NRI Papers No. 158 October 1, 2010

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—Building a Japanese-style export model combining economic cooperation and business—

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The growing shortage of usable water is a major concern for many countries. In view of increasing demand for water, the Japanese government and industries are jointly working to develop water businesses in emerging countries in Asia and other regions where water infrastructure is underdeveloped. These efforts aim to expand the opportunities for participating in overseas projects by drawing on technology, experience and expertise that Japan has accumulated over a long time, thereby helping to revitalize Japan's economy.

The global water market is projected to be worth about ¥90 trillion by 2025. In any attempt to pursue a greater market share, it is essential to participate in the fields of operation and maintenance (O&M) in overseas markets so that the water business can be continued for a long time and in a stable manner.

The water business is nothing more or less than public services for the participating country. While the culture, society and customs of the participating country must be fully comprehended in moving into its markets, Japan unfortunately has only limited experience and achievements. Because each municipal government bureau that is offering water services to the Japanese market individually has such experience and achievements, a system that enables water service operations in overseas markets in response to the needs of a particular participating country is yet to be established.

In order for Japan, which is a latecomer in the international water market, to win a competition with major, well-experienced water service companies in Europe and other countries, it is essential to build a Japanese-style business model. This model should be established while providing solutions to various water-related issues (e.g., infrastructure, management and attitude) that face the participating countries in Asia and other regions.

At the first step, upon strategically identifying a country, city or area where Japanese companies should operate a mid- and long-term water business, an organization must be urgently established that can consolidate the business expertise that is dispersed among the public and private sectors and that can take the lead in moving into overseas markets. In addition, tie-ups with a financial scheme that supports stable business operations in the participating country should be promoted. At the same time, policy dialogs should be continued with municipal governments and other concerned entities in the participating country so that Japan's technology and expertise can be fully utilized.

The Japanese government should take the initiative in promoting these actions by combining all the efforts of Japan's ministries and agencies regardless of which one has jurisdiction over a specific matter.

I Approaches to International Water Business, Which Is Attracting Increased Attention

Water, or what is sometimes called "blue oil," is an increasingly scarce resource globally. Usable water is limited to only about 0.15 percent of the total volume of water available on the earth. Research indicates that some 1.1 billion people in the world lack access to drinking water and about 2.4 billion people are exposed to an environment where no sanitary facilities are available. In an effort to eliminate widespread water shortages and provide improved access to safe drinking water, accelerated moves to invest in the water business are expected, leading to the emergence of many new markets.

In addition, in many cases, the water business, which uses long-life infrastructure such as purification and treatment plants and distribution pipes, is expected to continue over mid- and long-term periods. Accordingly, companies in a wide variety of fields including civil engineering, construction, housing, equipment construction, equipment manufacturers, parts and components manufacturers, finance and trading firms are likely to benefit from orders being issued at the initial capital investment stage such as those for materials, equipment and machines including pumps and membrane filters as well as demands arising during the business operation stage such as for materials and chemicals.

Given these circumstances, in Japan, active moves are being taken to revitalize the stagnant Japanese markets by developing the water business in Asian and other emerging economies. In December 2009, the Hatoyama administration launched its "New Growth Strategy (Basic Policies)—Towards a Radiant Japan." In this strategy, it was stated that "we will work to lessen the environmental burden accompanying the economic growth of Asian countries and make use of Japanese technology and experience as a sustainable growth engine for Asia; specifically, government and the private sector will work together to provide assistance in building infrastructure such as water supply." Based on this strategy, in April 2010, the Study Group for International Development of the Water Business, which was organized by the Ministry of Economy, Trade and Industry (METI), set the goal of winning market share worth ¥1.8 trillion by 2025.

To date, Japan provided assistance focused on technical cooperation in many water projects overseas, primarily through its ODA (official development assistance) programs and grant aid programs. In the future, more focus should be given to the development of the water "business," and actions should be taken that enable both Japan and the recipient country to thrive economically and socially by utilizing Japan's technology, management skills and financial capabilities in the global water market.

Unlike other infrastructure-related businesses, the water business greatly influences people's daily lives in the region or community where such service is provided because its operation includes the supply of household water and potable water and the treatment of wastewater. Accordingly, any approach to start this business must ensure the improvement of the socioeconomic level of the city or community where this service is provided, while at the same time considering how best to generate a profit as a business.

From the viewpoint of achieving Japan's growth strategy, this paper discusses the priority directions that the water business should pursue and the strategy to bring such priorities to fruition.

II Global Water Business Market and Its Characteristics

1 The idea of water recycling and reuse gives rise to a wide variety of markets

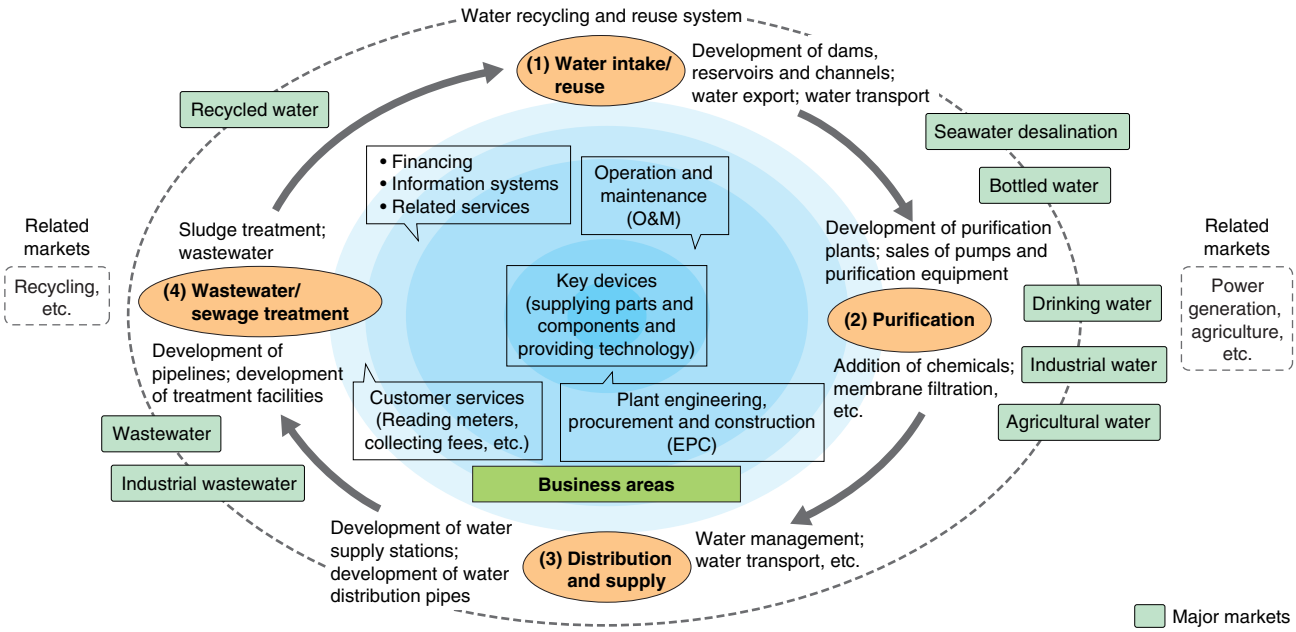
The water business extends over a wide range of fields from municipal services for residents such as water supply and sewage treatment and those for companies and industries such as industrial water and agricultural water through to beverages such as bottled water and mineral water.

Classification of the many participants in the water business market can be based on the idea of the so-called "water recycling and reuse system" where water is obtained from water sources and used for various purposes, and wastewater is treated, which can be shown in the cycle "water intake/reuse → purification → distribution and supply → wastewater/sewage treatment" (Figure 1).

For example, businesses in the field of water intake/reuse, which corresponds to Process (1) in Figure 1, include the development of dams, reservoirs and channels, as well as exporting and transporting raw water to areas suffering from water shortages. The field of purification, as indicated in Process (2), refers to the process by which impurities and sludge are removed through filtration and water is chlorinated to provide water of a quality that meets the prescribed standards of drinking water. Businesses in this field include the development, operation and management of purification plants and the addition of chemicals such as chlorine.

The field of water distribution and supply, which is Process (3), can be referred to as the so-called "water transport business" to supply purified water to households and enterprises in a consistent manner. Representative businesses are water management in which arrangements among multiple purification plants are

Figure 1. Overview of the water business



Source: Compiled based on various materials.

made in response to the status of water sources as well as water demand, the operation and maintenance of water distribution pipes and water supply stations and the transport of water from one area to another.

Businesses in the field of wastewater/sewage treatment, which is Process (4), relate to the operation and management of pipelines, treatment plants and related facilities to properly treat and recycle wastewater and sewage.

Other business areas involved in each of these fields include the sales of devices and technology, the design and construction of plants and the control, operation and management of infrastructure facilities, as well as customer services such as reading meters and collecting fees. In addition, the areas of financing and professional services are also involved. As such, enterprises in a vast array of industries are developing business by drawing on their own strengths.

2 Projected market size of about ¥90 trillion; priority needs are stable supply and stable business operation in many countries/regions

What is the projected market size of the world's water business? According to METI's estimate, it was about ¥36,200 billion as of 2007, and is predicted to expand to around ¥86,500 billion by 2025 (as shown on the left side of Figure 2). While the drinking water business will continue to account for the largest share (about 45 percent) amounting to around ¥38,800 billion, recycled water (at an average annual growth rate of 12.5 percent) and industrial water (at 6.3 percent) businesses are predicted to grow substantially.

If the trends are viewed in terms of business area, the market size is expected to expand in all business areas of devices, technology and services, with businesses related to the sales of devices and plant construction amounting to about ¥48,500 billion (about a 3-fold increase as compared to 2007), and businesses related to operation and maintenance totaling about ¥38 trillion (about a 2-fold increase over 2007).

In the future, we will see a growing demand for water in the countries where water resources are scarce and a rapid increase in population and rapid economic growth are expected. According to the latest forecast[1], demand arising in the areas of Southeast Asia and the Middle East & North Africa between 2007 and 2016 will account for 50 percent of the increase (about ¥8 trillion) in the drinking water market and about 40 percent of the increase (about ¥6,500 billion) in the wastewater market (as shown on the right side of Figure 2). In particular, the drinking water and wastewater markets (construction, operation and maintenance) in Jordan, Yemen, Algeria and Saudi Arabia are all showing high growth. While China and India continue to maintain large markets, they show potential for even further growth.

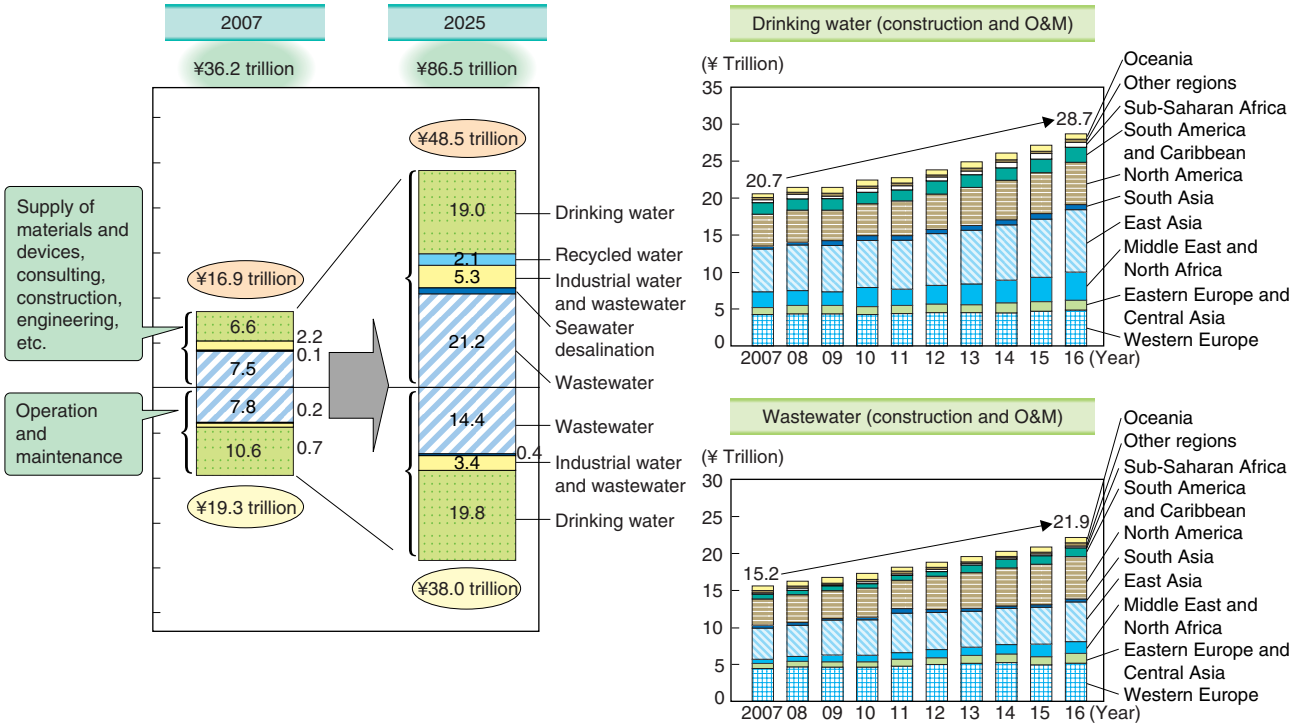
On the other hand, in these countries, sanitary conditions are poor, and people lack access to a stable water supply in many cities and areas. For example, in China, the rivers and soil are severely contaminated with sewage, and the government has been acting to eradicate such contamination. Accordingly, the demand for wastewater treatment is expected to expand in China.

While the demand for wastewater treatment is growing in the Middle East due to insufficient infrastructure, water supply hours in many cities in India are less than 20 hours per day. In urban areas, the demand for water is

greater than the capacities of the distribution pipes and the ratio of old pipes is high, causing frequent occurrences of water leakage, stolen water and unpaid fees. As a result, the percentage of non-revenue earning water is high at 20 to 50 percent, putting pressure on management performance. In Thailand and countries in the Middle East and Central America, needs for bottled water are rising (Figure 3). As such, in some cases, many emerging countries do not necessarily expect tap water to be potable.

As explained above, many countries in Southeast Asia, Oceania, the Middle East, Central and South America and Africa where water demand is predicted to expand do not have abundant water resources and are not equipped with facilities for the supply of high quality water and the treatment of wastewater as Japan does. Because of these situations, needs will increase for businesses that can ensure a stable water supply, establish the basis for sustainable management and build a low-cost water supply and treatment system.

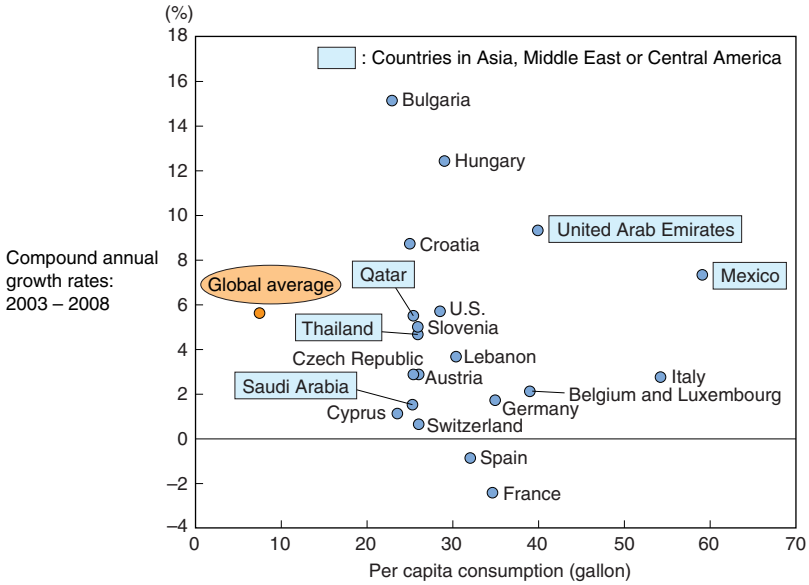
Figure 2. Water business outlook



Note: The market size is calculated at an exchange rate of ¥100/dollar.
Source: Compiled based on Global Water Market 2008 and materials published by the Ministry of Economy, Trade and Industry.

Note: The market size is calculated at an exchange rate of ¥100/dollar.
Source: Compiled based on Global Water Market 2009.

Figure 3. Consumption of bottled water



Source: Compiled based on the U.S. and International Bottled Water Developments and Statistics for 2008.

III Challenges Facing Japan in Promoting International Development of the Water Business

In the future, Japan is expected to develop a stable water business from the mid-term perspective while meeting diversified demands for water in emerging countries, as explained in Chapter II.

The water business can be divided into four areas (Figure 4):

(1) Key devices (supplying parts and components and providing technology)
(2) Plant engineering, procurement and construction
(3) Operation and maintenance (O&M)
(4) Business management, customer management, fee collection

Among these areas constituting the water business, the area of key devices in Item (1) presents extremely low risk and high profitability. While the profitability of operation and maintenance in Item (3) is low, once a company acquires the concession, it is likely that the company can operate the business stably for 10 to 20 years or even longer. In addition, the company can participate in procuring materials, equipment and technology on the side of issuing orders and will have some say in determining specifications and standards. Depending on the situation, it might be possible to invite bids based on conditions that are advantageous to the company's own country. This is possible, not only in the fields of drinking water and wastewater, but also in a variety of other businesses constituting a water circulation cycle such as seawater desalination, industrial water supply and water recycling.

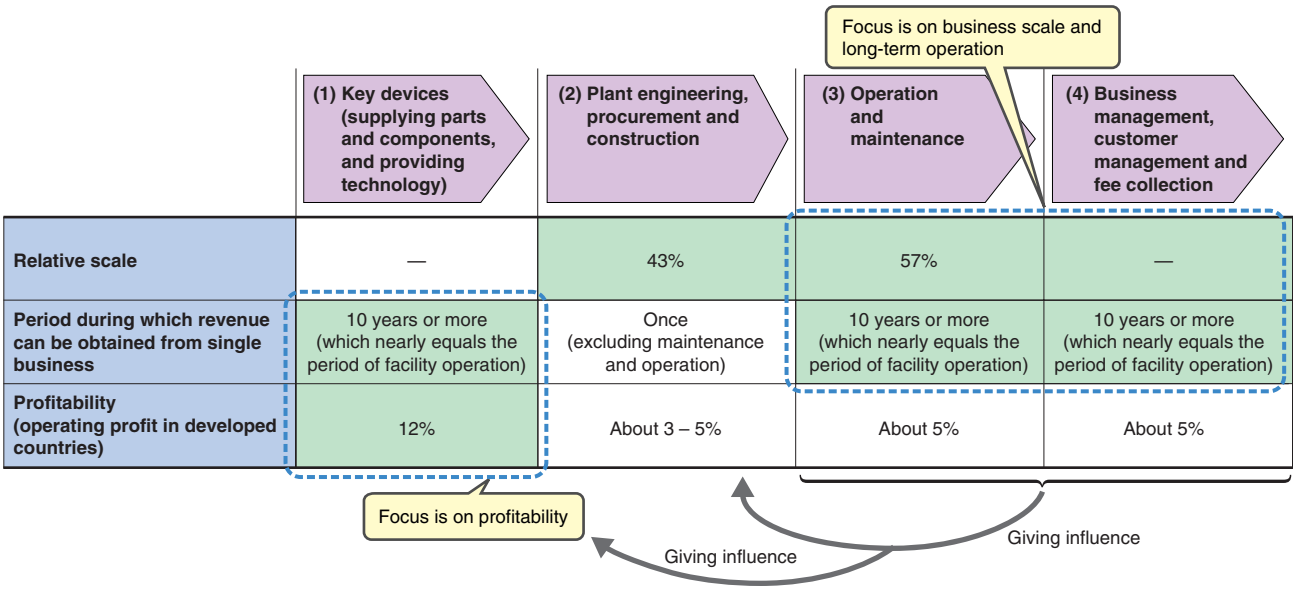
As people in various fields have pointed out, Japanese companies are strong overseas in fields such as pumps, ozone treatment, power generation plants and sewage treatment, which precisely falls under Item (1), i.e., providing key device technology. To date, it was believed that businesses selling products and technology enjoy the most benefit in terms of risk vs. return. In the future, however, companies should be ready to take on more risk and actively become involved in operation and maintenance, enabling them to take the initiative in the water business as a whole.

In the two years of 2008 and 2009, almost all companies that invested in world business entities operating large-scale water and wastewater facilities as the largest shareholders were those of France, Spain and the UK. When we see the form of participation in overseas water and wastewater operations, we find that in many cases a combination of a water operator conducting a global water business such as Veolia Environnement and GDF Suez and a general trading firm is involved. As such, the international presence of Japanese companies in the field of water business operations is weak. The two problems described in the following sections can be identified as the major reasons for such weak presence.

1 Japan is unprepared to meet business requirements expected by emerging countries

From the perspective of a country where the water business is operated, water service is part of the public services that protects people's lives and forms an element

Figure 4. Revenue structure of the water business



Notes: 1) Relative scale is calculated for water and wastewater businesses based on the values predicted in Global Water Market 2010 until 2016. 2) The number of years of operation and profitability are provided only for reference purposes based on interviews, etc.

of national infrastructure supporting the country's strength. Accordingly, market participants are closely scrutinized to see whether they have the abilities and expertise necessary to properly resolve issues facing the country such as those related to water resources, sanitation facilities and business management, and to provide services in a stable manner over a long period.

Such strict requirements are reflected in bidding conditions. For example, one Asian country requires a company to have the following abilities and experience[2] to be eligible for participating in the bidding process for water and wastewater services: the company must maintain a good financial standing and have experience in at least two projects of managing and operating large-scale facilities in developing countries. The Asian Development Bank has also prepared a template of tender specifications that requires market participants to have experience in managing and operating facilities of a prescribed scale or larger, management ability as seen from a financial position, overseas achievements and other related capabilities.

Japan's water service industry has the world's highest level of technology and experience as represented by an extremely low water leakage rate of around 5 percent, 24-hour water supply and water quality standards that are higher than those prescribed in the Guidelines for Drinking Water Quality published by the World Health Organization (WHO). However, it is difficult for Japanese companies that have little experience in operating water business overseas to meet all the bid requirements described above.

Furthermore, emerging countries have diverse needs for the entire cycle of water intake, treatment and recycling, which do not necessarily follow in the same direction as that pursued by Japan's water services. According to a questionnaire survey conducted by NRI in February 2010, respondents in Asian countries have the impression of "good quality, but high fees" with regard to Japan's water infrastructure. These survey findings indicate that it is difficult to simply sell Japan's technology and systems. Japanese companies are able to know of the needs of emerging countries through general trading firms that are actually developing projects in these countries or through engineers dispatched for technical cooperation, experts in municipal waterworks bureaus and consultants. However, it seems that their capabilities are poor in terms of presenting business proposals to emerging countries, municipal agencies and/or operating entities in these countries based on the needs they learned.

2 Japan's water business players that are needed to promote international development are dispersed

When we look at the current water business players, we find that the achievements, experience and enthusiasm that are necessary to operate water businesses in overseas markets are scattered in multiple organizations (Figure 5).

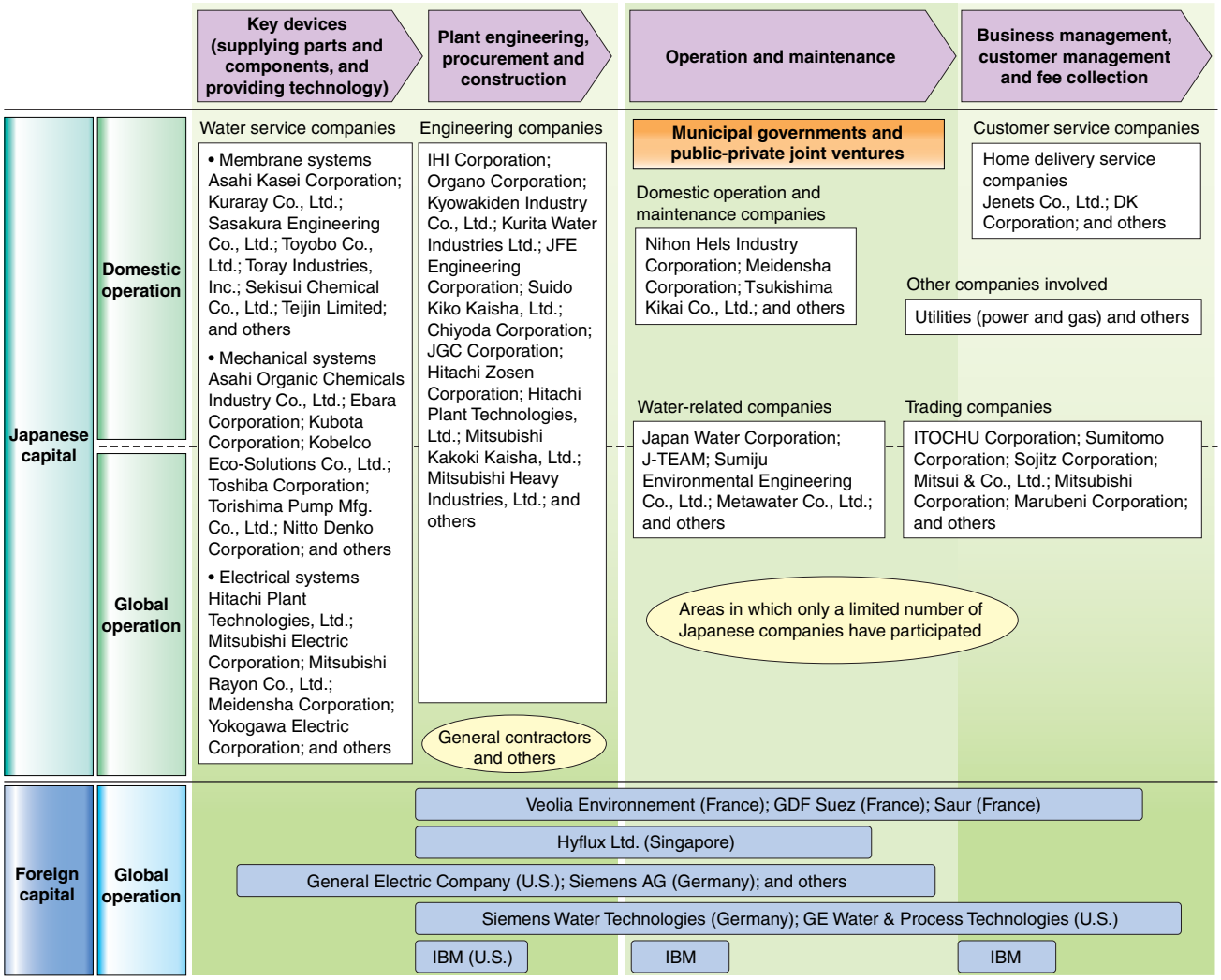
Most expertise and achievements related to water business operations (budget, plan formulation, regulation, operation, management and supervision, emergency response, etc.) are vested in municipal governments and their officials. Currently, the water and wastewater services provided by municipalities are handled by some 9,000 operating entities. This number far exceeds the number of municipalities. These operating entities provide services as public services in each of the business categories classified according to the usage purpose such as drinking water, wastewater, industrial water and small water-supply systems. Various laws and regulations governing municipal water and wastewater services such as the Local Public Enterprise Law and the Waterworks Law are designed to promote the smooth implementation of services within Japan, and do not assume international development.

In addition, municipal officials feel strongly that they are working for the citizens and are not so highly motivated to provide water services for more than ten years in foreign countries that are far from Japan. When we look at the private enterprises that recognize the needs for achievement in international projects, we are unable to find companies that can take the lead in developing overseas projects although many companies in each industry can offer high quality services in water treatment, plant engineering and construction, as well as customer services.

As such, currently, we are not yet in a situation where all water business players are unified in moving toward international expansion with the same attitude and with the aim of achieving the same goals.

Nevertheless, more attempts are being made for the international development of water businesses. In 2009, Team Water Japan was launched to address domestic and global water problems through the collaboration of industry, academia and government. Organizations such as the Global Water Recycling and Reuse System Association and Team Water Industry Japan are conducting activities to promote international expansion. These activities are noticeable in that chances to participate in global water businesses are given to all organizations that are willing to enter such markets regardless of whether they are in the public or private sector or are under the jurisdiction of any particular ministry or agency. However, the national and municipal governments and the water industry are still taking separate approaches to promote international development for their own purposes and from their own positions. As such, it appears that moves have yet to reach the stage where all efforts of the private and public sectors are integrated to strongly boost overseas expansion.

Figure 5. Industrial structure of the water business



Notes: 1) Companies listed in this table are based on materials published by the Ministry of Economy, Trade and Industry; the table does not necessarily cover all companies involved in the water business. 2) Companies listed as domestic operation and maintenance companies are those that have operated projects contracted by municipal governments.
Source: Compiled based on materials published by the Ministry of Economy, Trade and Industry.

IV Global Strategy of World's Leading Water Service Companies

In comparison with the current status in Japan, this chapter examines the strategy and organizational format adopted by water service companies in other countries such as those in Europe that have many achievements to facilitate global water business. In fact, most of the world's leading water companies have become involved in water business operations in countries other than their home countries (Table 1). The following sections present the approaches adopted by these companies.

1 Moves into global markets based on experience in home countries

Veolia, Suez, and Thames Water (UK), which are leading water service companies and are dubbed "water majors," have built their strengths by accumulating the experience of offering services such as water treatment and the management and operations of facilities for the public authorities of their home countries.

Among them, the world's leader, Veolia, was established in 1853 and has a history of more than 150 years. Of its annual consolidated sales of ¥4,300 billion in 2008, the water division accounted for nearly 40 percent, or ¥1,700 billion. This scale corresponds to slightly less than 60 percent of Japan's entire water service market. In France, Veolia has engaged in outsourced water and wastewater service operation and maintenance, and has been awarded concession contracts under which work such as fee collection, operation and maintenance has been conducted over a long period. The company also has experience in peripheral businesses such as water transport. By drawing on its expertise and experience in such a wide range of fields, the company has met diverse business needs arising in international markets.

In 1880, Veolia moved into markets outside France and, since 1980, has operated water services in Africa,

Table 1. Moves into global markets by the world's major water service companies

Company	Home country	Population served by water supply (million persons)	Major operating markets	Population served (million persons; approximate)
GDF Suez	France	99.57	France China Argentina	17.00 15.00 9.50
Veolia Environnement	France	53.27	China Mexico Germany	21.00 6.00 5.20
SABESP	Brazil	22.60	Brazil	
American Water	U.S.	14.69	U.S. Canada	14.00 0.70
ACEA	Italy	13.20	Italy Colombia	7.00 3.90
Aguas de Barcelona	Spain	12.80	Only Spain	
SAUR	France	12.17	France China	5.50 3.50
FCC	Spain	11.55	Spain Czech Republic	9.50 1.00
COPASA	Brazil	11.30	Only Brazil	
United Utilities	U.K.	10.42	U.K. India Bulgaria	6.80 1.60 1.20
Bouygues	France	9.57	Cote d'Ivoire Senegal	5.00 3.80
Agbar	Spain	9.26	Chile Cuba	6.00 1.35
Andrae Gutierrez	Brazil	8.10	Only Brazil	
Severn Trent	U.K.	7.93	U.K. Trinidad and Tobago Italy	7.28 0.40 0.25
AWG	U.K.	6.63	U.K. China	4.00 2.50
Gelsenwasser	Germany	5.21	Germany Hungary	4.65 0.19

Source: Compiled based on Global Water Market 2008.

Asia, North America and South America for 30 years. While about 70 percent of all sales come from European Union (EU) markets, Veolia has a presence in all five continents. The company has also invested in Aguas de Barcelona, which is a major water service provider in Spain, and has indirectly become involved in its international business operations.

SAUR, which is France's third largest water service provider in terms of annual sales (about ¥120 billion), has adopted the strategy of specializing in water business operations under contracts with small- and mid-sized municipalities in France. SAUR is also active internationally. It has received orders for water business operations in areas where the presence of European companies is limited such as the US, Poland, Spain, Mali and Senegal.

In Germany, companies that have grown by offering outsourcing services to municipalities are now internationally active service providers. Gelsenwasser, which was established in 1887 as a regional water provider in Land Nordrhein-Westfalen in the northwest part of Germany, is now Germany's largest public utilities company covering the fields of drinking water supply, wastewater treatment and natural gas supply. The company has contracts with 39 municipalities to provide these services.

In 2000, about 120 years after its establishment, the company moved into international markets by purchasing shares of companies that had contracts for offering water and wastewater services in some areas of France and Poland.

In Asia, Singapore's Hyflux, which was established in 1989 as a water service company operating in Singapore as well as in neighboring countries such as Thailand and Malaysia, has accumulated technology and management capability through its experience in reclaiming used water (new water) and winning contracts for seawater desalination facilities. After only 5 years, in 1994, the company moved into China, and into the Middle East in 2004 and India in 2006. In 2007, the company won a contract to construct and operate Algeria's largest seawater desalination plant.

2 International operations by multinational manufacturers

Heavy electric equipment and electric appliance manufacturers that are supplying water-related equipment are

also engaged in water business operations all over the world.

With 6,000 employees around the world, Siemens Water Technologies headquartered in Germany, a company in the Siemens group, operates more than 200,000 technology and service installations in 179 countries. This company is characterized by its strategy of establishing close relationships with customers rather than pursuing rapid growth. GE Water & Process Technologies, a company in the General Electric group, has a history of more than 100 years. In both cases, their parent companies, Siemens and GE, established companies specializing in water and wastewater businesses through repeated mergers and acquisitions of companies that had a customer base and core technologies. Currently, these companies are offering services and solutions on a one-stop basis to address the issues related to all processes of a water recycling system.

In Asia, Doosan Heavy Industries & Construction, which is one of Korea's largest heavy industrial manufacturers, is active in the international development of businesses focusing on the construction of seawater desalination plants. Primarily in countries of the Middle East, Doosan is moving to expand their areas of business beyond plant construction to include peripheral businesses.

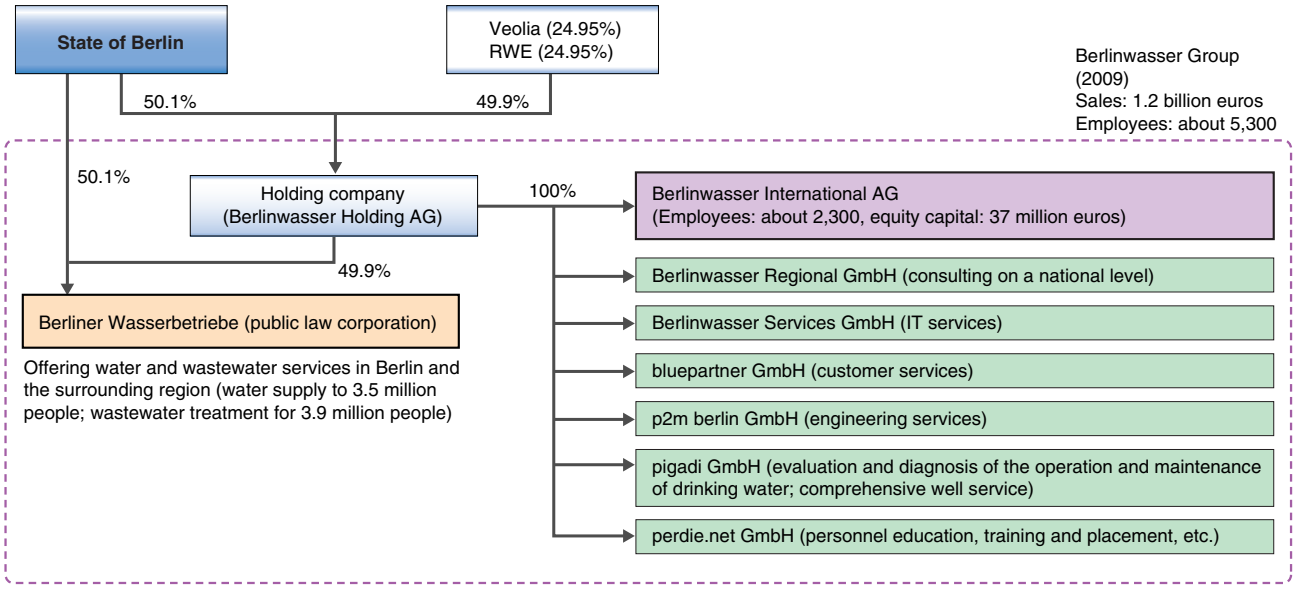
3 International development by public-private partnerships

In some cases, municipal governments operating water and wastewater services form alliances with private-sector enterprises to move into the international water market. In Berlin, Berlinwasser Holding AG is engaged in water and wastewater management for 3.5 million people. The shareholders of this company are the state of Berlin with a share of 50.1 percent and two companies, Veolia and RWE (German utility company), each owning 24.95 percent. In the past ten years, its subsidiary, Berlinwasser International AG (BWI), expanded its business from Europe as its base into China, African and other countries. Currently, with about 2,300 employees in 12 countries, the company's equity capital is 37 million euros (Figure 6).

The method by which BWI has moved into international markets is unique. Starting with the operation and maintenance of wastewater disposal systems in Budapest, Hungary, which is a neighboring country and has similar culture and climate, BWI subsequently expanded its service areas to include Asia, South America and Africa. In each of these regions, the company won a contract for a flagship project, which the company then used as a base for developing business in surrounding areas.

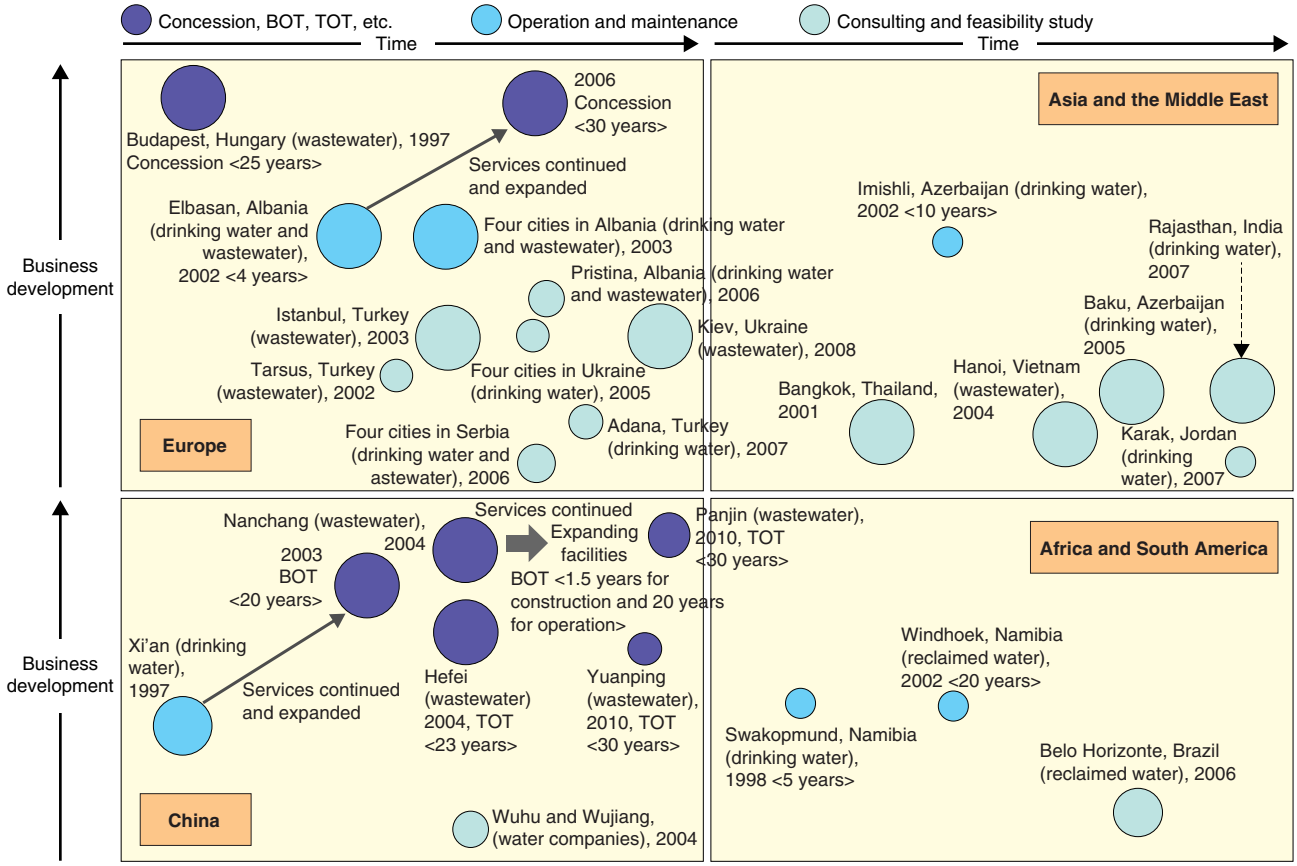
By way of example, in China, BWI started with building and operating the drinking water supply plant in Xi'an, and then moved into Nanchang and Hefei. In Africa, it is interesting to note that the company had contracts with cities in Namibia, which has close political and cultural ties with Germany. Unlike the water majors described in Section 1, rather than aiming to receive a long-term contract (BOT (Build Operate Transfer) projects, concession agreements, etc.) from the beginning, BWI first obtained fee-based contracts for consulting and feasibility studies to reduce the percentage of non-revenue earning water. After making ample studies, the company embarked on full-scale operations. Because the State of Berlin is its major shareholder, it is reasonable to assume that the company adopted the strategy of moves in stages from the perspective of both making an international contribution and pursuing profitability as a business.

Figure 6. Overview of Berlinwasser International (BWI)



Note: IT = information technology.
Source: Compiled based on websites of the Berlinwasser Group.

Figure 7. Berlinwasser International's strategy for moves into global markets



Notes: 1) The sizes of the circles represent the relative scale of covered population and project. 2) BOT (Build, Operate, Transfer) is a scheme in which a contractor builds, operates and transfers a facility. TOT (Transfer, Operate, Transfer) is a scheme in which a facility is transferred to a contractor; the contractor operates it during a concession period and transfers said facility to its original owner. 3) The number of years in brackets (< >) refers to a contract term.
Source: Compiled based on the website of Berlinwasser International AG (http://www.berlinwasser.com/content/language1/html/index.php), GWI reports and other materials.

A financial scheme for projects requiring investment of approximately one million euros or more is that BWI pays about half of the needed investment amount, with the remaining amount financed by a loan from Kreditanstalt für Wiederaufbau (KfW), a promotional bank under the ownership of the Federal Republic and federal states.

4 Domestic business structure and the extent of deregulation affect international expansion

When we look at moves made by water companies around the world into global markets, their strategies vary widely.

Behind the growth of the world's leading water service companies, Veolia and Suez, is a long history of several hundred years of experience and achievements within the French domestic market. On the other hand, Siemens and GE have worked to grow their businesses as multinational companies. As part of these efforts, they have autonomously developed water business operations in global markets. As represented by the case of BWI, when municipal governments already have a greater amount of resources such as personnel, technology and organizational strength, skillful collaboration with enthusiastic private-sector companies (water service companies) that have achievements in global markets will open the way towards international development. As such, the optimal format to adopt to move into global markets varies according to the maturity of domestic companies, the extent to which public services are open to the private sector and the scale of an operating entity that aims to develop international operations.

V Specific Measures to Promote Japan's Global Water Business

It was in 1980 that Veolia began expanding business beyond its home country of France into EU member states, and it was in the mid-1990s that the company entered the markets of countries other than EU nations. Compared to these moves, Japanese companies are approximately 30 years behind European companies in their approaches to international markets. Nevertheless, because Japan is a latecomer, it can learn from the failures encountered by first comers such as a riot started by residents due to a large increase in water prices and the

cancellation of a contract by a country where services were offered prior to the expiration of a contract period. While studying these failures, consideration can be given to how to draw on Japan's strengths to move into global markets.

Currently, Japan faces the challenge of how best to contribute to world development, in particular, to the growth of Asian countries in order to increase its international presence. To meet this challenge, future activities should be based on a "Japanese-style international development model linking economic cooperation and business" in which, while providing solutions to water-related issues facing Asian countries, the possibilities of developing business are sought.

Japan has only limited achievements and experience in water business operations in international markets. Accordingly, rather than pursuing comprehensive global development, the targets should be countries, cities and regions that can prove to be beneficial to Japan from the mid- and long-term perspectives. In setting such targets, a system must be established that enables the autonomous development of a series of activities from planning a project to receiving an order.

To date, studies have been made on the direction of Japan's approaches to international development primarily by the Ministry of Economy, Trade and Industry, the Ministry of Health, Labour and Welfare, the Ministry of Land, Infrastructure, Transport and Tourism and water industries. These organizations have presented proposals and suggestions from a multilateral perspective. The following sections discuss the direction of four priority areas, i.e., an important strategy from the perspective of advancing Japan's growth, a promotional structure for this purpose, a financing program and economic cooperation.

1 Adopting a strategy for international developments by limiting targeted countries and cities

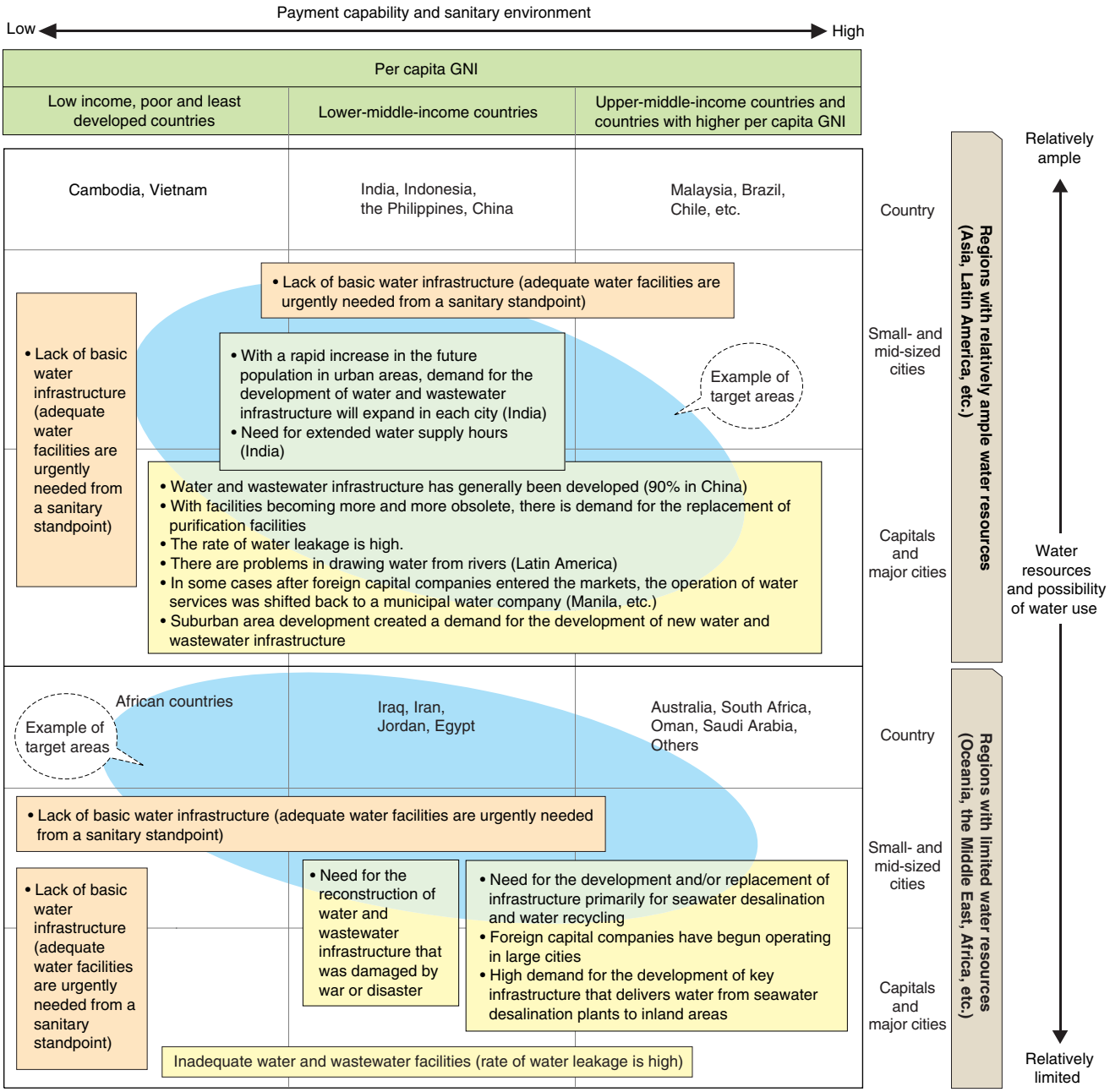
When we see moves by European countries including BWI into international markets, we find that water and wastewater services were expanded in either of two formats: "area-based development" in which services are concentrated on multiple cities in a single country and "time-based development" in which a company is involved in a single project for long time from the planning to implementation stages. If a company can receive an order for all multiple projects located adjacent to each other, management efficiency improves. If a company can be involved in all the processes of a single project from formulating a plan to operating water services, the company can gain an understanding of the actual status of water usage in the country where it operates, which can lead to opportunities to participate in related water markets such as agriculture, recycling and transport.

As these cases suggest, Japan should determine target countries, cities and areas by examining the situations there such as the stage of economic development, water resources and acceptability of doing business with Japanese companies. It is effective to identify the target countries, cities and regions with which long-term relationships could be established through service operations, while making the best use of the technology and management skills accumulated in Japan (Figure 8). Specifically, countries such as Taiwan, Australia, Vietnam and countries in the Middle East merit attention for several reasons: (1) these countries have close relationships with Japan in terms of historical background and resource trade; (2) Japan's economic cooperation is highly valued as compared to other countries and (3) certain environments exist that facilitate the acceptance of Japan's technology, services and management capabilities because of weather conditions, susceptibility to disaster, etc. Among these countries, it would be reasonable to select cities and areas facing the following problems:

- A rapid increase in population has created a demand for additional water supply and treatment beyond planned volume.
- A need exists to replace the entire water supply and treatment infrastructure and system in order to prevent any accident caused by obsolete infrastructure (pipes, etc.).
- Management performance must be improved by minimizing the rate of water leakage and the rate of non-revenue earning water and by preventing stolen water and unpaid fees.
- Water infrastructure that was damaged by an earthquake or flood requires reconstruction.
- Accelerating environmental pollution has created a need for establishing a system to supply a minimum level of safe drinking water.
- Because a utility company operating services other than water services purchased (invested in) a company operating water and wastewater services in the target country, the company needs to acquire expertise and strengthen its capabilities to operate such services, and increase the number of skilled personnel.

When we look at the markets in Asia, we see many large cities with expected high water demand that are not served by major overseas water service companies, such as large cities around provincial capitals mostly in inland China, cities in India, and second- and third-tier cities in ASEAN (the Association of Southeast Asian Nations) countries (Figure 9). Various reasons have been pointed out for preventing the establishment of business in these cities such as the issue of a social system, regulations imposed on foreign capital companies, unstable public order and disasters. However, because such problems

Figure 8. Conceptual direction of Japan's strategy for global water business



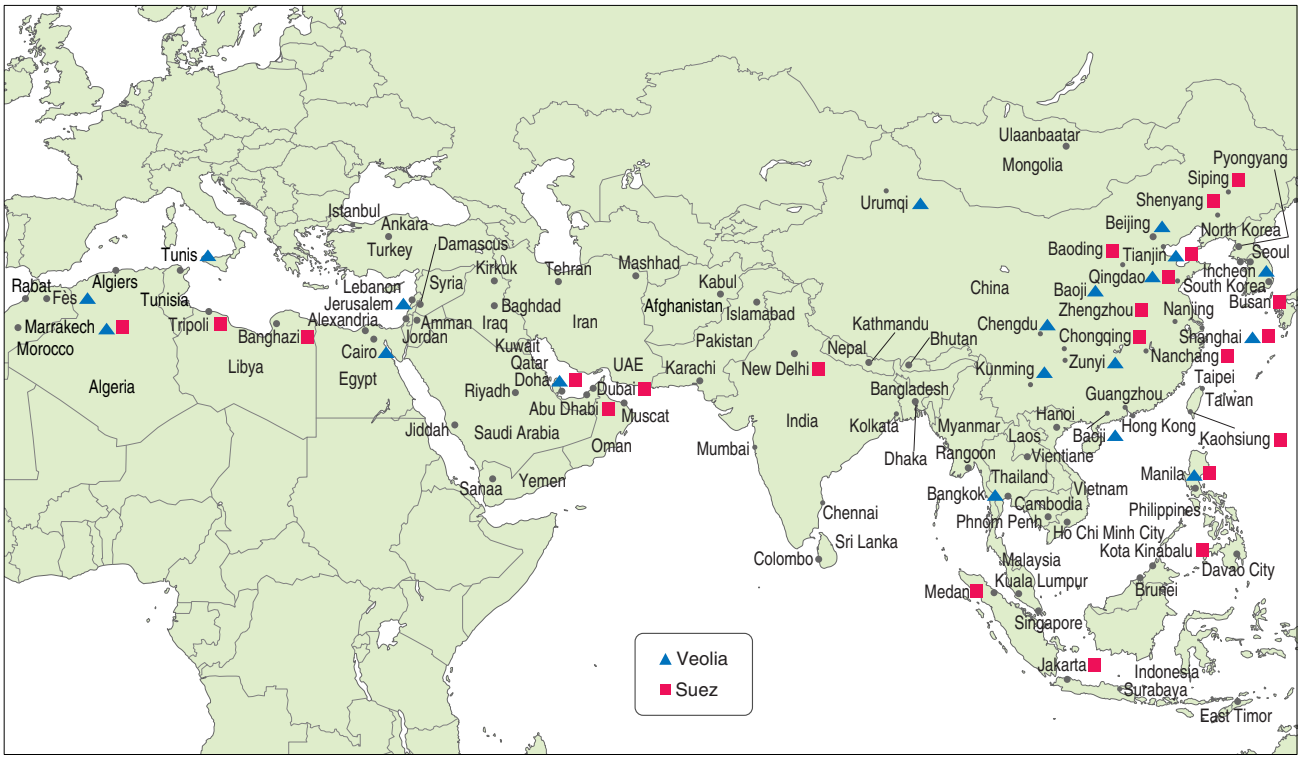
Note: Country classification based on per capita GNI (gross national income).
Upper-middle-income countries: $3,706 – $11,455, lower-middle-income countries: $936 - $3,705, low income countries: $935 or less.

exist, there is room for Japan to become involved in water and wastewater projects starting from the upstream fields such as formulating a master plan and providing support in developing local personnel. These activities could lead to the development of business.

2 Building and reinforcing an organizational structure to promote the international water business

Emerging countries face diverse water-related challenges such as the need for solutions to providing water where resources are scarce, the improvement of a sanitary environment, the extension of water supply hours, the reconstruction of infrastructure damaged by an earthquake or other disasters and the improvement of fee collection. To meet these needs, a highly feasible proposal for establishing a system must be made to working-level officials of the target country at the stage before a project is set up. An organization that is strong enough to realize such a proposal as a business is required. This organization should be formed by the government (responsible for diplomacy), municipal governments (operating entities) and the private sector (responsible for setting up projects, engineering, technology, supply of materials and equipment, and providing financial support) through cross-sector (public and private sectors) and cross-field (water and wastewater fields) collaboration.

Figure 9. International moves by French water service companies (Veolia and Suez) in Asia and other regions



Note: The locations of capitals and major cities are shown in the above map.
Source: Compiled based on the Global Water Market 2008 and other materials.

However, when we look at Japan's water business industries, because of a great number of participating players, it is highly likely that a long time and a great deal of labor would be required before a full-fledged organization could be established. Accordingly, a realistic solution is to set up an organization that can be involved up through service operations in stages, depending on the target country and the type of targeted water business. The methods required to establish such an organization include the following three (Table 2).

(1) Forming a joint venture with a municipal government that has operated water service in the domestic market and a private-sector company (general trading firm, engineering manufacturer, construction company, etc.) that has experience in moving into international markets; or using an existing water-related public-private joint venture.
(2) Purchasing or investing in a company (either public or private) that has experience in operating a business in international markets to acquire the necessary experience, expertise and technology relative to overseas projects.
(3) Transferring the technology, experience and personnel that Japan's municipal governments have to a private-sector company in order to foster a water service company.

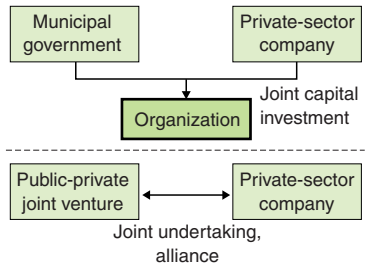
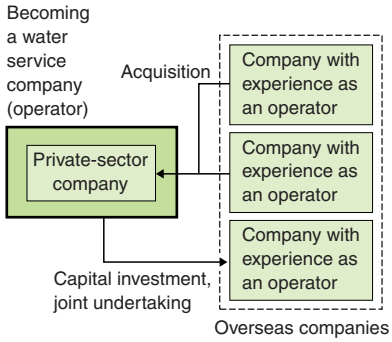
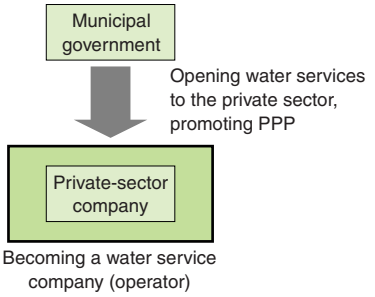
The appropriate method should be flexibly selected depending on the characteristics of the target project and accumulated expertise. For example, Case (1) should be adopted for a large-scale project operating water and wastewater services by using multiple facilities; Case (2) for the operation of facilities and plants. In any case, the national government's leadership, which is demonstrated regardless of which ministry or agency has jurisdiction, is essential in establishing partnerships.

3 Tie-ups among public and private financing programs to support long-term, stable business operations

To pursue stable water business operations in emerging countries, a large outlay of funds is required in a variety of fields such as the replacement of pipelines, purification and water supply facilities that have become obsolete, the development of water resources and the establishment of a fee collection system. In addition, there are many cases in which at least a minimum investment is required in a water service operating entity of the target country in order to take part in a concession. It is very difficult to raise these funds in emerging countries that have little investment capacity and provide a limited means of raising funds. Accordingly, money from Japan that is invested in high-risk high-return projects should be used. Additionally, funds should be sought from financial institutions and investors in the target country.

In fiscal 2008, Japan disbursed some ¥220 billion as ODA (official development assistance) funds and sent nearly 500 experts in the water and hygienic fields to recipient countries. These numbers are greater than

Table 2. Patterns of Japan's entry into international water markets

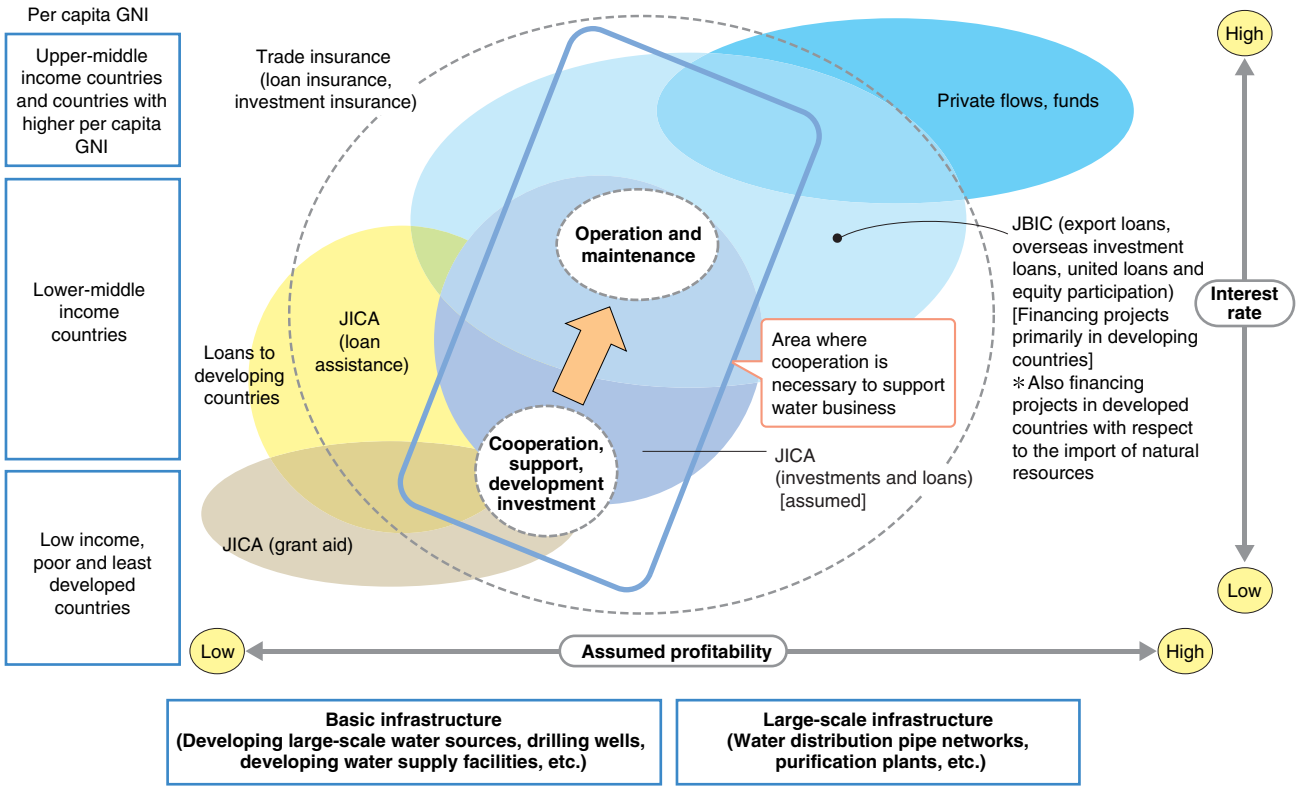
Entry pattern	Outline		Examples of major overseas water companies
(1) Forming public-private partnerships	• Setting up a new organization jointly by a municipal government (or its auxiliary organization) that is an operating entity and a private-sector company • Assumed patterns include establishing a joint venture through joint capital investment, capital participation (increase in capital) in an existing joint venture, and forming a partnership between a private-sector company and a municipal government • Key issues are the selection of a partner from the viewpoint of impartiality and the governance of a public-private organization		• BWI (Germany)
(2) Strengthening the functions of a private-sector company that has experience in moving into international markets	• A company that has experience in moving into international markets such as a trading firm purchases, invests in and/or establishes a joint venture with a company that has experience in operating a water business overseas. While doing so, the company builds up its strength for international development • While it is possible to strongly promote international development based on market principles, it is less easy to directly reflect the government's intention • The key issue is the identification of a company that is to be purchased		• Siemens (Germany) - Siemens Water Technologies • GE (US) - GE Water & Process Technologies • IBM (US) • Doosan Heavy Industries & Construction (Korea)
(3) Fostering a water service company (operator)	• Through promoting deregulation (opening water services to the private sector) or privatization in domestic markets, fostering companies that can operate water businesses • With the strong support of the government, companies might be developed in three to four years in some cases. However, when we look at the cases in Europe, a longer period is necessary for a company to autonomously move into overseas markets		• Veolia (France), Suez (France), Saur (France), Agbar (Spain) • Thames Water (UK) • Gelsenwasser (Germany) • Hyflux (Singapore)

Notes: 1) PPP = public-private partnership. 2) An entry that combines these patterns is also conceivable.

those in other fields such as communication, transport and energy. In addition, by means of ODA and OOF (other official flows), a large number of public financing programs are available that provide funds to the governments of emerging countries and to Japanese companies that plan to move into such countries. However, because these programs are managed based strictly on their respective intended purposes, they lack the flexibility needed to meet the demand for funds required in emerging countries. The basic purpose of yen loans provided by the Japan International Cooperation Agency (JICA) is to provide "assistance" to developing countries. Accordingly, it is likely to be considered that supporting the business operations of Japanese companies is outside the purpose of this program. While export loans and overseas investment loans provided by the Japan Bank for International Cooperation (JBIC) are the financing tools for companies (organizations) operating in overseas markets, these loans are provided for the purpose of earning profit. Accordingly, financing cost might be a problem for companies that are unable to earn more than a certain level of revenue.

Japan's public financing systems, which mostly consist of direct financing, are comparable to those of other developed countries. Currently, however, each program is individually and separately managed according to the development stage of the target country and depending on the characteristics of a particular project. These programs must be changed to a system that enables mutual linkage among these financing programs including those available in the private sector and makes it possible to supply the requisite funds quickly and seamlessly. Specifically, the public and private sectors should jointly study the establishment of the following systems (Figure 10).

Figure 10. Overview of financial scheme tie-ups to support Japan's international water business



Notes: 1) Country classification is based on the OECD's DAC (Development Assistance Committee) List of Aid Recipients for 2008. 2) JBIC = Japan Bank for International Cooperation, JICA = Japan International Cooperation Agency.
Source: Compiled based on materials published by Japan's Ministry of Finance and other materials.

(1) A financial system that supports the maintenance of business stability in a company operating in the participating country
(2) A financial system that enables a seamless supply of funds according to the level of progress in the economic development of the participating country
(3) A package scheme that combines funds provided through local financing, international financing and private-sector financing programs

Germany's KfW, which was mentioned in Chapter IV, enables companies participating in infrastructure projects in overseas markets to use ODA funds and loan guarantee programs in addition to offering its own investment and loan products. These activities can be used for reference in studying new schemes.

4 Promoting economic cooperation that can lead to a reform of public services offered by municipal governments

In emerging countries, water services are often operated by municipal governments such as provinces, prefectures and cities. Therefore, providing solutions to the issues facing municipal governments and proposing an institutional framework that makes it easier to accept Japan's technology and services would lead to increased opportunities for Japanese companies to be involved in the essential parts of water businesses.

To deal properly with rapid economic growth and increases in population, emerging countries must quickly develop an infrastructure, embark on financial reconstruction and re-build a social system. These needs are similar to those experienced by Japan during its period of high economic growth. Accordingly, there is a good chance of being able to transfer the fiscal, financial and local autonomy systems that Japan accumulated during that period. In the case of water and wastewater services, it is important to continue economic cooperation not only for the national government but also in a way in which such cooperation can lead to improved systems and services offered by municipal governments that have jurisdiction over these businesses.

In the field of ODA, in addition to financial assistance such as general budget support (GBS) arrangements, assistance schemes in which a donor country is involved in the formulation of a poverty reduction plan of a recipient country have already been implemented in Asian countries such as Vietnam and Cambodia. While making use of these schemes, comprehensive assistance for water and wastewater services covering not only technology but also institutional, management, economic and accounting systems must be strengthened.

VI Efforts towards International Development

It has been several years since attention was focused on the need to promote Japan's international water business. Rather than discussing strategies for international development simply from the theoretical perspective, the public and private sectors must jointly work seriously so that Japanese companies can take the lead in receiving orders for as many representative projects as possible.

In May 2010, a consortium consisting of the Innovation Network Corporation of Japan, which was co-founded by the Japanese government and private-sector companies, Mitsubishi Corporation, JGC Corporation and Manila Water Company acquired a 100 percent stake in United Utilities Australia Pty Limited. It was announced that United Utilities Australia, the Waterworks Bureau of the Tokyo Metropolitan Government and Tokyo Suido Services Co. Ltd. would enter into a consulting agreement. As such, moves have begun to develop the international water business. The author sincerely hopes that these attempts can drive the establishment of a new Japanese-style international development model in which the expertise that Japan has accumulated for a long time in the field of water service operations can be utilized in providing solutions to various water-related challenges facing the target country, city or area. Consequently, orders could be received continuously for water-related businesses over a long period.

Notes:

1 This forecast was published by Global Water Intelligence, a research organization for the international water industry.

2 Example requirements to be eligible for participating in the bidding procedures include: (1) experience in the operation of water and wastewater services in at least two countries including a developing country, (2) specifically, serving 100,000 people, supplying 100,000 m^3 per day and a rate of paid fees of 90 percent or more, (3) good management performance (operating profit of $20 million or higher), (4) personnel responsible for general operation management, construction and finance must have at least 15 years of experience, and (5) experience in managing an expansion project. These examples are indicated in Reference 1 below.

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