

>> OUR ENGINEERING ACTIVITIES CONTRIBUTE TO PRESERVING THE ENVIRONMENT

Environmental Activities

JGC's Engineering & Construction (E&C) business, which provides engineering, procurement and construction (EPC) services for energy-related plants such as for oil and natural gas, is closely related to environmental protection in and of itself.

Since the 1960s, JGC has worked on environmental issues as an E&C contractor, striving for cleaner petroleum products, making its plants more energy-efficient, and eliminating hazards from waste products. Our understanding that our business activities themselves contribute to environmental protection has not changed today, and this is symbolically expressed in our corporate philosophy.

Activities that contribute to environmental protection are expanding into a wider range outside of our E&C business, as we start up a new clean development mechanism (CDM) business in our enterprise investment business.

Activities focused on how to provide our customers with plants that place a minimum burden on the environment are also an important part of JGC's environmental management approach. We are testing various techniques and improvements at each stage of our E&C business, which have won high marks from our customers.

These activities to lessen the burden on the environment at the home office and construction sites involved in EPC activities are the foundation supporting JGC's environmental management. CO₂ reductions at the home office and reduction/recycling of waste products at construction sites are producing improved results every year.

Corporate Activities Related to Environmental Protection

JGC's business activities, such as the execution of energy-related plant construction projects for natural gas and oil, development of new fuels, and promotion of a global-warming-gas emission credits business, are closely connected to the protection of the global environment. Through these business activities, JGC is actively involved in reducing environmental burdens.

Effective use of natural gas

Use of natural gas is rapidly increasing because it is a relatively clean fuel that is environmentally friendlier, not only having higher energy efficiency than oil or coal, but contains no sulfur, nitrogen, or metals and burns with fewer CO₂ emissions. JGC is contributing to the expanded use of natural gas as a clean fuel by executing construction projects for liquefied natural gas (LNG) plants around the world and constructing the world's first GTL plant, which manufactures clean synthetic oil using natural gas as a raw material. In addition, we are developing manufacturing/usage technologies for dimethyl ether (DME) and manufacturing technologies for synthetic gas, aiming to further expand ways to use natural gas.



World's first commercial GTL plant, constructed by JGC, Malaysia

Making fossil fuels cleaner

Transforming petroleum, a substance that places a heavy burden on the environment, into a cleaner fuel is a major theme of JGC's business activities, which emphasize environmental protection. We are advancing various activities, such as the construction of plants compatible with moves to make petroleum fuel sulfur-free, and the development of technologies for removing toxic materials from crude oil.

Waste disposal

Human activity generates various waste products. Waste products sometimes contain materials that are toxic to living organisms or materials that can be reused. Leaving toxic materials untreated increases the burden on the environment. JGC is developing technologies for radioactive waste disposal, collecting basic data related to radioactive waste disposal, and developing technologies for the disposal of sludge generated from sewage treatment in order to reduce the environmental impact of waste products.

■ Contributions to greenhouse gas reduction

Global warming is a pressing issue that must be tackled by global society. JGC is promoting activities aimed at reducing greenhouse gases based on technologies and know-how accumulated over many years of energy plant construction and technological development.

■ Pursuit of renewable energy

Natural energy sources such as solar, water, wind, and biomass are attracting attention as renewable energy sources that place little burden on the environment. JGC is developing manufacturing technologies related to new fuels that use biomass as raw materials, aiming for zero CO₂ emissions.

Environmental Protection Activities During Project Execution

JGC's environmental management system takes into account the environmental impact of the overall project, including construction and operation, and places emphasis on environmental management during project execution. We take particular care in drawing up and applying appropriate management systems in the design stage, when the basic specifications of the plant are determined.

Environmental protection at the design stage —Creation and implementation of environmental management plan

The objective of the environmental management system at the design stage of project execution is to take up problem areas expected to affect the environment during operation based on the unique environment of each project, and take measures to reduce that impact from the design stage. By doing so, environmental issues are clarified within overall project operations, enabling specialist engineers to take appropriate measures systematically.

The contents of the environmental management system during the design stage are listed in a document called the environmental management plan, summarized to enable environmentally friendly project execution (design, construction, operation), and contain the following items.

1. Project environmental policy
2. Organization, accountability for project environmental operations
3. Contents of operations that impact the environment
4. Audit of environmental operations

The environmental management plan envisions not only construction and operation of the plant, but also dismantling/disposal of the plant 20 to 30 years down the road, and sometimes prohibits the use of materials and substances that impact the environment (such as asbestos and Freon) at the design stage.



President Takeuchi patrols a construction site

Once the environmental management plan for the design stage is proposed, a meeting is held of project managers from the various design divisions to convey the contents of the plan and project-specific areas warranting caution. The project managers then spread the word to all members of the project team, and environmentally friendly project execution is implemented.

Environmental protection at construction sites

JGC has long taken the environment into consideration during construction, based on customer requests. Since the environmental management system is a structured method that covers all aspects equally, and is not influenced by differences in the level of customer demands or personal experience and hunches, we are currently introducing the environmental management system into construction work to strengthen our consideration of the environment.

We are placing emphasis on the following.

1. Tightening legal compliance by specifying environmental regulations related to construction work.
2. Improving customer satisfaction and strengthening communication among interested parties.
3. Minimizing environmental disasters and managing environmental risks by anticipating, preparing for, and dealing effectively with emergencies.

At construction sites within Japan and abroad, we are advancing environmental management activities for construction work through the following steps.

1. Specifying of environmental aspects
2. Setting of environmental objectives/targets
3. Creation of an environmental management plan for construction work
4. Environmental education/training
5. Implementation of regular tests for emergency response procedures
6. Monitoring the measurement of environment-related factors
7. Monthly reports

Activities to lessen the burden on the environment

By employing environmental management systems for both office activities and project execution activities, we have reduced greenhouse gas emissions from office activities by more than 3,000 tons compared to fiscal 1998, when we moved our offices to Minato Mirai 21. In addition, we have steadily reduced the burden we place on the environment, turning close to 80% of waste products at medium-sized plant construction sites into resources.

Initiatives for office activities

JGC's Yokohama World Operations Center is located in Queen's Square Yokohama, a multi-use complex in the Minato Mirai 21 district of Nishi-ku, Yokohama. In the Minato Mirai 21 district, urban management is conducted based on the Basic Agreement on Town Development under the Minato Mirai 21 agreement, with emphasis placed on urban planning that takes into account energy conservation, measures toward a recycling society, urban disaster prevention and surrounding areas. JGC's initiatives to reduce the burden on the environment from office activities are being implemented on top of the basic foundation of environmental protection provided by these facilities.

Contribution to Society

JGC is involved in a training program called "Job Shadow" provided by Junior Achievement Japan, a non-profit organization working to educate and inspire young people to value free enterprise, business, and economic activity to improve the quality of their lives. As part of efforts in this area since fiscal 2004, in fiscal 2007 JGC hosted visits by 31 students from the Yokohama Seiryō Sogo High School to the JGC Yokohama World Operations Center during which the individual participants were given the opportunity to accompany and directly observe JGC staff members as they carried out their duties. In the U.S., more than 2 million high school students participate annually in similar Junior Achievement programs which help them to make career decisions and plan their future through actual workplace visits.

As part of other social contribution activities, JGC has also established the JGC-S Scholarship Foundation (formerly the Saneyoshi Scholarship Foundation) and the JGC Social Welfare Foundation, and provides support to them.

The JGC-S Scholarship Foundation was originally created as the Saneyoshi Scholarship Foundation in 1968 from an endowment by the late Masao Saneyoshi, JGC founder and president, and was renamed in October 2007. The foundation encourages the advancement of science and technology, the cornerstone of Japanese industry, and seeks to cultivate world-class scientists, engineers, and researchers. To this end, the foundation's operations include offering educational loans to science and engineering students, providing grants to overseas students studying in Japan, and offering research assistantships to young science and engineering instructors.

Now in its 40th year, the JGC-S Scholarship Foundation disbursed a total of ¥285 million in educational funds and assets in fiscal 2007, including ¥186 million in educational loans, ¥49 million in grants, and ¥47 million in research assistantships. In fiscal 2008, the foundation will begin offering new types of grants to overseas students, and is taking steps to further expand the scale of its systems and operations accordingly.

The JGC Social Welfare Foundation was established in 1994 to commemorate the Company's 65th year in business. Alongside the development and provision of social welfare equipment for physically disabled people, this foundation provides funding assistance to support groups and volunteer organizations in Japan's Kanagawa Prefecture involved in social welfare services for the mentally and physically disabled and the elderly. Through these activities, the foundation strives to make a positive contribution to the local community. In fiscal 2007, the foundation logged 19 cases of assistance to support groups, and 14 cases for volunteer organizations.



High school students taking part in a meeting at JGC through "Job Shadow"