Biodiversity

Principle and Outline

Daigas Group Biodiversity Policy

Believing that the many blessings of biodiversity are essential for the promotion of the Group's business, the Daigas Group in April 2010 established the "Osaka Gas Group Biodiversity Promotion Policy," which was revised to the Daigas Group Biodiversity Promotion Policy in March 2018. Subsequently, we made revisions to the Daigas Group Biodiversity Promotion Policy in April 2024 to clearly state that we will work to "understand our dependence and impact on biodiversity, as well as the risks and opportunities that come with them," and to "avoid or minimize our impact on biodiversity." Prior to the revisions, we referred to Japan's National Biodiversity Strategy 2023-2030 formulated based on the launch of the Taskforce on Nature-related Financial Disclosures (TNFD)* in June 2021 and Kunming-Montreal Global Biodiversity Framework, which was adopted at the 15th Conference of the Parties to the Convention on Biological Diversity (COP15) held in December 2022. The Group have begun to identify the relevance (dependencies/impacts) between nature and our business as recommended by the TNFD and to study our response, in line with the Policy. Through its business activities, the Group intends to offset its negative impacts on biodiversity and aims to build a nature-positive society.

* An international organization, originally conceived at the Annual Meeting of the World Economic Forum (known as the Davos Meeting) in 2019. It requires companies to disclose and act on their nature-related dependencies and impacts, and risks and opportunities.

Start of Study for TNFD Response

The recognition that natural capital is in crisis has been shared globally, as it was reported at the World Economic Forum that more than half of the world's GDP (approximately 44 trillion US dollars) has been potentially threatened by the loss of nature. In response to this situation, "nature positive," a global societal goal to halt the loss of nature and put it on a recovery track by 2030, and achieve a society in harmony with nature by 2050, was established. Recognizing that companies are required to make efforts to contribute to achieving that goal, the Daigas Group has embarked on an analysis and assessment in line with the LEAP approach*, recommended by the TNFD, in studying nature-related dependencies, impacts, risks and opportunities.

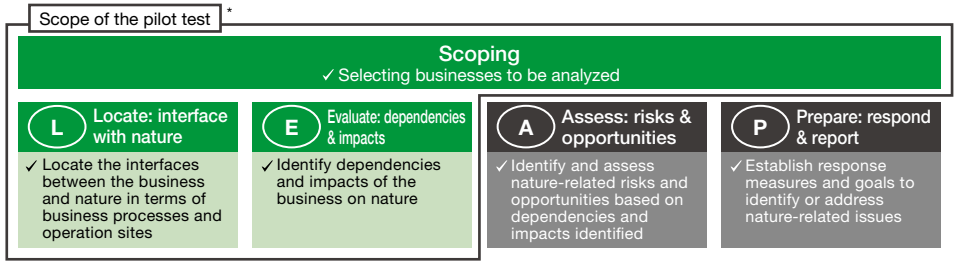
* A methodology developed by the TNFD to enable assessment of nature-related issues in corporate activities such as interfaces with nature, dependencies and impacts on nature, and nature-related risks and opportunities.

TNFD and LEAP approach

Taking into consideration the Group's business scale and the degree of its dependencies and impacts on biodiversity, we included the direct operations of the Group's domestic and international energy (LNG utilization) business in the scope of analysis under the LEAP approach. In the analysis, items related to Locate (interface with nature) and Evaluate (dependencies & impacts) were pilot tested within the scope of the LEAP approach.

As for governance, our biodiversity-related initiatives are managed and supervised under the same system as for climate change. Please see "Disclosure based on the TCFD Recommendations" (P.047) for details.

Pilot Test Process Using the LEAP Approach



* L (Locate) and E (Evaluate) processes were analyzed and assessed this time.

Analysis result 1 Dependencies and impacts on nature

Under the LEAP approach, we used ENCORE,* one of the analysis tools recommended by the TNFD, to analyze the ecosystem services of the business analyzed and their relationship to natural capital in terms of potential dependencies and impacts. We also created a heat map showing the dependencies and impacts relationship between the business analyzed and nature, based on the results of the ENCORE analysis.

As a result of the ENCORE analysis, in the nature impacts category, the impact on nature through GHG emissions was assessed as high, in common except for the storage process in the gas business. For the production process, the impact was assessed as high in the category of impacts on nature through input such as the use of terrestrial and freshwater biological systems.

In the category of dependencies on nature, it was assessed that the businesses analyzed were commonly dependent on the supply service of surface water and underground water. The transportation process was also assessed as being dependent on the climate control services through ocean currents and wind. The ENCORE data used in the analysis (as of April 2024) did not include the impacts by invasive species in the assessment metrics. However, we are aware of their impacts on nature in the Group's businesses, and will continue our existing initiatives.

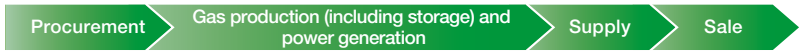
* A tool jointly developed by UNEP-FI, UNEP-WCMC, and Global Canopy that can be used to identify the general dependencies and impacts of each business process relevant to a company.

Heat Map Showing Dependencies and Impacts of the Business on Nature*1

Business category		Dependencies on nature								
		Supply services		Adjustment and maintenance services						
		Water		Removal/mitigation of hazardous substance		Atmosphere-related	Water-related		Land-related	Other
Name of business	Category	Surface water	Underground water	Decomposition function	Filtration	Climate control	Water quality	Water flow maintenance	Slope stabilization and erosion control	Flood and storm prevention
Gas business	Transportation*2	H	H	—	—	VH	M	M	M	H
	Storage	—	—	—	—	VL	—	—	L	M
	Production	H	VH	M	M	M	H	—	M	H
	Supply	—	—	VL	VL	M	VL	VL	H	M
Electricity business	Power supply	VH	M	VL	L	VL	L	M	L	M

Business category		Impacts on nature									
		Input				Output					
Name of business	Category	Use of terrestrial ecosystems	Use of freshwater ecosystems	Use of marine ecosystems	Use of water	GHG emissions	Non-GHG air pollutants	Water pollutants	Soil contaminants	Solid wastes	Disturbance (disturbance to life)
Gas business	Transportation*2	H	VH	VH	—	VH	H	H	H	M	H
	Storage	H	—	—	—	—	—	L	L	—	—
	Production	VH	VH	VH	VH	VH	VH	H	H	H	H
	Supply	H	H	H	H	VH	M	H	H	M	—
Electricity business	Power supply	—	H	—	VH	VH	H	H	H	H	H

Relationship between the Daigas Group's Businesses and Nature Based on the LEAP Approach (Conceptual Diagram)



Ecosystem services we depend on
- Water resources • Climate control functions
- Slope stabilization and erosion prevention functions
- Flood and storm prevention functions

Impact drivers on nature
- Use of terrestrial, marine, and freshwater ecosystems
- GHG and non-GHG emissions • Water use • Water pollution • Soil contamination
- Solid wastes • Disturbance • Invasive species

VH	··· Very High
H	··· High
M	··· Medium
L	··· Low
VL	··· Very Low
—	··· Not Detected

*1 Created in April 2024 using ENCORE. A heat map is created for each business and supply chain (if multiple processes can be considered, the assessment with higher impact is adopted as the result.) [Example of integration]: If there are two processes upstream of Business A, and L and VH are shown in impacts category A, then assessment is determined to be VH. Items that were assessed as ND in all categories of dependencies and impacts were excluded.
*2 Since the same process and assessment results apply to those for electricity business, they are omitted in its section.

Analysis result 2 Interface with important areas in relation to natural capital

In addition to identifying dependencies and impacts on natural capital in the Group's businesses, we identified areas requiring attention*2 in the Group by using a tool*1 recommended as an assessment perspective in the TNFD, with the aim of understanding the relationship between the Group's operation sites and the surrounding natural environment.

The results of the analysis showed that five of our domestic and overseas sites (overseas offices and domestic LNG terminals and power plants) are located in protected areas and areas of biodiversity importance, and we have identified them as falling under areas requiring attention.

As for water stress assessment of our business sites, Osaka Gas has been compliant with CDP,*3 a global environmental protection organization that evaluates environment-related strategies and initiatives of companies and other organizations, and we conducted water stress assessment using Aqueduct at our sites, including office sites not covered by the LEAP approach. As a result, business sites covered by the LEAP approach were not located in areas of high water stress. We found that several business sites not covered by the LEAP approach were located in areas of high water stress, mainly overseas sites. Since businesses at these sites do not use a large amount of freshwater, the Group considers them to be areas of low priority for response while identifying them as areas requiring attention.

Furthermore, we studied trends in the state of the natural environment at our business sites using Biodiversity Risk Filter of WWF, and found that tree cover is on a decreasing trend in the surrounding areas at our overseas sites. The study results suggested that the ecosystem condition tends to deteriorate in the surrounding area of sites in Japan. We will analyze these trends to see how they relate to our business and assess the effectiveness of environmental impact reduction measures through our various existing initiatives.

*1 Area where activities in the organization's direct operations (or in the entire value chain) interface with environments assessed as requiring attention based on each standard. Standards defined by the TNFD are "biodiversity importance," "ecosystem integrity," "water stress," and "importance of ecosystem services supply."
*2 We used four tools: IBAT (Integrated Biodiversity Assessment Tool), Global Forest Watch, BRF (Biodiversity Risk Filter), Aqueduct (WRI Aqueduct Water Risk Atlas and Tools). These tools help us to identify areas requiring attention.
*3 Non-governmental organization (NPO) managed by UK charity. It runs the global information disclosure system for investors, companies, states, regions, and cities to manage their environmental impacts.

Present and future initiatives

In terms of the dependencies and impacts on natural capital identified in ENCORE, the Daigas Group has implemented a wide variety of activities to conserve biodiversity and reduce impacts on nature, including conducting environmental assessments and activities to conserve biodiversity. In the energy business, we conduct ballast water management during transportation by LNG tankers, and appropriately use water resources and control water discharge at our power plants and LNG terminals. Please see P.055-P.058 for more information on our initiatives.

Going forward, we will conduct analysis and assessment in accordance with “Assess” (risks & opportunities) and “Prepare” (respond & report) of the LEAP approach based on “Locate” (interface with nature) and “Evaluate” (dependencies & impacts) obtained from the LEAP approach, as well as the business process specific to the Group’s business and the status of our initiatives, and strive to proactively disclose information.

Efforts live up to the Policy

The Daigas Group has been striving to conserve biodiversity through various measures, including protecting rare native plants growing on the LNG terminal sites, reusing soil excavated during gas piping works, building multi-level gardens at the experimental residential complex NEXT 21,* and planting trees in Japan. Since we formulated the Daigas Group Biodiversity Promotion Policy in April 2010, we have made positive efforts in line with this policy and actively provided information thereon. Our efforts to conserve biodiversity, have been made under the guidance of government and research institutes, outside experts, and external consultants. Since 2003, Osaka Gas has been participating in the Keidanren Nature Conservation Council as a member company; we also participate in the Keidanren Initiative for Biodiversity Conservation to collaborate with stakeholders, including the government and regulatory bodies. Based on its Green Purchasing Guidelines (formulated in 2000, revised in 2022), Osaka Gas works with business partners to promote green purchasing: prioritized procurement of biodiversity-friendly goods and construction works that have less impact on the environment.

In the Daigas Group, every new investment and development project, whether in Japan or abroad, follows an environmental impact assessment at the planning stage when required by law. We survey the water environment, flora and fauna on land, and ecosystems to assess environmental impacts and take necessary measures to achieve a sustainable society. We have set environmental targets in line with our environmental management system (EMS) and the Group Medium-Term Management Plan 2026, both of which are aimed at the complete implementation of the Daigas Group Environmental Policy. These environmental targets also include paying due consideration to biodiversity in business activities.

*Experimental Residential Complex “NEXT 21”
The “NEXT 21” was constructed in October 1993 by Osaka Gas to propose an ideal neo-futuristic urban multiple-unit housing under the concept of “Achieving both comfortable and convenient life and energy-saving/environmental preservation.” With Osaka Gas’s employees and their families actually living there, NEXT 21 has conducted demonstrative experiments based on the themes that are in tune with the times. Such themes include energy saving for the entire building, reducing its CO_2 emissions, greenery restoration and environmental symbiosis in urban areas, ideal forms of residence that reflect diverse lifestyles, and product development. Also, many proposals and presentations that may lead to ideal multiple-unit housing in the future have been made at a time when the liberalization of the energy market is advancing. Some of the proposals have been commercialized.

Daigas Group’s Biodiversity Efforts in the Value Chain

Transportation	**Consideration to biodiversity in LNG tanker transportation**	Production	**Green space management at LNG terminals using native seeds and seedlings, etc.**	Supply	**Reduction in excavated soil from underground gas piping works and promotion of recycling to reduce pit sand extraction**	Office Customers	**Activities to raise awareness toward biodiversity**
	・Ballast water management		・Conservation of native seeds and seedlings and rare species ・Network formation with nature in local areas		・Use of Vermeer method to reduce excavated soil ・Recycling of excavated soil and road work waste		・Provision of information on measures taken at our showroom and LNG terminals ・Use of native seeds and seedlings in the urban development business

Biodiversity conservation activities

The Daigas Group is committed to helping build a society harmonious with nature that can conserve biodiversity and enjoy the bounties of nature into the future, and will undertake efforts that promote the conservation of biodiversity and sustainable use, based on the "Daigas Group Biodiversity Promotion Policy." We promoted the following initiatives in FY2024.3.

Transportation

We manage ballast of LNG tankers we use in accordance with regulations of the country where the port of call is located. In addition, our tankers are equipped with water-processing facilities that meet the conditions set under the International Convention for the Control and Management of Ships' Ballast Water and Sediments stipulated by the International Maritime Organization (enacted in September 2017). We have reduced the impact of ballast on ecosystems by, for example, replacing ballast taken on at a Japanese port with water from the open ocean before releasing the ballast in a foreign port.

Production

At our LNG terminals (Senboku LNG Terminals I and II, Himeji LNG Terminal), green areas were managed in a way that contributes to biodiversity through native seeds and seedlings utilization, etc. In addition, biotopes were created, which also serve as refuge for rare species, and biodiversity monitoring studies were conducted at LNG terminals in collaboration with external experts.

Supply

The Daigas Group works to reduce the amount of excavated soil and waste asphalt generated as a result of gas pipe installation, which contributes to reduce impact on the ecosystem. Ways to achieve this include the Vermeer method, which requires soil excavation of only two points, and the shallow pipe installation method. In FY2024.3 these methods allowed us to reduce the amount of excavated soil generated by approx. 399 thousand tons compared to what would have been generated using conventional methods. Our soil and asphalt recycling system promotes the reuse of waste asphalt and excavated soil as either recycled asphalt, regenerated roadbed material, or improved soil. These efforts allowed us to recycle 98% of material excavated during gas pipeline construction in FY2024.3 and send to final disposal approx. one thousand tons.

* Since April 2022, the city gas supply business has been conducted by Osaka Gas Network Co., Ltd.

Business office Customers

We conduct community and environmental communication, as well as environmental education in collaboration with local educational institutions, in approximately 100 m^2 of rice paddies and 12 m^2 of fields created on the roof of its own facilities. In addition, our group company engaged in urban development projects is working on planting plants that take biodiversity into consideration at its facilities and the condominiums they develop, encouraging interaction with the local community and creating connections between people and the city.

Habitat creation for biodiversity: Use of native seedlings in green space management at LNG terminals

At Osaka Gas LNG terminals, we are conducting afforestation activities that recreate the area's original ecosystems and are capable of supporting a high level of biodiversity. We are also regularly conducting biodiversity monitoring studies to verify the effectiveness of our biodiversity efforts.

At the Senboku LNG Terminal, our concept is "a network of greenery that brings us closer to the community." We are striving to create a green belt that will be home to a diverse range of life through efforts such as planting native seedlings in a green area, the "Senboku no Mori," and planting a field of Japanese blood grass as described in "The Pillow Book," an ancient Japanese essay written in the Heian Period.

Green belt planted with Cogon Grass at Senboku LNG Terminal

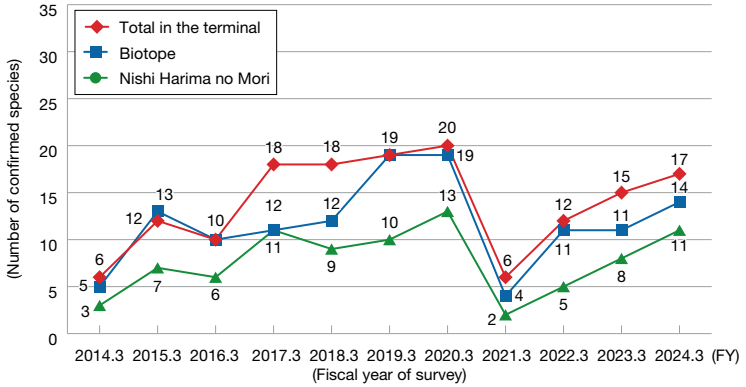
Since 2002, under the guidance of the Museum of Nature and Human Activities, Hyogo, the Himeji LNG Terminal has been preserving rare plants native to the area of Nishi Harima, Hyogo Prefecture. We are currently growing rare plants including Gardneria multifolia "CHITOSEKAZURA" and Red-root Lithspermu (both rated level 2 endangered on the Ministry of the Environment's endangered species list). The new biotope created in FY2014.3 reproduces satoyama woodlands, grasslands and marshes with plants originating from the area of Nishi Harima, preserving such rare species as the Platycodon or Japanese Bellflower.

Biotope at Himeji LNG Terminal

LNG terminals are required to form green areas by laws and regulations, and a certain amount of greenery needs to be secured. Both LNG terminals believe that the quality of greenery is important, and are contributing to the preservation of biodiversity in the local communities by using seedlings of local origin.

As there are indications that these efforts are resulting in an increase in the number of insect and bird species, it is hoped that these trends will also spread to neighboring green belts. In the future, we will continue to monitor these areas under the guidance and advice of experts.

■ Changes in Butterfly Species Confirmed at Himeji LNG Terminal



*The decline in the number of confirmed species in FY 2020 was due to the fact that survey activities were suspended due to COVID-19 measures.

Creation of biodiversity habitats: Development of condominiums introducing the indigenous species in their gardens

Osaka Gas Urban Development Co., Ltd. is a real estate company and is engaged in the development and management of office buildings and condominiums/rented apartments. In addressing “co-existence with the environment,” one of its “five focuses” for urban and property development, Osaka Gas Urban Development Co., Ltd. is pursuing a planting plan that takes biodiversity into consideration.

The planting of native seedlings of “Chimakizasa,” a species of bamboo grass called Sasa, was introduced to the garden of The Urbanex Kyoto Matsugasaki, which was completed in March 2014. Chimakizasa has been recognized as an endangered plant in Kyoto City as a result of excessive eating by wild deer, whose population in the neighboring woodlands has been increasing in recent years. All of the 10 bamboo grass plants that were planted in the garden of The Urbanex Kyoto Matsugasaki were donated by the Chimakizasa revival committee, a local team formed to increase numbers of the plant, with members being mainly residents of Sakyo Ward, Kyoto City and researchers from Kyoto University.

At the “Urbanex Kobe Okurayama” completed in February 2016, Osaka Gas Urban Development has planted Japanese blue oaks, gooseneck loosestrife, and other local seeds/seedlings with support from the Museum of Nature and Human Activities, Hyogo. Signs describing plant names and their characteristics were also installed to help local residents learn about the importance of biodiversity. These combined efforts, including the active use of native seedlings, earned the 2016 Good Design Award.

Osaka Gas Urban Development Co., Ltd. has steadily increased the use of native seedlings in the planting of its properties, and has introduced them to 37 properties as of March 31, 2024. Osaka Gas Urban Development will continue to standardize biodiversity-friendly planting plans as specifications and work on such plans at the condominiums it develops.

Scenes Tsukaguchi (Completed in May FY2024)

As of March 31, 2024, 37 properties have introduced local biodiversity-friendly planting.
(including properties for sale and for rent)

Biodiversity-conscious initiatives at the Scenes Tsukaguchi condominium selected for the 10th ABINC Certification and Good Design Award 2020

In February 2021, Scenes Tsukaguchi, a condominium in Amagasaki City, Hyogo Prefecture, developed by Osaka Gas Urban Development Co., Ltd., acquired the 10th Ikimono Kyosei Business Establishment *1 certification organized by the Association for Business Innovation in harmony with Nature and Community (ABINC)*2.

The ABINC certification aims to foster harmony between nature and human beings in business activities. ABINC conducts a third-party assessment of biodiversity-conscious initiatives to create, manage and use green spaces, and it certifies eligible business sites as “Business Sites in Harmony with Nature.” Osaka Gas Urban Development constructed Scenes Tsukaguchi while implementing biodiversity-conscious initiatives in cooperation with experts, including those from the Museum of Nature and Human Activities, Hyogo. On the condominium site, native plant species, such as the bamboo-leaf oak and the sawtooth oak, were planted to create green spaces in consideration of local vegetation. These green spaces were designed to create a network with other small green spaces dotted nearby and help birds and butterflies find places to inhabit. In addition, seedlings thinned in the planting management process on land owned by the Daigas Group were transplanted to the condominium site to help preserve the genes of plant species native to the Rokko mountains in Hyogo prefecture.

Scenes Tsukaguchi also won the Good Design Award 2020 organized by the Japan Institute of Design Promotion. Following the Good Design Award 2016, this was the second time that Osaka Gas Urban Development had won the same award. The 2020 award came to the company in recognition of its success in facilitating interactions between the condominium and the neighborhood and creating a linkage between residents and the local community by designing the condominium to be open under the concept of “Re:CONNECT,” and in fostering communication between people from different areas or age groups in the living environment abundant with rich natural features by building three gardens with different themes on the condominium site.

*1 “Ikimono Kyosei Business Establishment” (lit. “Business Sites in Harmony with Nature”) is the registered trademark of the Japan Business Initiative for Biodiversity (JBIB).
*2 ABINC (Association for Business Innovation in harmony with Nature and Community)

Scenes Tsukaguchi

Appropriate Use and Discharge of Water Resources

Water is not a primary material among the products handled by the Daigas Group. We recognize that the use of water does not pose a major business risk for our Group. However, the Group controls water discharge after using drinking water, industrial-use water, groundwater and seawater. At power plants, core facilities for its electricity business, the Group uses industrial water as a coolant in a steam turbine condenser, and vaporizes it inside the cooling tower. Drinking water, industrial-use water and groundwater are also used at LNG terminals, power plants and offices, and discharged. Seawater is mainly used for vaporization of LNG at city gas plants and for cooling in steam turbine condensers at some power plants. We discharge the seawater to the sea without consuming it or affecting its composition. In discharging water, we have conducted water quality inspections in line with relevant laws, ordinances and agreements with local municipalities. We continued to comply with the effluent standards of the Water Pollution Prevention Act, etc. in FY2024.3, and there were no violations. The Group sees water as a limited natural resource. We will continue to use water adequately, control its discharge strictly, and promote water saving.

Osaka Gas has pleased to announce that we have been recognized for leadership in corporate transparency and performance on water security by global environmental non-profit CDP, achieving a place on the CDP A- List.

Amount of Water Intake in FY2024.3

General water, industrial water	11,744 thousand m^3
Undergroud water	3,493 thousand m^3
Seawater	519,326 thousand m^3

Amount of Water Discharge in FY2024.3

Sewer	687 thousand m^3
River	3,043 thousand m^3
Sea	520,739 thousand m^3

Efforts to reduce water use

The Daigas Group is working together with business partners and customers to reduce water consumption.

In its employee activities at offices, the Group strives to conserve water and addresses the challenge of reducing the amount of water it uses.

Making use of its technological capabilities cultivated in the gas business, Daigas Energy Co., Ltd., a wholly owned subsidiary of Osaka Gas, provides customers with water purification and treatment services, including cooling water chemical services, to reduce water consumption.

Biodiversity risk assessment

The Daigas Group, being aware of the environmental impact of its value chain, strives to minimize its impact on biodiversity and expand its contribution.

We conduct questionnaires regarding sustainability activities at our LNG suppliers to check on the status of their monitoring activities for local ecosystems and their efforts to conserve the biodiversity of local ecosystems.

In the Group, every new development project, whether in Japan or abroad, follows an environmental impact assessment at the planning stage when required by law. For example, in the process of constructing the Senboku Natural Gas Power Plant, the core facility for the Group's electricity business, between 2002 and 2006, we conducted an environmental impact assessment. It covered the construction work (the impact of transportation of construction materials, such as air pollution, noise, and vibration) and the presence and shared use of land and workpieces (the impact of ground modification and the facility's existence on local flora and fauna and the impact of exhaust gas and wastewater from the facility in operation on the quality of air and water). We also adopted environmental conservation measures against air pollution, noise, vibration, and wastewater, as well as measures to form green areas that foster biodiversity, in order to further reduce the environmental impact of the project.

Also, in the Himeji Natural Gas Power Plant construction project, which Himeji Natural Gas Power Generation Co., Ltd., a wholly owned subsidiary of Osaka Gas, is implementing, an assessment process has been completed in compliance with the Environmental Impact Assessment Act.

Please see the following website for more information about the initiatives in the Himeji Natural Gas Power Plant Construction Project.