimated at 300 trillion yen (3.3 trillion dollars) as of December 2008. The revision of 2011 included a stricter approval process, a new tender system and a mechanism to monitor projects from the start of exploration and test drilling. The revised act may favor major oil and metals exploration companies in Japan such as Inpex Corp., Japan Petroleum Exploration Co., JX Holdings Inc., and Sumitomo Metal Mining Co. The state-owned Japan Oil, Gas and Metals National Corp. (JOGMEC) helps these domestic companies financially.

This paper first examines the history of Japan's mining resources policies, and secondly analyses the contemporary background of the 2011 revision of the Mining Law. It also makes an international comparison of mining law regulations among Norway, the U.S.A., the U.K., Australia and Japan.

II. *Historical Overview of Japan's Mining Resources Policy*

1. The 1972 Mine Subcommittee Report and Creation of the Metal Mining Agency of Japan

This chapter provides an overview of the development of Japan's mining resources policy after the 1970s, during which period the world experienced two oil crises.

The *Fundamental Direction for Future Mining Policy* report prepared by the Mining Industry Council Mine Subcommittee in June 1972 laid out the orientation for the Japanese

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TABLE 1. BASIC DIRECTIONS FOR MINING POLICY LAID OUT IN THE *FUNDAMENTAL DIRECTION FOR FUTURE MINING POLICY REPORT (1972)*

Theme	Policy
Approach to domestic mines	Position as a supply source for highly stable supply/Promote exploration
Approach to domestic smelters	Further improve earnings structure through independent efforts
Approach to overseas development	Independent exploration and development projects/ Position as economic cooperation (ODA)
Overseas ore transactions and stockpiling	Considerations toward resource exporting countries

Source: Japan Oil, Gas and Metals National Corporation (JOGMEC), *Base Metals: International Conditions and Changes in Japan's Mining Resources Policy* (2007).

government's mining resources policy from the 1970s. The same report mapped out the basic directions with regard to the four themes shown in Table 1: approach to domestic mines, approach to domestic smelters, approach to overseas development and overseas ore transactions and stockpiling.

In May 1973, a year after this report was released, the Act on Special Measures for Pollution Caused by the Metal Mining Industry, etc. was promulgated to address mine pollution from suspended or abandoned mines or other facilities, which had become a serious social problem (enforced July 1973). As the measures it would implement to address mine pollution based on this law are closely related to metal ore exploration and mine development, the government reorganized and expanded the existing Metallic Minerals Exploration Promotion Agency of Japan into the Metal Mining Agency of Japan (MMAJ) and adopted the policy of giving the revamped agency responsibility for all mining resources policies. MMAJ was launched in May 1963.

2. Four Pillars of Japan's Mining Resources Policy and JOGMEC's Succession to Their Management

Together with promoting mine pollution countermeasures based on the Act on Special Measures for Pollution Caused by the Metal Mining Industry, etc., in FY1974 MMAJ started an overseas exploration financing and investment system and a subsidy system for overseas joint geological structure surveys. It also began an import stabilization and stockpiling system in FY1976, and a rare metal stockpiling system in FY1983. Thus MMAJ came to serve as the main actor for all mining resources policies.

Based on the points described above, the following four key programs have existed as part of Japan's mining resources policy from the 1970s:

- (1) Promotion of domestic exploration to maintain the economic rationality of domestic mines, which are the most stable supply source of mining resources.
- (2) Support for overseas resource development activities and technical cooperation for resource development by developing countries in order to secure stable overseas mining resources.
- (3) Creation of a rare metals stockpiling system from the standpoint of national economic stability and security.

(4) Prevention of mine pollution from suspended or abandoned domestic mines.

Each of the activities of MMAJ, which promoted the mining resources policy comprised of these four programs, was succeeded to by Japan Oil, and Gas and Metals National Corp. (JOGMEC), which was created in February 2004. JOGMEC, an independent administrative agency, was formed through the integration of Japan National Oil Corporation and MMAJ. MMAJ was dissolved simultaneously with JOGMEC's launch.

The following sections look back on the development of mining resources policy in Japan, by exploring each of these main programs with the exception of (4) prevention of mine pollution.

3. Promotion of Domestic Exploration

MMAJ's predecessor, the Metallic Minerals Exploration Promotion Agency of Japan, first began undertaking precise geological structure surveys in FY1964, based on the thinking that domestic mines are the most stable supply source of mining resources and the idea that, if high-grade mines were discovered, they might retain their economic rationale even under severe global competition. Moreover, based on its opinion that in order to conduct domestic exploration more effectively it was necessary to undertake wide-area surveys as a preliminary step for precise geological structure surveys, in FY1966 the government consigned wide-area geological structure survey activities to the Metallic Minerals Exploration Financing Agency of Japan.

In 1966, the Mining Industry Council prepared the *First Domestic Exploration Long-term Plan* covering the six metallic minerals, copper, lead, zinc, manganese, gold and tungsten, and selected 28 regions as survey sites. The *Second Domestic Exploration Long-term Plan*, which newly included 25 additional regions in the survey sites, was prepared in 1973. The domestic mine surveys and exploration were implemented through a three-stage process, beginning with wide-area geological structure surveys and then proceeding to precise geological structure surveys and corporate exploration.

The Mining Industry Council implemented revisions to the *Domestic Exploration Long-term Plan* in 1988 based upon updated geological knowledge, and again selected 19 regions as surveying sites. The domestic mine survey and exploration activities based on the three-stage process, for which the Metal Mining Agency of Japan had responsibility, were taken over by JOGMEC. All of the activities were reorganized along with the establishment of JOGMEC, however, and the wide-area geological structure surveys were halted in FY2003, followed by an end to the precise geological structure surveys in FY2006.

The domestic mine surveys and exploration based on the three-stage process were conducted in various regions throughout Japan and achieved considerable results. The number of surveys included 54 wide-area geological structure surveys and 34 precise geological structure surveys, ultimately leading to nine projects that reached the stage of mine development or expansion.

The cost required for the domestic mine surveys conducted under the three-stage process by the Metallic Minerals Exploration Financing Agency of Japan, Metal Mining Agency of Japan and JOGMEC until FY 2005 was approximately 42.6 billion yen. On the other hand, when calculated using metal prices as of September 2007, the value of the resources extracted

by domestic mining companies based on this survey and exploration activity exceeded 450.0 billion yen (the data in the following sections are taken mainly from JOGMEC's report *Base Metals: International Conditions and Changes in Japan's Mining Resources Policy* (2007)).

4. Support for Overseas Resource Development

Supporting overseas resource development activities in order to stably secure overseas mining resources has extremely important significance for Japan's economic security. Support measures built around several key matters, including (1) a system of equity capital for overseas exploration and a system of liabilities guarantees for overseas development, (2) an overseas geological structure survey system and overseas joint geological structure survey subsidy system and (3) resource development cooperation base surveys, were developed from this viewpoint.

Among the various systems related to the financial support system in (1), a system of financing for overseas exploration and system of liabilities guarantees for overseas development were begun in 1968, and the system of equity capital for overseas exploration was started in 1974, respectively. Through FY2006, funding of 7.9 billion yen + 960,000 dollars (80 projects) was provided under the system for financing overseas exploration and 6.2 billion yen (3 projects) was provided under the system of equity capital for overseas exploration, and financing liability guarantees totaling 34.0 billion yen + 26.48 million dollars (12 projects) were implemented under the system of liabilities guarantees for overseas development.

The agencies implementing (2) were the Metallic Minerals Exploration Financing Agency of Japan, MMAJ and JOGMEC; they commenced overseas geological structure surveys in FY1968 and started the overseas joint geological structure survey subsidy system in FY1974, respectively. Overseas geological structure surveys are implemented in regions where Japanese companies or other entities hold exploration rights (or regions where they are reliably expected to acquire such rights) and have an operatorship, if there is a possibility the region is endowed with large-scale, high-grade deposits. The overseas joint geological structure survey subsidy system is a support system that receives central government grants and provides funding corresponding to a maximum of 50% of the exploration cost that Japanese corporations will bear when they conduct the geological structure surveys needed for exploration in cooperation with foreign companies. Through FY2005, 71 overseas geological structure survey projects were conducted, and 42 projects were implemented under the overseas joint geological structure survey subsidy system.

As it is highly dependent on developing countries for its supply of mining resources, Japan must cooperate in the economic growth of these countries. Moreover, because the private sector is frequently unable to respond to requests for cooperation with mining resources development from developing countries, supporting such requests on a government basis is vitally significant. Given such circumstances, the (3) resource development cooperation base surveys were begun in FY1970 as a cooperation activity. The aim of these resource development cooperation base surveys is to promote exploration and development in partner countries by dispatching survey teams to developing countries based on requests from their governments and implementing base surveys, ranging from preliminary surveys to precise surveys of mining resources, in cooperation with the partner countries. As of FY2006, resource development cooperation base surveys had been implemented in 180 regions in 46 countries.

5. Deep Sea-floor Mining Resources Exploration

Together with support for overseas resource development activities, undertaking deep sea-floor mining resources exploration as well is vital for ensuring stable access to mining resources. Deep sea-floor mining resources include manganese nodules, cobalt-rich crust and sea-floor hydrothermal deposits, which differ respectively in terms of available form and metal content.

MMAJ or JOGMEC have carried out surveys of deep sea-floor mining resources since FY1975. The survey vessel *Hakurei Maru No. 2* launched in May 1980 has demonstrated substantial capabilities when conducting such surveys.

Surveys of manganese nodules were conducted in waters southeast of the Hawaiian Islands from FY1975 to FY1996, with results that contributed to the acquisition of a Japanese concession covering 75,000 km² by Deep Ocean Resources Development Co., Ltd. in 1987. Cobalt-rich crust surveys in the Chubu Pacific Ocean region were begun as well in FY1987. In addition, deep sea-floor hydrothermal deposit surveys were conducted along the East Pacific Rise off the coast of Mexico (FY1985-1994), in the Okinawa Trough (FY1995-1999) and in the ocean areas around Izu and Ogasawara (FY2000-2005), which led to the discovery of the “Hakurei Deposit,” a new deposit located in the Bayonnaise Knoll in Izu-Ogasawara ocean area in FY2003.

Distinct from these surveys, a base survey concerning the extension of Japan’s continental shelf was begun in FY1998. This base survey is intended to illuminate the resource potential in the ocean areas off Japan where continental shelf extension might be a possibility.

6. Creation of a Rare Metals Stockpiling System

“Rare metals” is a generic name for metallic elements that exist in only scant quantities in the earth’s crust or that are difficult to extract. Added to metals such as iron, aluminum and copper to create alloys, rare metals have the effect of enhancing properties such as strength, hardness, heat resistance, abrasion resistance and ferromagnetism. Rare metals currently are used in steel products including stainless steel, structural steel, high-tensile steel and heat-resistant steel, materials that are utilized widely in products such as buildings and structures, bridges, ships, aircraft, automobiles, commercial kitchenware and electric and electronic devices. In addition to the demand for these minerals as base materials, in recent years demand has expanded rapidly in new sectors as well, including superconducting materials, semi-conductors, metal alloys for hydrogen storage, shape-memory alloys, electronic materials such as ceramic capacitors, permanent magnets, and environmental impact load mitigation catalysts.

Only a small number of countries such as Russia and South Africa produce rare metals so there is a significant potential for the supply of rare metals to be abruptly destabilized, and product shortages and sudden price jumps to occur, should situations such as political unrest or a sudden change in the exchange rate unfold in the producing countries.

Based on such circumstances, in 1983 Japan’s government set up a rare metal stockpiling system and consigned national stockpiling activities to MMAJ. JOGMEC succeeded to this activity from MMAJ.

MMAJ and JOGMEC sold stockpiled rare metals as appropriate in response to market fluctuations. Triggers of rare metal sales included increases in demand for elements such as

vanadium, molybdenum and manganese that reflected growth in the demand for steel or stainless steel, and sudden jumps in rare metals prices caused by mine closures, mine accidents, mine strikes and other incidents.

7. From a Comprehensive Rare Metals Policy to the Strategy to Secure Rare Metals

Ensuring rare metals availability required not only creating a stockpiling system but also considering a comprehensive policy. In December 1984, one year after establishment of the rare metals stockpiling system, the Rare Metal Comprehensive Policy Special Subcommittee of the Mining Industry Council's Mine Subcommittee drafted a report entitled *Comprehensive Rare Metals Countermeasures — Toward Technical Innovation, Industrial Revitalization and Economic Security*. These comprehensive measures mapped out three points touching on (1) promotion of exploration and development, (2) promotion of technological development and (3) promotion of supply disruption countermeasures, but the main details focused on an expansion of the stockpiling system. Points (1) and (2) included measures such as a survey of the state of domestically available rare metals mining resources, support for independent rare metals exploration overseas, development of rare metals resource exploration technologies, research cooperation concerning the effective utilization of unused rare metals, and development of advanced rare metals separation and refinement technologies.

Although the need to ensure rare metals supplies had been recognized in this manner from the mid-1980s, this awareness was heightened even further in the 2000s when rare metals demand soared and prices skyrocketed. Therefore in July 2009, the Ministry of Economy, Trade and Industry prepared and released a *Strategy for Ensuring Stable Supplies of Rare Metals* based on the results of a study conducted by the Mineral Resources Subcommittee, Advisory Committee for Natural Resources and Energy. This strategy for securing rare metals identified various factors as the “issues surrounding rare metals,” including scarcity, uneven distribution, the expansion of consumption on a global scale, growth of demand in the new energy, energy conservation and environmental protection sectors, the emergence of resources nationalism, and the intensifying competition to acquire resources, and proposed “strengthening four pillars for securing rare metals,” namely (1) securing overseas resources, (2) recycling, (3) development of alternative materials and (4) stockpiling. Of these four alternatives, the strategy respectively emphasized building strategic, mutually beneficial relationships with resource-producing countries (application of Official Development Assistance (ODA) tools for construction of infrastructure around mines, cooperation through programs such as technology transfers and collaboration on environmental preservation that demonstrate Japan's strengths, etc.), the securing of rights and interests in rare metals resources through the supply of risk money, and the deliberate development of sea-floor hydrothermal deposits and other resources in the ocean area around Japan for Measure (1) and the establishment of a recycling system for critical rare metals, the creation and enhancement of a recycling system for small devices (mobile phones, digital cameras, etc.) and the construction of a resource recycling system covering all of Asia for Measure (2).

III. *Background to the 2011 revision of the Mining Act*

1. **Japan, the Country with the World's Sixth Largest Ocean Area**

Japan possesses the world's sixth largest ocean area in terms of the size of its territorial waters, exclusive economic zone (EEZ) and continental shelf – an ocean area in which, in addition to oil and natural gas, the existence of energy and mining resources such as methane hydrate and sea-floor hydrothermal deposits has been confirmed. Various issues remain, however, with regard to the practical application and commercialization of these energy and mining resources. These include an understanding of the amounts of available resources and the status of their availability, the development of production techniques, and controls on the environmental impact from development.

The ocean areas around Japan where the government has until now conducted geophysical surveys are extremely limited. Specifically, the areas where the government had conducted two-dimensional geophysical surveys by FY2009 totaled only about 120,000 square kilometers, while three-dimensional geophysical surveys had been completed in areas covering about 6,000 square kilometers.

Compared with the two-dimensional geophysical surveys conducted up to that point, three-dimensional geophysical surveys sharply improve the accuracy of exploration site selection. There were no firms in Japan, however, with the capacity to conduct three-dimensional geophysical surveys. Given these circumstances, in February 2008 Japan's first three-dimensional geophysical survey vessel "Resources" was introduced as a government vessel owned by the Agency for Natural Resources and Energy, with the aim of building the domestic exploration capacity to enable the discovery of oil and natural gas resources in Japan's ocean area and implement development activities more systematically and flexibly. Future geophysical surveys in the ocean area around Japan will be accomplished using "Resources." Under the *Ocean Energy and Mineral Resource Development Plan* prepared in 2009, three-dimensional geophysical surveys covering 62,000 square kilometers will be implemented by FY2018.

2. **The "Unguarded State" of Japan's Marine Resources**

Thus the delays in three-dimensional geophysical surveys in the ocean area around Japan can be overcome in the future through activities conducted by "Resources." One point that cannot be overlooked here, however, is that two other major problems exist with regard to resource development in Japan. One is the problem that, for a long time, Japan's marine resources were in an "unguarded state," so to speak.

Table 2 is a comparison of the resource exploration regulations of several countries. As can be grasped from this table, the resource exploration regulations that have been implemented in various other countries do not exist in Japan. Nor does a systematic framework concerning the submission of survey data exist. As a result, disorganized resource exploration activities were carried out, and the de facto resource exploration activity by foreign vessels in ocean areas in particular in a form that took advantage of this systematic deficiency was remarkable.

TABLE 2. COMPARISON OF RESOURCE EXPLORATION REGULATIONS BY COUNTRY
(AS OF MARCH 31, 2010)

Country	United States	United Kingdom	Australia	Norway	Japan
Type of resource exploration regulation	Permit system	Permit system	Permit system	Permit system	No regulation
Regulated exploration	Geological surveys (exploration etc.) and geophysical surveys (seismic surveys etc.)	Geological surveys based on physical and chemical methods and shallow drilling not accompanied by acquisition of resources	Seismic surveys etc., and surveys implemented with the intent to use data and information from said surveys to acquire samples and discover oil	Geological surveys or rock physical surveys, geophysical surveys, geochemical surveys, geo-engineering surveys, shallow drilling	—
Administration of exploration data	Submission in response to government request	Submission in response to government request	Submission in response to government request	Submission in response to government request	No regulation

Source: Advisory Committee for Energy, Mining Subcommittee and Oil Subcommittee Combined Legislation Working Group: Reference Materials from *Approach to Japan's Future Mining Legislation System* (January 1, 2011).

3. Harmful Effects of the First-to-File Principle

The second problem arises from the fact the first-to-file principle was adopted in Japan for deciding resource development entities. As a result, there have been frequent occurrences of cases in which an entity with inadequate technical capabilities or financial wherewithal has acquired mining rights and development has not been carried out. As of the end of March 2010, 8,179 mining rights existed in Japan but only 1,558 were producing, while 5,562 had not yet begun operations and 1,059 were dormant.

Table 3 compares the method in each country for deciding resource development entities. As can be understood from this table, until 2010 development entities were decided in Japan based on the first-to-file principle, without investigating either technical capabilities or the financial base. There also was no screening of business plans and no requests for bids when making such decisions.

4. First Full-Fledged Revision of the Mining Act in 61 Years

To resolve these problems, the Mining Act was broadly revised during the 2011 session of the Diet, the first-ever revisions since the law was enacted in 1950. Key points of the revision included:

- (1) Addition of permit standards for creation of mining rights: Added provisions such as parties that possess the technological capabilities and financial base and parties that will not interfere with promotion of the public interest to the permission standards.
- (2) Introduction of a specified area system for creation of mining rights: Revised the

TABLE 3. COMPARISON OF EACH COUNTRY'S METHOD FOR DECIDING RESOURCE DEVELOPMENT ENTITIES (AS OF MARCH 31, 2010)

Country	United States	United Kingdom	Australia	Norway	Japan
Method for deciding development entities	Selection of appropriate development entities based on tenders etc., not first-to-file	Selection of appropriate development entities based on tenders etc., not first-to-file	Selection of appropriate development entities based on tenders etc., not first-to-file	Selection of appropriate development entities based on tenders etc., not first-to-file	First-to-file principle
Confirmed points	Bidders must be screened by price through tender offers, and the development entity decided as the result of bidding must demonstrate it is financially capable of conducting operations.	Select the most appropriate entity after confirming it has the technical capabilities and financial base.	Select the entity based on contents of its business plan or offer price after confirming it has the technical capabilities and financial base.	Select the entity after evaluating its technical capabilities, financial base and the contents of its business plan.	Checks only non-approval requirements such as adverse effects on other industries and elimination of redundant concessions.

Source: Same as Table 2.

existing first-to-file system and enables the national government to solicit and select development entities in specified areas designated by the government for "Specified Minerals" (oil, natural gas etc.) that are especially important for the national economy and for which a stable supply is strongly required.

- (3) Introduction of a permission system for mineral resources exploration: Parties wishing to engage in mineral resource exploration will be required to apply for permission. In addition, the government can require reports on exploration results when it judges such reports to be necessary.

With this first full-fledged revision of the Mining Act in 61 years, the two problems concerning mining resources development in Japan identified earlier have begun moving toward a resolution.

IV. Concluding Remarks

As described/discussed previously, Japan has the possibility of becoming the world's preeminent country possessing marine resources. One example is methane hydrate. An ice-like substance formed from the crystallization of methane gas and water under low-temperature, high-pressure conditions, methane hydrate will greatly improve Japan's energy situation if it can be produced and used.

The *Ocean Energy and Mineral Resource Development Plan* formulated by the Ministry of Economy, Trade and Industry in March 2009 discussed this point as follows:

Methane hydrate - often called 'flammable ice' - is separated into water molecules

and methane gas molecules when subjected to changes such as increasing temperature or lowering pressure. The separated methane molecules possess the same principal components as conventional natural gas, and methane hydrate is expected to be commercialized as a non-conventional hydrocarbon resource.

Provided methane hydrate production technology is established and the practical application and commercialization of methane hydrate are realized, it will give Japan – a country that depends on imports from other countries for more than 80% of its primary energy supply – a supply source of domestic energy resources (natural gas resources) that will have an extremely significant impact because Japan is relatively well endowed with large quantities of methane hydrate as a type of hydrocarbon resource in its territorial waters, exclusive economic zone (EEZ) and continental shelf (‘‘ the ocean area around Japan’’). Needless to say, an energy supply source (continental and ocean areas) that exists in Japan would be the most stable supply source from the viewpoint of supply risk. Therefore succeeding in the development of technologies to enable the stable, economical production of methane hydrate would be identical to possessing an extremely large domestic hydrocarbon resource supply source. For that reason, the development of methane hydrate production technology is deemed an extremely important agenda from the viewpoint of securing a stable energy supply for Japan.

Large quantities of methane hydrate are suspected to lie in the ocean area around Japan, centered on the eastern portion of the Nankai Trough ocean area (Tokai coast-Kumano open sea). Because methane hydrate is found within strata as a solid, however, it cannot be made to flow like conventional oil and natural gas resources simply by sinking wells. To produce natural gas (methane) stably and economically from methane hydrate strata, it will be necessary to develop new production technologies, including methodologies to decompose the substance by lowering pressure, as touched upon in the quotation above.

Japan has been the world leader in undertaking R&D on methane hydrate, mainly through Japan Oil Gas and Metals National Corporation (JOGMEC), an independent administrative corporation. In 2007, for example, it established a procedure to evaluate the quantity of in-place methane hydrate and publicly released the quantity of in-place resources in the eastern Nankai Trough ocean area (about 14 years of Japan’s natural gas consumption). In addition, in 2008 the world’s first successful continuous collection of methane gas using the ‘‘depressurization method’’ was achieved in onshore production tests conducted as an international joint activity between Japan and Canada, using methane hydrate layers in the permafrost region of the Canadian Arctic. JOGMEC has also conducted tests of methane hydrate ocean production in the ocean area around Japan since FY2009. These as well have been the first such tests anywhere in the world.

For a long time, becoming a ‘‘major ocean resources country’’ was nothing more than a dream for Japan, a country suffering from a paucity of natural resources. The revision of the Mining Act in 2011 could become the first step toward actually achieving that dream.