



# Japan: Soil Remediation

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## Summary

Expansion of Japan's soil remediation market started with the introduction of the Soil Contamination Measures Law (SCML) that was implemented February 15, 2003. The SCML is similar to the Superfund Act in the U.S. that was introduced in the U.S. in 1980. In this sense, the Japanese soil remediation market is 23 years younger than the U.S. market. Many municipal governments have revised their ordinances or introduced new ones to comply with the SCML. The demand for survey and purification work for contaminated soil has been accelerated by commercial motivation rather than by enforcement of the law. This soil remediation market has grown at a pace more than 20 percent p.a. since 2003 and is expected to keep this pace. Business areas related to soil remediation have been expanding with survey and purification to risk management, insurance, due diligence, reclamation of brown fields, etc. Market participants include construction companies, water treatment companies, non-ferrous metal producers, cement producers, survey companies, research and analysis companies, insurance companies, real estate companies, trading companies, waste management companies as well as manufacturers of environmental equipment. Competition is tough, as so many companies participate in this market. The market is fairly collusive and poses a challenge for new to market U.S. companies. To be successful in Japan, we recommend that new to market U.S. companies team up with Japanese companies established in this market.

## Market Demand

The purpose of the Soil Contamination Measures Law (SCML) is to protect human health against risks from contaminated soil through the management of hazardous materials. On the other hand, the demand from the market and consumers is for the complete purification of contaminated soil. There is a large gap between the law and the expectations of the market. We believe that U.S. companies have a wealth of experience and competitive technology to bring to the Japan soil remediation market.

The outline of SCML (implemented since February 15, 2003) follows:

Survey of soil contamination is mandatory when designated facilities using hazardous materials cease operation (Article 3), or prefectural governments recognize that fear exists such facilities may cause damages to human health (Article 4). Designated survey organizations will conduct survey and report. If the survey result shows that the land does not meet the standards, the prefecture will designate the land as a designated area and publicly announce (Article 5) and put the land in the list of designated areas. The list is open to public. Details can be found (in Japanese) at <http://www.env.go.jp/water/dojo/sekou/shitei.html>. Those who wish to change use of the land in the designated area must report their plan to the prefecture. If the plan is not appropriate, the prefecture can order the revision of the plan. (Article 9) If a prefecture recognizes that contaminated land may cause damage to human health, the prefecture can order the owner of the land or those who contaminated the land to take measures including elimination of the contamination, etc. (Article 7) A fund will be established to subsidize the owner of the contaminated land that will take measures to eliminate contamination if those who contaminated the land are unknown. (Article 22) If elimination of the contamination is conducted, designation of the contaminated area is released.

According to a survey conducted by the Geo-Environmental Protection Center (GEPC), voluntary soil surveys by landowners for the purpose of commercial transaction or asset evaluation cover 90 percent of the total surveys conducted.

At the early stage, survey and measures for soil contamination focused on heavy metals and organic solvents only. Subsequently, soil contamination focus has been expanded to include dioxins and agricultural chemicals and others. In addition, soil contamination has proved to be combined and complex. New technologies to address complex contamination have been developed or imported. The number of contaminated sites has increased and

the market for soil remediation has expanded. Many new entrants, including analytical companies, insurance companies, cement producers and trading companies have entered the market.

Introduction of the requirement to include "impairment accounting" in March 2006 also contributed to the growth in demand for survey and consequent soil remediation services. Under this policy, companies must account for the liability due to soil contamination on their balance sheets.

## Market Data

Based on the data published by the Geo-Environmental Protection Center (GEPC), we estimated Japan's market size for soil remediation (survey and measures) was as follows:

Year	Market size (in million dollars)
2002	578
2003	832
2004	1,147
2005	1,912
2006	2,210
2007	2,685

Result of GEPC member questionnaires (billion yen):

	2002	2003	2004	2005	2006
Survey	7.9	12.8	17.2	18.0	19.1
Measures	47.4	60.1	76.3	144.4	180.2
Total	55.3	72.9	93.5	162.4	199.3
		(+32%)	(+21%)	(+74%)	(+23%)

# GEPC: Geo-Environmental Protection Center ([www.gepc.or.jp/](http://www.gepc.or.jp/))

# GEPC estimates that GEPC members cover 60% of the total survey market and 80% of the total measures market.

Based on this information, we estimated total market size as follows:

2002	72.4 billion yen = \$578 million (125.22 yen/\$)
2003	96.4 billion yen = \$832 million (115.93 yen/\$)
2004	124.1 billion yen = \$1,147 million (108.15 yen/\$)
2005	210.5 billion yen = \$1,912 million (110.11 yen/\$)
2006	257.1 billion yen = \$2,210 million (116.31 yen/\$)
2007	316.2 billion yen = \$2,685 million (117.76 yen/\$)

(For 2007, we estimated 23 percent up from 2006 in Japanese yen terms.)

The market for equipment and chemicals is not included in the above figures.

## Best Prospects

- Efficient and cost-effective in situ purification technologies for contaminated soil with heavy metals
- Efficient and cost-effective in situ purification technologies for contaminated soil with volatile organic compounds (VOCs)
- Efficient and cost-effective in situ purification technologies for contaminated soil with oils
- Cost-effective technologies applicable to small sites like gas stations
- Cost-effective in situ technologies applicable to factories in operation
- In situ thermal treatment technologies that enable quality of soil after treatment uniformly hazardous free

Digging and removal are considerably more expensive than in situ remediation. However, in many cases, owners of contaminated lands are in a hurry to have their land free from contamination to be able to execute commercial transactions. Therefore, digging and removal are frequently used despite its high cost. When owners are not in a

hurry, they prefer less expensive in situ remediation methods. The problem with in situ treatment is dealing with the concerns of nearby residents. Many of large general contractors own a number of stationary and mobile soil segregation and washing systems for the treatment of delivered soil or on-site treatment.

## Key Suppliers

**General contractors:** They are better placed as they can quickly learn information on contaminated lands detected at planned construction sites or existing facilities. In addition, their advantages are that they are able to propose in a comprehensive manner excavation of contaminated soil, purification of the soil and burying it back after the purification. Shimizu Corporation, Kajima Corporation, Obayashi Corporation and Taisei Corporation are covering major market shares. It is estimated that the four major general contractors have taken more than 50 percent of the total soil remediation market.

**Water treatment companies:** They are good at treatment of soil contaminated with volatile organic compounds (VOC) soluble in water. Kurita Water Industries Ltd., Organo Corporation and Ebara Corporation are major players.

**Non-ferrous metal companies:** They are able to offer technologies to remove heavy metals in soil. Dowa Eco-System Co., Ltd. takes a large share in the market.

**Cement producers:** They are able to receive contaminated soil excavated and removed from the contaminated sites. Taiheiyo Cement Corporation, Mitsubishi Materials Corporation, Ube Industries, Ltd. and Sumitomo Osaka Cement Co., Ltd. are major players.

Other players include following companies:

**Surveying, geological research and consulting companies:** Asia Air Survey Co., Ltd., ERS, Oyo Corporation, E&E Solutions, Kokusai Kogyo Co., Ltd., Techno-Earth, DRICO Ltd., Mitsubishi Materials Natural Resources Development, Ltd.

**Research and analytical companies:** Environmental Control Center, JFE Techno-Research Corporation, Shimadzu, Techno-Research, Sumika Chemical Analysis Service, Ltd., Chugai Technos Corporation, etc.)

**Manufacturers of measuring instrument:** OMRON Corporation, Sibata Scientific Technology, Ltd., Shimadzu Corporation, JEOL Ltd., Horiba Ltd., Yokogawa Electric Corporation, etc.

**Financial institutions:** Development Bank of Japan, Mitsubishi UFJ Financial Group, Inc., Sumitomo Mitsui Banking Corporation, The Chuo Mitsui Trust and Banking Co., Ltd.,

**Insurance companies:** AIU, Sompo Japan Insurance Inc., Tokio Marine & Nichido Fire Insurance, Mitsui Sumitomo Insurance Co.

**Risk hedging companies:** Property Risk Solution and Land Solution.

**Real estate companies:** Daiwa House, Tokyo Tatemono Co., Ltd., Nomura Real Estate Co., Ltd., Mitsui Real Estate Sales Co., Ltd., Mitsubishi Estate Co., Ltd.

**Trading firms:** Itochu Corporation, Mitsui & Co., Ltd. and Mitsubishi Corporation.

**Waste management companies:** Kureha Ecology Management Co., Ltd., Sanyu Plant Service Co., Ltd., Daiseiki Eco Solution Co., Ltd., Miyama, Inc.

**Manufacturers of pollution control equipment and environmental engineering companies:** Ataka Construction and Engineering Co., Ltd., Katayama Chemical, Inc., Kankyo Engineering, Kankyo Techno, Kimitsu System, Kubota, Kurita Kogyo, Kurimoto Tekkoujyou, JFE Engineering, Shinko Kankyo Solution, Nippon Steel, Sumitomo Metal Mining, Sumitomo Heavy Industries, Tsukishima, Hitachi Zosen, Maezawa Kogyo, Mitsubishi Heavy Industries, Mitsui Zosen, etc.

## Prospective Buyers

**Municipal governments:** Tokyo Metropolitan Government, Iwate Prefecture, Aomori Prefecture, etc.

**Electronics equipment manufacturers:** Toshiba Corporation, Hitachi, Ltd., Mitsubishi Electric Corporation, etc.

**Car manufacturers:** Toyota Corporation, Nissan Corporation, Honda Motor Co., Ltd., etc.

**Real estate companies:** Mitsubishi Estate Co., Ltd., Mitsui Fudosan Co., Ltd., Sumitomo Realty & Development Co., Ltd., etc.

**Gas companies:** Tokyo Gas Co., Ltd., Osaka Gas Co., Ltd., Toho Gas Co., Ltd., etc.

**Electric power companies:** Tokyo Electric Power Company, Kansai Electric Power Company, Chubu Electric Power Company, etc.

Oil companies: Nippon Oil Corporation, Idemitsu Kosan Co., Ltd., Japan Energy Corporation, etc.  
Steel companies: Nippon Steel Corporation, JFE Steel Corporation, Sumitomo Metal Industries, Ltd., etc.  
Non-ferrous metal companies: Mitsubishi Materials Corporation, Sumitomo Metal Mining Co., Ltd., Mitsui Mining & Smelting Co., Ltd., etc.  
Paper mills: Oji Paper Co., Ltd., Mitsubishi Paper Mills Ltd., Daio Paper Corporation, etc.  
Chemical companies: Mitsubishi Chemical Corporation, Sumitomo Chemical Co., Ltd., Showa Denko K.K., etc.  
Ceramic industries:

The above list represents typical prospective buyers- present market requirements may differ. Possible contaminated sites include following areas: Manufacturing facilities, agricultural fields, hospitals & R&D facilities, waste treatment facilities, incineration facilities, reclaimed land, oil handling facilities like gas stations, areas where illegal dumping of waste has taken place.

## Market Entry Strategies

There are many U.S. and other foreign companies that own land or wish to buy or sell land in Japan. As a first step in participating in the Japanese soil remediation market, we recommend that working with these foreign companies. Many are familiar U.S. methods of due diligence, and soil survey and purification work. They often are not satisfied with the work done by Japanese companies and may welcome your proposals and services.

Although soil remediation market in Japan has been expanding at a high space for the last several years and is expected to grow further in the coming years, competition is fierce because many companies from various sectors have entered in this growing market. As an example, 1,638 survey companies were recognized by the Ministry of the Environment based on SCML as of July 18, 2008. It would be advisable to team up with Japanese companies and keep your initial investment at a minimum level.

## Market Access Issues & Obstacles

Current Japanese national laws and regulations do not require firms to disclose information on possible land contamination, unless otherwise mandated by local ordinances. Therefore, inside industry observers point out, "even though land contamination is found, it remains strictly confidential within the firm." Under these circumstances, end users purchase soil remediation services on a confidential basis to avoid getting a bad reputation and decrease in asset value.

U.S. firms wishing to enter the Japan's soil remediation market will face critical hurdles. Open information on this market is very hard to locate. Many of the major Japanese players have already established close ties both domestically and overseas. Breaking into these cozy relationships will be a challenge for newcomers. Many of the same collusive practices that inhibit market penetration in Japan's construction market are being used in soil remediation.

Track records in the U.S. and other foreign countries are not treated as equal to the track records in Japan. Track records in Japan are required to participate in the Japanese soil remediation market. Finding a contaminated site for a demonstration testing of remediation technologies is the challenge to foreign entrants.

If you pass the demonstration test sponsored by the Ministry of the Environment, it will be much easier for you to sell services to municipal governments and private entities. However, applications for the demonstration tests for foreign companies are often difficult to obtain and require substantial time, money and effort.

## Trade Events

Name: 2008 Exhibition for Geo-Environmental Restoration  
Theme: Exhibition of technologies and businesses for soil and groundwater remediation  
Dates: 10/1-3/2008  
Venue: Tokyo Big Sight, Tokyo, Japan  
Organizers: Geo-Environmental Protection Center (GEPC) and the Nikkan Kogyo Shinbun, Ltd.

Number of visitors: 30,000  
Frequency: Annual

Name: N-EXPO 2008 Osaka  
Theme: Waste treatment & recycling, environmental protection for air, water and soil, energy conservation and renewable energies  
Dates: 9/18-20/2008  
Venue: Intex Osaka, Osaka, Japan  
Organizers: Nippo I. B. co., Ltd.  
Number of visitors: 60,000  
Frequency: Twice a year (Tokyo & Osaka)

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