JGC

Environment Report 2009

Editorial Policy

The JGC Group engages in environmental preservation activities in accordance with its Environmental Policy (see P3). In Fiscal 2006, to report on the nature and performance of these environmental preservation initiatives, we issued a report titled, "*Working for Societal Development and Global Environmental Preservation*" on the JGC website and in a PDF format. Since fiscal 2007, we have reviewed the details of these activities every year and issued our annual Environmental Report. We have also updated the environment-related content on the JGC website and posted this report.

A description of the principal content for fiscal 2008 follows.

(1) The JGC Group's Environmental Technologies
In this section, we introduce several environment-related businesses in which JGC is involved.

(2) Concern for the Environment in Business Activities
Since JGC is an engineering company, our business is closely related to environmental preservation in and of itself. In this section, we describe how JGC demonstrates consideration for the environment at each stage of project execution.

(3) Environment Protection Framework Based on Environmental Management Systems
As JGC is an engineering company which has no production facilities of its own, our report concerns itself with the targets and results of the environmental preservation activities we undertake in our business activities at construction sites in Japan and overseas.

(4) Reporting on the Social Dimensions of Sustainability
In this section, we report mainly on occupational health and safety, and regarding contributions to communities in countries around the world.

Scope of Reporting
The content of this report includes information concerning the activities of JGC Corporation ("JGC") together with those of 16 domestic and 19 overseas Group companies. At left [3]: This report covers the JGC Group's construction sites in Japan and overseas and offices in Japan. (Environmental impact reduction reports for overseas offices are not included at this time.)

Reporting Period
This report is compiled principally on the basis of data for fiscal 2008 (from April 1, 2008 to March 31, 2009). Important matters, and those regarded as highly significant, concerning activities outside the reporting period are also reported.

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Message from CEO

Toward a Sustainable Society

Keisuke Takeuchi
Chairman and Chief Executive Officer
JGC Corporation

In order to realize a sustainable society, environmental issues including global warming that are becoming increasingly diversified and their impact more noticeable will have to be decisively tackled. All of us on earth are required to play our part in this effort and enterprises in particular are expected to exercise an important role through their business activities.

Since its establishment in 1928, JGC Corporation has been contributing to the stabilization of the world's energy supply through its core engineering business, which includes the design and construction of oil and natural gas energy production plants. Recognizing that engineering enterprises have a role in making energy cleaner, in rendering plants more energy-efficient, and in detoxifying wastes, we are actively and consistently involved in activities that contribute to environmental protection and conservation.

Our corporate philosophy can be summarized as, "Our group aim is to be a prosperous enterprise with engineering as our core business. Our goals include contributing to the prosperity of the global economy and society while working to assure environmental preservation". Based on this philosophy, we involve ourselves in a variety of business activities.

"Environment Report 2008" details the measures being taken by the JGC Group to protect the environment and conserve resources. The Report describes what we are doing to protect the environment in all business phases, ranging from sales activities, design work, material procurement, and construction, to investment businesses and research & development. We want you to know about the efforts we are making to aid in environmental conservation.

The JGC Group is continually examining the burden placed on the environment by our business activities, which in turn allows us to take the steps needed to mitigate such impact. As in the previous year's Report, the 2008 edition discusses the environmental loads introduced by construction work at our overseas project sites. The Report also shows labor safety indicators as a function of the Group's efforts towards meeting its societal responsibilities.

Starting from fiscal 2008, the JGC Group launched the Zero-emission Initiative which targets the elimination of toxic byproducts emanating from our business activities. In 2008, we focused on domestic sites. We set targets that included the minimization of CO_2 emission levels, as well as the improvement of industrial waste recycling efficiency rates. In this way, we have actively worked at reducing environmental loads.

The JGC Group is committed to stepping up even further its efforts to realize a sustainable society. We greatly appreciate your support.

Environmental Policy

JGC is committed to achieving environmental excellence in both, its corporate operations and the services it renders its clients, as a reputable and professional engineering contractor. To meet this commitment, JGC hereby establishes the following principles, which shall be applied throughout its operations.

• We shall endeavor to preserve the natural environment through the prevention of pollution and the conservation of energy and natural resources.
• We shall provide our clients with technical solutions that conserve energy and natural resources and reduce pollution and other adverse environmental impacts
• We shall fully comply with both, environmental laws and regulations and the environmental requirements of our clients.
• We shall reduce the production of waste through measures that emphasize reuse, recycling.
• We shall apply the following specific principles to the execution of our EPC projects:

- Design Phase:
we shall reduce the adverse environmental impacts of completed plants by minimizing a plant's operating consumptions of energy and natural resources and minimizing its emissions of pollutants and its production of waste.

- Procurement Phase:
we shall give preference to vendors that adopt environmentally friendly manufacturing operations.

- Construction Phase:
we shall plan construction activities to minimize polluting emissions, adverse impacts on the surrounding environment, the consumption of energy and resources, and the production of waste, and we shall ensure that our subcontractors adopt work practices consistent with this principle.

To ensure the thorough, consistent and effective implementation of this policy throughout its operations, JGC shall establish, maintain and continually improve a corporate Environmental Management System in conformance with ISO 14001.

Masahiko Yaegashi
President and Chief Operating Officer,
JGC Corporation
1st July 2009

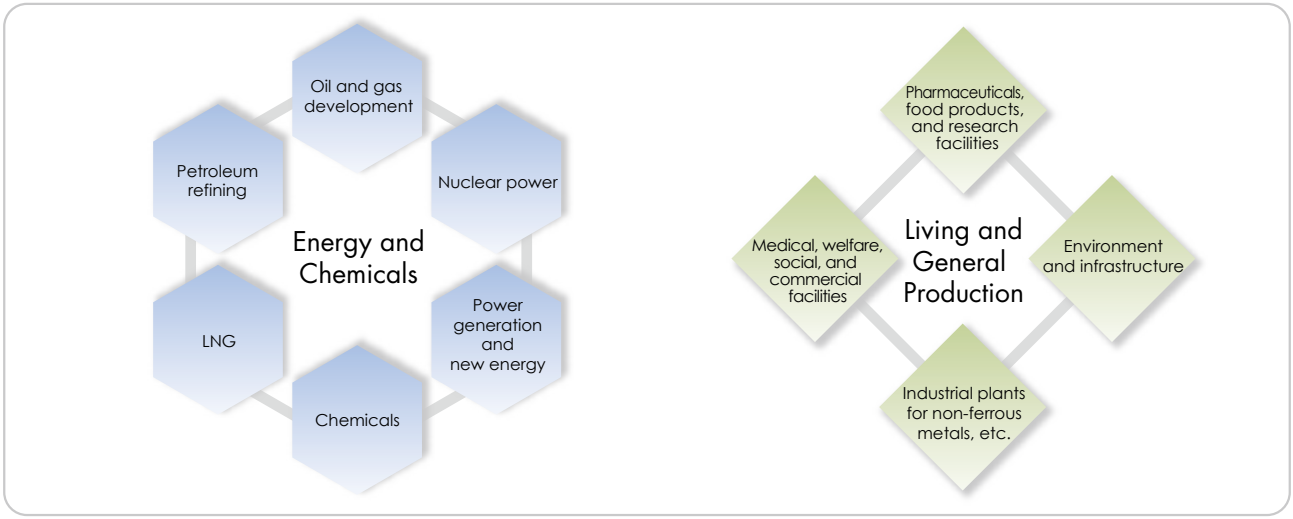
Engineering is Essentially an Activity that Contributes to Environmental Preservation.

JGC's engineering business, which involves the provision of EPC (engineering, procurement, and construction) services for oil and natural gas production plants, is intrinsically closely related to environmental preservation.
JGC has grappled with environmental issues in its capacity as an engineering company since the 1960s. We remain keenly aware that our business activities in and of themselves must contribute to environmental preservation, and that awareness is symbolically manifested in the JGC corporate philosophy.
In the enterprise investment business, a new business sector for JGC, we have further expanded the scope of environmental preservation activities. For instance, we have launched the clean development mechanism (CDM) business.
Activities to supply clients with low-environmental-impact plants are another important constituent element of environmental management at JGC. Various devices and improvements have been tested and proven in each process of plant EPC services and have won accolades from clients.
Environmental impact reduction activities at construction sites and the home office are the foundation that supports environmental management by JGC. We achieve significant results each year from waste reduction and recycling efforts at construction sites and CO_2 reduction at the home office.

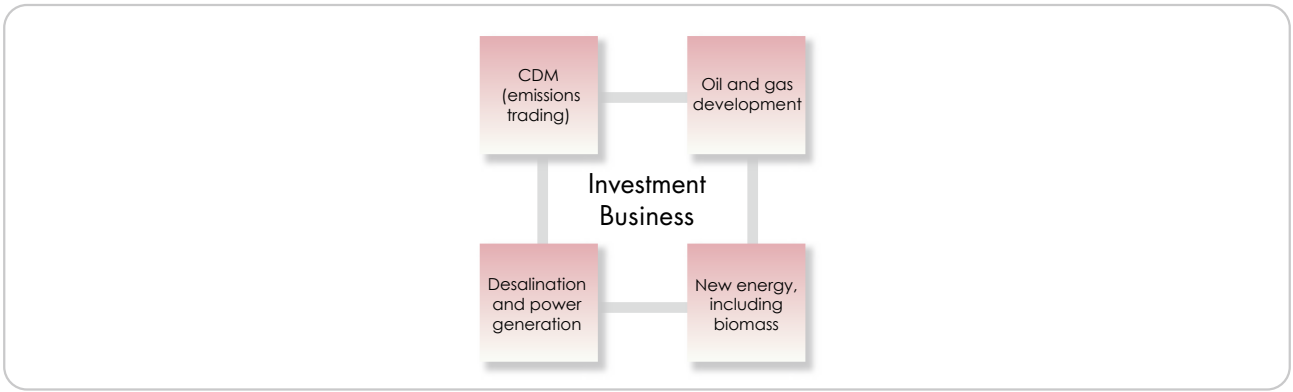
Relationships Between the JGC Group's Businesses, Society, and the Environment

The JGC Group provides engineering services to private-sector corporations, government organizations, and other clients around the world. Needless to say, this business is intrinsically closely related to the efficient use of energy and global environmental preservation. We also engage in business activities closely tied to society and the environment in a number of other business fields, such as our enterprise investment in the environment and energy sectors.

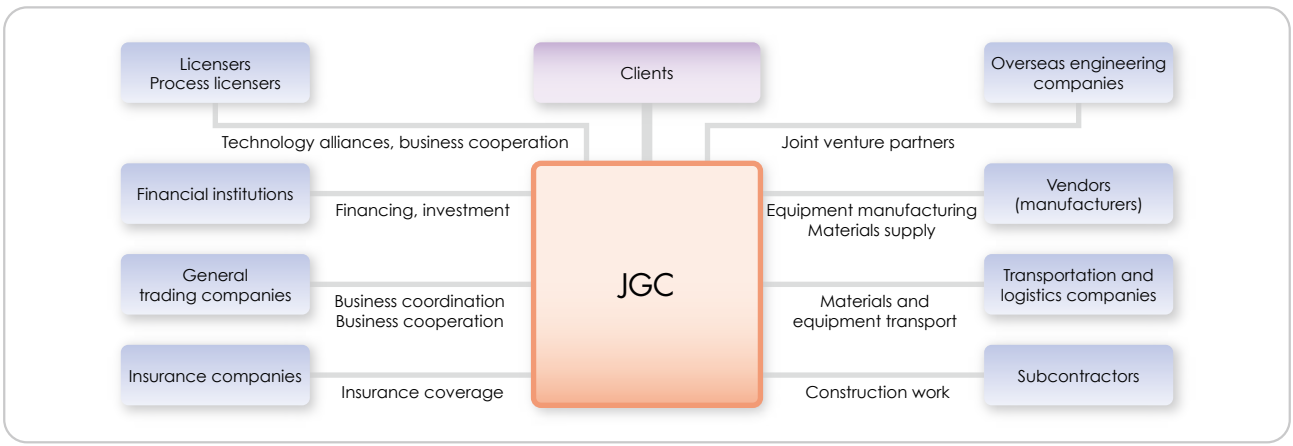
Business Sector 1) Engineering, Procurement, and Construction (EPC) Services



Business Sector 2) Enterprise Investment

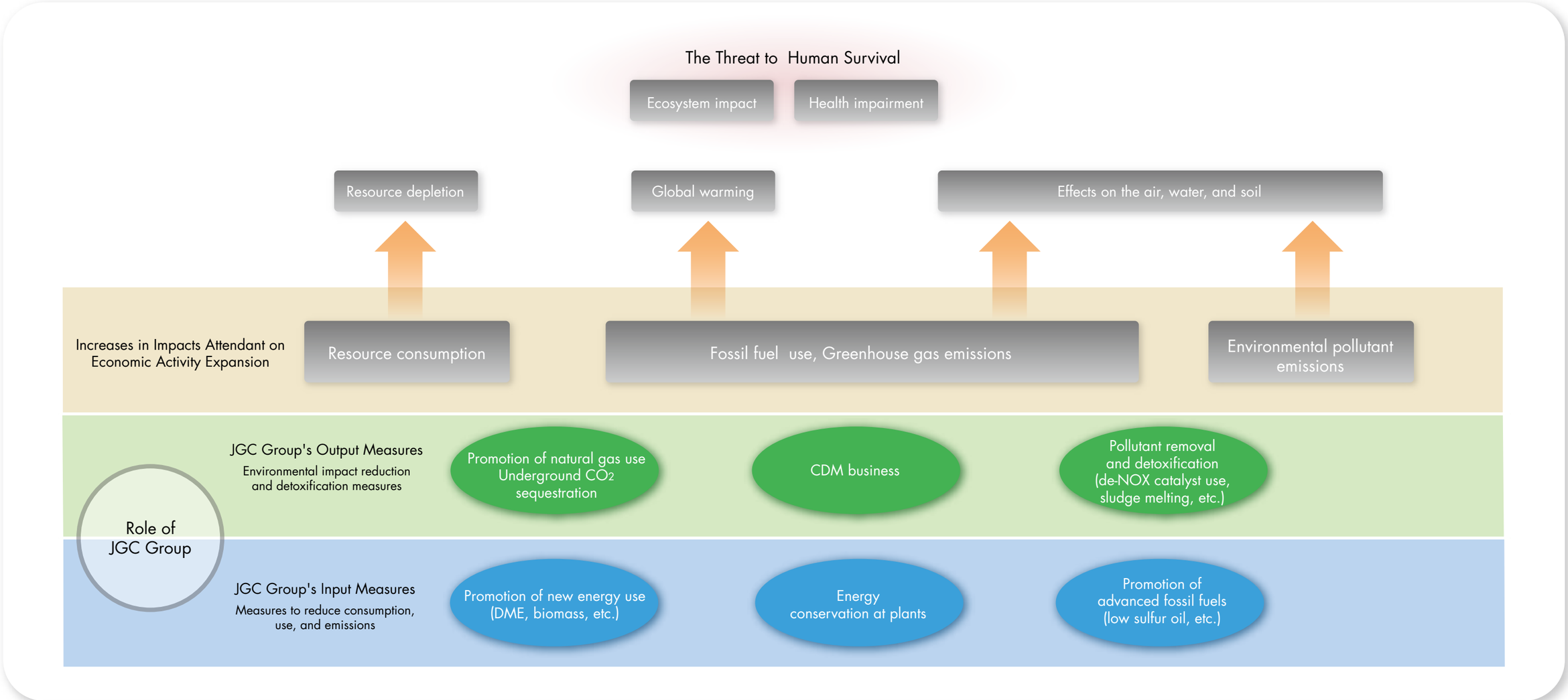


Companies Involved with JGC



The Role of the JGC Group's Engineering in Mitigating Environmental Impacts in Society

JGC Group has participated in numerous large-scale infrastructure construction projects around the world, including oil, natural gas, and petrochemical facilities.
These facilities are essential to economic development and prosperity. At the same time, their construction and operation require the input of many resources and have an impact on the natural environment.
JGC Group does not take into account only technological and economic considerations when supporting the implementation of clients' capital investment projects. We also consider the reduction of environmental impacts as an important duty to future generations and over the years have diligently and actively engaged in environmental load reduction activities.
The JGC Group seeks to optimize client facilities through the active introduction of the latest technologies in addition to proven engineering technologies and simultaneously aims to ensure prosperity and environmental load minimization through means including the underground sequestering of CO_2.



II. The JGC Group's Environmental Technologies

Technology

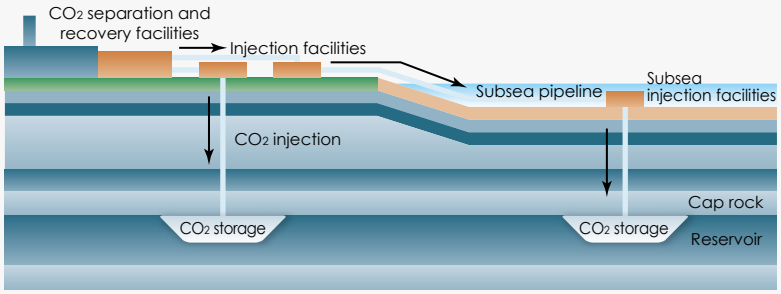
The engineering business is closely connected to environmental preservation, and the JGC Group actively addresses environmental issues. We also engage in activities that contribute to environmental preservation in other business areas such as the Clean Development Mechanism business.

In this section we report on environmental preservation activities that take full advantage of JGC's environmental technologies. These activities include efforts to realize low-carbon societies, an urgent priority worldwide, the development of low environmental impact energy resources, and environmental clean-up projects.

Underground CO_2 Sequestration

Expectations have increased for carbon dioxide capture and storage (CCS) as a means of global warming prevention. CCS involves the recovery and underground storage of CO_2 instead of its release into the atmosphere. The G8 Summit has provided powerful support for the widespread implementation of CCS.
JGC is also working to further develop and disseminate CCS in collaboration with companies in countries around the world: for instance, we engineered and constructed the world's second large-scale CCS plant in the In Salah natural gas development project in Algeria.

CO_2 capture and storage (CCS)



Reference material: Information from Japan CCS Co., Ltd.

The natural gas processing plant in Algeria

Development of an Efficient CO_2 Separation and Recovery Technology

JGC is developing the HiPACT (High Pressure Acid-gas Capture Technology) process in partnership with BASF of Germany. HiPACT is a technology for high-pressure recovery of the CO_2 in natural gas and synthetic gas. The technology makes it possible to reduce energy use and costs in the underground injection of CO_2 and can contribute significantly to the widespread use of CCS.
Development of the basic technology in pilot testing at the Research and Development Center has been completed, and plans are underway for demonstration testing using actual natural gas and synthetic gas to verify the technology's applicability to commercial facilities.

Solutions for Promoting the Dissemination of CCS

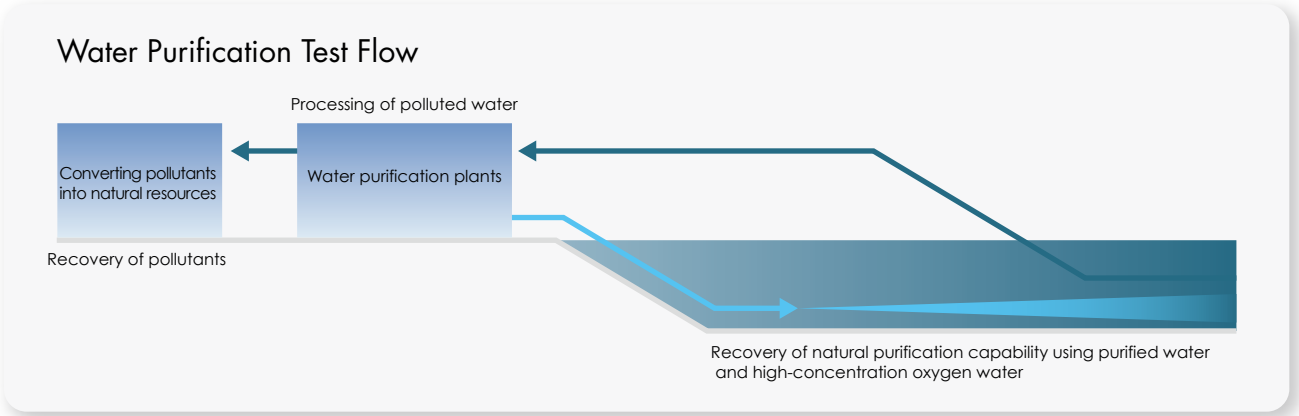
It is said that CCS at natural gas processing plants, a JGC area of expertise, represents an early opportunity in terms of technological and economic efficiency, compared with CCS at electric power plants that separate and recover CO_2 from combustion flue gas. For this reason, JGC is prioritizing CCS project development at natural gas processing plants, where CCS can be realized rapidly and on a large scale.
The cost burden is a major obstacle to the realization of CCS. One solution is the implementation of CCS as a CDM project under the Kyoto Protocol, and JGC is continuously engaging in activities to achieve this. Another solution under consideration is enhanced oil recovery (EOR) using CO_2, which can be expected to increase oil yield by means of the injection of CO_2 in oil reservoirs where yield is declining. JGC also seeks to develop projects that combine CCS and EOR.

International Contributions in the Research and Development of CCS Technologies

In 1991, the International Energy Agency (IEA) established the IEA Greenhouse Gas R&D Programme (IEA GHG) for global warming prevention. The IEA GHG has played a central role in international R&D concerning CO_2 capture and storage (CCS) and contributed greatly to the promotion of CCS technologies.
JGC is the only private company in Japan to participate in the IEA GHG as a sponsor, together with oil majors and other leading companies around the world. We are actively engaged in the development and expansion of CCS technologies worldwide.
JGC also participates as a founding member of the Global CCS Institute (GCSSI), established to launch 20 industrial-scale CCS demonstration projects around the world, and cooperates internationally in CCS demonstration project development.

Lake Water Purification and Quality Improvement

To meet the needs of countries plagued by water pollution, JGC applies engineering technologies in the water purification business.



Water Purification Test at Lake Taihu in China

China is an example of a country where water pollution has become a severe problem in conjunction with rapid economic growth, and dealing with it is an urgent matter. In October 2008 JGC conducted water purification testing at Lake Taihu in Jiangsu Province, which is rapidly becoming polluted.
The test was conducted in the area where the pollution of Lake Taihu is worst. Using technology ozone developed by a Japanese venture company, we acquired basic data in order to comprehensively purify the entire aquatic environment.
As a result of testing, in a period of one month we succeeded in cleaning up the water in the test area, which had been the most polluted water, to a level where it could be used as drinking water.
JGC is conducting the following activities with respect to the water pollution of Lake Taihu, and aiming to purify the entire aquatic environment comprehensively.

- Purifying the water
- Converting pollutants into natural resources
- Recovering the natural purification capability of the system

Going forward, we will conduct engineering work based on the data and know-how that we gain from element technology testing at JGC's research and development center, on-site studies in China, and the purification testing using actual-size equipment on-site in China.

The governments of both Japan and China are very interested in this initiative that could only be carried out by an engineering company. On November 28, 2008, this was recognized as a signature project at the third Japan-China Energy Conservation Forum held jointly by both governments.
JGC will partner with the China Energy Conservation Investment Corporation (China's only national-class energy conservation and environment-focused investment company) to advance the water purification business in China and contribute to protecting the environment.

Testing area before purification (approx. 20,000 m³)

Roughly 6 cm of transparency

Testing area one month after start of purification

More than 1.25 m transparency

CDM Projects in China

Clean Development Mechanism (CDM) emission reduction projects are implemented through cooperation between developed countries and developing countries. Emission reduction credits issued in accordance with the resulting CO_2 emission control effect or CO_2 absorption enhancement effect are divided among the project participants. This system makes it possible for developed countries to apply emission reductions made in investment recipient countries toward the achievement of their own CO_2 emission reduction targets. JGC engages in CDM projects in China.

Reduction of 15 Million Tons from Chlorofluorocarbon Substitute Gas Recovery and Decomposition

JGC conducts the Juhua CDM project, the first-ever Japan-China CDM project, jointly with Marubeni Corporation and Daioh Construction Co., Ltd. The project objective is the acquisition of Certified Emission Reduction (CER) credits through the recovery and decomposition of the greenhouse gas HFC23 emitted at a chlorofluorocarbon substitute production plant owned by Zhejiang Juhua Co., Ltd. in Zhejiang Province in China. Enormous greenhouse gas reductions equivalent to 40 million tons of CO_2 are planned over a period of seven years. The Juhua CDM project's decomposition facilities began operation in August 2006, and GHG reductions of approximately 15 million tons were achieved by May 2009.

Chlorofluorocarbon substitute production plant (Zhejiang Juhua Co., Ltd.)

Residual Heat Power Generation for a Cement Plant: Emission Reduction Credits of 22,000 Tons / Year (Planned)

JGC launched its second CDM project in September 2008, when a project operated by Huaibei Mining (Group) Co., Ltd. of Anfui Province in China was registered by the United Nations. The project involves residual heat power generation facilities for a cement plant. JGC plans to obtain emission reduction credits for the equivalent of 22,000 tons of CO_2 per year.

The Huaibei Cement plant in Anfui, China

Cement Raw Material Substitution: Emission Reduction Credits of 550,000 Tons / Year (Planned)

China is a large country that ranks second in the world in energy consumption and also accounts for 40% of the world's cement output. However, since many cement production facilities are outdated, China uses large quantities of limestone (calcium carbonate), which entails high CO_2 emissions. Also, the effective utilization of energy released during production hasn't reached the level of developed countries.

In March and April of 2009, CDM projects to be implemented by JGC in partnership with Elion Jidong Cement Co., Ltd. of the Inner Mongolia Autonomous Region and Jutai Building Material Co., Ltd. of Quzhou City, Zhejiang Province were registered by the United Nations. The projects involve cement production applying a new production method that uses a substitute raw material.

In conventional cement production, the intermediate product clinker is produced using limestone as a raw material. The new production method uses carbide residue (calcium hydroxide), a substance produced as a by-product at vinyl chloride production plants, as a substitute for limestone. Because the by-product generated through clinker production is water vapor , not CO_2, the new method makes possible a significant reduction in CO_2 emissions from production processes in addition to the effective utilization of carbide residue. Through this project, JGC plans to acquire emission reduction credits for the equivalent of approximately 550,000 tons of CO_2 per year.

JGC will continue to contribute to environmental impact reduction in China's cement industry, not only with respect to CO_2 emissions control, but also the effective utilization of resources.

The Commercial Application of New Energy

The JGC Group engages in the dissemination of fuel DME (dimethyl ether) and the development of fuel cell materials, biomass, and other renewable energy resources as greenhouse gas reduction measures.

Dissemination of Fuel DME

DME is attracting public attention as a next-generation clean fuel with low environmental impacts because absolutely no soot (particulate matter) or sulfur oxides are emitted at the time of DME combustion.
In April 2007, JGC established Fuel DME Production Company, Ltd. jointly with Mitsubishi Gas Chemical Co., Inc. and eight other companies. In July 2008, the new company began supplying fuel DME produced at a DME production plant (annual production of 80,000 tons) constructed within Mitsubishi Gas Chemical's Niigata Complex. This has made it possible to supply fuel DME for a variety of applications, including industrial boiler fuel, clean diesel fuel, power generation fuel, and chemical raw materials.

The DME production plant (Niigata City)

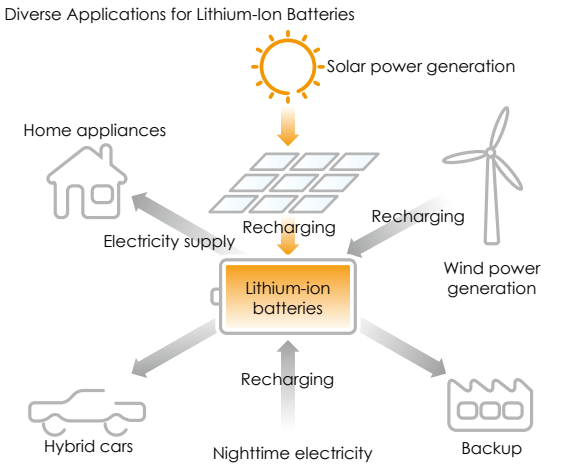
The Development of New Materials for Effective Energy Utilization

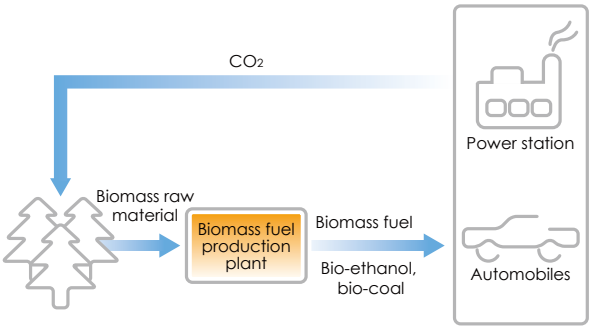
The Development and Manufacture of Lithium-Ion Battery Cathode Materials

Lithium-ion batteries are the smallest and lightest type of secondary batteries, the rechargeable, reusable batteries used widely in mobile phones, power tools, personal computers, and other devices. Further performance enhancement is required for the application of lithium-ion batteries as devices essential to the dissemination of electric cars and hybrid cars and the promotion of photovoltaic power generation and wind power generation.
JGC Catalysts and Chemicals Ltd. develops and manufactures safe, high-performance manganese cathode materials used to produce core components of lithium-ion batteries.

The Development of New Biomass Fuels

Since CO_2 is absorbed during the growth of the trees that are the source of plant-derived biomass fuels made from wood, even the burning of these materials and consequent emission of CO_2 is not considered to increase the CO_2 in the atmosphere.
To promote the utilization of biomass fuels, JGC is developing technologies to produce new fuels using wood processing waste, forestland residual lumber, construction wood waste, palm waste, and bagasse (sugarcane fiber waste) as raw materials.





The Provision of Environmental Consulting Services

JGC Group estimates the impact of business activities on the environment and proposes measures for environmental preservation, management, and improvement to contribute to the realization of a low-carbon society.
We also support the development of our clients' eco-friendly facilities through comprehensive proposals and consultation from the project proposal to operation stages.

Development of a social environment conducive to CCS deployment

JGC Group affiliate Japan NUS Co., Ltd. utilizes environmental consulting expertise and knowledge of risk assessment to support environmental impact assessment and public consensus formation concerning CCS (CO_2 capture and storage). The company also supports legislation and regulation formulation and policymaking concerning CCS and is actively contributing to the development of a social environment for the widespread use of CCS in the future.

Measures to develop eco-friendly facilities

To reduce environmental impacts, we implement heat isolation measures (cooling and heating load reduction using eaves, insulation materials, and rooftop greening), adopt Eco Mark certified and recycled equipment and materials, and effectively utilize natural energy (sunlight, wind, and rainwater). To cite a recent example, we have planned for our clients architectural designs harmonized with existing plantings to achieve windbreak effects, mitigate direct exposure to sunshine, and thus inhibit temperature increases.

Energy conservation measures

We implement CO_2 reduction measures involving energy consumption reduction and the selection of energy sources that entail low CO_2 emissions. As a recent example, we recommended the installation of heat source systems that cut CO_2 emissions by more than 20%. An effective energy conservation measure we propose to reduce lighting loads is the adoption of lighting methods that utilize new light sources that reduce luminous intensity while maintaining brightness or task-ambient lighting (for illuminating work areas only).

Noise reduction measures

We implement measures to mitigate noise from facilities installed in clients' buildings. A recent example of such a measure is the proposal for a noise reduction measure of 7 to 10 dB lower than the noise standard for construction sites. This measure has yielded nearly the expected result.

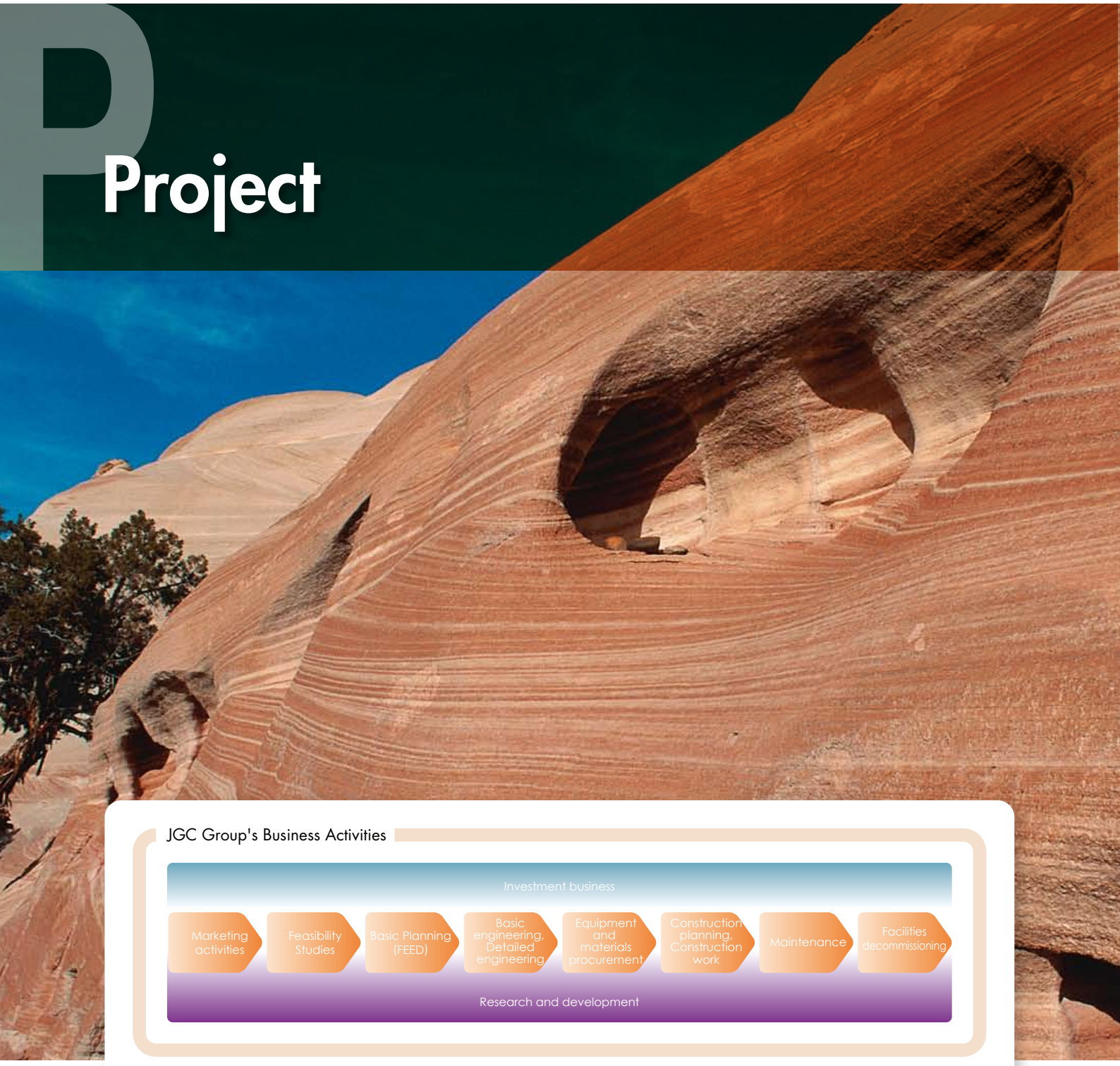
CASBEE*(Comprehensive Assessment System for Built Environment Efficiency) assessment

We create eco-friendly buildings which receive a CASBEE"A"ranking or higher for their environmental performance that demonstrates a superior balance between high quality for the user and low impact on the environment.

*CASBEE (Comprehensive Assessment System for Built Environment Efficiency) is an environmental performance assessment system for buildings that was developed by a committee established within the Institute for Building Environment and Energy Conservation, a public interest corporation under the jurisdiction of the Ministry of Land, Infrastructure, Transport and Tourism. CASBEE comprehensively assesses the environmental performance of buildings with respect to environmental load reduction factors such as energy conservation, resource conservation, and recycling performance as well as environmental quality and performance improvement factors such as consideration of interior comfort and scenery.

III. Environmental Consideration in Business Activities

Project



JGC Group's Business Activities

JGC Group executes projects around the world in wide-ranging business sectors, from resource development, oil, natural gas, and petrochemicals to environmental projects and medical facilities. In all of its businesses, the Group constantly strives to engage in business activities that reflect full and sufficient consideration of environmental impacts.
We demonstrate environmental consideration not only in Plant EPC activities, but also in our marketing activities and at all project stages from feasibility studies to maintenance and plant decommissioning.

Environmental Consideration at Every Stage of EPC

In Marketing Activities

In response to growing concerns for global environmental protection, our clients are paying greater attention toward environmentally friendly plant construction than before. JGC is engaged in the development of our own sales and marketing activities to meet such clients' environmental needs and demands.
Currently, there are many plans or studies to convert feedstock from coal and petroleum to natural gas for seeking lower environment loads in terms of CO_2 emissions. For these business needs, JGC is pleased to support such studies. As well as such movements, gasoline/diesel deep desulfurization projects, and IGCC (Integrated Gasification Combined Cycle) are also strongly recommended.
At the same time, we vigorously engage in marketing activities directed at business sectors where environment improvement needs have become actualized. We engage in solar power projects and solar thermal power projects to promote the use of renewable energy in the Middle East and other areas. We plan to make the global water business (desalination and water supply projects), undertaken in response to increased demand for water, a major pillar of future marketing activities.

IGCC Plant

In Feasibility Studies

We consider many matters at the feasibility study stage, including market analysis, technologies for application, systems capabilities, facilities configuration, and construction and operation cost analysis. When considering facilities configuration, we take into account regional characteristics and safety as well as environmental measures. We also consider the availability of waste disposal facilities in the region and secondary environmental impacts, such as whether any transportation-related problems exist.

In Basic Engineering (FEED)

At the basic engineering (front-end engineering design, or FEED) stage in which the basic engineering specifications of plant construction are decided, JGC decides specifications that reflect comprehensive consideration of plant construction costs, safety, operation costs, environmental preservation, and other factors. In this planning, JGC applies its energy conservation and energy effective utilization technologies.
For instance, in a certain plant project we proposed energy conservation and energy efficiency improvement measures, including the adoption of pinch technology to optimize heat recovery and heat utilization, the adoption of aero-derivative gas turbines for power generation facilities, and consideration of combined cycle power generation.
We also actively engage in environmental impact mitigation by means of CO_2 emissions reduction, considering measures such as waste heat recovery maximization and flare gas emissions reduction.

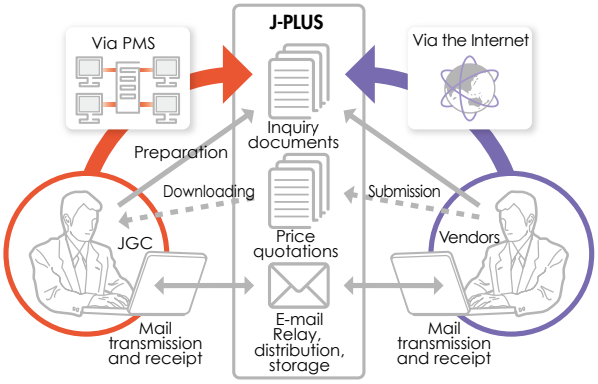
In Basic Engineering and Detailed Engineering

At these stages, we consider practical, concrete measures to reduce environmental impacts as far as possible and reflect those measures in basic engineering and detailed engineering (equipment specifications). Specifically, we ensure that gas and liquid emissions from plants satisfy legal and regulatory emissions and environmental standards and also consider ways of minimizing these emissions. We estimate emissions by identifying not only exhaust flues and vents, but every conceivable emissions source, such as leakage from valves and pipe couplings and gas emitted during maintenance. We review the basic engineering from the perspective of emissions avoidance or reduction by operation modifications, the reuse of waste heat and wastewater, and other means and decide appropriate design specifications for each emissions source, such as the selection of low-emission valves.

In Equipment and Materials Procurement

JGC also engages in environmental improvement activities in procurement, encouraging the vendors of materials and equipment used at plants to adopt a forward-looking stance on environmental preservation.
Whereas previously we used vast numbers of specifications and other paper documents in dealings with vendors, we have successfully converted to digital documents by introducing the JGC e-Procurement Solution System (J-PLUS), which we developed in-house. In this way, we have achieved both environmental improvement and greater work efficiency by reducing the use of paper forms.
After purchase order finalization, interaction with vendors at the detailed engineering stage is computerized using J-PLUS to realize a nearly paper-free work environment.

Overview of J-PLUS



In Construction Planning

In plant construction, meticulous concern for environmental impacts at construction sites is essential. In many countries where plants are constructed, for newly planned plants it is necessary to ascertain the nature of construction site environment impacts and submit an environmental impact assessment (EIA) report for the purpose of minimizing these impacts. The EIA report describes in detail impacts that construction work will have on the air and water environment, soil, flora and fauna, and marine life.

JGC applies environmental management systems to construction work to ensure that we demonstrate environmental consideration in compliance with EIA reports, emphasizing the following points.
1. We practice rigorous legal compliance and environmental risk management by identifying environmental laws and regulations and environmental considerations that bear on construction work.
2. We endeavor to increase customer satisfaction and reinforce communication with stakeholders.
3. We undertake environmental risk management and environmental disaster minimization by anticipating, preparing for, and responding to emergencies.
Before starting construction work we consider the above matters and unfailingly perform the following preliminary work.
1. Identification of the environmental aspects of the construction work
2. Setting of environmental objectives and targets for the construction work
3. Preparation of a construction work environmental management plan
4. Conduct of environmental education and training for new workers
We incorporate the Zero Emissions Initiative, a JGC Group independent environmental improvement activity, into this preliminary work, and thoroughly confirm environmental preservation measures before starting construction work.

In Construction Work

JGC engages in construction work on the basis of thorough environmental consideration at the planning stage. Matters decided in a construction environmental management plan include the project environmental policy, the organizations and persons responsible for environment-related work, environmental improvement measures, environmental performance monitoring and measurement, emergency prevention and mitigation procedures, periodic testing, and monthly reporting. Following the start of construction, a review of the environmental aspects of the project (causes of environmental impacts that are subject to environmental management) is conducted to confirm whether the construction work differs from the plan. If any differences are found, the plan is revised to ensure that there are no omissions in environmental consideration in the environmental management framework.

Example of Environmental Consideration at the Construction Work Stage

In the construction of an LNG plant in Papua, Indonesia, JGC successfully implemented a policy of minimizing environmental impacts on the surrounding area. There were more than 1,200 environment-related prescriptions and prohibitions, and we implemented measures to catch and release crocodiles, snakes, and insects. JGC obtained government approval to fell trees with trunks over 20 cm in diameter, attached numbered tags to the trees to be harvested, and managed the felling work. With regard to waste management at the construction work stage, we processed the domestic wastewater from a camp facility that housed about 10,000 workers using sewage treatment facilities. A portion of the used timber was recycled, and since the remainder couldn't be burned on-site, we used a crusher to process it into wood chips. We used a composter to compost a portion of the kitchen waste for use together with the wood chips in revegertating the construction site. We used an industrial waste control manifest to manage the processing of toxic waste, transporting it by ship to Jakarta, more than 3,000 km away, for processing by a licensed processor. We plan to apply this experience as valuable expertise in environmental management methods for future overseas construction projects.

A composter installed at a construction site

In Maintenance

Appropriate maintenance is essential to the stable plant operation, and failure to perform the appropriate maintenance increases the potential risk of unplanned production outage or even a major incident such as an explosion or fire. In this way, the quality of daily maintenance is directly linked not only to the production margin, but also safety and environmental impacts. JGC has established work systems that ensure the performance of effective, efficient maintenance. At the plant design stage, we prepare comprehensive maintenance plans based on the latest technologies. For instance, we use a state-of-the-art simulation technique for anticipating damage and assessing the magnitude of the consequences (production, safety, environmental impacts). Based on the assessment, risk based inspection and maintenance plans are developed. Appropriate maintenance promotes more stable plant operation and longer equipment life, which, as a result, contributes to waste reduction and environmental impact mitigation.

In Facilities Deccommissioning

JGC also strives to minimize environmental impacts in deccommissioning work during facilities renewal. For instance, in construction work for the renewal of a certain pharmaceuticals laboratory, before deccommissioning facilities we used construction drawings and materials analysis to confirm the presence or absence of asbestos dust, PCBs, chlorofluorocarbons, and other substances and materials harmful to the environment or people. On the basis of the results, we sought to minimize environmental impacts by implementing asbestos dispersion prevention measures and appropriate measures to recover and destroy fluorocarbons. With regard to asbestos dispersion, we measure asbestos particle concentrations in the air before, during, and after construction work and confirm that asbestos has not been dispersed outside the work area.
To reduce the processing of industrial waste generated in decommissioning work, we dismantle each type of waste separately and promote waste recycling and reuse. In this way, we have achieved a recycling rate of 100% for concrete and asphalt. We use industrial waste control manifests to confirm the appropriate disposal of industrial waste at every stage up to final disposal.

Ceiling dismantling

Separation of waste

Environmental Consideration in Investment Projects and Research and Development

Enterprise Investment Business

JGC engages in investment projects such as greenhouse gas emissions reduction projects, infrastructure projects (desalination, power generation, etc.), environmental projects (lake water purification, etc.), resource exploration projects (oil, gas, and resource development), new energy development projects (bio-ethanol and coal reforming), and environmental catalyst manufacturing projects. Through these projects, we contribute to environmental improvement on a global or local scale and also to improvement in energy use efficiency.

In investment projects, from the feasibility study stage onward we bear in mind the environmental regulations of the country or region and the environmental standards set down by the International Finance Corporation (IFC). For instance, in desalination and power generation projects in operation in the UAE and Saudi Arabia, we perform detailed environmental impact assessment and comply with the aforementioned environmental standards and regulations.

JGC engages in investment projects on the basis of our fundamental stance that such projects increase corporate value for JGC and our business partners through environmental consideration.

Desalination and power generation facilities (UAE)

Research and Development

JGC conducts nearly all its research and development work at the Research and Development Center in Oarai-machi, Ibaraki Prefecture. For all new R&D projects, at the time of test plan preparation we first conduct checks and reviews within the organization in charge of the basic flow of test equipment management within the center (clarification of the controlling organizations, persons responsible, authorizers, and the workflow for the use of appropriate processes to reliably manage matters related to test safety). Furthermore, we engage in rigorous self-management by means of a wide-ranging preliminary examination by the R&D Center's Safety and Health Committee, which carefully considers the utilities and raw materials to be used, by-product types, quantities, and storage methods, generated waste types, quantities, disposal methods, and disposal timing, applicable laws and regulations, and compliance measures.

Similarly, planning for tests in controlled areas begins following a detailed examination by the R&D Center's Radiation Safety Committee. We reduce as far as possible the quantities of test waste liquid used and hand washing wastewater generated, use a closed wastewater treatment system for ion exchange, filtering processing, and recycling within the controlled area, and avoid the discharge of used water outside the controlled area. We contract with a waste disposal contractor for the disposal of waste generated at laboratories and make efforts to reduce and reuse waste.

A technology laboratory (Oarai-machi, Ibaraki Prefecture)

IV. Environment Protection Framework Based on Environmental Management Systems

Management

Environmental Management Systems Operation Structure

JGC Group considers the creation of sustainable local communities and the preservation of global environments to be critical priorities in the conduct of business. As we pursue our business activities, we carefully consider the natural environment from a variety of perspectives. At the core of our robust environmental protection framework are JGC's Environmental Management Systems (EMS).

Environmental Management Plans and Environmental Audits

Environmental Management Plans

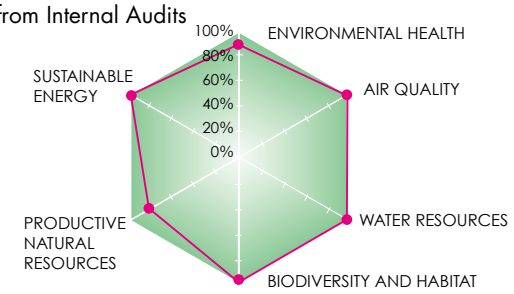
Prior to plant construction EPC, project teams identify environmental aspects (causes of environmental impacts from business activities) and establish environmental objectives and targets. To achieve these objectives and targets, the project teams prepare Environmental Management Plans, which are examined by the HSE (Health, Safety, and Environment) Committee in advance of project implementation.

Matters set forth in the Environmental Management Plans include environmental improvement schedules, persons responsible for environmental improvement, environmental laws and ordinances to be observed, environmental improvement methods, environmental performance measurement and assessment methods, emergency prevention measures, and monthly reporting.

Environmental Audits (Internal and External Audits)

JGC assesses the operational effectiveness of environmental management systems by means of internal environmental audits and external environmental audits.
Internal environmental audits of organizations and projects are conducted on the basis of the HSE Committee's annual audit plan. In addition, we promote the operation of environmental management systems by having organizations and project teams conduct self-audits. External environmental audits are conducted by project clients (including client-designated third-party organizations) and Lloyd's Register Quality Assurance (LRQA), a certification body. The conclusion of an executive report issued by Lloyd's in December 2008 reads as follows: "The significance of an environmental management system is 1) organizational contribution to the global environment and social environment, 2) avoidance of organizational risk, and 3) cost reduction. JGC implements Design EMS Improvement and the Zero Emissions Initiative out of awareness of this significance. We expect JGC to continue to engage in activities that reflect consideration measures required to prevent potential environmental pollution (environmental impacts) from its organizational activities."

Environmental Performance Audit Results from Internal Audits



An internal environmental audit

ISO 14001 certification

In December 2003, JGC obtained certification in the ISO 14001 international standard for environmental management systems from third-party certification and registration body LRQA (Lloyd's Register Quality Assurance). In August 2005, we completed the transition to the new ISO 14001:2004 standard. In December 2006, the third year of certification, we completed an examination for renewal of certification.


CERTIFICATE OF APPROVAL

JGC Corporation (Nikki K.K.)
Yokohama-shi, Kanagawa-ken
Japan

ISO 14001:2004, JIS Q 14001:2004

Project management, engineering, procurement and construction management for projects for the oil, gas, nuclear energy, coal processing, petrochemical, chemical, pharmaceutical, food processing, factory automation, utility and offshore industries, laboratories, medical and welfare facilities, environmental protection facilities, subterranean facilities and space experimental facilities.

Environmental Objectives and Targets

In accordance with its Environmental Policy, JGC undertakes continuous improvement of its environmental management systems by setting environmental objectives and targets for office activities and project execution and by measuring and assessing achievement as shown in the table below.

E : Completely implemented
G : Extensively implemented
NG: Not yet implemented
: Substantial modification of environmental improvement measures
: Continuation of environmental improvement measures

Fiscal 2008 Activities Results and Fiscal 2009 Improvement

Sector	Environmental objectives	Environmental targets	Activity details	Implementation status	Fiscal 2008 results	Improvement for 2009
Office activities	1. Reduction of electricity use 2. Reduction of cooling and heating use 3. Reduction of paper use and paper waste 4. Promotion of waste recycling	Conduct of e-learning concerning environmental problems	Use of National Institute for Environmental Studies' Eco-life Guide and other instructional materials	G	Although the number of participating organizations increased, the average implementation rate did not.	
		Elimination of stationery and office supplies waste, prohibition of personal files	Periodic pooling and reuse of unused stationery and office supplies, prohibition of personal files	E	Reuse of stationery and office supplies remained at a high level. Prohibition of personal files is taking hold.	→
		Reduction of overtime hours through the greater work efficiency and streamlining	Improved work efficiency, no-overtime days, and shortening of business hours in accordance with the circumstances of individual organizations	E	No-overtime days were decided and overtime reduction gained impetus.	
		Voluntary restraint in elevator use	Implementation of the "One up, two down" movement	E	The number of employees who use stairways increased, contributing to elevator load reduction and employee health.	→
		Thorough use of window blind control	Thorough performance of window blind control, which has a significant energy-saving effect	E	The significance of window blind control became widely understood, and blind control contributed to air conditioning load reduction.	→
		Exhaustive participation in the Ecocap Movement	Separate collection and recycling of PET bottle caps	E	The cumulative number of PET bottle caps collected by the JGC Group reached 600,000.	→
Project execution	Implementation of the Zero Emissions Initiative	Industrial waste recycling rate (sites in Japan) 89% or higher	Study of recycling rates at Intermediate disposal companies, vendor selection, elimination of mixed waste, etc. (similar measures for overseas sites, for which numerical target have not yet been set)	G	Industrial waste recycling rate (sites in Japan) 94% Target achieved.	→
		Zero complaints due to oil, liquid, or water spills	Monitoring of fueling, use of oil pans, spill inspections at the time of heavy equipment delivery	G	Minor leaks within sites Overseas sites: 14 leaks Sites in Japan: 1 leak Nearly all leaks were less than 5 liters.	→
		Total CO_2 emissions per working hour (sites in Japan) Less than 1 kg-CO_2/hour	Use of high-efficiency electrical equipment, promotion of carpooling, shortening of transportation distances, curbing of excess air conditioning, etc. (similar measures for overseas sites, for which numerical target have not yet been set)	G	Total CO_2 emissions per working hour (sites in Japan) 1kg- CO_2/hour Target achieved.	→
		Reduction in man-hour and cost increases due to rework	Implementation of a risk management PDCA cycle, prevention of confusion in work execution, minimization of the impact of problems that occur, taking maximum advantage of potential adverse impacts	E	Organizations and project teams vigorously implemented rigorous, integrated project risk management and undertook effective utilization of resources (manpower, machines, materials, money). The results are reflected in fiscal 2008 business performance.	
		Achievement of targets in detailed environmental impact assessment (DEIA) reports	Examination and assessment of relevant environmental impact mitigation measures at each responsible organization, shifting to the project execution stage	G	Target values were unfailingly reflected in drawings and specifications, and construction performed on that basis. During the fiscal year environmental impact mitigation measures were 100% implemented.	→

Activities at Offices

With regard to office activities, in addition to the above measures we pursue environmental improvement by implementing the following maintenance control items.

Reduction of electricity use
- Automatic extinguishing of lights at night
- Automatic extinguishing of lights during noon breaks
- Reduction in the number of corridor lights
- Expanded use of energy-saving features of office equipment and vending machines
- Conversion to energy-saving lighting

Reduction of cooling and heating use
- Shortening of air conditioning hours of operation
- Control of air conditioning temperature settings
- Operation of equipment in energy-saving mode

Reduction and recycling of waste
- Promotion of use of both sides of paper
- Installation of collection boxes for separated waste
- Non-collection of waste by the cleaners when waste baskets contain large amounts of paper waste

JGC Environmental Indicators

The JGC Group implements the Zero Emissions Initiative, an environmental improvement activity with the aim of achieving zero by-products attendant on business activities. In addition to implementing environmental impact mitigation measures, we are developing an environmental data collection and analysis system to ascertain the degree of mitigation of environmental impacts.

Zero Emissions Initiative Environmental Performance

Zero Emissions Initiative			
JGC sites in Japan	Target	Result	Evaluation
1. Industrial waste recycling rate	89%	94.7%	Excellent
2. Number of spills complaints	Zero	1 complaint	Passing
3. Energy-related CO_2 emission units	1 kg-CO_2/hour	1.05 kg-CO_2/hour	Good

Environmental Accidents, etc.	
Environmental accidents requiring notification to the regulatory authorities	None
Environmental accidents	None
Spills within facilities	JGC sites in Japan: 1 leak JGC overseas sites: 14 leaks

JGC Group in Japan (JGC Yokohama Headquarters, Tokyo Headquarters, Research and Development Center, Sales Offices, Group Companies)

		Unit	Construction sites	Plants	Offices
Energy consumption	Fuel oil	MWh	191,497	82,452	429,968
	Gas	MWh	714	607,898	5,838
	Electricity	MWh	1,860	72,323	19,158
Water consumption		m^3	12,048	10,954	13,172
Waste	Industrial waste	tons	20,656	15,110	360
	Specially controlled waste	tons	185	152	0
CO_2	Direct emissions	t CO_2 equiv.	129,677	434,391	293,486
	Indirect emissions (energy-related)	t CO_2 equiv.	653	26,759	7,031

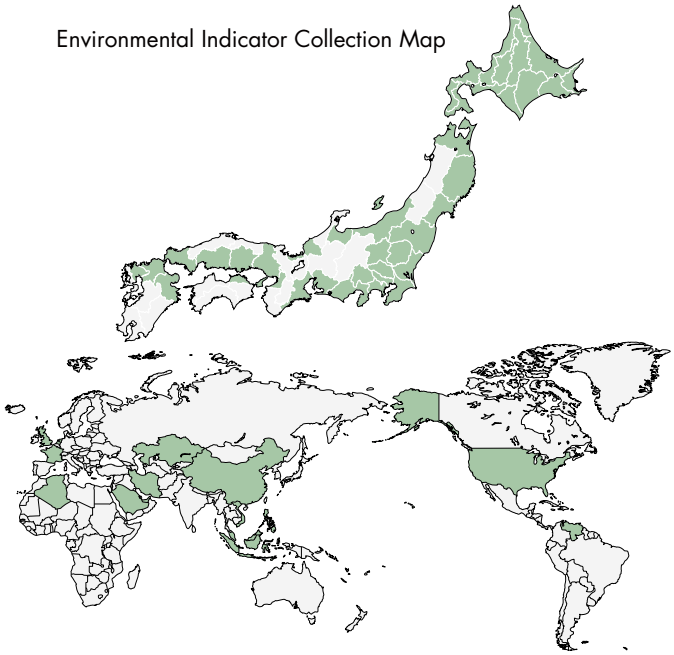
JGC Group Overseas (JGC Construction Sites, Sales Offices, Group Companies)

		Unit	Construction sites	Offices
Energy consumption	Fuel oil	MWh	64,296	1,008
	Gas	MWh	1,976	48
	Electricity	MWh	2,017	6,127
Water consumption		m^3	—	—
Waste	Industrial waste	tons	28,850	—
	Specially controlled waste	tons	2,259	—
CO_2	Direct emissions	t CO_2 equiv.	51,936	921
	Indirect emissions (energy-related)	t CO_2 equiv.	1,008	3,346

Note: "–" indicates not yet surveyed or impossible to survey

The environmental data collection and analysis system began with the posting of data for JGC construction sites in Japan and overseas and for the headquarters on the JGC intranet. We have expanded the system to include JGC Group companies and business sites and are continuously striving to improve data validity assessment through means including assessment technique enhancement and comparison against benchmarks.

Environmental Indicator Collection Map



The Zero Emissions Initiative

Since fiscal 2008 the JGC Group has implemented the Zero Emissions Initiative, an activity with the aim of achieving zero by-products attendant on business activities. This year we are focusing particularly on construction sites in Japan, where we are actively undertaking to reduce environmental impacts by establishing targets for curbing CO_2 emissions and increasing the industrial waste recycling rate.

In environmental performance at construction sites in Japan in fiscal 2008, we got off to an excellent start with the Zero Emissions Initiative, achieving the results shown below in the accompanying figure for waste, spills and greenhouse gases.

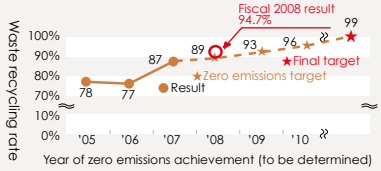
In emissions reduction efforts at overseas construction sites, the Yokohama home office engineering organizations, the Research and Development Center, domestic and international sales bases, and Group companies in Japan and overseas, we increase environmental awareness by posting awareness posters and engage in independent environmental improvement activities using construction sites in Japan as benchmarks.

Poster at overseas construction sites

1. Waste recycling rate

Targets for sites in Japan: 89% (2008), 93% (2009)

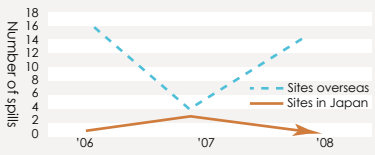
Approaching zero waste (sites in Japan)



2. Number of Leak Complaints

Target for sites in Japan: zero

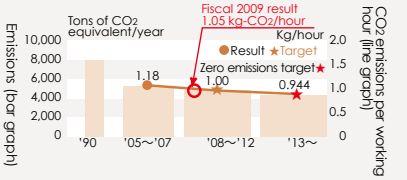
Number of spills at construction sites in Japan and overseas



3. Energy-related CO_2 Emission Units

Targets for sites in Japan: 1 kg-CO_2/hour (8 kg-CO_2/ hour)

Approaching zero emissions of greenhouse gases (sites in Japan)



V. Social Dimensions of Sustainability

S Social

The JGC Group regards the development of the professional business skills of employees and the maintenance of a high level of occupational health and safety to prevent occupational accidents as important social responsibilities. During the many years we have executed projects all over the world, we have always considered contributing to the communities located near construction sites to be an important corporate mission and actively engaged in social contribution activities.

Personnel Development and Communication with Employees

It is people who achieve the sustained growth of JGC, a specialty engineering company. JGC's fundamental policy for personnel systems is "Autonomous development and creation of new value." In 2001 we introduced a personnel system to enable employees to autonomously develop their professional skills while sharing the strategic direction of the company and contributing to new value for customers and society. In the ensuing years we have undertaken to firmly establish the system.

Personnel Development at JGC Techno-College

In 2001 JGC established the JGC Techno-College as a forum for autonomous participation in education by people motivated to learn. Employees who volunteer as instructors develop and conduct many of the courses, ensuring the transfer of techniques, skills, and experience from senior colleagues to junior colleagues. In addition, JGC invites outside experts to conduct periodical courses, in which more than 1,800 officers and employees participated in 2008.

Employee Attitude Surveys

It is important to develop an environment in which employees can experience purpose in life and personal growth. To that end, JGC conducts employee attitude surveys to ascertain and increase employee motivation. The following results were obtained from past surveys.

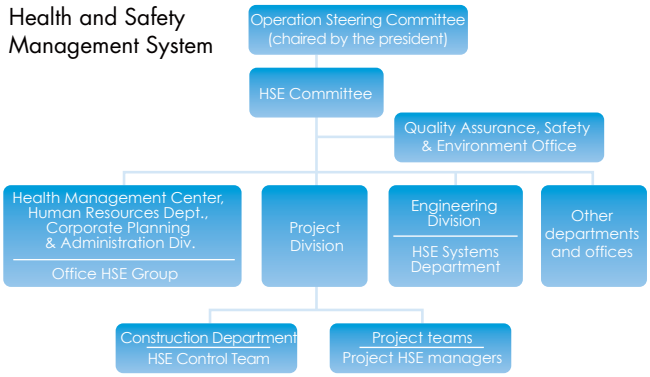
Occupational Health and Safety

In accordance with the Health and Safety Policy, JGC engages in health and safety management that includes JGC Group companies and business partners. Above all, we focus on the prevention of occupational accidents at construction sites.

Health and Safety Management Structure, Health and Safety Auditing and Monitoring System

The HSE Committee deliberates and decides important matters concerning safety for the entire Group. It also reports to the Operation Steering Committee, which is chaired by the president. Matters decided by the HSE Committee are promptly implemented by the company divisions.
An audit group appointed by the chairman of the HSE Committee conducts health and safety audits at principal construction sites in Japan and overseas and reports the audit results to the Operation Steering Committee.

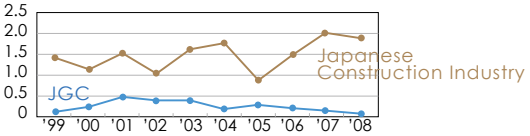
Health and Safety Management System



Safety Performance

As a result of continuous implementation of health and safety improvement measures group-wide, the incidence rate (ILO method/OSHA method) has remained at around 0.2/0.04 for the past ten years, a lower level than the average incidence rate of 1.4 for the construction industry as a whole.

Safety performance, the accident incidence rate (percentage) (ILO method)



Production of DVDs on Construction Safety Assurance Expertise

With the aim of preventing accidents, in fiscal 2008 JGC used computer graphics animation to reenact past construction site accidents and produced the DVDs Accident Case Study File 1 and 2, safety education tools that explain about accidents using easy-to-understand images and narration. The DVDs are widely used in safety education within JGC. The Accident Case Study File DVDs have met with acclaim by clients and construction companies that experience accidents and they are now being offered for sale outside the Group.


The Accident Case Study File 2 DVD

Social Contribution Activities

The JGC Group is keenly aware of its social responsibility as a corporate citizen. We seek a harmonious coexistence with society and aspire to contribute to local communities and society at large through business activities.

Participation in Job Shadow

Since 2004 JGC has participated in the Job Shadow program of NPO Junior Achievement Japan.
Job Shadow is a motivating program for academic improvement designed for high school students to get the opportunity of an up-close look at the world of work. In the United States, where Job Shadow originated, two million high school students participate in the Job Shadow program each year. Its goal is to deepen their understanding of occupations and work and to help them select careers and make their future plans by enabling them to observe working people at close-hand.
JGC participates in this program in the belief that cooperation in the education of high school students is part of its corporate social responsibility. In 2008, the fifth year of our participation, we welcomed 40 students from the Yokohama Seiryo

High school students participate in a business meeting.

Acceptance of Internship Students

JGC accepts university students and graduate students as interns. Each year we accept approximately 30 students from universities in Japan on their summer break and give them an opportunity to experience the actual work in JGC. From overseas universities, eight students participated in JGC's internship through a student exchange program in 2008.

Participation in the Kanagawa Water Source Forest Conservation Project

Since September 2008 JGC has participated in Kanagawa Prefecture's Water Source Forest Conservation Project. The aim of the project is to preserve and bequeath to future generations healthy, vital forests in Kanagawa Prefecture's water catchment areas. JGC, as a "Water Source Forest Partner", donates funds and engages in the activities necessary for the forest conservation program.
As an initial step in the activities, we made twice forest walking tours guided by the forest instructors with the aim of deepening understanding of this project among JGC employees and establishing a foundation for the corporate environmental preservation activities. We plan to continuously offer once-monthly events, such as nature observation tour, wood working, for the employees to commune with nature, and the activities to enable the employees to get hands-on learning opportunity of the forest conservation activities, including undergrowth clearance, pruning, and thinning.

A forest walking tour

Environmental Preservation Activities in the Philippines

The La Mesa Ecopark in Quezon City, located in the north of Manila, is home to the most extensive forest remaining in the capitol area and is important to Manila residents as the site of a tap water reservoir. JGC Philippines, Inc., a JGC Group company, supports the La Mesa Ecopark Movement to preserve the La Mesa district. In March 2009 it donated funds for the preservation activities, and the employee volunteers planted about 800 trees. The employees also participated in the environmental orienteering at the park, raising their environmental awareness while communing with nature.

Employee volunteers at JGC Philippines

Support for the Development of the Next Generation through the JGS-S Scholarship Foundation (Established in March 1968)

Through the JGS-S Scholarship Foundation, JGC contributes to the cultivation of scientists in Japan and overseas and to the advancement of science and technology. The foundation was established in 1968 with the endowment by Masao Saneyoshi, JGC founder. Its principal undertaking is the provision of educational loans to Japanese university and graduate school students majoring in science and technology, grants to foreign students studying in Japan, and research funding assistance to young researchers.
Up to 2008 the foundation has provided educational loans to a total of 12,585 students, educational grants to 4,376 students, and research funding assistance to 1,897 researchers. Annual disbursements have reached 285 million yen.


2008 assistance recipients

Contribution to Public Welfare through the JGC Social Welfare Foundation (Established in March 1994)

The JGC Social Welfare Foundation is an organization that provides funding assistance to support groups and volunteer organizations in Kanagawa Prefecture involved in social welfare services for people with mental and physical disabilities and the elderly and develops and provides welfare equipment for people with physical disabilities. Since its establishment, the foundation has logged 413 cases of assistance to support groups and 232 cases to volunteer organizations, including 24 cases and 14 cases, respectively, in 2008.

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