



Technology



Project



Management



Social

Environment Report 2010

Editorial Policy

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

Principal content for fiscal 2009.

I JGC Group's Environmental Technologies

In this section, we introduce several environment-related businesses in which JGC is involved.

II Environmental Consideration in Business Activities

Since JGC is an engineering company, our business is by nature closely related to environmental preservation. In this section, we describe how JGC demonstrates consideration for the environment at each stage of project execution.

III Environment Protection Framework Based on Environmental Management Systems

As JGC is an engineering company which has no production facilities of its own, we report on the targets and results of the environmental preservation efforts at our construction sites in Japan and overseas.

IV Social Dimensions of Sustainability

In this section, we report on occupational health, safety, and 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) and of 16 domestic and 18 overseas Group companies.

Section III at left: This section covers JGC Group's construction sites and offices in Japan and overseas and plants in Japan.

Note: Matters other than those specifically attributed to JGC or Group companies refer to activities of JGC Group.

Reporting Period

This report is compiled principally on the basis of data for fiscal 2009 (from April 1, 2009 to March 31, 2010). Important matters, and those regarded as highly significant, concerning activities outside the reporting period are also reported.

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Message from the CEO



Contributing to a Sustainable Society through the Engineering Business

Keisuke Takeuchi

Chairman and Chief Executive Officer JGC Corporation

The JGC Group contributes to 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 can play a key role in making energy cleaner, rendering plants more energy-efficient, and detoxifying wastes, we have developed the corporate philosophy, "As a global company with engineering as our core business, we aim for sustainable development while contributing to global economic prosperity and working to ensure environmental preservation." With this philosophy as its cornerstone, JGC engages itself in a variety of business activities and geographical areas.

In this Environment Report for fiscal 2009, we detail our recent achievements in electric power, water, and environment-related projects, as well as the future directions we will pursue in such projects. We also highlight examples of JGC Group involvement in environment-related research and development, production business, construction services, and consulting activities. Moreover, we provide specific examples of our consideration given to the environment through all business phases, from sales to design work, materials procurement, construction projects, and R&D.

I would like to talk here about the JGC Group's contributions to environmental conservation. The Group is continually monitoring the burden placed on the environment by our business operations, and we are tirelessly striving to mitigate our environmental impact. In this year's Report, we provide environmental impact data from our overseas construction sites, and inform on labor safety indicators as part of our effort to fulfill our social responsibilities. In fiscal 2008, the JGC Group implemented the "Zero-Emissions Initiative" with the aim of eliminating harmful by-products generated by our projects. We set targets for curbing CO₂ emissions and increasing industrial waste recycling, focusing on domestic sites in particular. We are working vigorously to reduce environmental loads.

We face many social and environmental issues. Geopolitical matters and international disputes cannot be solved through the efforts of private companies. However, we can contribute in areas directly related to the day-to-day living environment-energy security, water supply, and electricity, to name a few. With our accumulated engineering and project management experience, the JGC Group can help improve the quality of global living. We do greatly appreciate your support as we step up our efforts to realize a sustainable society.

JGC Group's Environmental Management

Environmental Policy

JGC, as a professional engineering contractor, is committed to achieving environmental excellence in both its corporate operations and the services it renders its clients. To meet this commitment, JGC has hereby established 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 and recycling.
- We shall apply the following specific principles to the execution of our EPC projects:

- Engineering Phase:

We shall reduce the adverse environmental impacts of completed plants by minimizing the energy and resource consumption of each plant, and minimizing emissions and waste production.

- Procurement Phase:

We shall give preference to vendors that adopt environmentally-friendly manufacturing practices.

- Construction Phase:

During construction, we shall endeavor to minimize emissions, adverse impacts on the surrounding environment, energy and resource consumption, and waste production. Furthermore, 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 our 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 related to environmental preservation. Since the 1960s, JGC has been grappling with environmental issues in its capacity as an engineering company. We remain keenly aware that our business activities in and of themselves must contribute to environmental preservation, and we declare that awareness in the JGC corporate philosophy.

In the enterprise investment business, a new business sector for JGC, we have further expanded the scope of our environmental preservation activities. For instance, we have launched biofuel production, Clean Development Mechanism

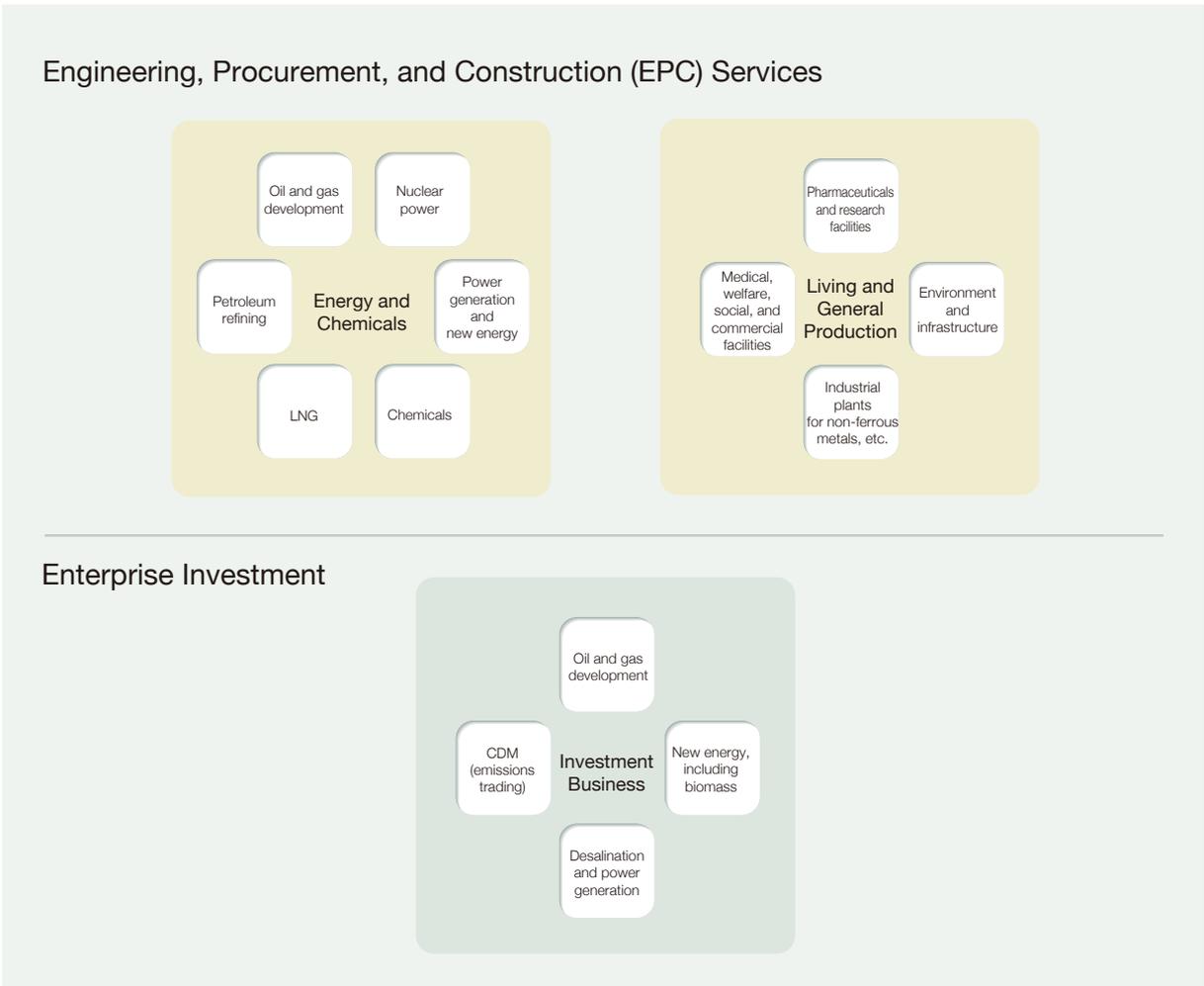
(CDM, a form of emissions trading), and lake water purification/quality improvement projects. Supplying clients with low-environment-impact plants is another important element of environmental management at JGC. Over the course of the EPC process, we have tested various devices and improvements aimed at environmental efficiency, and won accolades from clients for our efforts.

Environmental impact reduction at construction sites and the home office are the foundation supporting JGC's environmental management. Each year, we achieve significant results from waste reduction and recycling efforts at construction sites, and CO₂ reduction at the home office.

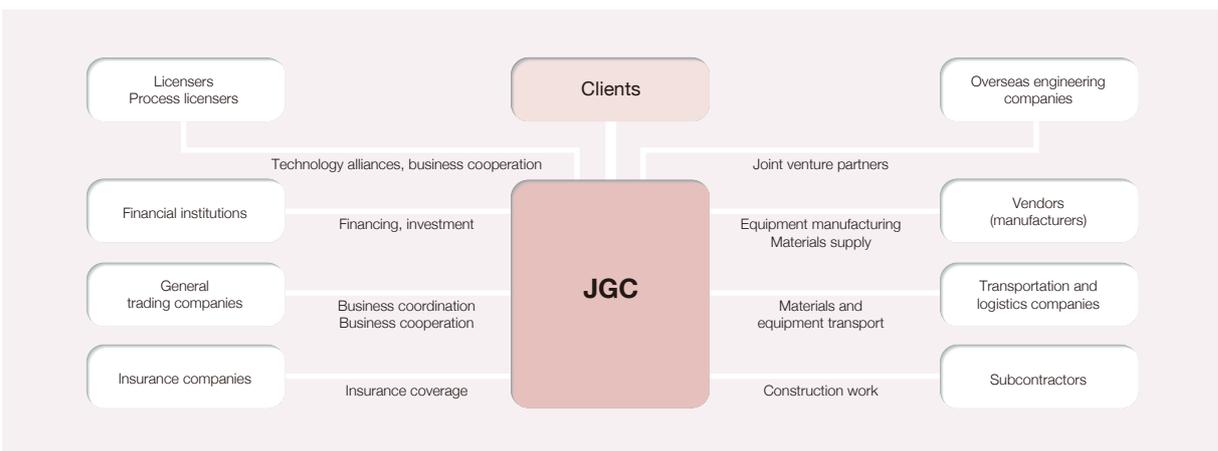
Relationships Between JGC Group s Businesses, Society, and the Environment

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

Business Sector

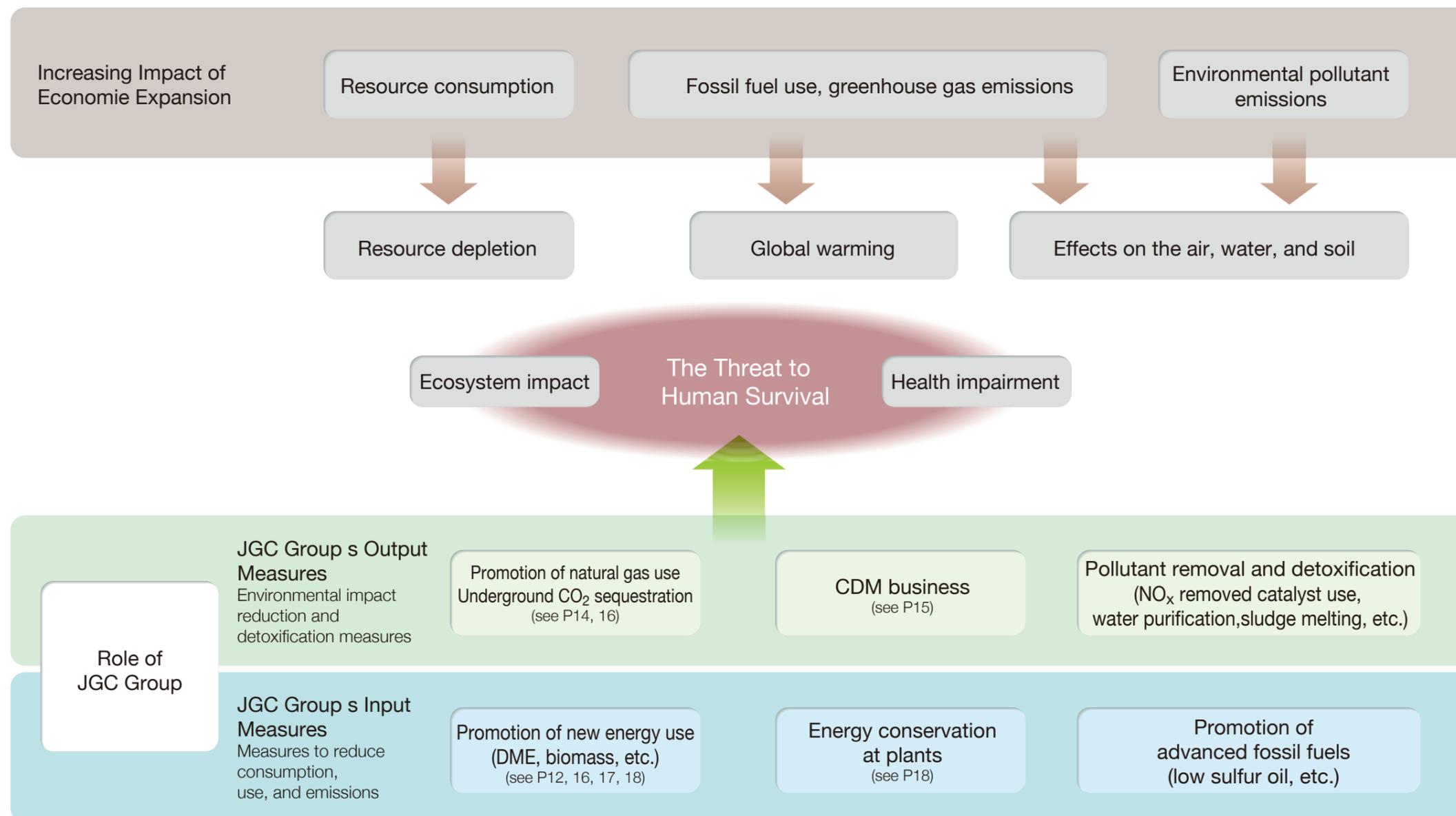


Companies Involved with JGC



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

When supporting the implementation of clients' capital investment projects, JGC Group takes into account more than technical and economic considerations. We consider the reduction of environmental impacts to be an important duty to future generations. We work diligently towards environmental load reduction throughout our business. JGC Group seeks to optimize client facilities through the active introduction of the latest engineering technologies. We are also working for prosperity and environmental load-reduction through other means, including the underground sequestration of CO₂.



New Approaches to Solving Electric Power, Water, and Environmental Problems

JGC: An Investor with Thorough Knowledge of Engineering and the Environment

JGC has begun to participate in electric power and water projects around the world.

Over the years, JGC has contributed to the development of the countries in which we do business through construction projects for a wide range of fields. These projects include numerous oil refineries, natural gas processing plants, chemical plants, nuclear power plants, and pharmaceuticals facilities. However, in recent years, the needs of our clients and the countries in which we do business have been diversifying. Problems are emerging that cannot be solved by means of plant construction alone.

In response to this situation, JGC established the Scenario 2010 medium-term management plan, to cover the five-year period from fiscal 2006. We have expanded the range of fields in which we can apply our project management capabilities, and we have launched initiatives to support economic development and living standards in the countries where we operate, not only through plant construction, but also through the development of a wide variety of public infrastructure.

In recent years, problems in developing countries include energy and water security and environmental pollution. As a consequence of global climate change and rapid population increases, water shortages have become a critical problem. According to a 2009 United Nations study, more than one billion people around the world have trouble obtaining safe water. To address this global problem, JGC participates not as a plant construction contractor, but as an investor, promoting electricity and water projects. In this section, we provide an overview of new projects JGC is set to undertake, and report on the future directions of these projects.



As one of a handful of companies combining a thorough knowledge of energy and the environment, JGC will continue to involve itself in new environmental businesses.

Koichi Kawana

Executive Vice President

Venturing beyond the EPC business to meet diverse needs

JGC has long demonstrated its engineering capabilities through the plant engineering, procurement and construction (EPC) business, focusing on the energy and hydrocarbon market sectors. In recent years, however, we have come to realize that, given industrial advancement and rising standards of living in the countries in which we operate, we cannot provide the facilities and services these countries truly require by simply continuing conventional plant construction.

In the “Scenario 2010” five-year management plan we implemented in fiscal 2006, we made it our objective to actively apply our engineering capabilities not only to plant construction but also to resource development, electric power, water, and environment-related projects. Now we participate in projects not just as an EPC contractor, but also as an investor and operator.

Collaborating with partners on global water development

In accordance with Scenario 2010, JGC is engaging in new business, including electric power generation, desalination, water purification and quality improvement, as described in this report. In desalination and power generation projects, we apply our engineering knowledge by contributing to the stable operation of facilities. Through our collaboration with Hyflux Ltd. (see P9) and our management participation in Ebara Engineering Service Co., Ltd. (see P10), our goal is to actively engage in the water business around the world. Furthermore, with the water purification project at Lake Taihu in China (see P11), and our CDM (emissions trading) projects, JGC’s engineering and management capabilities are contributing to local environmental protection measures.

Speedy, efficient project development for strengthening environmental business

JGC’s strength lies in our ability to rapidly detect market needs, integrate effective technologies domestically and internationally, and effectively organize projects in overseas markets, especially developing countries. Our thorough familiarity with legal systems and business practices that differ between countries will allow us to take full advantage of our advanced engineering capabilities in water and environment-related businesses around the world.

In addition to the water business, we have launched projects and businesses that contribute to environmental preservation, including a bio-ethanol project in the Philippines and underground CO₂ sequestration projects for greenhouse gas emissions reduction. As one of the few companies in the world with an extensive knowledge of both energy and the environment, we will continue to develop new environmental business strategies.

Major Electric Power, Water, and Environment-Related Projects Currently in Progress

In this section, we provide an overview of major new projects in which JGC is involved, including electric power, water, and environment-related projects.

Desalination and Power Generation Projects for Ensuring Stable Water and Electricity Supplies in the Middle East

JGC is participating in a desalination and power generation (IWPP) project in Abu Dhabi, UAE. From 2005, we have also been participating in a desalination, power generation, and industrial steam supply (IWSP) project in Saudi Arabia. In addition, from 2008, we have been participating in another desalination and power generation project in Abu Dhabi. We will operate the projects in Abu Dhabi for 20 years and the project in Saudi Arabia for 25 years.

Accomplishments to Date

- Taweelah B IWPP Project (Abu Dhabi, UAE)
Power generation: 2,000 MW
Desalination: 168 MIGD
- Rabigh IWSP Project (Rabigh, Saudi Arabia)
Power generation: 600 MW
Desalination: 30 MIGD
Steam: 1,230 tons/hour
- Taweelah A2 IWPP Project (Abu Dhabi, UAE)
Power generation: 710 MW
Desalination: 50 MIGD



The desalination and power generation plant in Saudi Arabia

Implementation of a Seawater Desalination Project in Tianjin, China

In December 2009, JGC entered into an agreement with Hyflux Ltd. of Singapore to jointly operate a seawater desalination project in Tianjin City, China. Hyflux, a company with international water business operations, began construction of a seawater desalination plant (desalination capacity 100,000 tons) in Tianjin in 2005, and in 2009 began selling industrial water to a nearby petrochemical complex. JGC performs plant maintenance, operation, and upkeep, in addition to project operation. Due to rapid economic growth and population increases, Tianjin City and other areas in Northern China face chronic shortages of industrial and residential water. This desalination project has garnered high expectations, as one part of the solution to China's ongoing water problem.

In addition, JGC is actively involved in seawater desalination projects in the Middle East, North Africa, and other regions, and aims to upgrade and enhance water infrastructure facilities in these regions.



The seawater desalination plant in Tianjin



Desalination equipment

* A Collaboration of JGC and Hyflux

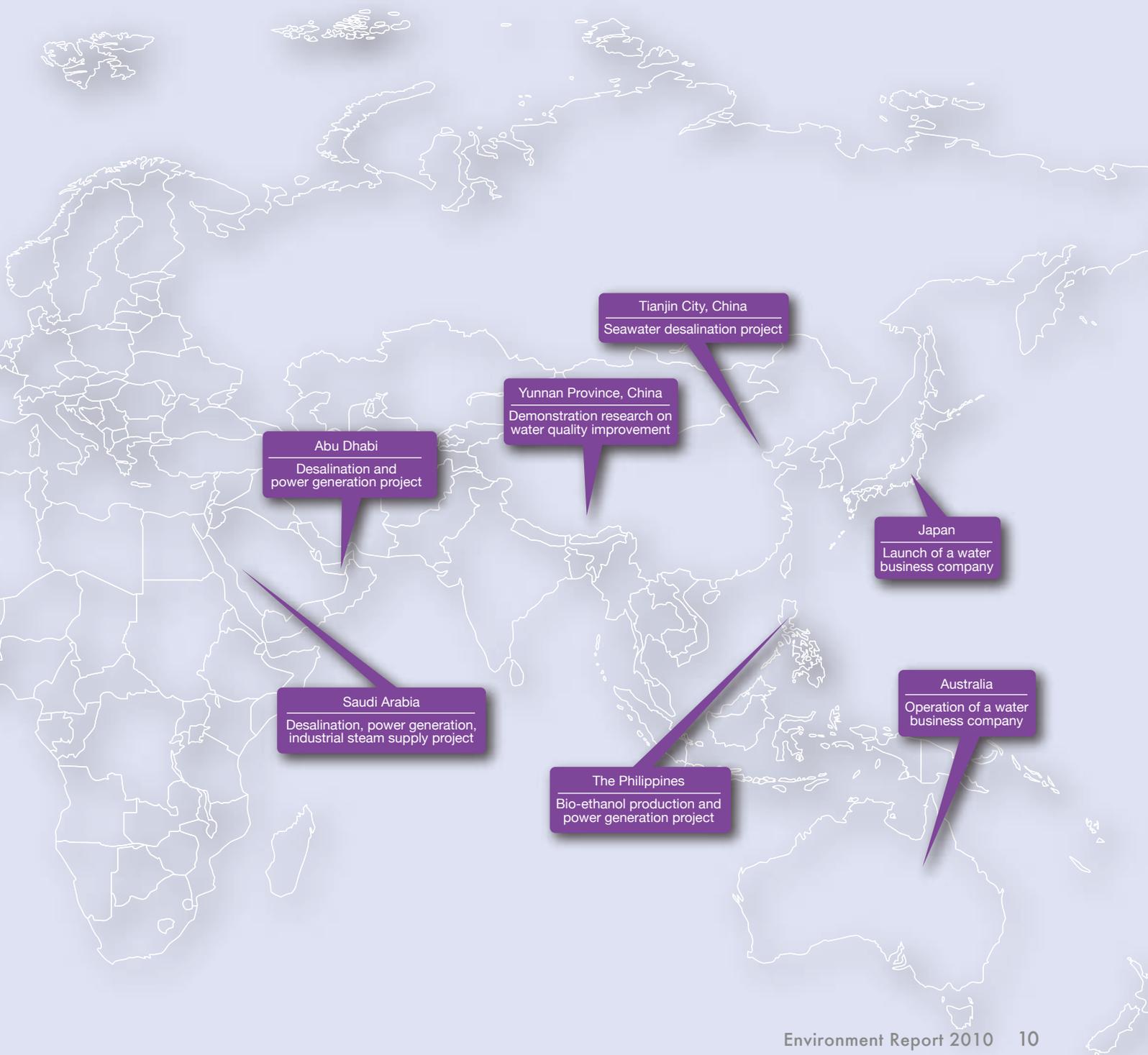
The Launch of a Water Business Company

In April 2010, JGC and Mitsubishi Corporation acquired equity stakes in Ebara Engineering Service Co., Ltd. (EES). EES, the water business subsidiary of Ebara Corporation, is one of Japan's largest domestic contractors for construction, maintenance, and operation of water and wastewater facilities. The newly launched water business company will combine the water treatment engineering, operation, and maintenance expertise of Ebara Engineering Service Co., Ltd., the global network and business management capabilities of Mitsubishi Corporation, and the global engineering and project management capabilities of JGC. Ebara Engineering Service Co., Ltd. aims to strengthen its

water treatment operating base in Japan, and eventually expand the business to overseas water markets.

In May 2010, JGC entered into an agreement with Mitsubishi Corporation, Innovation Network Corporation of Japan, and other partners, to jointly acquire a water business company in Australia. Through these and other initiatives, JGC is continuing to pursue a new business approach.

JGC is committed to combining its project management and engineering capabilities to propose businesses that effectively utilize resources and energy. We are also contributing to environmental conservation through water, electric power, and urban development projects.



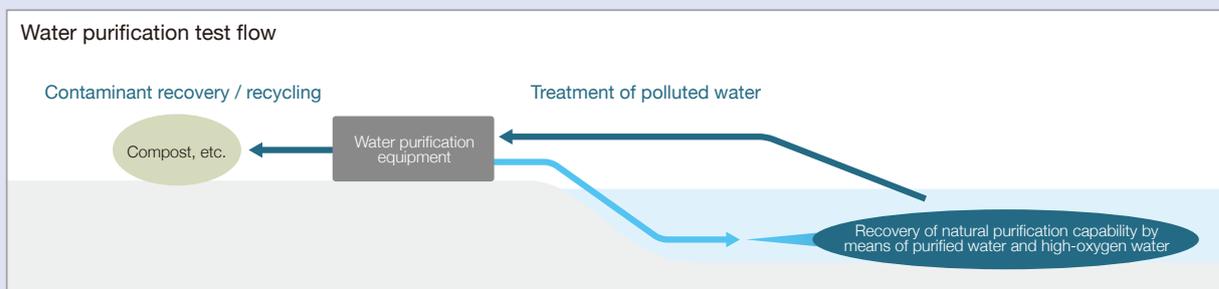
Demonstration Research on Water Quality Improvement in Yunnan Province, China

In China, rapid economic growth has made river and lakewater pollution a severe problem urgently in need of a solution. To address this problem, in 2008, JGC used an ozone-based technology, developed by a Japanese venture company, to conduct water purification testing at Lake Taihu in Jiangsu Province. The testing confirmed the effectiveness of this new technology for purifying water to a drinking-water safety level, and the initiative subsequently attracted the attention of the Chinese and Japanese governments. At the fourth Japan-China Energy Conservation Forum, (November 2009), JGC concluded an agreement with the People's Government of Kunming, Yunnan Province, and China Energy Conservation and Environmental Protection Group, to conduct a purification project at Dianchi Lake in Yunnan Province. China Energy Conservation and Environmental Protection Group are JGC's business partners in China, and China's only national energy investment and conservation company.

JGC has begun investigational research aimed at designing and promoting a water-quality improvement system for Dianchi Lake. This research has been commissioned by the New Energy and Industrial Technology Development Organization (NEDO). It will be conducted by the National Development and Reform Commission, the Yunnan Province Development and Reform Commission, and NEDO, as a joint development project between the governments of Japan and China. In this way, JGC will be applying its engineering expertise to environmental preservation initiatives in China.

Overview of the Investigational Research

- Water purification facility capacity: 300 m³/hour x 2 units
- Purified water quantity: Approx. 5 to 15 million m³ (approx. 1 year)
- Water quality improvement objective: Chinese Surface Water Quality Standard Class III equivalent (suitable for use as drinking water)



Dianchi Lake, site of the demonstration test



Severe water pollution

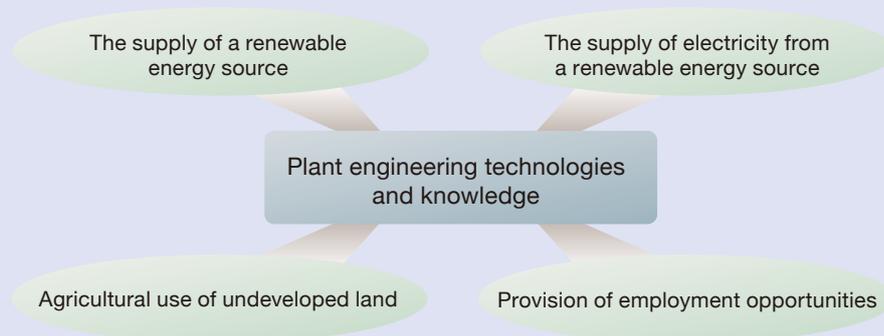
Bio-ethanol Production and Power Generation Project in the Philippines

In April 2010, in a partnership with ITOCHU Corporation and agriculture businesses in the Philippines, JGC launched a project to construct a bio-ethanol plant in Isabella, Luzon. The plant will produce bio-ethanol from sugarcane (54,000 kiloliters per year) and generate thermal power (19 MW) from bagasse (sugarcane residue). By February 2012, the partners will invest more than 10 billion yen to prepare new sugarcane farmland in Isabella, (11 thousand hectares) and construct ethanol production facilities and power generation facilities on the same site.

The Philippines currently mandates a mixture of 5% bio-ethanol in gasoline for automobiles, and plans to raise the mixture rate to 10% in 2011. Although the law mandates

preferred use of domestically-produced ethanol, currently domestic production falls far short of the amount required. The Philippines is also preparing a program to provide favorable treatment for the use of renewable energy sources, which will include bagasse-fueled power generation.

This multifaceted project is made possible by a combination of fuel-plant and power plant technologies, in which JGC has a solid track record. It is also a unique undertaking, serving both as an environmental business that will create renewable energy, and as a socially beneficial business that will create many local jobs. Through sugarcane cultivation and plant operation, the project will create continuous employment for approximately 3,000 households.



A broad expanse of sugarcane farmland



Technology

JGC Group actively contributes to environmental preservation through our wide-ranging engineering business, especially in the field of energy.

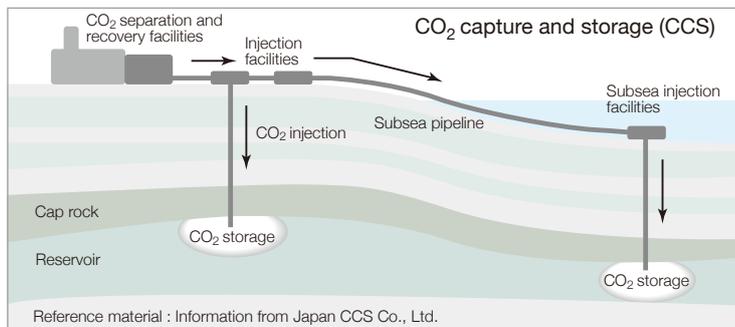
Furthermore, we apply the knowledge we have acquired over the years to various environmental businesses, including electric power and water projects and Clean Development Mechanism (emissions trading) projects. In this section, we report on how JGC Group companies have taken advantage of our environmental technologies to contribute to environmental conservation efforts.

These efforts include environmental clean-up projects, development of low-environmental-impact energy resources, and initiatives to realize a low-carbon society.

Underground CO₂ Sequestration

CO₂ capture and storage (CCS) is a global warming counter-measure that involves recovering and storing CO₂ underground, instead of releasing it into the atmosphere. Demand for CCS is likely to increase in the coming years, with the International Energy Agency (IEA) predicting 100 CCS projects worldwide by 2020, and 850 projects by 2030.

JGC engineered and constructed the world's second large-scale CCS plant (annual amount of CO₂ injection approximately one million tons) in the In Salah natural gas processing plant in Algeria. Together with partner companies, we are working to further develop and disseminate CCS in countries around the world. Currently, we are participating in the design, procurement management, and construction management of the Gorgon LNG project, slated to encompass the world's largest CCS project.



The natural gas processing plant in Algeria

Participation in the World's Largest CCS Project

In 2009, JGC formed a joint venture with KBR (U.S.), Clough (Australia), and Hatch (Canada and Australia) and obtained an order from the Gorgon Joint Venture, in which Chevron is a major investor. The order is for the design, procurement management, and construction management of the Gorgon LNG project, an LNG facility to be constructed on Barrow Island in Northwest Australia. As part of this project, the

world's largest CCS facility (average of 3 million tons of CO₂ per year) is planned as an environmental protection measure. The facility will compress, inject, and store CO₂ underground instead of releasing it into the atmosphere, making the Gorgon project an advanced LNG plant that reflects maximum consideration of the natural environment.

Development of an Efficient CO₂ 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 CO₂ in natural gas and synthetic gas. The technology makes it possible to greatly reduce the energy use and cost of CO₂ underground storage, and could contribute significantly to the widespread use of CCS.

Basic technology pilot testing at the Research and Development Center has been completed. To verify HiPACT's applicability to commercial facilities, for several months, JGC has been conducting demonstration testing of CO₂ recovery (40,000 tons per year) using actual natural gas, at the carbon dioxide gas removal facility of INPEX Corporation's Koshijihara Gas Plant (Nagaoka City, Niigata Prefecture). In this way, JGC is actively working to achieve the early dissemination of CCS technology.



The INPEX Corporation's Koshijihara Gas Plant

Preparation for CCS Implementation

The cost burden is a major obstacle to the realization of CCS. One solution would be implementing CCS as a CDM project under the Kyoto Protocol, and JGC has been working continuously to achieve this. Another solution under consideration is enhanced oil recovery (EOR) using CO₂. EOR increases oil yield by injection of CO₂ into oil reservoirs where yield is declining. In China, a project combining CCS

and EOR technology to sequester CO₂ in oil fields is under consideration as a public-private sector effort involving the governments of Japan and China. JGC, the Research Institute of Innovative Technology for the Earth (RITE), and the China National Petroleum Corporation (CNPC) are conducting a joint technical investigation in preparation for CCS implementation.

CDM Projects in China

Clean Development Mechanism (CDM) emission-reduction projects are being implemented as cooperative efforts between developing countries and developed countries. Emission-reduction credits issued for CO₂ emission control and/or CO₂ absorption enhancement achieved by a given project 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 CO₂ emission reduction targets. JGC participates in CDM projects in China.

17-Million-Ton Greenhouse Gas Reduction from Chlorofluorocarbon Substitute Gas Recovery and Decomposition

JGC, in partnership with Marubeni Corporation, is implementing the Juhua CDM project, the first-ever Japan-China CDM project. The project objective is the acquisition of Certified Emission Reduction (CER) credits through the recovery and decomposition of the greenhouse gas HFC23 at a chlorofluorocarbon substitute production plant in China's Zhejiang Province. The plant is owned by

Zhejiang Juhua Co., Ltd. Enormous greenhouse gas reductions (equivalent to 40 million tons of CO₂) are planned over a period of seven years. The Juhua CDM project's decomposition facilities began operation in August 2006, and greenhouse gas reductions of approximately 17 million tons were achieved by December 2009.

Acquisition of Emissions Reduction Credits of 22,000 Tons / Year Through Residual Heat Power Generation for a Cement Plant

In September 2008, a residual heat power generation project, in which JGC was a participant, was registered as a CDM project by the United Nations. The project is operated by Huaibei Mining (Group) Cement Co., Ltd. in Anhui Province in China, and is the second CDM project in which JGC has been involved. JGC plans to obtain emissions reduction credits for the equivalent of 22,000 tons of CO₂ per year from the project, which involves residual heat power generation facilities for a cement plant.



The Huaibei Cement plant in Anfu, China

Acquisition of Emissions Reduction Credits of 520,000 Tons / Year Through Cement Raw Material Substitution

China is the world's second-largest consumer of energy, 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 creates high levels of CO₂ emissions. Many Chinese cement plants also do not effectively utilize the surplus energy released during cement production.

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, is currently involved in cement plant projects that apply a new cement production method using more sustainable raw materials as a substitute for limestone. These projects were registered as CDM projects by the United Nations in March

and April of 2009, respectively.

In conventional cement production, clinker, the intermediate product, 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.

In this new method, the by-product generated through clinker production is water vapor, not CO₂. Therefore, the new method enables a significant reduction in CO₂ emissions from production processes, as well as effective utilization of carbide residue. Through these projects, JGC plans to acquire emissions reduction credits for the equivalent of approximately 520,000 tons of CO₂ per year.

U.N. Registration of an Emissions-Reduction Project for the Recovery and Use of Coal Mine and Ventilation Air Methane

During coal mine operation, methane gas in the coal bed is recovered to ensure the safety of the miners. However, much of the recovered coal mine methane (CMM) is emitted into the atmosphere. In addition, the air used for the ventilation of mine shafts also contains methane gas in extremely low concentrations (0.3% to 0.7%). This is known as ventilation air methane (VAM). Since methane gas has 21 times the greenhouse gas potential of CO₂, the recovery and effective use of methane gas can be expected to have global warming prevention and energy conservation effects.

A VAM recovery and utilization project in Anhui Province in China, implemented by a partnership between JGC and Huaibei Mining (Group) Co. Ltd., was registered by the United Nations as a CDM project in October 2009 (annual GHG

reductions equivalent to 45,000 tons of CO₂). In addition, JGC has applied for U.N. registration of another CDM project to recover CMM (annual GHG reductions equivalent to 75,000 tons of CO₂).



A coal mine VAM duct facility

Environmental Activities at Group Companies

JGC Group includes companies that operate EPC (engineering, procurement, and construction) businesses similar to that of JGC, as well as companies involved in process licensing, inspection, maintenance, consulting, catalyst and fine chemicals businesses.

In this section, we report on the development of new environmentally-friendly technologies and mechanisms at these Group companies.

Introduction of a NO_x Removal Catalyst in Overseas Markets

Nitrogen oxides (NO_x) are substances that cause acid rain and photochemical smog. In the early 1970s, JGC Catalysts and Chemicals Ltd., a member of JGC Group, began to develop catalysts for the flue gas de-nitrification equipment used at power plants and other facilities, and in 1976 it became the first company to offer a honeycomb structure de-nitrification catalyst (NO_x removal catalyst) to the Japanese market. Subsequently, following the strengthening of NO_x regulations in various countries, the company has offered NO_x removal catalyst manufacturing technology licenses to companies in the EU, the US, and South Korea.

Increased global environmental awareness has driven up Chinese demand for NO_x removal catalysts as well, and now the company is selling NO_x removal catalysts for use at a number of thermal power plants in China. China's demand is expected to continue to expand, so in addition, JGC Catalysts and Chemicals operates a sales company in Beijing

to provide service to Chinese customers. It has also begun offering NO_x removal catalyst manufacturing technology licenses to manufacturers in China. In the coming years, NO_x removal catalysts manufactured under license are expected to come into widespread use at power plants in China and to broadly contribute to the curbing of China's NO_x emissions.



Huaneung Hainan Dongfang Power Plant in China is supplied with NO_x removal catalyst.

Development of Titanium Materials for Dye-Sensitized Solar Cells

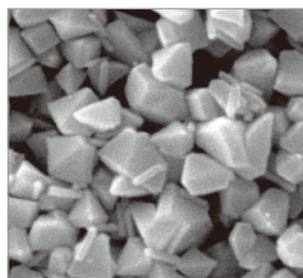
Solar cells, which convert solar energy into electricity, are power generation devices that require no oil, coal, natural gas, or other fossil fuels. Solar cells have attracted increasing attention and come into widespread use in recent years as a solution to energy problems and a means of preserving the global environment.

Several types of photovoltaic materials are used for solar cells. Although high-purity silicon is now the most commonly used material, dye-sensitized solar cells are being heralded as a next-generation material. Dye-sensitized solar cells are made using a photovoltaic material that consists of a thin nanoparticle titanium dioxide layer infused with a special dye on a glass or plastic plate. This material possesses characteristics not found in silicon solar cells: it offers good reactivity to comparatively faint light energy such as artificial light, comes in a variety of colors, and is easy to fabricate.

Two factors that affect the performance of dye-sensitized solar cells are a technology that controls the titanium dioxide nanoparticles (the material that causes the light-encapsulating

effect) to the ideal average diameter of 0.4 microns, and a special technology for preparing a paste of titanium dioxide nanoparticles with a diameter of 0.02 microns or less, for use in forming a thin titanium dioxide particles layer.

JGC Group member JGC Catalysts and Chemicals has already refined these technologies to the industrial level and is endeavoring to promote the dissemination of dye-sensitized solar cells, an energy source with great promise for the future.



Titanium dioxide particles with an average diameter of 0.4 microns

Environmental Impact Assessment Method for CCS Projects

CCS (underground sequestration of CO₂) is attracting considerable attention as an immediately effective means of global warming mitigation. JGC has constructed the world's second large-scale CCS plant in Algeria and is currently participating in the construction of what will be the world's largest CCS plant, located in Australia.

JGC Group company Japan NUS Co., Ltd., offers environmental consulting and risk assessment to promote environmental impact assessment and social consensus in CCS projects.

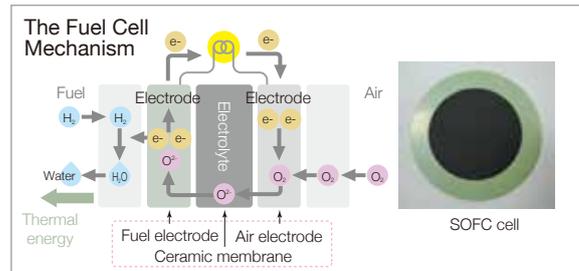
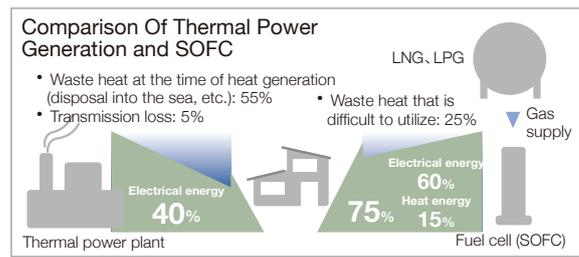
The introduction of CCS involves issues that require careful consideration. For instance, is there a possibility that CO₂ sequestered for long periods of time will leak into seawater or the atmosphere? That is, is CCS an environmental protection technology that involves inherent risk of environmental pollution? A mechanism for assessing this risk was discussed

at the London Convention, and the framework for that mechanism was completed in 2007. Japan revised the Marine Pollution Prevention Law in 2007 in response to this international development, and it was decided that the Environment Minister would permit the sequestering of CO₂ under the seabed following the completion of environmental impact assessments. As an environmental consulting firm, Japan NUS has provided support in all aspects of this deliberation process, from the Japanese government's participation in the international convention to the procedure for revising Japanese law. The company is currently supporting the preparation of a technical manual to enable the government (Ministry of the Environment) to appropriately examine future environmental impact assessments performed by CCS contractors.

A Cell Structure for Solid Oxide Fuel Cells

Solid oxide fuel cells (SOFC), which generate electricity by causing a chemical reaction between hydrogen and oxygen, provide greater power generation efficiency than conventional thermal power generation. In addition, since electricity is generated where it is used, SOFC are power generation systems that entail no transmission loss and enable previously unusable waste heat to be effectively used as heat energy of at the time of power generation. For these reasons, SOFC are an environmentally-friendly power source that offer higher fuel and energy use efficiency than thermal power generation.

JGC Group member Japan Fine Ceramics Co., Ltd. contributes to the practical application of eco-friendly SOFC by applying expertise in diverse fields, such as thin plate forming techniques developed for the manufacture of ceramic substrates. The company assists the development efforts of electrical equipment manufacturers, gas equipment manufacturers, and research institutions by engaging in contract manufacturing involving trial production, start-up of mass production, and production scale expansion for the cells that are the heart of SOFC.



Development of a Commercial Air Purification System Incorporating a Bactericidal Enzyme

JGC Group member JGC Universal Ltd. is working to realize clean air in office and living environments through the application of numerous elemental technologies for dust removal, deodorizing, volatile organic compound (VOC) removal, and disinfecting. The company provides bactericidal enzyme filters for air conditioning at food, medical, pharmaceutical, and research facility clean rooms and has recently commercialized the Clean Pro BIOFREE commercial air purification system for the prevention of secondary infection of influenza and other illnesses at medical care facilities and public spaces.

A bactericidal enzyme developed by JGC Universal is affixed to the filter. The enzyme deactivates bacteria collected by the filter, preventing secondary infection caused by microorganism propagation. Whereas ordinarily approximately 100 bacteria exist per cubic meter of air several days after air passes through a filter, the enzyme filter makes it possible to control the number of bacteria to nearly zero.



The BIOFREE air purification system

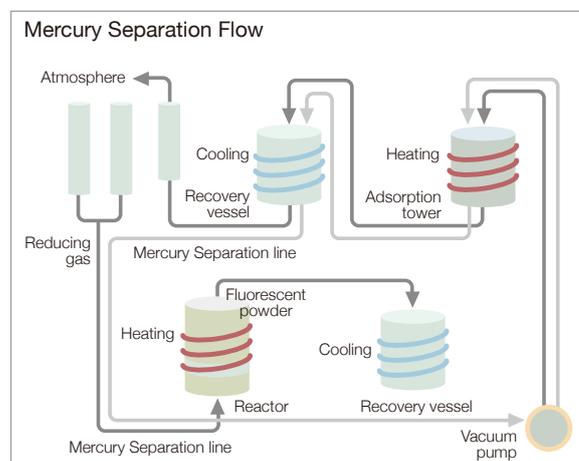
Commercial Application of a Mercury Separation System for Fluorescent Lamps

Even as awareness of environmental problems increases worldwide, many local governments in Japan continue to dispose of fluorescent lamps in landfills. Mercury is enclosed in fluorescent lamps, and there is concern that landfill without treatment may result in mercury ground pollution and ocean pollution.

JGC Group company JGC PLANTECH Co., Ltd. has scaled up the capacity of its vacuum-reducing gas ventilation method laboratory equipment (jointly developed by Civilian Eco Research Co., Ltd. and Professor Masahiro Hori of Yokohama National University) to commercial size, and succeeded in separating the mercury in fluorescent powders to landfill standards (concentration of 5 mg/l or less in elution testing)

Previously, the separation of the mercury in fluorescent powders was a difficult undertaking.

JGC PLANTECH's highly regarded separation system has been installed at two waste disposal plants in Yatsushiro City, Kumamoto Prefecture and Naha City, Okinawa Prefecture, where it serves the purpose of fluorescent lamp recycling.



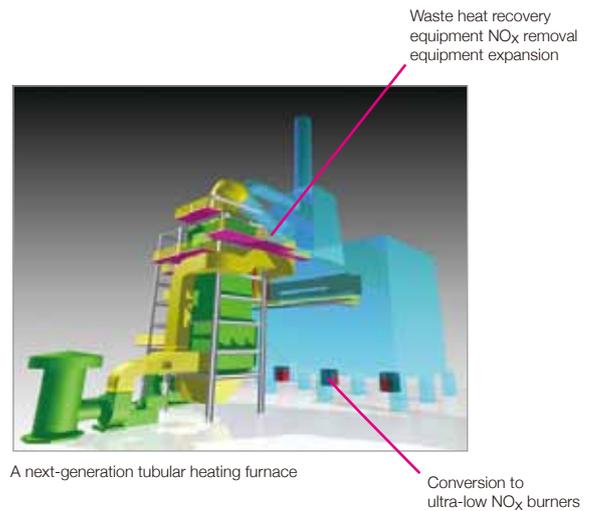
Next-Generation Tubular Heating Furnaces

Tubular heating furnaces are an integral equipment item at various industrial plants, where they are used to heat liquids or gaseous fluids to required temperatures. However, since large quantities of fossil fuels are used to fuel ordinary heating furnaces, the fuel cost burden is high and fuel combustion causes emission of large quantities of nitrogen oxides (NO_x), which have a serious impact on the global environment, and CO₂, a greenhouse gas.

The ability to increase the thermal efficiency of heating furnaces, or reduce NO_x emissions, has historically been limited, for reasons involving combustion techniques, facilities cost, and anti-corrosion technologies. However, JGC Group member JGC Project Services Co., Ltd., which has been involved in the engineering and construction of numerous heating furnaces in Japan and overseas, offers next-generation tubular furnace heaters that solve these issues. The company has already built several facilities in Japan.

Features of Next-Generation Tubular Heating Furnaces

1. Application of energy-saving technologies
 - Exhaustive recovery of heat from flue gas
 - Increase in thermal efficiency through combustion with a low coefficient of excess air
 - Reduction of furnace wall radiation heat loss through insulation reinforcement
2. Application of green technologies
 - Realization of an ultra-low NO_x combustion technique through the installation of leading-edge burners
3. Improvement in combustion control and operation control
 - Increase in combustion safety.



A next-generation tubular heating furnace

Conversion to ultra-low NO_x burners

Energy Conservation Using Server Virtualization Technology

JGC Group member JGC Information Systems Co., Ltd. is adopting server virtualization technology in order to conserve energy, save space, and reduce the total cost of servers.

Server virtualization is a technology for reducing the number of installed servers by logically splitting up a server's physical environment and causing the server to operate as if it were multiple servers.

JGC Information Systems is executing a virtualization project for the servers that operate as the information systems infrastructure at JGC's Yokohama headquarters. The first stage of the project is a three-year plan from fiscal 2010 to fiscal 2012 to integrate approximately fifty print and plot servers, file sharing servers, and other servers into a virtual server environment of servers. In this way, we expect to reduce server power consumption in fiscal 2012 by 85% from the previous level.

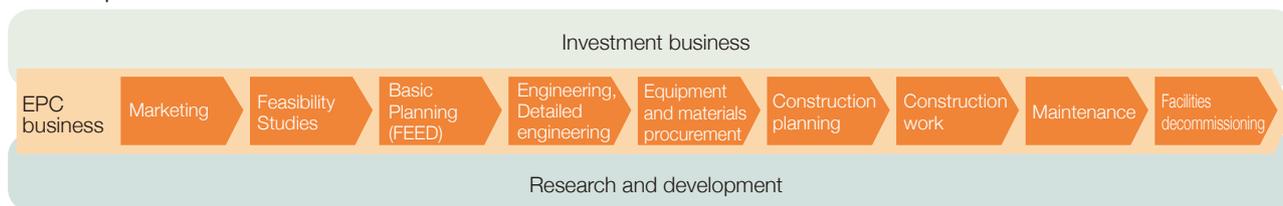
Beginning in fiscal 2011, JGC Information Systems plans to seek further energy savings by integrating JGC's project management system and other mission-critical systems into a new information infrastructure (mail, groupware, electronic bulletin board system, etc.) currently being developed using server virtualization technology.

The company's future plans call for applying its expertise and project management capabilities as a systems integrator to offer a server integration service that will contribute to environmental impact reduction.

II Environmental Consideration in Business Activities

Project

JGC Group's Business Activities



JGC Group executes projects around the world in business sectors ranging from resource development, oil, natural gas, and petrochemicals, to the environment, chemicals, pharmaceuticals, water resources, and new energy.

In all of its businesses, the Group constantly strives to fully consider environmental impacts.

We demonstrate environmental consideration not only in plant EPC (engineering, procurement, and construction), but also in our marketing and at all project stages, from feasibility studies to maintenance and plant decommissioning.



JGC aims to be a No. 1 HSE contractor.

We aim to faithfully fulfill our social responsibility by considering HSE in every aspect of our business.

Hidenori Yashima

Senior Executive Officer, Senior General Manager, Quality Assurance, Safety & Environment Office

Intensive Management of HSE to Meet Newer, Higher Standards

JGC has established the Quality Assurance, Safety and Environment Office for constant environmental consideration in all aspects of business. Client interest in HSE has heightened in recent years, and the requirements of clients have become more stringent. JGC aims to maintain customer trust and fulfill social responsibility by becoming a No. 1 HSE contractor.

HSE in the Concept and Basic Planning Stages

JGC carefully considers HSE concerns, starting from the concept and basic planning stages. For example, in a recent LNG plant project in Indonesia, JGC met the strictest standards in Indonesia's environmental impact assessment system. JGC considered environmental factors starting at the basic engineering stage, including shipment of materials and equipment from remote areas, protection of flora and fauna, and local employment policies. With the cooperation of the client, JGC completed a world-class plant satisfying all environmental requirements.

Balance of Long-Term and Short-Term Perspectives

Energy and infrastructure facilities in operation around the world, even those that make full use of the latest technologies, all have an impact on the environment over the long term. Parties responsible for the concepts, detail specifications, and construction of these facilities must consider not only ad-hoc economic rationality, but also long-term environmental impacts. Provided all involved parties understand the essence of HSE and overall optimization can be achieved, the result will meet with the approval of customers and society. JGC is keenly aware not only of the need for initial cost performance, but also for consideration from both short-term and long-term perspectives of matters including subsequent environmental impact, operating safety, and ease of maintenance. We aim to be a company that achieves a good balance between short-term and long-term perspectives.

Environmental Consideration at Every Stage of EPC

In this section, we report on specific examples of JGC Group's concern for the environment at every stage of EPC services.

In Marketing

Achieving balance between generating a stable energy supply and protecting the natural environment is a critical issue facing the human race. Our clients are expressing an increasing demand for environmental sensitivity and sustainability, and JGC Group has been orienting marketing and sales strategies toward these environmental concerns. Recently, many plants have been switching from coal or oil over to fuels with a lower environmental impact, such as natural gas. JGC will continue to market its services to clients with needs of this kind. We will also be marketing our environmental facility EPC services more broadly. These services include EPC for gasoline and diesel oil desulfurization facilities, LNG plants, and integrated gasification combined cycle (IGCC) facilities.

In addition, we are increasing our presence in new environmental sectors like renewable energy, with solar radiation and solar thermal power projects in the Middle East and other areas. In response to increased demand for water, we are also making the global water business (incl. desalination and water supply projects), a major part of our future marketing plans.

Marketing



IGCC Plant

In Feasibility Studies

We consider many matters at the feasibility study stage, including market analysis, potentially useful technologies, systems capabilities, facilities configuration, and construction and operation cost analysis. When selecting facilities configuration, we take environmental concerns into account,

along with regional characteristics and safety. We also consider secondary environmental impacts, such as whether waste disposal facilities are available in the region, or whether any transportation-related problems exist.

Feasibility Studies

In Basic Planning (FEED)

Basic engineering specifications of plant construction are decided at the FEED (front-end engineering design) stage. At this stage, JGC Group draws up specifications reflecting comprehensive consideration of plant construction costs, safety, operation costs, environmental impact, and other factors, and applies technological strategies for energy conservation and effective energy use. During FEED, we measure the overall thermal balance of the plant and propose

energy conservation and efficiency improvement measures, including pinch technology for optimization of heat recovery and use, aero-derivative gas turbines for power generation facilities, and combined cycle power generation. We also work to actively mitigate damaging environmental impact by reducing CO₂ emissions, and considering measures such as waste heat recovery maximization and flare gas emissions reduction.

Basic Planning (FEED)

In Basic Engineering and Detail Engineering

At the basic and detail engineering stages, we consider practical, concrete measures for minimizing environmental impacts, which are reflected in the equipment specifications decided at these stages. During initial engineering design for a recently opened overseas natural gas processing plant, we created a compact design for compressor locations, piping layout, and other details to achieve a 35% reduction in structure height and a 28% reduction in length. As a result,

we increased production efficiency and reduced construction cost.

To increase thermal efficiency, we recover and reuse the heat of high-temperature flue gas from compressor turbines. Whereas previously the heat was reused at various plant departments through an oil medium, now, we have further increased thermal efficiency by converting waste heat to steam and using it to power an additional steam turbine.

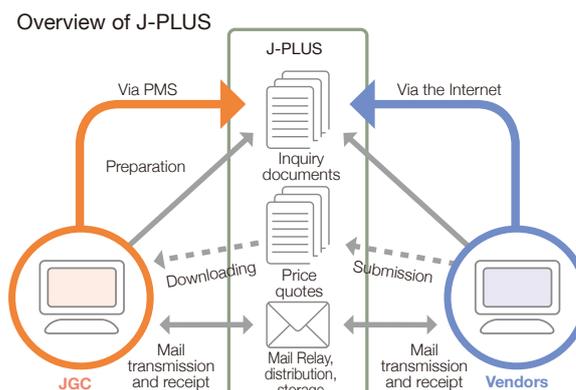
Engineering, Detailed engineering

In Equipment and Materials Procurement



JGC Group also takes environmental considerations into account at the procurement phase of projects, encouraging the materials and equipment vendors with whom we do business to adopt a forward-looking stance on environmental conservation, including protection of biodiversity.

Though transactions with vendors previously required a large volume of paper documentation, we have now successfully switched to digital documents with our in-house JGC e-Procurement Solution System (J-PLUS). This system is environmentally friendly and improves work efficiency by reducing the use of paper forms. After purchase order finalization, interaction with vendors at the detail engineering stage is computerized using J-PLUS, resulting in a virtually paper-free work environment.



In Construction Planning



Meticulous concern for sustainability at plant construction sites is essential. In many countries, construction of new plants requires submission of an environmental impact assessment (EIA) report for the purpose of minimizing environmental impacts wherever possible. The EIA report describes in detail impacts that construction work will have on the air, water, soil, flora, 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 strict 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 manage environmental risk and endeavor to minimize the possibility of environmental disasters 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. Identifying environmental impacts of the construction work
2. Setting environmental objectives and targets for the construction work
3. Preparing an environmental management plan for construction work
4. Providing new workers with environmental education and training

We incorporate the Zero Emissions Initiative, a JGC Group independent environmental conservation initiative, into this preliminary work, and thoroughly confirm environmental conservation measures before starting construction.

In Construction



Construction work by JGC is preceded by thorough environmental consideration at the planning stage. Matters decided in the Construction Environmental Management Plan include project environmental policy, the organizations and persons responsible for environment-related work, environmental protection measures, environmental performance monitoring and measurement, emergency prevention and mitigation procedures, environmental

monitoring, and monthly reporting. Following the start of construction, a review of environmental aspects of the project (the relationship between construction work and the environment) 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.

Containment Engineering for Pharmaceutical Plants

Some pharmaceutical plants handle potentially hazardous substances. Focusing on this characteristic of pharmaceutical plants, JGC has developed a rational containment engineering approach to ensure worker safety, protect the local environment, and provide comprehensive

protection from hazardous substances. By participating in plant construction from the basic planning stage, JGC makes doubly sure of environmental safety even at pharmaceutical plants that handle hazardous substances.

Preservation of Sacred Symbols at Construction Sites

Construction work for an LNG plant on Papua, Indonesia required consideration of two forms of sustainability: minimizing project impact on the natural environment in accordance with Indonesian government regulations, and avoiding introduction of objects and actions that would be detrimental or offensive to the culture and society of the indigenous people. The plant site contained sacred trees and sacred stones that are religious symbols for the area's original inhabitants. These symbols have been preserved within the site and are made accessible for festivals and other religious rites.



Sacred trees preserved within the plant site

In Maintenance

Rigorous HSE risk assessments are conducted in the engineering phase for oil and natural gas plants, and risk mitigation measures determined to be necessary are borne out in engineering and construction. However, over years of plant operation, operating conditions change and facilities age. In some cases, chemical substances not assessed as risks at the time of construction become recognized as health risks. HSE organizations in the Western Hemisphere have long advocated the timely reassessment of risks that may potentially increase over the course of long-term plant operation. Plant operators recognize the need for this, and in

general have been consistently conducting more rigorous risk reassessment. JGC Group actively supports plant operators in conducting risk assessment at operating plants. We have an excellent reputation for our ability to act as a third party, provide the latest technologies and knowledge, and supply needed resources to plant operators.

As evident from the April 2010 oil spill in the Gulf of Mexico, the energy industry carries an inherent risk of causing environmental problems on a global scale. This makes risk assessment at plants all the more important.

In Facilities Decommissioning

JGC also strives to minimize environmental impacts in dismantling work during facilities renewal. For example, during the renewal of a pharmaceuticals laboratory, we used construction drawings and materials analysis to confirm the presence or absence of asbestos dust, PCBs, chlorofluorocarbons, and other harmful materials before dismantling facilities. On the basis of the results, we sought to minimize environmental impact by preventing asbestos dispersion, and recovering and decomposing chlorofluorocarbons. We measured asbestos particle concentration in the air before, during, and after construction and confirmed that asbestos had not been dispersed outside the work area.

To reduce the processing of industrial waste generated during decommissioning, 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 determine appropriate treatment for industrial waste at every stage up to final disposal.



Ceiling dismantling



Separation of waste

Environmental Consideration in Investment Projects and Research & Development

In this section, we report on the environmental considerations related to our investment projects, and in the research and development that supports our engineering business.

Enterprise Investment Business

In addition to the EPC business, JGC Group is involved in infrastructure projects (desalination and power generation), resource development projects (for oil, gas, and other resources), CDM projects, new energy development projects (bio-ethanol and coal upgrading), as well as environmental catalyst and fine chemicals manufacturing projects. As a general rule, in the enterprise investment business, we keep the following objectives in mind: development of social infrastructure, environmental improvement on a global or local scale, and improvement in energy use efficiency.

In investment projects, from the feasibility study stage onward, we abide by the environmental regulations of the country or region, as well as the environmental standards set down by the International Finance Corporation (IFC). In our current desalination and power generation projects in the UAE and Saudi Arabia, we are performing detailed environmental impact assessments, and are working in compliance with the aforementioned environmental standards and regulations. JGC Group makes investments with the belief that environmentally considerate projects increase corporate value for JGC and for our business partners.

Investment business



Desalination and power generation plant (Abu Dhabi, UAE)

Research and Development

JGC conducts research and development, principally testing, at the Research and Development Center in Oarai, Ibaraki Prefecture. At the Research and Development Center, we treat testing wastewater by filtering, adsorption, and neutralization, in strict compliance with voluntary management criteria as well as relevant laws, ordinances and regulations. We dispose of treated water in accordance with environmental standards. In controlled areas where we use radioactive isotopes, we strive to reduce the amount of test waste liquid and hand washing wastewater generated. We treat these liquids and wastewater by ion exchange, filtering, adsorption, and concentration, and recycle them within the controlled area. Under no circumstances do we discharge this water outside the controlled area. Furthermore, we release exhaust from the controlled area after filtering it through a high-performance HEPA filter, with continuous monitoring to confirm that it complies with emission control standards. We aim to reduce the amount of industrial waste generated within the Research and Development Center, and we separate and dispose of waste in compliance with industrial waste disposal standards.

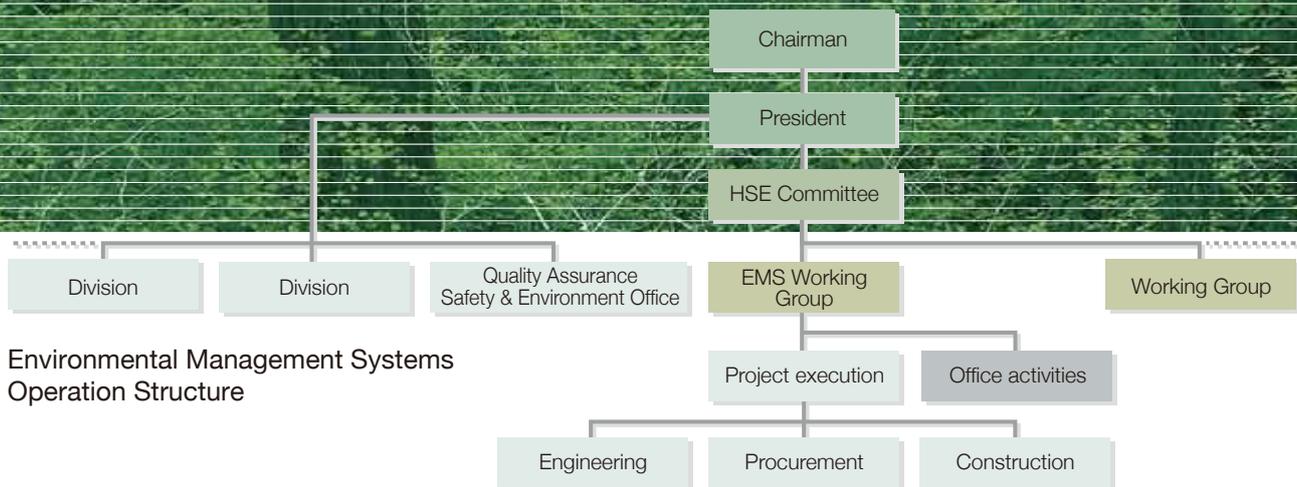
Research and development



Research and Development Center (Oarai, Ibaraki Prefecture)

III 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 the global environments to be critical business priorities.

We carefully consider the natural environment from a variety of perspectives, and we have achieved significant environmental improvement results through innovation in business execution.

At the core of JGC's robust environmental protection framework are our environmental management systems.

We have also focused on biodiversity preservation in preparation for the International Year of Biodiversity in 2010.



We aim to be an engineering company with a high level of HSE awareness and HSE employee education.

Fumio Nishiyama

Group Leader, Safety Management Group, Construction Management Dept.
Industrial & Domestic Energy Project Division

HSE Leader in Charge of Policy Implementation, Awareness, and Education.

I am responsible for the promotion of HSE (health, safety, and environment) at construction sites in Japan. I work mainly on the promotion of the Zero Emissions Initiative, and also for the company's policy for preventing environmental accidents, raising awareness of company policies at construction sites, ensuring compliance with relevant regulations, and conducting HSE education programs for everyone involved in construction.

Problems Associated with Environmental Management at an Engineering Company

Our safety management target is very clear: to achieve zero accidents rate at construction sites. With environmental targets, however, matters are not so clear. Although we set targets each year, we found it difficult to explain the targets and how to go about achieving them in a way that is easy for the people involved to understand. Although we worked continuously for several years to reduce paper, waste, and electricity use, there are limits to what can be accomplished in strengthening environmental management by repeating the same activities year after year. Accordingly, we wracked our brains searching for the next environmental target.

In addition, although we devoted considerable time and effort to improving deficiencies identified in environmental assessments, the task was so arduous that Department Environmental Key Persons expressed doubts about the purpose of environmental management and whether it contribute to profits. Since even Department Environmental Key Persons felt that way, I was forced to recognize the inadequacy of our internal environmental education and awareness.

Implementing Environmental Policy and Setting of Clear Targets with Partner Companies

Recently, we have been setting more concrete environmental targets, such as the Zero Emissions Initiative, which was instituted in 2008. Together with partner companies, we have set clear objectives for industrial waste recycling, CO₂ emissions reduction, and prevention of oil and chemical spills at construction sites.

Environmental awareness in the general population is increasing year by year, with issues like hybrid cars, energy conservation, and residential waste reduction/separation gaining more and more attention. This increased awareness facilitates the implementation of new environmental policies at construction sites. I hope to continue to raise environmental awareness among employees involved in construction, just as I hope to support safe, accident-free construction site operation.

Environmental Objectives, Targets, and Achievement

In accordance with the company environmental policy, JGC strives for continuous improvement of its environmental management systems by measuring and assessing achievement as shown in the table below.

Fiscal 2009 Results and Fiscal 2010 Improvement

E : Completely implemented G : Extensively implemented NG : Not yet implemented

♻️ : Substantial modification of environmental improvement measures → : Continuation of environmental improvement measures

Sector	Environmental objectives	Environmental targets	Activity details	Implementation status	Fiscal 2009 results	implemented for 2010
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	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 stationary and office supplies waste, prohibition of personal files	Periodic pooling and reuse of unused stationary and office supplies, prohibition of personal files	E	Reuse of stationary 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
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 1kg-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 unflinchingly reflected in drawings and specifications, and construction performed on that basis. During the fiscal year environmental impact mitigation measures were 100% implemented.	→
Group companies	Implementation of the Zero Emissions Initiative	Obtaining orders for jobs that can contribute to recycling	Obtaining orders for mercury recovery jobs and jobs waste vegetable oil reuse	G	Achievement of target number of orders	♻️
		Sludge reduction	Installation of high-performance dewatering machines	G	Achievement of a sludge reduction of 25% or higher	♻️
		Prevention of leakage into the surrounding environment	Continuation of breakwater installation and environmental improvement activities (prevention planning, monitoring)	G	Zero leaks within sites	→
		Product development that contributes to global environmental impact reduction	Anode materials improvement, development of automotive catalysts	E	Achievement of the target level for commercialization	→
		Five-year average improvement of 1% or higher in energy-related CO ₂ emissions units	Steady implementation of energy-saving measures (installation of energy-efficient lighting, equipment, and air conditioning facilities)	G	Achievement of five-year average improvement of 1% or higher in energy-related CO ₂ emissions units, with favorable effect of a decline in production volume	→
		Office environment improvement	Wearing of energy-efficient summer and winter business wear, automatic extinguishing of lights during noon breaks, reduction in the number of lights, shutdown of idle PCs, water conservation, rigorous separation of waste, use of both sides of paper, reuse of stationary, eco-friendly stationary, prevention of rework, use of own drinking cups	G	Rigorous discipline in office environmental measures	→

JGC Environmental Indicators

JGC collects, analyzes, and assesses environmental data for the head office, the Research and Development Center, JGC construction sites in Japan and overseas, JGC Group companies in Japan and overseas, and domestic and international sales bases. However, since JGC conducts projects on a made-to-order basis, environmental impacts of business activities vary substantially by country and project type. In addition, some construction sites are managed directly by clients, making it difficult for JGC to collect data. For these reasons, major differences in our environmental monitoring occur from year to year. Furthermore, even when environmental indicator data are collected, data analysis and assessment is difficult. Accordingly, we are proceeding with trial implementation of CO₂ emission unit management on a working-hour basis.

Zero Emissions Initiative Environmental Performance

Environmental Indicators		Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010 forecast
JGC sites in Japan					
1. Industrial waste recycling rate	Target	%	89	93	96
	Result	%	94.7	96.3	96
2. Number of leaks	Target	Leaks	0	0	0
	Result	Leaks	0	2	0
3. Energy-related CO ₂ emission units	Target	kg-CO ₂ /hour	1	1	1
	Result	kg-CO ₂ /hour	1.05	0.94	1
Environmental Accidents, etc.					
Environmental accidents	Notification	Accidents	0	0	0
	Other	Accidents	0	0	0
Spills within facilities	JGC sites in Japan	Leaks	1	2	0
	JGC overseas sites	Leaks	14	1	0
JGC sites in Japan					
Energy consumption	Fuel oil	KI Crude Oil equiv.	23,340	14,757	15,108
	Gas	KI Crude Oil equiv.	20,702	27,008	27,214
	Electricity	KI Crude Oil equiv.	23,865	23,466	24,698
Waste	Industrial waste	tons	36,128	36,066	53,836
	Specially controlled waste	tons	356	320	514
Energy-related CO ₂ emission	Direct emissions	t CO ₂ equiv.	119,569	92,478	93,814
	Indirect emissions	t CO ₂ equiv.	34,448	33,699	34,774
	Total	t CO ₂ equiv.	154,017	126,177	128,588
JGC Group Overseas					
Energy consumption	Fuel oil	KI Crude Oil equiv.	16,721	9,422	30,488
	Gas	KI Crude Oil equiv.	519	2	6
	Electricity	KI Crude Oil equiv.	2,235	2,324	2,343
Waste	Non-hazardous waste	tons	28,850	22,161	42,000
	Hazardous waste	tons	2,259	42	80
Energy-related CO ₂ emission	Direct emissions	t CO ₂ equiv.	52,648	26,891	87,022
	Indirect emissions	t CO ₂ equiv.	4,466	4,989	5,020
	Total	t CO ₂ equiv.	57,114	31,880	92,042

Environmental Indicator Collection Map



The Zero Emissions Initiative

In fiscal 2008 JGC Group implemented the Zero Emissions Initiative, in order to fulfill our corporate social responsibility. The Zero Emissions Initiative covers the head office, the Research and Development Center, JGC construction sites in Japan and overseas, JGC Group companies in Japan and overseas, and domestic and international sales bases. We hang posters advertising the initiative at all business sites, to inspire broader interest in environmental improvement. At JGC domestic construction sites, we quantify environmental improvement targets in three areas: the recycling rate, number of spills, and CO₂ emission units (as indicated in the environmental objectives and targets section). In 2008 and

Poster at overseas construction sites

2009 we achieved our targets for recycling rate and CO₂ emission unit targets, and reduced the number of spills, as shown in the table Zero Emissions Initiative Environmental Performance (above). Furthermore, we made four construction sites into zero-waste sites. JGC defines zero-waste as a final landfill disposal rate of less than 1%. Based on these performance figures, JGC Group will set medium- and long-term targets (for 2020 and 2050). By setting high environmental improvement targets, we plan to step up the Zero Emissions Initiative and continue to fulfill our social responsibility.

Review of Environmental Management Systems (EMS) and Target Setting

In this section, we report on efforts for improvement in environmental management systems.

At JGC's Yokohama headquarters, we have used the ISO 14001 certification process as an opportunity to promote environmental conservation efforts in both office work and project execution. An issue at locations other than the Yokohama headquarters is that environmental target-setting was based on standards set at the Yokohama office, and therefore tended to center on reduction of waste, paper, and electricity consumption. To make environmental targets more applicable to the company at large, we reviewed environmental target setting procedures and created a company-wide process of trial and error for improving environmental management systems. As a part of that process, the heads of all relevant departments participated in the EMS workshop Environmental Aspects Identification from the viewpoint of Business Process Improvement.

At the EMS workshop, we sought for deeper understanding of environmental aspects of business, and developed methods for setting targets that accurately reflect the primary work of the company, and are not simply focused on waste, paper, and electricity. Workshop participants gained practical experience in how to identify environmental aspects in their primary work and review target-setting

procedures through a lecture by an instructor from Lloyd's Register Quality Assurance (LRQA) and a subsequent group discussion.

We plan to apply the experience gained from this workshop to revise departmental environmental targets in 2010.



The EMS workshop attended by department heads



The group discussion sparked a lively exchange of opinions



ISO 14001 certification

In December 2003 JGC obtained certification in the ISO 14001 international standard for environmental management systems from Lloyd's Register Quality Assurance (LRQA). In October 2009 we completed a second examination for renewal of certification.

Biodiversity Initiatives

In preparation for the International Year of Biodiversity in 2010, JGC has increased its contribution to biodiversity preservation. In this section, we report on examples of biodiversity preservation efforts.

Regeneration of Vegetation at Overseas Construction Sites

At an LNG plant project on Papua, Indonesia, JGC respected the client's policy of minimizing environmental impacts on the surrounding area by regenerating biodiversity after construction.

To help regenerate more than 100 indigenous plant species at the construction site, we

- Measured tree distribution at the planned construction site and recorded detailed tree-cutting data before the start of construction
- Reused a portion of felled trees in compost, etc.
- Replanted saplings of the same tree species to restore vegetation
- Employed plant specialists to manage vegetation regeneration

In addition, we took a variety of other measures to reduce the impact of the project on the local environment, including waste separation and reuse of all salvageable waste/debris material, achieving an unprecedented level of environmental sensitivity. Periodic environmental conservation reports, complete with third-party checks, were issued under the management of the client to provide information within and beyond the company. This project was unprecedented with respect to the rigorous implementation of action guidelines for preventing the sustainability of the natural environment and neighboring society.



A seedbed for vegetation regeneration

Wildlife Protection at Construction Sites

To minimize impact on ecosystems and the natural environment, JGC conducts environmental impact assessments of planned sites and surrounding areas before the start of construction, and devises mitigation measures to avoid damaging environmental impact. We are considering the preparation of our own biodiversity guidelines to prevent ecosystem damage even in cases where problems are not revealed in environmental assessment.

At the Sakai Refinery Project in Osaka, killifish, crawfish, and other wildlife had inhabited a rainwater ditch near the site of construction. To avoid filling them in the ditch with earth and sand in site preparation work, We discussed the matter with the client, and decided to build a pond alongside one of the construction site buildings. Wildlife was transferred to the pond, and following the completion of construction, the client decided to retain the pond as a permanent safe biotope.



The pond that has been permanently retained



The killifish that have become a symbol of wildlife protection

Forest Conservation in Kanagawa Prefecture Watersheds

To commemorate its 80th anniversary, on August 1, 2008, JGC became a watershed forest partner in Kanagawa Prefecture's Water Source Forest Conservation Project. Since that time, we have continuously supported environmental conservation efforts by the project, the aim of which is protect healthy, vital forests in Kanagawa Prefecture's watersheds for the next generation. Through the project, JGC Group employees assist with watershed forest conservation while deepening their understanding of the role of watershed forests and the importance of coexistence with nature.

On five occasions from April 2009 to June 2010, approximately 100 employees helped with watershed forest pruning and thinning. On thinning days in winter, they spent an hour climbing steep, snow-covered mountain paths to thin forest areas densely populated with trees for about two hours. Pruning of lower branches and thinning out of weaker trees helps remaining trees grow more vigorously, and lets in the wind and light necessary to foster a greater variety of species in the understory and forest floor. As part of the new employee training conducted in May 2010, employees helped with forest thinning under the guidance of a forest instructor. We also held a nature observation tour (forest walking tour), aquatic wildlife observation tour, and Christmas wreath making workshop for JGC Group employees and their families. Future plans include watershed forest development, such as the use of wood left over from thinning to make benches, tables, and nature observation walking paths.



Watershed forest in the snow



New employees pruning trees

IV Social Dimensions of Sustainability



Social

JGC Group regards the development of employee business skills and the protection of occupational health and safety as important social responsibilities.

As a good corporate citizen, we also contribute to building prosperous societies in developing countries by means of human resources cultivation and technology licensing.

Occupational Health and Safety

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

Health and Safety Management Structure

The HSE Committee deliberates on important safety matters 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 various company divisions.

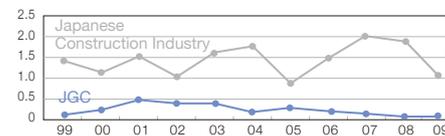
An audit group appointed by the chairman of the HSE Committee conducts health and safety audits at principal construction sites in Japan and overseas, and reports the audit results to the Operation Steering Committee.



Safety Performance

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

Safety performance, accident incidence rate (%) (ILO method)



HSE Conference Hosted by the President

Every year in July, JGC holds an HSE conference hosted by the President. Approximately 120 corporate officers, project division heads, project department heads, project managers, and construction managers participate in the conference, where they discuss health and safety reinforcement measures and prevention measures for common occupational accidents. Through the HSE conference, JGC seeks to enhance the health and safety awareness of officers and employees and demonstrate the leadership of the top management in HSE matters.



JGC President Masahiko Yaegashi delivers the opening speech.

Personnel Development and Communication with Employees

JGC's sustained growth depends upon its people. 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 offering new value and contributions to customers and society. In subsequent years we have worked to firmly establish the system.

Development of Broader Visions at JGC Techno-College

In 2001, JGC founded the JGC Techno-College to share in-house technology and engineering expertise more widely within the company. Senior staff with long-term technical experience are requested and encouraged to act as instructors at the college, to help pass on their knowledge to younger employees. In addition to offering conventional technical courses, the college invites prominent experts in various fields to deliver lectures on recent notable subjects. In 2009, more than 1,700 employees of JGC attended JGC Techno-College courses and lectures.



JGC Techno-College

JGC Family Day (Bring-Your-Child-To-Work Day)

On August 24, 2009 JGC held JGC Family Day, to allow children to observe their parents at work. Twenty-five children from grades four to six participated in the event, the purpose of which is to develop children's social awareness and foster the concept of work and occupation. They exchanged handmade business cards with JGC Chairman Keisuke Takeuchi and employees, in addition to observing work and meetings in the actual company office. We plan to hold this event again to encourage employees to maintain a healthy work-life balance.



Exchanging greetings with Chairman Takeuchi using handmade business cards



Employees and children participating in JGC Family Day

Corporate Social Responsibility

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 our business activities.

KAUST Industry-University Collaboration Program

In Saudi Arabia, JGC is a member company of the KAUST Industrial Collaboration Program (KICP), an industrial collaboration program at King Abdullah University of Science & Technology (KAUST), which opened in 2009. KAUST is a graduate-studies level university established by an initiative of King Abdullah to serve as a research base in advanced technology fields including resources development, energy, environmental studies, biological sciences, biotechnology, applied mathematics, computer science and materials science. As a KICP member, JGC is using its engineering experience to support the creation of next-generation technology and the training of personnel who can make a large contribution to both Saudi Arabia and to international society.

In fiscal 2010, JGC plans to participate in KICP's investigative research in water technology fields.



JGC staff together with the staff and students of KAUST.

Acceptance of Internship Students

JGC accepts university students and graduate students as interns. Each year we accept approximately 16 students from universities in Japan, and give them an opportunity to experience the actual work that goes on at JGC over their summer holiday. In 2009, 12 students from overseas universities also participated in JGC's internship program, through a student exchange program.

Participation in the Children's classroom for keeping rich sea

JGC Group company Japan NUS applies its knowledge of oceanography and marine organisms to children's environmental education with the Children's classroom for keeping rich sea, sponsored by the Beneficiaries of the Sea Coalition. The fourth seminar was held on May 30 and 31, 2009, at the Minami Boso Municipal Taibusa-misaki Children's Nature Center. Beneficiaries of the Sea Coalition is an organization that advocates for a socially conscious Japanese fishing industry.

Japan NUS is always involved in this event, with six researchers from the company participating in 2009. Approximately sixty parents and children participated in biological surveys, sweep netting, and beach clean-up at beaches (tidal zones). They listened with interest as Japan NUS researchers explained about microscopic observation, marine life ecology and evolution, looking up the names of fish, and the problem of marine debris. The seminar allows children and their parents to learn about ocean ecology through a variety of fun, hands-on activities.



Children enthusiastically collecting organisms

JGS-S Scholarship Foundation: Support for the Next Generation

Through the JGS-S Scholarship Foundation, JGC contributes to the cultivation of scientists and the advancement of science and technology in Japan and overseas. The foundation was established in March 1968 with an endowment by JGC founder Masao Saneyoshi. Its principal undertakings include provision of educational loans to Japanese university and graduate school students majoring in science and technology fields, grants to foreign students studying in Japan, and research funding assistance for young researchers.

Up to 2009, the foundation has provided educational loans to a total of 13,005 students, educational grants to 4,607 students, and research funding assistance to 1,943 researchers. Annual disbursements have reached 324 million yen.



2009 assistance recipients

JGC Social Welfare Foundation

The JGC Social Welfare Foundation provides welfare equipment for persons with physical disabilities, as well as funding for support groups and volunteer organizations for senior citizens and persons with disabilities in Kanagawa Prefecture. Since its establishment in March 1994, the foundation has made 437 contributions to support groups and 295 contributions to volunteer organizations. In fiscal 2009, the foundation made 38 contributions to support groups, 18 contributions to volunteer organizations, and 2 contributions to other groups.



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