「挑戦」
Challenging Spirit

「柔軟」
Flexibility

「誠実」
Sincerity

JFE

JFE GROUP
ENVIRONMENTAL SUSTAINABILITY REPORT
2009

Coordinating Corporate Growth, Environmental Conservation

Shinichi Okada
Senior Vice President
JFE Holdings, Inc.

The JFE Group pursues business activities in harmony with the environment in accordance with the concepts of "coexistence with the global environment" and "environmental improvement" in its Corporate Standards of Business and Environmental Philosophy.

We will enlist all of the Group's resources in addressing environmental issues under the Medium-Term Business Plan, starting from the fiscal year ending on March 31, 2010. In undertaking initiatives such as promoting energy-efficiency measures, reducing or transforming chemical substances with high global-warming potential, and introducing new technologies that lower our environmental impact, we aim to reduce our greenhouse gas emissions and achieve the Voluntary Action Plan reduction targets established by Nippon Keidanren. In addition, we are committed to lowering greenhouse gases to international levels by, for example, providing proprietary cutting-edge, energy-efficient technologies overseas.

We also strive to promote biodiversity through the development of our technologies, such as creating sea-grass beds and restoring coral reefs by using steel byproducts, as well as improving ballast water treatment methods to protect marine ecosystems.

The JFE Group has always developed and provided products and technologies in harmony with the environment. For example, our high-performance steel products make cars lighter, our technologies increase the efficiency of transformers and motors, and our recycling operations reuse resources. Looking ahead, the JFE Group will improve its operations and activities, fulfilling its responsibilities as a corporate citizen to protect the environment and the earth.

Environmental Philosophy

The JFE Group considers improving the global environment a management priority and promotes business operations in harmony with the environment. These efforts aim to create a prosperous society.

Environmental Policy

1. To reduce the environmental impact of all business operations
2. To make contributions through technologies and products
3. To make contributions through conservation of resources and energy
4. To promote communication with society
5. To promote international cooperation

挑戦
Challenging Spirit

柔軟
Flexibility

誠実
Sincerity

JFE GROUP ENVIRONMENTAL SUSTAINABILITY REPORT 2009

Editorial Policy

The JFE Group Environmental Sustainability Report 2009 describes the Group's environmental protection activities for the year ended March 31, 2009, as well as the results of those activities in the business operations of JFE Holdings, Inc., which is the holding company of the JFE Group. This report was edited/prepared in accordance with the "Guidelines for Environmental Reports (FY 2007 edition)" issued by Japan's Ministry of the Environment and "Sustainability Reporting Guidelines 2006." Please note that this report is disclosed only on our website. If you need a brochure(s), please print this document.
*For further Group information, business descriptions, product information, and operation facilities, etc., please refer to JFE GROUP BUSINESS REPORT 2009 or our website:
http://www.jfe-holdings.co.jp/en/

JFE Steel's Activities to Prevent Global Warming

—At the end of the first year of the Kyoto Protocol's initial commitment period*1

Message from Senior Management

The year ended March 31, 2009 was the first commitment period of the Kyoto Protocol.

To comply with the Japan Iron and Steel Federation's Voluntary Action Program*2, we at JFE Steel worked continuously to improve the efficiency of our operations and facilities, develop technologies, and take other steps to help stop global warming. In the end, we came very close to achieving the Voluntary Action Program objectives.

Based on our Corporate Vision of contributing to society with the world's most innovative technology, we will:

- Pursue further development of energy-saving technologies to fulfill the Voluntary Action Program for the first commitment period of the Kyoto Protocol;
- Help to reduce CO_2 emissions for society as a whole through actions like enabling the creation of lighter automobiles with high-performance steel products;
- Engage in international transfers of energy-saving technologies to help other countries with their efforts to stop global warming; and
- Advance the development of innovative technologies to help reduce CO_2 emissions on a global scale for the future.

Hiroshi Nishizaki
Vice President
JFE Steel Corporation

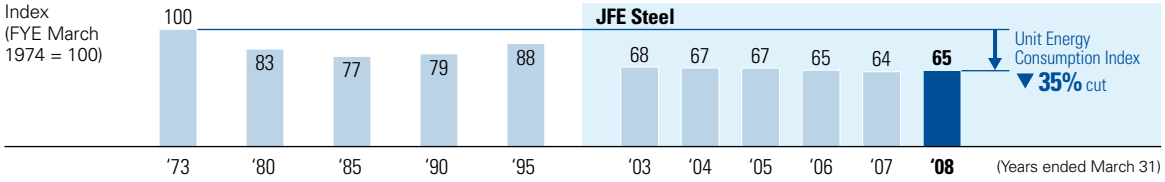
Approaches to Energy Saving and CO_2 Reduction

Since the first oil crisis, JFE Steel has actively been working towards energy saving and CO_2 reduction. For example, we recover by-product gases generated in the process of iron and steel making, as well as waste heat and pressure released from the BF top pressure recovery turbine, etc. Thanks to these efforts, we have achieved a 35% reduction in unit energy consumption during the period between the year ended March 31, 1974 and the year ended March 31, 2009, achieving world-class efficiency in energy consumption.

Unit energy consumption in comparison to the year ended March 1974

35% cut

Transition of Unit Energy Consumption Index at JFE Steel



History of Energy Saving Activities

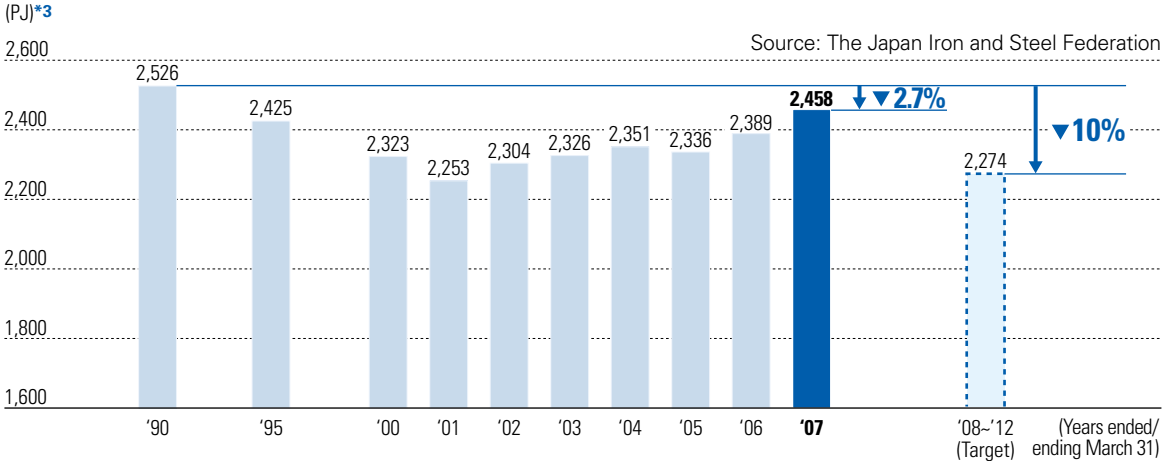
Introduction of energy saving equipment
- Reduction of reheating furnace fuel
- Large-scale waste heat recovery equipment
  BF top pressure recovery turbine (TRT), sintering waste heat recovery, etc.
- Process continuation
  Continuous casting line, continuous annealing line, etc.

Further promotion of energy saving
- Waste plastics feeding into BF
- Introduction of regenerative burner
- Endless rolling
- City gas blowing technology for BF
- High efficiency oxygen plant

Global warming prevention measures by energy saving
- Added a new shaft furnace
- Enhanced CDQ
- Broader introduction of regenerative burner
- Augmentation of high efficiency oxygen plant
- BOF gas sensible heat recovery
- Introduction of Super-SINTER™

Implementing the Voluntary Action Plan from the Japan Iron and Steel Federation

The Japan Iron and Steel Federation announced that the industry has to cut its energy consumption for the year ended March 31, 2008, by 2.7% compared with the level for the year ended March 31, 1991. As a complementary measure, the federation bought 59 million tons of carbon offsets under the Kyoto Protocol.



***1 The Kyoto Protocol's initial commitment period**
This period for meeting the targets started from the year ended March 31, 2009, to the year ending March 31, 2013.

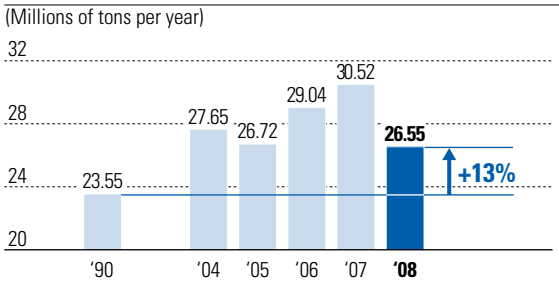
***2 Voluntary Action Plan**
This plan set an objective of a 10% reduction in energy consumption on average from the year ended March 31, 2009, to the year ending March 31, 2013, compared with the year ended March 31, 1991. This target assumes crude steel production of 100 million tons. This plan also aims for recycling of one million tons of plastic waste, assuming the establishment of a waste plastic collection system.

***3 PJ = Petajoule (10^{15} joules).**
1 PJ equals the energy derived from 25,800 kiloliters of crude oil.

Achievements in Crude Steel Production for the Year Ended March 2009

In the first half, we have maintained a high level of production volume in response to stronger demand for high performance steel products from our customers. However, we were obliged to reduce the volume level due to the economic slowdown in the second half. As a result, compared to the level at the year ended March 31, 1991 crude steel production had increased 13% by the year ended March 31, 2009.

Transition of Crude Steel Production at JFE Steel

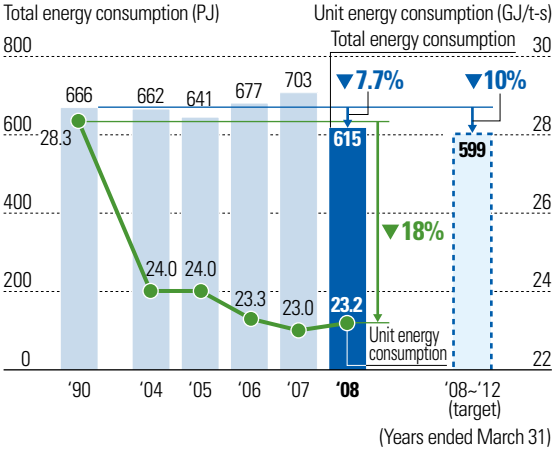


Transition of Total Energy Consumption in comparison to the year ended March 1991

7.7% cut

Reductions in Energy Consumption and Unit

Transition of Total Energy Consumption and Unit Energy Consumption at JFE Steel (estimates)



Although crude steel production increased 13% in the year ended March 31, 2009, compared with the year ended March 31, 1991, we decreased energy consumption by 7.7% and the energy required to produce one ton of crude steel by 18%.

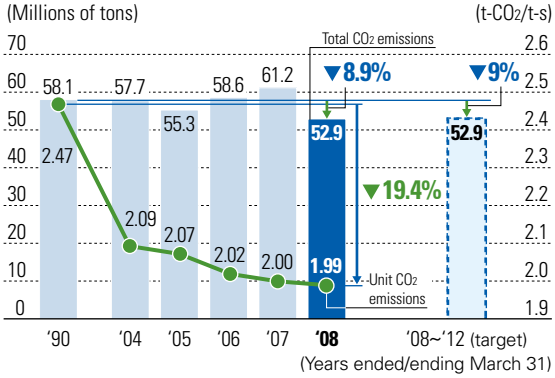
CO_2 emissions still remain low, down 4% compared with of the emissions for the year ended March 31, 2006, when the production volume of crude steel was almost the same as for the year ended March 31, 2009.

Unit CO_2 emissions in comparison to the year ended March 1991

8.9% cut

Achievements in CO_2 Emissions and Unit Emissions for the Year Ended March 2009 (Estimation)

Transition of Total Energy Origin CO_2 Emissions and Unit CO_2 Emissions at JFE Steel



While crude steel production increased by 13% in the year ended March 31, 2009 compared to the year ended March 31, 1991, we were able to reduce CO_2 emissions by 8.9% and CO_2 emissions involved in producing one ton of crude steel (unit CO_2 emissions) by 19%.

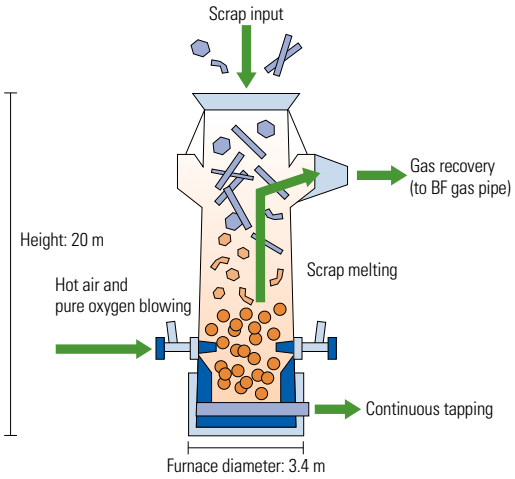
The level of CO_2 emissions still remains lower, a 4% decrease, when compared with that of the year ended March 31, 2006 where the production volume of crude steel was almost the same level of that of the year ended March 31, 2009.

Initiatives for Achieving the Voluntary Action Program

JFE Steel is gradually seeing the results of approximately ¥100 billion it has invested to reduce CO_2 emissions and energy consumption under the Second Medium-Term Business Plan (April 2006–March 2009). Key facilities brought on-line in the year ended March 31, 2009 include:

- New shaft furnace (launched in August 2008 at the East Japan Works, Keihin)
- Kurashiki CDQ (launched in March 2009 at the West Japan Works, Kurashiki)
- Expanded use of regenerative burner for reheating furnace for heavy-gauge, hot rolled steel plate (East Japan Works, Chiba, and West Japan Works, Fukuyama)
- Expanded use of city gas infusions to blast furnaces (East Japan Works, Chiba)
- Super-SINTER™ (launched in January 2009 at the East Japan Works, Keihin)

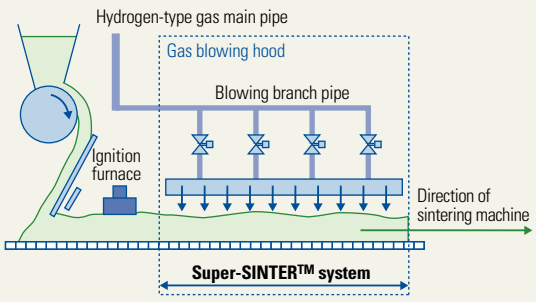
Structure of Shaft Furnace



World's First Application of Super-SINTER™ Technology for Infusing Hydrogen-Based Fuel into a Sintering Machine

JFE Steel pioneered the commercial application of Super-SINTER™, a Secondary-fuel Injection Technology for Energy Reduction, for infusing hydrogen-based fuel into a sintering furnace. We began using this technology on a commercial basis in January 2009. Super-SINTER™ technology makes the sintering process more energy efficient, thereby greatly reducing CO_2 emissions while producing high quality sintered ore.

Outline of Super-SINTER™ System



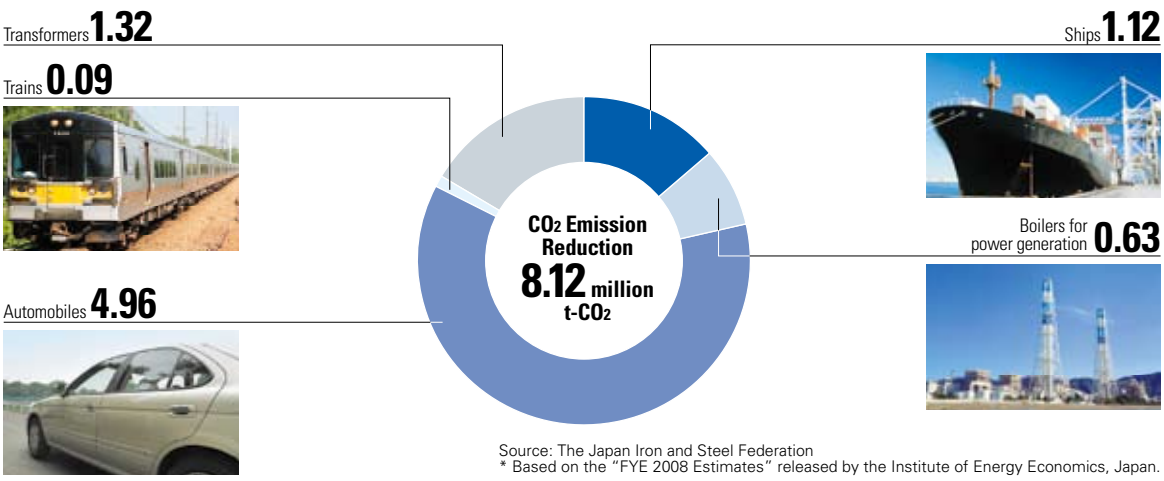
Contributing to the Reduction of CO_2 through Our Products

JFE Steel is actively moving forward with the development of high performance steel products such as highly formable and tensile steel sheets that contribute to the development of lighter, more fuel efficient automobiles; high flux density and low iron loss electromagnetic steel sheets to increase the efficiency of transformers and motors.

According to the "FYE 2008 Estimates" released by the Institute of Energy Economics, Japan, member companies of the institute have cut 8.12 million tons of CO_2 emissions by supplying 4.47 million tons of the high performance steel products.

The JISF's reduction of CO_2 emissions
8.12 million tons

CO_2 Emission Reduction Effect at the Stage of Using High Performance Steel Products (the year ended March 31, 2008)



Source: The Japan Iron and Steel Federation
* Based on the "FYE 2008 Estimates" released by the Institute of Energy Economics, Japan.

"Environmental Showcase" exhibit at the Hokkaido Toyako Summit

The Environmental Showcase was held during the Hokkaido Toyako Summit in July 2008, and featured exhibits of environmentally conscious products. JFE Steel participated by displaying its high tensile steel sheets for automobiles. These steel sheets can achieve higher strength without sacrificing workability and are manufactured with our advanced technologies, such as the addition of alloy elements. These sheets enable manufacturers to build lighter, more fuel-efficient automobiles, thereby contributing to a reduction of CO_2 emissions. The showcase was a great opportunity for us to promote a better understanding of our sophisticated technical capabilities among people from around the world.

High tensile steel sheets for automobiles

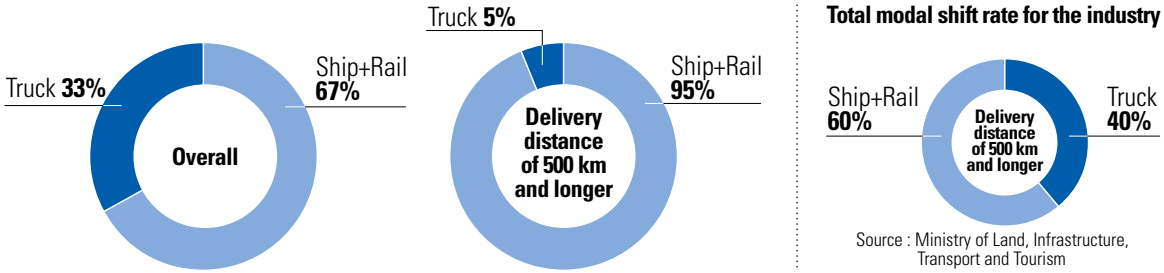
Transportation Division's Energy-Saving Measures

Modal shift rate
95%

To reduce CO_2 and NOx emissions from the transportation of steel products, JFE Steel is making a "modal shift" to relatively low-environmental impact ship and rail transportation modes. In pursuit of better transportation efficiencies, we are also using more large ore carriers to transport raw materials.

JFE Steel achieved a modal shift of 95% in the year ended March 31, 2009. The amount of CO_2 emissions for deliveries was approximately 390,000 tons.

JFE Steel's modal shift rate



Source : Ministry of Land, Infrastructure, Transport and Tourism

Work Completed on the Grande Progresso—One of the World's Largest Ore Carriers

Work on the Grande Progresso, which means "major progress" in Portuguese, was completed on May 30, 2008. This 300,000-ton ore carrier will transport raw materials for JFE Steel. Using larger vessels like the Grande Progresso creates transportation efficiencies and greatly reduces the environmental impact and transportation costs.

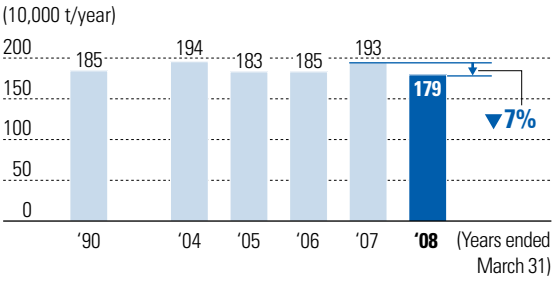
The Grande Progresso (built by the Universal Shipbuilding Corp.).

Non-Energy-Related CO_2 Emissions

To remove iron ore impurities, lime and dolomite are added to BF and converters. The CO_2 from the breaking down of these materials is non-energy-related CO_2.

During the year ended March 31, 2009, JFE Steel's non-energy-related CO_2 emissions were approximately 1.79 million tons, down 7% from the level of the prior year.

JFE Steel's Estimated Non-Energy-Related CO_2 Emissions



Fighting against Global Warming through the Application of Environmental and Energy Technologies

JFE Steel is using the world's most advanced energy-saving technologies to fight against global warming.

Exchange of Environmental Technology with China

The Japan Iron and Steel Federation and the China Iron & Steel Association have been holding an annual Japan China Steel Industries Conference on Exchange of Advanced Technologies on Environmental Preservation and Energy Saving since 2005. The fourth conference was held in March 2009 in Chiba and featured an active discussion of environmental protection technologies.

worldsteel*1 Initiatives

- Promotion of optimal energy-saving technologies based on international comparisons of unit CO_2 emission data.
- Thorough reduction of CO_2 emissions by promoting the development of long-term, innovative technologies in individual countries.

Sectoral Approach*2 for APP*3

Identify environmental and energy-saving technologies

Prepare manuals for the technologies
Include 64 environmental and energy-saving technologies from APP countries
Of these, Japan supplies 27 technologies

Conduct a field survey on diffusion of major environmental and energy-saving technologies at each site of APP countries

Evaluate possible reduction amounts based on the diffusion rate

Implement the practical introduction and promotion of technologies and facilities.

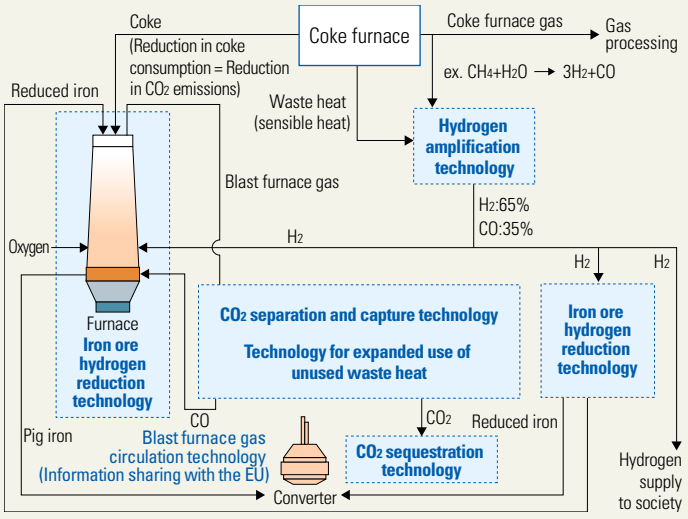
*1 worldsteel
The World Steel Association (worldsteel) represents approximately 180 iron producers/iron and steel institutes among 55 countries including Japan, the U.S., the EU, Russia, etc.

*2 The Sectoral Approach
A CO_2 reduction approach that applies efficiency indices categorized by each sector, such as steel (example: unit CO_2 per ton of crude steel). This indices-based approach is easy to adopt even for developing countries such as China and India, being a reliable method of reducing CO_2 backed by technology.

*3 APP
The Asia-Pacific Partnership on Clean Development and Climate (APP) is an international organization to address environmental issues such as climate change and energy security, launched in July 2005 with the participation of Japan, Australia, China, India, Korea, the U.S., and from October 2007, Canada.

COURSE 50*4: Revolutionary Steelmaking Method for Reducing CO_2 Emissions

In July 2008, the Japan Iron and Steel Federation started the COURSE 50 Project, which will develop technologies for drastically reducing CO_2 emissions. The purpose of this project, in which JFE Steel has a leading role, is to develop technologies for 1) reducing CO_2 emissions through the use of hydrogen reduction in blast furnaces and 2) separating and capturing CO_2 from blast furnaces. JFE Steel is working to develop physical adsorption technology that relies on pressure differences, as well as other innovative technologies, for separating and capturing CO_2.

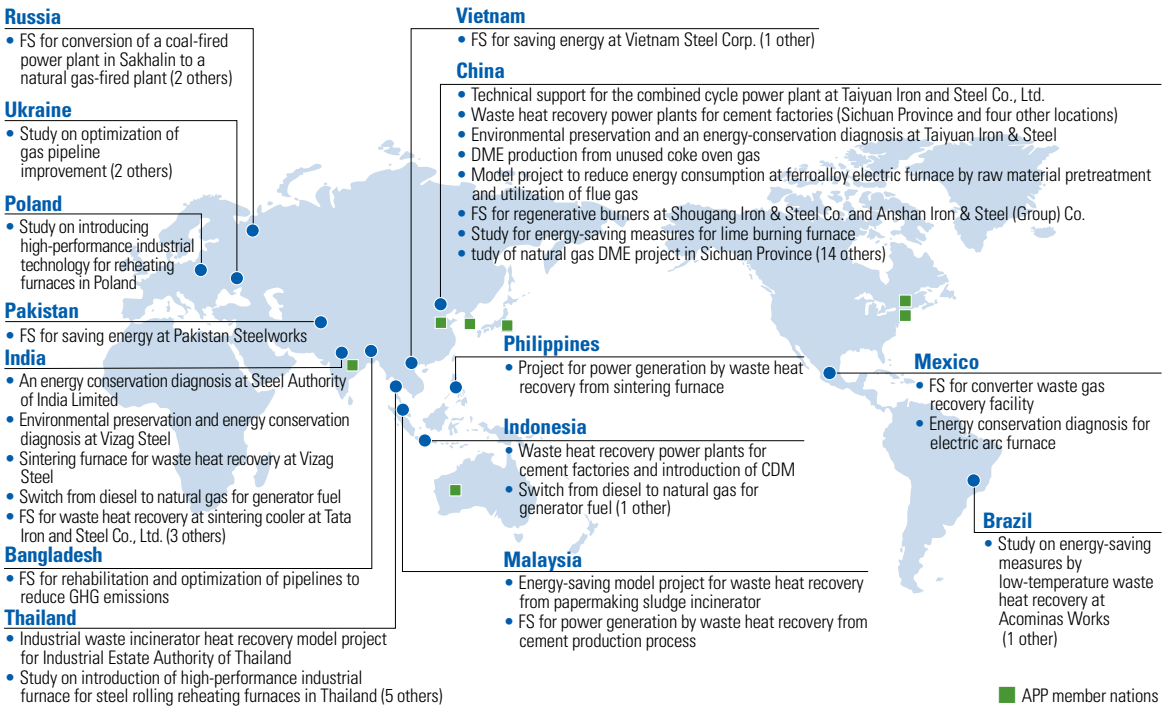


*4 **COURSE 50**
An acronym for CO_2 Ultimate Reduction in Steelmaking Process by Innovative Technology for Cool Earth 50.

Projects Outside Japan

The JFE Group has used environmental preservation, energy conservation, and CO_2 reduction technologies in its R&D to contribute to international society by undertaking numerous technology transfers that fight global warming and help developing countries advance economically while protecting their environments.

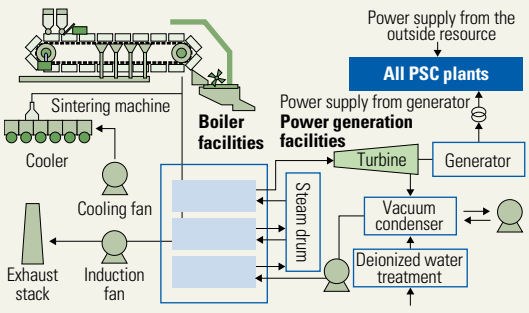
International Cooperation Projects by the JFE Group



New Power Generation by Waste Heat Recovery Launched at PSC

JFE Steel has transferred to Philippine Sinter Corporation (PSC)[*1] its technology for recovering waste heat from the sintering process and using the heat to generate electricity. PSC operation began using this technology on September 8, 2008. JFE Steel will acquire Certified Emission Reductions through this CDM[*2] project with PSC.

Outline of Power Generation by PSC Waste Heat Recovery



Comments of Project Participants

The waste heat recovery facility is operating steadily, and we believe the UN will approve Certified Emission Reductions in the near future. Looking ahead, we would like to contribute to measures against global warming in the Philippines through this kind of activity.

Toshimitsu Hayashi (right), Executive Advisor for HR and Corporate Planning, Philippine Sinter Corporation

*1 PSC (Philippine Sinter Corporation)
A subsidiary in Mindanao in the Philippines, manufacturing sintered ore as a raw material for steel production.

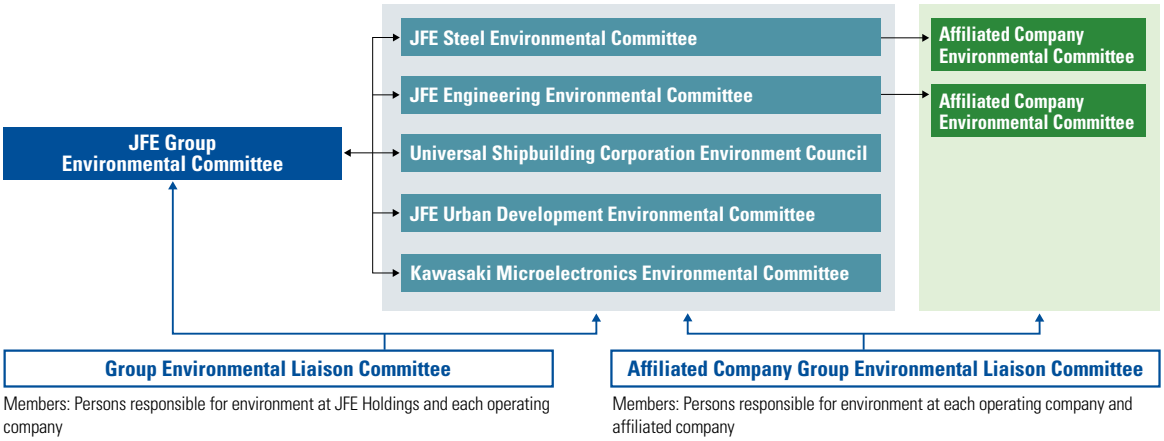
*2 CDM (Clean Development Mechanism)
A system introduced in the Kyoto Protocol wherein developed nations supply developing nations with technology and funds to reduce CO_2 emissions, and in return the supplying country can list the reductions in their own target achievement records.

Environmental Management System

Construction and Operation of Environmental Management System

Under the JFE Group CSR Council, the JFE Group has set up not only the Group Environmental Committee chaired by the President of JFE Holdings, but also an Environmental Committee in each of the Group's operating companies and affiliated companies. With this multi-tiered committee system, JFE has been dealing with environment-related issues such as setting objectives for environmental protection activities, progress checks of those activities, and evaluation of environmental performance for the whole group.

Environmental Management System



Members: Persons responsible for environment at JFE Holdings and each operating company

Members: Persons responsible for environment at each operating company and affiliated company

Promotion to Receive ISO 14001

Each company in the JFE Group has been aiming to receive ISO 14001 certification in order to promote voluntary and continuous environmental activities. Four operating companies with production facilities have all received ISO 14001 certification for individual works. The JFE Group will continuously extend the number of accredited companies/production facilities.

Environmental Auditing

At the JFE Group, environmental auditing has been conducted on the basis of ISO 14001 with the aim of enhancing environmental management quality. Regarding environmental auditing on the basis of ISO 14001, inspections are made by certification authorities, while internal auditing is conducted by qualified employees who not only have taken the auditor-training course offered by an external institution, but also have experience in environment-related, work.

Environmental Education

The JFE Group is actively conducting environmental education aiming to foster a corporate culture of engaging in environmental protection activities. In each operating company, environmental education is incorporated in training programs for new employees and promotions, and also includes annual programs at each level, covering environmental protection.

Communication with Society Related to the Environment

Participation in Clean-Up Campaigns of the Ashida Riverside and Horseshoe Crab Habitat

The JFE Group actively participates in volunteer cleanup activities in areas adjacent to its facilities.

Elsewhere, the JFE Steel West Japan Works went a bit farther afield, participating in a cleanup campaign of the Ashida Riverside held in July, a special month for protecting Japan's rivers, as well as a cleanup of the local seashore designated as habitat for horseshoe crabs, a protected species.

Cleaning up the banks of the Ashida River

Exchanges through Exhibitions

The JFE Group participates in various exhibitions on environmental themes in order to provide stakeholders with necessary information on its activities.

In December 2008, we participated in Eco-Products 2008, one of Japan's largest environmental fairs, presenting our environmental initiatives, along with our technologies/products that support entire society and life, and contribute to environmental preservation.

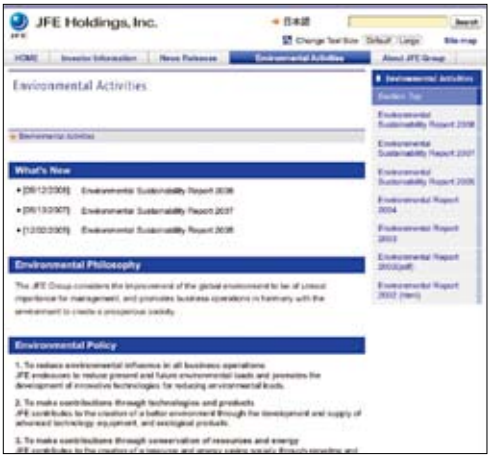
JFE booth at Eco-Products 2008

Information through the Internet

The JFE Group actively offers information related to the environment through the JFE Group website. Its environmental management policy, results and activities are introduced under the title of "Environmental Activities."

Moreover, JFE has been cooperating with an environmental website "ecobeing," where general knowledge on environmental issues is presented in an easily comprehensive way. Through this linkage, the Group introduces comments of "eco people," who are innovatively involved in environmental issues. This is one example of JFE's efforts to promote environmental awareness activities among the general public.

JFE Holding's environmental initiative website at:
URL http://www.jfe-holdings.co.jp/en/environment/index.html



Environmental website "ecobeing" at:
URL http://www.ecobeing.net/

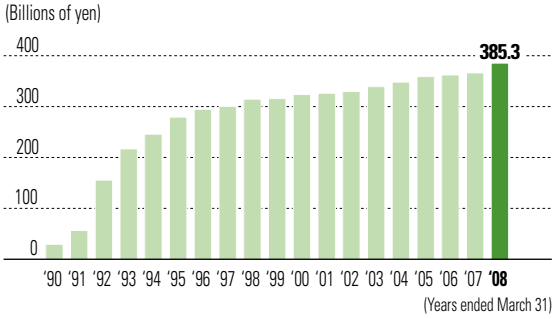
Environmental Accounting

Transition of Capital Investment

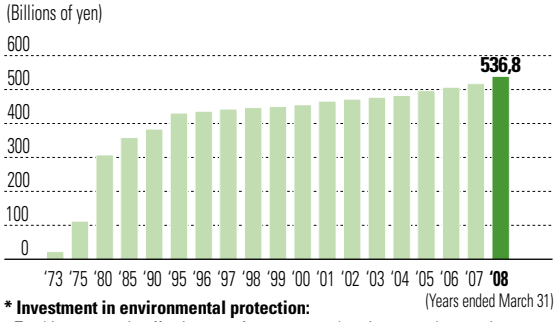
To promote energy saving and further reduce environmental loads, JFE has actively invested in plant and equipment based on R&D achievements in the Group's proprietary environmental technologies.

Cumulative investment in energy saving since 1990 has reached ¥385.3 billion, enabling us to achieve energy efficiencies that rank among the highest in the world. We are planning further investment in plant and equipment to promote global warming prevention. Meanwhile, cumulative investment in environmental protection since 1973 has reached ¥536.8 billion. We will continuously invest in measures to further reduce environmental loads.

Cumulative Investment in Energy Saving



Cumulative Investment in Environmental Measures*



*** Investment in environmental protection:**
Total investment in effective use of resources and environmental protection

Environmental Accounting

In the year ended March 31, 2009, environment-related capital investment totaled ¥39.4 billion and expenses amounted to ¥88.0 billion. The ratio of environment-related capital investment against total capital investment is approximately 19%. As a result of activities during the year ended March 31, 2009, the effects of energy conservation were valued at an estimated ¥0.9 billion.

Environmental Protection Costs (April 1, 2008 to March 31, 2009)

(Billions of yen)

Description			Investment	Expenses
Investment & expenses related to JFE's own business	Management	Monitoring & measurement of environmental influence, EMS-related activities, environmental education & training, etc.	0.2	2.5
	Prevention of global warming	Energy conservation, effective use of energy, etc.	19.0	16.5
	Effective use of resources	Recirculation of industrial water, recycling of by-products & waste generated in-house, waste management, etc.	0.9	19.1
	Environmental protection	Prevention of air pollution, water pollution, soil contamination, noise, vibration, ground subsidence, etc.	18.5	38.9
	Miscellaneous	Fees/charges, etc.	-	1.6
Investment & expenses related to customers and society	Research & development	Technology development for environment, energy, prevention of global warming	0.8	8.8
	Social activities	Protection of nature, support for afforestaion, information disclosure, exhibition, advertisement, etc.	-	0.6
Total			**39.4**	**88.0**

Environmental accounting data stated above was calculated on the basis of the following assumptions.
For costs, data on environment-related investment and expenses at JFE's steelworks were gathered, but in the field of research & development, Group-wide data was collected.
The effects refer to "presumed effects"; "risk aversion effects," etc., are excluded from calculations.

* Calculations do not include capital investments made primarily for purposes other than environmental protection, such as renovation of superannuated facilities, even if the process as a whole results in a net energy saving compared to the former process.

挑戦
Challenging Spirit

Reducing Environmental Loads in Business Activities

By Utilizing the World's Most Advanced Technology for Reduction of Environmental Loads

柔軟
Flexibility

誠実
Sincerity

Priority Environmental Targets and Results

* In the column "Pages to Refer," the number preceded by BR represents the corresponding page number in the "JFE Group Business Report 2009" and the ER number in the "JFE Group Environmental Sustainability Report 2009" respectively.

Group Companies	Pages to Refer	2009 Priority Environmental Targets
JFE Steel	BR55-58 ER3–10	**Promote measures to prevent global warming** • Promoting measures to prevent global warming in line with the Voluntary Action Program of the Japan Iron and Steel Federation (JISF) (Compared to 1990, we plan to achieve a 10% decrease in energy consumption for the period from the year ending in March 2009 to 2013)
	ER19–20	**Continuously strive to reduce environmental risks** • Comply with new regulations • Promote voluntary environmental conservation activities
	ER21 ER39–40	**Promote byproduct recycling** • Continue development of recycling technology for dust and sludge and implementation of actual equipment
	ER17–18 ER21 ER41	**Improve waste control** • Develop a group-wide waste material collection system • Introduce an electronic manifest system to the entire group, targeted at 80% computerization
JFE Engineering	ER23	**Promote energy-saving activities in production divisions** • Tsurumi Engineering & Manufacturing Center: 12% reduction compared to the year ended March 1998 level (the target is calculated based on electricity usage per hour of operation) • Shimizu Works: 40% reduction compared to the year ended March 1998 level (the target is calculated based on electricity usage per unit volume of production) • Tsu Works: 15% increase compared to the year ended March 1998 level (the target is calculated based on electricity usage per unit volume of production) * An increase compared to the year ended March 1998 is anticipated for Tsu Works due to an increased usage of high current welding machinery
	ER24	**Promote reduction of construction site waste** • A recycle rate of over 73%
Universal Shipbuilding	ER25	**Promote measures to prevent global warming** • Target a 10% reduction in electric power consumption in basic unit within the year ending March 2011 compared to the level of the year ended March 1991 (scope: new shipbuilding shipyards) • Target a 1% reduction in energy consumption in basic unit compared to the previous year (scope: 5 shipyards)
	ER26	**Reduce waste emissions** • Target the waste recycling rate to be 84% or more at the stage of production in the year ending March 2011 (scope: a group-wide level)
	ER26	**Take measures to regulate VOC emissions** • Aim to meet an emission standard level of less than 700 ppmC (scope: coating facilities with an air-exhaust capacity of 100,000 m^3/hour or more)
	ER26	**Monitor the chemical substances restricted under PRTR** • Monitor emissions into the air as well as transfers to other places of restricted chemical substances, particularly Xylene, Ethylbenzene, and Toluene (scope: 5 shipyards)
Kawasaki Micro-electronics	ER27	**Promote measures to prevent global warming** • Energy saving rate: 1% or higher • Complete new C_2F_6 gas substitute experiments and will begin reductions in early 2009
		Reduce consumption of chemical substances • Reduce usage amount of notification substances • Reduce the amount of types of substances used
		Reduce industrial waste • Achieve recycling rate of over 50% for the dehydrated sludge from wastewater treatment
JFE Urban Development	ER28	**Promote energy-saving activities in the condominium development business** • Acquire Housing Performance Evaluation Reports Anti-degradation of structural frames measure grade: Grade 3 Energy efficiency grade: Grade 3 Formaldehyde emission control grade: Grade 3 • Promote the use of energy-conserving materials and facilities
		Promote measures to prevent global warming in the facility management business • Renew the energy-conserving equipment
		Promote measures to reduce waste emissions in the facility management business • Improve commercial and business recycling rates THINK: Recycling rate 54.7% Orto Yokohama: Recycling rate 50%

(Year ended/ending March 31)

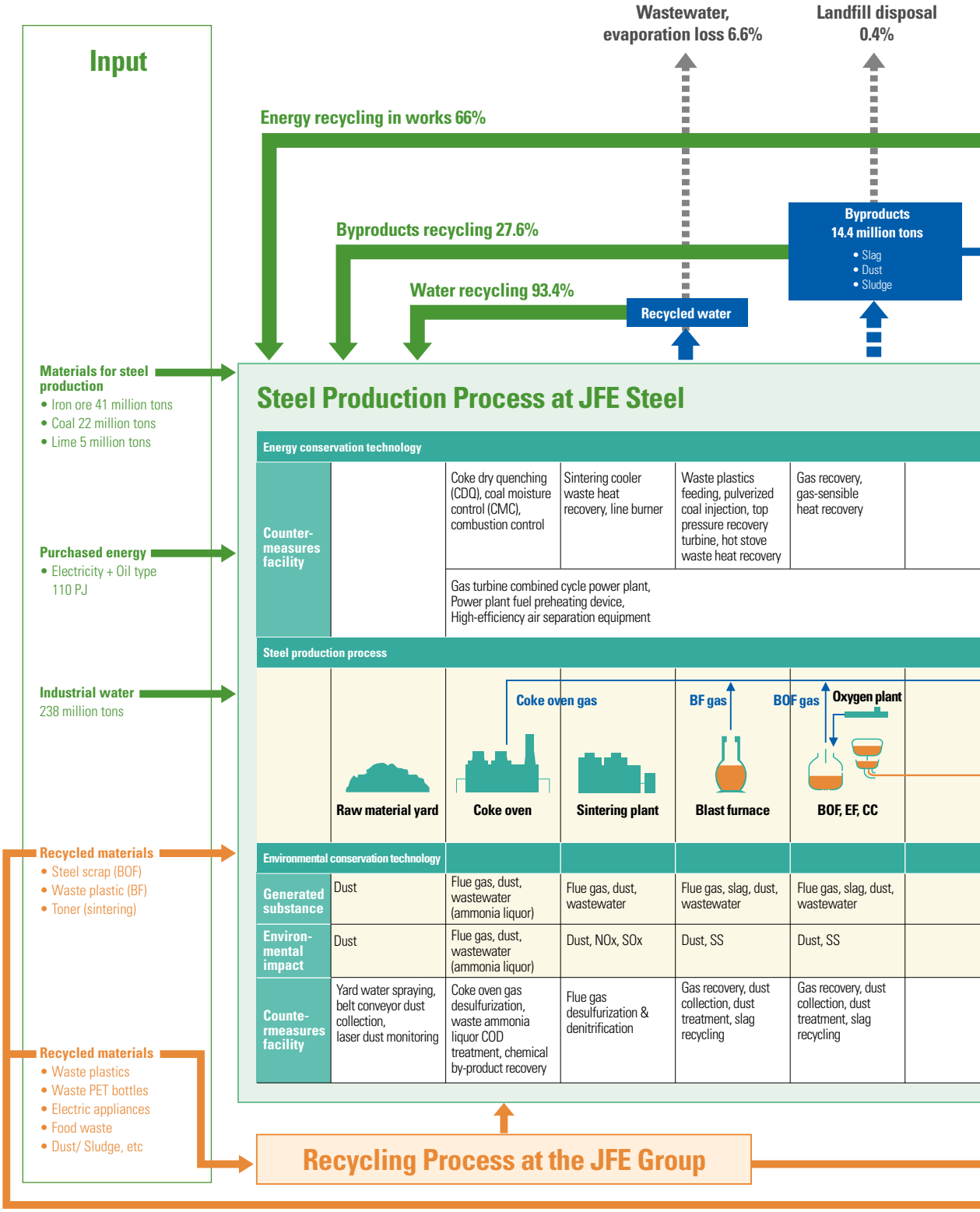
	2009 Results	2010 Priority Environmental Targets
	• Approx. 8% reduction in energy consumption, and approx. 18% reduction in unit energy consumption compared to the year ended March 1991 • CDM implementation: Commenced PSC operation in September 2008 • Commenced shaft furnace operation in August 2008 • Commenced Kurashiki CDQ operation in March 2009 • Commenced Super-SINTER™ operation in January 2009 • Introduced and expanded the regenerative burners	**Promote measures to prevent global warming** • Promoting measures to prevent global warming in line with the Voluntary Action Program of the Japan Iron and Steel Federation (JISF) (Compared to 1990, we plan to achieve a 10% decrease in energy consumption for the period from the year ending in March 2009 to 2013)
	• Newly added the wastewater treatment facilities (in order to comply with stricter restrictions on nitrogen in Chiba region) • Continued voluntary control measures for VOC reduction	**Continuously strive to reduce environmental risks** • Comply with new regulations • Promote voluntary environmental conservation activities
	• Commenced oil sludge recycling facilities (roasting furnace) • Introduced dust recycling facilities (Fukuyama region)	**Promote byproduct recycling** • Continue development of recycling technology for dust and sludge and implementation of actual equipment • Launch a group-wide waste date collection system
	• Currently introducing a waste material collection system • Introduced an electronic manifest system to 69% of the Group's major works	**Improve waste control** • Develop a group-wide waste material collection system • Introduce an electronic manifest system to the entire group, targeted at 80% computerization
	• Tsurumi Engineering and Manufacturing Center: achieved a reduction of 17% compared to the year ended March 1998 • Shimizu Works: achieved a reduction of 33% compared to the year ended March 1998 • Tsu Works: generated an increase of 4% compared to the year ended March 1998 • Total CO_2 Emission of 3 works: 16,849 t-CO_2	**Promote energy-saving activities in production divisions** • Tsurumi Engineering and Manufacturing Center: achieves a reduction of 13% compared to the year ended March 1998 • Shimizu Works: achieves a reduction of 24% compared to the year ended March 1998 • Tsu Works: limit the increase to a maximum of 5% compared to the year ended March 1998 * An increase compared to the year ended March 1998 is anticipated for Tsu Works due to an increased usage of high current welding machinery
	• A recycle rate of 85.9%	**Promote reduction of construction site waste** • A recycle rate of over 74%
	• Achieved an 18% reduction compared to the level of the year ended March 1991, due to the delivery of LNG carriers at Tsu Shipyard • Achieved a total of 5% reduction in 5 shipyards compared to the previous year • Achieved a 2.4% reduction in CO_2 emission at the group-wide level with the emission amount of 72,644 t-CO_2	**Promote measures to prevent global warming** • Target a 10% reduction in electric power consumption in basic unit within the year ending March 2011 compared to the level of the year ended March 1991 (scope: new shipbuilding shipyards) • Target a 1% reduction in energy consumption in basic unit compared to the previous year (scope: 5 shipyards)
	• Achieved a group-wide waste recycling rate of 87.5%, a substantial increase from the previous year	**Reduce waste emissions** • Target the waste recycling rate to be 84% or more at the stage of production in the year ending March 2011 (scope: a group-wide level)
	• Achieved a level of less than 700 ppmC of the emission standard at both the Ariake and Tsu Shipyards	**Take measures to regulated VOC emission** • Aim to meet an emission standard level of less than 700 ppmC (scope: coating facilities with an air-exhaust capacity of 100,000 m^3/hour or more)
	• The amounts of emission and transfer regarding 3 major chemical substances under control have been increased substantially from the previous year	**Monitor the chemical substances restricted under PRTR** • Monitor emissions into the air as well as transfers to other places of restricted chemical substances, particularly Xylene, Ethylbenzene, and Toluene (scope: 5 shipyards)
	• Achieved a 3% energy conservation rate. Energy origin CO_2 emission: 15,800 t-CO_2 • Achieved the practical application of substitute gas. PFC gas emission: 22,500 t-CO_2	Along with the closing of the Utsunomiya Works, we will review our activity themes and implement the following: • Target a 100% recycling rate for the wastewater treatment-origin dehydrated sludge • Aim to reduce consumption of chemical substances under PRTR In addition, further improve the chemical substance control system for LSI products under EU-REACH
	• Reduced hydrogen fluoride usage • Reduced TBP emission	
	• Achieved a recycling rate of over 71% for dehydrated sludge	
	• Acquired for all condominiums • Adopted LED lights, PVC window frames, double-glazed windows, and thermally insulated bathtubs	**Promote energy-saving activities in the condominium development business** • Acquire Housing Performance Evaluation Reports Anti-degradation of structural frames measure grade: Grade 3 Energy efficiency grade: Grade 3 Formaldehyde emission control grade: Grade 3 • Promote the use of energy-conserving materials and facilities
	• THINK: Renewed pumps, etc.	**Promote measures to prevent global warming in the facility management business** • Renew the energy-conserving equipment
	• THINK: Recycling rate 55.4%: a 6.1% increase from the level of the year ended March 2008 • Orto Yokohama: Recycling rate 48.5%: a 1.9% increase from the level of the year ended March 2008	**Promote measures to reduce waste emissions in the facility management business** • Improve the recycling rate of targeted commercial and business wastes THINK: Recycling rate 56.5% Orto Yokohama: Recycling rate 50%

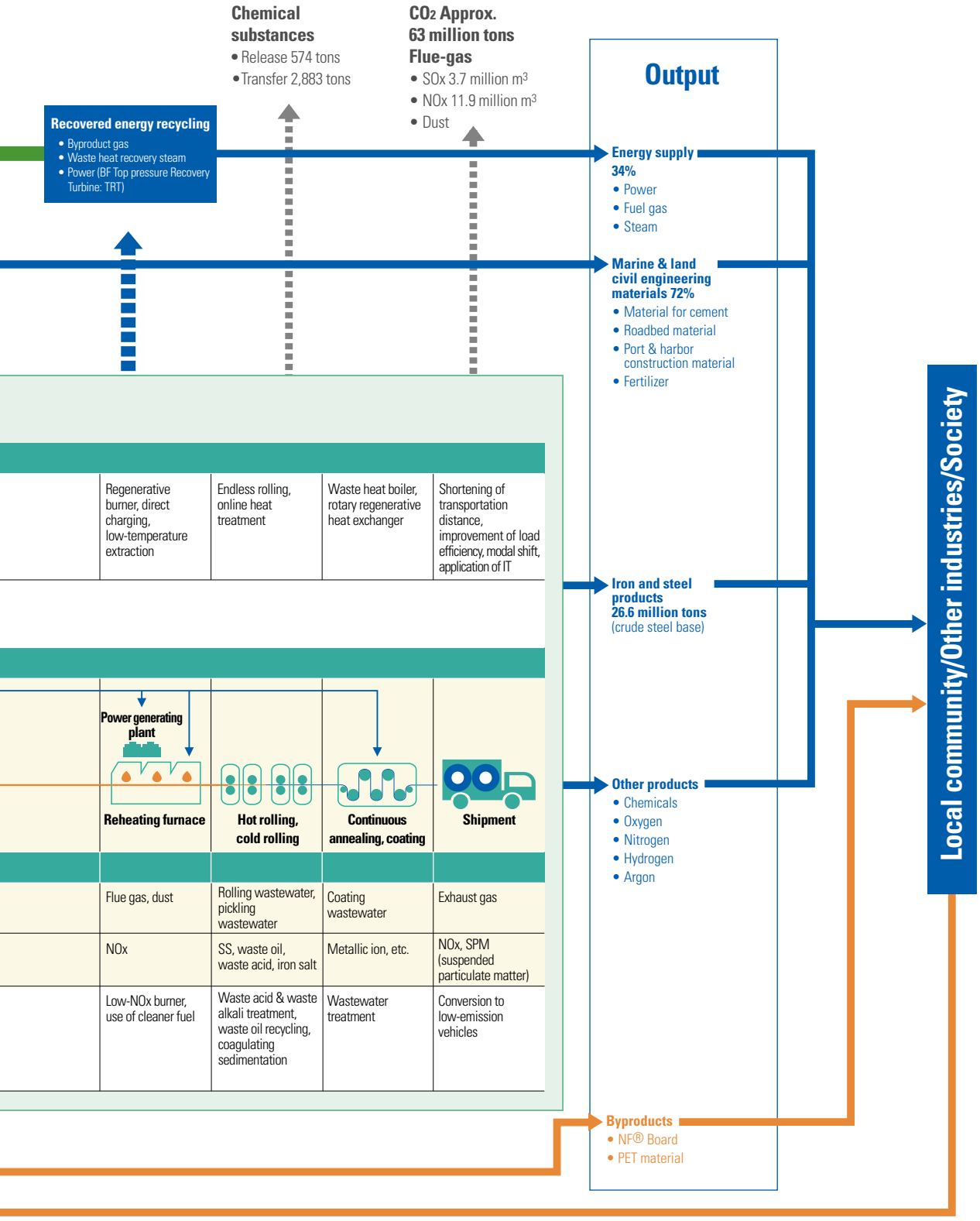
Energy/Material Flow in the Steelmaking Process

JFE Steel Corporation has endeavored to reduce environmental loads through R&D on energy saving and environmental protection technologies and aggressive investment in facilities. As a result, our steel production processes now boast the world's highest energy efficiency and recycling rates. Far from becoming complacent with its achievements, JFE Steel still continues to conduct R&D and introduce equipment to further reduce environmental loads in each steel production process.

Energy recycling in works

66%





Byproduct recycling rate

99.6%

Water recycling

93.4%

Reducing Environmental Loads in Business Activities at JFE Steel

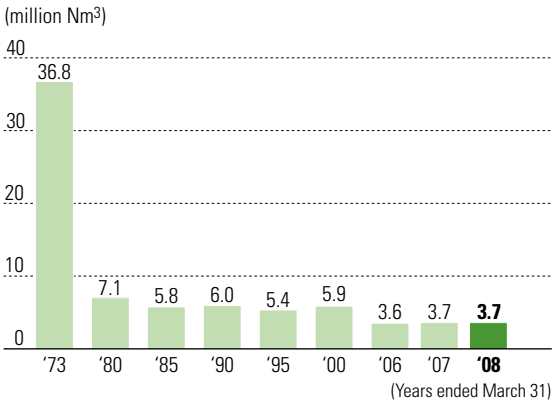
Air Quality Preservation

Reducing Sulfur Oxide (SOx) and Nitrogen Oxide (NOx) Emissions

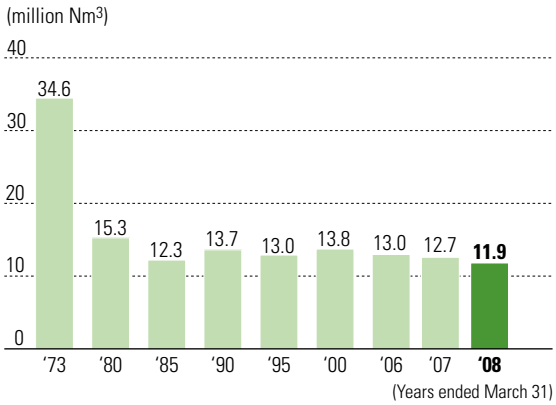
In an effort to control emissions of SOx and NOx, JFE Steel is actively pursuing the installation and usage of desulfurization equipment and denitrification equipment for major emissions sources.

Exhaust gas treatment equipment for sintering machine: an example of the activated coke method at the West Japan Works (Fukuyama)

Transition of SOx Emissions

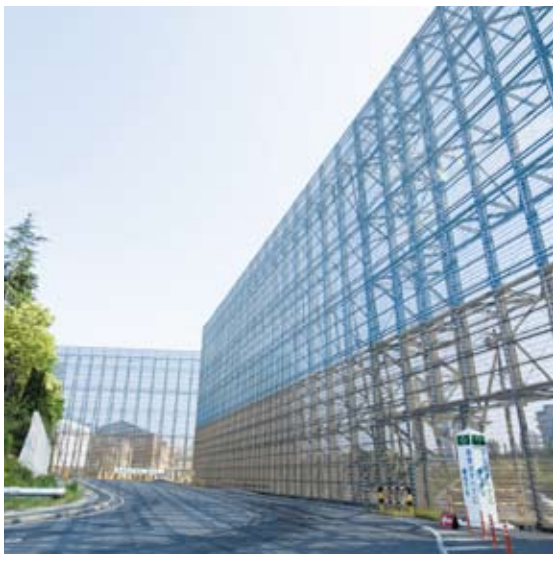


Transition of NOx Emissions



Reducing Dust

Since dust is generated from various sources in the steel production process, JFE Steel has been promoting appropriate reduction measures by identifying individual sources and designing specific measures for each source.



Dust prevention fence at East Japan Works (Chiba)

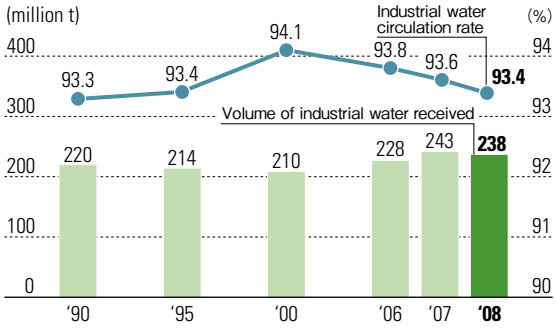
Water Quality Preservation

JFE Steel has been earnestly promoting circulation/recycling of industrial water consumed in the steel production process, with its industrial water circulation rate* maintained at as high a level as about 93%. For release into public waters, wastewater is given appropriate purification treatment so that its pollution loads can be reduced.

* Industrial water circulation rate
Industrial water circulation rate = (Total consumption - Received industrial water) /Total consumption

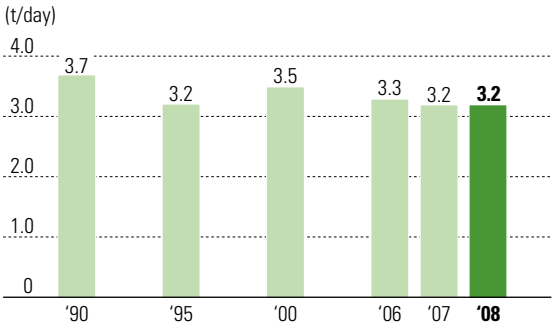
Wastewater treatment equipment: Example of denitrification equipment for wastewater at the East Japan Works (Chiba)

Transition of Received Industrial Water and Circulation Rate



(Years ended March 31)

Transition of COD (Chemical Oxygen Demand)



(Years ended March 31)

Environmental Surveillance

To prevent environmental abnormalities, JFE Steel constantly monitors the load on air and on water quality through a combination of methods like periodic batch analyses, continuous analyses by an automatic analyzer, and ITV-based remote monitoring.

Exhaust gas sampling

Remote surveillance of environmental data: an example from East Japan Works (Keihin)

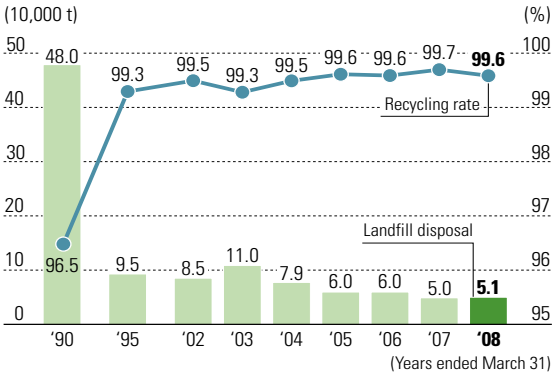
Automatic wastewater analyzer: an example from East Japan Works (Chiba)

Effective Utilization of Byproducts

JFE Steel has been recycling byproducts (i.e., iron and steel slag*1, dust, and sludge*2) in the steel production process in the works as raw materials for steel manufacturing and has been promoting effective utilization of byproducts as resources. During the year ended March 31, 2009, JFE Steel took another step forward in its on-site recycling by starting up a roasting furnace for oil sludge in the Kurashiki region.

Roasting furnace for oil sludge started in the Kurashiki region

Transition of Landfill Disposal and Recycling Rate of Byproducts



***1 Iron and steel slag:**
Material consisting of non-iron rock components in iron ore and lime, etc. It separates from and floats on the molten metal. Slag is mainly used as material for cement.

***2 Sludge:**
Material remaining after dewatering of the mud-like substance separated and removed by circulating water/wastewater treatment equipment.

Appropriate Processing of PCB Waste

We practice appropriate storage of PCB waste in accordance with the law as well as disposal of such waste based on the schedule directed by the Japan Environmental Safety Corporation (JESCO).

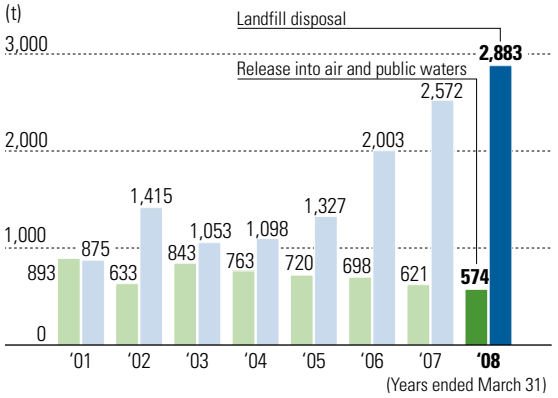
Furthermore, for large transformers and other items exceeding JESCO's size limitations, we have developed and commercialized technology for on-site oil removal and disassembly, thereby, contributing to proper disposal.

Oil removal test for large devices

Control/Release Reduction of Chemical Substances

JFE Steel has been promoting voluntarily release reduction program, which gives the first priority to chemical substances having higher toxicity and larger release amounts. Since the year ended March 31, 2002, total release into air and public waters has been reduced continuously.

Release and Landfill Disposal



Substances Reported under PRTR (The Year Ended March 2009)

(Unit: tons/yr; dioxins: g-TEQ/yr)

No.	Substance	Release				Transfer	
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Off-site
1	Zinc compounds (water-soluble)	0	5.5	0	0	0	0
16	2-aminoethanol	1.4	0.05	0	0	0	0
25	Antimony and its compounds	0	0.4	0	0	0	18.3
26	Asbestos	0	0	0	0	0	18.4
30	Bisphenol A type epoxy resin (liquid)	0	0	0	0	0	0
40	Ethylbenzene	37	0	0	0	0	0.4
43	Ethylene glycol	0.2	0.2	0	0	0	6.0
63	Xylene	196	0	0	0	0	4.4
68	Chromium and chromium (III) compounds	0.03	0.9	0	0	0	1,048
69	Chromium (VI) compounds	0	0.2	0	0	0	3.9
85	HCFC-22	0	0	0	0	0	0.3
100	Cobalt and its compounds	0	0	0	0	0	0.3
132	HCFC-141b	62	0	0	0	0	0
144	HCFC-225	12	0	0	0	0	0
145	Dichloromethane	28	0	0	0	0	0
177	Styrene	0.3	0	0	0	0	0.1
178	Selenium and its compounds	0	0.2	0	0	0	3.4
179	Dioxins	6.1	0.003	0	0	0	0
198	Hexamethylenetetramine	0	0	0	0	0	0
200	Tetrachloroethylene	30	0	0	0	0	0
207	Copper salts (water-soluble)	0	0.04	0	0	0	0
224	1,3,5-Trimethylbenzene	7.5	0	0	0	0	0
227	Toluene	78	0	0	0	0	3.4
230	Lead and its compounds	0	0.3	0	0	0	210
231	Nickel	0	0	0	0	0	36
232	Nickel compounds	0.02	2.3	0	0	0	59
253	Hydrazine	0	0	0	0	0	0
266	Phenol	1.0	0.02	0	0	0	0
283	Hydrogen fluoride and its water-soluble salts	0	28	0	0	0	530
299	Benzene	30	0	0	0	0	0
304	Boron and its compounds	0	21	0	0	0	7.1
307	Poly (oxyethylene) alkyl ether	0	0.06	0	0	0	0
309	Poly (oxyethylene) nonylphenyl ether	0	8.5	0	0	0	3.3
310	Formaldehyde	0	0	0	0	0	0
311	Manganese and its compounds	0.07	17	0	0	0	914
345	Mercaptoacetic acid	0.002	0	0	0	0	0
346	Molybdenum and its compounds	0.001	6.2	0	0	0	17
Total		**484**	**91**	**0**	**0**	**0**	**2,883**
		Total release 574				**Total transfer 2,883**	

Reducing Environmental Loads in Business Activities at JFE Engineering

Material Balance for the Year Ended March 2009

INPUT		JFE Engineering	OUTPUT	
Raw materials	88,331 t	• Tsurumi Engineering and Manufacturing Center	Products	78,470 t
Energy		• Shimizu Works	Air pollutants	
Electricity consumption	34,955,640 kWh	• Tsu Works	CO_2	16,849 t
A-heavy oil	44.4 kl		NOx	max 85 ppm
Kerosene	69.0 kl		SOx	max – ppm
Light oil	244.3 kl		Dust	max 0.007 g/Nm3
Gasoline	24.0 kl		Waste generated	1,636.5 t
Urban gas	890,316.0 Nm3		Wastewater	260,921.2 t
LPG	256.6 t		Other (PRTR)	223,600 kg
LNG	0.0 t			
Water	169,389 t			

JFE Engineering constructs environmental management systems in line with the function and activities of each production center and is promoting activities to reduce environmental loads.

Global Warming Prevention

In the office area, we do what we can to promote energy conservation by using a highly efficient Clathrate Hydrate Slurry (CHS) Heat Storage Air-conditioning System and turning off lights during lunch breaks. In the year ended March 31, 2009, we installed additional solar street lights at the Tsurumi Engineering & Manufacturing Center, adding to that installed the prior year, and adopted energy-saving equipment in remodeling the kitchen for the employee cafeteria.

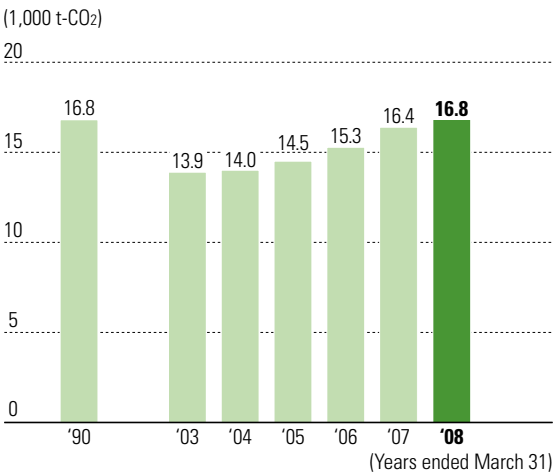
Solar street lights

In the production divisions, we took several measures such as reducing the amount of gas used for cutting and welding, and improving the efficiency of our compressed air usage.

In the production divisions and office divisions together, the total amount of CO_2 emissions was 16.8 thousand tons for the year ended March 31, 2009.

From August 2004 onward, we have been striving to assess the amount of CO_2 emissions for local construction sites. In addition, from the year ended March 31, 2007, we continue implementation of other activities designed to reduce CO_2 output such as reducing occurrences of machine idling at construction sites.

Transition of CO_2 Emissions



Reducing Generation of Waste

JFE Engineering strives to reduce generation and discharge of waste.
The office divisions have carried out educational activities through on-site broadcasting and posters, etc., as well as more segmented sorting for the purpose of reducing the landfill disposal rate of office waste.

The production divisions have worked on thorough sorting, complete sorting and effective use of recyclable waste, and recycle patrol to check sorting conditions.

The planning and designing divisions have been making environment-friendly plans and designs by adopting recycling materials or selecting energy-saving equipment, etc.

Recycle patrol underway at the Tsurumi Engineering & Manufacturing Center

Area cleanup activities around the Tsurumi Engineering and Manufacturing Center

Reduction of Waste (The Year Ended March 2009)

Waste recycling in offices		
Recycling rate in offices	**Target**	**Actual**
Tsurumi Center (%)	96	97.8
Shimizu Works (%)	97.6	98.1
Tsu Works (%)	implementing in the production division.	

Waste recycling in the production divisions		
Recycling rate in the production divisions	**Target**	**Actual**
Tsurumi Center (%)	50	48.4
Shimizu Works (%)	15	21.4
Tsu Works (%)	28	20.4

Waste recycling at construction sites		
Recycling rate at construction sites	**Target**	**Actual**
Construction work sites (%)	73	85.9

Control and Reduction of Chemical Substances

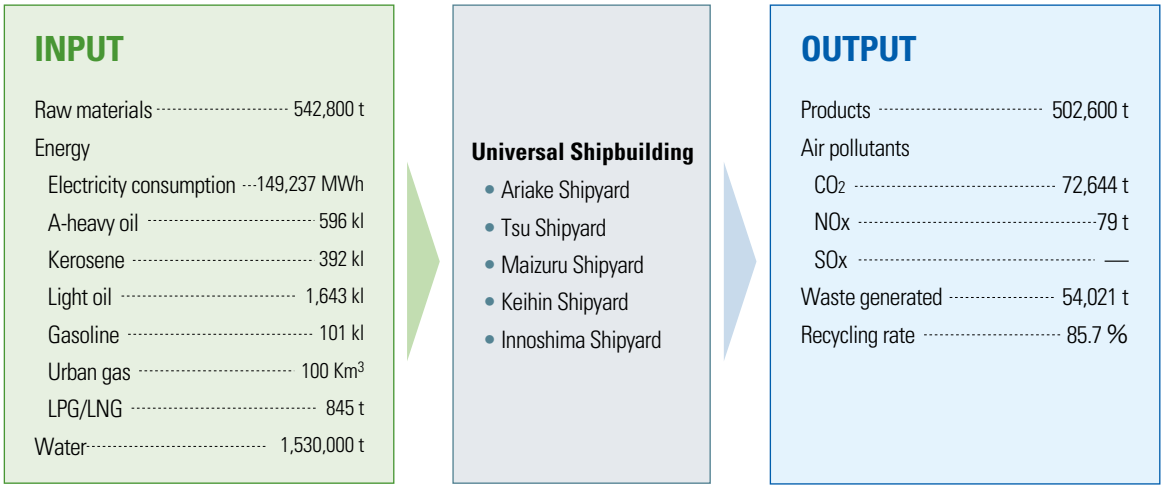
In compliance with the Pollutant Release and Transfer Register (PRTR) Law, JFE Engineering controls release and transfer volumes of the designated chemical substances and reports those figures to the national government through local governing bodies. The company has been promoting activities to reduce controlled substances, including paints, solvents, and gasoline.

Substances Reported under PRTR (The Year Ended March 2009) (kg)

No.	Substance	Release				Transfer	
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Offsite
30	Bisphenol A type epoxy resin	0.0	0.0	0.0	0.0	0.0	2,385.3
40	Ethylbenzene	47,476.3	0.0	0.0	0.0	0.0	3,932.0
63	Xylene	107,668.6	0.0	0.0	0.0	0.0	9,973.7
68	Chromium and trivalent chromium compounds	0.0	0.0	0.0	0.0	0.0	210.0
227	Toluene	31,281.0	0.0	0.0	0.0	0.0	7,003.2
230	Lead and its compounds	0.0	0.0	0.0	0.0	0.0	247.0
232	Nickel compounds	0.0	0.0	0.0	0.0	0.0	342.0
311	Manganese and its compounds	0.0	0.0	0.0	0.0	0.0	13,104.2
Total		186,425.9	0.0	0.0	0.0	0.0	37,197.4
		186,425.9				**37,197.4**	
		223,623.3					

Reducing Environmental Loads in Business Activities at Universal Shipbuilding

Material Balance for the Year Ended March 2009



Universal Shipbuilding Corporation has built environmental management systems tailored to the functions and operations of individual shipyards in an effort to lower its environmental burden.

Global Warming Prevention

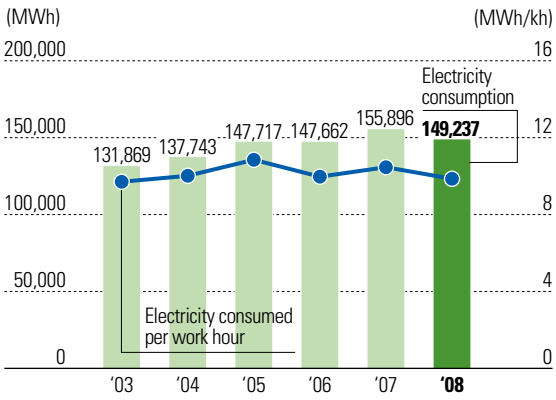
A breakdown of Universal Shipbuilding Corporation's energy-origin CO_2 emissions shows that 86% are associated with electricity usage, 10% with petroleum usage, and 4% with gas usage. These figures remained unchanged over the past several years.

The company's most pressing concern is to lower its electricity consumption, the greatest source of its energy-origin CO_2 emissions. Toward that end, the production divisions are taking steps like turning off lights during lunch hours, reducing electricity consumed by welding equipment standing by for use, and replacing electrical equipment with energy-conserving options. The office divisions are doing things like turning off lights during lunch hours, turning off computers when not in use, and adjusting thermostats to use air conditioners and heaters less.

Total electricity consumption of production and office divisions for the year ended March 31, 2009 came to 149,237 MWh, 6,659 MWh less than in the previous year. The completion and delivery of an LNG carrier by the Tsu Shipyard accounted for much of this decrease. A slight decrease in electricity consumption per work hour (MWh/kh), versus the prior year, also helped.

Simultaneous with efforts to reduce electricity consumption, the company is also proactively engaged in activities such as turning off the engines of shipyard vehicles and trucks when idling, shutting off gas mains at the completion of work, etc. in order to reduce wastage of petroleum and gas.

Electricity Consumption



Reducing Generation/Discharge of Waste

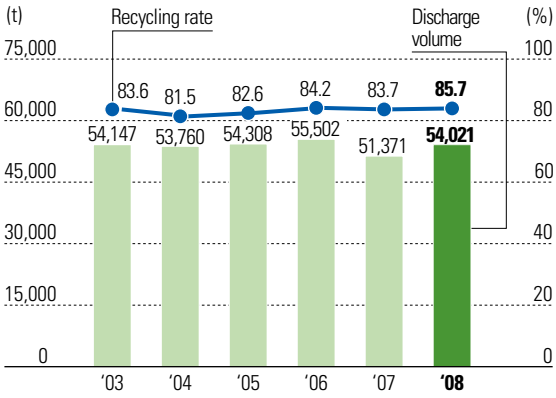
Universal Shipbuilding Corporation is working to reduce the generation and discharge of waste.

For this purpose, the production divisions are putting out more garbage receptacles for separated waste, conducting patrols, and taking other steps to help ensure that garbage is properly separated, reused, and recycled. The office divisions are reusing wastepaper and thoroughly separating garbage in a bid to dispose of less and recycle more.

Despite these efforts, however, combined waste discharges from the production and office divisions came to 54,021 tons for the year ended March 31, 2009, an increase of 2,650 tons compared to the previous year, while waste discharged per unit of work time (t/1,000 hrs) also increased slightly from the prior year.

On a positive note, the waste recycling rate increased significantly to 85.7% from 83.7% last year.

Transition of Waste Discharge



Control and Reduction of Chemical Substances

In compliance with the Pollutant Release and Transfer Register (PRTR) Law, Universal Shipbuilding controls release and transfer volumes of the designated chemical substances and reports those figures to the national government through local governing bodies. The company has been promoting activities to reduce controlled substances, including paints, solvents, and gasoline.

As a shipbuilder, Universal Shipbuilding pays particular attention to monitoring releases and transfers of three key substances, namely ethylbenzene, xylene, and toluene that are important for painting work.

Conditions of Three Key Substances (t/yr.)

	Atmospheric releases		Transfers to off-site locations	
Three key substances	Year ended March 31, 2008	Year ended March 31, 2009	Year ended March 31, 2008	Year ended March 31, 2009
Ethylbenzene	314	298	19	20
Xylene	801	968	52	70
Toluene	235	404	16	29
Total	**1,350**	**1,670**	**87**	**119**

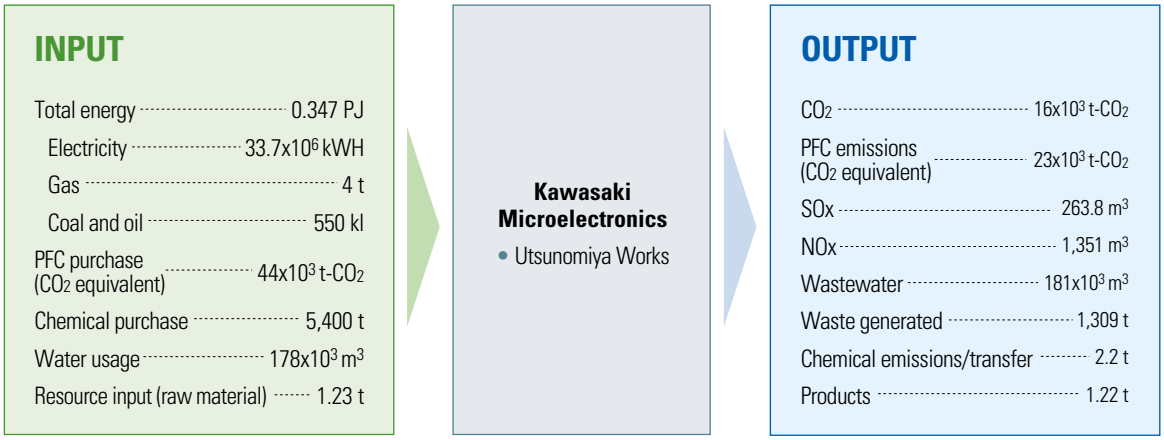
Zero Fuel Leak Campaign

Universal Shipbuilding Corporation considers fuel leaks to be a significant source of marine environmental pollution and conducts regular training to prevent accidents and minimize damage.

Training to respond to fuel leaks

Reducing Environmental Loads in Business Activities at Kawasaki Microelectronics

Material Balance for the Year Ended March 2009



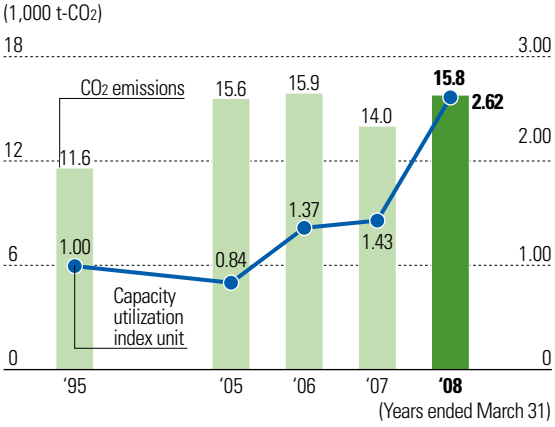
Global Warming Prevention

Through measures like improving the operation of air-conditioning equipment and reducing the number of production units in operation, Kawasaki Microelectronics managed to achieve a 3% energy saving rate*. Despite that positive result, however, the company's energy-origin CO_2 emissions increased because of an unfavorable change in the CO_2 conversion coefficient for electricity.

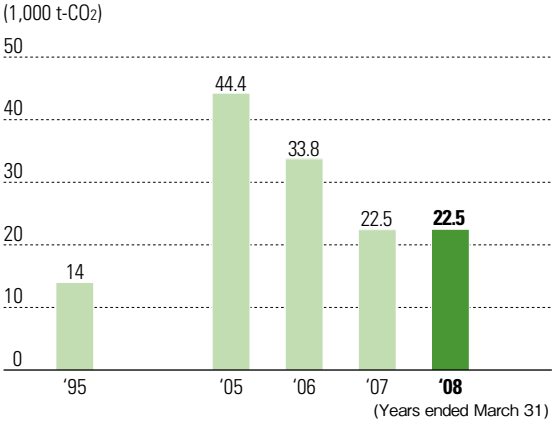
Plans to use an alternative to PFC gas (C_2F_6 gas), which has powerful greenhouse effects, had to be revised because supplies of the substitute gas were discontinued. A new substitute gas was approved for use in February 2009.

* Energy saving rate
Percentage of energy saving effect for the fiscal year relative to energy consumption (crude oil equivalent) in the works as a whole

Energy-Origin CO_2 Emissions



CO_2 Equivalent Emissions of PFC, HFC and SF_6 Gases



Reducing Generation/Discharge of Waste

Kawasaki Microelectronics is almost achieving its goal of recycling all sludge generated from its wastewater treatment facilities. A 71% recycling rate was achieved for the year ended March 31, 2009.

Control and Reduction of Chemical Substances

In the year ended March 31, 2009, Kawasaki Microelectronics eliminated all use of Tri-n-butyl phosphate and improved a product cleaning method to reduce its use of hydrogen fluoride. Both of these chemicals are PRTR substances.

Substances Reported under PRTR (The Year Ended March 2009) (kg)

No.	Substance	Release				Transfer	
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Offsite
283	Hydrogen fluoride and its water-soluble salts	80	690	0	0	0	990
Total		770				990	

Reducing Environmental Loads in Business Activities at JFE Urban Development

Use of Energy-Saving Facilities and Construction Materials in Condominium Business

JFE Urban Development is working to make condominiums more energy efficient.

Energy-Saving Lighting

The company has begun to use energy-saving, long-life LED lighting in the entrance ways, corridors, and other common areas of condominium projects.


LED lighting in the common areas of the Shinkawa 2-chome Project (tentative)

Energy-Saving Construction Materials

At its Grand Scena Yamato Premium Fort condominium project, the company used double-pane glass to improve the thermal insulation performance of windows. It also took steps like using bathtubs with high heat-retaining performance to lower the project's environmental load.

Grand Scena Premium Fort

Heat-retaining bathtub

Double-pane glass for windows

Recycling Waste and Reducing Energy Consumption at Company-Operated Facilities

Reducing Waste Generation and Discharge

The JFE Urban Development Group manages and operates the THINK (Techno Hub Innovation Kawasaki), a science park, and the Orto Yokohama, a multipurpose commercial building. At both of these facilities, the company separates waste related to building operations into categories like paper, metal cans, glass containers, and kitchen waste, and measures the volumes of each. The company also works to reduce waste generation and recycle the collected waste.

THINK (Techno Hub Innovation Kawasaki)

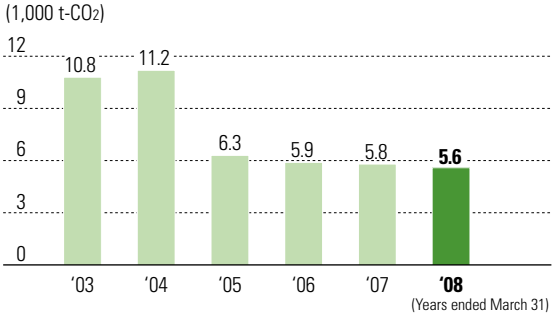
Facility Waste Recycling Rate

Waste recycling rate	Year ended March 31, 2008	Year ended March 31, 2009
THINK	49.3%	55.4%
Orto Yokohama	46.6%	48.5%

Controlling CO_2 Emissions

THINK has installed highly energy-efficient air-conditioning systems, and is upgrading and retrofitting facilities and equipment in its effort to reduce its energy usage.

CO_2 Emissions at THINK



Figures for the year ended March 31, 2006 or later exclude energy management data under the authority of tenants.

「挑戦」
Challenging Spirit

Reducing Environmental Loads through Products and Technologies

Providing Society with Steel Products, Engineering Technologies, and Recycling Businesses, All of Which Contribute to Global Environmental Protection

「柔軟」
Flexibility

「誠実」
Sincerity

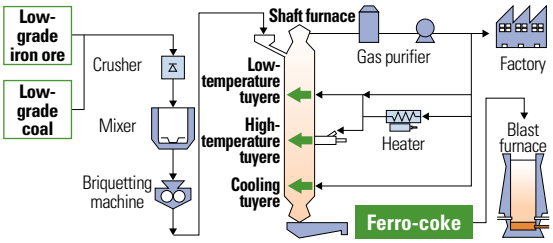
R&D of Environmental Conservation Technology

Steelmaking Technology

Development of Ferro-Coke Production Process

Ferro-coke is a highly reactive formed coke produced by carbonizing low-grade coal mixed with iron. Replacing some of the coke used in blast furnaces with ferro-coke greatly reduces coke usage. Thus, ferro-coke is expected to save energy, cut CO_2 emissions, and conserve resources.

Ferro-Coke Production Process Using Low-Grade Raw Materials



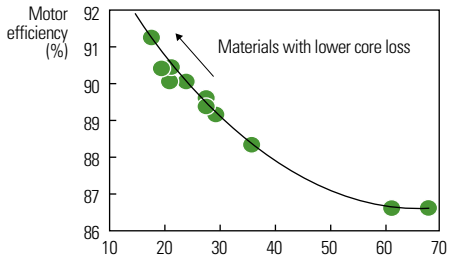
Takashi Anyashiki
Senior Researcher
Ironmaking Research Department
Steel Research Laboratory

Electrical Steel Sheets for Hybrid/Electric Vehicles
Non-oriented electrical steel sheets used for motors

Super Core with Si content of 6.5% used for power booster systems

JFE's electrical steel sheet with low loss contributes to reducing the size and weight of vehicle motors as well as improving fuel efficiency. Super Core is the electrical steel with Si content as high as 6.5%, which was previously impossible to manufacture using the conventional rolling method. JFE has succeeded in manufacturing this product in an industrial scale for the first time in the world using a siliconization technology (CVD process). Super Core brings such benefits as high efficiency and low noise in power booster systems.

Impact of Material Core Loss on Motor Efficiency



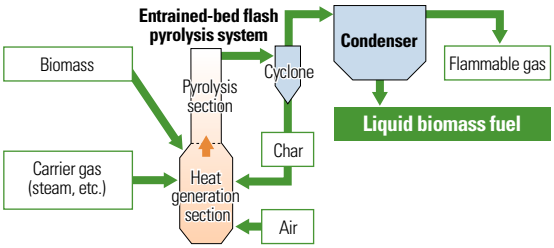
Akira Fujita
Senior Researcher
Electrical Steel Research Department
Steel Research Laboratory

Development of a New Technology for Generating Biomass Fuel

Helping to Cut CO_2 Emissions

Biomass fuel is carbon neutral and, therefore, good for the environment. JFE Engineering is moving forward with the development of technology for thermally decomposing wood-based biomass rapidly and producing a liquid biomass fuel. This fuel has drawn praise for its practicality as a substitute for heavy fuel oil.

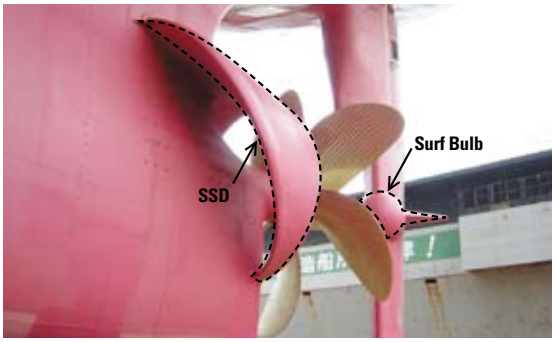
Generation of Liquid Biomass Fuel Using Entrained-bed Flash Pyrolysis Technology



Seiji Kinoshita
Senior Researcher
Environmental Technology Research Department
JFE Engineering Engineering Research Center

Energy-Saving Devices for Ships

Universal Shipbuilding Corporation installs "SSD" and "Surf Bulbs" as propulsion efficiency improvement devices on nearly all the ships it builds, increasing their propulsion efficiency by 6%–13%. In the case of Very Large Crude Carriers (VLCCs), which are at sea around 200 days a year, a 10% improvement in propulsion efficiency equates to a CO_2 emission reduction of about 6,000 tons per ship.

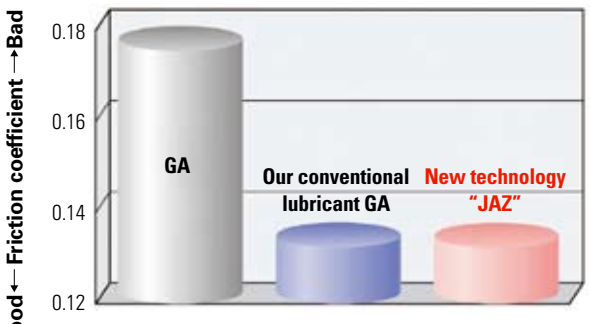


Propulsion efficiency improvement device installed on a ship

Seiji Masuda
Senior Researcher
Hydrodynamics Engineering Lab
Universal Shipbuilding Technical Research Center

JFE's Technologies Contribute to Global Environmental Protection

1,200 t actual press test (Fender model)



Sliding characteristics of our innovative products (Sliding test with flat sheets before processing)

Protecting the Environment with Heavy Metal- Free Products

Highly-lubricated automotive galvannealed (GA) steel sheets "JAZ® (JFE Advanced Zinc)"

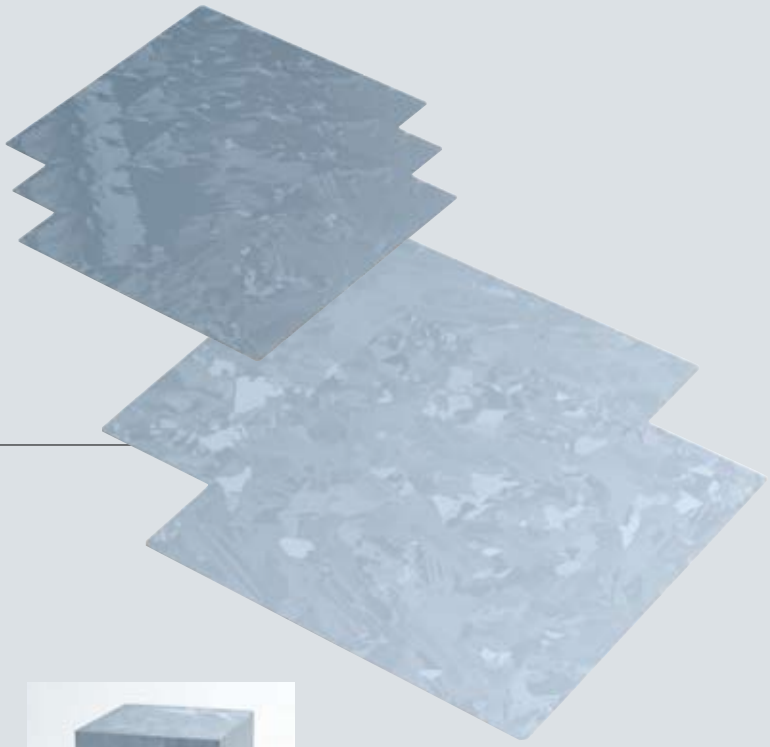
POINT

- **Anti-corrosion steel sheets with excellent press formability**
- **Environmentally friendly and heavy metal free**

A GA steel sheet* offers improved press formability through optimization of its nano-level surface structure. It is favorable for automobile side panels, fenders, doors, and wheel housings as well as other difficult-to-form outer panels and various inner panels.

* GA steel sheet is an abbreviation of "galvannealed steel sheet."

URL http://www.jfe-steel.co.jp/products/car/products/surface/jaz/index.html



Polycrystalline silicon wafers for solar batteries

Achieved the World's Highest Level of Conversion Efficiency

Silicon Wafer for Solar Batteries

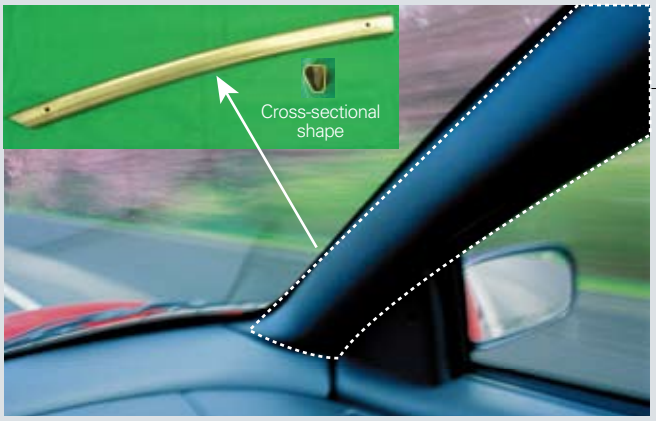
POINT

- **A material used for solar batteries, critical for fighting against global warming**
- **Achieves the world's highest level of conversion efficiency**

Using its advanced solidification technology, JFE Steel is manufacturing polycrystalline wafers offering world-class energy conversion efficiency (approx. 17%). The company is also applying highly sophisticated metallurgical technologies, such as electron beam refining and vacuum plasma melting, to manufacture the highest grade of solar grade (SOG) silicon in the world.

URL http://www.jfe-steel.co.jp/release/2006/07/060726.html

Silicon block



Example of an application of 980-MPa tube in a front pillar reinforcing component. The smaller cross section realizes better front visibility.

Helping to Make Cars Lighter and Safer

Ultra High Tensile Strength Steel

JFE Steel has seen steadily growing demand for its high tensile strength steel sheet (HITEN) as a material that helps to make lighter cars. In recent years, however, the company has also seen upticks in demand for even stronger 980-MPa Ultra HITEN with outstanding workability and has brought processed tube products to market.

URL http://www.jfe-steel.co.jp/products/car/products/sheets/WQhiten/index.html

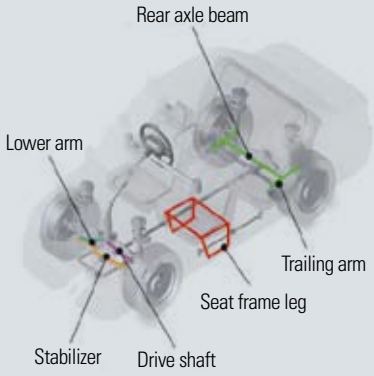
Outstanding Strength and Workability

Automotive Steel Tubes "HISTORY"

HISTORY (High Speed Tube Welding and Optimum Reducing Technology), a high-performance electric resistance-welded steel tube, has outstanding strength and workability. Using this product to make hollow automobile components results in lighter cars .

*Electric resistance-welded steel tube: a tube formed from steel strips by electric resistance welding

URL http://www.jfe-steel.co.jp/products/car/products/pipe/history/index.html



Environmental Friendliness and High Corrosion Resistance

Chromate-Free Coated Steel Sheet

This product is an environment-friendly coated steel sheet that contains no chrome (VI). Its surface is coated with a proprietary composite film (consisting of a special organic resin and inorganic substances) for corrosion resistance equivalent to that of existing products. Customers use this new product, for example, to make interior panels for home appliances and interior components for OA and AV equipment.

URL http://www.jfe-steel.co.jp/products/usuita/aenmekki/JC.html

No Use of Rare Metals

Resource-Saving Type Stainless Steel Sheet

Amid rising concerns regarding the depletion of rare metals, such as nickel and molybdenum, JFE Steel became the world's first company to develop high corrosion resistant ferrite stainless steel sheet "JFE443CT" that offers corrosion resistance equivalent to that of ordinary stainless steel SUS304, without using any nickel or molybdenum.

URL http://www.jfe-steel.co.jp/products/stainless/index.html

JFE's Technologies Contribute to Global Environmental Protection

Prime Minister Aso examining the CHS air conditioning system installed in the Azalea underground shopping mall in Kawasaki.

Sufficient Energy-Saving and CO_2 Emission Reductions

Clathrate Hydrate Slurry (CHS) Heat Storage Air Conditioning System

POINT

- **Uses a fluid with cold storage capacity twice that of water to realize energy savings and reduced CO_2 emissions**
- **Suited for use in underground shopping malls, commercial buildings, and a wide variety of other facilities**
- **Reduces CO_2 emissions from air conditioning by 40% (Azalea underground shopping mall in Kawasaki)**

The CHS air conditioning system uses a hydrate slurry that can store over twice the amount of cold energy as water used in conventional air conditioning systems. Having first been introduced in office buildings in the year ended March 31, 2006, this system is now being used in underground shopping malls, large commercial buildings, factories, and a wide variety of other facilities.

URL http://www.jfe-eng.co.jp/product/environment_energy/environment_energy1211.html

Carbon Neutral Eco-Energy

Wood Chip Biomass Gasification System for Power Generation (Licensed by Voelund)

POINT

- **Wood chip biomass fuels engines and industrial furnaces**
- **Eco-energy helps to prevent global warming**
- **Overall energy efficiency of 80% plus**

Carbon-neutral wood chip biomass is fueling boilers and, thereby, reduces the use of fossil fuels and helps in the fight against global warming. The wood chip biomass gasification system uses forest thinnings, construction waste, and other inexpensive wood materials to make combustible gas, tar, and other general-purpose fuels. This system uses biomass to create fuels for gas engines used to generate power and for existing industrial furnaces—applications previously thought to be too technically difficult to incorporate biomass systems.

URL http://www.jfe-eng.co.jp/product/environment_energy/environment_energy1121.html

From Sewerage to Energy

Sewerage Sludge Digestive Gas Power Generation

The high-efficiency engine of this system converts digestive gases, generated from sludge digestion tanks at sewerage treatment plants, into electricity and thermal energy.

URL http://www.jfe-eng.co.jp/product/environment/environment2246.html

Using VOCs as Energy

VOC Recovery Equipment

JFE Engineering recovers Volatile Organic Compounds (VOCs), which are usually released when crude oil is shipped, and uses them as an energy source after removing odorous components.

URL http://www.jfe-eng.co.jp/product/energy/energy3421.html

Helping to Cut CO_2 Emissions

Biomass Boiler System

This system uses a circulating fluidized bed boiler in which air is injected to increase combustion efficiency. This type of boiler efficiently converts carbon-neutral biomass fuel into electricity and thermal energy.

URL http://www.jfe-eng.co.jp/product/environment_energy/environment_energy1111.html

Preventing Declines in Water Quality

Seawater Exchange-type Hybrid Caisson

These breakwaters allow for the exchange of seawater, thereby preserving harbor water quality.

URL http://www.jfe-eng.co.jp/product/instruct/instruct4421.html

JFE's Technologies Contribute to Global Environmental Protection

Cape-size bulker "CAPE SALVIA"

A New Bow Shape Improves Performance

Ax-Bow and LEADGE-Bow Enable Higher Performance in Real Sea Conditions

POINT

- **Reduces increases in fuel consumption when cutting through waves and cuts greenhouse gas emissions**
- **With strong support by ship owners, 100 ships with these designs are sailing the world's seas**

The Ax-Bow and LEADGE-Bow designs have been pioneered over the past 10 years. The designs specifically improve the efficiency of operation on actual sea surfaces. Ships employing the Ax-Bow and LEADGE-Bow lose less speed when cutting through waves and, therefore, have better fuel efficiency.

URL http://www.u-zosen.co.jp/recruit_info/newtech/m1-2.html

Voyage Support System

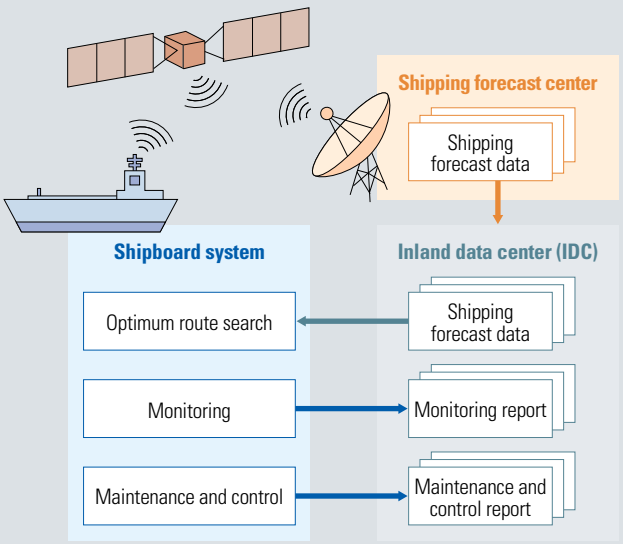
"Sea-Navi®"

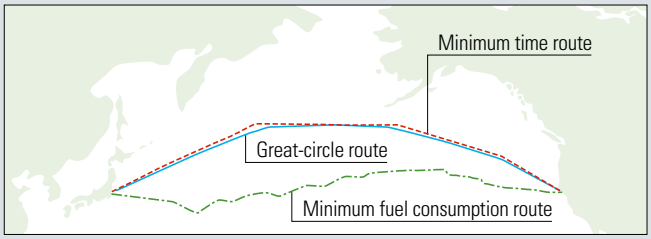
POINT

- **Optimizes ship navigation to reduce fuel consumption**
- **Recommends optimum routes based on the weather**
- **Two-year test under actual operating conditions in progress**

Optimizing shipping routes can effectively reduce the fuel consumption, as well as by improving vessel shapes and propulsion performance. Sea-Navi®, a voyage support system that takes its name from a car navigation system, is designed for this purpose. Before leaving port, the system provides the best routing plan considering fuel consumption, punctuality, and safety. While the vessel is underway, the system can adjust the plan depending on the conditions which are always changeable, as well as displaying the results of fatigue life evaluation of the hull structure and a recommended maintenance plan.

URL http://www.u-zosen.co.jp/giken/review02.html





Support for Lithium Ion Secondary Batteries

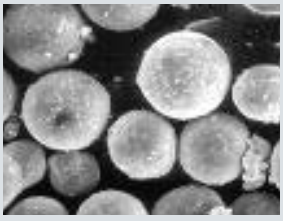
Fine Spherical Graphite Powder

POINT

- **Improves the performance of lithium ion secondary batteries**
- **Made from coal-tar pitch, a steel manufacturing byproduct**

Fine spherical graphite powder is used in making high-performance anodes for lithium ion secondary batteries, which are in great demand for use in hybrid and electric cars. JFE Chemical uses proprietary technology to make its fine spherical graphite powder from coal-tar pitch, a steel manufacturing byproduct. Its high crystallinity with large packing density helps to significantly increase battery capacity and service life.

URL http://www.jfe-chem.com/products/carbon/carbon01.html



Fine spherical graphite powder

Lithium ion secondary batteries

Turret cart equipped with hydrogen gas tanks

Hydrogen gas tanks up close (under the cargo bed)

Helping to Build a Fuel Cell Society

Hydrogen Gas Tanks

POINT

- **Core high-pressure gas tank technology for a wide variety of needs**
- **Currently testing a jointly developed fuel cell turret cart**

JFE Steel developed the gas tank (13-ℓ capacity, 190-mm diameter, 840-mm length, 35 MPa) and related systems for a turret cart powered by hydrogen fuel cells. Turret carts are used to transport goods in fresh food markets and within factories. With fuel cells increasingly being used in transportation, medical, and environmental applications, the company aims to contribute in a wide variety of ways based on its high-pressure gas tank technology.

URL http://www.jfe-steel.co.jp/products/car/products/others/cylinder/index.html

http://www.jfecon.jp/product/g01.html

Recycling Technology Supporting a Sustainable Society

RECO Board (NF Board®, KG Panel)

JFE manufactures recycled plastic boards (RECO board = Recycle ECO board) using container and packaging plastic recovered from household waste.

Municipalities collect container and packaging plastic as household waste. Foreign matter is then removed from this waste, which is then compressed into bales. These bales are transferred via the Japan Containers And Packaging Recycling Association to JFE and other companies that process the plastic into new products.

JFE uses the bales to manufacture RECO boards, which, as a wood substitute, helps to protect tropical rain forests and stop global warming.

NF Board®

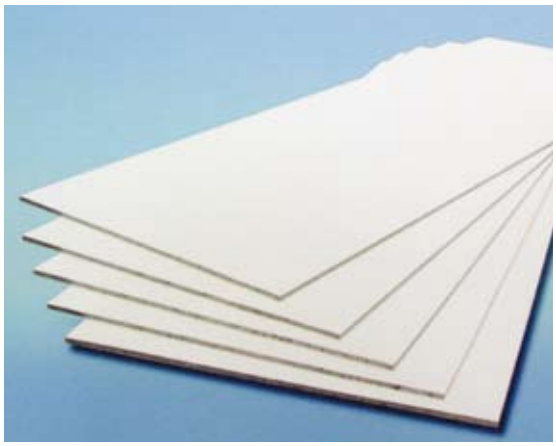
Since 2002, JFE has been using pellets made from pulverized bales of container and packaging plastic to manufacture NF Boards® (12-mm thick) for use in concrete forms.

300,000 NF Boards® are used as a substitute for wooden forms at construction sites. Used NF Boards® are recovered and used instead of coke as a reducing agent in blast furnaces.

Development of Thin Boards

In 2008, JFE perfected KG Panels as a lighter, thinner (5.5-mm thick) version of NF Boards®.

These thinner boards are now being used, for example, as election poster boards.



NF Board®

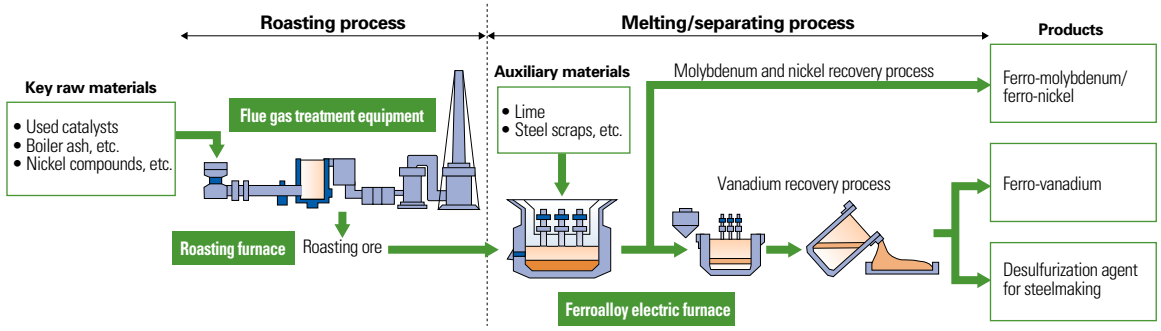
NF Board® in use at a construction site

KG Panel used as an election poster board

Recovering Rare Metals from Waste Catalysts

JFE has developed a zero-emission manufacturing process for recovering rare metals like nickel, molybdenum, and vanadium from substances like used catalysts from petroleum refineries. In this way, we are contributing to the development of a recycling-oriented society that puts waste to effective use.

Recovery Process Overview



Amount of fluorescent tubes processed for the year ended March 2009 (Total tube length is calculated in terms of straight 40 W tubes)

20 million tubes

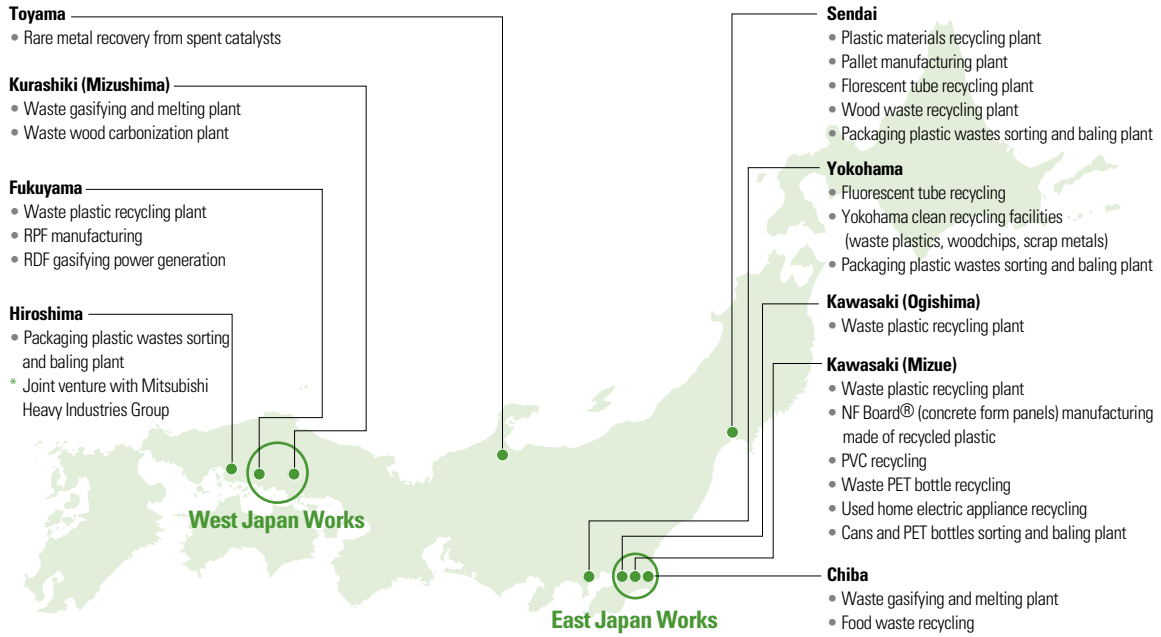
Recycling Different Used Products

JFE is also involved in recycling various waste materials.

After safely recovering the mercury in used fluorescent tubes, we recycle these tubes into raw glass and raw metal.

We are also recycling used home electric appliances and food waste to help bring about a resource-recycling society.

JFE Group's Recycling Businesses



Amount processed of the four regulated types of discarded home electronic appliances for the year ended March 2009

820,000 products

Container and packaging plastic for the year ending March 2010 (Other plastics) Amount successfully bid on

114,000 tons

Restoring Marine Environments

Coral restored on a Marine Block® and native fish

Restoring Marine Environments with a Steel Byproduct

JFE is developing and expanding the use of steel manufacturing byproducts, taking advantage of their unique function in restoring coastal ecosystems, in order to protect marine environments

Restoring Coral Reefs with Marine Blocks®

Coral reefs are declining worldwide due to bleaching events, which are triggered by higher sea temperatures resulting from global warming. JFE Steel is developing technologies to help restore coral reefs.

Marine Block® is an artificial reef material developed by JFE, which consists of calcium carbonate produced by a chemical reaction between CO_2 gas emissions and calcium in steelmaking byproducts.

This calcium carbonate is also found in seashells and coral, with the characteristics of tiny irregularities on the surface that make it easy for coral to adhere and grow.

JFE has also developed technology for using steel byproducts to create coral settlement devices as a growing base for coral. Focusing on the fact that coral larvae naturally try to attach themselves to small holes and crevices in rocks, these coral larvae substrates are to be installed just before a coral bloom, and then a large number of larvae will eventually take up residence.

Coral settlement devices (basic shape developed by Associate Professor Okamoto at the Tokyo University of Marine Science and Technology)

Devices with coral larvae attached are placed on Marine Block®

Four years after installation, the coral has grown to a diameter of 26cm and is expected to reproduce.

Voice from the Frontline of Coral Restoration

Coral reef restoration technology using Marine Blocks® has received a lot of media coverage not only in Japan but also abroad. I hope that more people will come to know about our proprietary technologies in this area and that this will allow us to help protect the global environment.

Kumi Oyamada (Right)
Slag & Refractories Research Department, Steel Research Laboratory, Slag Business Planning & Control Department

Using Steel Byproducts to Create a Forest in the Sea Contributing to the development of a low-carbon society

JFE is working to reduce CO_2 and increase the basic productivity of oceans to improve marine ecosystems, thus creating rich marine environments. The company is also developing technologies to restore them.

For example, the company is participating in a proof-of-concept, industry-government-academia partnership working toward the realization of a low-carbon society. This partnership, which is sponsored by Japan's Ministry of Economy, Trade and Industry, has created a forest of seagrass using steel manufacturing byproducts off the coast near Kawasaki to measure and assess the volume of CO_2 it can absorb.

Kelp, a common variety of seaweed, growing on a Marine Block®

Ship Ballast Water Treatment System Helping to maintain marine ecosystems

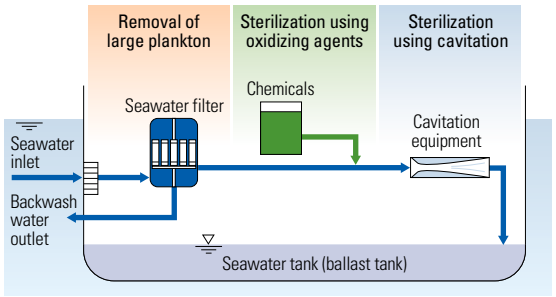
Ships with no cargo carry ballast water (seawater) to maintain their balance. When they enter a port and take on cargo, they release the ballast water, which includes plankton and other organisms the ship took in at the port of unloading. Therefore, such releases impact marine ecosystems around the port of loading, and have become an international problem.

To address this problem, the JFE Group has applied its water treatment, mechanical, and shipbuilding technologies to develop a high-performance ballast water treatment system that is compact and easily installable inside a ship.

Moving forward, JFE will contribute to maintaining marine ecosystems by receiving orders and sales for the ballast water management system.

Ballast Water Processing System

Pumping ballast water into the ballast tanks (when unloading at ports)



History of Environmental Measures in JFE Group

	Social Trends	Environmental Protection & Energy Saving Activities at Works General Measures
1997	• Kyoto Conference of the Parties of the United Nations Framework Convention on Climate Change (COP3): Adoption of Kyoto Protocol	• Establishment of Voluntary Action Program by Keidanren • ISO 14001 certification of Keihin Works • ISO 14001 certification of Mizushima (Kurashiki) Works and Utsunomiya Works (LSI plant)
1998	• Implementation of Law concerning the Promotion of the Measures to Cope with Global Warming	• Establishment of Voluntary Action Program by Keidanren • ISO 14001 certification of Chiba Works
1999	• Implementation of Law concerning Special Measures against Dioxins • Implementation of PRTR Law	• ISO 14001 certification of Engineering Division • ISO 14001 certification of Chita Works • ISO 14001 certification of Maizuru Shipyard
2000	• Implementation/revision of 6 laws related to establishment of recycling-based society	
2001		• Establishment of Environment & Energy Liaison Center • ISO 14001 certification of Tsu Shipyard
2002	• Implementation of Soil Contamination Control Law	• Start of JFE Group (September) • ISO 14001 certification of Ariake Shipyard • ISO 14001 certification of Innoshima Shipyard
2003		• Start of 5 operating companies (April) • Start of Environmental Management Network System • ISO 14001 certification of Keihin Shipyard
2004		
2005	• Effect of Kyoto Protocol • Revision of Law Concerning the Promotion of the Measures to Cope with Global Warming	• Overhaul of the environmental management system
2006	• Enforcement of the revised Energy Saving Law	• Startup of environmental abnormality prevention system (Chiba)
2007		• Commencement of Environmental Information Publication System (Keihin)
2008	• Commencement of First Commitment Period of the Kyoto Protocol	• Commencement of Environment & Energy Information Management System

JFE Group Social and Environmental Efforts

Yoshinao Kozuma
Professor, Faculty of Economics,
Sophia University

1. JFE Efforts regarding Climate Change

Efforts to address climate change issues remain the most important criteria for evaluating the JFE Group's social and environmental activities, given that its core businesses are in energy-intensive industries. It is highly likely that obligations to further reduce greenhouse gases within a post-Kyoto Protocol international framework will become more rigorous at the next climate change meeting in December 2009, and an even stricter greenhouse gases emissions cap will be imposed on energy-intensive industries. As a result, such business activities may be exposed to significant regulatory risk, and this in turn may adversely affect their financial position over the mid term.

From this perspective, my opinion is that JFE Steel has made a solid effort, taking into consideration its exposure to higher climate change risk. Consistent with the Group's Corporate Vision of "contributing to society with the world's most innovative technology," JFE Steel has leveraged its advanced technical capabilities to reduce CO_2 emissions at the production stage. The company has also introduced Coke Dry Quenching (CDQ) and Blast Furnace Top Pressure Recovery Turbine Generation waste heat/pressure recovery technologies, as well as other new energy-saving technologies such as shaft furnaces, regenerative burners, and Super-SINTER™. As a result, the company has managed to reduce its CO_2 emissions by 8.9% and unit emissions by a significant 19%, compared to the year ended March 31, 1991, despite a 13% increase in crude steel production.

JFE Steel uses its technical capabilities for the benefit of other countries as well. Through its participation in COURSE 50, a Japan Iron and Steel Federation project pertaining to CO_2 emissions reduction technology, the company has worked to develop physical adsorption and other innovative technologies, and actively promotes technology transfers to developing countries.

On the financial front, JFE Steel is strengthening its financial position to secure higher profitability in a low-carbon society by offering a broad range of high-value-added products. JFE Steel is clearly demonstrating its strategy of positioning itself to meet future demand in the market for low-carbon products.

Nevertheless, JFE Steel still needs to do more to reduce its energy consumption. The company reported a mere 7.7% reduction compared to the year ended March 31, 1991, falling short of the 10% reduction target indicated in the Japan Iron and Steel Federation's Voluntary Action Program. If the company can apply its outstanding technical strengths to further reduce energy consumption through innovation, then it will be rewarded with greater market competitiveness. Therefore, I expect JFE Steel to forge ahead with its advances in carbon management through technology development.

2. Information Disclosure

The Group has reduced by about 20–30% the volume of both its 2009 Business Report and 2009 Environmental Sustainability Report (Web information). Some changes, such as eliminating large photos, don't give the impression that the reports are skimping on content. However, the social information provided, which always has been somewhat sparse, fails to demonstrate any real improvements in disclosure, barely managing to maintain the level of the previous year.

If we are to realize a sustainable society, then along with focusing on environmental considerations we must also avoid neglecting social considerations. I hope to see the Group make renewed efforts to improve the quality of social information in order to more clearly demonstrate its consideration for socially vulnerable groups both inside and outside the organization.

3. Radical Change in Thinking about Fair Trade

As discussed in this Business Report, the JFE Group was again reported to have engaged in unfair trade practices last year. The Group's serious efforts towards compliance education over the past several years do not seem to have been sufficient to sweep away the negative legacy of the past. Although the Group was able to implement meaningful remedial action as soon as its price cartel for galvanized steel sheet was revealed, it must continue to thoroughly reinforce awareness-raising practices throughout the Group if it is to reduce the risk of future incidents and regain society's trust.

JFE Holdings, Inc.

1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6527
http://www.jfe-holdings.co.jp/

Contact
Corporate Planning Department
TEL: +81-3-3217-3133
FAX: +81-3-3214-6113
E-mail:kankyo@jfe-holdings.co.jp