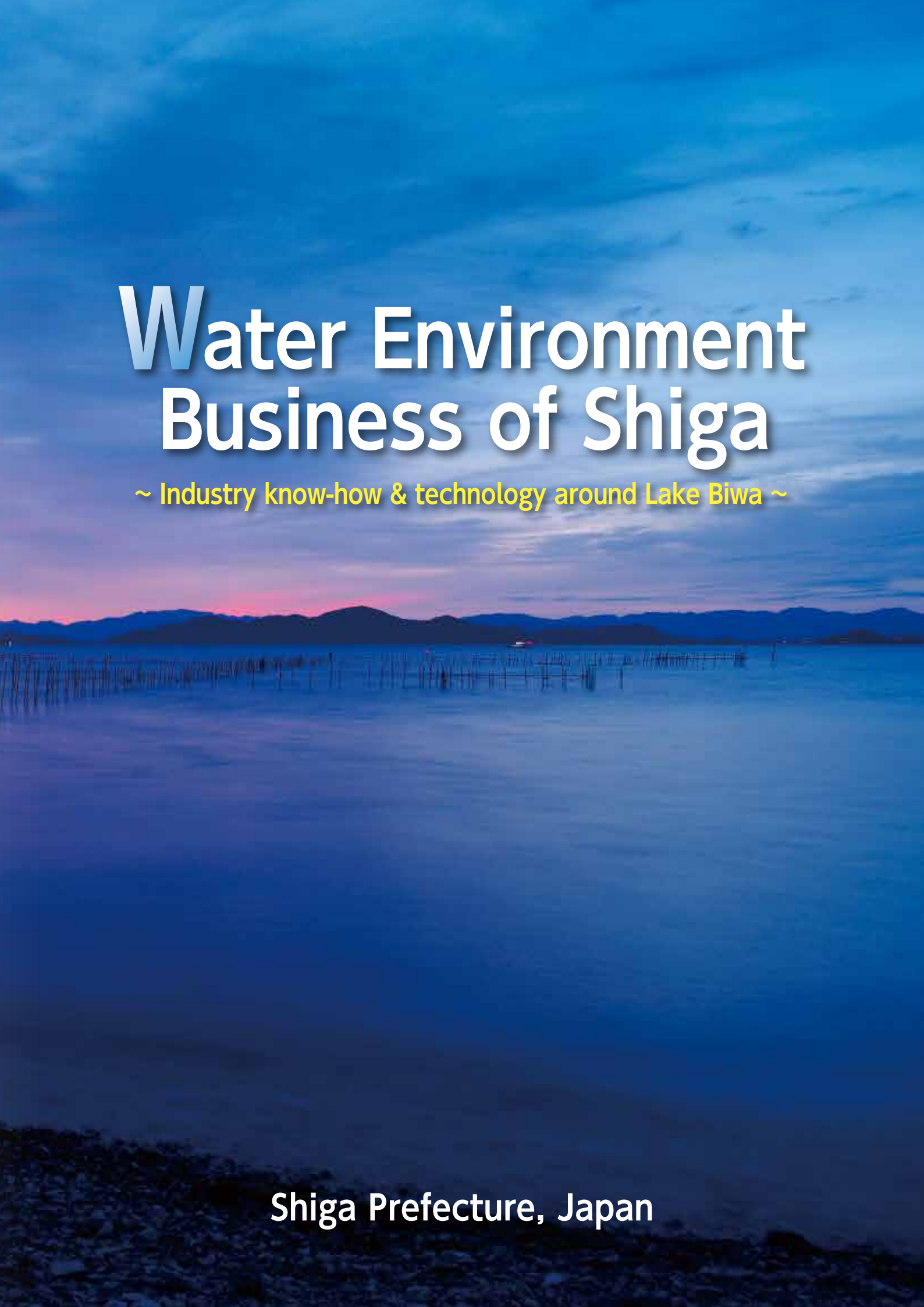


Water Environment Business of Shiga

~ Industry know-how & technology around Lake Biwa ~

Shiga Prefecture, Japan

Contents

*This booklet introduces members who agreed to publication of the questionnaire survey.

*In this brochure, “fiscal year” (FY) refers to the period from April 1 to March 31 the following year.

1. Introduction: Shiga Prefecture – Guardian of Lake Biwa

Lake Biwa is the largest lake in Japan, and one of the world's ancient lakes. Its values are wide, as a rich nature environment, as a water source, and as a site of the water industry.

Currently Lake Biwa supports 14.5 million people in the Kansai areas, providing water for the use in their everyday lives and for industrial use. In the Lake Biwa–Yodo River Basin, the water is first used in the upper reaches and then reused in the lower reaches. As Shiga Prefecture is located in the uppermost region, the prefectural government has taken measures to improve the quality of water flowing down to the lower reaches. After the 1970s, Shiga Prefecture rapidly constructed sewage treatment plants. It also adopted advanced water treatment systems ahead of the rest of Japan and disseminated them through the prefecture. As a result, Shiga Prefecture boasts a very high penetration rate for sewage treatment and advanced water treatment systems.

With the abundant water of Lake Biwa as well as the geographical advantage of being located midway between the Kansai and Tokai areas, Shiga Prefecture has been home to many enterprises, notably manufacturers and their factories. As exemplified by the fact that the percentage of secondary industries in the Gross Prefecture Product for the prefecture is the highest in Japan, Shiga has been growing as one of Japan's most active "Manufacturing Prefectures."

Thus, Shiga Prefecture can be seen to have accomplished economic growth, and is making efforts to conserve the closed water environment of Lake Biwa.

Water of Lake Biwa Supporting Life and Industry in Kansai.

Lake Biwa, the largest and oldest lake in Japan

● The oldest lake

・It is the third oldest lake in the world, and is thought that the lake formed approximately 4.4 million years ago, and shaped into the current Lake Biwa approximately 430, 000 years ago.

● Vast catchment area of Lake Biwa

・With 460 rivers, both large and small, flowing into Lake Biwa, its catchment area extends to 3,848 km^2 (1.0% of Japan's land area).

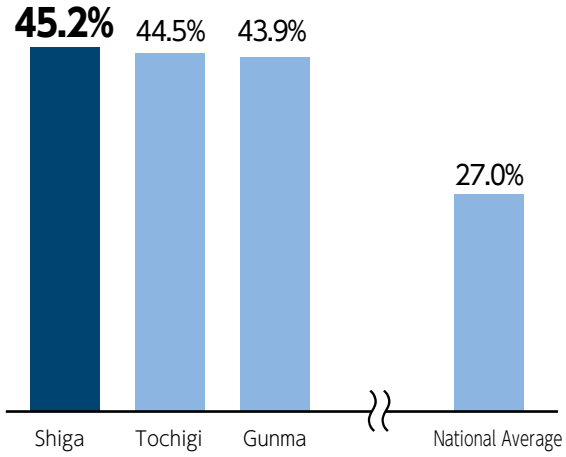
Age	Approx. 4.4 million years old.
Lake surface area	670 km^2
Length of perimeter	235 km
Maximum depth	104 m
Average depth	41 m
Water storage capacity	27.3 km^3
Number of species living in the lake	Approx. 600
endemic species	60 or more

Water use population of 14,500,000

Supporting 14.5 million people's lives and industries in Kansai. This is equivalent to 11% of the Japanese population.

Shiga, one of the most active manufacturing prefectures in Japan

● Percentage of secondary industries in the Gross Prefectural Product: 45.2% (highest in Japan)



*Source: Prefectural Accounts for fiscal 2015 (issued by the Cabinet Office)

Advanced Approach to Wastewater Processing

Various wastewater treatment facilities have been developed for each district, tailored to their specific circumstances. As a result, Shiga Prefecture has extremely high penetration rates for wastewater treatment and advanced sewage treatment systems.

● Penetration rate of wastewater treatment based on population: 98.7% (*1)
Third highest in Japan (following Tokyo and Hyogo Prefecture)

Type of wastewater treatment system	Population with access to wastewater treatment	Penetration rate based on population	Penetration rate based on population (as of March 31, 2015)	Difference
Public sewage systems	1,271,046	89.68%	89.30%	0.38%
Drainage facilities for agricultural communities	89,813	6.34%	6.57%	△0.23%
Combined household wastewater treatment facilities	37,344	2.63%	2.74%	△0.11%
Drainage facilities for forestry communities	47	0.00%	0.00%	0.00%
Total	1,417,306	98.7%	98.6%	0.1%

● Penetration rate of public sewage systems in Shiga Prefecture: 89.7% (*1)
Seventh highest in Japan

● Percentage of population with access to advanced sewage treatment systems compared to the total population of the prefecture: 88.2% (*2)
Highest in Japan

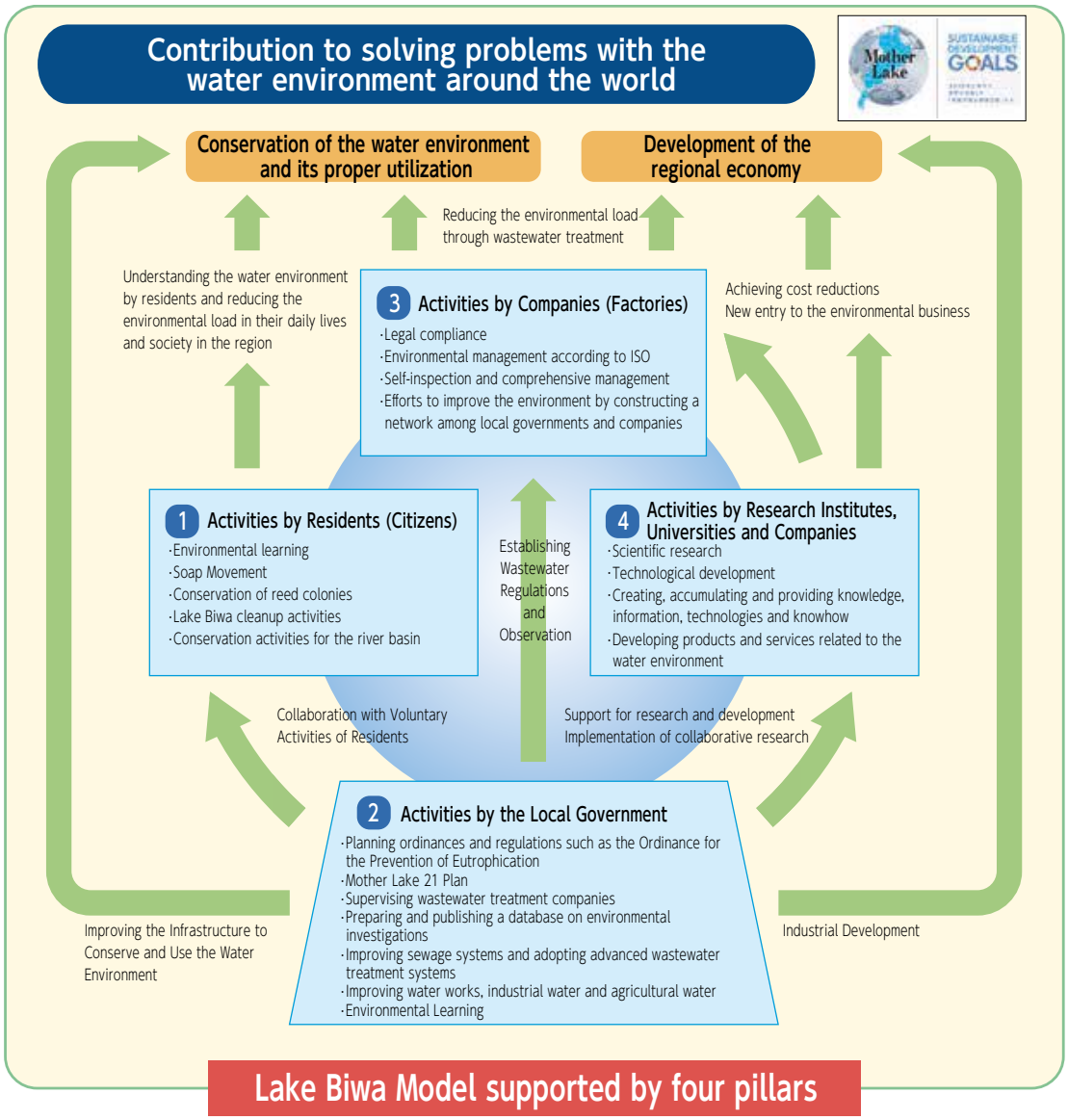
*1 Source: FY 2018 Sewage Works in Shiga (issued by Shiga Prefecture)
*2 Source: Independent survey conducted in FY 2015 by Shiga Prefecture

2. Lake Biwa Model for the coexistence of economic development and conservation of the water environment

Introduction: Four pillars that support the Lake Biwa Model

Among the activities conducted for conservation of the water environment of Lake Biwa, comprehensive actions based on the technologies and know-how accumulated by residents, governments, companies (including factories) and research institutions are collectively known as the “Lake Biwa Model.” This model is supported by four pillars; (1) residents (citizens), (2) the local government, (3) companies (factories) and (4) research institutions, universities and companies related to the water environment. The Lake Biwa Model enables economic development in conjunction with the conservation of the water environment and its utilization.

This model may be applied not only to other lakes, but also to various water-related settings, such as seas, rivers and industrial parks. Application of the Lake Biwa Model can contribute to resolving a range of problems and challenges regarding the water environment around the world.



At the United Nations Summit in September 2015, SDGs(Sustainable Development Goals) were adopted, consisting of 17 goals designed to be a “blueprint to achieve a better and more sustainable future for all.” Shiga Prefecture announced that it would be the first prefecture in Japan to incorporate the SDGs into the prefecture's policies. The Lake Biwa Model also contributes to achieving SDGs.

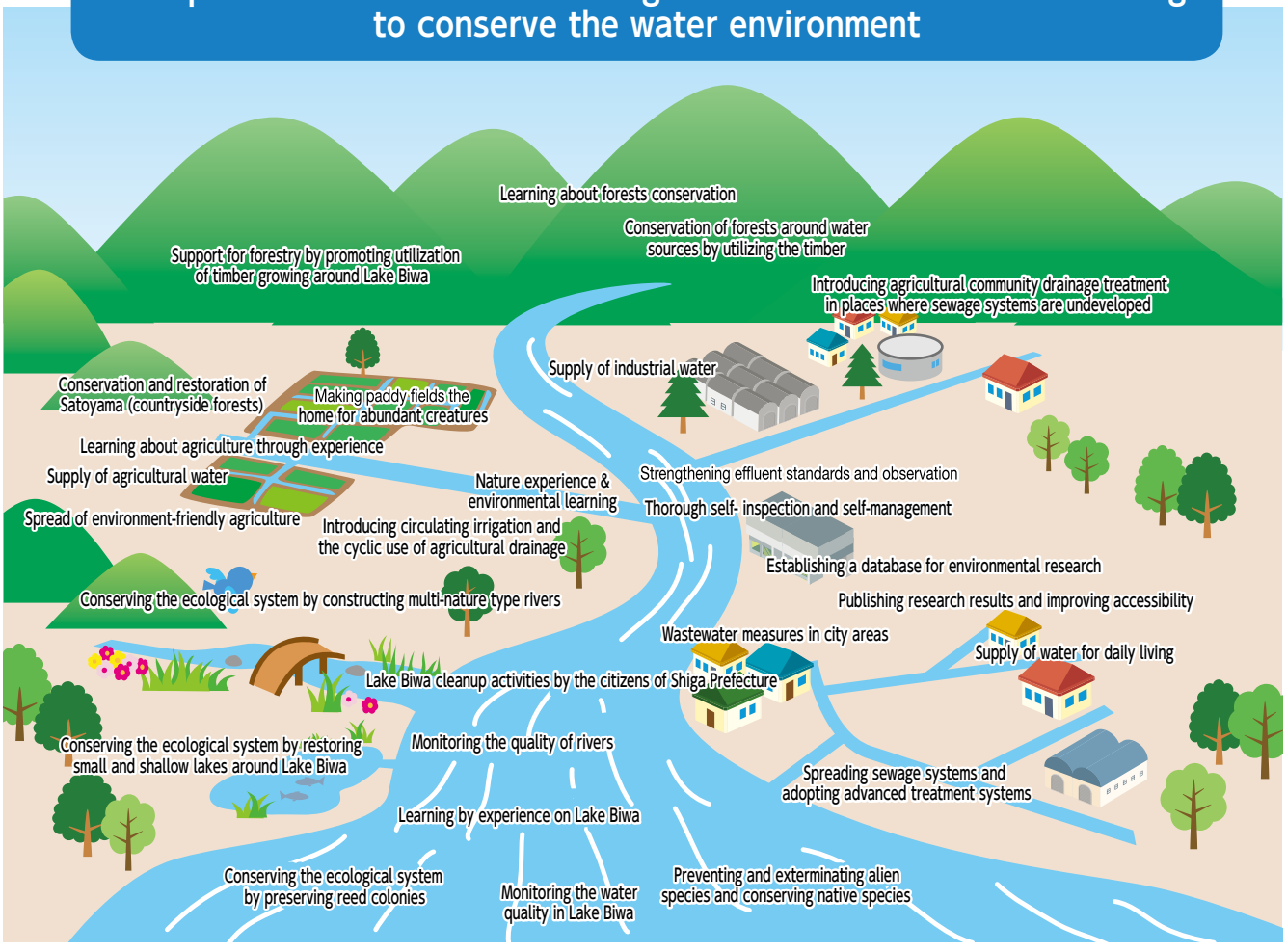
Activities to conserve the water environment and to properly manage the river basin

Interacting with the air, soil and other elements in the environment, water flows from mountains to the countryside, from the upper stream to the lower stream. In this flow process, water has a large influence on diverse ecosystems, including human beings. In the circulating process, water enriches our lives and plays an important role in developing our industries and culture.

In conserving and utilizing the water environment, it is important not only to think about the individual elements, but also for all the parties in the Yodo River Basin to work together, taking into account the character of each region and its connection from the upper stream to the lower stream.

In Shiga Prefecture, citizens, companies, research institutes, universities and the local governments have conducted their activities as a unified body in the Yodo River Basin to achieve comprehensive conservation for the whole of the river basin surrounding Lake Biwa. These activities have produced fruitful results.

Examples of the activities that Shiga Prefecture has been conducting to conserve the water environment



Column

Example of Water Quality Improvement Projects Capitalizing on the Lake Biwa Model

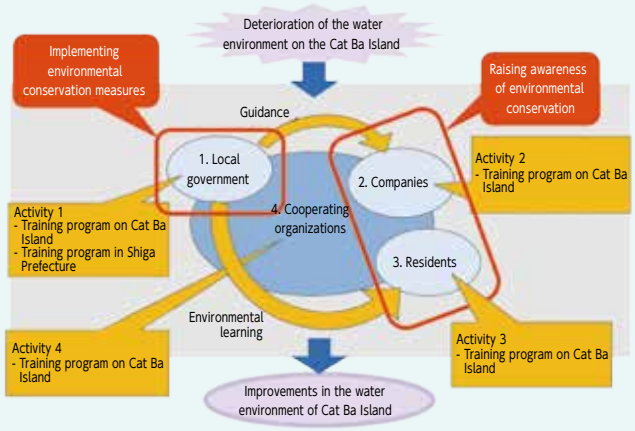
Cat Ba Island

Thus far, Shiga Prefecture has worked to conserve Lake Biwa, and collaborated with companies in conducting water quality improvement projects through effective application of the Lake Biwa Model. Here is one example of these projects, which was carried out on the Cat Ba Island in the Ha Long Bay, Vietnam.

With a population of approximately 30,000, the Cat Ba Island is highlighted by flourishing fishing and tourism services industries. In the past ten years, however, the load of water quality pollutants increased due to the growing numbers of tourists and people living on the water, causing water quality deterioration, offensive odors, and the outbreak of a red tide. If this situation continues, it is feared that deterioration of the landscapes may lead to a reduction in the number of tourists, and degradation of the water environment candecrease the catch of fish.

To improve the situation and promote "green growth" that will realize both environmental preservation and economic development simultaneously, the following project was carried out, making effective use of the Lake Biwa Model. The project resulted in enhanced environmental awareness among the local government, companies and residents of the Cat Ba Island, thereby forming the foundations for implementing environmental protection activities through industryacademia-government collaboration.

Project Name	Collaborative support for organizing a structure for cooperation in improving the aquatic environment in the attractive tourism island, Cat Ba
Scheme	JICA Grass Roots Partnership Project (Local Revitalization Special Program)
Project site	Cat Ba Island, Cat Hai County, Hai Phong City, Vietnam
Term	March 2015 – March 2017
Implementing Organizations	[Japanese side] Shiga Prefectural Government, KANSO Co., Ltd., Hiyoshi Corporation, and Osaka Prefecture University [Vietnamese Side] Hai Phong Department of Natural Resources and Environment (DONRE), Cat Hai County People's Committee, Vietnam National University, companies, residents, etc.



1 Activities by Residents

In the late 1970s, an outbreak of a fresh water red tide in Lake Biwa triggered the so-called “Soap Movement,” which was initiated primarily by housewives. This campaign encouraged people to use powdered soap instead of detergent, and became widespread over the entire prefecture.
In addition to the Soap Movement, diverse activities and actions by residents to protect the water environment of Lake Biwa have been developed, and remain active still now.

1) The Soap Movement by residents triggered by the outbreak of a fresh water red tide in Lake Biwa


Soap Movement (1970s)

During the period of high economic growth, Shiga Prefecture saw a population growth and an increasing number of factories, which caused the load of pollutants to increase in Lake Biwa. Consequently, deterioration of the water quality in the lake became a matter of serious concern in the late 1960s.
Meanwhile, in May 1977, a “fresh water red tide” occurred in Lake Biwa, i.e., a serious outbreak of red-brown plankton that gave off an offensive odor. One of its causes proved to be the phosphorus contained in synthetic detergents. A campaign was then started at the initiative of residents to stop using detergents containing phosphorus, and to use soap powder whose main ingredients are natural oil materials. This was the so-called “Soap Movement.”
In 1978, amid the increasing ground swell for using soap powder, a prefectural liaison council for the residents’ campaign to protect Lake Biwa by promoting the use of soap powder was formed, mainly consisting of housewives. This liaison council played a key role in demanding that the government take immediate measures. This led to the enactment of the Ordinance for the Prevention of Eutrophication of Lake Biwa (Eutrophication Prevention Ordinance) in 1979, coming into effect in 1980. To commemorate the 1st anniversary of Eutrophication Prevention Ordinance, it was decided in 1981 that July 1 would be “Lake Biwa Day.”

2) Activities to conserve the water environment through public-private collaboration – Lake Biwa cleanups and reed colony conservation –

[Initiatives for Lake Biwa Day, including cleaning activities conducted throughout Lake Biwa]

July 1 has been designated “Lake Biwa Day.” On that day every year, local residents, companies, and governmental agencies work together under the campaign of “Make Lake Biwa beautiful” throughout the prefecture. A total of 5.8 million people have participated in the campaign since 1981.


Lake Biwa cleanup

[Conservation of reed colonies]

Reed colonies play an important role in environmental conservation on Lake Biwa. They play a variety of roles, including providing habitat for fish and birds, preventing lakefront erosion, and conserving water quality. Based on the Ordinance for Reed Colony Conserva-tion (which took into effect in 1992), activities to create, plant, cut, and clean and maintain reed colonies are carried out through public-private collaborations.

3) Environmental learning – Development of environmental education

Shiga Prefecture has set up the Environmental Learning Center at the Lake Biwa Museum as a hub for promoting environmental learning. The Center helps residents, regional groups and NPOs engaged in environmental learning activities by providing support with planning environmental education programs and offering relevant information. Its website, “Eco-lo-Shiga,” has 149 members registered (as of December 2018), including regional groups and

NPOs, who give guidance and instruction on environmental learning. Shiga Prefecture operates the Biwako Floating School, “Uminoko” (lit. children of Children receiving environmental learning on the lake). It is an educational boat where all the fifth graders in the prefecture go on board, stay overnight on Lake Biwa, and learn about the lake as a part of their school education. The total number of the children who have boarded this ship since its inaugural day in 1983 exceeds 550,000.

Environmental learning and education activities that lead to resident-driven environmental conservation are conducted throughout the prefecture.

Children receiving envirenmental learning on the educational boat “Uminoko”

4) Civic activities to protect Lake Biwa tied through the Mother Lake Forum

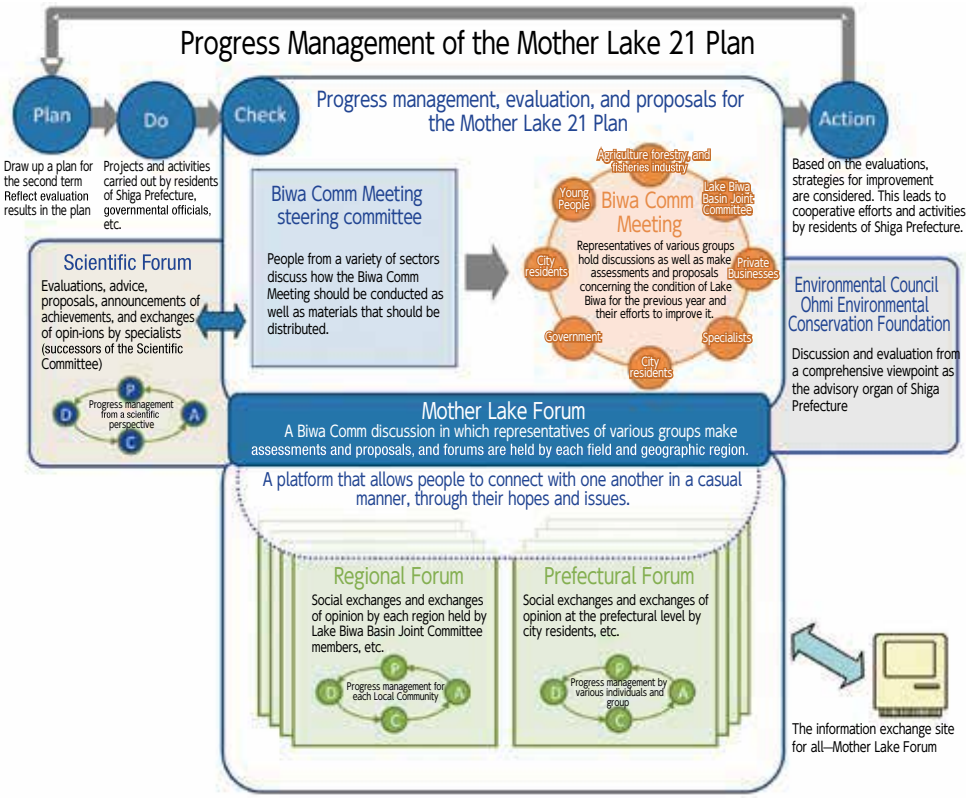
The Mother Lake 21 Plan was revised in October, 2011 and during the second planning period, the Mother Lake Forum was provided as a place for various entities including citizens, NPOs and companies involved in the Lake Biwa basin to manage the progress of the plan and to make evaluations and proposals. The forum is operated by the Mother Lake Forum Steering Committee consisting of NPOs and researchers. Shiga Prefecture participates in the Forum as one of the committee members.

Mother Lake Forum is a platform to connect members loosely through their “hopes” and “themes.” One of the activities, “Biwa Comm Meeting”* is held annually around August or September to discuss the present and future conditions of Lake Biwa. There is also an information exchange site named Mother Lake Forum, which connects members from the various entities beyond their fields through the Internet, and encourages them to undertake new activities.

Mother Lake Forum is a system that allows the various entities to act voluntarily and willingly. It is very important in forming bonds between members to conserve Lake Biwa.

Mother Lake Forum

* The name "Biwa Comm Meeting" is made up of "Biwa," from Lake Biwa, and "Comm," which expresses community (region), communication (dialogue), and commitment (promise).



2 Activities by the Local Government

Shiga Prefecture instituted the Ordinance for the Prevention of Eutrophication and other regulations on water environmental conservation, and drew up the Mother Lake 21 Plan. In so doing, the prefecture has encouraged companies and residents to participate in conservation activities for the water environment.
By adopting and maintaining sewage treatment systems, including a public sewer system geared to each different local circumstance, Shige Prefecture has introduced advanced sewage treatment.

1) Enactment of the Eutrophication Prevention Ordinance Designing and implementing systems for companies to develop and maintain their sewage treatment facilities

In 1977, the outbreak of a fresh water red tide occurred in Lake Biwa, which led to a ground swell of civic campaigns, including the Soap Movement. Against this backdrop, Shiga Prefecture enacted the Ordinance for the Prevention of Eutrophication (also known as the “Eutrophication Prevention Ordinance”) in 1979.
Under the Eutrophication Prevention Ordinance, effluent control standards for nitrogen and phosphorus are applied to industrial drainage. In this sense, the ordinance was the first of its kind in Japan and served as a pioneering regulation in the world. It is said that it was significantly difficult for companies and factories to satisfy these standards at that time.
In 1980 just after the enforcement of the Eutrophication Prevention Ordinance, on-site inspections of factories and enterprises came into force, to monitor improvements to effluents containing nitrogen and phosphorus.
To comply with the effluent control standards for nitrogen and phosphorus, factories need to develop and maintain waste water facilities incorporating appropriate technologies. To help these factories to meet these needs, Shiga Prefecture designed and implemented the following new systems.

Ordinance for the Prevention of Eutrophication (1979.10)

- Ban on the use and sale of synthetic detergents that contain phosphorus in Shiga Prefecture
- Control of effluents containing nitrogen and phosphorus in industrial drainage <<For the first time in Japan>>
- Proper use of fertilizers
- Proper disposal of livestock excretions
- Miscellaneous waste water treatment

●"Technical Manual for improving nitrogen and phosphorus processing facilities" was pre-pared and briefing sessions were held according to the type of industry. Training courses for managers and persons in charge of designated facilities were also conducted.
●The "Shiga nitrogen, phosphorus processing facilities maintenance fund loan summary" was established, separately from the loan system for pollution control. This new system was to provide small and medium-sized businesses with long-term loans at a lower rate of interest. (1980.4)

• Loan limit	50 million yen per 1 plant/office
• Interest rate	2% annually (Interest-free to small-scale entrepreneurs)
• Redemption period	Not exceeding 10 years (including a grace period not exceeding 2 years)

* The loan system has been abolished.

2) Promoting measures to conserve the water environment by establishing various regulations

Even before the red tide outbreak, Shiga Prefecture had standards and regulations to maintain the water quality, and the stringent prefectural standards of the Water Pollution Control Law and Shiga Environmental Pollution Prevention Ordinance are more severe than the national laws.

In addition, the Shiga Prefectural government worked to promote conservation of the water environment around Lake Biwa by establishing advanced regulations and developing plans for conservation of the water environment. (Fig. 1)

Major prefectural regulations on conservation of the water environment around Lake Biwa

1972	Enactment of the stringent prefectural standards of the Water Pollution Control Law, which is from 2 to 10 times more severe than the national law.
	Enactment of the Shiga Environmental Pollution Ordinance. In the ordinance, Shiga added extra facilities and items to those specified by the national government.
1979	Enactment of the Ordinance for the Prevention of Eutrophication of Lake Biwa (Eutrophication Prevention Ordinance)
1987	Development of the Plan for Conservation of the Lake Water Quality in Lake Biwa (Legal plan based on the provisions in the Law Concerning Special Measures for the Conservation of Lake Water Quality).
1991	The whole of the prefecture was appointed as a priority area for domestic effluent measures.
1992	Enactment of the Ordinance for the Conservation of Reed Colonies.
	Plan for Conservation of the Lake Water Quality in Lake Biwa, Second Period
1996	Enactment of the regulation regarding the promotion of measures against domestic effluents in Shiga [Combined household wastewater treatment facilities are required.]
1997	Plan for Conservation of the Lake Water Quality in Lake Biwa, Third Period
2000	Development of the Lake Biwa Comprehensive Conservation Plan (Mother Lake 21 Plan), First Period
2002	The Ordinance Related to the Appropriate Leisure Usage of Lake Biwa was enacted.
	Plan for Conservation of the Lake Water Quality in Lake Biwa, Fourth Period
2003	An ordinance for the promotion of environmentally conscious farming was enacted. (Re-duction of chemical fertilizers and chemical pesticides, and appropriate agricultural drainages management)
2007	Development of the Plan for Conservation of the Lake Water Quality in Lake Biwa, Fifth Period
2011	The Lake Biwa Comprehensive Conservation Plan (Mother Lake 21 Plan) was revised. Second Period, 2012
2012	Development of the Plan for Conservation of the Lake Water Quality in Lake Biwa, Sixth Period
2015	Enactment of the Ordinance for the Conservation of the Forest Area Supporting Water Source.
2017	Development of the Plan for the Lake Biwa Conservation and Regeneration Measures

*In addition, each municipality developed a Program for the Promotion of Measures against Household Effluents.

3) Spread of three sewage treatment models, including the public sewer system

《The spread of sewage treatment systems》

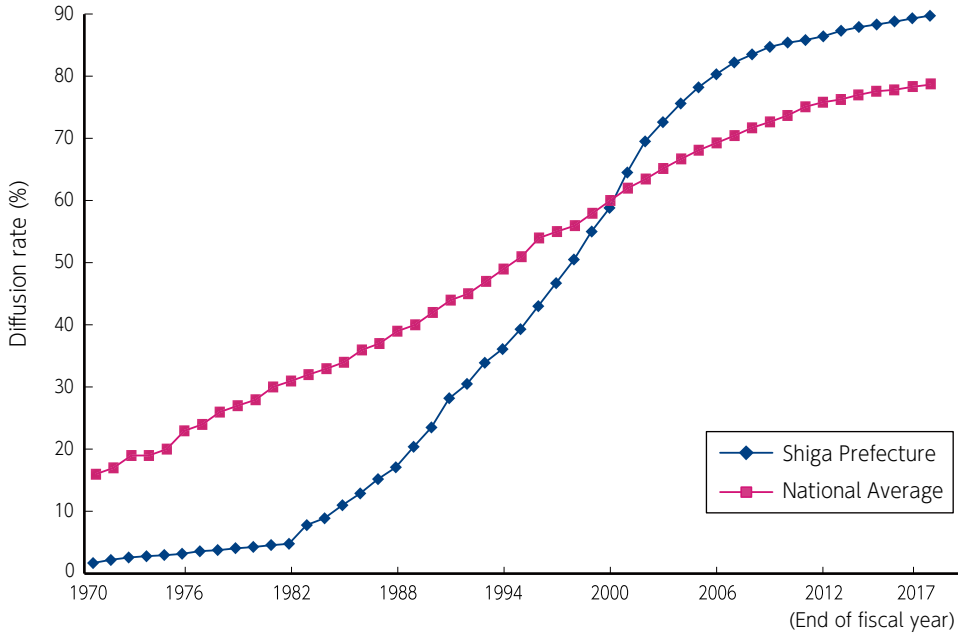
As water quality deterioration caused by the increasing load of contaminants became a matter of concern, improvement of sewage systems was recognized as one of the important pillars for water conservation in the Lake Biwa Comprehensive Development Project. In 1973, a project was launched to improve the sewage systems in the Lake Biwa basin in Shiga Prefecture.

Shiga Prefecture improved the facilities in the purification centers and trunk pipes and drains for these basin sewage systems, and each city and town improved the remaining parts of these systems. A total of 1.53 trillion yen had been invested in the project by the end of fiscal 2013. Consequently, the penetration rate of wastewater treatment systems increased to 89.7%, ranking seventh highest in Japan at the end of Fiscal Year 2017. The sewage systems in the Lake Biwa basin are primarily aimed at conserving the water quality in the lake. To prevent eutrophication, an advanced treatment system capable of removing nitrogen and phosphorus as well as organic matter from wastewater was introduced for the first time in Japan. After continuous technical development, a step inflow type nitrification-denitrification treatment system was introduced ahead of the rest of the nation in 2001.

Also, a system that converts waste to fuel was introduced for the treatment of sludge generated during sewage processing. This system is expected to help reduce environmental impact, and is now in place in the Kosei Purification Konan-Chubu Sewage Treatment Plant Center.

Konan-Chubu Sewage Treatment Plant

Transition in the percentage of the population connected to sewers



＊The national mean is reference level,because in Iwate and Fukushima, there are cities,towns and villages that could not be moniyored because of the effects of the East Japan earthquake and are not included in the publication.

《Spread of other sewage treatment facilities》

Shiga Prefecture conducts different types of sewage treatment according to the specific regional characteristics, ranging from urban to rural. Specifically, public sewage systems are mainly used for urban area, whereas drainage facilities are adopted by agricultural communities in farm villages, and combined household wastewater treatment facilities are used for areas where houses are well dispersed.

As a result, Shiga Prefecture achieved a wastewater treatment penetration rate, including public sewage systems, based on population, of 98.7%. This rate was the third highest among all prefectures in Japan.

●Drainage facilities for agricultural communities

These facilities are installed in agricultural communities in the districts that promote agriculture to collectively process night soil, miscellaneous household drainage and other types of wastewater, excluding industrial effluents generated within these districts. While providing advanced treatment, Shiga Prefecture has encouraged the reuse of processed water for farming, and developed composting facilities that can return sludge to farmland, aimed at establishing a recycling-oriented society.

Combined Household Wastewater Treatment Facilities

●Combined Household Wastewater Treatment Facilities

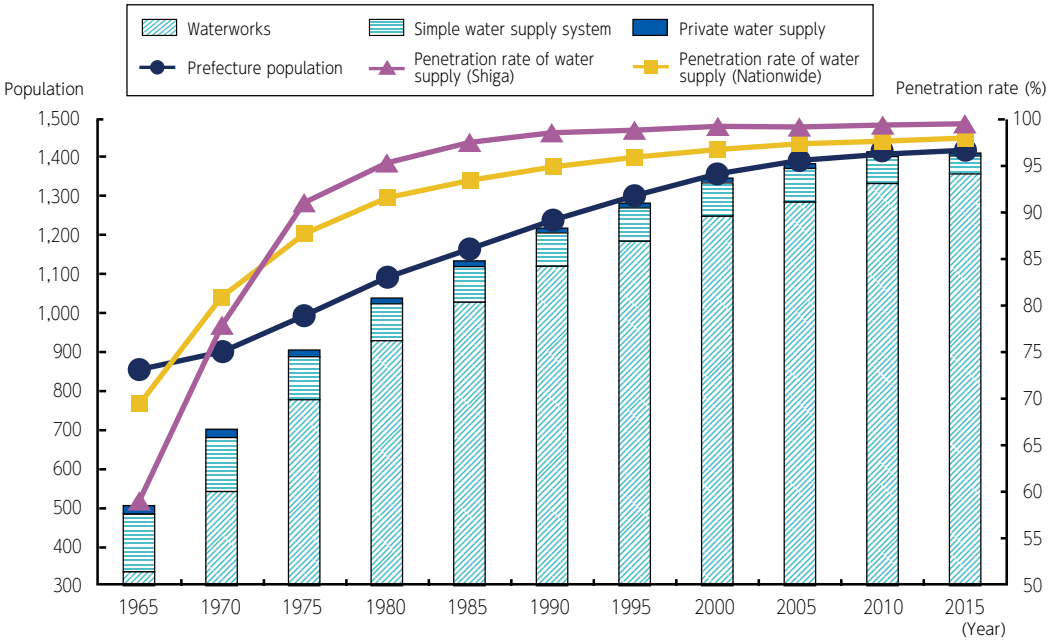
In scattered small-scale villages, wastewater treatment is introduced by installing Combined Household Wastewater Treatment Facilities.

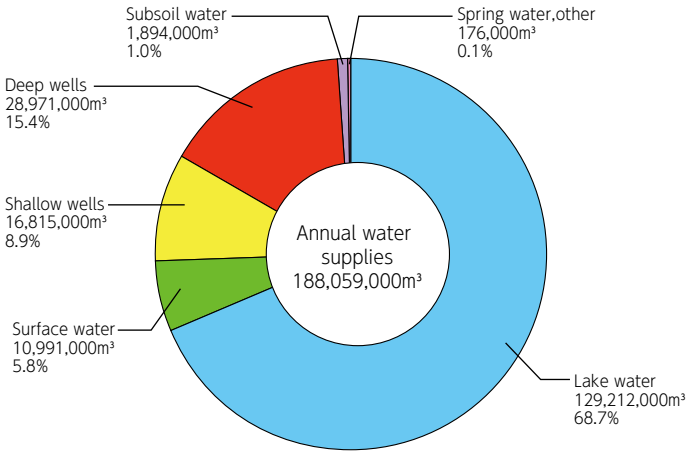
4) The spread of a public water supply

《Improvement of purification facilities as measures for the spread of public water supply and prevention of increased pollutant load》

The modern water service in Shiga Prefecture began in Yanagasaki in Otsu City in 1930, when water drawn from Lake Biwa started to be supplied after purification. From the 1950s and onward, the prefecture and its municipalities started to supply water and undertook the development of facilities. As a result, the public water supply spread rapidly. As of March 31, 2016, the percentage of households supplied with water in Shiga Prefecture stood at 99.4%, exceeding the national average and putting the prefecture in eleven place in Japan. With abundant volumes of water, Lake Biwa serves as the main source for the water purifications plants, and 129,210,000 m³, which is equivalent to 68.7% of the total water volume supplied, is drawn from the lake.

Transition of the spread of the public water supply





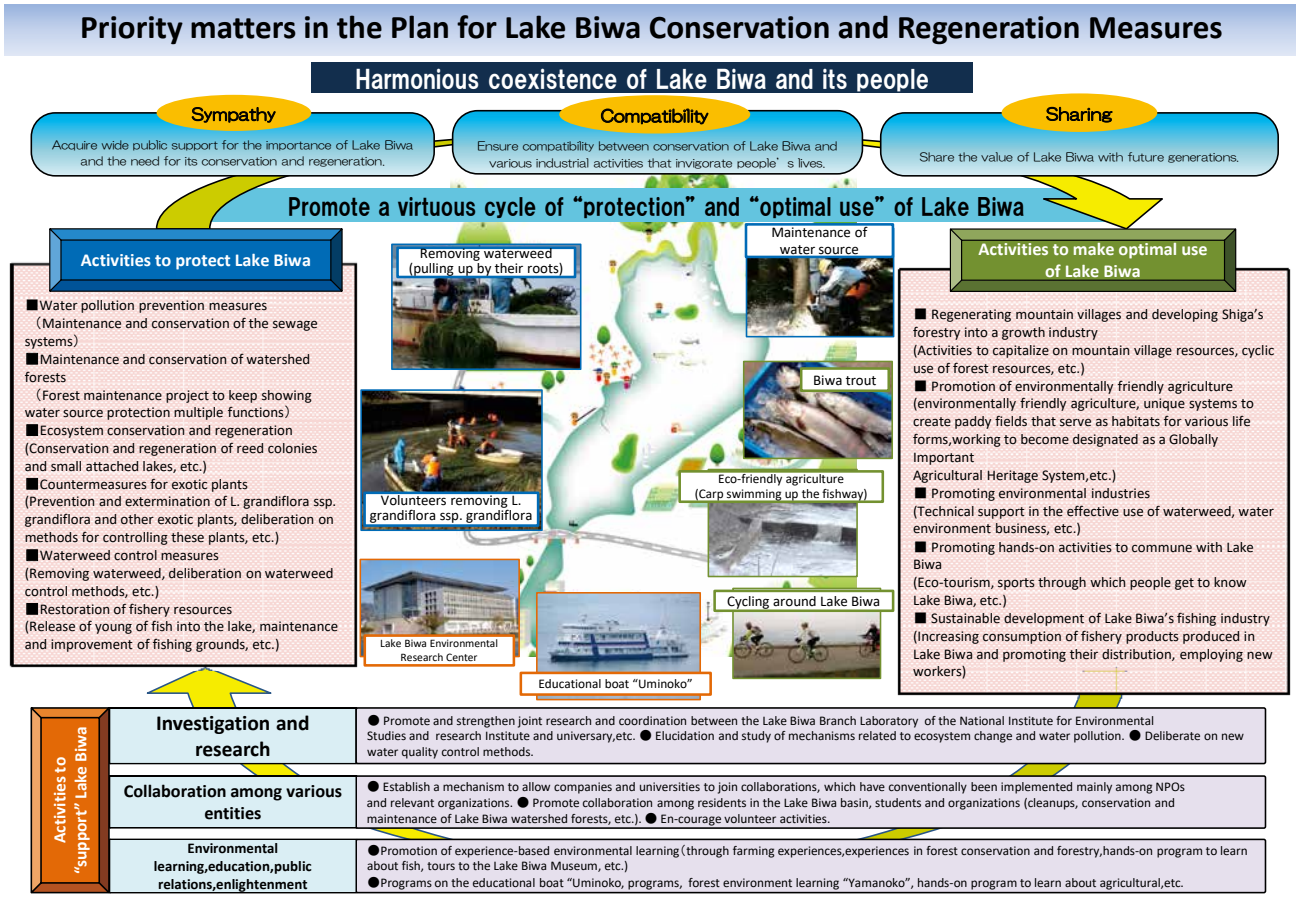
《Introduction of Advanced Water Purification Facilities》

Due to the progress of eutrophication in Lake Biwa, in 1969 a moldy smell occurred in tap water for the first time. In addition, from August to September 2016, a large number of cyanobacteria causing mold odor occurred in Lake Biwa, causing unprecedented off-flavor damage in the middle eastern part of the prefecture. For this reason, water suppliers that take in Lake Biwa water have introduced the mechanism enabling them to share the odor information of each water source, and have performed advanced purification treatment, including granular activated filtration ponds, to take measures against off-flavors.

5) Plan for Lake Biwa Conservation and Regeneration Measures

On September 28, 2015, the Law concerning the Conservation and Regeneration of Lake Biwa was promulgated and went into effect. The law stipulates that Lake Biwa, which is a national asset, shall be conserved and restored as a sound lake endowed with abundant nature.

Based on the law, Shiga Prefecture will draw up a Plan for Lake Biwa Conservation and Regeneration Measures, taking into account the Basic Policy for Lake Biwa Conservation and Regeneration established by the national government. The Plan aims to ensure that Shiga Prefecture and its municipalities can push forward with Lake Biwa conservation and regeneration measures in a comprehensive and effective manner, with the participation and cooperation of various entities. The harmonious coexistence of Lake Biwa and its people is the underlying philosophy behind the Plan for Lake Biwa Conservation and Regeneration Measures (draft). This draft plan is intended to promote a virtuous cycle of “protection” and “optimal use” of Lake Priority matters in the Plan for Lake Biwa Conservation and Regeneration Measures (draft) Biwa, with the recognition that importance should be attached to “sympathy,” “compatibility,” and “sharing.”



3 Activities by Companies (Factories)

As consciousness of the need to conserve the water environment increased, and under the influence of the citizens who developed activities including the so-called "Soap Movement," companies and factories held a mission to protect the environment of Lake Biwa, and have been working proactively in cooperation with the local government to establish company groups.

1) Companies’ efforts to meet standards under the Eutrophication Prevention Ordinance and other laws and regulations, and the establishment of industry-government relationships

《Individual consultations and instructions by the prefecture given to companies and factories》

As companies had to observe the severe drainage regulations including the Eutrophication Prevention

Ordinance enacted in 1979, the prefecture received inquiries from many companies asking for consultation and instructions. The administration accepted the inquiries and focused on these duties. The following is extracted from the Annual Report on the Environment in Shiga (1981) issued by the Shiga Prefectural Government.

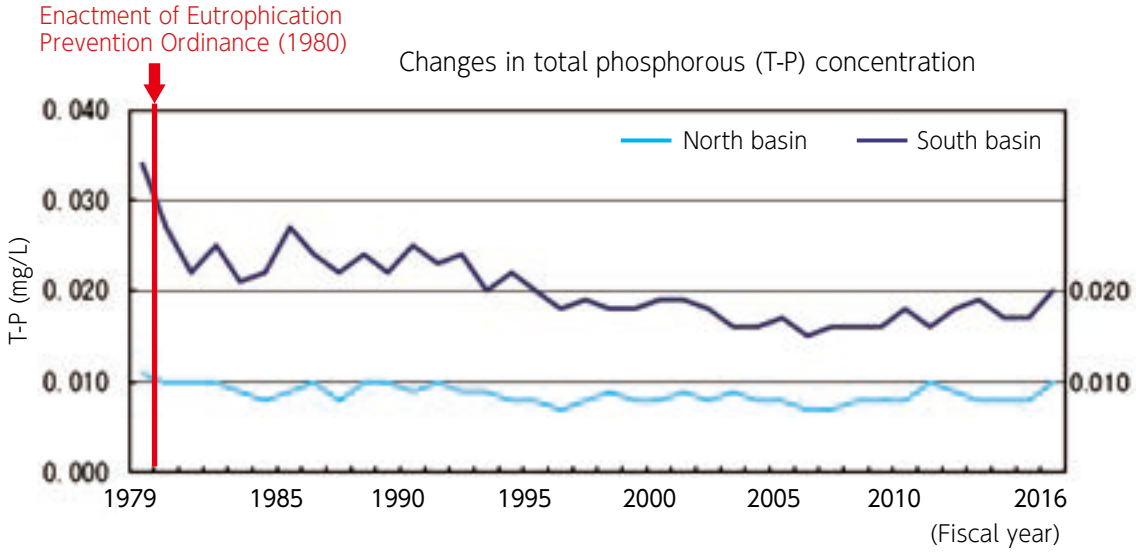
> "To fulfil the wastewater standards, companies and factories frequently requested the prefecture to give consultation and instructions regarding the facilities, cost, and maintenance of wastewater processing. It generated stern feelings among the parties concerned.

Various matters have arisen concerning actual operations, including the operating control method for existing processing facilities, capital spending necessary to satisfy the regulations, solutions in cases where a discrepancy exists in the examination results for factory effluent between voluntary inspections and inspections by the administration and the length of the anaerobic period during the denitrification process for activated sludge. The prefecture has accumulated technologies and know-how on conservation of the water environment through giving consultation and instructions to companies on such matters.

《Improvements in the water quality as a result of companies' efforts and consultation and instructions by the prefecture》

Under the Eutrophication Prevention Ordinance, the waste water regulations were due to come into effect on July 1, 1981. Out of 514 facilities subject to the regulations, 130 factories had shown the need for improvement if they were to meet the regulations by the day of application. However, 95% of these factories were able to improve their facilities on time, thanks to the great efforts made by these companies and the prefecture.

As a result, the phosphorus concentration in Lake Biwa decreased drastically in a few years from then, and continues to maintain a low concentration up to the present. Currently, companies not only comply with the relevant laws and regulations, but also take voluntary actions such as defining their own criteria that are more severe than the ordinances. This indicates the fact that awareness of the need for water quality management in Lake Biwa has taken root in local companies.



*Lake Biwa is divided by the Biwako-Ohashi Bridge into the north basin and the south basin.

2) Progress of activities to conserve the water environment that took root in companies and factories

In 1970s, aggravation of the water quality in Lake Biwa became an issue, and environmental problems were imminent. Companies and factories were suspected as the source of the pollution.

Under these circumstances, many companies became aware that they needed to take stronger measures to improve the water quality in Lake Biwa. These companies also clearly realized the need to establish a self-management system that would allow them to independently acquire knowledge on environmental laws and regulations and pollution control technologies, not just through receiving administrative guidance. The system would also enable these companies to share their experiences and expertise through information exchanges.

For these reasons, local companies gathered and established the Konan-Koka Environmental Association in 1978. Then the Shiga Prefectural Association for Environmental Pollution Prevention (now Environmental Conservation Association of Shiga Prefecture) was set up in 1981.

Although more than 30 years have passed since their establishment, these two associations are still vigorous in implementing community-based activities to preserve the water environment in collaboration with prefectural and municipal governments, while ensuring active communication between member companies.

Environmental Conservation Association of Shiga Prefecture

- Established in 1981. (Established as Shiga Prefectural Association for Environmental Pollution Prevention)
- Areas the whole of Shiga Prefecture
- Membership 380 companies (mainly located in Shiga Prefecture) (as of October 2018)

Konan-Koka Environmental Association

- Established in 1978
- Areas Kusatsu, Moriyama, Ritto, Yasu, Konan, Koka
- Membership 174 companies / 11 individual members (as of November 2018)

4 Activities by research institutes, universities and companies

Companies in the water environment business and research institutes and universities studying conservation of the water environment congregate around Lake Biwa. Some companies are developing new technologies and services through collaboration with government agencies or other companies, to achieve further business expansion and development.

Shiga Prefecture has accumulated a wealth of experience in conserving Lake Biwa for many years. Based on this experience, in recent years, international support projects aimed at improving the water environment were implemented on Cat Ba Island in Vietnam and Hunan Province in China.

1) Joint development examples of a technique, the service to lead to water environment business.

Highly efficient adsorbent for phosphorus, fluorine and other chemicals jointly developed in cooperation with industry, university and the local government (Takahashi Metal Industries Co., Ltd., Kyoto University and Shiga Prefecture)

Takahashi Metal Industries Co., Ltd. developed a porous material named "Ecoridge," which is a highly efficient adsorbent that removes phosphorus, fluorine, and nitric acid from wastewater, made from recyclable iron. It was achieved through collaborative research with universities and other companies including Kyoto University, and was a part of the national project for research & development* with the Shiga Prefecture Industrial Support Center working as the core. The company continues its own research, development, and sales, of the adsorption system, including an adsorbent plant, after the project has finished.

* "Development of generic technology for the construction of sustainable industry systems." Japan Science and Technology Agency, Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE). (2003-2007)

Ecoridge

At the prefecture's request, a measuring instrument for water transparency was developed, and our business expanded into the water environment business. (OPTEX CO., LTD.)

OPTEX CO., LTD.* developed the world's first "automatic water transparency measuring system" in 1996 at the request of Shiga Prefecture, then expanded into the water environment business.
The company has applied this technique to the continuous precision measurement of the color and cloudiness of liquids, and develops, manufactures, and sells various sensors for monitoring the water environment.

A state of the transparency automatic measurement at the time of the development. A measured result was posted in front of the prefectural office.

Development of Biwalite, a sulfide dispersed lead-free copper alloy (Shiga Valve Cooperative, BIWALITE Co. Ltd., Kansai University and Shiga Prefecture)

Conventional bronze castings contain several percent of lead to maintain an excellent casting performance and free-cutting properties. However, as water quality and environmental regulations are strengthened, it is becoming urgently necessary to eliminate the use of lead. At the same time, there is a worldwide trend toward eliminating lead components not only from metallic materials but also from all types of industrial materials. In response to this trend, Shiga Valve Cooperative, BIWALITE Co. Ltd., Kansai University and Shiga Prefecture jointly developed Biwalite, and obtained a patent for this new copper alloy in 2007. Biwalite was also certified to meet the Japanese Industrial Standards (JIS) as “CAC411” in October 2009.
Unlike conventional bismuth lead-free copper alloys, Biwalite is an entirely new type of lead-free copper alloy, in that instead of lead and bismuth, a granular sulfide is dispersed on the metallic structure. Biwalite castings compare advantageously with conventional bronze castings in terms of casting performance, free-cutting properties, mechanical characteristics, fatigue characteristics, corrosion properties, leaching characteristics, and recyclability.

Biwalite

Development of an emergency drinking water production system making effective use of fluid control and membrane processing technologies (Shimizu Alloy Mfg. Co., Ltd. and Shiga Prefecture)

The 2011 Great East Japan Earthquake was an unprecedented disaster that claimed many victims. Since then, there have been concerns over a possible Tonankai earthquake and other disasters. In the event of emergencies, such as typhoons, tornados and other damage caused by natural disasters and pipeline accidents, it is extremely important to secure drinking water and speedily supply the water.
In disaster situations, it may be difficult for large tank trucks to transport water to the affected area. To address this problem, Shimizu Alloy Mfg. Co., Ltd. and Shiga Prefecture developed a portable-type water purification and supply system capable of producing drinking water from naturally-available water and swimming pool water at the affected site. This system makes effective use of fluid control and membrane processing technologies that have been used in valves and cultivated through many years. This water production system is designed for use in an emergency and for use by small households.

Emergency drinking water production system

Decomposition treatment test of the Lake Biwa aquatic plants with active oxygen (Aoyama Eco System Co., Ltd. and Shiga Prefecture)

Aquatic plants flourish in Lake Biwa in large quantities, creating a stench and hindering the navigation of the ships. Aoyama Eco System Co., Ltd. has developed a technology using active oxygen to dry and pulverize aquatic plants within a day. Verification tests were conducted utilizing Shiga Prefecture's financial support. Currently, aquatic weeds are collected by Shiga Prefecture and being composted by natural fermentation, but the whole process takes about two years. Active oxygen, which electronically adds electrons to oxygen molecules, has high reactivity in oxidation and scientifically decomposes organic substances. In addition, it breaks down cell walls and can be decomposed in a short time. The powder residue produced by the active oxygen treatment is an organic compound bonded to carbon and is generally a necessary element for organic vegetable production, so it may contribute to the production of safe and delicious vegetables.

α-Gaia

Development of short-term composting technology for Lake Biwa aquatic plants (Meiho-Construction Inc. and Shiga Prefecture)

The aquatic plants causing odors are prosperous in large quantities, at a maximum of them covering 90% of the South Lake. At present, aquatic weeds are collected and composted by Shiga Prefecture, taking about two years for the whole process.
With the support of Shiga Prefecture, microbial fermentation using the KS method succeeded in turning the aquatic plants into organic compost in a short time. The KS method is the one in which fermentation promoters and wood chips are mixed and piled with aquatic plants, then aged and fermented while covering with sheets to form compost.

KS

2) Companies and research institutes, universities, and clusters in Shiga Prefecture

Shiga Prefecture is home to many companies engaged in the water environment business, as well as universities and other research institutes that conduct environment-related studies including the water environment. These companies and organizations are listed below.

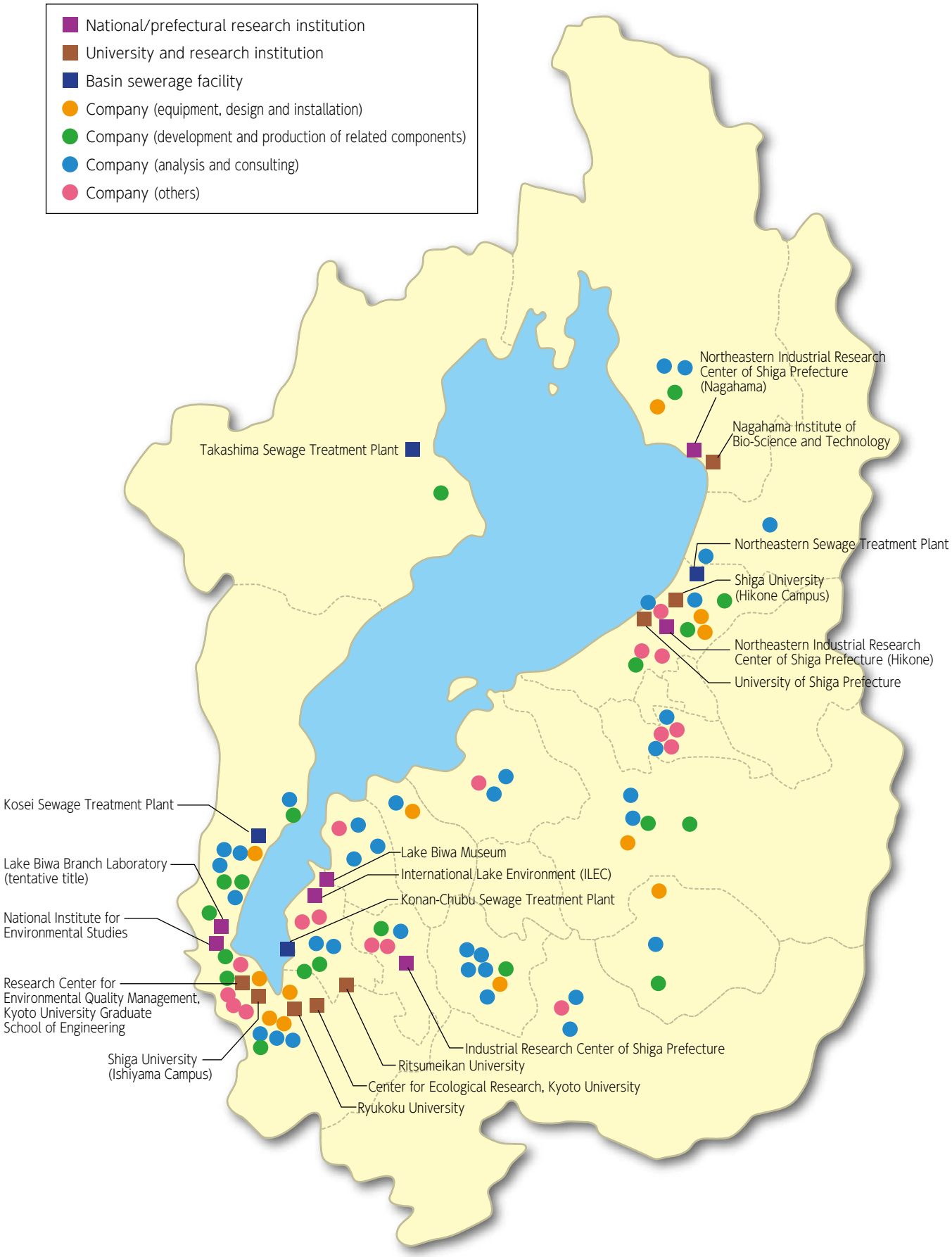
Companies engaged in the water environment business in Shiga

Otsu	
1	BASIC CO., LTD.
2	Omi Giken Co., Ltd.
3	SHIGA TOKKI LTD
4	Kimura Denko Inc.
5	Oumi Mineral Water Service Co., Ltd.
6	Aoyama Eco System Co., Ltd.
7	TORAY TECHNO CO., LTD.
8	SEIWA SEKKEI.,LTD
9	Kinki Bunseki Center,Ltd
10	Toku Co.,Ltd
11	F Water Management Co., Ltd.
12	OPTEX CO., LTD.
13	Mizu Laboratory
14	Nagaoka Sangyou Co., Ltd.
15	Toray Industries, Inc., Shiga Plant
16	Kokkasou Co.,Ltd
17	Think Mate Research Co., Ltd.
18	BSC Watersports Center
19	Otsu Itagami Co.,Ltd
20	Triangle web
21	nakatec Co., Ltd.
22	Itplants Co.,Ltd
23	THE MYW Co.,Ltd
24	WEF Institute of Technology Inc.
25	PANTECH Co.,Ltd
26	KUsystem Co.,Ltd
27	SUIDOU KIKO KAISHA,LTD
28	Kinki eco science inc
29	OKUMURAGUMI CO.,LTD
30	Toray Industries, Inc., Shiga Plant
31	Toray Research Center, Inc.
32	HACHISHIGE INDUSTRY
33	TOYOBO CO., LTD., Research Center
34	Daiichigiken Inc.
Kusatsu	
35	Nishinihon Engineering Consultant Ltd.
36	Tohzai Chemical Industry Co., Ltd., Shiga Office
37	NITTO DENKO CORPORATION, Shiga Plant
38	Iwahori Professional Engineer Office
39	Osaka Gas Co.,Ltd
40	Daigo Industry Co.,Ltd
41	Willstage Co.,Ltd
Moriyama	
42	Leimac Ltd
43	TECHNO SCIENCE CO., LTD.
44	GUNZE LIMITED
45	Ohsaki Setsubi Kogyo Co., Ltd.
Ritto	
46	VANTECH Co.,Ltd
47	Kankyo Souken Co, Ltd.
48	SEKISUI CHEMICAL CO., LTD., Shiga Ritto Plant
49	SHINSHU CO., LTD.
Yasu	
50	Pacific Giken Company, Ltd.
51	Tsujiyoshi Co., Ltd.

Koka	
52	New Fuel Laboratory Institute
53	Wako Prastic Co.Ltd
54	Osaka Welding Industrial Co., Ltd.
Konan	
55	YAMANAKA CO., LTD.
56	ICHIMIYA
57	SANWA INDUSTRY CO., LTD.
58	SENKA Corporation, Shiga-Konan Factory
59	CAMS Co.,Ltd
60	KUBOTA Corporation, Shiga Plant
61	MOTHER COSMO CO., LTD., Konan Branch
Higashiomi	
62	Kyowa Industry Corp.
63	Wako Co., Ltd.
64	Fukuda Metal Foil & Powder Co., Ltd. Shiga Factory
65	Nakajima Syouji Co., Ltd.
66	NIPPON ENGINEER CO., LTD., Shiga Office
Omihachiman	
67	Hiyoshi Corporation
68	LifePlan Omi
69	Shigaootaramber Co.,Ltd
Hino	
70	Suiken Co., Ltd.
71	Okumura Engineering Corporation
72	Hirose Co., Ltd.
Hikone	
73	Shimizu Industrial Corporation
74	One For All Ltd.
75	ICHIEN TECHNOS INC
76	ARTPLAN Co.,Ltd
77	TAIYO SANGYO CO., LTD.
78	MATSUO VALVE INDUSTRY CO., LTD.
79	SHIMIZU ALLOY MFG.CO., LTD.
80	Shiga Office of Nihon Maintenance Engineering Corporation
81	NATSUHARA Industrial Technologies Inc.
82	AQUA SYSTEM Co.,Ltd
83	SHOWA VALVE CO.,LTD
84	Eagle Electronics Corporation
85	Yamato Valve Co.,Ltd
86	Katsuda
87	Ohsugi Co., Ltd.
88	Kotera Co., Ltd.
Aisho	
89	Chiyoda-kogyo KK
90	SHIGAKENKI Co., Ltd., Mist Dept.
91	NIDEC CORPORATION, SHIGA TECHNICAL CENTER
92	KOKUYO PRODUCT SHIGA
93	Fuji Iron Works Co., Ltd., Echigawa Plant
Maibara	
94	SAMEGAI KOGYO Co., Ltd.
95	Nippon Software Knowledge Corp.
Nagahama	
96	Yamakyu Corporation
97	Takahashi Metal Industries Co., Ltd
98	KASHIRO KENSETSU CO., LTD.
99	Ryobi Techno Corporation
100	Meiho-Construction inc.
Takashima	
101	AYAHA INDUSTRIES CO., LTD.

* Companies that were reported in the "Research survey on water environment business development" (FY2011).

Distribution map of companies and researchers that are engaged in the water environment business in Shiga



3. Shiga Water Environment Business Promotion Forum

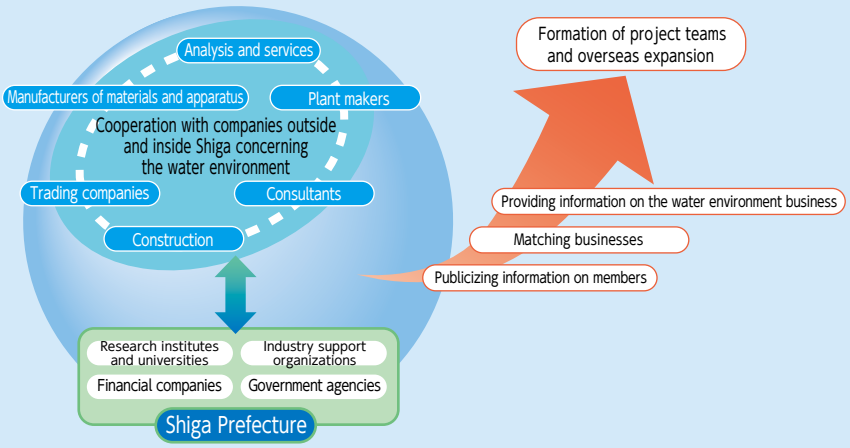
1 What is the Shiga Water Environment Business Promotion Forum?

The Shiga Water Environment Business Promotion Forum is a network aimed at developing new business projects through industry-government-academia collaboration. Shiga Prefecture established the Forum in March, 2013 to develop the water environment business, by utilizing the concentration of industries and research institutions related to the water environment in the prefecture, as well as the outcomes of activities conducted so far to conserve the water environment around Lake Biwa.

This Forum provides the latest trends in the water environment business, and information on progressive approaches adopted by local companies and on various support measures. Shiga Prefecture operates the forum as a center for business matching to create specific new business projects and to find partners for joint development.

Outline of Shiga Water Environment Business Promotion Forum

Name	Shiga Water Environment Business Promotion Forum (abbreviated name: Team Water Shiga)
Establishment	March 25, 2013
Aims	To promote the development of the water environment business by utilizing (1) the research results accumulated by companies, research institutes and universities and (2) activities done for the water environment. To contribute to the solution of problems on conservation of the water environment inside and outside the country
Activities	- Organizing seminars and inspection tours related to the water environment business - Participating in trade fairs as an exhibitor both in Japan and overseas - Promoting business exchange with overseas partners - Creating and implementing projects associated with the water environment - Providing information regarding the water environment business, etc.
Constitution of members	This forum consists of companies who agree with the aims of the forum and are involved in the water environment business or who intend to start a water environment business, and organizations that support and cooperate with them. Number of members: 171 companies and organizations (as of the end of December 2018)
Secretariat	Commerce and Industry Policies Division, Dept. of Commerce, Industry, Tourism and Labor, Shiga Prefectural Government



Promotional Image of the Forum

Team Water Shiga

Logo of the forum

This logo signifies people involved in “water” flapping from Lake Biwa.

2 Past activities

2011		Research on the expansion of the water environment business ● Questionnaire survey of companies (Effective response rate is 42.2% out of 1000 companies.) ● Hearing survey of companies (26 companies) ● Workshop on Shiga's water environment business held four times.
2012	Oct 24	First seminar on Shiga's water environment business
	Nov 16	Company tour of Shiga water environment business
	Nov 27	Inspection tour to Kita-kyushu City, an area with advanced environmental businesses
	Dec 5	Acceptance of the governmental inspection mission to Vietnam
2013	Jan 28	Second seminar on Shiga's water environment business
	March 25	Third seminar on Shiga's water environment business Establishment of the Shiga Water Environment Business Promotion Forum
		Setup of the portal site
		Publication of "The Water Environment Business in Shiga – Industry Knowhow & Technology around Lake Biwa – 2012

Company tour of Shiga's water environment business (November 16, 2012)

The Water Environment Business in Shiga – Industry Knowhow & Technology around Lake Biwa – 2012

Third seminar on Shiga's water environment business (March 25, 2012)

3 Activities

1) Organizing seminars and inspection tours

2013	Aug 7	Seminar on Shiga's water environment business (Opening event at the Ohmi Environmental Plaza)
	Oct 24	Seminar on Shiga's water environment business
2014	Oct 23	Seminar on Shiga's water environment business
	Dec 18	Seminar on Shiga's water environment business (Seminar on the water environment business in South Korea)
2015	Oct 21	Seminar on Shiga's water environment business
	Dec 1	Seminar and exchange meeting with the Ministry of Construction of Vietnam
2016	March 15	Matching seminar
	Oct 19	Seminar on Shiga's water environment business
2017	March 13	Seminar on Shiga's water environment business
	July 28	Asian water business market trend seminar
	Oct 20	Seminar on Shiga's water environment business
	Dec 18	Technical seminar on water and sewage improvement projects in Batam Island, Indoneshia

Seminar on Shiga's water environment business (October 21, 2015)

Seminar and exchange meeting with theMinistry of Construction of Vietnam (December 1, 2015)

Seminar on Shiga's water environment business October 19, 2016

2018	March 7	Seminar on Shiga's water environment business
	July 20	Asian water business market trend seminar
	Oct 19	Kansai SDGs caravan in Shiga × Seminar on Shiga's water environment business
2019	March 11	Seminar on Shiga's water environment business

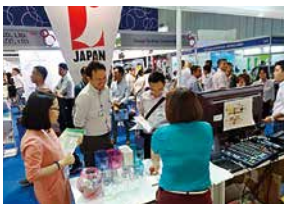
Kansai SDGs caravan in Shiga × Seminar on Shiga's water environment business (October 19, 2018)

2) Participating in trade fairs as an exhibitor (both in Japan and overseas)

2013	Oct 16 - 18	Put up a booth at Eco-Technology Exhibition 2013.
	Oct 24 - 26	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2013.
2014	Oct 8 - 10	Put up a booth at Eco-Technology Exhibition 2014.
	Oct 22 - 24	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2014.
	Nov 12 - 14	Put up a booth at VietWater Expo & Forum 2014.
2015	Jan 28 - 30	Set up a Forum pavilion at InterAqua 2015.
	Oct 21 - 23	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2015.
	Nov 25 - 27	Put up a booth at VietWater Expo & Forum 2015.
2016	Jan 27 - 29	Set up a Forum pavilion at InterAqua 2016.
	Oct 19 - 21	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2016.
	Oct 8 - 9	Put up a booth at Kitakyushu Eco Life Stage 2016.
	Nov 9 - 11	Put up a booth at VietWater Expo & Forum 2016.
2017	Oct 18-20	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2017 and organized the Environmental Water Business Meeting.
	Nov 8-10	Put up a booth at VietWater Expo & Forum 2017.
2018	Feb. 14 - 16	Set up a Forum pavilion at InterAqua 2018.
	March 14	Set up a Forum pavilion at Sourcing Fair 2018.
	Oct 17-19	Set up a special zone for the Forum at Biwako Environmental Business Exhibition 2018 and organized the Environmental Water Business Meeting.
	Oct 25-28	Set up a Forum pavilion at Eco Expo Asia 2018.
	Dec 12-14	Set up a Forum pavilion at VIMAF (Vietnam International Machinery Fair) & VSIF (Vietnam Supporting Industry Fair 2018.)
2019	Jan 30-Feb 1	Set up a Forum pavilion at InterAqua 2019.

InterAqua
(January 28 - 30, 2015)

Biwako Environmental Business Exhibition
(October 21 - 23, 2015)



VietWater Expo & Forum
(November 9 - 11, 2016)

Eco Expo Asia 2018
(October 25 - 28, 2018)

3) Promoting business exchange with overseas partners

China (mainly Hunan Province)

2013	July 15 - 18	The technical and economic exchange delegation visited Hunan Province, China.(Hunan Province and Shiga Prefecture signed a Memorandum on Promoting Mutual Exchange in the Field of Environmental Protection.)
2015	Aug 10	Shiga Prefecture signed a memorandum for promoting industries in the water environment field with Hunan Province, China.
	Sept 10	A delegation from the Department of Water Resources of Hubei Province visited Shiga Prefecture.
	Oct 20 - Dec 11	Accepted technical trainees from Hunan Province, China (theme: Water environmental business).
	Oct 20 - 21	A delegation from the Department of Commerce of Hunan Province visited Shiga Prefecture.
	Oct 29 - 30	A delegation from the Department of Water Resources of Hunan Province visited Shiga Prefecture.
2016	Jan 27 - 29	The sewage treatment project team visited Hunan Province, China.
	March 25	Held a meeting to exchange opinions between the specialist team from Hunan Province, China and the Forum members.
	August	Adopted a JICA Grass-Roots Technological Partnership Program (Second Phase, Hunan Province in China) to be implemented by Shiga Prefecture and the Ohmi Environment Conservation Foundation.
2017	Nov 1	A delegation from the Huishan District, Wuxi City, Jiangsu Province, visited Shiga Prefecture.
	Dec 1	A delegation from Guangdong Province visited Shiga Prefecture.
2018	Nov 13	Hunan Province and Shiga Prefecture co-hosted a symposium to commemorate the 35th anniversary of the friendship agreement.

The technical and economic exchange delegation visited Hunan Province, China. (July 15 - 18, 2013)

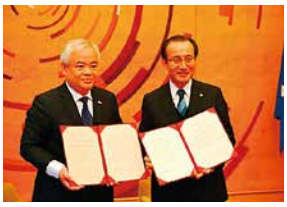
Conclusion of the Memorandum on Promoting Mutual Exchange in the field of environmental protection. (July 2013)

Conclusion of the memorandum for Promoting Industries in the Water Environment Field. (August 10, 2015)

Taiwan (mainly Tainan City)

2013	May 23	Accepted a company inspection group from Taiwan.
	July 7 - 13	Accepted the company inspection group from Taiwan again.
	Aug 27 - 30	Held an inspection and exchange tour for the sewage treatment project in the industrial park in Tainan City, Taiwan.
	Dec 19	Deputy Mayor of Tainan City paid a courtesy visit to the Governor of Shiga Prefecture.
	Dec 19	Concluded a memorandum on economic and industrial exchange with Tainan City.
2014	Feb 6	Concluded a memorandum with Chimei Group Lianchi Development Corp.
	Feb 6	Set up the Shiga Business Support Desk in Taiwan.
	March 5 - 9	Accepted a delegation from Tainan City, Taiwan.
	March	An NPO opened its office in Taiwan (Tainan City) aiming at environmental city planning and environmental business development (March 2014 - January 2015).
	June 10 - 12	Forum members visited the Tainan City government, Taiwan and a Taiwanese company (Lianchi Development Corp.).
	June 17	Forum members paid a courtesy visit to a manager of Lianchi Development Corp.
	July 2	Held a meeting with the Taiwan sewage treatment project subcommittee.
	July 2 -	Held a meeting with the Team Tainan Council.
	Oct 6 - 10	Held an on-site technological exchange program under the sewage treatment and water environment improvement project in Taiwan.
	Oct 23	A delegation from Tainan City, Taiwan visited Shiga Prefecture.
2015	Sept - March	An NPO conducted a survey to identify problems regarding the water environment in Tainan City.
2016	March 9 - 12	Held a business matching meeting with companies in Taiwan.
2017	Jan 9 - 13	Held a meeting for water environmental technical exchange in Taiwan (at the Industrial Technology Research Institute), and a seminar & business matching event in Taiwan (in Taipei City).
	May 8	A delegation from Taiwan Water Resources Agency visited Shiga Prefecture.
	Aug 8-10	A delegation from Tainan City, Taiwan, visited Shiga Prefecture.
	Sep 15	Seminar on Taiwan-Shiga water environment business in Kaohsiung, Taiwan.
2018	Oct 20-21	5th anniversary event of economic exchange.

Acceptance of a company inspection group from Taiwan (May 23, 2013)



Conclusion of a memorandum on economic and industrial exchange with Tainan City (December 2013)

On-site technological exchange program under the sewage treatment and water environment improvement project (October 2014)

Seminar on Taiwan-Shiga water environment business in Kaohsiung,Taiwan (Sepember 2017)

5th anniversary event of economic exchange (October, 2018)

Vietnam

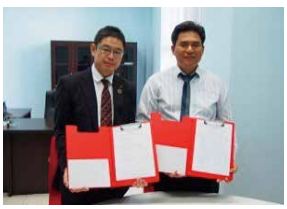
2013	Nov 14	Held a seminar on Vietnam.
	Dec 17	Prof. Boi of Vietnam National University paid a courtesy call on the Deputy Governor of Shiga.
2014	Jan and March	Visited and studied relevant agencies in Vietnam (January, March and April 2014).
	March 17	The Kansai Consulate Forum held the 17th Kansai Tour (to Shiga Prefecture)—Let's Learn Lessons from an Environmentally Advanced Prefecture.
	April 11	Director of the Vietnam Academy of Science and Technology / Institute of Environmental Technology and other members paid a courtesy call on the Director of the Department of Commerce, Industry, Tourism and Labor.
	Sep 5	Concluded a memorandum on cooperation with Saigon Hi-Tech Park.
	Nov 13	Concluded a memorandum on Economic and industrial cooperation with Ho Chi Minh City.
	Dec 19	Delegations from Vietnam's Ministry of Natural Resources and Environment, Vietnam National University and other organizations visited Shiga Prefecture.
2015	Nov 30 - Dec 1	Interested parties from Vietnam's Ministry of Construction paid a courtesy call on the Governor of Shiga Prefecture and participated in a seminar and exchange meeting with Forum members.
2016	April 25	Held the counterpart's invitation program for the Project for Green Growth Promotion in the Halong Bay Area, Quang Ninh Province, Vietnam.
	Nov.8	Held the Event for Technological Exchange and Individual Consultations regarding the Water Environment and Polymer Technology in Vietnam (Ho Chi Minh).
	Nov. 14	Held the Event for Technological Exchange and Individual Consultations regarding the Water Environment in Vietnam (Hanoi).
	Nov 30	Participated in the kick-off seminar for the Project for Green Growth Promotion in the Halong Bay Area, Quang Ninh Province, Vietnam (Second Phase)
2017	Oct 20	Concluded a memorandum on environment and economics cooperation with Quang Ninh Province.
	Nov 8	Seminar on water environment business in Ho Chi Minh City.
	Nov 21	Seminar on water environment technology in Quang Ninh Province.
2018	Aug 31	Technical exchange meeting with Quang Ninh Province.
	Dec 14	Concluded a memorandum on research and development with Saigon Hi-Tech Park Laboratory.
2019	Jan 16	Seminar on water environment technology in Quang Ninh Province.

Forum members visiting and studying relevant agencies in Vietnam (January and March 2014)

Concluded a memorandum on cooperation with Saigon Hi-Tech Park . (September, 2014)

Concluded a memorandum on economic and industrial cooperation with Ho Chi Minh City. (November 2014)

Concluded a memorandum on environment and economics cooperation with Quang Ninh Province. (October,2017)



Concluded a memorandum on research and development with Saigon Hi-Tech Park Laboratory. (December, 2018)

Other regions

2014	Aug 5	Provided cooperation for JICA projects (inspection tours by the Governor of Gilan Province, Iran and other members)
	Oct 24	Provided cooperation for a JICA training program.
2015	Oct 23	Provided cooperation for a JICA training program.
2016	May 29 - Jun 5	The Local-to-Local Exchange Delegation between Shiga Prefecture and Thailand was organized by the Royal Thai Consulate-General in Osaka.
2017	Oct 10	Provided cooperation for a JICA training program.
	Nov 10	Concluded a memorandum on mutual cooperation with Hong Kong Trade Development Council.
2018	Dec 6	Provided cooperation for a JICA training program.

Local-to-local Exchange Delegation between Shiga Prefecture and Thailand (May 29 - June 5, 2016)

Concluded a memorandum on mutual cooperation with Hong Kong Trade Development Council.

4) Other activities

- Appointing water environment business coordinators (June 2013 - March 2016)
- Conducting surveys and coordination activities to promote the water environment business (2016)
- Providing a subsidy to commercialize model projects for overseas expansion of the water environment business (2016)
- Joined the Fine Bubble Regional Revitalization Council (Jan.2018～)

4 Major results

■ Major projects implemented by Forum members

Project name	Target country	Project term	Members	Scheme
Project for improving the water quality from wastewater treatment facilities and its operation in fishery processing factories	Vietnam (Da Nang)	August 2014 – March 2017	Kanso Co., Ltd. Kuraray Aqua Co., Ltd. Hiyoshi Corporation Osaka Prefecture University	Ministry of the Environment's model project for improving the water environment in Asia
Collaborative support for organizing a structure for cooperation in improving the aquatic environment in the attractive tourism island, Cat Ba	Vietnam (Cat Ba Island)	March 2015 – March 2017	Kanso Co., Ltd. Hiyoshi Corporation Osaka Prefecture University Shiga Prefecture	JICA Grass Roots Partnership Project
Opening up new overseas markets for the water business related to the Lake Biwa Model, a regional resource	India	October 19 – 23, 2015	Hiyoshi Corporation HORIBA Advanced Techno Co., Ltd. Kyoto University Shiga Prefecture	HIDA project for the utilization of overseas human resources and discovering the attractive features of regional resources
Study on the feasibility of introducing a simplified water quality measurement kit and automatic data collection technology aimed at improving the management of a catchment area's water environment in Vietnam	Vietnam (Hanoi and Ho Chi Minh)	November 2016 – June 2017	Optex Co., Ltd. Kyoto University International Lake Environment Committee	JICA's program to support Japanese small and medium enterprises (SMEs) in overseas business development (feasibility study)
Project for promoting and improving river purification in Wuxi City (Jiangsu Province, China) and for water environment business expansion around Lake Tai	China (Jiangsu Province)	July 2016 – February 2017	Aoyama Eco System Co., Ltd. NAKATEC Co., Ltd. Environmental Conservation Association of Shiga Prefecture	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Feasibility survey and domestic verification tests regarding the establishment of a centralized monitoring system for the water quality of rivers flowing into the area west of Jakarta Bay in the Special Capital Territory of Jakarta, Republic of Indonesia	Indonesia (Jakarta)	July 2016 – February 2017	Tanahashi Electric Machinery Co., Ltd. Eagle Electronics Corporation.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to study the feasibility of establishing a dispersed and small-scale wastewater treatment system in Ho Chi Minh City, Socialist Republic of Vietnam	Vietnam (Ho Chi Minh City)	July 2016 – February 2017	Optex Co., Ltd. Aoyama Eco System Co., Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to survey the feasibility of wide-area and simplified water quality analysis services in the People's Republic of China	China (Guangdong Province)	October 2016 – February 2017	Techno Science Co., Ltd. Optex Co., Ltd Optex (Dongguan) Co., Ltd	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to study the feasibility of introducing the super-high speed centrifugal drainage device to Da Nang City	Vietnam (Da Nang City)	July 2017-February 2018	VANTECH Co.,Ltd Leave a Nest Co.,Ltd. Ryukoku University.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business

Project name	Target country	Project term	Members	Scheme
Feasibility survey and verification tests for efficient water environment business utilizing the "water quality measurement kit" in People's Republic of China	China(Guangdong Province)	June 2017-February 2018	Optex Co., Ltd. Techno Science Co., Ltd. Optex (Dongguan) Co., Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to study the feasibility of "on-site simple water quality analysis service" in the aquaculture industry in the Asian markets including Taiwan, ASEAN, and India	Taiwan ASEAN India	December 2017-February 2018	Techno Science Co., Ltd. Optex Co., Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Feasibility survey for holistic management system of sewerage treatment plant with remote monitoring technology	India	June 2018-June 2019	Hiyoshi Corporation	JICA's program to support Japanese small and medium enterprises (SMEs) in overseas business development (feasibility study)
Project to study the feasibility of the water quality monitoring/consulting service utilizing IoT technology in USA	USA	July 2017-February 2019	Optex Co., Ltd. Techno Science Co., Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to introduce the CLIRAC method for neutralizing and recycling dredged/wastewater sludge in Vietnam	Vietnam	July 2018-September 2019	TAIYO SANGYO CO.,LTD. WEF Institute of Technology Inc.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Feasibility survey for recycling technology of agricultural film and waste plastic in Mexico	Mexico	2018-2019	Kuroda Industry Corporation. PANTECH Co.,Ltd.	JICA's program to support Japanese small and medium enterprises (SMEs) in overseas business development (feasibility study)
Project to study the feasibility of "water quality monitoring/analysis consulting service utilizing IoT technology" in the aquaculture industry in the Asian markets including Taiwan, ASEAN, and India	Taiwan ASEAN India	August 2018-February 2019	Techno Science Co., Ltd. Optex Co., Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to study the feasibility of the knowledge-based business model in Ha Long Bay/Cat Ba Island and their surrounding areas in Vietnam	Vietnam	September 2018-February 2019	Kanso Co., Ltd. Hiyoshi Corporation F Water Management Co.,Ltd. CHODAI CO.,LTD.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Project to study the feasibility of the energy/resource-saving building management utilizing ultra-fine bubble in Hong Kong	Hong Kong	October 2018-February 2019	WEF Institute of Technology Inc. YBM Co.,Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Feasibility survey of introducing the additive-free electrolyzed water cleaner to Thailand	Thailand	November 2018-February 2019	Takahashi Metal Industries Co.,Ltd. Takahashi Metal Industries Co.,Ltd(Thailand).	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business
Feasibility survey of introducing the open type crossflow turbine to Vietnam	Vietnam	December 2018-February 2019	ARCS Co.,Ltd. Spec Co.,Ltd.	Shiga Prefecture's commercialization model projects for overseas expansion of the water environment business

▶ As described so far, members of the Forum have held exchange programs, business matching meetings and other projects and participated in various exhibitions. Some of these activities have created actual business opportunities.

Column

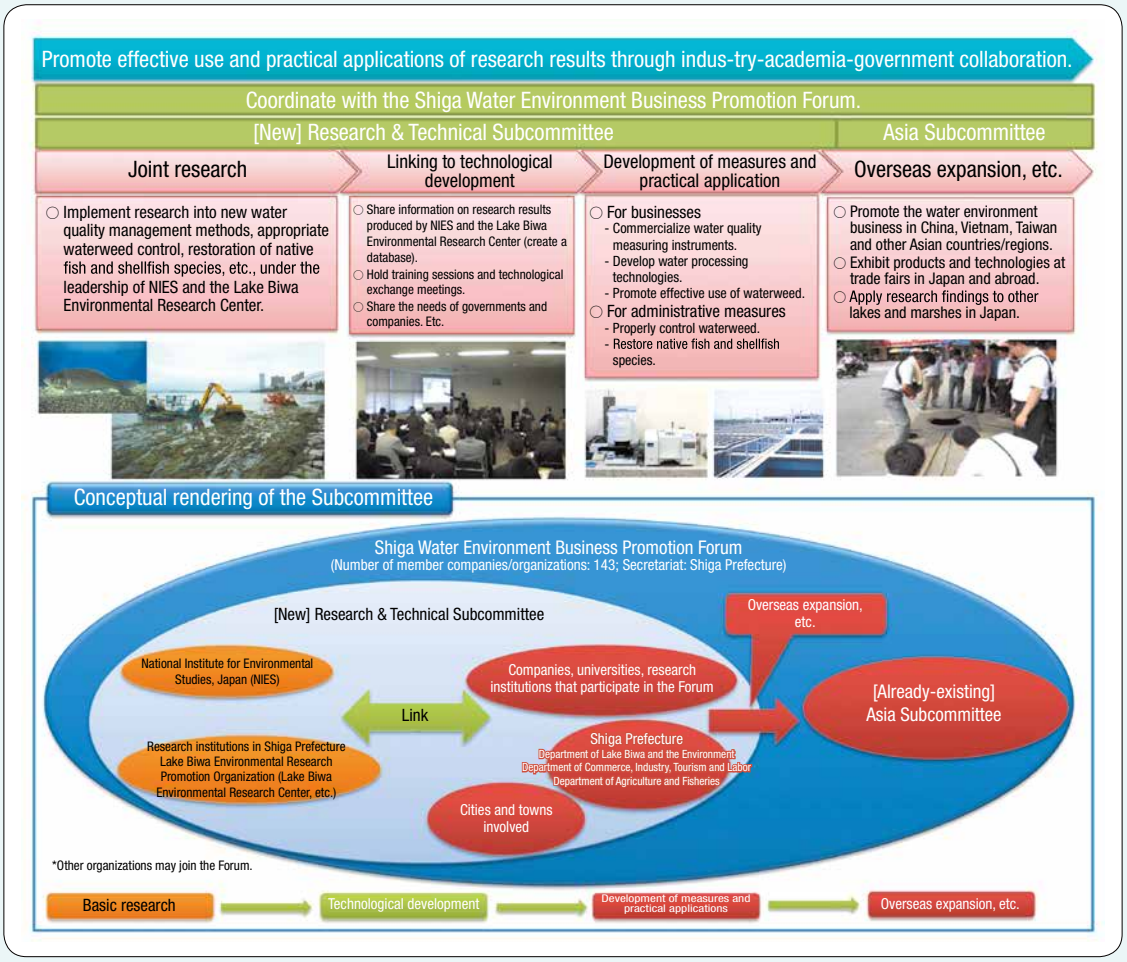
Establishment of the Research & TechnicalSubcommittee and Promotion of the Regional Revitalization Project

The National Institute for Environmental Studies, Japan (NIES) takes the lead in Japan's studies on lakes and marshes. Its Lake Biwa Branch Laboratory (tentative title) will be established in Shiga Prefecture in April 2017, by transferring part of the functions of NIES.

Taking this opportunity, in January 2017 the Shiga Water Environment Business Promotion Forum set up the Research & Technical Subcommittee. Its objectives are to implement joint research on themes such as devising new methods of water quality management that are friendly to ecosystems, and to use the research outcomes for technological development related to the water environment business and for promoting the fisheries industry.

In the future, the Research & Technical Subcommittee will work to provide a venue for matching between various business needs and research seeds. In so doing, the Subcommittee will press ahead with the Lake Biwa Model and Water Environment Business

Promotion Project, which is one of Shiga Prefecture's regional revitalization schemes, to bring about regional innovation.



5 Introductions of the forum members

Device design, fabrication and construction

1 Aoyama Eco System Co., Ltd.

Develops technologies for local production and consumption of water, energy and food

2 Ogiso Construction Limited Liability Company

Helps conserve abundant water supplies and human-friendly living environments

3 Kimura Denko Inc.

We invented the device through our experience in the construction and maintenance of electric facilities to contribute to the conservation of the water environment.

4 SHIMIZU ALLOY MFG. CO., LTD.

Global business development of technologies, products and systems with consideration for the water environment.

5 Suiken Co., Ltd.

We are proud of our abundant business expansion into foreign countries with our original technologies and product lines.

6 TAIYO SANGYO CO., LTD.

We are a manufacturer of water purification equipment, providing a total service from design, manufacture and on-site construction to adjustment work.

7 Takahashi Metal Industries Co., Ltd.

Global business development of environmentally conscious technologies, products and systems, e.g., washing systems using ionized water

8 One For All LTD.

We offer a total service of the design and assembly of machinery and equipment, etc., making the best use of our technology and knowhow in solvent welding.

Materials development and production

9 Okumura Engineering Corporation.

"Creating products that satisfy customers" is the motto of the valve manufacturer.

10 OPTEX CO., LTD.

A unique sensor system for aquatic environments developed by an original sensing technology

11 KansaiKako Co., Ltd.

Globally develops environmental business centered on microorganisms.

12 Kyowa Industry Corp.

We develop new products every year in response to on-site needs. Our goal is to become a top brand in the niche industry of valves and fire hydrants.

13 SANWA INDUSTRY CO., LTD.

Our quest is to produce the ideal concrete, and we offer ecoproducts such as small manholes that satisfy the needs of society.

14 Shimizu Kogyo Co., Ltd.

Proposes and develops innovative water valves to meet the needs of the worksite

15 Showa Valve Co., Ltd.

We supply gas and liquid control valves from Hikone to the world to sustain infrastructures worldwide.

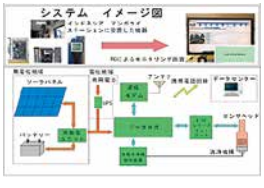
16 SEKISUI CHEMICAL CO., LTD., Shiga Ritto Plant

Ahead of the times, we provide state-of-theart technology and services required for the water infrastructure of the future.

17 SENKA Corporation, ShigaKonan Factory

Provides water treatment agents that meet customers' needs based on the techniques of polymer chemistry

18 Tanahashi Electric Machinery Co., Ltd.



Consult Tanahashi Electric Machinery for all your electrical solutions.

19 T ohzai Chemical Industry Co., LTD., Shiga Factory

We provide a total service of water treatment ranging from consultation, design, and manufacture to marketing and maintenance.

20 Toray Industries, Inc., Shiga Plant

A global leader in sustainable water treatment technology with a comprehensive global network of R&D, production and sales.

Materials development and production

21 NITTO DENKO CORPORATION, Shiga Plant

One of the dominant companies in the global RO membrane market, in such areas as seawater desalination and wastewater reuse.

22 Pacific Giken Company, Ltd.

Develops filter media for water purification with high added value and good cost performance

23 Hanshin Engineering Co., Ltd.

Aquarator designed to conserve the water environment worldwide

24 HORIBA Advanced Techno, Co., Ltd.

Experts in water and liquid measurement

25 Osaka Welding Industrial Co., Ltd.

Steadily expanding business in China with thermal spray technology as the core technology

26 BASIC CO., LTD.

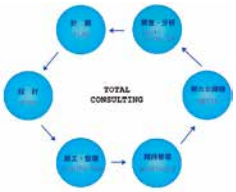
Develops and sells various types of water purifiers using "backwashing technology"

27 Dia Aqua Solutions Co., Inc.

In addition to agents for cooling water systems of air conditioning facilities, we promote the technical development of agents for water treatment.

Analysis, consulting, etc.

28 F Water Management Co., Ltd.



Works to conserve clean water and beautiful nature for future generations.

29 S pecified Nonprofit Corporation Carbon Sink

Offers rich domestic and international experience plus a network of contacts to enable you to pursue global business expansion

30 Kankyo Souken Co., Ltd.

Total Service Company for Water Treatment Facilities.

31 Shiga Branch, Kanso Co., Ltd.

Deploys our proprietary technologies to build affluent local communities and conserve the invaluable environment of the earth.

32 TORAY TECHNO CO., LTD.

We provide total support services of research, analysis, evaluation, etc. for the water environment business developed by municipalities and companies, etc.

33 Nakatec Co., Ltd.

Dynamic eco technology

34 Nihon Maintenance Engineering Corporation, Shiga Office

Taking Advantage of Technology Developed for Water Supply and Sewerage Maintenance, and Practicing Consulting and Product Development

35 Hiyoshi Corporation

We are a one-stop environmental services company developing business overseas with one-of-a-kind technology.

36 New Fuel Laboratory

A general consultant of the production of biodiesel fuel including its wastewater treatment.

37 TECHNO SCIENCE CO., LTD.

A general analysis service company responding to diversified needs with advanced technologies.

38 N ATSUHARA Industrial Technologies Inc.

First Environmental Laboratory in Shiga Prefecture with O/IEC17025 Certification of Laboratory Accreditation for Drinking Water Analysis

39 Nishinihon Engineering Consultant Ltd.

A water and environment consultancy that provides future-oriented consultations and reliable techniques.

Companies belonging to other categories

40 Elcenergy Co., Ltd.

With an understanding of the importance of water, we work to improve water quality to conserve the beauty of Lake Biwa for future generations.

41 Nagaoka Sangyou Co., Ltd.

We contribute to society with plastic processing technology.

42 Nakashima Bussan Co., Ltd.

Since its founding in 1915, Nakashima Bussan has established warm relationships with its customers.

43 Nippon Software Knowledge Corp.

低コストで安心なクラウド遠隔監視サービス
SOFINET CLOUD

Provides computer network solutions to realize a rich environment and life

44 Biwako Total Support Center Cooperative

We support the acceptance and utilization of international human resources.

45 Yamakyu Corporation

Consult Yamakyu for machinery, tools, mechatronics, and environmental commodities.

YAMAKYU

We provide a sense of security to local communities and people.

46 Ohmi Mineral Water Service Co., Ltd.

The first company to start a delivery service of mineral water in Japan

47 Meiho-Construction Inc.

Change the future ! Change your life !

48 Nakajima Shouji Co., Ltd.

Planner working for energy and comfortable living

49 YAMANAKA, Co., Ltd.

株式会社山中

A one-stop wholesaler specializing in piping materials and house equipment, proposing materials and products from the customer's point of view

50 Nodak Co.Ltd.

Welcome to the world of "Aqua System Engineering."

51 WEF Institute of Technology Inc.

Development of local production and consumption technology for water, energy and food.

Research institutes and universities

52 Ritsumeikan University, Research Center of BIWAKO Σ

We have a strong network of researchers working on leading-edge research on Lake Biwa and its surrounding environment.

53 Ryukoku University - Ryukoku Extension Center (REC)

A bridge that connects university intellectual resources with society.

54 Shiga University

Boasts a long history of research results on the environment of Lake Biwa and contributes to the regional community

55 University of Shiga Prefecture

Supports the development of the water environment business through collaborative research and consignment research with companies, organizations and administrations

Industrial support organizations

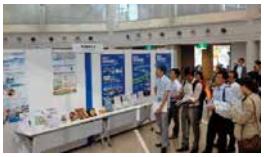
56 Asia International Cooperation Agency (AICA)

AICA, like a bridge, provides support for you in entering Asian markets.

57 Organization for Small & Medium Enterprises and Regional Innovation, JAPAN-Kinki Head Office

We support all worries for small and medium enterprises.

58 Ohmi Environment Conservation Foundation



Symbiosis between nature and people.

59 Environmental Conservation Association Of Shiga Prefecture

We support the realization of a sustainable society for companies.

60 Konan-Koka Environmental Association

Local environmental conservation activities

61 Global Environment Centre Foundation

Aims to conserve the global environment by promoting partnerships between developing countries and Japan

62 The Overseas Human Resources and Industry Development Association, Kansai Kenshu Center

Promotes technology partnerships by training industrial personnel mainly from developing countries and sending experts to those countries.

63 International Lake Environment Committee Foundation (ILEC)

Save Water, Save Lakes—to promote the sustainable management and conservation of lakes in the world

64 Shiga Prefecture Industrial Support Center

Various kinds of support according to the stage of development of the company.

65 Shiga Economic and Industrial Association

An economic organization established to develop the potential of Shiga Prefecture based on the motto, "To the benefit of one's own company, other companies, and society"

66 The Hikone Chamber of Commerce and Industry

Revitalize local enterprises. Make Hikone an attractive destination for tourists to visit.

1

● Develops technologies for local production and consumption of water, energy, and food

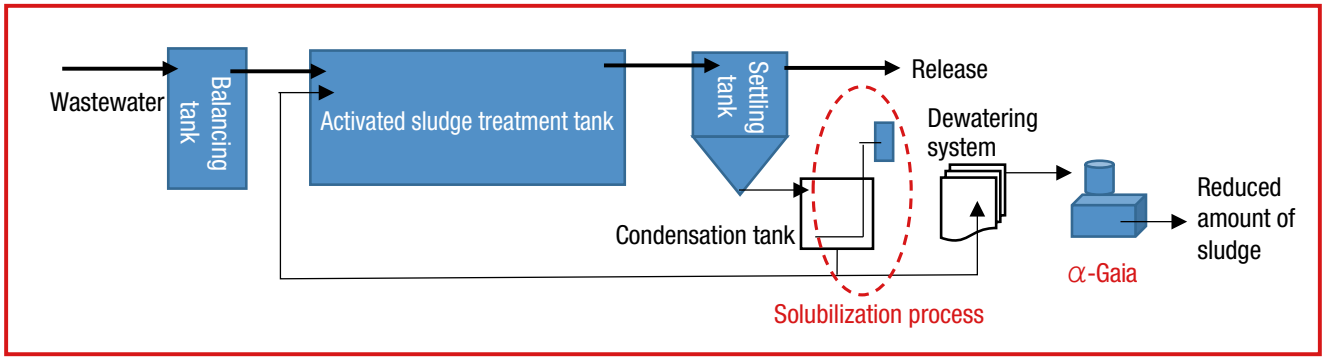
Aoyama Eco System Co., Ltd.

Address: 40-3 Setajinryo-cho, Otsu-shi, Shiga URL: http://www.aoyamaeco.co.jp

Products/Services	Solutions to wastewater treatment problem of excess sludge Solubilization process to reduce excess sludge production α-Gaia designed to reduce the water content of excess sludge to 30% or less

Wastewater treatment (activated sludge process) produces excess sludge. Excess sludge contains dead microorganisms, the cell membranes of which are hard to decompose. Even with the most advanced dewatering system, it is difficult to reduce the water content to 70% or less. We have developed a technology to produce activated air (containing active oxygen). Using this technology, α-Gaia destroys cell membranes and dewaters cytoplasm diffusing out of cells to turn sludge into a powder with a water content of 30% or less.

Prototype α-Gaia installed at a wastewater treatment plant in Shiga



Business deployment in the future	Solving the environmental problem of excess sludge, recycling excess sludge, and treating general organic waste

● Solve the environmental problem of excess sludge and promote the agricultural use of excess sludge in China.
● Disposal of waterweed from Lake Biwa → Joint research is undertaken with a college to use the waterweed as a soil improver (to grow microorganisms stably) for organic farming.
● Incorporate α-Gaia as a microorganism-free, energy-efficient onsite refuse treatment system in waste treatment infrastructures in ASEAN countries.

Company Profile

Company Name: Aoyama Eco System Co., Ltd.
Address: 40-3 Setajinryo-cho, Otsu-shi, Shiga
Representatives: Atsushi Aoyama, President
TEL: +81-77-547-0802

Established: 1977
Capital: ¥40,000,000
Employees: 20
Business: Maintenance of plant facilities and equipment, water treatment, and waste recycling

2

● Helps conserve abundant water supplies and human-friendly living environments

Ogiso Construction Limited Liability Company

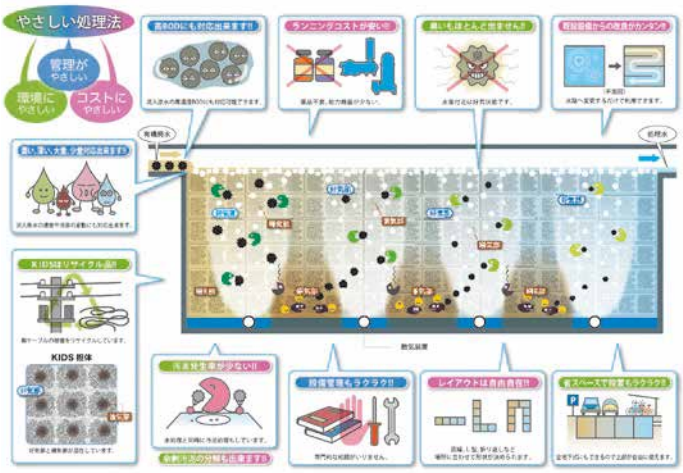
Address: 24-53 Nagase-cho, Tajimi-shi, Gifu URL: http://ogiso-ken.jp

Products/Services

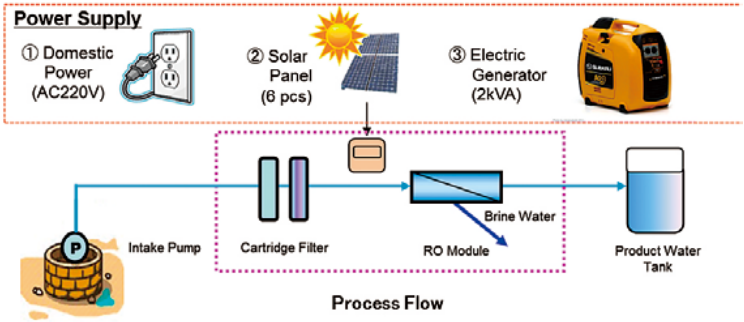
Treatment processes friendly to the environment, and with easy maintenance, and low cost

Carrier-based organic wastewater treatment KIDS/Portable RO water purifier

[KIDS] KIDS is a wastewater treatment system that is friendly to the environment, with easy maintenance, and low cost. Using recycled materials, this carrier-based organic wastewater treatment system runs even under varying wastewater conditions. What is more, it carries out wastewater treatment at reduced running costs, reducing the volume of the resultant sludge.



[RO water purifier] The RO water purifier incorporates top-quality reverse osmosis membranes, which are small and portable, to make it easy to provide safe potable water in emergencies or at locations where stable power is not available.



Development/ Corporate efforts

We address challenges to develop superb water treatment technology, making the best use of our experience and expertise in building and construction.

● Water availability is becoming a serious issue on a global scale. We are working to improve water quality, visiting areas that need water and surveying the specific local needs of the area.

Business deployment in the future

We will deploy our water treatment technology to contribute to improving the environment in fast-growing Asian countries.

● We will work towards the widespread use of the KIDS water treatment technology, which produces a reduced amount of sludge, and the RO water purifier to meet local needs in Vietnam.

Company Profile

Company Name: Ogiso Construction Limited Liability Company
Address: 24-53 Nagase-cho, Tajimi-shi, Gifu
Representative: Naohiro Ogiso, President
TEL: +81-572-22-8703

Established: 1962
Capital: ¥20,000,000
Employees: 10
Business: Construction, general civil work, real estate, and import and export

3

KIMURA DENKO

● We invented a device through our experience in the construction and maintenance of electric facilities to contribute to the conservation of the water environment.

Kimura Denko Inc.

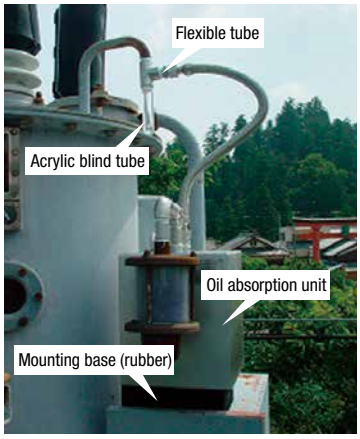
Address: 1-3 Akane-cho, Otsu, Shiga URL: http://www.kimuradenko.co.jp/ (Japanese website)

Products/Services

The “Oil-Water Separation Tank” and the “Spouting Oil Adsorption Unit for Electric Equipment Filled with Oil”
—devices designed to shut leaked oil out of a site

The Oil-Water Separation Tank is a device designed to prevent leaked oil from spreading outside of a site or penetrating the soil of a site by separating oil and water using gravity.
When a sensor senses an oil leak at a site, this device automatically stops the drainage and prevents the outflow of the leaked oil outside the site by shutting the oil inside a concrete tank under the ground. This device is used in power plants and transformer substations, where insulation oil is used in electric apparatuses for the purpose of insulating electricity and removing or cooling the heat generated in the apparatus. Due to its compact size of 600 mm in width, 3000 mm in length and 1500 mm in depth, this device can be used in a factory where there is a possibility of leaked oil flowing outside of the site.
The Spouting Oil Adsorption Unit for Electric Equipment Filled with Oil, a patented oil absorbing box, is mainly installed in electrical equipment filled with oil in telegraph poles, power stations or transformer substations. Internal breakdown of the electrical equipment often causes an oil leak. This device prevents the spouting of leaked oil from a facility, site, road or agricultural water channel by absorbing the leaked oil into a diatomaceous earth ceramic material that acts as a sorbent.

An Oil-Water Separation Tank blocks in leaked oil at a site



Installation example No. 1 of Spouting Oil Adsorption Unit for Electrical Equipment Filled with Oil

Installation example No. 2 of Spouting Oil Adsorption Unit for Electrical Equipment Filled with Oil

Development/ Corporate efforts

We promote the collaborative development or proposal of new techniques to solve problems found in electric insulation and in the maintenance of equipment.
Participating in the Biwako Environmental Business Exhibition gave us the opportunity to actively develop devices for the conservation of the water environment.

- As a nominated bidder of an electric power company, we have been conducting electrical construction work for overhead transmission facilities, underground transmission facilities, power stations, transformer substations, communication line facilities, communication controllers, and engineering surveys.
- Our first step in the environmental business was collaborative work with an electric power company to invent an auxiliary device to lock in sulfur gas hexafluoride. Our participation in the Biwako Environmental Business Exhibition gave us the opportunity to enter the water environmental business. There we met a manufacturer of high-quality safe oil absorption materials. These materials matched our Spouting Oil Adsorption Unit, and we gained a good reputation from the electric power company.

Business deployment in the future

By assigning an expert as our new staff member, we are improving the Oil-Water Separation Tank.

- We are making efforts to improve the performance of the Oil-Water Separation Tank.
- We aim to collaborate with a company with a chemical removal system in order to develop a new device that can remove both of chemicals and oil for the further expansion of the water environmental business in Shiga Prefecture.

Company Profile

Company name: Kimura Denko Inc.
Address: 1-3 Akane-cho, Otsu, Shiga
Representative: Tadashi Kimura, President
TEL: +81-77-522-5673

Established: 1960
Capital: ¥30,000,000
Employees: 17
Business: Electric construction work in power plants and transformer substations.
New energy-and environment-related business.

4

● Global business development of technologies, products and systems with consideration of the water environment.

SHIMIZU ALLOY MFG. CO., LTD.

Address: 928 Higashinonami-cho, Hikone, Shiga URL: http://shimizugokin.co.jp/ (Japanese website)

Products/Services

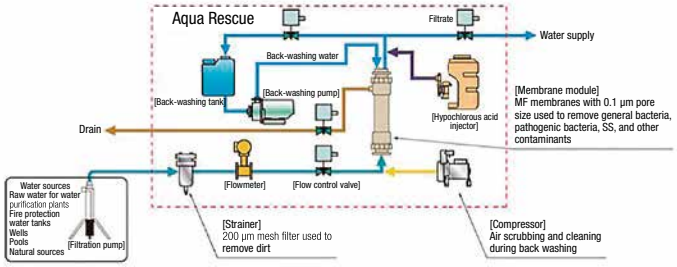
"Aqua Rescue," an emergency water purifying apparatus

A movable and compact water-purifying apparatus for times of disaster, temporary dwellings, water purification facilities, and other purposes

Aqua Rescue is an emergency water-purifying apparatus that satisfies the water quality standard for tap water. The water from various sources such as raw water for water purification plants and fire protection water tanks, as well as from wells, pools, and other natural sources can be purified.
It can be operated by a small capacity power supply such as a household wall outlet or a small generator. It features full automatic operation, and is equipped with devices for backwashing (air washing and backwashing tanks). The apparatus has a maximum processing capacity is 50m3 per day, and it can process water for a small-scale water purification plant. Due to its compact size of 650 mm x 800 mm x 1750 mm,
it can be easily installed inside a building. Aqua Rescue can be used for water supplies during the repair or renovation of filtration facilities, during the sudden deterioration of quality of water resources, for emergency water supply in disasters, or for medium- or long-term use in
water purification facilities.
We have also developed Aqua Rescue Light, a water-purifying apparatus for disasters that can easily generate water in disaster times. It is more compact and portable and can be operated by a petrol engine or a manual pump in the event of a loss of electric power.

Aqua Rescue

Aqua Rescue Light
A newly developed Emergency Water-Purifying Apparatus for Disasters. It can generate drinking water and domestic water for 1,600 persons per a day at disaster times (30 L per day per person).



Processing flow

Development/ Corporate efforts

A valve maker has developed compact water treatment equipment in collaboration with universities and commercialized it.
Based on customer needs, device variations including devices for urgent use and involving processing by ultraviolet rays have also been developed.

- The development of compact water treatment equipment started in 1996 with collaboration between the group companies and the Northeast Shiga engineering center. This was intended to allow efficient use to be made of the membrane produced by the group company, KITZ CORPORATION. Within the membrane filtration device market, the market for the compact devices was not as competitive other markets. As a background, there had also been an outbreak of the parasitic worm cryptosporidium. This was the company' s first attempt at producing valves since its establishment in 1947. The microfiltration membrane water purification system "Aqua MF" for a small water purification plant was developed based on repeated trial and error by trial runs following the assembly of various parts. It received accreditation from a device certifying body and was launched on the market.
- The mobile device "Aqua Rescue" was developed following the development of "Aqua MF" in response to requests from customers. Ultraviolet irradiation came to attract attention as a new method of removing cryptosporidium. The water treatment system "Aqua UV," using ultraviolet rays, was developed, and thus the variations of water treatment systems further increased.

Business deployment in the future

Expansion of options for water treatment equipment. Our future aim is to sell equipment for private use.

- Further expansion of device options, such as preprocessing and postprocessing—which are already available on the market—to improve the usability of the equipment, are to be developed.
- Not limited to small water purification plants and urgent business, our future aim is to sell equipment for private use, including at hotels and inns.

Company Profile

Company name: SHIMIZU ALLOY MFG.CO., LTD.
Address: 928 Higashinonami-cho, Hikone, Shiga
Representative: Masanori Wada, President
TEL:+81-749-23-3131

Established: 1947
Capital: ¥90,300,000
Employees: 150
Business: Production of various valves for water and sewage. Production and sale of water treatment equipment.

5

● We are proud of our abundant business expansion in foreign countries with our original technologies and product lines.

Suiken Co., Ltd.

Address :206-7 Kitawaki, Hino-cho, Gamo-gun, Shiga URL: http://www.suiken.jp/en/

Products/Services

"SUPER FLEX," Flexible Expansion Joint, and "S-GATE," Under-Pressure Installation System
Our creative product lines are widely adapted in water pipes and highly evaluated in Japan and foreign countries.

SUPER FLEX is a ball type, flexible expansion joint for water and sewerage pipes made of ductile cast iron, characterized by its displacement absorption in every direction. We developed the early model of SUPER FLEX in 1980, and it spread to foreign countries in the late 1980s. The joint moves in accordance with the movement of an earthquake, subsidence or liquefaction. In addition to the strong material, SUPER FLEX prevents damage from reaching the water pipe. No damage to SUPER FLEX was reported during the Loma Priesta Earthquake in 1989, the Northridge Earthquake in 1994, or the Great Hanshin and Awaji Earthquake in 1995. Thus, the product's quake-absorbing efficacy was proven.
S-GATE is an under-pressure valve installation system that avoids the suspension of water service by employing end-mill drilling. Only a minimal slot is cut into the pipe by the mill, and a soft-seal-type valve can be inserted in the existing pipe. Compared with the conventional method, which largely cuts the pipe with a circular cutter, S-GATE has greater advantages such as superior sealing performance, less damage to the existing pipe, compact design, and rapid installation procedures. S-GATE has been licensed to distributors in the U.S., South Korea and Taiwan. In recent years, the system and its materials have been made more compact and undergone a model change into the S-GATE EX, which has now found extensive applications not only in water plumbing but also facility plumbing.
SUPER FLEX and S-GATE have abundant product lines adaptable to various diameters and types of pipes. Their sales have been increasing both in Japan and overseas.

Structure of SUPER FLEX
With a dual-structure pipe set between two balls, SUPER FLEX absorbs compound displacement such as deflection, expansion, contraction and torsion.

New model
S-GATE EX

SUPER FLEX incurred no damage during the Loma Priesta Earthquake.

Valve installation with S-GATE (end mill under a pressure installation system)

Development/ Corporate efforts

Corporate efforts Promote the development of products, targeting the global market.
Participate positively in water services exhibitions held overseas.

● As a manufacturer of joints for life lines, we have been developing products while seeking global markets since our establishment in 1970. We have been disseminating our creative technologies and products such as SUPER FLEX and S-GATE to the world. To protect our technologies and products, we have obtained about 200 patents, and we actively license them to domestic and overseas companies.

● Every year since 2009, we have had a solo booth at ACE, the exhibition hosted by the American Water Works Association (AWWA), to actively demonstrate and promote new technologies. In addition to the United States, we have actively participated in other water-related exhibitions held overseas in countries such as India, Malaysia, the Netherlands and Russia, for public relations purposes and partly for market research. In 2018, we also participated in the World Water Forum and its exhibition hosted by the International Water Association (IWA), which was held in Japan for the first time.

Business deployment in the future

Pursue cost efficiency-oriented development of new technologies from the viewpoints of users for further overseas expansion, focusing on products for uninterrupted water supply.

Company Profile

Company name: Suiken Co., Ltd.
Address: 206-7, Kitawaki, Hino-cho, Gamo, Shiga
Representative: Syunichi Fujimoto, President
TEL: +81-748-53-8083

Established: 1970
Capital: ¥95,600,000
Employees: 70
Business: Development, manufacture and sale of joints for water supply and sewage. Valve installation under pressure. Development, manufacture and sale of quake-absorbing joints for plumbing facilities.

6

● We are a manufacturer of water purification equipment, providing a total service ranging from design, manufacture and on-site construction to adjustment work.

TAIYO SANGYO CO., LTD.

Address: 528 Serikawa-cho, Hikone, Shiga URL: http://www.taiyosangyo.co.jp/index_english.html

Products/Services

Various kinds of facilities for water treatment

Designs, manufactures and develops made-to-order systems in accordance with the needs of customers

The equipment works as a system to stably and efficiently remove dissolved organic matters and particulates such as salts dissolved in water, trihalomethane, pesticides, etc., making use of the reverse osmosis membrane. It is used for producing drinking water, water purification, pretreatment of pure water equipment, and reuse of various kinds of wastewater such as industrial wastewater and sewage.
We have realized the provision of made-to-order systems in accordance with the needs of the customers by implementing consistent in-house manufacturing ranging from design, manufacture and local construction at the site to adjustment work. In fact, we have been supplying various systems such as seawater desalination and sanitary equipment (plumbing space) for condominiums.

RO filtration equipment

RO plant for seawater desalination

Large RO plant

View of the site where on-the site support is conducted

Development/ Corporate efforts

Due to the experience and knowhow we have accumulated over 30 years, the design and manufacture of special water treatment equipment has become possible.
The personnel in charge directly and consistently provide support ranging from sales and design, through mechanical and electrical systems, to estimation and maintenance.

● We started business in 1951 to manufacture valves for chemical plants as our core product. Withdrawing completely from the production of valves in 1978, we changed our business to secondarily found a new business of plant piping, machining and assembly, water purification equipment, etc. Thereafter, for more than 30 years, we have developed high technology to be applied in design and manufacture in any specialized field based on the experience and knowhow we have accumulated so far of development and manufacturing, as well as the installation and adjustment of various types of water treatment equipment using membranes, such as wastewater treatment, our main business, RO water production, concentrated water production, seawater desalination, etc.

● Since the personnel in charge directly and consistently provide support ranging from sales and design, through mechanical and electrical systems, to estimation and maintenance, we can accurately and quickly respond to customer needs and establish a system whereby we can provide services at an even lower cost. It is also possible to design and construct a factory system developed in conjunction with business areas other than water purification, such as plant piping, machining and assembly, and so on.

Business deployment in the future

in the future We are developing overseas business targeting Southeast Asian countries including Vietnam, etc.

● We plan to develop markets overseas according to local needs, such as by providing lower cost, lower power consumption, smaller equipment, etc., focusing mainly on Southeast Asia, where there are a number of critical issues concerning water. We established a subsidiary company in Vietnam in January 2013, and have started our business development in the same way as in Japan. We have sold our water treatment facilities and water purifiers to Japanese-affiliated plants, hotels, apartments and households.

● In Japan, on the other hand, we plan to expand the outsourcing business of our plant maintenance work by leading Japanese manufacturers in terms of both local and global development, aiming to establish a small engineering company.

Company Profile

Company name: TAIYO SANGYO CO., LTD.
Address: 528 Serikawa-cho, Hikone, Shiga
Representative: Odagaki Yoshinobu, President
TEL:+81-749-22-6213

Established: 1951
Capital: ¥25,000,000
Employees: 43
Business: Plumbing, iron structure works, water treatment systems using membrane filtrations.

7

高橋金属株式会社

● Global business development of environmentally conscious technologies, products and systems, e.g., washing systems using ionized water

Takahashi Metal Industries Co., Ltd.

Address: 864-4 Hosoe-cho, Nagahama-shi, Shiga URL: http://www.takahasi-k.co.jp/ (Japanese website)

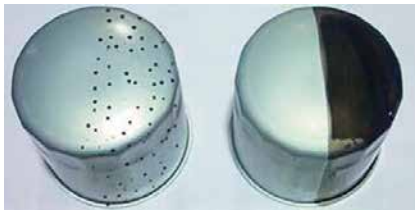
Products/Services

"TIWS," a washing system using ionized water

Chemical-free eco-friendly washing system

A device that uses an alkaline ionized water formed by using a special technique to electrolyze water, for washing off smears from the surfaces of industrial parts including metal parts.
Conventional industrial washing systems use chemicals as cleaners, presenting pollution risks to the environment, while residues and stains may remain after rinsing the washed products. "TIWS" solves such problems, realizing a highly effective washing process with consideration for the water environment.
In addition, because the system does not use chemicals, the rinsing process is reduced and the device can be made compact. Furthermore, since detergents are not required and the wastewater can be recycled, the cost can be reduced.

Perspective of the washing system using ionized water
A conveyer-type cleaning device that can be mounted onto ionized water generators, grease skimmers, or waste evaporators



Comparison of cleaning samples in a wettability test with Indian ink
The left sample is before cleaning. The residual oil content repels the Indian ink. The right sample is after cleaning. As the oil content is removed, the Indian ink covers the surface uniformly.

According to the work shape and the product line, the device comes in many variations.
The left one is a conveyer-type. The right one is a batch-type.

Development/ Corporate efforts

Commercialization of the cleaning system due to the high detergency of the alkali ionized water found during the research of the ionized water.
The washing system is proposed as a whole. The washing test is conducted before the contract is completed to avoid technical troubles.

- While researching and developing the production of acid ionized water for food sterilization in response to a customer's request, the alkali ionized water was found to be highly detergent. A prototype cleaning device for metal parts was produced and tested in-house and by the customer. The washing ability of the device received a high evaluation and was then commercialized. It was displayed at the "Lake Biwa Environment Business Messe" in 1998 for the first time in public, and was launched for sale. Both domestically and overseas, many metal-parts processing factories employ it today.
- The washing system is designed to meet the individual needs of companies and factories, and to be constructed as a whole. Before accepting an order, meetings and washing tests are held to meet the customer's needs in detail. In addition, aftercare services including maintenance are also provided.

Business deployment in the future

We have established local corporations in China and Thailand, and are carrying out design, production and sales that meet local needs.

- A local corporation was established in Suzhou, China in 2005, and one in Bangkok, Thailand in 2011. Design, production and sales of the washing systems to meet the local needs are carried out. Besides the above, overseas sales including in Mexico and Poland are being rolled out.
- In addition, the porous adsorption material called "Ecoridge" was jointly developed through industry-academia-government co-operation. The test marketing and system development of "absorption cylinders" for small factories and "absorption plants" for large-scale factories are carried out with the aim of expanding sales.

Company Profile

Company name: Takahashi Metal Industries Co., Ltd.
Address: 864-4 Hosoe-cho, Nagahama-shi, Shiga
Representatives: Yasuyuki Takahashi, President
TEL: +81-749-72-3980

Established: 1958
Capital: ¥98,320,000
Employees: 236
Business: Production of precision metal press parts; the design and production of press dies; and the development, production and sale of environmentrelated devices.

8

● We offer a total service of the design and assembly of machinery and equipment, etc., making the best use of our technology and know-how in solvent welding.

One For All LTD.

Address: 755-1 Nodayama-cho, Hikone, Shiga URL: http://www.onefor-all.co.jp/ (Japanese web site)

Products/Services

Processing and equipment assembly for plumbing by the solvent welding method using resin and plastic materials

Offer a plumbing service with highly reliable assembly and construction technology, as well as the design and assembly of machinery equipment.

Our plumbing has the advantage of seldom generating leaks from the joints due to highly reliable piping construction, which employs the "solvent welding" method that joins pipes by heat and pressure without using adhesive materials, using only such materials as resin and plastics made from polypropylene (PP), polyethylene (PE), polyvinyl fluoride (PVDF), etc., the use of which materials duly complies with Europe and RoHS orders.
We also realize a remarkable cost reduction in construction and transportation by conducting "prefabricated plumbing" on the construction site, having already made an appropriate plumbing design beforehand based on the factory floor plan.
We have abundant experience of conducting plumbing on devices for chemicals and superpure water in semiconductor factories. Recently, we have been conducting plumbing in sewage water treatment plants and desalination plants. On the basis of these achievements, we now propose and implement new services such as plumbing of low-pressure filter devices, in addition to designing and assembling total systems for liquid transfer.

IR Welding (Infrared Radiation Welding)
IR Welding is a method of welding the end faces of pipes by heating them with far infrared radiation. This helps prevent cracking caused by residual stress, because the connected parts are stiff and have less stress.

Prefabricated plumbing pipes for PVDF
PVDF is a material with a long life due to its excellent characteristics of heat-, pressure- and chemical-resis tance to acid, etc. Few enterprises produce pipes using the same material.

A sample of the designing and welding of a membrane module for low-pressure filtration

Development/ Corporate efforts

Developed the market in the water-related business by taking advantage of our technology and knowhow in the production and equipment assembly of liquid plumbing for semiconductor equipment.
In addition to the production of pipes, we are ready to propose and implement the design and assembly, etc. of machinery equipment based on any request.

- By taking advantage of the technology and knowhow of precise design and minute processing such as careful consideration of the air outside and the management of temperature and flow that we have so far developed in the production of pipes used for such liquids as baths for semiconductor equipment and ultrapure water equipment, we have applied it to the development of business in the market of drained water treatment equipment and seawater desalination plants.
- Since we have thus far solved many technical problems together with our customers regarding semiconductor equipment over many years, we are now ready to propose the implementation of not only production, construction and plumbing, but also total design of the assembly, installation of electric equipment and the operation testing of machinery equipment using pipes as parts. Also, regarding water treatment equipment, we are ready to make specific and detailed proposals for implementation from design to operation testing including the balancing of membranes and pumping performance and the balancing of flow between multiple pipes.

Business deployment in the future

Promote product development in cooperation with enterprises, taking advantage of our ability to make total proposals for machinery equipment.

- We will jointly develop our machinery equipment, etc. in cooperation with enterprises in the aquatic environment business, taking an advantage of our ability to make total proposals on the development of machinery equipment using pipes as parts.
- Through our business development, we will also further promote the use of resin and plastics, which are light in weight and strong in machinery strength, that comply with European and RoHS orders. In particular, we are aiming at the business expansion of membrane modules for low-pressure filtration in design, manufacturing and marketing.

Company Profile

Company name: One For All LTD.
Address: 755-1 Nodayama-cho, Hikone, Shiga
Representative: Takashi Matsushita, President
TEL:+81-749-23-3866

Established: 1988
Capital: ¥1,000,000
Employees: 30
Business: Weld plumbing for prefab houses, special welding, device assembling, made with plastics such as PP, PE and PVDF.

9

● Valve manufacturer with the motto “Create products that make customers feel appreciated”

Okumura Engineering Corporation

Address: 446-1 Otani, Hino-cho, Gamo-gun, Shiga, Japan URL: http://www.okm-net.jp/english/

Products/Services

Environmentally friendly marine valves conforming to international environmental regulations

High temperature control exhaust butterfly valves for marine engines

After international emissions control on vessels was tightened, we developed a high temperature control valve for marine exhaust gas that complies with NOx and SOx regulations, and expected to see growing demand. Sales then started in 2017. The product has the following four features:

(1) Space-saving design for ease of valve installation

In the engine room of a vessel, installation space is limited. We achieved a maximum space reduction of 30% (for the single action type) compared to the previous model by using a small, high-power actuator. The smaller size of the actuator has made the product lighter, improved the anti-vibration performance, and the actuator mounting base is now smaller in size.

(2) Securing stable performance within the range of practical use temperatures

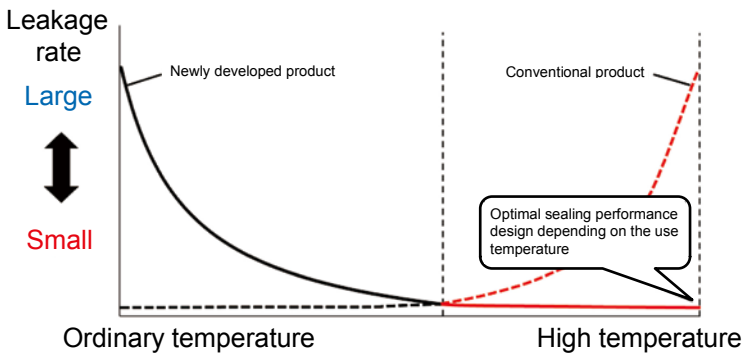
The sealing performance of a valve varies greatly depending on the temperature of the fluid and the ambient environment. Specifying the range of valve use temperature and designing each part specifically allows the most appropriate clearance to be provided, resulting in stable sealing performance.

(3) Durability that leads to high reliability

Soot and other combustion byproducts in exhaust gas can stick to the inner surface of a valve and enter the spindle section, adversely affecting operation. To address this problem, by installing a soot protector that prevents entry into the valve spindle section and improving the bearing bushes, we were able to obtain stable operation at normal to high temperatures.

(4) Mitigation of valve pressure loss

By customizing the product according to the use purpose, and by using analysis software to review and modify the geometry of the inner surface of the valve and the valve body to achieve the optimal design, we reduced the pressure loss coefficient of the valve.



Development/ Corporate efforts

The only company in Japan that succeeded in commercializing a product that complies with marine exhaust gas regulations

- Regulations regarding air pollutants (NOx, SOx) emitted from marine engines are becoming increasingly strict each year.
- We are the only single company in Japan that succeeded in developing an exhaust gas valve for marine engines and received attention from shipbuilding companies both inside and outside the country.

Business deployment in the future

Work toward “Create products that make customers feel appreciated”

- To respond to the increase in orders for exhaust gas valves, a second manufacturing plant in the country is under construction in Higashiomi City. This is scheduled to be start operations from next spring.
- We were selected as “The Driving Company for the regional future” because we have a significant impact on the local economy, have growth potential, and serve as a pillar of the local economy. 地域未来牽引企業 Driving Company for the regional future
- Being aware of the viewpoints of our customers every day, we are working on product development with the motto “Create products that make customers feel appreciated.”

Company Profile

Company name: Okumura Engineering Corporation
Address: 446-1 Otani, Hino Town, Gamo District, Shiga Prefecture
Representative: Yoneo Murai
TEL: +81-748-52-2131

Established: June 1, 1962
Capital: ¥499,665,280
Employees: 205
Business: Development, manufacturing, and sales of valve products

10

● A unique sensor system for aquatic environments developed by an original sensing technology

OPTEX CO., LTD.

Address: 5-8-12, Ogoto Otsu, Shiga URL: http://www.optex.co.jp/e/

Products/Services

“Turbidity Checker TC-100/500/3000”

Conveniently simplified maintenance realized by a cleaning device with a wiper that makes consecutive monitoring possible.

Turbidity is an index of the turbidness of water. This is an analyzer that can be placed at the outlets of rivers and factory sewage and near the intakes of water supply and sewages to measure turbidity of the water.
TC series of turbidity checkers, which are used independently used from display devices and sensors, measure turbidity employing a system of “turbidity checking by a beam transmitted through a sample” and obtain numerical data from an analytical curve using a standard solution. Maintenance is simple since the cleaning device is equipped with a wiper, which is attached to the window of the transmitted beam detector in the sensor, making accurate and consecutive measuring of turbidity possible even in a contaminated environment caused by industrial liquid waste, etc.
The TC-100 is much smaller in size at 32 mm in diameter and 163 mm in length, and can easily be installed in any small space.

Turbidity Checker

Cleaner with built-in wiper. Maintenance is simple due to the sapphire glass used for the display window.

Converter used with turbidity checker. The converter has a built-in turbidity display and a signal for response time based on the output data, warning level, etc.

Development/ Corporate efforts

Downsizing of the device has been realized by applying the proprietary technology of a security sensor for crime prevention and an automatic door sensor to water-quality measuring devices.
The development of various types of monitoring devices, which render continuous measuring possible and are also usable outdoors is now under way, and test goods will be ready for the market in due course.

- We started the aquatic environment-related business 20 years ago upon receiving an inquiry from the Shiga prefectural government. Since then, we have made use of our proprietary technology in our main line business of security sensors for crime prevention and automatic door sensors, and have thus developed products of water quality measuring devices to realize downsizing and reasonable pricing as well. Currently we have a 25% share of the turbidity measuring device market nationwide.
- Taking into account our technological strength in downsizing devices, in addition to our development of turbidity checkers which enable continuous measuring even outdoors, and water limpidity sensors which indicate the clearness of water, we have also developed and marketed, in cooperation with an enterprise, the “Digital Pack Test,” which can measure heavy metals such as hexavalent chromium. The “Digital Pack Test” has been used to measure water quality in places affected by the East Japan Great Earthquake, etc.

Business deployment in the future

We plan to develop the market in the water treatment service business through the development of measuring devices for various aspects of water quality.

- In addition to our main product line of turbidity checkers and water transparency checkers in the water quality measuring device market, we plan to increase our customers through the development of measuring devices for various aspects of water quality such as pH, etc.
- We also plan to employ local human resources and develop overseas markets in Southeast Asia and the Middle East, as well as China, where we have already been establishing a market.

Company Profile

Company name: OPTEX CO., LTD.
Address: 5-8-12, Ogoto Otsu, Shiga
Representative: Toru Kamimura, Chairman, President and CEO
TEL:+81-77-579-8000
Established: May 25, 1979
Capital: ¥2,798,270,000
Employees: 1,120(consolidated)
Business: The production and distribution of various sensors and systems for industrial / business uses, including burglar alarms, automatic door sensors, and water quality measuring instruments.

11

● Operate a global environmental business with microorganisms as the core competence.

KansaiKako Co., Ltd.

関西化工株式会社

Address: 9-9, Hiroshiba-cho, Suita-shi, Osaka URL: http://kansaikako.co.jp/english/

Products/Services

With a large specific surface area and positive charge, our product can hold a large number of microorganisms. It also supports treatment under high load conditions.

Functional foam carrier "Carrier Frontier"

● Holding a large number of microorganisms

The foam carrier “Carrier Frontier” has a large surface area with many vacant spaces because it is made through a foaming process, thus creating large surface undulations. It is also positively charged so that microorganisms (negatively charged) are likely to adhere to it, meaning it can hold a large number of microorganisms. For this reason, it also supports treatment under high load conditions.

● Superior fluidity

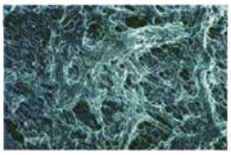
The specific gravity can be adjusted over a wide range to obtain greater fluidity in all sorts of treatment tanks found in practical applications. In addition, the product flows smoothly because its shape is cylindrical making it subject to less resistance.

● Abrasion resistance

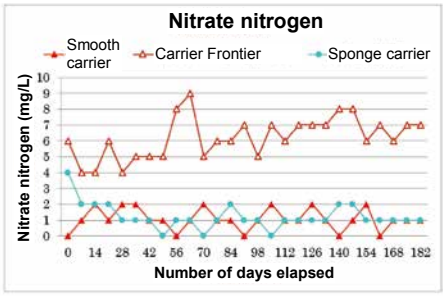
Carrier Frontier is an abrasion-resistant carrier because it is made of PP and rigid.

Main material: polypropylene

Size (mm)	Specific surface area (m^2/m^3)
φ20×10	720
φ15×7.5	1000



Picture of foam carrier’s surface



Nitration test

Carrier Frontier (φ15×7.5); Carrier filling ratio 10%; HRT: 24 hours; BOD volume load 0.5 kg-BOD/m^3; Artificial sewer (50 mg/L in the case of NH_3)

Development/ Corporate efforts

Developed a carrier that can support high load treatment, with a focus on microorganisms.

● As for filter media, we have continued research and development for many years as a manufacturer of contact filter media for septic tanks and wastewater treatment. In this way, we have gained the position of a contact filter media manufacturer and earned trust. Thorough development of high-performance carriers, we have contributed to the improved performance of wastewater treatment.

● Using the wealth of test data obtained through cooperation between our internal personnel and universities, we have made proposals to plant manufacturers, maintenance agents, and end users, while sales performance has also improved.

Business deployment in the future

Expand our business into the Asian and African markets.

● For the domestic market, we will focus on measures against aging wastewater treatment facilities and work on leasing out temporary water treatment equipment, and repairing and improving facilities. With the technological strength to realize our customer requests, we aim to develop and provide better new products.

● For overseas markets, we have actively worked to expand the business with a focus on improving water quality in the fields of wastewater treatment and inland aquaculture on the basis of our performance so far.

Company Profile

Company name: KansaiKako Co., Ltd.
Address: 9-9, Hiroshiba-cho, Suita-shi, Osaka
Representative: Shigeyuki Hamai, Representative Director
TEL: +81-6-6192-5830

Established: July 1, 1983
Capital: ¥40,000,000
Employees: 98
Business: Manufacturing and sales of water treatment related products Manufacturing and sales of organic matter treatment systems Flower-related business, LOHAS business

12

● We develop new products every year in response to on-site needs. Our goal is to become a top brand in the niche industry of valves and fire hydrants.

Kyowa Industry Corp.

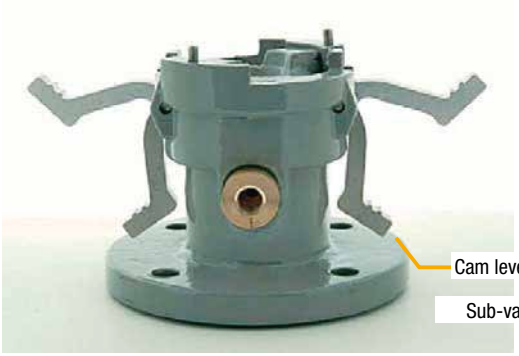
Address: 1790 Kotakaricho, HIgashiomi, Shiga URL: http://www.kyowakk.com/ (Japanese website)

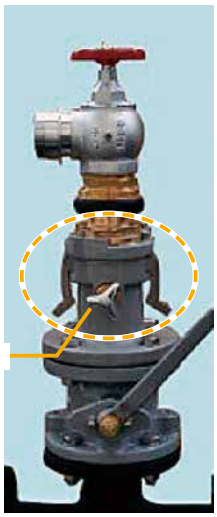
Products/Services

"Cam-an-Air," a high speed air vent valve with a cam lever lock.

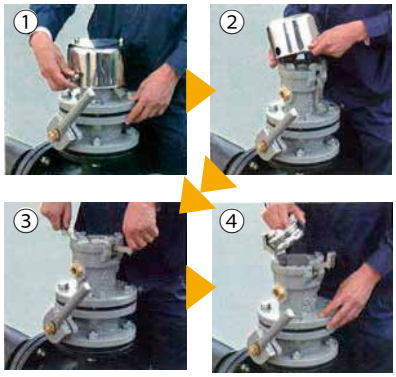
Easily removable for operation tests. An air vent valve that can improve work efficiency.

The air vent valve is for discharging air from pipelines, making water supply smoother and preventing air from belching from the faucets; it is an indispensable product for the maintenance of water pipelines.
The "Cam-an-Air" was developed to satisfy customers' demand for simple and easy maintenance. It has two features that make the product distinctive from other valves. The first feature is that it can be taken apart without tools by using cam levers instead of conventional bolts, thus reducing the time required for disassembly, cleaning and reassembly. The second feature is that an operation test valve has been newly applied. The operation of the air valve that used to be checked by regular overhaul is now confirmed without taking it apart.
Acquisition of the design right to the shape of the operating state using the cam levers protects our original technique and design.





Left: The valve in the operating state using the cam levers.
Right: The valve being installed on the water pipe. To check the operation, rotate the operation test valve once. Then, if only water comes out, the valve is working correctly; if you hear the sound of air, the valve has an operational defect.



The procedure for taking apart the valve is as follows. It is easy and quick, and also takes safety measures into consideration.
① Stop water at the sub-valve, and then remove the operation test valve.
② Remove the cap nuts and then remove the cover.
③ Turn off the cam levers.
④ Remove the valve cover and then remove the internal parts.

Development/ Corporate efforts

We started as a subcontractor for a major company and became a household brand manufacturer of valves for waterworks.
We develop products with innovative ideas to meet customer needs, launching a new product every year.

● We produced OEM valves for waterworks as a subcontracting factory of a major company, and Hikone valves, for many years following our establishment.
Because our customers shifted to overseas procurements, we became a household brand manufacturer around 2002, and manufacture and distribute valves for waterworks. Since then, we have been creating our original brand utilizing the advanced techniques that we cultivated as a subcontractor, and are developing and launching a new product every year.
● We bring ideas together from each of the sales, production, and technology departments, for new products based on customers' needs, and develop novel products such as those featuring "rust resistance" and "easy operation," besides the abovementioned products. We proactively acquire intellectual property including patents and designs to protect our products from imitations. We carry out marketing research thoroughly and set our sale prices based on a reasonable balance between development costs and market trends.

Business deployment in the future

By continuing our one-of-a-kind marketing and development, we build a manufacturing brand specialized in "water."

● We hear the voices of customers who have purchased our product and then discover new needs in connection with the product they have purchased. By continuing to develop and distribute products with reliable technologies, we will raise our recognition, and then will establish a manufacturing brand specializing in "water."
● We will continue to actively participate in exhibitions relating with "water," exhibit our newly developed products, and build networks of customers and companies with whom we can align.

Company Profile

Company name: Kyowa Industry Corp.
Address:1790 Kotakaricho, HIgashiomi, Shiga
Representative: Shigenobu Shimizu, President
TEL:+81-749-45-0561

Established: 1961
Capital: ¥85,000,000
Employees: 24
Business: Manufacture and sales of valves for waterworks, and fire hydrants for water and sewage.

13

● Our quest is to produce the ideal concrete, and we offer eco-products such as small manholes that are pleasing to society

SANWA INDUSTRY CO., LTD.

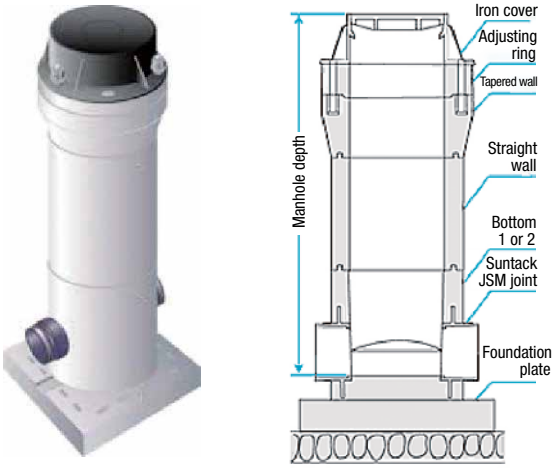
Address: 2071-3 Bodaiji, Konan, Shiga URL: http://www.sanwa-shiga.co.jp/ (Japanese website)

Products/Services

The "Small Machine Hole," a knocked-down-type inverted small manhole with a flexible cutoff joint.

Durability, workability and economy are its strong points. The market share of the small manhole is 40%.

In urban areas, the need for small manholes has increased due to the increase in underground facilities.
The Small Machine Hole, a concrete small manhole with superior performance and durability, is easy to construct. High durability is realized, because the load on the manhole cover is transmitted to the base plate through the main body, despite it being made of concrete. It is easy to set it horizontally using the base plate, and construction is simple and easy in any setting, thus shortening the work period and reducing construction costs.
The base block of the small manhole and its construction technique have been patented. The “Japan Small Manhole Association" was established by small- and medium-sized concrete-related businesses all over Japan. The production is carried out based on license agreements among the member companies. The Small Machine Hole is disseminated through the activities of the association, and has captured 40% of the market share for small manholes.



The exterior of the "Small Machine Hole" (left), and the cross-sectional view (right)

Setting of the direct wall | Setting of the canted wall | Setting of the iron cover

Metal fittings for adjustment | Finishing the circumference of the iron cover | Completion of the construction

Development/ Corporate efforts

We quickly focused on small manholes, while looking for sewer-related products to newly develop. "Eco-products pleasing to society" are provided by through the profitable use of waste materials, based on industry-academia-government collaboration research.

- While we were looking for sewer-related products to newly develop, demand for small manholes increased. We quickly focused on the small manhole, mitigated its disadvantages, and strengthened its durability through the use of concrete. The compact manhole, made of concrete and easy to build, was newly developed and commercialized.
- Regarding the molten slag from the sludge utilization for construction works, fundamental research was started in collaboration with the prefecture and other companies, and was successfully put to practical use. Building materials are produced and are used for basic blocks and materials for exterioruse items, such as benches.
- Besides molten slag, other waste materials, such as ceramic, glass and scrap wood, are used mixed with concrete. Profitable use of waste materials as building materials is proactively promoted. In this way, we provide "eco-products pleasing to society."

Business deployment in the future

Promoting cross-industrial exchanges, and developing a wide range of water environment business

- Promoting cross-industrial exchanges, and developing a wide range of water environment business

Company Profile

Company name: SANWA INDUSTRY CO.,LTD.
Address: 2071-3 Bodaiji, Konan, Shiga
Representative: Hiroyuki Kuwana, President
TEL:+81-748-74-1330

Established: Founded in 1966/Incorporated in 1979
Capital: ¥27,500,000
Employees: 20
Business: Civil engineering and construction. Manufacturing of precast concrete for sewage uses.

14

● Proposes and develops innovative water valves to meet the needs of the worksite.

Shimizu Kogyo Co., Ltd.

Address: 250 Nire-cho, Hikone, Shiga URL: http://shimizukogyo.co.jp/ (in Japanese)

Products/Services

Various water valves and hydrants (compliant with JIS, JWWA, and major international standards)

- Since our establishment in 1933, we have been an inspection facility of the Japan Water Works Association, manufacturing and selling valves for waterworks, such as gate valves, butterfly valves, fire hydrants and air valves.
- In 2011, we made a capital tie-up with the AVK Group, a global company that sells valves in more than 80 countries. As the sole associate of AVK in Japan, we import and sell valves and joints that comply with the major foreign standards, including BS (UK), DIN (Germany), AWWA (USA) and AS (Australia), in addition to ISO.

Underground fire hydrant Sus Camel with its stainless-steel valve body

Products from the AVK Group compliant with major international standards

Development/ Corporate efforts

Good Design Award 2016 winner

- We won a Good Design Award 2016 (organized by the Japan Institute of Design Promotion) for the underground fire hydrant Sus Camel, with its stainless-steel valve body. This product was selected for Good Design Best 100 and the Good Design Special Award (Design of Production Development).
- We differentiate our products by regularly inventing, developing, and launching products that meet the needs of the worksite, including air valves that prevent failure caused by the increasing volume of frozen water, incorporating a spring to absorb increases in volume. We are the in-dustry's leading manufacturer in terms of market share for and product lineup of stainless steel fire hydrants, air valves, and repair valves.

Business deployment in the future

Contributing to the water environment with valves and fire hydrants

- We will work to develop valves and fire hydrants that are cost-effective, ecofriendly, and easy-to-operate for the water, sewerage, and fire-fighting pipe markets in Japan and abroad. We intend to pursue our water environment business focusing on valves.

Company Profile

Company Name: Shimizu Kogyo Co., Ltd.
Address: 250 Nire-cho, Hikone, Shiga
Representatives: Yasuhiro Shimizu
TEL: +81-749-25-2550

Established: 1933
Capital: ¥30,000,000
Employees: 40
Business: Manufacture and sale of valves for water works. Import and sale of valves and joints based on major foreign standards.

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● We supply gas and liquid control valves from Hikone to the world to sustain infrastructures worldwide.

Showa Valve Co., Ltd.

Address: 155-9 Koizumi-cho, Hikone-shi, Shiga URL: http://www.showavalve.co.jp/

Products/Services

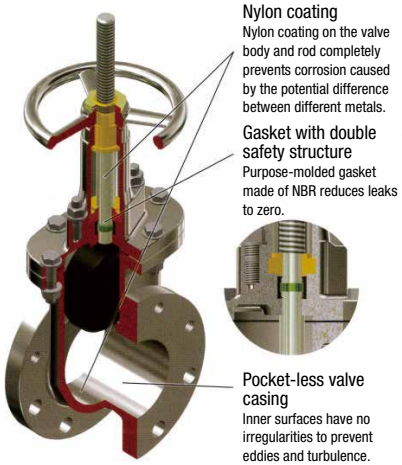
Seawater corrosion-resistant valves in which the metal surfaces do not come into contact with fluid

Type ES soft seal gate valve

Stainless steel is a relatively highly corrosion-resistant and mechanically strong material. However, the metal is not completely corrosion free. Stainless steel materials with enhanced corrosion resistance are extremely high-priced.

Usually, valves are made of several different metals. If exposed to seawater, these materials result in galvanic corrosion due to the potential difference generated between components.

The type ES soft seal valve has been developed to solve these problems. This product is mostly constructed of cast iron, which is less costly than stainless steel. Applying a nylon coating to the valve rod has traditionally been thought to be difficult. However, we have successfully put a nylon coating on the valve rod as well as on the valve interior. The nylon coating avoids exposing the metal parts to the fluid and completely prevents galvanic corrosion.



Nylon coating
Nylon coating on the valve body and rod completely prevents corrosion caused by the potential difference between different metals.

Gasket with double safety structure
Purpose-molded gasket made of NBR reduces leaks to zero.

Pocket-less valve casing
Inner surfaces have no irregularities to prevent eddies and turbulence.

■Comparison with previous products

Parameter	General gate valve (SCS14)	Knife gate valve (SCS14)	Type ES soft seal valve	Performance comparison
Weight	Poor	Fair	Good	Lightweight design incorporating reduced face-to-face dimension and handle diameter for improved ease of installation
Corrosion resistance	Fair	Fair	Good	Nylon coating on outer and inner surfaces combined with a rubber lining on the valve body completely prevents electrolytic corrosion.
Flow-through resistance	Fair	Poor	Good	Soft seal structure combined with pocket-less valve casing reduces pressure losses.
Operating torque	Fair	Poor	Good	Improved ease of operation due to substantially reduced seating torque and gasket resistance
Maintainability	Poor	Fair	Good	Reduced number of components and improved ease of onsite replacement work
Valve seat sealing performance	Fair	Poor	Good	Soft seal structure assures a long-term seal against water flow.
Cost effectiveness	Poor	Fair	Good	45% improvement over general gate valves and 15% improvement over knife gate valves (in-house comparison)

Development/ Corporate efforts

Improved cost effectiveness, enhanced ease of maintenance, and extended product lifecycle

● We undertook the development of the valve in response to requests from power companies looking for corrosion-resistant valves for use on power station seawater lines. When commercializing this valve, we aimed to reduce the cost to be lower than the previous line of products and extend the product lifecycle. Applications of the valve have expanded from their original use in power stations to include other sites that use seawater such as seawater desalination plants, petrochemical plants, and ironworks. The valve has been well received.

Business deployment in the future

As specialists in fluid control, we contribute to society, today and tomorrow.

● Our main strength lies in the numerous types of valves we offer. Different valve types, shapes, and sizes should be selected according to the intended liquid or gas and to the purpose, such as the prevention of reverse flow or removal of foreign matter. Showa Valve offers many types of valves that you can depend on from design to manufacture. We provide ideal products to fulfill your various valve needs.

Company Profile

Company Name: Showa Valve Co., Ltd.
Address: 155-9 Koizumi-cho, Hikone-shi, Shiga
Representative: Satoshi Nakagawa
TEL: +81-749-22-4545

Established: 1968
Capital: ¥22,500,000
Employees: 70
Business: Manufacture and sale of industrial valves

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SEKISUI

● Ahead of the times, we provide state-of-the-art technology and services required for water infrastructure for the future.

SEKISUI CHEMICAL CO., LTD., Shiga Ritto Plant

Address: 75 Nojiri, Ritto, Shiga URL: http://www.sekisuichemical.com/

Products/Services

"SPR construction method" & "Omega-Liner construction method"

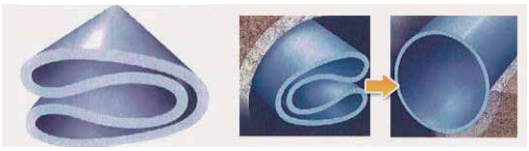
We have developed a new sewer plumbing system and its construction method for aging and deteriorated sewage, etc.

We have developed a new method to revive conduits of aging and deteriorated sewage pipes, etc., without digging the ground.
When you dig the ground under a trunk road to replace an aging and deteriorated sewage pipe with a new one, problems such as traffic diversion and temporary closure of the sewage system, etc. are likely to occur. Using the "SPR construction method," however, a new strong conduit of pipes can be constructed, without having to divert traffic or close sewage system, by filling a special backfill material in the space between the old pipe and a spiral shaped material made from vinyl chloride, which is fixed on the inner surface of the old pipe. This method can be applied to any cross-sectional shape (round, square, horseshoe, etc. with a diameter range of 250–6000 mm). It was presented the First Monozukuri Nippon Grand Award (Japan Manufacturing Grand Award) of the Minister of Economy, Trade and Industry's Awards and the 59th Okochi Memorial Prize by the Okochi Memorial Association.
Furthermore, based on the "Omega-Liner construction method," the rehabilitation of pipes with a smaller diameter of 150 mm through 450 mm can be realized in a safe, sure and speedy manner, by merely applying steam heating to the site to remold the cross-sectional shape of the pipe into a round shape.
Sewage heat is an untapped energy source. We have recently developed and launched on the market the Esloheat sewage heat recovery system. This advanced rehabilitation system repairs aging pipes and at the same time uses the heat from sewage to provide air conditioning in buildings, since the sewage temperature is stable throughout the year. The Esloheat system can also be used with sewer pipes that do not yet need rehabilitation.

Construction site where the SPR method is implemented

Omega-Liner R
(a type of independently used pipe)

Applicable to all types of shapes including round, horseshoe, square, etc.



A PVC pipe that memorizes and stores its shape

An omega (Ω)-shaped folded pipe

A round shape has been restored.

Development/ Corporate efforts

The Shiga Ritto Plant, as a main factory for manufacturing water infrastructures, etc., has a range of technologies related to research and development, production and construction.
By reading the needs of the times, spreading the seeds of potential technology is sure to realize business.

- The Shiga Ritto Plant, which opened in 1960, started production and supplied the market with PVC pipes used for water supply and sewage. In recent years, the plant has supplied the market with a variety of products such as PVC pipes that are strong, heat-resistant and chemical resistant, special PVC pipes with a three-layer structure, and corrosion-resistant reinforced plastic composite pipes that are strong and useful for drainage, etc.
- Since the establishment of the plant, a pioneer spirit has been handed down from generation to generation, and in combination with our accurate reading of market needs and patient promotion of technology development has put our efforts on the right track for a successful business. The SPR method of construction and the Omega-Liner construction method are also businesses born as a result of our efforts to quickly catch urgent market needs to prevent accidents such as subsidence, etc. caused by an aging and deteriorated sewage infrastructure. These rehabilitation methods born at the Shiga Ritto Plant now occupy the largest share of the domestic market. The SPR construction method alone has a large share of the domestic market of aging and deteriorated sewers with medium and large diameters.

Business deployment in the future

We aim to supply with the market comprehensive value-added products (value) related to lifelines including diagnostic research, design, construction and maintenance.

- We need to address the social problem of aging sewer pipes, as well as to meet product manufacturing challenges. In response to these issues, we have developed a business framework to propose comprehensive solutions encompassing areas from diagnosis, through design and construction, to maintenance. The Shiga Ritto Plant has a training center to showcase our extensive business lineup and the performance of our products to visitors in a dynamic manner. The training center accepts trainees from our affiliated construction companies. Many visitors and trainees come to the center from abroad as well as from within Japan.

Company Profile

Company name: SEKISUI CHEMICAL CO., LTD., Shiga Ritto Plant
Address: 75 Nojiri, Ritto, Shiga
Representative: President Katsumi Take
TEL: +81-77-553-0782

Established: 1960
Capital: ¥100,000,000,000 (SEKISUI CHEMICAL CO., LTD.)
Employees: 603
Business: Maintenance of infrastructure such as water supply and sewage systems.
Pipeline rehabilitation business.

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● Providing water treatment agents that meets customers' needs based on the techniques of polymer chemistry.

SENKA Corporation, Shiga-Konan Factory

Address: 7-2 Oike-cho, Konan, Shiga URL: http://www.senkajpn.com/eng/

Products/Services

The "SENKAFLOCK Z series," a wastewater decolorant,
which provides high performance decoloration upon dropping a small amount into wastewater.

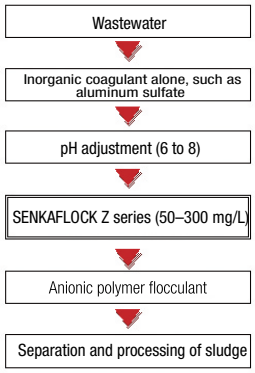
The "SENKAFLOCK Z series" are wastewater decolorants based on cation polymers. Insoluble substances are formed from the reaction of the colorants in the wastewater. The product demonstrates high efficiency in coagulation and decoloration.
It can be used with any type of colored water, and shows high performance decoloration with the use of only a small amount. It therefore generates less sludge than processes using inorganic coagulant alone such as aluminum sulfate. It can be used with wastewater treatment devices and operations.
SENKA has one of the leading market shares in wastewater decolorants with its "SENKAFLOCK Z series."

Test of SENKAFLOCK Z-150C

Colored wastewater

Aluminum sulfate	2000 mg/L	1000 mg/L	1000 mg/L
SENKAFLOCK Z-150C	nil	50 mg/L	100 mg/L

The flow of decoloration using the SENKAFLOCK Z series



The pH of the sample is adjusted after adding aluminum sulfate. The SENKAFLOCK Z series and the anionic polymer flocculant are added. Then the sludge is separated and processed.

Development/ Corporate efforts

The company entered the water treatment business with a synthetic technique for water-soluble cation polymers. Salespersons who have technical chemical knowledge respond to customers' requirements.

- Abundant knowledge and synthetic technologies regarding water-soluble cation polymers of high functionality have been cultivated in the field of dyeing agents for textiles since the company' s establishment. They are now used in various types of functional chemicals for paper manufacture processing, metal surface treatment and cosmetics. The water processing business started with the development of decolorants for the large amount of colored wastewater from the process of textile dyeing, while the "SENKAFLOCK Z series" came onto the market in 1992. Since then, the business has expanded, and flocculants for the treatments of sewage, night-soil and industrial wastewater, as well as decolorants and coagulants, are produced and sold.
- Most of the salespersons have a technical background and a knowledge of chemistry. This enables them to make prompt, detailed responses to customers' requests, and is a strength of the company. Furthermore, the customers' needs gleaned from sales activities can be used in the development of new products used for basic blocks and materials for exterior-use items, such as benches.

Business deployment in the future

Collaborations with research institutes including universities will strengthen research and development, and the development and sale of high-performance products will be promoted.

- The research and development of nitrogen removal agents that can remove nitrate nitrogen, nitrite nitrogen, and ammonia nitrogen from wastewater have been performed since 2007, with subsidies and other support from Shiga Prefecture. Industrialization will be promoted by evaluations and test manufacturing using the actual devices.
- The research and development base at the Shiga Konan Factory is to be enhanced. Further improvement of the product performance, development and sale of high-performance products in the water processing and other businesses are also aimed at.

Company Profile

Company name: SENKA Corporation, Shiga-Konan Factory
Address: 7-2 Oike-cho, Konan, Shiga 1-17-34 Hanatenhigashi, Tsurumi-ku, Osaka(Head Office)
Representative: Kenji Hayashi, President
TEL: +81-748-75-1155 / +81-6-6968-9101

Established: Incorporated 1950
Capital: ¥100,000,000
Employees: 100
Business: Development, production and sale of processing chemicals for textile processing, paper & pulp, bacterial prevention and fungal prevention, and water treatment.

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● Consult Tanahashi Electric Machinery for all your electrical solutions.

Tanahashi Electric Machinery Co., Ltd.

Address: 2-7-44 Gamo, Joto-ku, Osaka-shi, Osaka URL: http://tanahashidenki.co.jp/

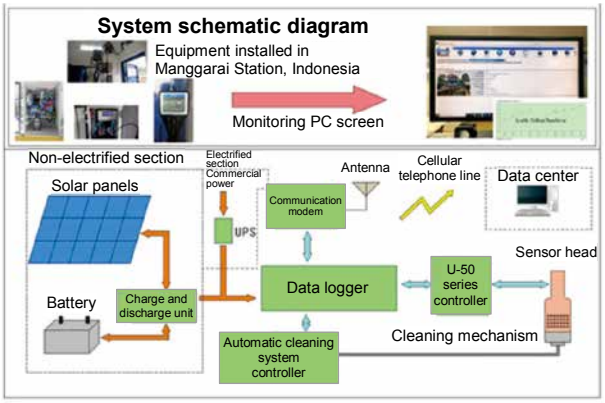
Products/Services

(Everything begins from data collection, which is the first stage of water improvement.)

Perform detailed analysis by remote data transfer of water quality measurements.

In Indonesia, there is a growing need for full-time monitoring of river and industrial drainage in order to fully understand the actual state of the rapidly deteriorating river water quality, and to strengthen the controls over and the guidance provided to pollution sources. However, after system operation starts or several days after a sensor is cleaned by hand, dirt becomes adhered to the sensor due to the high turbidity and it becomes impossible to measure accurately. In addition, the burden of securing the workers and bearing the labor costs for sensor cleaning is so high that it is difficult to proliferate the use of a full-time water quality monitoring system. Therefore, we developed a full-time water quality monitoring system which can work in various environments. This system is known as a "remote-controlled low-maintenance water quality monitoring system," which implements "data transfer functionality" in normal water quality measuring sensors and "automatic cleaning functionality" in the sensing parts. This system is also intended to be introduced in rivers in Indonesia and will be proposed to countries with the same problems in the Southeast Asian region through application of this technology.

- ✓ For the sensor, the U-50 series manufactured by HORIBA, Ltd. is adopted (measures 10 items).
- ✓ Possible to measure the primary water quality items designated in the Indonesia 2004 Environment Minister's Executive Order No. 51.
- ✓ With an automatic cleaning mechanism, field trials are underway to achieve maintenance-free operation for more than one month (as of October 2018).
- ✓ A mechanism to prevent dirt and an automatic cleaning mechanism on the sensing part.
- ✓ The cost of staff periodically cleaning the sensing part is reduced.
- ✓ The measuring part has a power consumption of 12 W, providing energy savings.
- ✓ Solar panels and batteries are used in non-electrified areas, sea areas etc.




Ciliwung River in Jakarta


Garbage accumulated in one day


Measuring tank


Controller


Cleaning controller


Data logger

Development/ Corporate efforts

Adaptable to highly viscous and very poor-quality water in Indonesian rivers (Jakarta and its surrounding areas).

- ● The river water quality is so poor that the sensor gets dirty in about one week and cannot measure the water quality successively.
- ● Trial tests are underway to achieve maintenance-free operation for one month by developing automatic leaning functionality in the sensing part.
- ● Data is sent to the host server using portable radio-wave message communication.

Business deployment in the future

Collect data to improve the water environments in Indonesia.

- ● Jakarta region: Collect water quality data from the Ciliwung-Cisadane river basin and other major rivers.
- ● Bandung region: Collect water quality data from the Citarum river basin.
- ● Note: The counterpart is the Ministry of Environment and Forestry of the Republic of Indonesia, Indonesian local governments, and those parts of the private sector involved in drainage.

Company Profile

Company Name: Tanahashi Electric Machinery Co., Ltd.
Address: 2-7-44 Gamo, Joto-ku, Osaka-shi, Osaka
Representative: Hideyuki Tanahashi, Representative Director and President
TEL: +81-6-6939-1621

Established: 1970
Capital: ¥15,000,000
Employees: 28
Business: Construction and manufacturing (e.g. electrical work and design and fabrication of control boards)

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● We have developed a total service of water treatment ranging from consultation, design, and manufacture to marketing and maintenance.

Tohzai Chemical Industry Co., LTD., Shiga Factory

Address: 1000-66 Okamoto-cho, Kusatsu, Shiga 18F MID Tower, Twin 21, 2-1-61 Shiromi, Chuo-ku, Osaka (Head Office) URL: http://www.tohzai.co.jp/ (Japanese web site)

Products/Services

"Biobreak" series of multiple cooling water treatment chemicals.

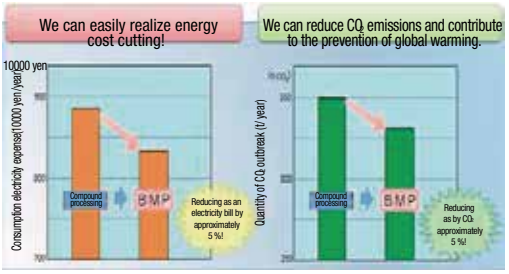
We have succeeded in reducing the amount of CO2 used in treating water for air-conditioners to enhance the efficiency of freezers by controlling microbes.

We have developed multiple cooling water treatment chemicals of two types, one of which brings excellent action against rust and scales when reacting with a small amount of a hypochlorous acid-based compound, and the other bringing a powerful bactericidal action when reacting with a zinc chlorate complex.

By adding "Biobreak", hypobromous acid is produced, generating a strong oxidizing power in the cooling water system of air conditioning equipment, thus maintaining bactericidal action in the system environment. As a result, since the environmental load is minimal due to the low amount of internal corrosion generated in the freezer in air conditioning equipment, a significant amount of energy saving and CO_2 reduction is realized, and the efficiency of the freezer is also greatly enhanced.

"Biobreak" is a product series developed based on the company's business concept described as follows: "There are a number of water treatment methods we should develop according to the purpose of use, analogous to the saying 'the right man in the right place,' and there should be a suitable and satisfactory water treatment method for water of any type." The mechanism of generating hypobromous acid has been patented at home and abroad.

Biobreak is used for cooling towers, etc. (right-hand photo).



Empirical comparisons of Biobreak and its combined treatment. Biobreak is expected to contribute to the saving of electricity costs and the reduction of CO_2 emissions.

Development/ Corporate efforts

Total and tailor-made development of any type of water treatment system is possible in compliance with the needs of customers. We have also developed a new system targeting drainage in cooperation with other companies.

● At the Kusatsu Factory, we have a sales office and research and development and design departments. The main business line is the production and sale of water treatment chemicals, and the design, manufacture and sale of plants using well water and equipment for rainwater treatment. In the water treatment field, a main line of business is water purification treatment systems for water for air conditioning equipment, swimming pools, public baths and well water, and the production of water for hospitals and various types of water used in manufacturing factories. Among these, the "Sawa Filter" series—a type of rainwater filtration equipment—is the company's representative water retreatment equipment manufactured at the factory, consisting of a compact and simplified filtration tower, a pump and a control panel.

● Equipment manufactured at the plant is tailor-made, complying with the needs of the customers, and is the result of various steps ranging from basic research through commercialization, the design and manufacture of sample models, lab tests, data collection regarding model plants and field tests, etc., up to the final checking of treatment effects. Also, total correspondence with the development of a water treatment system is possible, including such activities as consultation, customer service, and the implementation of research and development infrastructure. These rehabilitation methods developed at Shiga Ritto Plant now occupy the largest share of the domestic market. The SPR construction method alone has a major share of the domestic market of aging and deteriorated sewers with medium and large diameters.

Business deployment in the future

Through our technological development, we will make utmost efforts toward the commercialization of water treatment chemicals and water treatment equipment, which should provide a more optimal water environment for communities.

● We also promote the sales of water treatment chemicals that contribute to the reduction of CO2 emissions by maintaining the running efficiency of air conditioning equipment and water treatment equipment for various types of water that are still under development, which are also expected to bring water- and energy-saving.

Company Profile

Company name: Tohzai Chemical Industry Co., LTD., Shiga Factory
Address: 1000-66 Okamoto-cho, Kusatsu, Shiga 18F MID Tower, Twin 21, 2-1-61 Shiromi, Chuo-ku, Osaka (Head Office)
Representative: Shinichirou Kohno, President
TEL: +81-77-516-1600 / +81-6-6947-5511 (Head Office)
Established: Established 1957/Incorporated 1964
Capital: ¥100,000,000 (Group ¥250,000,000)
Employees: 195 (Group 248)
Business: Development, production and sale of water

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"TORAY"
Innovation by Chemistry

● Global leader in sustainable water treatment technology through a comprehensive global network of R&D, production and sales

Toray Industries, Inc., Shiga Plant

Address: 1-1, Sonoyama 1-chome, Otsu, Shiga URL: http:// www.toraywater.com/

Products/Services

High-performance water treatment membranes which have contributed to solving water problems worldwide for half a century through research and development.
RO membrane element "ROMEMBRA®", ultrafiltration membrane element "TORAYFIL®", Membrane Bioreactor (MBR)-specific membrane element "MEMBRAY®"

High-performance water treatment membranes are the core technology which achieve these water treatments: seawater desalination, which is extraction of fresh water from sea water for drinking water use; water purification treatment, which is removal of turbidity and fungi from river/lake water for drinking water use; and wastewater reuse, which is treatment of wastewater to change it to usable water. The core technology that enables such water treatment is high-performance water treatment membranes.
Toray possesses all kinds of their own water treatment membranes through in-house development and is one of the leading manufacturers of water treatment membranes.

RO membrane element "ROMEMBRA®"

Ultrafiltration (UF) membrane module "TORAYFIL®"

MBR-specific membrane element "MEMBRAY®"

Development/ Corporate efforts

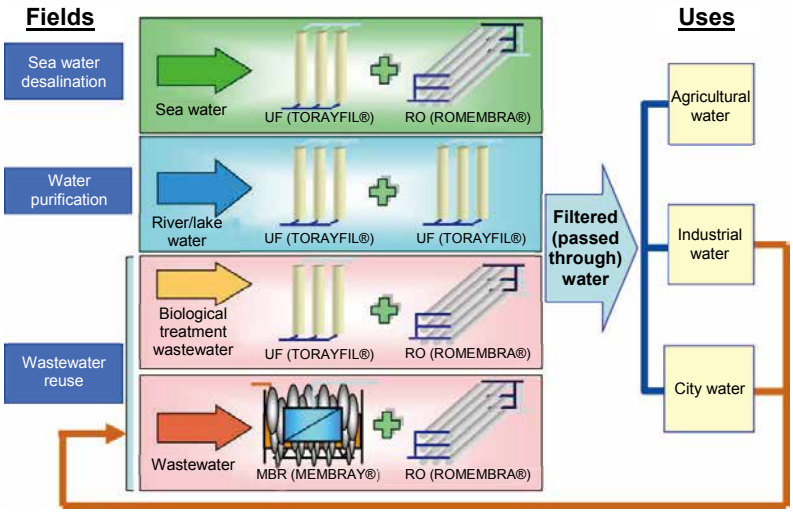
Develop all kinds of membranes through the knowledge of high polymer chemistry nurtured in the fiber field.

"Materials have the power to change society." We started research and development about 50 years ago and have expanded our product lineups: reverse osmosis membranes, ultrafiltration membranes, and MBR-specific precision filtration membranes. The volume of water treatment membranes shipped has grown to become the equivalent to the daily life water for 400 million people.

Business deployment in the future

Expand water resources through global business operations.

Adapting to the water situation which varies from one region to another, we will build a foothold in North America, Europe, the Middle East, China, and Asia to provide the most suitable products and technology for water treatment membranes—for the water planet "Earth" and for the "people on earth." For details on water treatment membranes, please visit www.toraywater.com.



Company Profile

Company name: Toray Industries, Inc., Shiga Plant
Address: 1-1, Sonoyama 1-chome, Otsu, Shiga Nihonbashi Mitsui Tower, 1-1, Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo (Head Office)
Representative: Akihiro Nikkaku, CEO & COO
TEL: +81-77-533-8020 / +81-3-3245-4111 (Head Office)

Established: 1926
Capital: ¥147,900,000,000
Employees: 45,762 (consolidated, as of 2018/3)
Business: Production & sale of fibers, plastic & chemicals, IT-related products, carbon fiber composite materials, environment & engineering products, life science products.

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Nitto
Innovation for Customers

● Contribute to solving global environmental/energy/water problems and improving living environments through separation technology

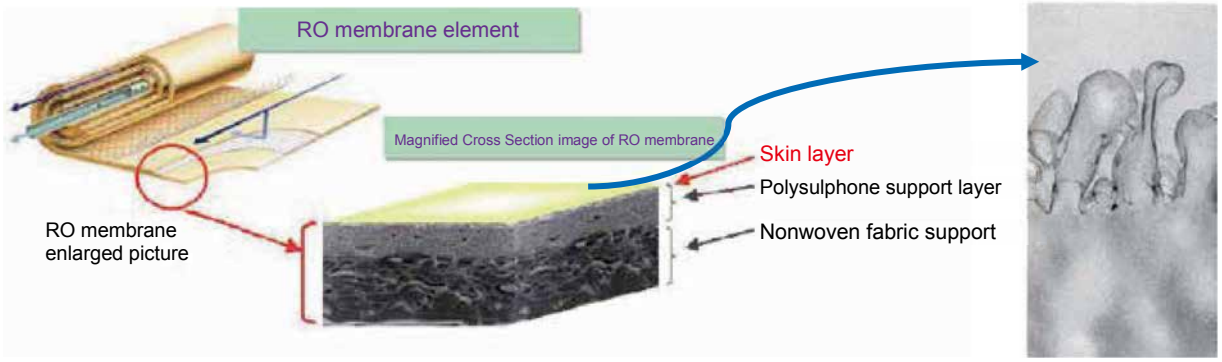
NITTO DENKO CORPORATION, Shiga Plant

Address: 61-7 Sasadani, Yamadera-cho, Kusatsu, Shiga URL: http://www.nitto.com/jp/en/

Products/Services

Spiral RO membrane element
with high NaCl rejection, high flow and energy saving

Nitto Denko has spiral RO membrane elements suitable for applications such as seawater desalination, primary desalination of ultrapure watersystems, and desalination of brackish water.
The skin layer, the polysulfone support layer and the nonwoven fabric layer form the trilaminar structure of the RO membrane. The pleated structure of the skin layer increases its surface area and improves the efficacy of the high rejection rate of salt concentration and specified substances, while the high permeability contributes to the reduction of operational costs.
It has been employed by overseas seawater desalination plants in Spain, Algeria, China, India, the United States, Cyprus, Chile, Saudi Arabia, the UAE, Oman, Australia, and other countries. The company is one of the dominant companies in the market for RO membranes.



Ultra low-pressure spiral RO membrane; structure of the RO membrane

There is a patented technology to provide high permeability, producing a two-dimensional dense layer in the height direction.

Development/ Corporate efforts

The R&D and production divisions of membranes are located at the Shiga Plant to bestmeet global water demand. The business operation is developed by the company's global network.

● The membrane division started as an important pillar of the company's future 40 years ago. The Shiga Plant was completed as a membrane-specialization plant in 1986. In Japan, only the Shiga Plant conducts the research and development of skin layers, the most important part of a RO membrane, and of the membrane products themselves. In May 2009, the third factory, the production site of the latest RO membrane elements, was completed at the Shiga Plant to strengthen the R&D and production of RO membranes to meet global water demand.

● Within the membrane division, there are three production bases—Shiga, Hydranautics (a wholly owned subsidiary of Nitto Denko Corporation in California, U.S.), and Shanghai—and sales and technical service bases located in more than 20 places. The headquarters of the business are located in the United States, and the business operation is developed by a global network under quick decision making. In addition, close cooperation between Hydranautics in the U.S. (specializing in membrane R&D), and the R&D center in Singapore (developing membrane applications) have achieved synergy effects.

Business deployment in the future

We have shifted our business to the development of new markets and the new usage of our products.

● In order to meet the needs of global markets and customers, we are making efforts to explore new markets in addition to our established markets of pure water production and seawater desalination. With the slogan "Innovation for Customers," we are now developing our business in fields from water treatment to membrane separation.

Company Profile

Company name: NITTO DENKO CORPORATION
Address: 4-20 Ofuka-cho, Kita-ku, Osaka-shi
Representative: Board Member and President Hideo Takasaki
TEL: +81-6-7632-2101 (Head Office)

Established: October 25, 1918
Capital: ¥26,700,000,000
Employees: 29,704 (consolidated), 6,030 (non-consolidated)
Business: Manufacturing of packaging materials, semiconductor-related materials, optical films etc.

22

PGC

● Development of filter media for water purification with high added value and good cost performance

Pacific Giken Company, Ltd.

Address: 1772-8 Yasu, Yasu-shi, Shiga URL: http://www.pgc-ltd.co.jp/ (Japanese website)

Products/Services

"Bioflex"

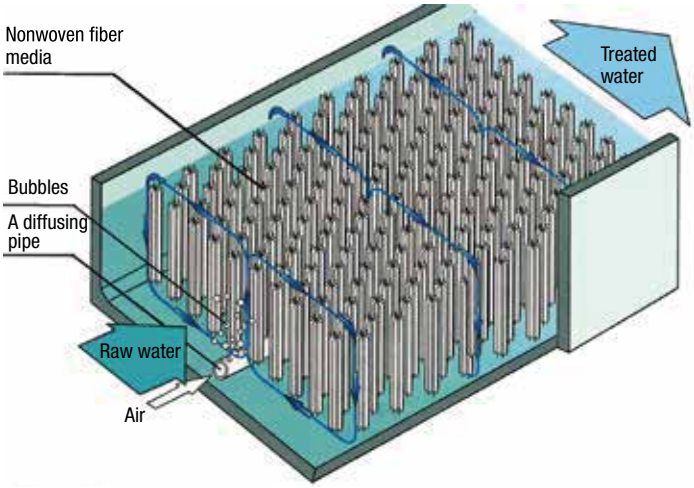
A filter medium for water purification made of nonwoven fabrics featuring good cost performance

Bioflex is a filter medium for water purification made of nonwoven fabrics in the shape of a flower with eight petals. The surface is coated with specific cationic polymers to allow microorganisms to propagate on it to purify water effectively. This method is very environmentally friendly.

The accurate design of the huge surface area, porosity and pore diameter allow the filter medium to effectively catch floating contaminants in water in a short time without disturbing the water current. Moreover, due to its tensile strength and chemical resistance, it has a long operating life and high cost performance.

Bioflex was first used to purify river water about 15 years ago. It has recently been introduced into sewage treatment systems and has earned a favorable reputation.

Our product lines designed for various purposes—
flower-, board- and ball-shaped



Structure of a contact aeration tank

Development/ Corporate efforts

We manufacture nonwoven products with high added value by combining our processing technologies.
We have developed high-energy-saving sewage treatment systems with the collaboration of plant makers.

● In 1985, Pacific Giken Co., Ltd. became independent of the processing department of Japan Vilene Co., Ltd., the top manufacturer of nonwoven fabrics in Japan, and specialized in the processing of nonwoven fabrics. We have been manufacturing a wide range of nonwoven products, such as for medical, electrical, automotive, air conditioning and clothing purposes, by combining various techniques to add special value to them.

● We have collaborated with plant makers and universities to develop sewage treatment systems, the effectiveness of which was proven in various operating tests. These systems were used for aerobic treatment, anaerobic treatment and advanced treatment.

Business deployment in the future

We develop water treatment systems with high cost performance to meet market needs with the collaboration of plant makers.

● Our filter media have been used in various situations from research and measurement to sewage systems. We continuously develop filter media made of nonwoven fiber for the conservation of the water environment.

● In addition to water treatment systems with high cost performance, we aim to collaborate with plant makers to develop largescale treatment for accumulated sludge in the lower basins of rivers.

Company Profile

Company name: Pacific Giken Company, Ltd.
Address: 1772-8 Yasu, Yasu-shi, Shiga
Representative: Masahiro Nakajima, President
TEL: +81-77-586-2977

Established: 1985
Capital: ¥80,000,000
Employees: 120
Business: Development and manufacture of nonwoven fabric products. Manufacture of medical apparatuses.

23

阪神動力機械
HANSHIN ENGINEERING

● Aquarator designed to conserve the water environment worldwide

Hanshin Engineering Co., Ltd.

Address: 2-26-7 Shikanjima, Konohana-ku, Osaka-shi, Osaka URL: http://www.hanshin-pm.co.jp/

Products/Services

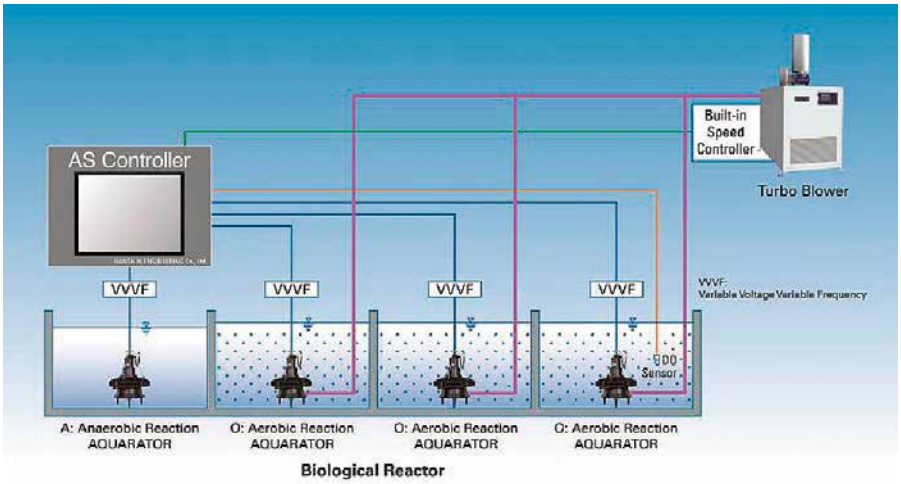
High efficiency and long service life

Submersible mechanical aerator-agitator Aquarator/Sludge collector drive system

【Aquarator】

- Installable in existing or newly constructed aeration tanks at wastewater treatment facilities (e.g. activated sludge process) (Motor power: 1.5–30 kW)
- Flexibly switchable between anaerobic and aerobic agitation
- Superb agitation performance, high oxygen transfer efficiency, and ease of installation and removal

Solutions
Stable quality of treated water
Energy saving



Development/ Corporate efforts

High oxygen transfer performance for improved energy efficiency

● Previous models of air diffuser had problems such as sludge sedimentation due to insufficient agitation power and power consumption due to insufficient aeration capacity.
●The submersible mechanical system enhances aeration and agitation performance and stabilizes the water treatment system.
●Improved oxygen transfer performance has helped achieve high energy efficiency.

Business deployment in the future

Aeration and agitation to improve the water environment worldwide

● Strengthen our equipment service and maintenance business in Japan.
● Work on the development and sales of new products in overseas markets.
● Expand business specifically in fast-growing ASEAN countries.

Company Profile

Company Name: Hanshin Engineering Co., Ltd.
Address: 2-26-7 Shikanjima, Konohana-ku, Osaka-shi, Osaka, 554-0014 Japan
Representative: Hiroyuki Izui
TEL: +81-6-6461-6551

Established: 1950
Capital: ¥72,600,000
Employees: 100
Business: Gear reducers, devices for river water management, water treatment devices, and industrial devices

24

HORIBA Advanced Techno

● Experts in water and liquid measurement, “Beyond Water with You”

HORIBA Advanced Techno, Co., Ltd.

Address: 31 Miyanonishi-cho, Kisshoin, Minami-ku, Kyoto, Japan
URL: https://www.horiba.com/horiba-advanced-techno/home/

Products/Services

A broad range of water quality measuring instruments from the laboratory to the field
pH, ORP, DO, turbidity, electrical conductivity, various ions,
COD, nitrogen, phosphorus

HORIBA Advanced Techno, Co., Ltd. is a group company of HORIBA, Ltd., a manufacturer specializing in analyzers, and a company expert in sensing technology in the fields of water environmental measurement and semiconductor manufacturing. By making relevant products available in areas such as water treatment, semiconductors, global environment, agriculture, forestry, fisheries, and food, we are helping water supply and sewerage lifelines to support people’ s daily lives and all aspects of industrial activities while playing our part in global environment conservation.
Supporting all use environments, our pH/ORP meters, various ion concentration meters, dissolved oxygen analyzers, ammonia nitrogen analyzers, UV meters, COD analyzers, total nitrogen/phosphorus analyzers, residual chlorine analyzers, sludge density meters, turbidity/SS meters, and various automatic cleaning devices are all top class nationally in both quality and quantity.
We demand usability and durability as well as more advanced sensing technology, and are trying to become the de facto standard for water measurement while serving as an ecological leader in creating comfortable environments.

Development/ Corporate efforts

From HORIBA group companies, we started as a group of experts in water and liquid measurement.

- From HORIBA group companies, a group of experts in water/liquid-related research and development, design, sales and manufacturing got together at HORIBA Advanced Techno and started as HORIBA Water Experts.
- By brushing up the various “invisible assets” owned by the HORIBA group companies, we will not only create economic value but also contribute to success in the areas that HORIBA is focused on, under the framework of the SDGs (Sustainable Development Goals) proposed by the United Nations.

Business deployment in the future

- We will expand globally as an expert group who tries to measure all types of liquids such as water supply and sewerage, ultrapure water for use in the semiconductor and electronics fields, and production water for food and pharmaceutical production and bio-processes.
- With our analysis and measurement technology, we support “water infrastructures” and the “security and safety of society,” from familiar living environments and industrial development through to the global environment.
- Taking advantage of the sales network of the HORIBA overseas group companies, we aim to expand our business globally.

Company Profile

Company name: HORIBA Advanced Techno, Co., Ltd.
Address: 31 Miyanonishi-cho, Kisshoin, Minami-ku, Kyoto
Representative: Dan Horiba
TEL: +81-75-321-7184

Established: March 28, 1975
Capital: ¥250,000,000
Employees: 307 (as of January 1, 2018)
Business: Manufacturing, sales, services of water/liquid measuring instruments

25

● Steady business expansion in China with thermal spray technology as the core technology

Osaka Welding Industrial Co., Ltd.

Address: 1426-10 Ukawa, Minakuchi-cho, Koga, Shiga URL: http://www.osakawel.co.jp/ (Japanese website)

Various components coated by thermal spray technology

A robot is thermal-spraying the cemented carbide on the surfaces of rolls.

Products/Services

● Since the establishment of the company in 1962, we have been developing our business mainly with thermal spray technology to coat the surface of an industrial component with an alloy, metal, ceramic, or mixture thereof. We also manufacture various kinds of components for industrial machines according to the requests of our clients. As for the water environmental business, we coat the axis of the centrifugal separator of a pump or a valve and the components of a drying machine in a sewage plant.

● Thermal spray technology can give additional features to the component, such as wear resistance, high temperature resistance or corrosion resistance, as necessary. As coated components are more durable, the running costs including the purchase fee of the new component and the maintenance fee can be reduced. This technology is commonly used for components of machines operated under severe conditions. Moreover, we developed the machining technique because many coating materials are difficult to machine. Accordingly, we conduct the total process from the manufacture of a material to the finishing touches in our factory. Therefore, we can quickly provide components to clients at reasonable prices. We built a factory in Shanghai in 2001 and started our business in China. Later we enlarged the Shanghai factory and built a factory in Shandong. In 2013, we established Dongying Izushi International Trading Co., Ltd., a joint corporation with a machine trading company whose headquarters are located in Kyoto, Japan.

Business deployment in the future

● Aiming at further expansion in China, Dongying Izushi International Trading Co., Ltd. is engaged in active sales promotion. We are planning to start our own brand and to set up a maintenance department. If required, we will support entities that want to start business in China by advising and consulting them based on our experience and knowhow.

Company Profile

Company name: Osaka Welding Industrial Co., Ltd.
Address: 1426-10 Ukawa, Minakuchi-cho, Koga, Shiga 2-20-11 Ai, Ibaragi, Osaka (headquarters)
Representative: Tetsuo Uotani, President
TEL: +81-748-62-3771/ +81-726-43-1323 (headquarters)

Established: 1962
Capital: ¥30,000,000
Employees: 60
Business: Manufacture and sale of durable machine components coated by thermal spray technology

26

● Development and sale of various types of water purifiers using “backwashing technology”

BASIC CO., LTD.

Address: 35-13 Oe, Otsu, Shiga URL: http://www.basiccoltd.jp/ (Japanese website)

“Food Washer,” a domestic tap water filter

“Mobile Oasis,” a bicycle with a water purification system

Products/Services

● We started our business with the development and sale of domestic tap water filters. Since then, we have been developing pot-type water filters, standing water dispensers, shower heads with water filters, and a bicycle and a motorbike with a water purification system.

● Our patented method is as follows: by providing the water outlet of the filter at 180 degrees to the tap water inlet by integrating the water outlet and the body of the filter, the inside of the filter can be cleaned easily and frequently with tap water by turning the body of the filter 180 degrees. The backwashing technology applied to most of our products enables the high filtration and durability of our filters.

● When the Great Hanshin and Awaji Earthquake struck, a shortage of water was reported. That inspired us to invent a bicycle with a water purification system that produces drinking water from the water in pools or ponds. We also recently developed a motorbike with a water purification system for desalinating seawater.

● In our laboratory on the Seta Campus, Ryukoku University, we have been researching water purification and inspecting the effects of our water purifier. We have also been developing emergency water producers to support drinking water supply during disasters such as earthquakes.

Business deployment in the future

● Based on our company’s philosophy, “All the basics of life are in water,” we contribute to building a society where all people on earth can drink safe water, by developing water purifiers with low running costs for developing countries.

Company Profile

Company name: BASIC CO., LTD
Address: 35-13 Oe, Otsu, Shiga
Representative: Tsutomu Sasaki, President
TEL: +81-77-544-0875

Established: 1977
Capital: ¥30,000,000
Employees: 5
Business: Research, development, manufacture and sale of domestic water filters and water purification systems. Manufacture and sale of “Mobile Oasis,” a bicycle with a water purification system.

27

● Creating an earth-friendly environment with the power of chemistry

Dia Aqua Solutions Co., Inc.

Address: Keihanshin Yodoyabashi Bldg. 8F, 4-4-7 Imahashi, Chuo-ku, Osaka-shi, Osaka
URL: http://www.dia-aqua.co.jp/ (Japanese website)

Products/Services

- The water treatment agent Contolime series reduces the various problems occurring in cooling water, such as corrosion, scaling, slime and legionella spp., and allows for stable operation of facilities, significantly contributing to water savings, energy savings and CO2 reductions.
- As for environmental agents, the most suitable formula is proposed according to each purpose such as improving the living and work environment (disinfection, deodorization) or reducing environmental load (preventing oil pollution, treating wastewater).
- We are making efforts toward achieving the SDGs (Sustainable Development Goals) and think that using our products (water treatment agents, environmental agents) will help our customers' efforts to achieve their SDGs.

Business deployment in the future

Package Fresh project
[Prevents mold growth in air conditioning units to create a hygienic environment]

- The interior of an air conditioning unit such as an air conditioner forms condensation when the air conditioning is in operation and takes in mold and dust floating in the air, becoming a hotbed for mold and microorganisms. Any mold which grows then spreads spores through the interior space due to the air blowing and has become a main cause of ill health and unpleasant odors.
  In Japan, there is also a risk of the growth of molds which affect the human body and used to live only in the tropics (e.g., aspergillus flavus, which produces aflatoxin B1, a known cause of liver cancer) due to changes in the climate associated with global warming, meaning in future, it will become increasingly important to disinfect the interior of air conditioning units.
  Package Fresh is a disinfectant that kills the mold inside air conditioning units; the more continuously it is used, the longer the antimicrobial activity lasts.

Osaka Top Runner Project

"Package Fresh" was recognized by Osaka City as one of the 2018 Osaka Top Runner Projects.

Package Fresh H-20

Package Fresh sheets

Company Profile

Company name: Dia Aqua Solutions Co., Inc
Address: Keihanshin Yodoyabashi Bldg. 8F, 4-4-7 Imahashi, Chuo-ku, Osaka
Representative: President Seiji Yamada
TEL: +81-6-6229-5600

Established: 1984
Capital: ¥35,000,000
Employees: 26
Business: Manufacturing and sales of water treatment agents for air-conditioning and industrial circulating water

28

● Works to conserve clean water and beautiful nature for future generations.

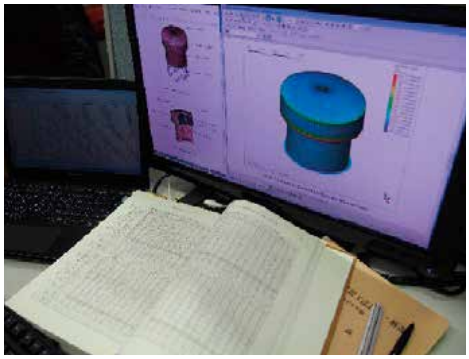
F Water Management Co., Ltd.

Address: 1-6-11 Chuo, Otsu-shi, Shiga URL: http://www.fwater-mgt.co.jp/

Products/Services

Future-oriented earth-friendly maintenance of the water environment

Comprehensive consulting service for the water environment



We have a wealth of more than 50 years of experience in consulting on waterworks and sewerage design.
Focusing on the designing of waterworks and sewerage as a general water environment consultant, we work on water-related provision and maintenance projects, ranging from water quality analysis to construction, construction supervision, and maintenance and management.
Water is alive and is circulating. If carried out locally, water environment maintenance is not sufficient for the Earth to remain clean. To build locally suitable facilities and manage them continuously, it is necessary to engage in water environment maintenance from a comprehensive perspective, considering factors such as potable water and water returned to nature. We will make the optimal use of our engineering experience and expertise to continue to maintain the water environment.
F Water Management is committed to passing on a clean water environment—essential for people to live—to future generations, believing in and constantly embracing a creative and harmonious mind.

① Planning: Develop a master plan for discussions with local people and understanding their culture.
② Design: Cover a broad range of civil work and construction designs from waterworks to sewerage.
③ Construction/Supervision: Adhere to the design concept when constructing facilities even under varying site conditions.
④ Survey/Analysis: Conduct land, soil, waterhead, and water quality surveys and various analyses accurately.
⑤ Novel challenges: Address novel challenges such as facility improvement, earth-quake-resistance, and renewable energy.
⑥ Maintenance and management: Maintain and manage waterworks and sewerage from our wide perspective on waterworks and sewerage projects.

Development/ Corporate efforts

We offer comprehensive consulting services covering design, construction, and management.

- We provide services such as setting out a vision for your waterworks and asset management based on our experience.
- We work to understand what the owner really wants, and construct or supervise the construction of waterworks and sewerage facilities that accurately incorporate the design concept.
- We are willing to offer environmentally conscious designs for micro hydropower and solar power generation.

Business deployment in the future

Work to make water clean on a global scale, while embracing the Japanese spirit of respect for water.

- We will focus on formulating project plans, improving facilities, and making facilities earthquake-resistant, while considering lifecycle costs.
- We will actively work on challenges in new areas such as the consolidation and decommissioning of waterworks and sewerage facilities and advisory business.
- We are expanding our consulting business overseas in developing countries to contribute to creating job opportunities that guarantee gender equality as well as giving support for the development of the water infrastructure.

Company Profile

Company Name: F Water Management Co., Ltd.
Address: 1-6-11 Chuo, Otsu-shi, Shiga
Representative: Nobuyasu Okamoto, President
TEL: +81-77-524-1411
Established: 1959
Capital: ¥52,700,000
Employees: 70
Business: Construction consultancy (waterworks, sewerage systems, rivers, agricultural civil projects, steel structures, and electrical/electronic projects), supervision of construction for waterworks and sewerage facilities, soil surveys, maintenance and management, and water quality analysis

29

● Offers rich domestic and international experience plus a network of contacts to enable you to pursue global business expansion

Specified Nonprofit Corporation Carbon Sink.

Address: 3-1-6-803 Oujigaoka, Otsu, Shiga URL: http://www.carbonsink.jp

Activities

- Institution Building: We investigate, research, and commercialize low-carbon technology, in collaboration with the people, enterprises and local governments of the host country/region, under the theme of compatibility between the environment and the economy. In Shiga Prefecture, we undertook the Household Energy Service Company (ESCO) project (Ministry of the Environment) and institutionalized the certification of CO_2 absorption by forests and CO_2 fixation of wooden goods (kikito).
- Networking: Our staff members have a range of backgrounds with specialized knowledge and business experience, including university professors, consultants, and environmental NGOs. Accordingly, we are good at helping private enterprises expand their businesses overseas.
- We will also support stakeholders dialogues in companies and administrative activities, and support SDG 's promotion by companies.

①Joint research with universities in Tainan City in Taiwan

②Dialogue with Tainan City Government

③Business matching for water environmental sectors

④Training for Hsinchu City Environmental Protection Organization

Development/Corporate efforts

- To bring about innovation from superb elementary technology, it is essential to know the local needs and social challenges, to improve engineering in a flexible manner, and to develop a scheme for widespread use. We have demonstrated our strengths in these various aspects.
  - Indonesia (finding local needs for water environment technology and exploring project promotion measures)
  - Taiwan (assistance to commercialize water environment technology, opening a base in Tainan, and conducting needs surveys)

Business deployment in the future

- We have overseas experience and capacity for solving social challenges to provide all kinds of assistance needed for the creation of sustainable lowcarbon business. Our assistance includes planning and personnel development in Asia, support for small and medium-sized Japanese companies to expand their business overseas, and building inter-governmental networks in Japan and abroad.

Organization Profile

Company name: Specified Nonprofit Corporation Carbon Sink.
Address: 3-1-6-803 Oujigaoka, Otsu, Shiga
Representative: Emiko Nakano, Director
TEL: +81-77-516-8930

Established: 2008
Capital: -
Employees: 14
Business: Investigation, research, proposals, planning, education, international negotiations and policy making

30

● Total Service Company for Water Treatment Facilities.

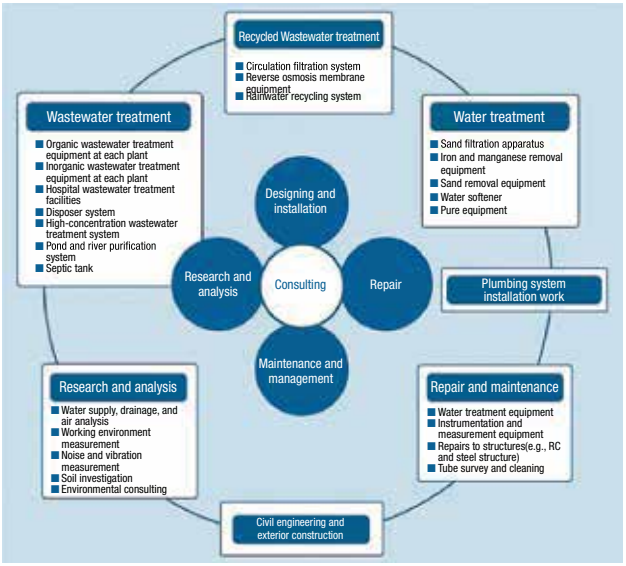
Kankyo Souken Co., Ltd.

Address: 9-3-26 Ogaki, Ritto, Shiga URL: http://www.kankyosouken.co.jp/ (Japanese website)

Products/Services

We provide a total service of water treatment, such as the design and installation of water treatment facilities, the analysis of water quality, the maintenance of facilities, and water-related consultation.

Kankyo Souken Co, Ltd. responds to all water treatment needs, which change with the times, and acts accordingly at low cost using energy-saving measures. The company offers a total solution of water treatment services covering water and soil research and analysis as well as the design, installation, maintenance and management of water treatment facilities along with their repair. The company provides support to enable customers to use water treatment facilities without any concerns.
We handle a variety of water treatment facilities including wastewater treatment, intermediate water treatment, and drinking water treatment facilities.



Scope of business operations

Consultation on wastewater treatment site

Sewer abatement facility: The example of the total service for design, installation and maintenance of high-concentration oil-containing waste water treatment facilities.

Development/ Corporate efforts

Water treatment experts provide total services in response to customer needs.
We have knowledge about all kinds of water treatment and provide strong support with solutions to problems.

- The company was founded in 2009. It has experts with engineering skills and knowledge including former Shiga prefectural officials who were engaged in research of the water environment, and is headed by President Furuya, who has been designing wastewater treatment facilities for over 30 years. Each expert selects problems from an on-site viewpoint, grasps customers' needs for water treatment, practices precise and comprehensive consultation, and provides total services. Furthermore, we conduct our own water quality investigation in the southern area of Lake Biwa and distribute the results of the investigation to relevant organizations in the prefecture, thus working to grasp the local water environment comprehensively and continuously.
- We attach importance to having a long-term communicable relationship with our customers. For example, in the case of plant effluent, our experts grasp the production contents of the plant, the raw materials handled, and the situations of the workers' operation management, in addition to the components of the drainage and operating conditions of the plant, thus identifying problems in wastewater treatment. Furthermore, the company has an established system that responds quickly and attentively in the case of emergencies.

Business deployment in the future

Enhancing the possibility of the development and realization of state-of-the-art technology backed by the accumulation of verification test data.

- We take advantage of our technology of water quality analysis along with a number of verification tests in actual fields, thus accumulating rich data and enhancing the possibility of the development and realization of new technology. Furthermore, in cooperation with leading manufacturers, we provide a wide range of technical support covering a wide range of industrial drainage. The company participates in the Biwako Environmental Business Exhibition every year, and continues to introduce state-of-the-art technologies.
- We have been working on the development of young human resources in order to hand down the techniques and know-how of the company's experienced staff members. In addition, we employ Ritsumeikan University students as part-time workers on a long-term basis for person-to-person exchange to provide technical guidance.

Company Profile

Company name: Kankyo Souken Co., Ltd.
Address: 9-3-26 Ogaki, Ritto, Shiga
Representative: Kenichi Furutani, President
TEL: +81-77-553-0099

Established: 2009
Capital: ¥3,000,000
Employees: 15
Business: Consulting, planning, design construction, maintenance of various water processing facilities

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● General engineering company for environmental and civil projects, and construction (Kansai Electric Power Group)
Deploys our proprietary technologies to build affluent local communities and conserve the in-valuable environment of the earth.

Shiga Branch, KANSO Co., Ltd.

Address: 19-22 Karahashi-cho, Otsu-shi, Shiga URL: http://www.kanso.co.jp/index.html

Products/Services

KANSO, a member of the Kansai Electric Power Group, is a general environmental engineering company, which offers integrated services across the environmental, civil engineering, and construction sectors. Collaboration and synergy between these areas enables us to provide high quality and value-added services in a consistent manner spanning surveys, diagnosis, and analysis consultation as well as design, construction, and maintenance.

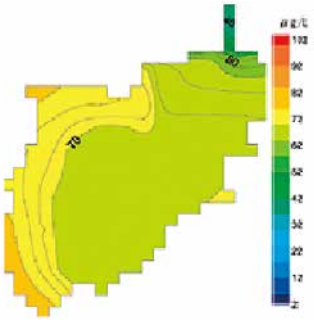
As a general environmental consultant, the environment division of KANSO can draw on its years of experience, specialized knowledge, and technical expertise to respond promptly to all kinds of environmental needs, including assessments and surveys.

■ Survey of rivers and lakes

Population surveys in river waterfront areas, river morphology surveys, river water quality surveys, turbid water surveys, impact monitoring during construction work, environmental surveys of fishing sites for sweetfish, etc., eutrophication surveys of natural/artificial lakes, investigation of the causes of blue-green algae, measures to control fish of foreign origin, and environmental education

■ Water quality forecasting using ecosystem models

When looking at the water quality of marine areas and lakes, in addition to water transfer processes such as currents, it is important to consider changes in pollutant concentrations caused by phytoplankton photosynthesis and other biochemical processes.
For this reason, an ecosystem model incorporating water transfer and biochemical processes is used to forecast future water quality.



Phytoplankton forecasts for lakes

Operation on the survey boat

Development/ Corporate efforts (environmental division)

Since its foundation in 1974, KANSO has had many achievements centering on its core business of environmental assessment. We are skilled in helping to promote projects accepted by local communities, owing to the social trust we have built based on our years of experience and technical prowess.

- Our specialized engineers respond promptly to a range of environmental survey and assessment needs.
  - ▶ Environmental assessment achievements: power stations and other large plants, overall development, and urban renewal
- We have years of experience in high-accuracy analysis techniques to fulfill various needs.
  - ▶ All kinds of chemical analyses ranging from general analyses to high-accuracy microanalysis of dioxin and other substances
- We take part in national marine and deep-sea projects to investigate and counter global environmental problems.
  - ▶ Environmental surveys for sub-seabed CO2 storage planned by the Ministry of the Environment and marine resource development projects (e.g. rare metals and methane hydrate) organized by the Ministry of Economy, Trade and Industry

Business deployment in the future (environmental division)

To address the problem of climate change resulting from increasing emissions of greenhouse gases, it is important to implement global measures that are also locally appropriate. KANSO works on the development and wide deployment of suitable technology in cooperation with local colleges and government agencies, as well as with Japanese manufacturers.

- Help improve analysis and measurement accuracy on a global scale.
  - ▶First Japanese producer of seawater reference material certified under international standards (certification number: ASNITE 0052R)
  - ▶Japan's official greenhouse gas data being continuously acquired by KANSO's remote-controlled automatic measurement systems
- Participate in global warming mitigation measures and environmental improvement programs to contribute to local communities.
  - ▶We cooperated with the prefectural government of Shiga to implement JICA's grass-roots technical cooperation project on the Cat Ba island in Vietnam (2014–2016). Established a local subsidiary in Hanoi, Vietnam (2018).

Company Profile

Company Name: KANSO Co., Ltd.
Address: 1-3-5 Azuchi-machi, Chuo-ku, Osaka-shi, Osaka
Representative: Takashi Nakayama, President
TEL: +81-6-6263-7300

Established: 1974
Capital: ¥100,000,000
Employees: 568 (as of April 1, 2018)
Business: Environmental research, measurement, analysis, impact prediction, and assessment

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"TORAY"
Innovation by Chemistry

● We provide total support services of research, analysis, evaluation, etc. for the water environment business developed by municipalities and companies, etc.

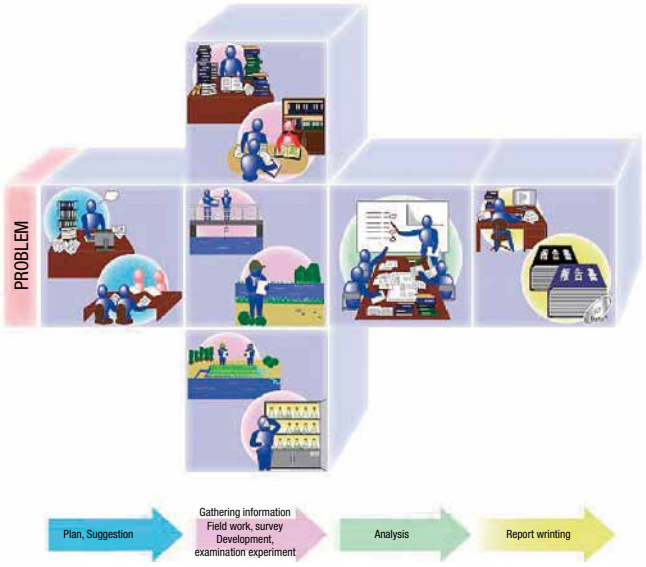
TORAY TECHNO CO., LTD.

Address: 1-1, Sonoyama 1-chome, Otsu, Shiga URL: http://www.toraytechno.co.jp/ (Japanese website)

Products/Services

Comprehensive environmental research services ranging from planning and proposing, and research and analysis, to evaluation and reporting regarding the aquatic environment and living environment.

We provide full support ranging from planning and proposing to conducting on-site research, field work, development, examination, information gathering, analysis, evaluation and reporting. This support is aimed at solving various kinds of issues relating aquatic and living environments that communities and corporations are tackling. To achieve the goal, we take advantage of our extensive knowledge, expertise, rich experience, information-gathering ability and wide network.
Moreover, we also provide add-on services including proposing business approaches to solve problems and developing new technologies and equipment. In this service, we make the most of our experience of study and construction of the community participation model of water purification systems and water process development, which was derived from research of water sources and purification.



Workflow of environmental research job


A field survey scene

Development/ Corporate efforts

Taking advantage of our strengths, such as a wide variety of research experience of field work on Lake Biwa, we have supported our customers in resolving issues relating to aquatic environments.
We have been collaborating with our customers in tackling unsolved issues.

● After starting business in the "Consultation Room for Pollution Preventive Technology" in the Shiga Plant of Toray Co., Ltd., we established a newly independent company, leaving the Toray's research and development department in 1986. Since then, we have been tackling various kinds of issues regarding the aquatic environment that communities and enterprises had been facing, such as verification of the condition of the aquatic environment, water purification, measures taken for improvement of the aquatic environment and waste recycling, etc., taking advantage of our strengths in knowledge and knowhow and advanced technology, which we have developed through our considerable experience of research focusing on Lake Biwa, which has served as a model and field of a closed water area, together with collaborative studies with Shiga Prefecture and the Lake Biwa-Yodo River Water Quality Agency Preservation Organization.
● With respect to environmental research, even considering the difficult and unsolved issues, we have been growing together with our customers to learn and gain new research techniques and knowhow, by boldly taking on challenges while collaborating with municipalities, enterprises, communities and academics, making the best use of all of our available survey methods.

Business deployment in the future

Taking advantage of the experience of surveys conducted on the shores of Lake Biwa, we will continue to support local governments and companies throughout the country.

● Regarding themes such as water treatment technology, etc. for improvement and conservation of the aquatic environment and the living environment, we continue to render total, professional services to municipalities nationwide and private companies that are seeking chances in the water environment business by taking advantage of our experience from the technology and the research we have conducted so far.

Company Profile

Company name: TORAY TECHNO CO., LTD.
Address: 1-1, Sonoyama 1-chome, Otsu, Shiga
Representatives: President Manabu Oishi
TEL: +81-77-537-5188

Established: 1986
Capital: ¥100,000,000
Employees: 38
Business: Civil engineering and construction. Manufacture of precast concrete for sewerage use.

33

● Dynamic eco technology

Nakatec Co., Ltd.

Address: 3-4-40, Nionohama, Otsu-shi, Shiga URL: http://nakatec.jp/

Products/Services

Safe, secure, reliable construction with no accidents in 31 years and lasting relationships

Design and construction of water treatment facilities that meet customers' needs

1. (Treatment of wastewater for use as recycled water etc.)
2. (Treatment of oils and fats using micro-fine bubbles)
3. Heavy metal treatment using TERRAST
4. Hydroelectric power facilities

Development background and track record

● Track records of construction etc. are confidential according to our customers' request.

Business deployment in the future

Always! Forever!

● Construction management system based on ISO9001:2015.

Company Profile

Company name: nakatec Co., Ltd.
Address: 3-4-40, Otsu-shi, Shiga
Representative: Masami Nakamura
TEL: +81-77-521-4461
Established: January 30, 1988
Capital: ¥20,000,000
Employees: 10
Business: A contract construction company that undertakes its own turnkey construction industry plant works, machine and tool installation works, piping/electrical/engineering works etc.

34

● Taking Advantage of Technology Developed for Water Supplies and Sewerage Maintenance and Involvement in Consulting and Product Development.

Nihon Maintenance Engineering Corporation, Shiga Office

Address: 8-7 Ekihigashi-cho, Hikone-shi, Shiga URL: http://www.jme-net.co.jp/ (in Japanese)

Products/Services

"Sakura-series®" antifouling coating solution using a photo catalyst

Finding problems in the management of maintenance and servicing of facilities, and commercializing products through joint research with universities.

Nihon Maintenance Engineering Corporation was involved in industrial-academic cooperation with a university for research into a coating technique using a photo catalyst (titanium oxide) and developed an antifouling coating.

The conventional photo catalyst made of titanium oxide causes an oxidation reaction only with ultraviolet rays, and does not work effectively in the shade, because the photo catalyst is not exposed to direct sunlight. The company developed a visible light-responsive photo catalyst that reacts under visible light, such as fluorescent light, thus demonstrating an effect indoors.

The antifouling coating can be applied, as a photocatalytic cover coat, to organic coating surfaces of outdoor facilities to prevent soiling, cracking, and chalking of coated surfaces, thereby extending the service life of the equipment and facilities.

We have also developed a coating with an improved rust-inhibiting performance, which extends the service life of equipment and facilities at locations subject to salt damage. Making the optimal use of the expertise we have developed through maintaining aesthetic appearances using the antifouling effect and service life extension techniques, we have delivered various products that have been favorably accepted by our customers in various sectors. Examples include on-shelf antifouling car and building coatings at retail stores for personal users, as well as coatings for professionals.

Photo-catalytic heat-shielding coat Sakura WT-06

Example of onsite application of photocatalytic cover coating to equipment

Example of application of antifouling coating to window pane, using our expertise in photocatalytic cover coats

Development/ Corporate efforts

Nihon Maintenance Engineering Corporation's expertise, knowledge, and maintenance and inspection technology in water treatment accumulated for many years make maintenance management including comprehensive consulting possible. With its comprehensive technology, the company has developed the easy-to-use products required by maintenance administrators.

- Since its establishment, Nihon Maintenance Engineering Corporation has been in the water environment business, focusing on managing the maintenance of waterworks and sewer systems. The company's strong points are the advanced technology that we have built up over many years and the professional and comprehensive consulting services that make use of that technology. Based on this, the company has been accumulating work experience in Shiga Prefecture, where public consciousness of the water environment is high, and gaining the trust of customers throughout Japan. Furthermore, the company has been involved in community-based business activities; one of our strong points is our 24-hour backup system that can respond quickly in case of emergency.
- While conducting its maintenance management business, the company developed the required easy-to-use products in-house. In the past few years, the company has developed a device that automatically measures and monitors the quality of tap water and a web system that remotely controls and monitors facilities, and has been adopting this for in-house maintenance management and servicing.

Business deployment in the future

Nihon Maintenance Engineering Corporation aims at the development and sale of user-oriented new products that contribute to comprehensive facility maintenance and management.

- The company makes effective use of photo catalysts, thus continuing the development and sales of new products.
- The company will manufacture and sell affordable products that will contribute to the prolongation of equipment, LCC (lifecycle cost) reduction, and energy saving.

Company Profile

Company name: Nihon Maintenance Engineering Corporation, Shiga Office
Address: 8-7 Ekihigashi-cho, Hikone-shi, Shiga
Representative: Shigenari Tabushi, President
TEL: +81-749-26-9058

Established: 1968
Capital: ¥60,000,000
Employees: 1202 (as of October 2018)
Business: Management, maintenance, construction of environmental conservation facilities including water processing facilities.

35

● We are a one-stop environmental services company and we are developing business overseas with our Only-one technology.

Hiyoshi Corporation

Address: 908 Kitanosho, Omihachiman, Shiga URL: http://www.hiyoshi-es.co.jp/english/

Products/Services

We offer comprehensive support for addressing water environmental issues, investigating every sign of trouble from the perspectives of measuring, seeing, and preventing.

Since its founding in 1955, under the corporate philosophy of "To establish a community- and technology-oriented company," Hiyoshi has contributed for 60 years to devising solutions to environmental issues concerning public health, pollution, ambience and ecology that are changing with time. Examples include measures to control the eutrophication of Lake Biwa, to comply with tightened nitrogen regulations, and to counter the dioxin problem.

As our technical capabilities specifically show, with the various know-how gained through experience, more than 80 business licenses issued by authorities and a total of more than 2000 certified qualifications of 200 kinds held, we have developed an analytical business that includes environmental water quality testing of Lake Biwa and other water sources, and drinking water analysis, etc. This is related to the perspectives described above. Our management business, including management of all kinds of environmental infrastructures such as water supply facilities, domestic wastewater treatment facilities including septic tanks, sewerage facilities, industrial wastewater treatment facilities and water supply facilities, is related to the perspectives described above. Our manufacture and sale of industrial chemicals, collection and transportation of waste, road maintenance and suggestions for improvements to renewal proposals for wastewater treatment facilities, are related to the perspectives described above. We provide comprehensive support on various types of business related to the environment and offer new solutions as a one-stop service.

Calux® Assay

Management System of Sewage Treatment Plant in India

Development/ Corporate efforts

We took note of an analysis that uses the bioassay methodology for dioxins ahead of our competitors and had it authorized as an official method. Under the philosophy of "environmental problems are borderless," we have received trainees from and expanded our business overseas.

- Calux® Assay is a simple-to-use, fast, and highly sensitive dioxin measurement method. In 1998, Hiyoshi introduced it into Japan and developed it ahead of our competitors. In 2005, Calux® Assay was designated as an official method by the Ministry of the Environment. Our future projects include life innovation business using bioassays. (http://www.calux.jp)
- We have built our own international network, receiving more than 900 trainees from 35 countries and sending engineers.
- In 2011, we founded Hiyoshi India to commence providing environmental services in India.
- In 2018, our project "Feasibility Survey for Holistic Management System of Sewage Treatment Plant with Remote Monitoring Technology in India" was selected by the Ministry of the Environment.

Business deployment in the future

Taking advantage of the industry-university cooperation and international exchange activities over the years, we aim to develop our overseas business using Calux® Assay as a corporate strategic product.

- We aim to establish Calux® Assay as an international standard based on the knowledge we gained through having it authorized as an official method in Japan. Utilizing the network we have developed, we will work for widespread use of Calux® Assay in overseas countries.
- We intend to expand our water environment service business connecting Japan and overseas countries, using our network, our 60 years of experience, and our remote monitoring technology.

Company Profile

Company Name: Hiyoshi Corporation
Address: 908 Kitanosho, Omihachiman, Shiga
Representative: Hiroshi Murata, Representative Director, President
TEL: + 81-748-32-5111
Established: Established 1955/Incorporated 1958
Capital: ¥20,000,000
Employees: 298
Business: Total support services for environmental businesses. Analysis and measurement, industrial chemical sales, facility maintenance, environmental conservation, and others.

36

● General consultant on the production of biodiesel fuel including its wastewater treatment

New Fuel Laboratory

Address: 318 Iwasaka, Minakuchi-cho, Koga, Shiga URL: http://newfuel1.com/biofuel/biotop.htm (in Japanese)

Products/Services

- Since our establishment in 2004, we have been producing biodiesel fuel from vegetable oil and recycled cooking oil, designing the related facilities and equipment, and selling them. We are engaged in technical consultation on the production of automotive fuel from biodiesel fuel, and as a general consultant to biodiesel makers from Hokkaido to Kyushu.
- We provide a wastewater treatment consulting service on cleaning the drained water from purifying biodiesel fuel. We also sell reagents and equipment for this treatment.

Pollution Control Manager: Water Quality Class 1 05020652
We are certified as a “Person responsible for handling poisons and deleterious substances: Kyoto 21-13”

Organization Profile

Organization Name: New Fuel Laboratory
Address: 318 Iwasaka, Minakuchi-cho, Koga, Shiga
Representative: Pak Changsoo, President
TEL: +81-748-62-2176
Established: 2004
Capital: -
Employees: 2
Business: Engineering consultants on water treatment and the production of biodiesel fuel Design and sale of related facilities and equipment

37

● General analysis service company responding to diversified needs with advanced technologies

TECHNO SCIENCE CO., LTD.

Address: 2477 Mizuho-cho, Moriyama, Shiga URL: http://www.techno-science.jp/ (in Japanese)

Products/Services

- A comprehensive analysis service company that deals with environmental analysis (air, water, noise, vibration etc.), technical analysis (material analysis, performance tests etc.), food analysis (component analysis, agrochemical residues etc.) and other services. We also provide drinking water analysis and many other analyses under contract from local governments and private companies.
- Our strength is that we perform sophisticated analysis in our own way by improving and adjusting measuring equipment according to the analysis samples and our customers’ needs. With our wealth of experience in assessing product performance, we work with the customer from the stage of considering and suggesting testing methods, thereby providing highly accurate results and building a relationship of trust, which leads to continued use of our service.
  Our attitude is "start doing it anyway," rather than "it’ s impossible," even if it looks impossible. This attitude has helped to improve and build up our techniques and know-how, enabling us to offer a wide range of services, and secure a variety of customers, including large corporations.

Business deployment in the future

- We aim to challenge difficult analyses that have no precedent in the past and differentiate ourselves from other companies by responding to the various needs of our customers.
- We provide a one-stop service for a range of analyses including those outside our three major business fields. And we plan to develop into diversified analytical services.

Company Profile

Company Name: TECHNO SCIENCE CO., LTD.
Address: 2477 Mizuho-cho, Moriyama, Shiga
Representative: Yasuhito Yamamoto, President
TEL: +81-77-584-3003
Established: 1995
Capital: ¥30,000,000
Employees: 36
Business: Tap water quality inspection, leak testing, analysis of agricultural chemicals, and pharmaceutical analysis

38

● First Environmental Laboratory in Shiga Prefecture with ISO/IEC17025 Certification as an Accredited Laboratory for Drinking Water Analysis

NATSUHARA Industrial Technologies Inc.

Address: 2688-1 Takamiya-cho, Hikone, Shiga URL: http://www.natsuhara.co.jp/ (in Japanese)

Products/Services

- NATSUHARA Industrial Technologies Inc. was founded in 1972, and as a leading subcontractor, the company was designing and assembling manufacturing equipment along with electrical instrumentation for the equipment. In 1978, the company was entrusted with the overall maintenance of wastewater treatment facilities, at which time the company started its involvement in the field of water quality inspection and other environmental solutions on a full scale. Since then, the company has been implementing drinking water tests including tap water inspection and valve leak tests, environment measurement and analysis including water quality inspection, and the design, installation, and maintenance management of wastewater treatment equipment.
- The same salesperson takes care of the environmental analysis and measurement, from planning the inspection method through to reporting of inspection results, and thus we are able to grasp the customer's problems and propose wastewater treatment equipment and other neutralizing equipment, where necessary. The company's strong point is total support to each customer's environmental management.
- The company acquired ISO/IEC17025 laboratory accreditation for drinking water analysis. The company analyzes cadmium, selenium, lead, arsenic, hexavalent chromium, boron, zinc, aluminum, iron, copper, and manganese contained in drinking water and provides proper and highly reliable analysis results that meet international evaluation standards.

Business deployment in the future

- The company provides customers with diversified technologies and services, taking advantage of the company's unique ability to precisely grasp the challenges facing each of our customers.
- Furthermore, in order to provide reliable data, the company is considering the acquisition of certification in other fields or an expansion of its ISO/IEC17025 certification.

Company Profile

Company Name: NATSUHARA Industrial Technologies Inc.
Address: 2688-1 Takamiya-cho, Hikone, Shiga
Representative: Yoshitoki Natsuhara, President
TEL: +81-749-26-3272

Established: 1972
Capital: ¥20,000,000
Employees: 360
Business: Environmental measurement and investigation, facilities management & maintenance, distribution of parts & materials

39

● Water and environmental consultancy who practice the anticipated consultations with future view and the reliable technique.

Nishinihon Engineering Consultant Ltd.

Address: 649 Yabase-cho, Kusatsu, Shiga URL: http://www.ngcon.co.jp/ (in Japanese)

Products/Services

- Established in 1968, and relocated to Kusatsu in 1971. Since then we have acted as general consultants on water and the environment for Lake Biwa and local communities. Our three major businesses are waterworks facilities planning/design, measurement/certification, and assessment.
- The water service business has changed over time. The demands from business management for cost savings besides the conventional focus on public health is expected to increase. The focus on management consulting is also anticipated to increase. In collaboration with auditing firms, we have been involved in business planning for the operational management of waterworks facilities.
- We were one of the founding members of the "Konan, Koka Environmental Association." The association's activities include environmental conservation activities with local companies and factories through study sessions and various classes.

Business deployment in the future

- Always a good partner of the water utilities companies, and helping with the proper management of waterworks facilities. The water utilities industry is concerned with the passing on of techniques and the shortage of funds available for the renovation of facilities. A balance has to be maintained between facility renovation and management plans.

Company Profile

Company Name: Nishinihon Engineering Consultant Ltd.
Address: 649 Yabase-cho, Kusatsu, Shiga
Representative: Kazunori Okuyama, President
TEL: +81-77-562-4943

Established: 1968
Capital: ¥50,000,000
Employees: 90
Business: Planning, design and operational management of waterworks facilities. Analyses of water and soil quality. environmental surveys and lifestyle surveys.

40

ELCENERGY

● With an understanding of the importance of water, we work to improve water quality to conserve the beauty of Lake Biwa for future generations.

Elcenergy Co., Ltd.

Address: Fuji Bldg. 2F, 289 Sakuramiya-cho, Omihachiman-shi, Shiga URL: http://www.elce-shiga.com/

Products/Services

Elce turns water into ecofriendly working water.

Lake Biwa supplies everyday water to a population of 14.5 million in the Kansai area. People living in Shiga Prefecture need to conserve the lake water. However, wastewater from firms and households runs into Lake Biwa. We are responsible for improving the valuable water quality of Lake Biwa with our utmost efforts.

Treatment by Elce ceramic filters improves the antioxidative effect of water, which removes rust and scale from the water supply and drain pipes. This enables the user to reduce substantially their usage of chemicals.

Substantial decreases in the usage of detergents and chemicals from general households to large plants translate to very good water in terms of the water environment.

Elce is a highly ecological water treatment system, consuming no power and requiring almost no maintenance.

Development/ Corporate efforts

Elce is among the few systems listed as a water supply and drain pipe conservation system by NETIS run by the Ministry of Land, Infrastructure, Transport and Tourism.
Having met strict inspection criteria, Elce has been installed in many facilities.

- Elce has been selected for some 20,000 stand-alone houses and some 20,000 apartment households. Apartment complexes with Elce fitted can substantially reduce their maintenance costs for their water supply and drain pipes.
- We have also shipped our water treatment system to many customers, including government offices, public facilities, business buildings and hotels, as well as to restaurants (for use in kitchen facilities), Japan Railways companies, Toyota Group companies, and other major enterprises.

Business deployment in the future

We will supply ecofriendly Elce from Shiga to every part of Japan.

- Pressure-reducing valves are commonly used in apartment complexes to protect water equipment. We intend to combine a pressure-reducing valve and Elce into a single unit for stand-alone houses for launch in fiscal 2017.
- Apartment complexes spend a large amount of money to renew their water supply and drain pipes. By introducing Elce, they can substantially reduce these costs. Moreover, we offer Elce insurance to cover the system. We will continue to promote sales of Elce in the future.

Company Profile

Company Name: Elcenergy Co., Ltd. (Nihon Jisui Elce Logistics Center)
Address: Fuji Bldg. 2F, 289 Sakuramiya-cho, Omihachiman-shi, Shiga
Representative: Katsuyuki Nakashima, President
TEL: +81-120-644-147

Established: 2016
Capital: ¥5,000,000
Employees: 8 (including temporary staff)
Business: Sales of Elce (water activation device)

41

● Contribute to society with our plastic processing technology.

Nagaoka Sangyou Co., Ltd.

Address: 2-61 Awazu-cho, Otsu-shi, Shiga 520-0832 URL: http://www.nagaoka-sangyou.jp/ (In Japanese)

Products/Services

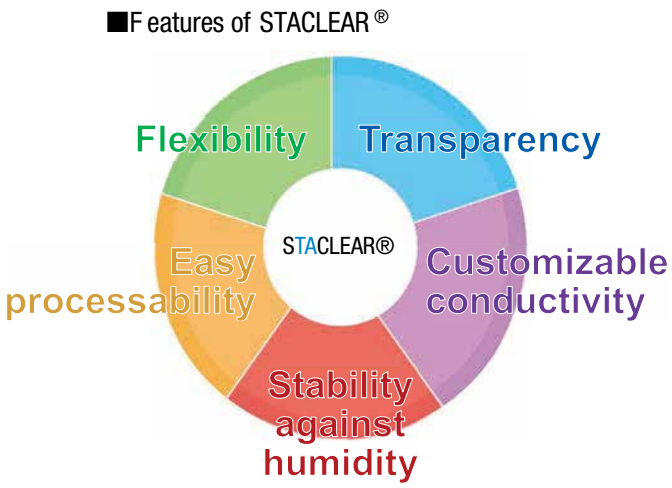
Flexible transparent conductive film “STACLEAR®”

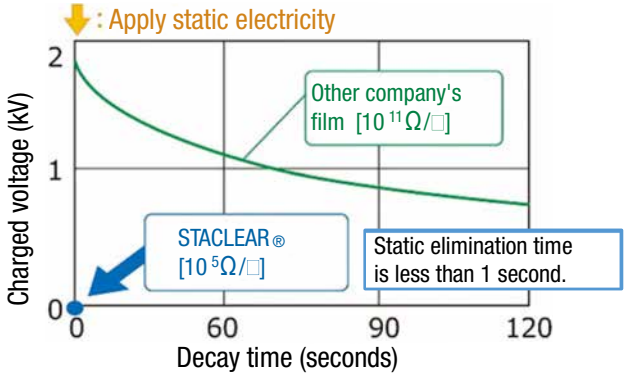
We develop, manufacture, and sell the flexible transparent conductive film “STACLEAR®” (Pic. 1).

STACLEAR® is a conductive film made by coating conductive polymers (PEDOT/PSS) on plastic film such as PET.

The instant elimination of static will solve static electricity problems (Fig. 1).

Pic . 1: Flexible conductive film “ STACLEAR®”





Test conditions: pursuant to JIS L 1094

Fig. 1: Comparison of speeds eliminating static when static electricity is applied

Development/ Corporate efforts

Measures taken against static electricity problems using STACLEAR® .

- Recently in the field of electronics, electronic components and devices have become increasingly finer and denser, with device malfunction problems and damage due to static electricity becoming more serious.
- STACLEAR® is effective in eliminating static electricity problems by being installed in places with static electricity of electronic and electrical devices.
- Actual examples: (1) Shielding against static electricity on a touch panel monitor
  → STACLEAR® eliminates the static electricity discharged from the fingertips and whereby prevents damage to and malfunction of the touch panel monitor.
  (2) Preventing micro-fine particles from becoming attached because of static electricity
  → STACLEAR® is installed on facility walls and inside equipment in order to prevent micro-fine particles from becoming attached.

Business deployment in the future

Development of an easily formable film. Identify a wide range of applications by molding using three-dimensional geometry.

- Development of an easily formable film that can be molded into three-dimensional geometry (e.g., tray shapes).
- Development of coating agents tailored for respective films.

Company Profile

Company name: Nagaoka Sangyou Co., Ltd.
Address: 2-61 Awazu-cho, Otsu-shi, Shiga 520-0832
Representative: Toshinori Nagaoka, President and Representative Director
TEL: +81-77-534-1730

Established: July 26, 1954
Capital: ¥40,000,000
Employees: 120
Business: Processing and sales of plastic products (planning, processing, sales)

42

● Since its founding in 1915, Nakashima Bussan has established warm relationships with its customers.

Nakashima Bussan Co., Ltd.

Address: 2-7-1 Shiranuhi-machi, Omuta-shi, Fukuoka URL: http://www. nakashimabussan.co.jp/

Products/Services

Build the future with air bubbles.
Fine bubble technology & amino acid extract

The term "fine bubbles" is the generic term for very small air bubbles 100 μm or less in diameter. Air bubbles 1 to 100 μm in diameter and between several tens of nanometers and 1 μm in diameter are categorized as microbubbles and ultrafine bubbles, respectively. Fine bubbles generated in water behave differently from ordinary air bubbles several millimeters in size that come up to the surface and burst. Air bubbles approximately 60 μm or less in size contract in water due to the surface tension of the water and eventually dissolve and vanish into the water. In this process, fine bubbles change the physical properties of water (the pH and surface tension decrease, while the electrical conductivity increases).
Water that contains fine bubbles has been reported in numerous papers to boost agricultural production, improve the fish survivalrate on fish farms, and has other bioactive effects. Thus, application areas for fine bubbles include pisciculture, agriculture, andwater purification. In the area of water purification, fine oxygen bubbles activate bacteria. In the subsequent sterilization process,fine ozone bubbles improve the purification efficiency due to an increased area of contact between the gas and the liquid.Additionally, ozone has been reported to be effective in removing coloring agents in dye stuffs.
We deal in amino acid extract and others for use in fisheries (mainly to improve water quality) and agriculture (to promote cropgrowth, to repel pests and germs), and propose FB generators and conditioning agents to improve the environment while listeningto the various problems facing agricultural, fishery and manufacturing companies.(A fine bubbles field test in a shrimp culture pond in Vietnam)

↑ Normally, the water flow from a pump does not make the pond water cloudy but using this generator (lower right picture) allows fine bubbles to be generated efficiently and increases the oxygen concentration in the pond.

Development/ Corporate efforts

ommercialization through an industry-academia R&D project. Deployment in pisciculture for environmental improvement.

- Nakashima Bussan and Ariake College jointly applied for a patent for this technology. We have worked to improve the environment of the Ariake Sea and laver grades.
- In the area of pisciculture, we improve the concentration of dissolved oxygen, combining an oxygen gas cylinder or oxygen generator and the fine bubble system.

Business deployment in the future

We will deploy this technology to improve food productivity and at the same time reduce the environmental burden of food production.

- We intend to deploy this technology in the ASEAN region where fish farming is thriving to improve the environment for pisciculture.
- In 2019, we will promote the aquaculture project in Vietnam which has been adopted as a JICA project.

Company Profile

Company Name: Nakashima Bussan Co., Ltd.
Address: 2-7-1 Shiranuhi-machi, Omuta-shi, Fukuoka
Representative: Yasuo Nakashima
TEL: +81-944-55-3335

Established: 1915
Capital: ¥20,000,000
Employees: 33
Business: Sales of FB generators, industrial materials and equipment; air conditioning installation

43

日本ソフト開発株式会社
Nippon Software Knowledge Corp.

● Challenges of computer network solution to realize rich environment and life

Nippon Software Knowledge corp.

Address: 23 Maihara Nishi, Maibara, Shiga URL: http://www.nihonsoft.co.jp

Products/Services

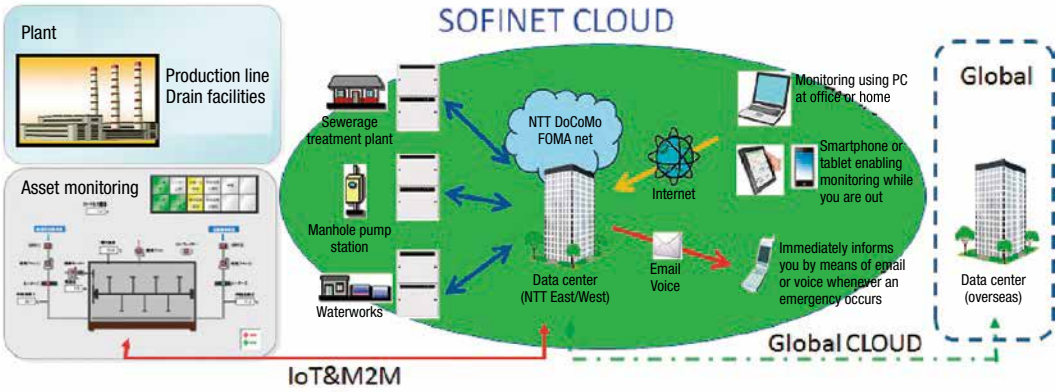
"SOFINET WATER CLOUD", remote monitoring of water processing facilities, and operations management system.

The system which performs the intensive monitoring and data management of the alarm in water processing facilities. Sofinet Water is an onsite-installed system, while Sofinet Cloud is a cloud system.

(1) Support services such as notification of alarm conditions and reporting to the person in charge (2) Monitoring of measured values, electric current values, and pumping station equipment, as well as management and visualization of the operating data for the entire treatment plant

(3) Statement in periodic report

Since their launch in 1992, the technology and expertise incorporated in Sofinet Water and Cloud have been well accepted. These systems have been selected by more than 5,000 public and private institutions and plants, including water and sewerage treatment facilities, distributing pumps, and at Tokyo SORA Machi and Haneda Terminal 2.



Development/ Corporate efforts

We have drawn on our knowledge and experience to develop various operational management systems for use as environmental solutions. These systems are implemented as rationalization investments made when consolidating and decommissioning sewerage monitoring systems run by local governments in and outside the prefecture.

- We complete our products by developing water treatment expertise and conducting proving experiments, including pH and flowrate measurement methods and data representation methodology. In 1998, we obtained a patent for our remote management system and its monitoring methodology.
- We have 20 plus years of knowledge and experience. As a software developer, we work on the development of various operational management systems for use as environmental solutions. In doing so, we address IoT and big data solution challenges to help people to build affluent lives and to protect the environment.

Business deployment in the future

We intend to combine IoT and cloud systems for enhanced versatility and overseas business expansion.

- Change from an on-premises management system to a cloud-computing one (service we launched in 2012) reduces the introduction costs and substantially improves monitoring and maintenance convenience through the use of innovative devices such as smartphones and tablets.
- In cooperation with governments, domestic water businesses, and universities and other research institutions, we will build a new sludge treatment system to provide environmental solutions for Southeast Asian countries.

Company Profile

Company Name: Nippon Software Knowledge corp.
Address: 23 Maihara Nishi, Maibara, Shiga
Representative: Yoshitsugu Fujita, Managing Director
TEL: +81-749-52-3811

Established: 1972
Capital: ¥190,000,000
Employees: 129
Business: System integration, software development and public solution systems services.

44

● We provide support for the acceptance and employment of foreign workers.

Biwako Total Support Center Cooperative

Address: 951-59 Kinokawa-cho, Kusatsu-shi, Shiga URL: http://www.biwa.so/

Products/Services

Supporting for introducing foreign workers

We will contribute to the development of Japanese companies through the introduction of foreign workers.
We provide the following support:

technical intern trainees;
internships; and work visas.

Vietnamese, Taiwanese, and Chinese workers can receive our support.
We intend to make more countries available in the future.

Instruction in manners and etiquette

A foothold for international business deployment

Development/ Corporate efforts track record

Making up for shortages of workers and adapting to globalization

- Overcoming labor shortages, supporting inbound tourism, adapting to internationalization and supporting internationalization
- Introduction of foreign workers, follow-ups
- We have a track record and experience of more than 10 years.

Business deployment in the future

Support for the globalization of companies

- We aim to have more dealings with ASEAN countries (Myanmar etc.).

Company Profile

Company name: Biwako Total Support Center Cooperative
Address: 951-59 Kinokawa-cho, Kusatsu-shi, Shiga
Representative: Shingo Kawahara
TEL: +81-77-535-6721

Established: 2006
Capital:
Employees: 15
Business: Job placement, training, and business support

45

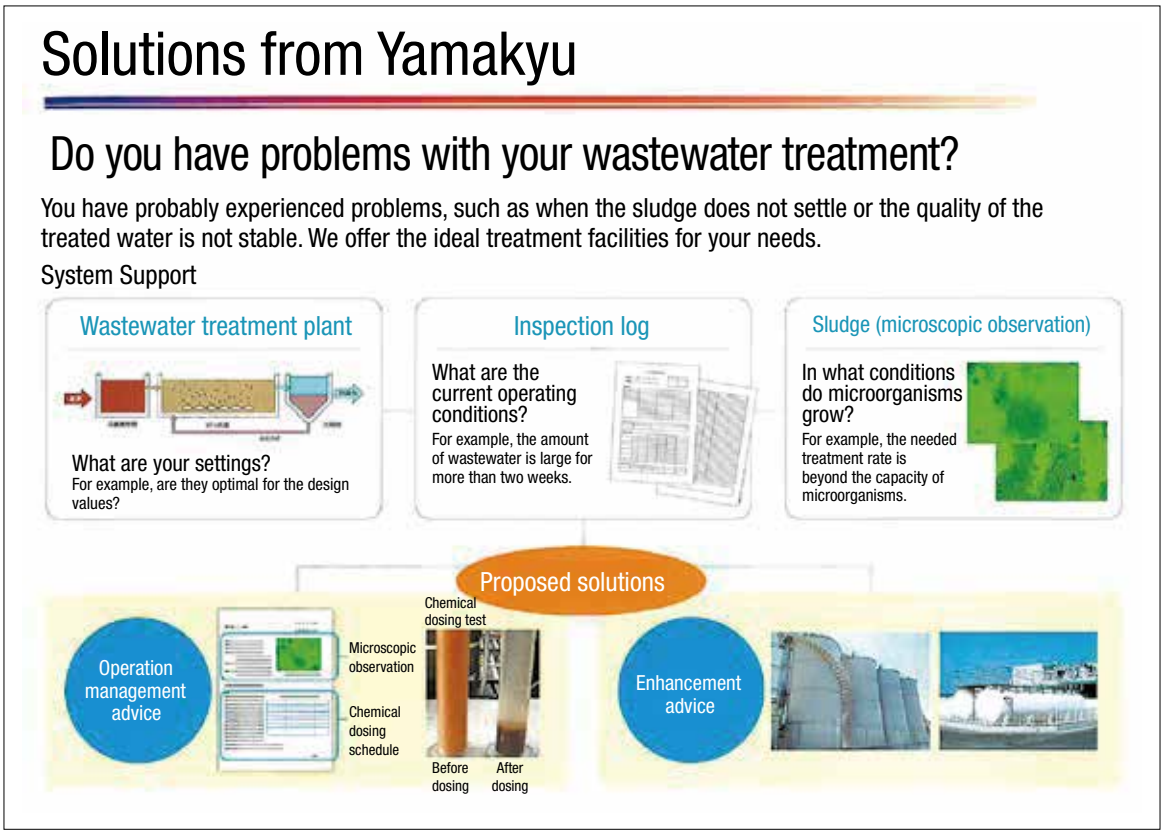
●We provide a sense of security for local communities and people.

Yamakyu Corporation

Address: 1202-5 Yawatanakayama-cho, Nagahama-shi, Shiga URL: http://www.the-yamakyu.co.jp/

Products/Services We offer cleansing service solutions.

Cooling towers are popular as refrigerating equipment used in air conditioning. However, if you fail to provide proper maintenance such as periodic inspection and cleaning, the cooling performance of the cooling tower decreases and it can develop fungi, blue-green and other algae, and slime, allowing Legionella bacteria to propagate. If left untreated, Legionella bacteria can be showered from the tower, potentially causing harm to the maintenance staff and neighbors. Yamakyu's cleansing service uses enzymes suitable for a wide range of applications including wastewater from factories and agriculture to purify the water by decomposing pollutants that have developed, plus growing and activating organic microorganisms. We run a novel business model making the optimal use of the capacity of ecofriendly enzymes to control the growth of blue-green and other algae.



Company Profile

Company Name: Yamakyu Corporation
Address: 1202-5 Yawatanakayama-cho, Nagahama-shi, Shiga
Representative: Masaki Hirayama, President
TEL: +81-749-63-6611
Established: 1957
Capital: ¥96,000,000
Employees: 78 (52 male and 26 female employees)
Business: Sale of machines and tools Sales and servicing of machine tools, cutting and measuring tools, motorized equipment, mechatronics products, pneumatic, conduction and household equipment, and environmental conservation items

46

● The first company to start a delivery service for mineral water in Japan

Ohmi Mineral Water Service Co., Ltd.

Address: 3-1-12 Nango, Otsu, Shiga URL: http://www.mineralwater.co.jp/ (in Japanese)

Products/Services

● In 1987 we started a delivery service for mineral water in Japan. The water is pumped up from a source that is located 600 meters below ground level in a mine, fed to our premises through a pipeline, filtered and filled into original, 10-liter polyethylene containers. The containers do not emit the smell of polyethylene, which damages the taste of the water. Containers are delivered door-to-door in the Kansai area including Shiga, Kyoto and Osaka. We also have 2-liter, 1-liter and 500-ml PET bottles, which are delivered to all over Japan.

● As the water at the source is rich in minerals, we want to deliver it to our customers as rich in minerals as possible. After inspection, we filter the water through a 0.22 μm filter that allows the minerals to pass. We do not sterilize the0 water with heat or ozone, because this can destroy the minerals. We named the water “Iwama no Tensui (sweat water between rocks)”, because it represents tasty water gushing out between rocks.

● Our mineral water is used for drinking and cooking in families and our PET bottled water is provided in guest rooms and the fitness club of a hotel in Otsu City, Shiga. On hearing the reputation of our mineral water, famous Western confectioneries, Japanese sweet shops and restaurants are very interested in the ingredients of our mineral water.

Mineral water in 10-liter polyethylene containers

Mineral water in PET bottles

Business deployment in the future

● We are developing our business to spread use of our mineral water to the regions in Japan.

● We are working to find partners with whom to develop new products using our mineral water and who share our philosophy, “Keep good

Company Profile

Company Name: Ohmi Mineral Water Service Co., Ltd.
Address: 3-1-12 Nango, Otsu, Shiga
Representative: Terumi Asano, President
TEL: +81-77-537-3350

Established: 1987
Capital: ¥10,000,000
Employees: 20
Business: Manufacture of mineral water and delivery to anywhere in Japan by our home delivery service

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● HAPPY & HEARTY Change the Future! Change our Life!

Meiho-Construction Inc.

Address: Kano-cho, Nagahama-shi URL: http://www.meiho-co.co.jp

Products/Services

Efforts to make organic compost from waterweeds in Lake Biwa using facultatively anaerobic microorganisms

The KS method allows for composting of all sorts of organic matter in short periods of time!

The KS method, which is also registered in NETIS (New Technology Information System) overseen by the Ministry of Land, Infrastructure, Transport and Tourism, allows for the composting of all sorts of organic matter in short periods of time. This method is unprecedented in that it allows efficient composting in any location using facultatively anaerobic bacteria that can be active irrespective of the presence or absence of oxygen. For composting, only five items are required: (1) organic matter, (2) fermentation accelerator (soil bacteria), (3) assisting material (wood chips), (4) heavy construction equipment (backhoe), (5) black sheeting. It takes only about three months to complete composting. During fermentation, the organic matter is matured and fermented at approx. 60 to 70 ° C by the microorganisms, with no risk of any unwanted bacteria or weed seeds remaining. The completed compost is rich in nitrogen, phosphoric acid and potassium, and also contains beneficial microorganisms. The KS method not only allows for composting in short periods of time but also allows the completed compost to be commercialized as special organic fertilizer for more effective utilization.

We use this method to recycle waterweeds in Lake Biwa, which have grown large in quantity and become a public concern issue, into special organic fertilizer in short periods of time and commercialize it as Benir du lac (Blessings of the lake) for practical use in society.

Final agitation after fermentation

Stylish package

Fully matured
“Benir du la

Development/ Corporate efforts

Started a recycling project for society with the theme “Change the blessings of waterweeds into blessings of the land!”

- For the problem of waterweeds in Lake Biwa, we considered “What can we do as a company within the prefecture?” and started work on composting from 2014.
- Shiga Prefecture selected our work as their anti-waterweed technology development support project for three years in a row from 2016 and conducted composting tests for organic compost.
- From 2018, we made the waterweeds in Lake Biwa into the special organic fertilizer product “Benir du lac (Blessings of the lake)” and then began its sales.

Business deployment in the future

Spread our recycling loop to lakes and marshes throughout the country while contributing to the environmental conservation of Lake Biwa!

- We will make the fermented extract of waterweeds into a new liquid fertilizer product for sale, and use part of the sales proceeds for the environmental conservation of Lake Biwa.
- Taking advantage of the characteristics of facultatively anaerobic microorganisms, we want to develop liquid fertilizer products that will be used for hydroponic culture and plant factories.
- We will expand our efforts at Lake Biwa into lakes and marshes throughout the country, and try to build new recycling and business models.

Company Profile

Company name: Meiho-Construction Inc.
Address: 394 Kano-cho, Nagahama-shi, Shiga
Representative: Koji Honjo, President and Representative Director
TEL: +81-749-62-6580

Established: August 30, 1965
Capital: ¥95,000,000
Employees: 60
Business: Total construction business and agri-science business

48

● Together with the local community, in the past, now and in the future.
Planner working for energy and comfortable living

Nakajima Shouji Co., Ltd.

Address: 61-5 Miyasho-cho, Higashiomi-shi, Shiga URL: http://www.nakajima-group.co.jp/

Products/Services

Safe and great tasting water constantly at hand Water Net home delivery service

● You may want to have a cup of hot tea immediately or use hot water at once for your cooking. A water server serves hot water whenever you want. Meanwhile, PET mineral water bottles take up all the space in your refrigerator. If you have a water server, your refrigerator will stay neat inside and you will be able to use a good amount of good tasting cold water whenever you want.
● Call us and we will deliver water to your home or office. We use ecofriendly returnable bottles for you to return empty when we deliver new bottles.

Business deployment in the future

● We will continue to explore and work on customer requests and needs by producing and delivering great tasting and safe Water Net water.
● To expand our Water Net water home delivery service, we are soliciting partner businesses and organizations. Products/Services

Company Profile

Company Name: Nakajima Shouji Co., Ltd.
Address: 61-5 Miyasho-cho, Higashiomi-shi, Shiga
Representative: Tomohisa Nakajima
TEL: +81-748-48-2301

Established: 1963
Capital: ¥40,000,000
Employees: 90
Business: Wholesale and retail energy supplies (LP gas and oil), household equipment, water home delivery, and industrial machinery

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● We look at the market from a comprehensive perspective and respond to various requests related to water environment issues.

YAMANAKA, Co., Ltd.

Address: 44 Yoshinaga, Konanshi, Shiga URL: http://www.kk-yamanaka.jp

Products/Services

We are a trading company specializing in plumbing equipment and house building equipment related to the water environment.

Boasting 60-plus years of business history since our foundation in Shiga Prefecture, the home of "Mother Lake Biwa" with strong awareness of the water environment, we are a trading company specializing in plumbing equipment and house building equipment related to the water environment.

■ Proposal activities : Comprehensive water environment proposals through our great wealth of specialized knowledge and ideas.
■ Rich stocks : Tens of thousands of items are always in stock in one of the largest warehouses in the prefecture.
■ Delivery system : A delivery system that covers service areas in a rapid and strategic way from four prefecture locations.

Company Profile

Company name: YAMANAKA, Co., Ltd.
Address: 44 Yoshinaga, Konanshi, Shiga
Representatives: Kazuhiko Matsuda, President
TEL: +81-748-72-1200

Established: February 1970 (founded in September 1956)
Employees: 53
Business: A trading company specializing in plumbing equipment and house building equipment

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● Aqua-System Engineering

Nodak Co.Ltd.

Address: 23-15 Houzan-cho, Toyonaka-shi, Osaka URL: http://www.nodak.co.jp/

Products/Services

Inland water environment management systems

Manufacturing, sales, and on-site construction of limnology machines

Our waterweed cutting boats and inland water environment multi-purpose boats are water area environment general-purpose machines produced from limnology applied research.

Their diverse functionality and track records are highly regarded both at home and abroad, including: extreme problematic waterweed cutting, collection of floating waste and driftwood in dam lakes, aquatic weed management, digging of rootstocks such as reeds and lotuses, bucket dredging and pump dredging.

To mitigate the various problems caused by aquatic weeds, they need to be removed and controlled periodically.

We cut a variety of aquatic weeds efficiently in a short period of time to control these aquatic plants using waterweed cutting boats, Weed Hunters (WHs), inland water environment multi-purpose boats, and Hydro-Mogs, all of which are based on limnology applied research.

Hydro-Mog (SRX-105)

Weed Hunter (GM-5000)

Weed Hunter (WH-3000)

Development/ Corporate efforts

For greater efficiency of inland water environment management systems; product development through cooperation between industry and academia

● Given the beneficial effects that aquatic plants provide, the only method that can meet the requirements of controlling aquatic plants and removing excessive nutrient salts is mechanical control, which has been widely implemented both at home and abroad.
Previously, control was mostly done using manpower which had the drawback that it took too much labor and cost. However, we design, manufacture, and sell cutting-specific boats while also doing the actual removal work. We also have a past record of sales and construction throughout Japan.

Business deployment in the future

Development of a large machine for overseas large-scale lakes and comprehensive proposals for waterweed use systems

● Overseas exports after being selected as an ODA (Official Development Assistance) project
● Selling large models of the WH series in ASEAN and African countries.
● Research and development into small and low-cost models with universities.
● Development and building of waterweed use systems (from cutting to production of secondary products).

Company Profile

Company name: Nodak Co.Ltd.Address: 23-15 Houzan-cho, Toyonaka-shi, Osaka
Representative: Hajime Izumi, Representative Director
TEL: +81-6-6841-1512

Established: 1973
Capital: ¥50,000,000
Business: All aspects of aqua-system engineering, including: planning and proposals for water area environmental improvement and its maintenance, planning, design, manufacturing, and construction of floating structures, water utility maintenance, and underwater construction/investigation.

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● Development of technology for local consumption of locally produced W (Water), E (Energy) and F (Food)

WEF Institute of Technology Inc.

Address: 1-19-15 Do, Otsu-shi, Shiga URL: http://aoyama-wefit.com/en/

Products/Services

The world's first equipment that allows organic matter to be decomposed by active oxygen

Product: α-Gaia

Organic substances all have robust cell walls, which had been a major barrier to the treatment and recycling of organic substances. We have now developed technology that alters the oxygen in the air into active oxygen, and have succeeded in decomposing the cell walls of organic substances using OH radicals, which disappear almost instantaneously even though they have the strongest oxidizing power on earth.
The product we introduced commercially using this technology is α-Gaia, which can be used to reduce volume of and to dehydrate organic substances (short-time treatment is possible), to pretreat methane fermentation (the fermenter can be made smaller in size), for refining in ethanol treatment (short-time treatment is possible) and other purposes.

100-kg
treatment equipment

2,000-kg
treatment equipment

Development/ Corporate efforts

Treat persistent organic substances using active oxygen.

- Currently, persistent organic substances are increasingly being found on earth. Until now, they have been decomposed and removed using the microorganisms around us. However, organic substances that cannot be decomposed by these microorganisms have increased in number and most of them are carcinogenicsubstances. Because of this, the COD of rivers, lakes and marshes worldwide has continued to increase. It has been said that only active oxygen (OH radical) can process these persistent organic substances, so research is underway worldwide. Our business started from water treatment and so we have continued our research on active oxygen. This led to us having developed a method of treatment using active oxygen in the air, and no one has successfully developed this method so far.
- For microbial treatment, the products are used for raw garbage treatment, which has many problems, in ASEAN countries, volume reduction of residues in cut vegetable factories, and reducing the processing time taken to compost wastewater excess sludge.

Business deployment in the future

Effective in the pretreatment stage of recycling organic matter

- In ASEAN countries including China, the construction of garbage-burning power plants continues. One factor that tends to be overlooked in this is the cost to transport the garbage to the incineration facility from wherever it is generated. Incineration facilities are often located away from urban areas in order to avoid problems with the local people. In addition, transportation of raw garbage is high in water content, foul-smelling and dirty. In these cases, installing the α-Gaia on a building-by-building basis and on an area-by-area basis results in volume reductions of 80% and water content of 20%, eliminating all transportation problems.
- In the future, we will promote our products more than before in China and ASEAN countries, as products for the pretreatment stage of recycling treatments, such as for use in incineration power generation systems.

Company Profile

Company name: WEF Institute of Technology Inc.
Address: 1-19-15 Do, Otsu-shi, Shiga
Representative: Akira Aoyama, Representative Director
TEL: +81-77-549-8015

Established: July 2016
Capital: ¥10,000,000
Employees: 5
Business: Water treatment, waste recycling

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RITSUMEIKAN

● We have a strong network of researchers working on leading-edge research on Lake Biwa and its surrounding environment.

Research Center of BIWAKO, Ritsumeikan University

Address: 1-1-1Noji-higashi, Kusatsu, Shiga URL: http://www.cfd.ritsumei.ac.jp/~biwako-sigma/

Activities

- At this research center, researchers conduct cross-disciplinary research under the common banner of "Lake Biwa". We promote academia-industrygovernment research projects, including those aimed at solving agricultural problems in drainage areas to improve the environment of Lake Biwa and freshwater bodies worldwide.
- Staff researchers are drawn from various fields, including environmental, urban, biofunctional, robot, and data engineering. Collaboration between researchers, drawing on the strengths of the university enables them to address problems with a novel approach. The Research Center has also conducted many joint and consigned research projects. One feature of the center's technical research and development is that researchers work with the widespread use of R&D results in mind.
- Most recent projects include joint research with a television company to shoot videos of the underwater scenery of Lake Biwa with a high-definition camera mounted on a submersible robot. Joint research to clarify the state of the Hachimanbori Canal in Omihachiman has also been conducted with an urban revitalization company using hydrodynamic simulations. These projects have achieved substantial results.
- BKC Research Office serves as the secretariat, facilitating academia-industry-government collaborations from a comprehensive perspective, covering from launching research projects to intellectual property management.

The research center holds symposia every year, as photographed above. These symposia facilitate communication between participants and are expected to create additional research networks.

Business deployment in the future

- We will disseminate the knowledge and technologies that the university possesses into society to revitalize local industries through technological transfers. To contribute to a better life for people in local communities and other areas, we will strengthen our links with local enterprises and surrounding local governments.

Organization Profile

Organization Name: Research Center of BIWAKO, Ritsumeikan University
Address: 1-1-1Noji-higashi, Kusatsu, Shiga
Representative: Motoki Kubo, Professor, College of Life Sciences
TEL: +81-77-561-2802 (Secretariat)
Established: 2010

Capital: -
Employees: -
Business: Environmental monitoring and analysis, simulation and estimation of economic effects. Promotion of interdisciplinary research on policy making involving the administration and residents.

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● Act as a bridge that connects the intellectual resources of the university to society.

Ryukoku University Ryukoku Extension Center (REC)

Address: 1-5 Yokotani, Setaoe-cho, Otsu-shi, Shiga URL: http://rec.seta.ryukoku.ac.jp/

Products/Services

Support corporate R&D through the intellectual resources of the university.

- After opening its Seta Campus in 1989, Ryukoku University has developed into a university with nine faculties and one junior college. They have worked on collaboration between industry, government and academia, with the Ryukoku Extension Center (REC; established in 1991) taking the lead.
- Built in 1994, REC Hall rents out the REC rental lab (rental laboratory) and rental offices for research and development by companies etc. In the REC rental lab, a lecturer from Ryukoku University supports the user companies as an instructor.
- The Department of Environmental Solution Technology, part of the Faculty of Science and Technology develops people who can consider and solve environmental problems comprehensively and creatively in the fields of both urban environmental engineering (ecology engineering) and environmental biology (ecological management). This department also developed the wastewater treatment technology that allows water treatment agents to be recycled for reuse.

REC rental lab used for research and development by companies etc.

Business deployment in the future

- We will operate the REC rental lab effectively. By holding research seminars and other events that introduce the research of the Department of Environmental Solution Technology, the Faculty of Science and Technology, we will further promote joint research, contracted research, and other activities connected to the water environment business.

Organization Profile

Organization name: Ryukoku University Ryukoku Extension Center (REC)
Address: 1-5 Yokotani, Setaoe-cho, Otsu-shi, Shiga
Representative: Masataka Fukao, Director of the Center
TEL: +81-77-543-7743

Established: 1991
Capital: –
Employees: –
Business: Collaboration between industry, government and academia, lifelong learning services etc.

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SHIGA UNIVERSITY
滋賀大学

● Boasting a long history of research into the environment surrounding Lake Biwa and contributing to the regional community

Shiga University

Address: 1-1-1 Bamba, Hikone, Shiga URL:https://www.shiga-u.ac.jp/english/

Activities

● The University now consists of three faculties after the addition of the Faculty of Data Science in April 2017, the first of its kind in Japan, in addition to its traditional Faculties of Education and Economics. The Faculty of Education has accumulated research findings based on lacustrine ecology, environmental sociology, and environmental pedagogy, while the Faculty of Economics has conducted research looking at environmental economics, agricultural economics, and resource economics. With the addition of the Faculty of Data Science, the University is now an educational research institute that is still traditional while staying on the cutting edge.

● The Research Center for Sustainability and the Environment at Shiga University was established in 2003 as a comprehensive strategic base for environmental research and education at the University. From 2013 to 2014, the center conducted a research project consigned to it by the Global Environmental Faculty (GEF) of the United Nations Environmental Program (UNEP) through the International Lake Environment Committee Foundation (ILEC). Project members are responsible for all the lakes in the Transboundary Water Assessment Program (TWAP). By identifying, classifying and characterizing lakes and basins that have characteristic problems with transboundary management, project members provide the grounds for ranking or prioritizing the lakes.

● By constructing networks with other universities, local governments and economic organizations, the Research Center for Cooperation with Society at Shiga University holds seminars to develop human resources for citizens, companies and local governments. The center also offers consulting services to solve regional problems, utilizing the accumulated research resources of the University. The Agricultural Business Workshop is working on solutions to the murky water produced by agriculture. It also promotes sustainable agriculture and education for consumers. Furthermore, it is assessing the construction of a network between farmers, the modernization of agricultural management, the commercialization of agriculture and its development as the sixth of Japan's industrial bases.

Business deployment in the future

● Research into the environment always requires the cooperation of neighboring research institutes, local administrative bodies, NGOs, NPOs etc. Therefore, we value our interactions with these organizations and make use of the findings from the newly added faculty (Faculty of Data Science), thereby contributing to society while increasing added value.

Organization Profile

Address: 1-1-1 Bamba, Hikone, Shiga
Representative: President Ryuichi Ida
TEL: +81-749-27-1141

Established: 1949
Capital: -
Employees: 409
Activities: Education and research

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滋賀県立大学
THE UNIVERSITY OF SHIGA PREFECTURE

● Supporting the development of the water environment business through collaborative research and contracted research from companies, organizations and the administrations

The University of Shiga Prefecture, Collaborative Research Center

Address: 2500 Hassaka-cho, Hikone, Shiga URL: http://www.usp.ac.jp/english/campus/centers/chisan.html

Activities

- The University of Shiga Prefecture consists the School of Environmental Science, the School of Engineering, the School of Human Cultures and the School of Human Nursing. “General Environmental Management” is one of the compulsory subjects in the first year. With our motto, “Lake Biwa is our campus, and Humanity is our text” and the keywords, “The environment” and “Human life,” we devote ourselves to education and research.
- The Collaborative Research Center was established as the base facility for industrial-governmental-academic collaboration in 1999 and the name was changed to the present one in 2013. The center aims to contribute the educational research activities of the university through collaborative research with business and support for the creation of new projects.
- Followings are the research themes on the water environment: “the dynamic state of organic matters dissolving in lakes and oceans,” “ environmental impact assessment and environmental measures,” “investigation of the mechanism of the outflow of pesticides to rivers, lakes and other water environments,” “research on the growth characteristics of reeds for use in water purification,” “research on the relationship between the management of paddy fields and their habitation by fish,” “paleohydrologic and paleoclimatologic research based on the mechanism of sediment transportation,” “evaluation of the effects of global warming on the ecological system forming the outer layer of Lake Biwa,” “the form and behavior of trace elements in seawater, lake water and river water,” “a comparative study on lakes,” “ water purification using micro bubbles for lakes and deep dam lakes.”

Chemical laboratory that can be leased by collaborating companies

Business deployment in the future

- We are committed to revitalizing the water environment business and other innovative projects, by providing technicalconsultancy and leasing laboratories, measuring systems, and analyzers.

Organization Profile

Organization Name: Collaborative Research Center, The University of Shiga Prefecture
Address: 2500 Hassaka-cho, Hikone, Shiga
Representative: President Koji Yamane
TEL: +81-749-28-8604

Established: 1999
Capital: -
Employees: -
Business: Consultation on technologies, collaborative research with companies and consigned research. Leasing research laboratories and measurement analysis equipment to collaborators

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● AICA, like a bridge, provides support for you in entering Asian markets.

Asia International Cooperation Agency (AICA)

Address: 4-1 Kioi-cho, Chiyoda-ku, Tokyo URL: http://aica.asia/

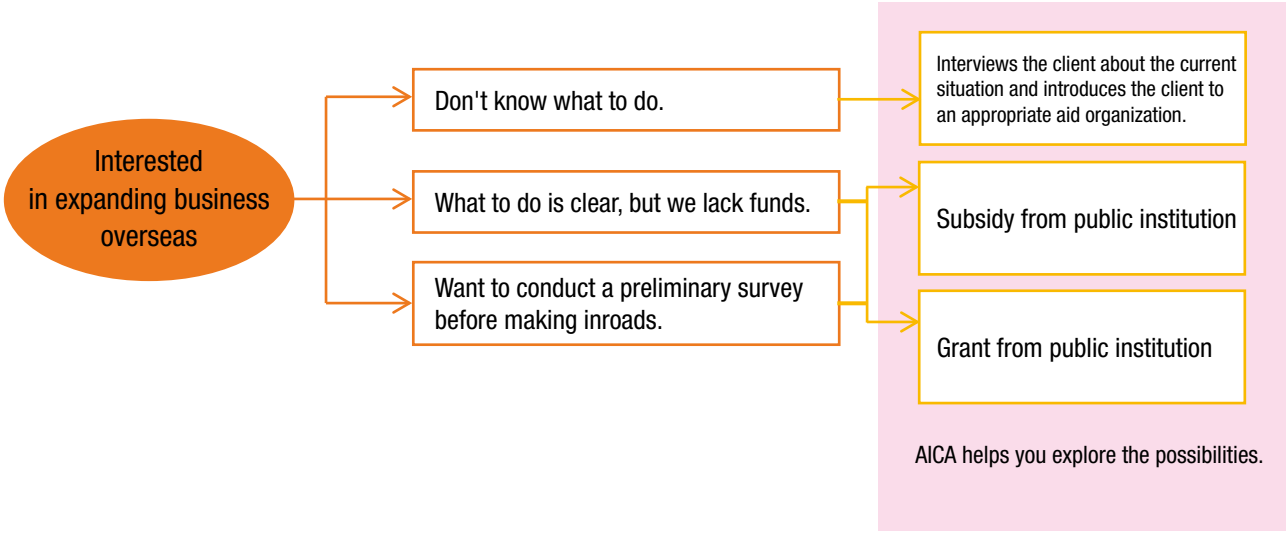
Products/Services

- Support for small- and medium-sized enterprises (SMEs) to expand their business overseas
- Provision of information on China and ASEAN countries

Japanese brands that successively deliver advanced and sophisticated commodities and service systems constitute the continuing base that constantly supports the Japanese economy. Currently they are offering their techniques and services to the world market.
The Asia International Cooperation Agency (AICA) provides extensive support to those who consider making inroads in Asia.

● Problem-solving flowchart

We interview SMEs considering expanding their business overseas or who are interested in doing so to explore with them what options are available. If they have a concrete plan, we are able to introduce them to a local consultant in some host countries.



Achievements

- Held business expansion support seminars for SMEs with full cooperation from JICA
- Member of the Public-Private Council for Promoting the Global Food Value Chain organized by the Ministry of Agriculture, Forestry and Fisheries
- Held the first seminar and government/private sector exchange meetings jointly organized by JICA and the Organization for Small & Medium Enterprises and Regional Innovation
- Authorized as an SWBS partner by the Organization for Small & Medium Enterprises and Regional Innovation
- Adopted into the Innovating Manufacturing Industry Creation and Collaboration Promotion Program run by the Small and Medium Enterprise Agency (collaboration with MYTS Co., Ltd.)
- Entrusted support under the Shiga Prefectural Subsidy Program for Model Projects of Water Environment Business Expansion Overseas

Organization Profile

Organization Name: Asia International Cooperation Agency (AICA)
Address: 4-1 (28F) Kioi-cho, Chiyoda-ku, Tokyo
Representative: Hiroyoshi Ikeda, Director
TEL: +81-3-6261-5383

Established: 2014
Capital: -
Employees: 10
Business: Support for SMEs to expand their business overseas

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● We will help SMEs find solutions to all sorts of problems!

Organization for Small & Medium Enterprises and Regional Innovation, JAPAN, Kinki Head Office

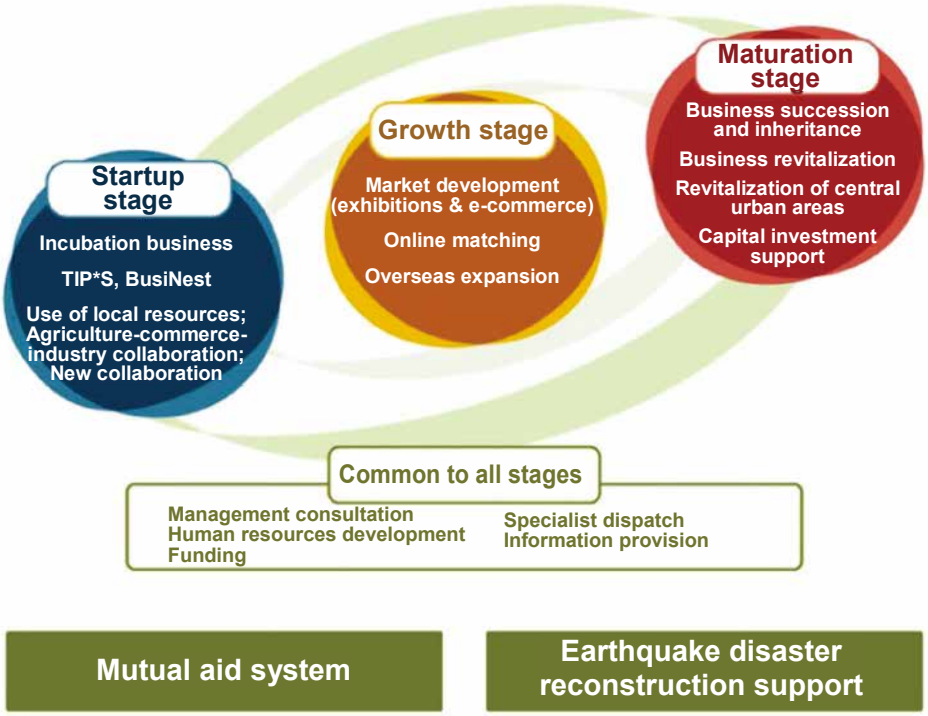
Address: 27th Floor, Osaka Kokusai Building, 2-3-13 Azuchi-machi, Chuo-ku, Osaka
URL: http://www.smrj.go.jp/regional_hq/kinki/index.html

Products/Services

As a core organization for implementing national measures for SMEs, we provide a wide-ranging support menu tailored to companies in the growth stage!

We provide expert advice and a menu of various support items to SMEs that are working on starting up a business, new business implementation, domestic and foreign market cultivation, business succession etc.

Please feel free to contact us.



Company Profile

Company name: Organization for Small & Medium Enterprises and Regional Innovation, JAPAN
Address: 37th Floor Mori Bldg, 3-5-1 Toranomon, Minato-ku, Tokyo
Representative: Atsushi Toyonaga, Chairman
TEL: +81-3-3433-8811 (main)

Established: July 1, 2004
Capital: ¥1,072,921,288,640
Employees: 13 directors, 743 officials
Business: SME support according to growth stage and business challenges

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● Harmonious relationships between humans and nature

Ohmi Environment Conservation Foundation

Address: 2108 Kihan, Yabase-cho, Kusatsu-shi, Shiga URL: http://www.ohmi.or.jp

Activities

- We are working for a harmonious relationship between humans and nature in the lake province of Shiga, actively pursuing projects in five categories:
  (1) Conservation of reed habitats, (2) Environmental conservation and nature protection, (3) Global warming mitigation, (4) Water quality conservation, (5) Information dissemination
- We are implementing the Ohmi Environment Plaza Project jointly with the Shiga Prefectural Government. This project supports businesses and universities in developing new technologies, disseminating technical information, and expanding their water environment technology business overseas mainly in the area of sewerage treatment.
- More specifically, the Ohmi Environment Plaza Project includes the following assistance programs for widespread use of innovative technologies: joint research with enterprises; support for new technology development such as by providing demonstration test fields using sewerage treatment facilities; showcasing technologies at the Ohmi Environment Plaza; running the water environment technology database S-WETS; and information collection and dissemination through overseas technical assistance projects.
- In 2017, we started the water environment technology database S-WETS. This system was developed to help users solve their challenges by matching proposals and needs relating to water environment technology.

Business deployment in the future

- We will enrich the technology showcase at the Ohmi Environment Plaza, and intend to work on information collection and dissemination in Japan and abroad.
- We intend to enhance our support for information dissemination by archiving more information in the water environment technology database S-WETS.

Information dissemination in Japan and abroad (Ohmi Environment Plaza)

Organization Profile

Organization Name: Ohmi Environment Conservation Foundation
Address: 2108 Yabase-cho, Kusatsu-shi, Shiga
Representative: Satoru Nakashika, Director
TEL: +81-77-569-5306
Established: 1993

Capital: ¥460,000,000 (basic fund)
Employees: 22
Business: Nature protection, scenery conservation, conservation of ecosystems and water quality in Lake Biwa, environmental beautification of prefectural land, global warming mitigation, and transition to a low-carbon society

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● We will help companies achieve a sustainable society.

Environmental Conservation Association Of Shiga Prefecture

Address: 1st Floor, Collabo Shiga 21, 2-1 Uchidehama, Otsu-shi, Shiga URL: http://www.kankyohozen.jp/

Association policy

Local partnerships lead to effective action toward an environmentally sound society

No one doubts that the 21st century is the century of the environment. The problem is how we will create an environmentally sound society. This association was originally an organization that was established to advance and improve environmental technology, share knowledge, and support environmental conservation activities while promoting coexistence with the local communities and cooperation with the relevant administrative bodies and organizations. Therefore, member companies share the mission of creating an environmentally sound society in cooperation with society.

To move toward an environmentally sound society, cooperation between the various stakeholders in society is indispensable.

Without cooperation, they will disagree on specifics, even when they are in general agreement, and no action will be taken, eventually resulting in the worst-case scenario. We believe that promoting cooperation with industrial circles, administration, local communities, universities etc. from Shiga Prefecture in order to lead to specific action will be the gateway to effective action on a national level, an Asian level, and a global level. We will work together so that this association can show what it can do as a group in response to the challenges of the 21st century.

(This association was inaugurated in 1981 as Shiga Prefecture Institute of Pollution Prevention and then incorporated in 1984 as the Environmental Conservation Association of Shiga Prefecture. In 2010, it was among the first in the prefecture to be certified as a Public Interest Incorporated Association.)

Primary business

Provide support for companies that respond to increasingly serious global environmental problems and carry out active environmental management.

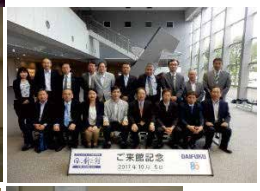
● Compliance support
Creation of frameworks for companies to ensure compliance with environmental laws and ordinances, and support for human resource development.
○ Lectures on laws and ordinances
○ Sales of a compilation of Shiga Prefecture environmental ordinances
○ Provision (online) of topics on laws and ordinances

● Promotion of local partnerships
Value coexistence with local communities and promote social contribution activities that are rooted in the local community.
○ Environmental preservation training on an area-by-area basis;
○ Social gatherings on an area-by-area basis; and others.

● Support for environmental management
Support for implementation of environmental management systems that underly environmental management, and provision of social meeting places where new collaborations are created.
○ ISO14001-related activities; ○ Gatherings; ○ Company tours; and others.

● Various support
For companies to carry out environmental conservation activities on their own, provide support through awareness-raising activities and polite responses to questions.
○ Commendation systems; ○ Consulting services;
○ Setting up PR sections; and others.

● Non profit-making activities
Actively exchange information with, and make policy recommendations to, the administration from a neutral standpoint as a Public Interest Incorporated Association.



[PR brochure]
Aoi Mizuumi (Blue Lake)

Association Profile

Association name: Environmental Conservation Association Of Shiga Prefecture
Address: 1st Floor, Collabo Shiga 21, 2-1 Uchidehama, Otsu-shi, Shiga
Representative: Takaaki Niren
TEL: +81-77-525-2061
Established: 1981
Corporate members: 380 companies (as of October 2018)

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● Local environmental conservation activities

Konan-Koka Environmental Association

Address: C/O South Environment Office, Shiga Prefectural Government, 3-14-75 Kusatsu, Kusatsushi, Shiga URL: http://kkkankyo.com

Activities

Readiness to make a contribution, collaborate with others, refine oneself, and take part in activities

(Introduction)

The Konan-Koka Environmental Association is the first not-for-profit environmental organization in Shiga Prefecture established in May 1978 to conserve great local environments. To achieve this goal, the Association facilitates advances in antipollution technologies, dissemination of relevant knowledge, and the establishment of a voluntary antipollution framework.

Current Association members include about 175 companies plus some individuals within the service areas of the South Environment Office and the Koka Environment Office (covering the cities of Kusatsu, Moriyama, Ritto, Yasu, Konan and Koka) of the Shiga Prefectural Government.

The Association works voluntarily principally to raise environmental conservation awareness in a locally suitable manner, in cooperation with prefectural and municipal environmental services, under a corporate social responsibility mindset, and making use of close collaboration between local businesses.

In June 1992, the Association was honored as a local entity of environmental conservation merit by the Director General of the Environment Agency (present Ministry of the Environment) for the achievements of its members.

The Association has five volunteer groups formed by corporate executive officers to actively promote projects worth taking part in. We hope that our efforts are effective in spreading environmental conservation activities to many businesses, many individuals, and to local communities.

Training workshop: Refining oneself

Training workshop for environmental staff

Recreational areal meeting: Spirit of cooperation

Information exchange meeting between the Association and prefectural/municipal governments

Training to prevent the spread of damage caused by water quality accidents

Manual development group and public relations group: Training environmental staff and information dissemination

Manual for preventing the spread of damage caused by environmental accidents

Newsletter Konan

Planning group: Contribution and collaboration

Lake Biwa Day cleaning event

Organization Profile

Organization Name: Konan-Koka Environmental Association
Address: 3-14-75 Kusatsu, Kusatsu-shi, Shiga
Representative: Shigeki Inoue
TEL: +81-80-8329-2319 (Association's mobile phone)
Established: 1978
Members: 174 enterprises and 11 individuals (as of Nov. 2018)

61

● Build partnerships between developing countries and Japan, and promote international environmental cooperation.

Global Environment Centre Foundation

Address: 2-110 Ryokuchi-koen, Tsurumi-ku, Osaka-shi, Osaka URL: http://gec.jp

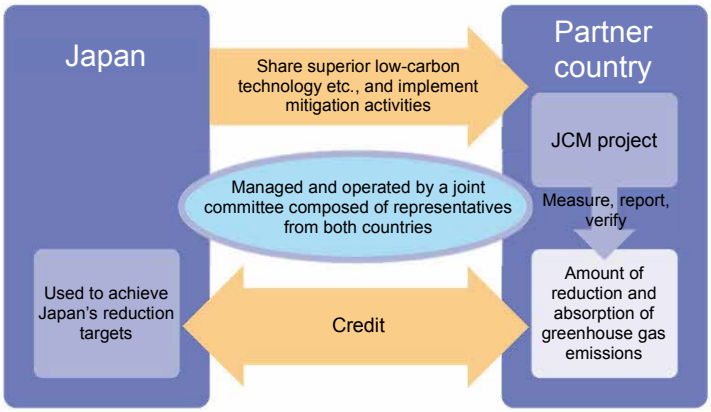
Activities

(1) Support for UNEP-IETC activities
(2) Technical support for developing countries
(3) Contribute to global warming measures
(4) Support for companies' overseas expansion

■ Support for UNEP-IETC activities and technical support for developing countries

We cooperate with projects from the United Nations Environment Program (UNEP) International Environmental Technology Centre (IETC) and support IETC activities in various ways by acting as a bridge between the relevant organizations in Japan and the IETC. We promote Japan's international contribution in environment fields through global environmental conservation activities, such as original investigation and research, collection and provision of information, and holding training courses and seminars.

[Support for hosting international conferences] (group photo)



[Basic concept of the Joint Crediting Mechanism (JCM)]

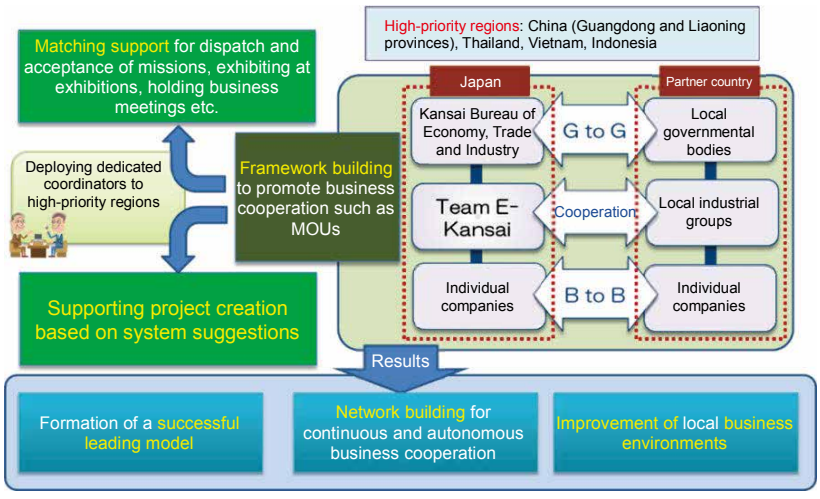
■ Contribute to global warming measures

As the executive body for subsidies provided by the "Joint Crediting Mechanism (JCM) Facilities Subsidized Program" and the "Low-Carbon Technology Innovation Creation Program for Developing Countries" from the Ministry of the Environment, we aim to contribute to sustainable development in developing countries and global warming measures through sharing and introducing superior low-carbon technologies, products, systems, services and infrastructures into developing countries, and by coordinating with the Green Climate Fund (GCF) and the Climate Technology Centre and Network (CTCN).

■ Support for companies' overseas expansion

Team E-Kansai

With assistance from the Kansai Bureau of Economy, Trade and Industry, we act as the executive office of the Kansai-Asia Environmental and Energy-Saving Business Promotion Forum (Team E-Kansai), which was established in November 2018. More specifically, we strengthen the network with the relevant governments and private sectors in China and the ASEAN regions, cultivate the required solutions to local environmental problems, and hold seminars and exhibitions, thereby supporting the overseas expansion of Kansai companies involved in environmental and energy-saving related technologies.



Team E-Kansai activity scheme

Organization Profile

Organization Name: Global Environment Centre Foundation
Address: 2-110 Ryokuchi-koen, Tsurumi-ku, Osaka-shi, Osaka
Representative: Naoshi Suzuki, President
TEL: +81-6-6915-4121
Established: 1992
Capital: ¥1,754,160,000 (basic fund)
Employees: 47
Business: Environmental conservation-related investigation and research business, support for companies' overseas expansion, human resource development etc. in developing countries

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● Promotes technology partnerships by training industrial personnel mainly from developing countries and sending experts to those countries.

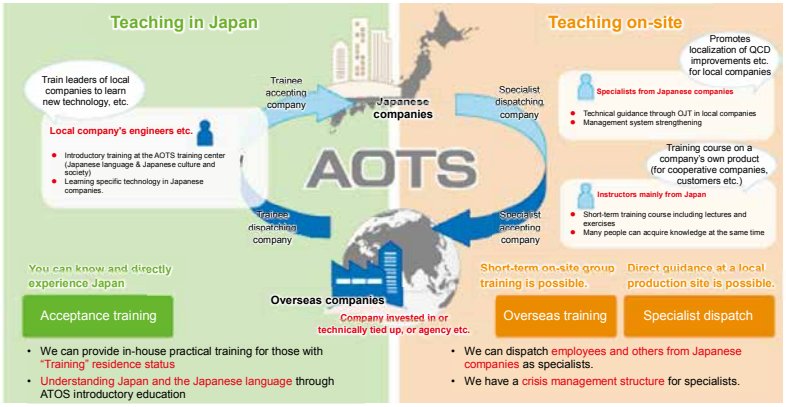
The Association for Overseas Technical Cooperation and Sustainable Partnerships

Address: 1-7-5 Asaka, Sumiyoshi-ku, Osaka-shi, Osaka URL: https://www.aots.jp/en/

Activities

● The Associations' Training Center in Kansai accommodates 300 guests, equipped with a canteen, a tea room, a lounge, laundries, a gymnasium and tennis courts. Guests from both Japan and abroad can stay at the center comfortably for training programs that extend over long periods of time.

● The Training Center provides various training programs annually to some 1,200 people including engineers and executives coming to Japan from 40 countries. These programs are funded by governmental subsidies and trust money under projects such as low-carbon technology export promotion and emerging market development projects. We support enterprises in expanding their business overseas in sectors such as environment and energy, by providing training in response to requests from businesses. At the same time, while trainees are staying at the center, we organize tours to companies in the neighboring area and discussion forums for trainees to understand the excellent practical techniques and business management of Japanese firms.



Organization Profile

Organization Name: The Association for Overseas Technical Cooperation and Sustainable Partnerships
Address: 1-7-5 Asaka, Sumiyoshi-ku, Osaka
Representative: Kazuhisa Ogawa, Director
TEL: +81-6-6690-2670

Established: 1959
Capital: ¥700,000,000 (basic fund)
Employees: 180
Business: Training industrial human resources from within Japan and abroad, dispatching specialists, surveys, and loaning funds to SMEs investing in developing countries

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● Save Water, Save Our Lakes — Promoting the sustainable management and conservation of the lakes of the world —

International Lake Environment Committee Foundation (ILEC)

Address: 1091 Oroshimo-cho, Kusatsu, Shiga URL: http://www.ilec.or.jp/en/

Activities

WLC 17 held in Kasumigaura, Ibaraki Prefecture, Japan

● Shiga Conference on Conservation and Management of World Lake Environment was held in 1984 in Otsu, Shiga. In this conference, Dr.M.K.Tolba, Executive Director of the United Nations Environment Program (UNEP) proposed the establishment of an international committee to realize the transgenerational succession of the conference.
Following the proposal, the International Lake Environment Committee Foundation (ILEC) was established by Shiga Prefecture in 1986. The World Lake Conference (WLC), which succeeded the above conference, is held in various places in the world roughly every two years. Important declarations or proposals such as the Biwako Declaration, Wuhan Declaration, Austin Declaration, Perugia Declaration, Bali Declaration and Kasumigaura Declaration were adopted at WLCs, providinga framework to advance the management of lakes and their basins worldwide.

●Lakes, which contain about ninety percent of the available freshwater on the Earth, are a vital water resource constituting a rich and essential component of nature as well as providing a variety of benefits to human beings. In spite of their global importance, many lakes and other lentic waters around the world are in a critical condition. Collaborating with our worldwide partners from the academic, public and private sectors engaged in the conservation of lakes and other lentic waters, ILEC has been promoting the sustainable management and conservation of lakes in the world and international cooperation and capacity building through training and education.

●ILEC has also been promoting Integrated Lake Basin Management (ILBM), a conceptual framework which emphasizes precautionary measures, scientific approaches and adaptive management.

Business deployment in the future

● The 18th World Lake Conference will be held with the University of Guanajuato in the fall of 2020 in Guanajuato, Mexico.

Organization Profile

Organization Name: International Lake Environment Committee Foundation (ILEC)
Address: 1091 Oroshimo-cho, Kusatsu, Shiga
Representative: Kazuhiko Takemoto, Director General
TEL: +81-77-568-4567
Established: 1986

Capital: ¥1,500,000,000 (permanent property)
Employees: 11
Business: Research and capacity building on the control and conservation of the environment of lakes. Support for conservation activities. Promotion of international cooperation through exchange of knowledge.

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● A range of support services appropriate for SMEs in the developmental stage

Shiga Prefecture Industrial Support Center

Address: 2nd Floor, Collabo Shiga 21, 2-1 Uchidehama, Otsu City URL: http://www.shigaplaza.or.jp

Business deployment in the future

● With the slogan “We will support companies pushing hard,” Shiga Prefecture Industrial Support Center works on providing management innovation support, market cultivation support, manufacturing support, startup support, and various other support appropriate for small and medium enterprises in the developmental stage in the prefecture.

● As part of this work, for manufacturing support, they organize the "Shiga New Industry Creation Network" and the "Shiga Medical-Engineering Cooperation Manufacturing Network" (membership of both networks is free) based on cooperation between industry, academia, government and financial institutions, and provide seamless support for the building of a research and development project, product development, and commercialization.

They are working on the following activities mainly through the "**Shiga New Industry Creation Network**" (membership 245), which is made up of companies and others that are focused on research and development of new technology:

○ Holding matching forums (lectures, gatherings);
○ Project-building support by coordinators;
○ Holding explanatory meetings, round tables etc. on the public funding system;
○ Support for exhibitions at nationwide exhibitions;
○ Support for raising competitive funds (supporting industries, often called "Sapoin");
and others.

Matching forum

They are working on the following activities mainly through the "**Shiga Medical-Engineering Cooperation Manufacturing Network**" (membership 221), which is aiming at industrial development in the medical and health fields:

○ Holding Shiga Medical-Engineering Cooperation Manufacturing Network meetings (lectures, gatherings);
○ Project-building support by coordinators;
○ Holding medical device development seminars;
○ Support for raising competitive funds;
and others.

Medical device development seminar

● In addition, they provide coordination support for research and development in fields related to "growing manufacturing", "the 4th industrial revolution" etc.

Environmental DNA device development seminar

Corporate Profile

Corporate name: Shiga Prefecture Industrial Support Center
Address: 2nd Floor, Collabo Shiga 21, 2-1 Uchidehama, Otsu City
Representative: Yoshio Daido, Chief Director
TEL: +81-77-511-1410

Established: 1999
Capital: -
Employees: 62
Business: Various support for SMEs in the prefecture

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● Economic Organization to develop the potential of Shiga Prefecture with the motto, "Beneficial to our own company, to other companies and to society"

Shiga Economic and Industrial Association

Address: 5F of Collabo Shiga 21, 2-1 URL: http://www.biwa.ne.jp/~shiga-ia/ (in Japanese)

Activities

- Our organization consists of 400 firms covering many business types, from manufacturers to service industries and from local small and medium sized companies to large enterprises with a branch, laboratory or factory located in Shiga Prefecture.
- Our activities aim at facilitating the growth of member firms and the economy of Shiga, making organizational efforts to address issues that cannot be solved individually by member companies. We run committees that work on general affairs, management, technological, environmental, and labor policy issues, in addition to the "Committee to Shape the Future of Shiga." We also organize wide-ranging workshops, such as on IE and innovative manufacturing, for visiting worksites, on cost management, and for female empowerment. Among others, "Asatte Juku" (literally, a workshop to think about the day after tomorrow) is designed for participants to learn management as pursued by top executives.
- As a local organizational member of the Japan Business Federation, we take part in nationwide activities. We also actively promote labor-related projects, such as the provision of labor and employment information and wage survey results, as well as aiding young jobseekers and providing recruiting assistance.
- As the main co-organizer of the Biwako Environmental Business Exhibition (Biwako Business Messe) held annually in Shiga Prefecture's Nagahama Dome, we actively support the expansion of environmental businesses including water environmental businesses.

Organization Profile

Organization name: Shiga Economic and Industrial Association
Address: 5F of Collabo Shiga 21, 2-1
Representatives: Kazuyoshi Ikado, Chairman
TEL: +81-77-526-3575

Established: 2003
Employees: 5
Business: Conduct of various activities on manufacturing and on personnel management to support the development of regional economy and society

66

● We support companies, people and the region.

The Hikone Chamber of Commerce and Industry

Address: 3-8 Chuo-cho, Hikone, Shiga URL: http://www.hikone-cci.or.jp/ (in Japanese)

Activities

- In addition to offering consulting services on management, accounting, tax, investment and labor and holding seminars and lectures, we provide opportunities to exchange information on technologies and management for small and medium-sized companies at our "Hikone Exchange Meetings for Different Types of Industries." We also dispatch experts on business planning, sales promotion, quality control, capacity building and intellectual property to small companies.
- We have inquiry counters for Shiga University, the University of Shiga Prefecture and Seisen University and we act as a bridge between companies and universities to introduce appropriate laboratories or researchers that meet a company's requirements. We conduct a broad consulting service on product improvements, the development of new technology and new products, functional tests, efficiency evaluation, management strategy and the revision of product design.

Organization Profile

Organization name: The Hikone Chamber of Commerce and Industry
Address: 3-8 Chuo-cho, Hikone, Shiga
Representatives: Hideki Koide, Chairman
TEL: +81-749-22-4551

Established: 1938
Employees: 12
Business: General support to companies as the regional economic association

＜Reference＞ About SDGs（the Sustainable Development Goals）…

The United Nations Sustainable Development Summit was held at the United Nations Headquarters in New York on September 25-27, 2015, and the 2030 Agenda for Sustainable Development was adopted with the participation of more than 150 Member States.

The Agenda sets out declarations and goals as action plans for humanity, the planet, and prosperity. The SDGs, succeeding to the Millennium Development Goals (MDGs), consist of 17 goals and 169 targets.

In January 2017, Shiga Prefecture announced that it would be the first prefecture in Japan to incorporate the SDGs into the prefecture's policies.

Shiga Prefecture is an area where the public sector and the private sector have been working together to protect the environment, such as the Soap Movement urging citizens to use environmentally friendly soap, to pass on Lake Biwa in good condition to the next generation.

Besides, in Shiga Prefecture, the spirit of the Omi merchants, whose philosophy called “Three-way Satisfaction” resembling SDGs can still be seen among private entities. The philosophy of Itoga Kazuo, a leading figure after WWII advocating the welfare of the challenged, has been passed down to the current generation in the prefecture.

Shiga's concept of harmonizing economic, social, and environmental aspects is consistent with the spirit of the Sustainable Development Goals.

Shiga Prefecture is expanding partnerships with various stakeholders such as business communities and universities while leveraging the Sustainable Development Goals perspective in its policies. As a result, new initiatives and new partnerships are being created.

Water Environment Business of Shiga

~ Industry know-how & technology around Lake Biwa ~

February 2019

Publisher: Commerce and Industries Policies Division,
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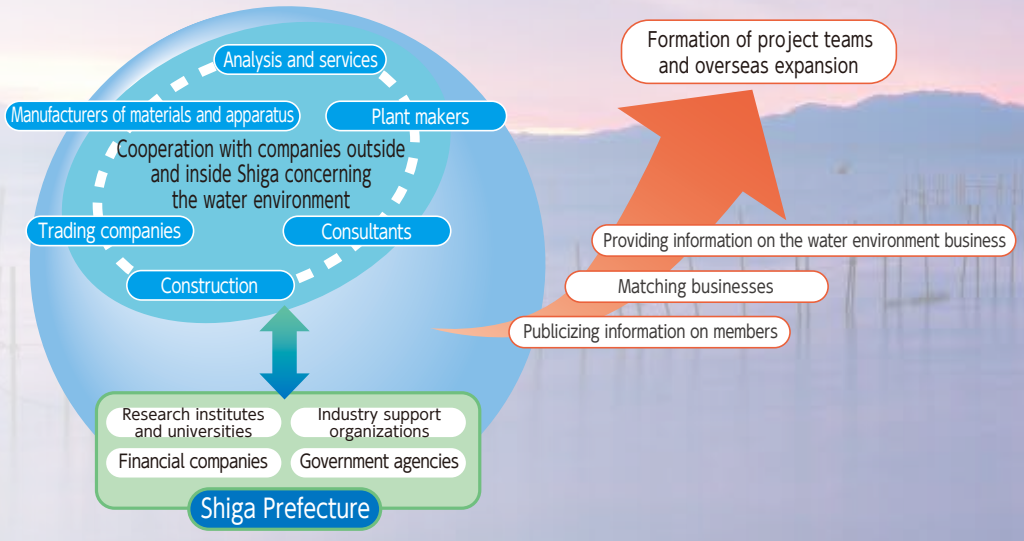
4-1-1 Kyomachi, Otsu, Shiga 520-8577 Japan
TEL: +81-77-528-3715
Fax: +81-77-528-4870
Email: fa0002@pref.shiga.lg.jp
URL: https://www.pref.shiga.lg.jp/mizukankyobusiness/english.index.html

Shiga Water Environment Business Promotion Forum
(Team Water Shiga)

Shiga Prefecture set up the industrial-academic-governmental platform named "Shiga Water Environment Business Promotion Forum (Team Water Shiga for short) to support the expansion of the water environment business by utilizing the accumulated research results of companies and research institutes and their activities for the environmental conservation.



Promotional Image of the Forum

As to the registration and the activities, please refer to the following URL;

https://www.pref.shiga.lg.jp/mizukankyobusiness/english/index.html

Published in February 2019