



J F E

Environmental Sustainability Report

2005

Environmental Sustainability Report 2005

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Third-party Comments/Editorial Postscript

● Editorial Policy

“Environmental Sustainability Report 2005” describes the basic policies related to the environment, environmental protection activities in fiscal year 2004, and results of those activities in the business operations of JFE Holdings, Inc., which is the holding company of the JFE Group, and its operating companies. From this year, the Report also includes “Community Involvement” pages. This Report was edited/prepared in accordance with “Guidelines for Environmental Reports (FY2003 ed.)” issued by Japan’s Ministry of the Environment (MOE) and “Sustainability Reporting Guidelines 2002” issued by the Global Reporting Initiative (GRI).

● Scope of Report

Organizations Included

This Report centers on JFE Holdings, Inc. and JFE Steel Corporation, which is responsible for the JFE Group’s steel business, and includes JFE Engineering Corporation and Kawasaki Microelectronics, Inc., which have also production facilities, JFE Urban Development Corporation, which is responsible for the Group’s urban development business, and JFE R&D Corporation, which is responsible for general research and development in the JFE Group.

Organizations Included in Environmental Performance Data Totals

JFE Steel Corp.
 East Japan Works (Chiba District/Keihin District)
 West Japan Works (Kurashiki District/Fukuyama District)
 Chita Works
 JFE Engineering Corp.
 Tsurumi Engineering and Manufacturing Center, Shimizu Works, Tsu Works
 Kawasaki Microelectronics, Inc.
 Utsunomiya Works

* Data for FY2002 and before are totals of data for Kawasaki Steel Corp. and NKK Corp. before merger.

* Affiliated companies which are subject to consolidated accounting by these operating companies are not included in the scope of this Report except where specifically noted.

* Tsurumi Engineering and Manufacturing Center is referred to as Tsurumi Center for short in some cases.

Period of Environmental Sustainability Report 2005

In principle, fiscal year 2004 (April 1, 2004 to March 31, 2005).

* A part of activities in FY2005 is also included.

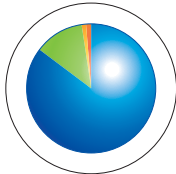
Scheduled Publication Date of Next Report

September 2006

What is the JFE Group?

JFE Holdings

JFE Holdings, Inc.



Date est. Sept. 27, 2002
 Head office 1-1-2 Marunouchi, Chiyoda-ku, Tokyo
 Consolidated net sales ¥2,803.6 billion (year ended March 2005)
 Consolidated ordinary income ¥460.6 billion (year ended March 2005)
 Employees 103 (as of end of March 2005)

The JFE Name

The JFE name is composed of the letter "J" for Japan, "F" for steel (as in Fe, the atomic symbol of iron) and "E" for engineering. The acronym can also be thought of as standing for "Japan Future Enterprise," i.e., a future-oriented Japanese business group centered around the core businesses of steel and engineering.

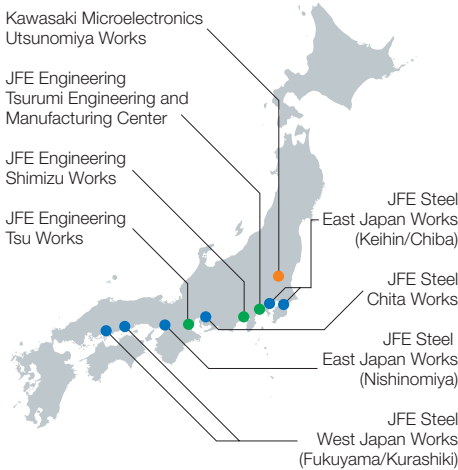
For the detail of JFE Name, refer to:

<http://www.jfe-holdings.co.jp/en/company/brand/index.html>

For the detail of consolidation, refer to:

<http://www.jfe-holdings.co.jp/en/company/tougou/index.html>

Main Works in Japan



JFE Steel Corporation

As an integrated steel producer ranking fourth in the world (2004) for crude steel production, the principal business of JFE Steel Corporation is the manufacture and sale of a diverse range of unprocessed and processed steel products and raw materials. It also engages in peripheral businesses including transportation, plant maintenance and engineering.

Paid-in capital	¥239.6 billion
Employees	13,846
Billions of yen	
Fiscal Year 2004	
Consolidated net sales	2,421.7
Consolidated operating income	456.3
Consolidated ordinary income	450.3



JFE Engineering Corporation

The company is responsible for the engineering business that is the JFE Group's core business together with steel. It provides solutions based on advanced technologies in the fields of energy, principally pipelines; environmental-related activities such as waste disposal; water and waste-water engineering; steel structures such as steel frames; industrial machinery and steelmaking technologies.

Paid-in capital	¥10.0 billion
Employees	2,190
Billions of yen	
Fiscal Year 2004	
Consolidated net sales	351.5
Consolidated operating income	5.3
Consolidated ordinary income	8.7



JFE Urban Development Corporation

This company helps create agreeable urban environments in the Tokyo area through three spheres of business: the development of large-scale complexes, involving the redevelopment of idle land owned by the JFE Group and the creation of new urban districts; the supply of distinctive, high-quality condominiums; and asset utilization, involving the development, management, and operation of land and buildings.

Paid-in capital	¥3.0 billion
Employees	49
Billions of yen	
Fiscal Year 2004	
Consolidated net sales	31.5
Consolidated operating income	2.4
Consolidated ordinary income	2.2



Kawasaki Microelectronics, Inc.

This company is an LSI vendor specializing in ASICs (application-specific integrated circuits) for customer, communication and office automation applications. It offers a comprehensive range of services to its customers from designing and development to manufacturing, testing, and shipping. It is particularly strong in circuits for digital cameras and LCD monitors, and holds substantial market shares worldwide.

Paid-in capital	¥5.0 billion
Employees	509
Billions of yen	
Fiscal Year 2004	
Consolidated net sales	36.0
Consolidated operating income	1.9
Consolidated ordinary income	1.8

JFE R&D Corporation

This is a concept-creation research institution that undertakes further development of core technologies common to the JFE Group's steel and engineering businesses, and opens up possibilities for new technologies by combining them organically with others.

Paid-in capital	¥10.0 million
Employees	88

Year ended March 2005

JFE Steel		
Works name		Main products
East Japan Works	Chiba District	Hot rolled/cold rolled steel sheets, stainless steel sheets, coated steel sheets, UOE pipe, iron powder
	Nishinomiya Works	Stainless steel products
	Keihin District	Plates, hot rolled/cold rolled steel sheets, coated steel sheets, electrical steel sheets, special steel products, welded steel pipes and tubes
Chita Works		Seamless/welded steel pipes and tubes, castings
West Japan Works	Kurashiki District	Plates, hot rolled/cold rolled steel sheets, coated steel sheets, electrical steel sheets, steel sheet piles, H-shapes, steel bars, wire rod material
	Fukuyama District	Plates, hot rolled/cold rolled steel sheets, coated steel sheets, steel sheet piles, H-shapes, rails, UOE pipes

JFE Engineering		
Works name		Main products
Tsurumi Engineering and Manufacturing Center		Shield tunneling machines, diesel engines, container cranes, boilers, turbines, waterworks pipes, etc.
Shimizu Works		Steel frame structures
Tsu Works		Various large-scale steel structures (long/large bridges, water gates, caissons, etc.)
Kawasaki Microelectronics		
Works name		Main products
Utsunomiya Works		ASICs

● A Message from the President of JFE Holdings

To our readers

The JFE Group has pursued environmentally sustainable business practices, based on coexisting with and enhancing the environment, within our corporate standards of business conduct and environmental policy. Nevertheless, since last December problems regarding wastewater pollution have occurred at JFE Steel's East Japan Works in Chiba Prefecture. The company is currently working hard on clean-up measures under the direction of the prefectural and local authorities. Let me take this opportunity to once again express my most sincere apologies for the many anxieties and concerns caused to local residents and all those affected.

The incident in Chiba highlighted some shortcomings in the environmental measures we have practiced to date. While it is imperative that we work out a comprehensive remediation program in Chiba, we fully realize that the issue is one confronting the entire JFE Group. We are now in the process of drastically revising our environmental management system across all the Group companies, and we are redoubling our efforts to implement preventive measures at administrative and operational levels.

I hope that the JFE Group will merit its customers' trust in the future through our determined efforts to conserve energy and to reduce the environmental influence of our business activities, and through our ongoing commitment to provide technology, products, and services that prevent global warming and otherwise contribute to the environment as we have in the past.

In the area of steel production, there has been a boom in steel demand in recent years, thanks to economic development in China and other regions. In this context, we believe that one of our most important corporate responsibilities is to provide our customers with reliable supplies of steel products that contribute to environmental sustainability through our use of manufacturing processes with the smallest environmental footprint in the world. For example, by supplying high tensile strength steel as a lightweight alternative for automobiles,

and products such as electrical sheets and silicon materials for power-saving components in motors and solar cells, we are contributing more than ever before to arresting global warming.

In the engineering and energy sectors, we are helping to reduce environmental loads and halt global warming through a range of new technologies. Among our achievements are technology for removing dioxins and other harmful substances, renewable energy technologies such as wind power and biomass power generation, energy saving technologies such as air-conditioning systems that utilize hydrate slurry, and the development of dimethyl ether (DME), an extremely promising clean fuel for the 21st century.

In the recycling area, we are moving forward with a number of interesting and synergistic recycling businesses that utilize technologies in both steel-making and engineering. These will support regional efforts towards sustainable recycling of resources.

This environmental sustainability report presents the environmental initiatives currently being pursued by the JFE Group companies. It also describes the background and remedial program relating to our environmental problems in Chiba, and discusses the relationships of the JFE Group with the wider community. I hope this report will help readers to better understand our environmental practices. We welcome frank opinions and advice concerning our environmental efforts in the future.



Fumio Sudo

Fumio Sudo
JFE Holdings President and CEO

Corporate Vision

The JFE Group — contributing to society with the world's most innovative technology.

Environmental Philosophy

The JFE Group considers the improvement of the global environment to be of utmost importance for management, and promotes business operations in harmony with the environment to create a prosperous society.

Environmental Policy

1. To reduce environmental influence in all business operations

JFE endeavors to reduce present and future environmental loads and promotes the development of innovative technologies for reducing environmental loads.

2. To make contributions through technologies and products

JFE contributes to the creation of a better environment through the development and supply of advanced technology, equipment, and ecological products.

3. To make contributions through conservation of resources and energy

JFE contributes to the creation of a resource and energy saving society through recycling and energy supply businesses which give priority to preservation of the global environment.

4. To promote communications with society

As a member of regional society, JFE contributes to a better environment at the regional level in cooperation with local citizens, government and administrative authorities, and other businesses.

5. To promote international cooperation

JFE contributes to environmental protection activities at the global level through active involvement in international cooperation in the form of technology transfer, etc.

Messages from the Group Operating Company Presidents

JFE Steel Corporation



President & CEO
Hajime Bada

As a company engaged in the steel business, a core segment for the JFE Group, we strive to reduce the environmental impacts of our business activities by utilizing the world's most advanced manufacturing technologies. At the same time, we are working hard to contribute to the broader community by developing and supplying environment-friendly products and technologies that meet social needs.

However, I am seriously concerned that our efforts to

protect the environment have been revealed as less than adequate by the water pollution incidents at our East Japan Works (Chiba) since last December. I offer my sincere apologies to the local residents and all those affected for the upset and trouble we have caused. I promise to do my utmost to establish a corporate basis that will ensure we fulfill our social responsibilities in environmental protection.

JFE Engineering Corporation



President & CEO
Osamu Saito

Since gaining ISO 14001 certification in 1999, JFE Engineering has carried out proper environmental management and undertaken activities aimed at reducing environmental impacts in shop manufacturing and site construction. Our business operations are primarily related to social infrastructures, and we regard the environment and energy sectors as key business areas within that endeavor. We have a proven track record in supplying a wide range of environment-friendly products and technologies. In addition to our mainstay new-energy and en-

ergy saving products and technologies aimed at reducing environmental impacts and halting global warming, we are also addressing social needs across a wide range of operations, right through to our recycling business which is helping to transform Japan into a recycling-oriented society. As a company charged with the JFE Group's engineering segment, we will make every effort to minimize environmental impacts within our business activities, and we will continue to develop products and technologies that are friendly to the environment.

JFE Urban Development Corporation



President
Noriaki Shigemi

Through our urban development projects, we aim to fulfill our goal of building pleasant and creative urban environments for people to live, work, and socialize.

The redevelopment of unused factory sites and existing commercial areas into large urban complexes is nothing other than town planning supportive of a whole range of social requirements. The scale of such operations has a major impact on the local environment. For this reason, environment-friendly practices

are crucial and the question of how to reduce environmental impacts at the development stage is a vital issue.

Recognizing these obligations, we will build on the corporate strengths we bring from our manufacturing background and fulfill our social responsibilities in regard to the environment.

Kawasaki Microelectronics, Inc.



President & CEO
Yukio Yamauchi

Our corporate goals are to provide optimum solutions to our customers based on our outstanding strengths in design and manufacturing technologies, and to become an ASIC-LSI vendor fulfilling its social responsibilities. Environmental activities are an important part of our social responsibilities and cover two main areas.

The first area is reducing the environmental effects of our manufacturing processes, by means such as lower electricity usage and less use of chemicals designated

in Japan's PRTR Law. The second area is establishing manufacturing systems for products free of hazardous substances such as lead and halides.

Kawasaki Microelectronics is promoting these two activities in a planned and systematic fashion.

JFE R&D Corporation



President
Toyofumi Kitada

As a research institute, we are tasked with creating new concepts and developing the common basic technologies involved in the JFE Group's core businesses of steel and engineering.

New energy and environmentally sustainable technologies are a major focus of our research and development efforts. The development of energy saving technologies to reduce carbon dioxide emissions is one example.

In recent years, the concept of business continuity management (BCM) to counteract environmental awareness, security, safety or disaster prevention have gained renewed recognition. We regard these challenges as an important direction for future R&D and we will work proactively to develop technologies in these areas.

•History of Environmental Measures in JFE Group

1995	2000	2005
Environmental Protection & Energy Saving Activities at Works		
General Measures		
'96 Establishment of Environmental Charter		'02 Start of JFE Group
'96 Establishment of Voluntary Action Plan by Japan Iron and Steel Federation		'03 Start of 5 operating companies
'97 Establishment of Voluntary Action Plan by Keidanren		'05 Overhaul of the environmental management system
'98 ISO14001 certification of Fukuyama Works		
'96 Settlement of Kawasaki pollution suit	'98 ISO14001 certification of Chiba Works	
'96 Settlement of Kurashiki pollution suit	'99 ISO14001 certification of Engineering Division	
	'99 ISO14001 certification of Chita Works	'03 Start of Environmental Management Network System
'97 ISO14001 certification of Keihin Works		
'97 ISO14001 certification of Mizushima (Kurashiki) Works and Utsunomiya Works (LSI plant)		
Energy Saving Activities		
'95-'02		'03-
4th Period		5th Period
Energy saving for global warming prevention		Thorough effort for global warming prevention Please refer to P.24 for the detail of energy saving activities
Supply of Environment-friendly Products, Engineering Technology, Equipment		
Supply of Environment-friendly Steel Products, Equipment		
'95 Non-oriented electrical sheets for high efficiency motors	'99 "Tsubasa" screw pile	'00 Development of Super-OLAC technology for shape steel
'96 Steel-framed House		'01 Tailor Welded Blank
'96 Start of waste plastic recycling for BF feed		'01 As-sintered alloy steel powder (heat treatment-free)
	Development of Super-OLAC technology for plates (high strength, high toughness, high weldability)	'01 High-purity silicon for solar cells
	'98 Ni-added high performance weathering steel	'01 Lead-free free-cutting bars for machine structural use
	'98 Water-permeable steel sheet piles	'02 Start of production of NF Board for concrete forms using recycled resin
	'98 BF cement/BF granulated slag	'02 Development of Super-OLAC technology for high carbon hot-rolled sheets
	'98 Chromate-free coated steel sheets	
		'03 Laminated steel sheet for food cans
		'03 JFE EWEL
		'04 Chromate-free steel sheet JC/JP
		'04 New alloy steel powder for automotive parts
		'04 Hat-shaped steel sheet pile 900
Supply of Clean, Energy Saving Technologies		
	'97 Startup of circulating fluidized bed (CFB) boiler turbine power plant	'01 Tie-up for high efficiency fuel cell power generation (SOFC)
	'98 Startup of wind power generation facilities	'03 Startup of pilot-scale plant for high efficiency fuel cell power generation (SOFC)
		'03 Startup of BIGADAN process biogas system
		'03 Order for JFE-Babcock & Wilcox Volund fixed-bed updraft gasifier for wood chips
		'03 Startup of RDF gasifying power generation plant
		'04 Startup of clathrate hydrate slurry (CHS) latent heat air-conditioning system
Supply of Environmental Protection Equipment		
	'97 Startup of electric resistance type ash melting furnace	'00 Startup of JFE THERMOSELECT gasifying & melting furnace
		'02 Startup of sewerage sludge circulating fluidized bed incinerator
		'04 Order for Hyper 21 Stoker System
		'00 Startup of U-tube ozone contact equipment
		'04 Order for flue gas dioxin removal equipment (Gas-Clean DX)
	'01 Startup of home electric appliance recycling plant	'04 Sales startup of cleaning robot for boiler water tube (Boiler-Clean DX)
	'01 Startup of environment-friendly high-efficiency arc furnace (ECOARC)	'04 Sales startup of photocatalyst air purification system
	'01 Completion of seawater exchange-type hybrid caisson	
		'02 Startup of high temperature gasifying & direct melting furnace
		'02 Startup of fly ash dioxin removal equipment High Clean DX

Environmental Problems in Chiba

Report on Pollution at JFE Steel's East Japan Works (Chiba)

The water quality problems that arose at JFE Steel's East Japan Works (Chiba) caused grave concern among local residents, the responsible authorities, and all those otherwise involved. We sincerely apologize for these incidents. To ensure that such contamination never happens again, we reaffirm environmental protection as being of the utmost importance in corporate governance. This has been a timely reminder of the seriousness of our responsibilities as a corporate citizen. We are going back to fundamentals and working to implement measures across the whole company to prevent any recurrence. This report outlines how the problems came about and discusses the remediation measures we have put in place.

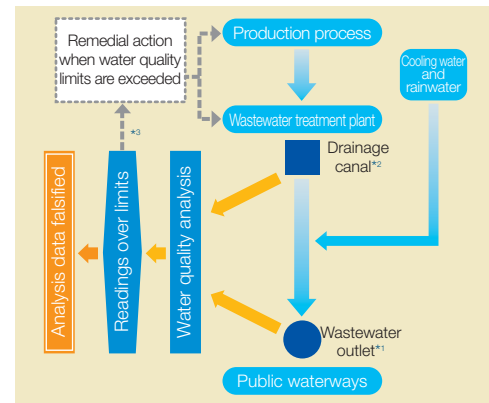
Overview

Under the wastewater management system at the East Japan Works, water quality is analyzed at the outlets to public waterways and at the drainage canals exiting the wastewater treatment plant. If any readings exceed the criteria, the cause must be investigated and appropriate action taken (box in dotted lines in the figure). On the occasions in question, however, readings exceeding the standards prescribed in the Water Pollution Control Law and in the pollution control agreement with local authorities were altered to within the allowable limits in reports submitted to Chiba municipal and prefectural authorities. (1,109 results were falsified out of a total of 89,642 results from 2001 onward.) Moreover, no one, from supervisors to executive level, was aware of these false reports. As a consequence, water quality control deteriorated, response to the quality problems was too late or overlooked, and wastewater containing contaminants in excess of the limits was discharged into public waterways.

This report presents the causes and remedies relating to the following two areas:

- I. Falsification of corporate measurement data
- II. Violation of Water Pollution Control Law or pollution control agreement

Water quality management framework and exposed problem areas



- *1) **Wastewater outlet:**
Discharge point to public waters from a factory subject to the Water Pollution Control Law.
- *2) **Drainage canal:**
Discharge point to public waters from a wastewater treatment plant subject to a pollution control agreement with local authorities.
- *3) Inadequate in this instance.

Background

[2004]	Dec. 16	The Chiba Coast Guard Office began investigations on suspicion that JFE Steel had discharged water with alkalinity levels in excess of the standards set in the Water Pollution Control Law.
As a result of the official investigation, JFE Steel voluntarily carried out a thorough internal investigation, which revealed that water quality data had been altered and wastewater exceeding the contaminant limits had been discharged from outlets since FY2001. Once appraised of the situation, the company immediately advised the Chiba municipal and prefectural authorities, and a full investigation was carried out under official supervision.		
[2005]	Feb. 3	Press conference held voluntarily to inform the public.
	Feb. 17	On the same day, Chiba authorities issued a cleanup directive based on the pollution control agreement.
	Mar. 9	JFE Steel filed a report in response to the directive.
	Mar. 16	JFE Steel filed a further report in response to the directive.
	Mar. 24	Chiba City issued suspension notices and improvement orders for some facilities based on the Water Pollution Control Law.
	Mar. 24	JFE Steel concluded a new agreement and declaration with Chiba municipal and prefectural authorities and recommenced operations.

For subsequent proceedings, see "Chiba Initiatives" and "Head Office and Company-Wide Initiatives" below.

Chiba Initiatives

I. Falsification of corporate measurement data

The falsification of measurements taken by JFE Steel was due to inadequate controls in the management of operational data relating to water quality operations, as outlined below. We are amending these irregularities and have begun a radical overhaul of our entire environmental management system to prevent any recurrence.

Problems	Actions taken in Chiba
① Poor leadership and inadequate staffing in Environmental Control Department	① Role of Environmental Control Department strengthened
② Inadequate checking and reporting of environmental data	② Better pollutant monitoring; timely response and remedial action ③ System upgrades to enable faster and more precise detection of abnormalities
③ Deficient awareness of environmental issues and need for compliance	④ Greater environmental awareness and reinforced compliance

1 Role of Environmental Control Department (ECD) strengthened

• ECD restructured as a separate department (Jan. 28, 2005)

The ECD was restructured as a separate department in recognition of environmental protection as the most important issue in corporate governance.

• ECD given greater authority (Feb. 16, 2005)

The ECD was given powers to order suspension of operations, and it was made clear that the environment is to take priority over all other concerns. The roles, responsibilities, and powers relating to environmental management in the ECD and in the various plants and facilities were clarified.

• Increased staffing levels (Mar. 24, 2005)

The number of ECD personnel and the number of employees patrolling the facilities on a 24-hour basis were increased from 12 to 22.

2 Better pollutant monitoring; timely response and remedial action

• Quicker analysis and reporting system set up (Jan. 22, 2005)

As well as shortening the time taken for analysis, we have ensured that any abnormalities are reported to the water quality manager as soon as discovered. A system has been established for reporting abnormalities immediately to the relevant authorities in Chiba, enabling decision making and response to situations as they arise.

• Checking and sharing of environmental data (Feb. 3, 2005)

Mechanisms have been established so that the environmental data collected by the ECD is double-checked by the supervisor, checked by the head of the Environmental & Plant Safety Section, then distributed promptly within the company. A system has been set up to enable prompt and appropriate remedial action in the event of an abnormality. The head of steelworks, deputy, and department managers are encouraged to verify data and share information at their daily meetings.

3 System upgrades to enable faster and more precise detection of abnormalities

• Online pollutant monitoring

An automatic analyzer will be deployed to enable abnormality monitoring using online measurements at wastewater outlets, drainage canals, and upstream production processes.

• More reliable analysis (April 1, 2005)

To improve the reliability of measurement data, personnel who take readings now need to be certified by "Specified Measurement Laboratory Accreditation Program".

4 Greater environmental awareness and reinforced compliance

• Crisis-response seminar (Feb. 7, 2005)

A seminar was held for the managers of all manufacturing departments and on-site subsidiaries in the Chiba district, to reinforce environmental awareness and compliance based on the recent incidents.

• Seminars on pollution control agreement (April 14 and 21, 2005)

Retraining about the provisions of the pollution control agreement was conducted for managerial staff in the Chiba district at departmental, plant, office, and administrative levels.

• Staff encouraged to attain Environmental Pollution Control Operator (national qualification)

Staffs are encouraged to become certified Environmental Pollution Control Operators so that the operational departments involved in production are environmentally aware and carry out environmental management voluntarily. Our target is a minimum of one qualified person responsible for each production process in the Chiba district.

5 Disclosure to local residents

Details about the background, remediation, and water quality data relating to the pollution problem have been posted on our website.

II. Violation of Water Pollution Control Law or pollution control agreement

Contaminants in excess of the limits laid down in the Water Pollution Control Law or pollution control agreement, and excessive wastewater discharge levels at some outlets, were identified in the Chiba district. We are thoroughly investigating and remedying these problems to ensure they can never happen again. This section reports the causes and countermeasures in regard to three distinct problems: leakage of highly alkaline water from the West Plant breakwater and vicinity; excessive cyanogen levels at West No. 6 Line outlet; and abnormal discharge volumes at some wastewater outlets.

• List of excessive contaminants in wastewater at drainage canals and outlets (April 2001 to December 2004)



Outflow of alkaline water from the West Plant breakwater and vicinity

Parameters exceeding permissible levels at wastewater outlets

- 1 Outlet from West No. 6 Line: Cyanogen, pH, chromium (VI), COD^{*1}, SS^{*2}
- 2 Outlet from West No. 7 Line: Cyanogen, COD
- 3 Outlet from New central No. 1 Line: Cyanogen, nitrogen, fluorine
- 4 Outlet from North coast Line (north): n-hexane extracts^{*3}
- 5 Outlet from South coast Line (south): n-hexane extracts
- 6 Outlet from West No. 5 Line: n-hexane extracts
- 7 Outlet from West No. 4 Line: n-hexane extracts, pH
- 8 Outlet from South No. 1 Line: n-hexane extracts, SS
- 9 North wastewater No. 1 outlet: Nitrogen, fluorine
- 10 South wastewater West No. 1 outlet: n-hexane extracts
- 11 East wastewater Central No. 1 outlet: n-hexane extracts

Parameters exceeding permissible levels at drainage canals

- 1 West integrated wastewater treatment drain: n-hexane extracts, COD, SS, nitrogen
- 2 West integrated effluent treatment drain: n-hexane extracts, COD, SS
- 3 Activated sludge treatment drain: Cyanogen, n-hexane extracts, COD, SS, nitrogen, phosphates, soluble iron
- 4 East integrated iron & steel wastewater treatment drain: n-hexane extracts, COD, SS, nitrogen
- 5 No. 5 pump station wastewater treatment drain: COD
- 6 Oihama wastewater treatment drain: COD, nitrogen, soluble iron

*1) COD: Chemical Oxygen Demand:

The amount of oxygen consumed when organic matter in water is broken down by an oxidizing agent. Used as an indicator of the amount of organic waste in outflows to inland and coastal waters.

*2) SS: Suspended Solids:

The amount of insoluble particulate matter in wastewater. Used as an indicator of water turbidity.

*3) n-hexane extracts:

An indicator of the amount of oil and grease in water.

Environmental Problems in Chiba

Leakage of excessively alkaline water from the West Plant seawalls and vicinity

Causes:

It is presumed that the slag*¹ placed in the vicinity of the northwest seawall of the West Plant and the calcium content of the topsoil laid in the public land dissolved in rainwater, turning into excessively alkaline water which leaked into the sea from the drip holes in the breakwater and the lower parts of the seawall.

Measures to prevent recurrence:

Measures at the West Plant

① Topsoil treatment (Mar. 31, 2005)

The topsoil laid in the public land was excavated and replaced with pit sand.

② Prevention of rainwater outflow to public land (May 27, 2005)

A weir was built on steel sheet piles erected along the boundary with the public land to prevent rainwater from seeping from the plant premises into the public land.

③ Prevention of rainwater outflow from the seawall (Mar. 19, 2005)

The north seawall was raised one meter to prevent surface rainwater from seeping from the seawall.



Level of the north seawall raised

Measures to prevent water leakage from Chiba premises

① Water stoppage at the rear of the seawall

We are considering installing a cut-off wall at the rear of the seawall, increasing the seawall height, and building an embankment in addition to the west plant.

② Rainwater at open yards

To prevent overflow of rainwater onto roads, we are considering dividing open yards from neighboring roads by dams and ditches.

Excessive cyanogen levels at West No. 6 Line outlet ① (cyanogen compounds)

Causes:

The causes of the cyanogen seepage from the dust smelting furnace were identified as follows:

- (1) The cyanogen contained in the circulating water in the wet-type dust removal plant is dispersed as mist from the cooling tower.
- (2) Seepage of dewatering sludge and wastewater leaks occurs during the process of removing the sludge in the thickener*². Some of this material adheres to the tires of the sludge trucks and spreads onto the roads.
- (3) Circulating water containing cyanogen seeped through the fine cracks in the concrete walls of the sedimentation tank.
- (4) Some of the cyanogen-contaminated sludge and wastewater collected while cleaning the equipment (wet-type dust collector, sedimentation tank, hot water tank, cold water tank, etc.) spilled outside during the process of transfer and transportation.

Measures to prevent recurrence:

The following emergency measures were implemented on discovery of the excessive cyanogen levels:

① Cleaning of area around the dust smelting furnace

- Dust smelting furnace shut down (Jan. 22).
- Accumulated dust and soil in the vicinity completely removed (Jan. 25-28).

② Improved rainwater treatment near the dust smelting furnace

- Surrounding area paved with concrete.
- Breakwater height raised from 30 cm to 50 cm (completed Mar. 2).

Remedial measures were discussed and agreed to at the Special Committee on Cyanogen Countermeasures, part of the Chiba City Environmental Council. Prior consultations have been completed, and we are proceeding with improvement work so that the dust smelting furnace can recommence operation.

① Prevention of mist dispersal from the cooling tower

Instead of a cooling tower, the circulating water will be cooled by an indirect cooling method, completely preventing mist dispersal.

② Measures to prevent spillage during discharge of the dehydrated sludge

A sludge basin (steel) and granulator will be installed. The dehydrated sludge travels directly into the granulator, preventing spillage of any sludge and wastewater outside the dehydrator. Spillage during transportation will be prevented by granulation.

③ Measures to prevent water leakage from the sedimentation tank

The cracks in the sedimentation tank, hot water tank, and cold water tank are being repaired and linings installed for better seepage control. The bottom of the sedimentation tank is being made convex to improve outflow of the accumulated sludge and to facilitate inspection.

④ Measures to prevent spillage during cleaning

Additional sedimentation tanks are being installed to reduce the amount of accumulated sludge. Some of the circulating water will be removed to prevent concentration of salts. Sensors are being installed to improve water quality monitoring.

The removed water and rainwater around the facility will be stored temporarily in a new embankment being built. The water will then be fully recovered and discharged following cyanogen removal at a new cyanide water treatment facility.

Discrepancies between reported and actual volumes of wastewater at some outlets

Causes:

There were discrepancies between reported and actual volumes of wastewater discharged at some outlets. Among probable causes are water seeping out of aging underground clean water pipes and industrial water pipes, and inflow of water overflowing from purification facilities.

Measures to prevent recurrence:

The inflowing water in the vicinity was investigated, leaking underground pipes were repaired, and overflowing purification water was recovered. We intend to implement further measures, including early detection and repair of leaking pipes, and planned replacement of aging underground pipes.

● Inadequate prior consultation as required under the pollution control agreement

In dismantling the existing cooling tower in preparation for installing measures to prevent mist dispersal from the dust smelting furnace, we failed to carry out prior consultation procedures with local authorities as required under our pollution control agreement with local authorities. Also, during the emergency transfer of cyanide water, we caused problems such as leakage above ground

from part of the storage area. The problems arose because the departments concerned divided up tasks to speed up the remedial work. Since then, we have insisted that staff understand and follow the provisions in the agreement, and we are making steady improvements in compliance with the agreement and in close liaison with Chiba municipal and prefectural authorities.

Head Office and Company-wide Initiatives

To prevent problems in the future, in addition to measures in Chiba, we have taken the following company-wide initiatives to raise environmental awareness and improve the environmental management system across the whole JFE Group.

① Environmental Control Department established (April 1, 2005)

This department was established at head office to propose, plan, and promote policies related to the environment, and to coordinate and supervise efforts across the whole Group.

② Environmental auditing by head office Auditing Department

The Auditing Department is staffed by environmental specialists and performs environmental auditing across the whole Group in regard to:

- 1) Environmental management systems
- 2) Environmental performance
- 3) Administrative reporting
- 4) Waste management

●Audits completed (as of Aug. 31)

Each area at JFE Steel : Total 6 times
14 JFE Group companies: Total 23 times



Head Office Auditing Department in action

③ CSR Section established (April 1, 2005)

A CSR Section was established at head office to fully address and promote corporate social responsibility. In July, a CSR committee was set up, headed by the company president.

④ Environmental Management Advisory Council established

This council was established directly under the president to solicit opinions from professionals outside the company regarding JFE Steel's handling of environmental issues. The first meeting was held on May 24, and members carried out an inspection of the Chiba site on August 31.

Chairman : President of JFE Steel
Vice chairman: Tomonori Matsuo, President of Toyo University
Members : Prof. Yutaka Terashima (Faculty of Human Environment, Osaka Sangyo University), JFE Steel vice president and directors (2), heads of steelworks and production centers (3)



Site inspection by external members (water treatment plant)

⑤ Regular internal environmental diagnostics

A system of internal environmental diagnostics was introduced, whereby environmental management at each steelwork and production process is checked by personnel from another production area.

⑥ Encouragement of Environmental Pollution Control Operator qualification

To raise environmental awareness, the entire 1,800 member engineering staff at JFE Steel will be required to pass the national qualification exams for Environmental Pollution Control Operator during the three years from 2005.

⑦ Environmental auditing by qualified auditors

Four auditors, including external auditors, look at how environmental management duties are being performed across the whole Group. They interview the directors concerned and conduct site inspections in conjunction with the environmental audits carried out by the Auditing Department.

Ongoing Initiatives

JFE Steel is taking steps in Chiba, at head office, and across the whole company to tackle the recent problems. Everyone is committed to making our environmental management system more effective. The entire JFE Group will continue to strengthen our environmental performance.

Contact for further information

Public Relations Sec., General Administration Dept., JFE Steel
Tel. +81-3-3597-3166

Information about the pollution incidents in the Chiba district:

<http://www.jfe-steel.co.jp/works/east/chiba/environment2.html>
(Japanese only)

*1) Slag:
Byproduct of steel production.

*2) Thickener:
Treatment facility that removes the liquid in wastewater.

Environmental Management

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Environmental Management

Objectives and Results for Global Environmental Activities

Objectives for 2004	Results in FY2004	Objectives for 2005
JFE Steel		
Promote global warming mitigation: · Measures based on Japan Iron and Steel Federation's Voluntary Action Plan.	· Unit energy consumption reduced by 0.4% from FY2003 level. · Unit CO ₂ emissions reduced by 1.1% from FY2003 level. (p.23)	Promote measures to mitigate global warming · Based on Japan Iron and Steel Federation's Voluntary Action Plan.
Promote byproduct recycling: · Promote resource recovery from dust. · Greater use of slag.	· Achieved 99.5% recycling rate by promoting dust recycling outside company. · Developed and commercialized a water-retaining paving material called "Road Cool" for mitigating the heat-island effect. (p.25)	Promote by-product recycling · Look at developing and applying technologies for recycling dust and slag.
Reduce environmental impacts: · Reduce emissions of harmful substances.	· Dioxin emissions reduced by 27% from FY2003 level to 8.8 g-TEQ/yr. (p.27) · Wastewater containing toxins in excess of standards in environmental law and agreements discovered at East Japan Works (Chiba). (p.7-10)	Overhaul the environmental management system: · Take steps to strengthen the EMS and prevent recurrence of the wastewater problems in Chiba. · Revise the company-wide EMS. Work toward a new regulatory system: · Draw up policies to reduce emissions of volatile organic compounds.
JFE Engineering		
Energy saving in production divisions: Tsurumi Center: Less than 0.93 Shimizu Works: Less than 0.89 Tsu Works : Less than 0.93 [Unit = ratio of unit energy consumption (electricity usage per unit production volume (kWh/ton)) to FY1997 levels]	Generally achieved energy saving targets. Tsurumi Center and Tsu Works: Target achieved. Shimizu Works: 0.93, target unachieved through a 20% reduction in operating ratio. (p.28)	Promote energy saving: Tsurumi Center: 1% reduction in unit energy consumption (electricity usage per unit operating time (kWh/hr)) from FY2004 level Shimizu Works: Less than 0.85 Tsu Works: Less than 0.85 [Unit = ratio of unit energy consumption (electricity usage per unit production volume (kWh/ton)) to FY1997 levels]
Reduce landfill disposal rate of construction site waste to 40% or less. (Landfill disposal rate = total waste volume less the recycled and reduced volume, as a percentage of the total volume)	24%, target achieved (total waste volume 7,870 tons) (p.28)	Promote reduction of construction site waste going to landfill and reduce landfill disposal rate to 35% or less in the 3 years up to FY2007.
Promote resource saving and environment-friendly office activities; extend green procurement of office products.	Switched to eco-labeled products for high-cost items (such as copier paper and toner cartridges).	Promote resource saving and environment-friendly office activities; raise green procurement ratio by 2% (cost basis) from FY2004.
Kawasaki Microelectronics		
Reduce energy consumption at production divisions by at least 1%.	Achieved 1.2% energy savings by adopting reverse osmosis membranes with a low pressure-loss design and inverter-type pumps in pure water manufacturing, and by improving the processing capacity of product inspection devices. (p.29)	Promote energy saving and achieve an energy savings ratio of at least 0.8%. (Energy savings rate = percentage energy saving for the year (kWh/yr) relative to total power consumption for the previous year (kWh/yr))
Reduce the use and discharge of fluoric acid and sulfuric acid.	Improved the cleaning process and reduced usage of fluoric acid and sulfuric acid by 4.5% and 0.87% respectively. (p.29)	Reduce emissions of PRTR substances and greenhouses gases.
Reduce waste by enhancing production technologies and extending equipment life span.	Expanded the scope of application of technology developed last year for reducing resist usage, and reduced waste oil by 0.35%.	Reduce waste generation by 3%.

Environmental Management

Operation of Environmental Management

“JFE Group Environmental Management” using 3-Tiered Committee System

The JFE Group has employed all its corporate strengths to protect the environment in our business activities, based on our environmental philosophy of “The JFE Group considers the improvement of the global environment to be of utmost importance for management, and promotes business operation in harmony with the environment to create a prosperous society”. By supplying a huge variety of products, technologies, and services that utilize the various environment and energy-related proprietary technologies we have developed over many years, we are taking positive steps toward solving challenges such as global warming, resource recycling, and energy issues.

JFE is dealing with environment-related problems with a 3-tiered committee system consisting of 1) JFE Environmental Committee chaired by the President of JFE Holdings, as the highest decision-making body for environment-related problems common to the Group, 2) Environmental Committees in each of the Group’s five operating companies, and 3) Affiliated Company Environmental Committees at affiliates under each of the operating companies. JFE has also established a Group Environmental Liaison Committee made up of persons responsible for environmental matters at JFE Holdings and the five operating companies to smoothly communicate related to the environment. In a similar manner, each of the operating com-

panies decides and implements environmental measures for the individual company and holds liaison meetings with its subsidiaries.

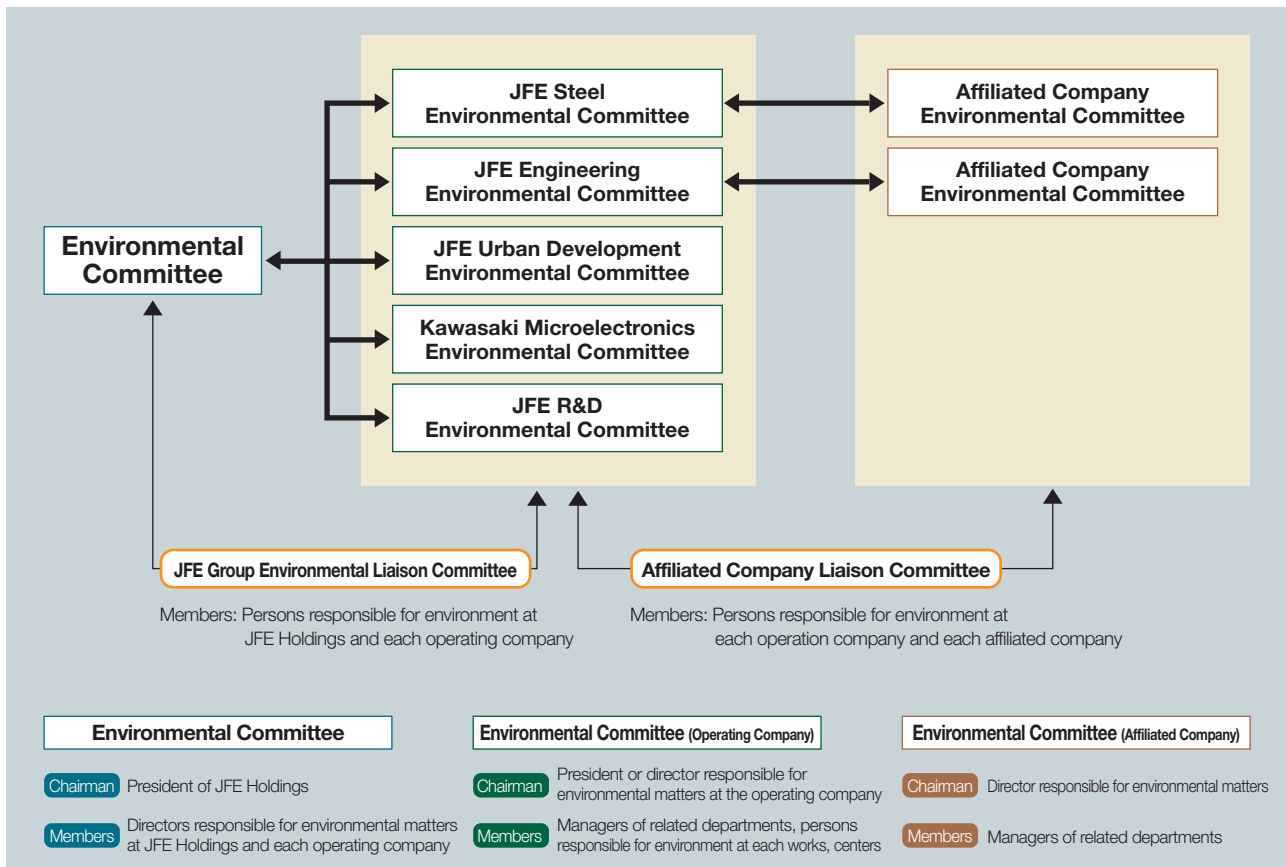
Environmental problems concerning wastewater (water quality) since last December have been identified at JFE Steel’s East Japan Works (Chiba). In response, the environmental management system is being completely overhauled across the entire JFE Group. We will make every effort to avoid any recurrence of such problems by implementing preventive measures at the managerial and operational levels, and in the production facilities themselves.

For details on the environmental problems in Chiba, see pages 7 to 10.



JFE Environmental Committee

•Environmental Management System



Environmental Management

Overhaul of Environmental Management

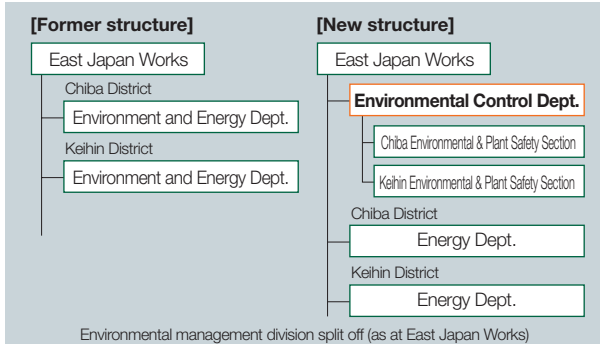
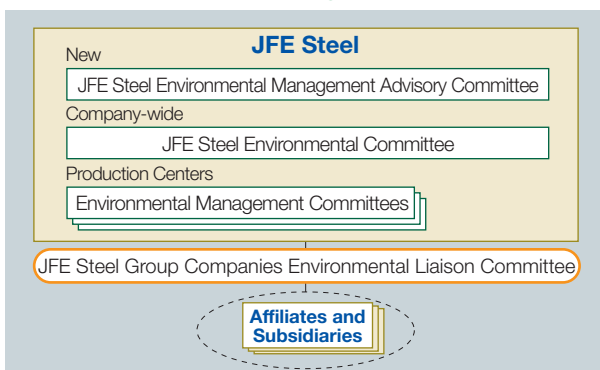
JFE Steel's Environmental Management

In view of the environmental problems at the East Japan Works (Chiba), JFE Steel initiated reforms of the environmental management framework at its production centers and at head office. At the production centers, the Environmental Control Departments, previously part of the Energy Department, were split off as separate departments in their own right, with defined and enhanced authorities relating to environmental management. At head office, a new Environmental Control Department was established in April 2005 to improve and maintain environmental governance across the whole company.

Environmental committees have been set up at each level of the corporate organization (company-wide, production centers, and affiliates and subsidiaries), as shown in the figure below. These form a framework for promoting environmental management across JFE Steel, with environmental management departments at the head office and production centers running the committees in a functional capacity. The Environmental Committee is chaired by the president of JFE Steel. Its function is to deliberate and communicate substantive matters such as environmental management-related policies affecting the whole company. The Environmental Management Committees are responsible for implementing environmental management geared to the particular production center.

The role of the JFE Steel Group Environmental Liaison Committee set up between JFE Steel and its subsidiaries is to support environmental management at the subsidiaries by conveying relevant information. In addition, in May 2005 an Environmental Management Advisory Council was established directly under the president to seek views from specialists outside the company regarding JFE Steel's handling of environmental issues, thus extending the management framework beyond internal mechanisms alone.

•JFE Steel Environmental Management System



JFE Engineering's Environmental Management

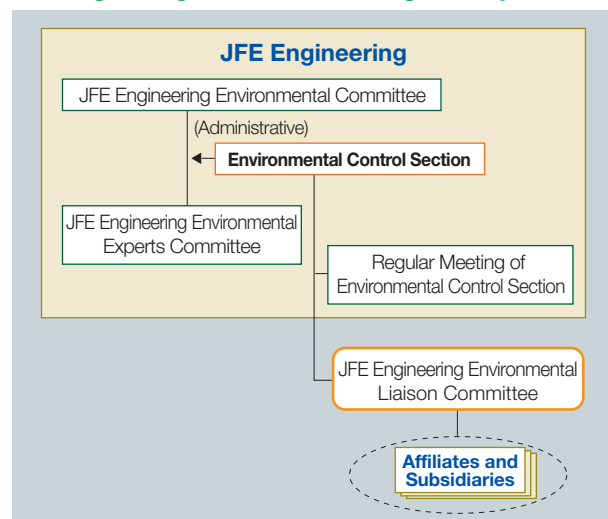
Environmental management at JFE Engineering was formerly conducted by two committees overseen by the JFE Engineering Environmental Committee, which is chaired by the president of JFE Engineering. The JFE Engineering Environmental Experts Committee supplemented the environmental committees at the practical level, maintained the company-wide environmental management system, and considered matters needing improvement. The role of the JFE Engineering Group Environmental Liaison Committee, on the other hand, was to encourage environment management activities at the engineering group companies and to consolidate their efforts.

In July 2005, with the aim of further strengthening the environmental management system and building and running an effective environmental risk management system, a new Environmental Control Section was established to act as the administrative authority in regard to environmental matters for the JFE Engineering Group as a whole. In addition, a Regular Meeting of Environmental Control Section was established as a new committee whose role is to prepare, implement, and supervise improvement policies, and to bring together the efforts of the staff in each area. Thus, the framework now consists of three committees under the JFE Engineering Environmental Committee.

Enhanced Environmental Auditing

Following the environmental problems at the East Japan Works (Chiba), JFE Steel appointed an environmental specialist to the Auditing Department at head office. Internal auditing of environmental performance and compliance with environment-related laws and regulations is now carried out at each production center and Group company within JFE Steel. Internal environmental auditing of operating companies by their head office is now being extended to JFE Engineering and other operating companies.

•JFE Engineering Environmental Management System



Environmental Management

Environmental Management System

Status of the JFE Environmental Management System

The JFE Group aims at developing a comprehensive environmental management system based on its environmental philosophy. As such, it is promoting voluntary and continuous environmental activities by each company in the JFE Group based on ISO 14001 certification. As shown in the table below, three operating companies with production facilities have all received ISO14001 certification, either for individual works or at the company level. These include JFE Steel, JFE Engineering, and Kawasaki Microelectronics.

Accreditation was temporarily suspended on Feb. 4, 2005 at JFE Steel's East Japan Works (Chiba), and recommenced on Aug. 4, 2005 following a review of the environmental management system.

•Environmental Management System Certification Certified in Operating Companies

	Company/Works	Certified in
1	JFE Steel, East Japan Works (Keihin)	May 1997
2	JFE Steel, West Japan Works (Kurashiki)	Oct. 1997
3	Kawasaki Microelectronics	Oct. 1997
4	JFE Steel, West Japan Works (Fukuyama)	March 1998
5	JFE Steel, East Japan Works (Chiba including Nishinomiya plant)	July 1998*
6	JFE Steel, Chita Works	July 1999
7	JFE Engineering	Dec. 1999

*Accreditation suspended from Feb. 4 to Aug. 4, 2005

•Environmental Management System Certification Certified in Affiliated Companies

	Company	Certified in
1	JFE GALVANIZING & COATING	May 1997
2	JFE URBAN RECYCLE	May 1997
3	NKK TUBES	May 1997
4	JFE REFRACTORIES	April 1999
5	JFE CHEMICAL	July 1999
6	JFE KANKYO	Dec. 1999
7	JFE MATERIAL	Jan. 2000
8	JFE Soldec	Feb. 2000
9	JFE CONTAINER	March 2000
10	JFE LOGISTICS	March 2000
11	TOYOHIRA STEEL	Sep. 2000
12	JFE METAL PRODUCTS & ENGINEERING	Dec. 2000
13	JFE SHOJI HOLDINGS	Dec. 2000
14	JFE Mie Tech. Service	Feb. 2001
15	JFE KOKEN	June 2001
16	Fuji Kako	Sep. 2001
17	Philippine Sinter Corporation	Nov. 2001
18	JFE MINERAL	Dec. 2001
19	JFE Environmental Services	Dec. 2001
20	NKK BARS & SHAPES	May 2002
21	JFE KOHNAN STEEL CENTER	March 2004
22	JFE Plant & Service	March 2005

Environmental Auditing

In order to implement a high-quality environmental management system, it is important to understand whether the system is operating appropriately, and whether performance is being continually improved. At JFE, in addition to external inspection by certification authorities, employees experienced in environment-related work participate in internal auditing. Also, the training of in-house environmental inspectors is being promoted. Teams of employees led by external experts carry out internal auditing in JFE in order to ensure transparency in inspection. Issues pointed out by internal or external auditing are used as a basis for revising and continuously improving the system, taking into account the changes in the surrounding conditions.

Environmental Education

The JFE Group conducts environmental education at all levels to deepen the understanding of each employee and encourage individual efforts to improve the environment as part of regular work.

In each operating company, environmental education is incorporated in training programs for new employees and promotion, and also includes annual programs at each level, covering social trends related to environmental problems, the significance of the environment to JFE and measures being taken by the company, the responsibility of individual employees, and the importance of environmental management.

Based on an annual schedule, each production center conducts periodical environmental education (once/year) such as environment-related regulations for general employees, employees engaged in designated work, internal environmental auditors, etc. as part of its environmental management system.

Environmental Management

Environment-related Activities

Environment Month Activities

As part of its environmental management system, the JFE Group voluntarily conducts a unique program of Environment Month Activities at each works in June of each year to raise employee awareness of the environment, as follows.

•Main activities

- Works Environmental Patrols
- Environmental training
- Facility inspections/chemical inventory check
- Lectures on the environment
- Environmental education under ISO14001
- Public Road Cleanup Operations
- Guided plant tours
- Fund-raising for environmental campaign, etc.



Environmental training (recovering spilled oil)

Disaster-prevention Training

The JFE Group conducts a variety of training programs to cope with emergencies or unforeseen events. At its West Japan Works (Kurashiki), JFE Steel participates in a joint training program at the Mizushima Industrial Complex. JFE Engineering is conducting training in coastal cleanup operations should an oil spill occur.



Joint disaster-prevention training at Mizushima Industrial Complex



Coastal anti-pollution training at Tsu Works

Status of Green Purchasing

In 2002, the JFE Group established a common group-wide set of "Green Purchasing Guidelines" for purchases of office supplies and parts/materials for production. Application is currently being expanded to affiliated companies.

•In outline, the Guidelines specify

- Adequate study of required quantities before purchase to minimize purchased amounts.
- Consideration of environmental loads over the entire life cycle of final products, in addition to price, quality, delivery schedules, etc.
- Requests for and cooperation with environmental protection efforts of suppliers on a daily basis.

Examples of green purchasing:

- Stationeries, office equipment
- Recycled oil, solvent containers, packaging materials, electric/natural gas/hybrid vehicles

Environmental Management

Communication with Society Relating Environment

Exchanges through Exhibitions

The JFE Group participates in various exhibitions on environmental themes to encourage information exchanges with a wide range of people. At Eco-Products 2004, which attracted more than 100,000 visitors, the JFE Group presented an exhibition called "JFE Technologies Working in the Community" to highlight the Group's technologies and products that are helping to protect the environment.



Eco-Products 2004

Information through Internet

The JFE Group actively offers information related to environment through Internet. On the JFE Group web site, its environmental management policy and activities are introduced in the title of "Environmental activities".



Website of JFE Holdings
<http://www.jfe-holdings.co.jp/en/index.html>

Cooperation with NPO

The JFE Group has been working with the Liaison Center for Creation of Industry & Environment since its inception. This nonprofit organization conducts research and makes recommendations on the industrial revitalization and environmental sustainability of the Kawasaki coastal area. It serves as a platform for collaboration between industry, government, universities, and citizens toward building a sustainable society that balances economic with environmental interests. As active participants, we are helping to stimulate industry and solve environmental and energy problems.

•Main activities

•Research and recommendations on industrial revitalization and environmental sustainability

- Partnership project for resource and energy recycling
- Environment-friendly town building projects
- Creation of frameworks for creating new industries
- Deregulation and incentive proposals

•Dissemination of information and PR activities

- News and publicity about activities through symposiums and the Internet



Presentation at
 the Kawasaki Coastal Renaissance Symposium

•Cooperation in Oceanographic Survey

Together with JFE LOGISTICS, JFE Steel is cooperating with the NPO VOS Nippon*1 in a Voluntary Oceanographic Monitoring Activities*2 by installing automatic monitoring equipment on oceangoing vessels operated by JFE LOGISTICS. Data are collected each time vessels return to Japan and made available to interested researchers.

*1) VOS Nippon:

Designated nonprofit organization (NPO) which conducts the following nonprofit activities to promote interest in and understanding of the marine environment by collecting, analyzing, and publishing surface-layer oceanographic monitoring data from private commercial ships and investigating surface-layer material circulation and the reproductive mechanisms of resource life forms.

- (1) Collection, organization, analysis, and publication of oceanographic surface-layer monitoring data
- (2) Development of automatic continuous oceanographic monitoring devices
- (3) Recruitment of volunteer monitoring ships to participate in monitoring activities
- (4) Education, popularization, and publicity activities related to the marine environment
- (5) Other activities necessary for achieving the organization's purposes

*2) Voluntary Oceanographic Monitoring Activities:

Activities involving monitoring of the temperature, salinity, etc. of oceans with monitoring devices mounted on private commercial ships and use of results in verification/elucidation of the actual condition of global warming, mechanism of climate change, etc.

Participation in "How Far Do Dragonflies Travel?" Forum

JFE Engineering's Tsurumi Engineering and Manufacturing Center has been a participant in studies on dragonfly populations since the first survey in 2003. We have provided a survey site within the company premises and are helping to capture dragonflies.

The aim of the "How Far Do Dragonflies Travel?" survey is to identify the areas visited by dragonflies. There has been a marked resurgence recently in the greenbelts and mini-ecosystems or "biotopes" set up by companies in the industrial zone along the Keihin coast. If dragonflies are traveling back and forth between corporate greenbelts, it would help to reliably restore the biodiversity of the Keihin coastal area and would mean that greenbelts in company sites are highly significant in preserving the urban environment.

The FY2004 survey was held on August 3. More than 200 people, including companies, community groups, high school students, and specialists, took part. They found 342 dragonflies of 12 different species.



Survey location in the Tsurumi Engineering and Manufacturing Center

Participation in Environmental Activities with Local Companies

The JFE Group actively participates in local environmental initiatives.

For example, as part of its cleanup volunteer program, the West Japan Works (Fukuyama) takes part every year in the cleanup of the Ashida River in Fukuyama, Hiroshima Prefecture, held three times annually. In FY2004, a total of about 200 employees participated. The company also takes part every year in cleaning up the horseshoe crab habitat in Kasaoka, Okayama Prefecture, and cleans the public walkways (footpaths) around the steelworks.



Ashida River cleanup

Forest Conservation on a Disused Iron-ore Strip Mine Site

JFE Okukusatsu Co., Ltd. is carrying out forest conservation work in Kuni village, Agatsuma county in Gunma Prefecture. The company is planting and thinning trees on 148.2 hectares of company-owned land and neighboring national forest where iron ore was formerly strip-mined. With little topsoil and prone to mudslides, the mine is hardly a suitable location for forestry, but thanks to the company's efforts over many years, the forest is reappearing and providing a habitat for precious flora and fauna. A nature holiday village has been built in the area, and is being used by JFE Group employees as a rest and recreation facility. The open space in the village is available as a summer camp site for the Boy Scouts and children's clubs.

Note: The CO₂ absorbed by 148.2 hectares of forest conservation is equivalent to 96kt-CO₂/yr (calculated using the conversion factor of the Forestry Agency's working group on citizen support for mitigating global warming).



Forest conservation on strip-mined land

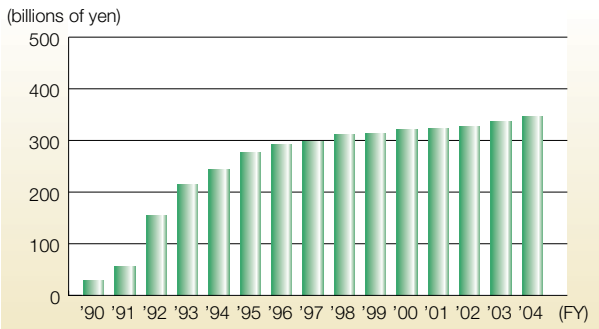
Environment Management

Environmental Accounting

Transition of Capital Investment

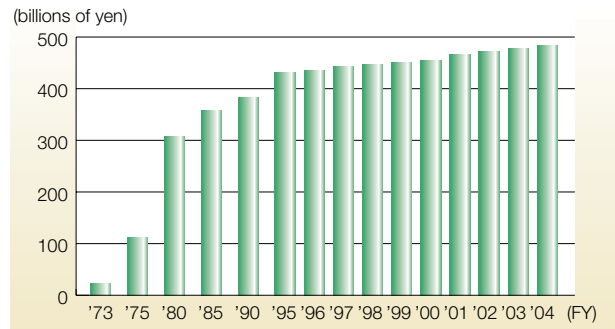
To improve the environment, JFE has actively invested in plant and equipment based on our achievements in technology development. Our total investment in energy saving since 1990 has reached approximately 348 billion yen. We have achieved energy efficiencies that rank among the highest in the world.

Cumulative investment in energy saving



Cumulative investment in environment protection since 1973 has reached approximately 483 billion yen. In FY2004, we invested in measures to reduce environmental impacts, such as additional dust collectors and installation of fencing to prevent dust dispersal.

Cumulative investment in environmental measures*



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

Environmental Accounting

In FY2004, investment in environment-related facilities was ¥14.7 billion, which accounted for approximately 16% of total capital investment for the year. Expenses were ¥71.9 billion.

Spending was focused primarily on the installation of a high-efficiency oxygen plant and blast furnace top-pressure recovery turbine (TRT) to mitigate global warming, and on additional dust collectors to prevent air pollution. Primary expenses were environmental

protection, effective use of resources, and prevention of global warming. Operation/maintenance and depreciation accounted for the majority of these expenses. Environment-related research and development expenses were ¥4.9 billion, or approximately 14% of total research and development expenses.

In FY 2004, JFE Steel achieved a recycling rate of more than 99.5%. Energy saving benefits were equivalent to ¥4.1 billion.

Environmental conservation cost

(billions of yen)

Major item			Investment	Expenses
Environmental investment & expenses related to JFE's own business	Management	Monitoring & measurement of environmental influence, EMS-related activities, environmental education & training, etc.	—	1.5
	Prevention of global warming	Energy conservation, effective use of energy, etc.	9.0	14.4
	Effective use of resources	Recirculation of industrial water, Recycling of by-products & wastes generated in-house, waste management, etc.	0.7	17.0
	Environmental protection	Prevention of air pollution, water pollution, soil contamination, noise, vibration, ground subsidence, etc.	5.0	31.7
	Miscellaneous	Fees/charges, etc.	—	1.7
Environmental investment & expenses related to customers and society	Research & development	Technological development for the environment, energy, prevention of global warming	—	4.9
	Social activities	Protection of the nature, support to forestation, information disclosure, advertisement, etc.	—	0.7
Total			14.7	71.9

The totals mentioned above were calculated on the following basis.

•Period: April 2004 to March 2005

•Scope: Environment-related investment and expenses at JFE's steelworks, but in the case of research and development, on a company-wide basis. Calculations include only actual effects, excluding presumed effects based on estimates or risk avoidance benefits.

(Note)*Calculations do not include investments made primarily for purposes other than environmental protection, for example, renovation of superannuated facilities, even when the process as a whole realizes a net energy saving in comparison with the former process.

Environmental Report I

Reducing Environmental Loads in Business Activities

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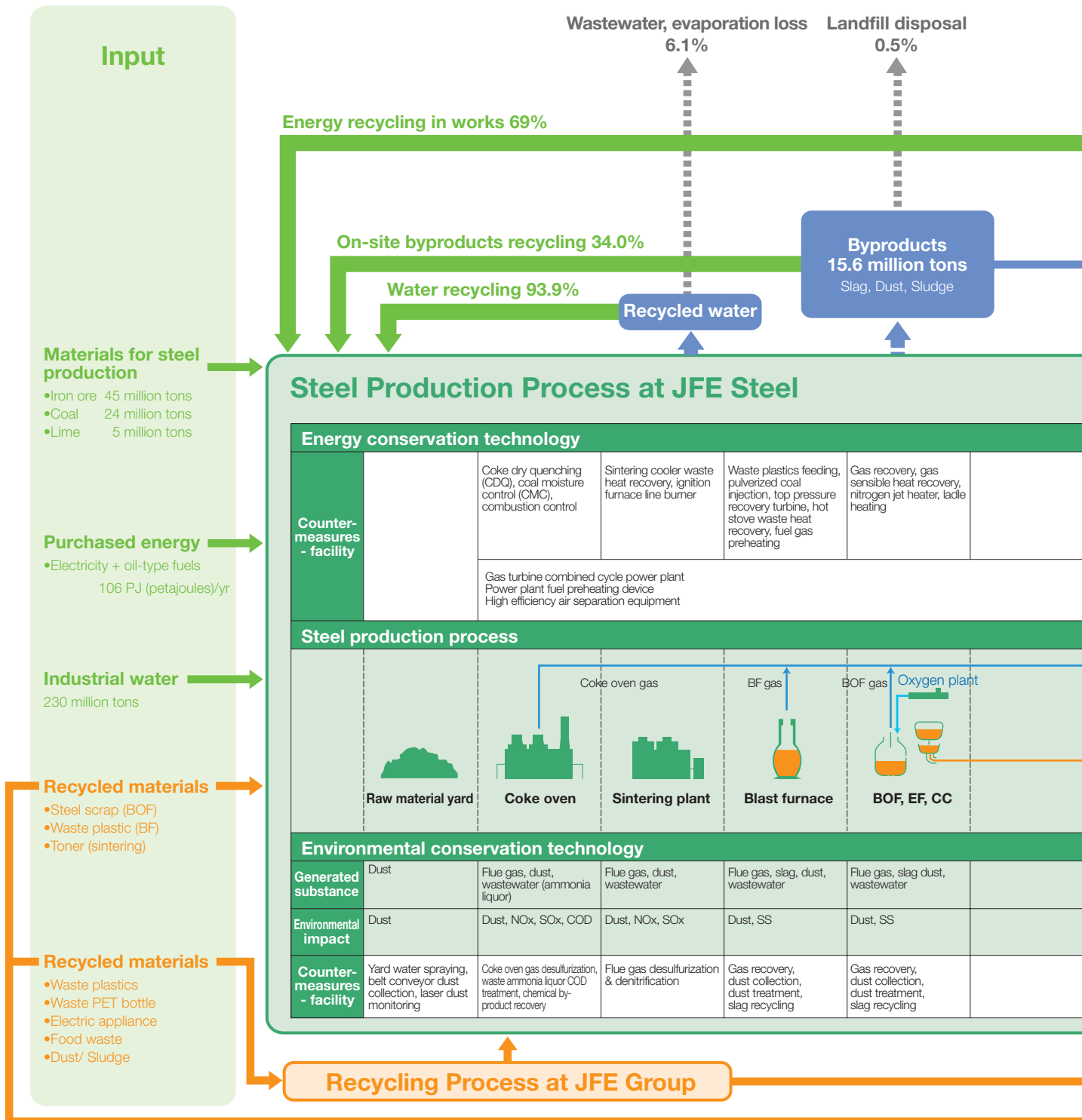
Efforts at Kawasaki Microelectronics29

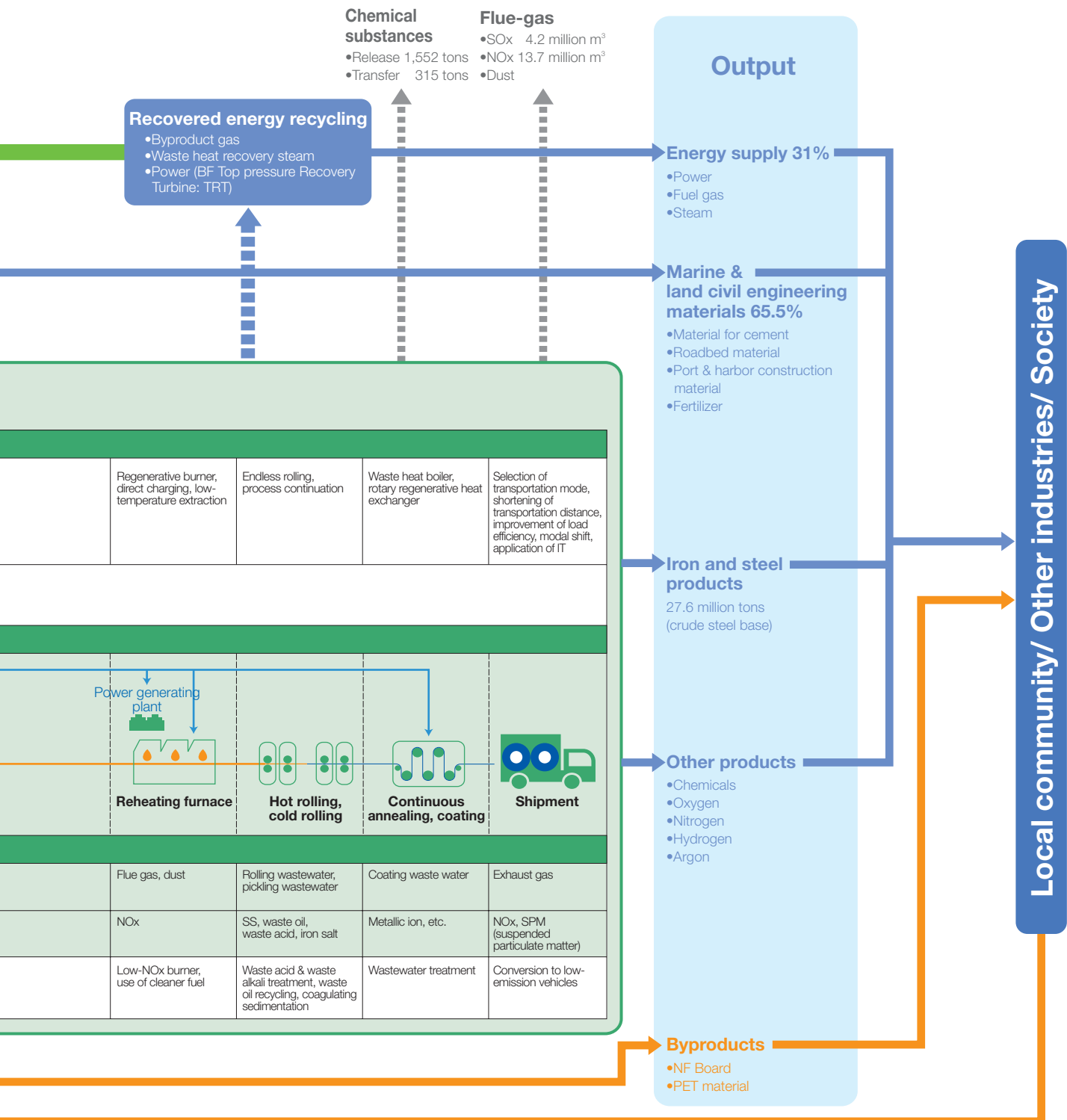
Efforts at JFE Urban Development30

Reducing Environmental Loads: JFE Steel

Material Flow in Steelmaking Process

JFE Steel 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 manufacturing processes now boast the world's highest energy efficiency and recycling rates, but are continuing to conduct R&D and introduce equipment to further reduce environmental loads in each steel manufacturing process. The main inputs/outputs in FY 2004 are shown below. In addition to efforts in the manufacturing processes, the JFE Group is actively involved in recycling and reuse of wastes from society and other companies using the steel works' infrastructure and unique JFE recycling technologies, contributing to build a recycling-oriented society.





Reducing Environmental Loads: JFE Steel

Preventing Global Warming

Reducing Energy Consumption

In December 1996, the Japan Iron and Steel Federation established a Voluntary Action Program for Environmental Protection^{*1}, which targets a 10% reduction in energy consumption in FY2010 against a FY1990 baseline. Among other positive efforts to prevent global warming, in September 1997, a supplementary goal^{*2} was incorporated in the Voluntary Action Program, calling for an additional 1.5% reduction in energy consumption. In FY2003, energy consumption of Japan's steel industry was 5.7% below the FY1990 baseline, demonstrating the success of voluntary action.

JFE Steel has a long history of positive efforts in energy saving and is continuing its energy saving activities based on the Japan Iron and Steel Federation's Voluntary Action Plan, while responding to rising crude steel demand and the requirements of higher value-added products.

In FY2004, unit energy consumption (energy consumption/ton-crude steel) at JFE Steel and four affiliated electric furnace steel-makers^{*3} was 22.4 GJ/t-s, or a 14% reduction from FY1990. In response to increased demand for high value-added products such as automotive steel sheets and plates for shipbuilding, JFE Steel increased crude steel production to 31.3 million tons, up 19% from FY1990 (2% increase from FY2003), and performed BF modernization work, which temporarily increased energy consumption. But at the same time, JFE Steel kept energy consumption to 702 petajoules (PJ)^{*4}, or only 2% increase from FY1990 (2% increase from FY2003) by energy saving activities and optimizing operating parameters. In a trial calculation, actual CO₂ emissions^{*5} in FY2004 were estimated at approximately 57 million tons, nearly same as FY1990.

JFE Steel fully recognizes the importance of global warming and is committed to solving this urgent problem by developing and introducing new energy saving technologies and developing next-generation steel manufacturing technologies. At the same time, JFE Steel is contributing to preventing global warming both in industrial sector and in the consumer/transportation sectors with environment-friendly steel products and new energy saving technologies.

***1) The Japan Iron and Steel Federation's "Voluntary Action Program for Environmental Protection":**

Details of the steel industry's Voluntary Action Program for Environmental Protection can be found at the Japan Iron and Steel Federation's website, "Ongoing Commitment of the Steel Industry Against Global Warming" at the following address: <http://www.jisf.or.jp/energy/index/htm>

***2) Supplementary goal under Voluntary Action Plan:**

The steel industry incorporated in its Voluntary Action Plan a 1.5% reduction in energy consumption by effective use of waste plastic in blast furnaces, coke ovens, etc., assuming creation of an adequate collection system.

***3) Four affiliated electric furnace steel makers:**

JFE Bars & Shapes Corp., Daiwa Steel Corp., Tohoku Steel Corp., and Toyohira Steel Corp.

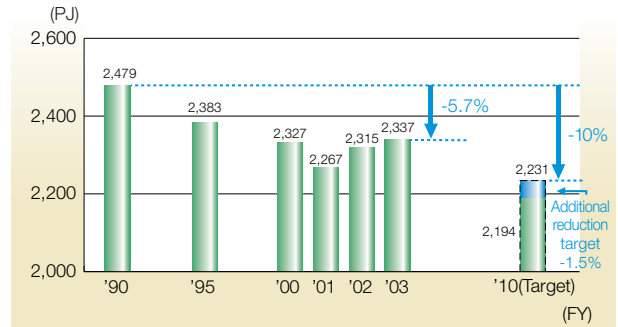
***4) PJ (Petajoule):**

10¹⁵ (1000 trillion) joule (heat unit), 1cal=4.186J

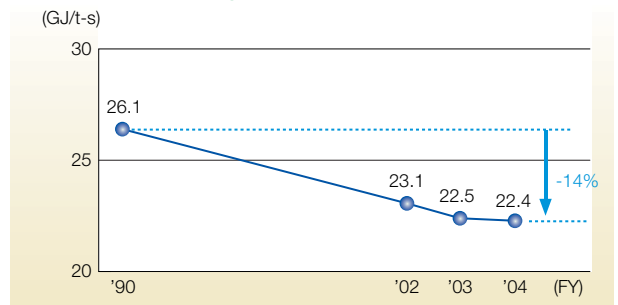
***5) The sum of data from JFE Steel and four affiliated electric furnace steelmakers.**

Japanese steel industry's total energy consumption

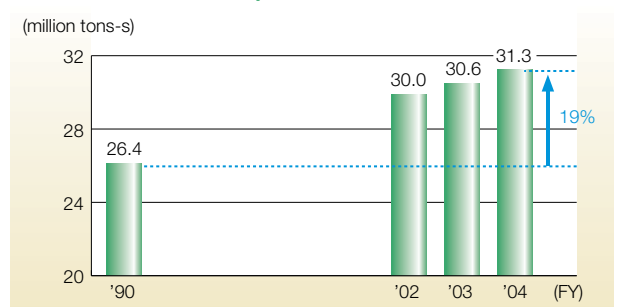
(Source: The Japan Iron and Steel Federation)



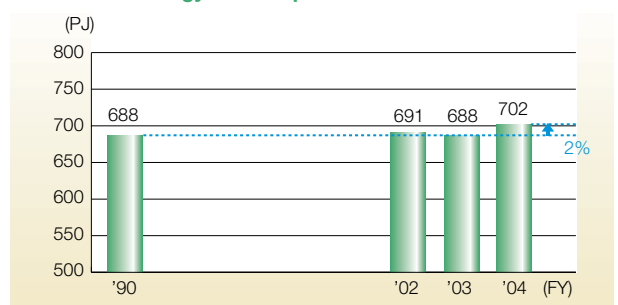
JFE Steel's unit energy consumption^{*5}



JFE Steel's crude steel production^{*5}



JFE Steel's energy consumption^{*5}



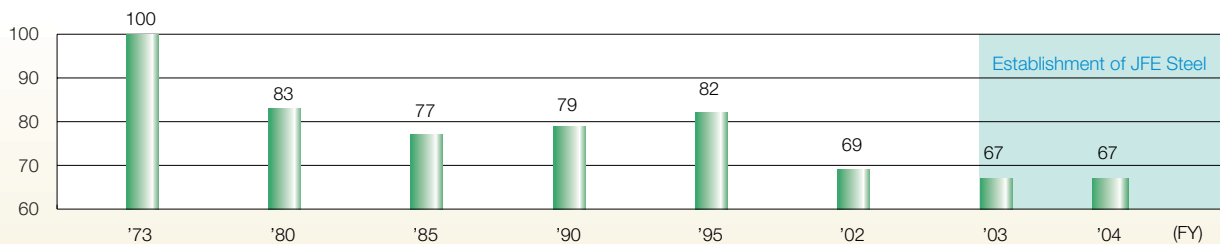
History of Energy Saving Activities

JFE Steel began its 1st Energy Saving Activities Plan in response to the First Oil Crisis in 1973. By 1990, the company had achieved energy savings of approximately 20% in comparison with FY1973 through measures such as reduced reheating furnace fuel consumption, operational improvements, introduction of large-scale waste heat recovery equipment, and process continuation/energy saving operation of production processes. The com-

pany also continued its aggressive energy saving activities in the years that followed.

Since the establishment of JFE Steel in April 2003, the company is implementing further measures, such as expansion of blast furnace top pressure recovery turbine (TRT) power generation, and introduction of high efficiency oxygen plant, to prevent global warming under its 5th Energy Saving Activities Plan.

•Transition of unit energy consumption index at JFE Steel (1973 = 100)



Energy Saving Activities

1st Plan ('73-'78)

2nd Plan ('79-'85)

3rd Plan ('86-'94)

4th Plan ('95-'02)

5th Plan ('03-)

Reduced reheating furnace fuel consumption

- Improved reheating furnace insulation
- Slab hot charging

Operational improvements

- BOF gas recovery

Introduction of large-scale waste heat recovery equipment

- BF top pressure recovery turbine (TRT)
- Sintering waste heat recovery
- Continuous caster
- BOF boiler

Process continuation Energy saving operation

- Continuous annealing line
- BF pulverized coal injection (PCI)
- Coal moisture adjustment equipment

Global warming prevention by energy saving

- Waste plastics feeding into BF
- Increased PCI
- Regenerative burner
- High efficiency power generation
- Endless rolling

Full operation of global warming prevention measures

- BF equipment modernization
- Trial operation of city gas blowing for blast furnace
- High efficiency oxygen plant
- Expansion of BF top pressure recovery turbine (TRT)
- Regenerative burner

•Examples of Energy Saving Activities at JFE Group Companies

JFE Bars & Shapes is modernizing the 150t electric arc furnace in the steel-making shop at its Himeji Works as an environment-friendly electric arc furnace with a direct linkage-type scrap preheating shaft. Startup is planned at the end of 2005.

The conventional electric arc furnace has the drawback of excessive heat loss (43%) due to opening of the furnace roof for scrap charging and discharge of high temperature exhaust gas during operation.

In contrast, in the revamped furnace, the scrap preheating shaft is connected directly to the melting chamber, enabling heat recovery.

Featuring virtually continuous scrap charging from the shaft top, heat loss will be reduced by large 14%, realizing an important energy saving. This technology was adopted by NEDO*1 as a support Project for Industries for increasing the Efficient Use of Energy for FY2004.

Due to its closed furnace structure, this is also a clean technology with minimum leakage of off-gas, and is therefore expected to be useful in recycling of automobile pressed scrap under the End-of-life Vehicles (ELVs) Recycling Law.

*1) NEDO

New Energy and Industrial Technology Development Organization (Independent Administrative Institution)

Fig. 1 Conventional electric arc furnace

Scrap is charged with a bucket in 2-3 batches by rotating the furnace roof.

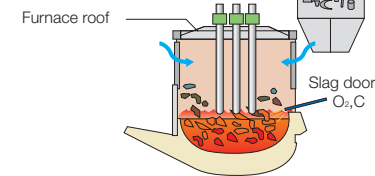


Fig. 2 Electric arc furnace with direct linkage-type scrap preheating shaft

Scrap is preheated by high temperature exhaust gas from furnace.



Reducing Environmental Loads: JFE Steel

Recycling Resources

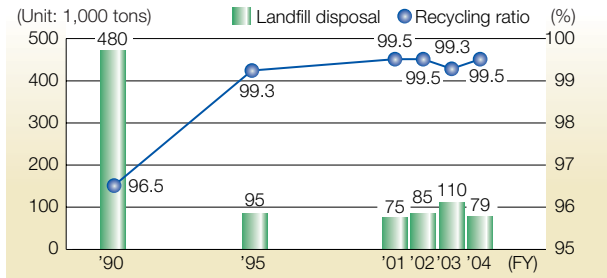
Reducing Generation/Discharge of Byproducts at JFE Steel

JFE Steel began Zero Waste Activities in advance of the industry, constructing a recycling system which uses generated byproducts (i.e., slag^{*1}, dust, and sludge^{*2}) in the works as raw materials for steel manufacturing, and now recycles more than 99% of the byproducts generated in its steel manufacturing processes. The company has also made efforts to reduce the amount of byproducts generated, and is helping to reduce landfill disposal by positively developing applications/expanding the market for recycled products made from slag, which accounts for the largest part of

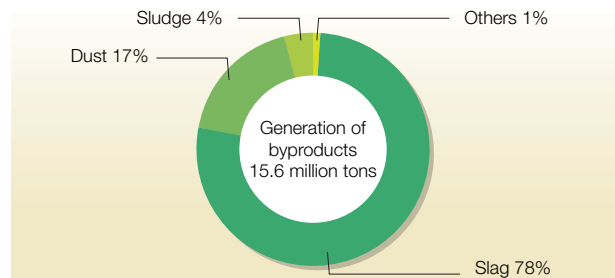
steel works byproducts. (See the article below)

In FY 2004, total amount of byproducts was 15.6 million tons, same as FY 2003 level. As a result of recycling dust as a resource both in internally and externally, JFE Steel's landfill disposal decreased by 30,000 tons from FY2003, reaching 79,000 tons (84% reduction from FY1990). Combining these results, JFE Steel's recycling ratio for FY2004 was 99.5%. In the future, JFE Steel will continue its efforts to reduce landfill disposal.

Transition of landfill disposal/recycling rates



Breakdown of steelworks byproducts (dry base)



***1) Slag:**

Material consisting of non-iron rock components in iron ore, and lime, etc. added to remove impurities such as phosphorus during steel refining. It separates from and floats on the molten metal, enabling deslagging. Slag is processed into fine particles and lumps as material for cement, civil works, fertilizer, etc.

***2) Sludge:**

Material remaining after dewatering of the mud-like substance separated and removed by circulating water/waste water treatment equipment. Although sludge consists mainly of iron, in some cases it also contains components which affect blast furnace operation and the quality of steel products and therefore cannot be completely recycled. Technologies for removing harmful components are being developed.

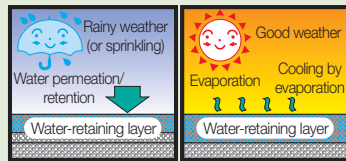
Advanced Applications for Slag

<http://www.jfe-steel.co.jp/products/slag/slag.html> (Japanese only)

Road Material Applications

“Road Cool” Heat-Island mitigating Paving Material

The heat-island effect can be mitigated by using a water-retaining solid composed mainly of fine BF slag in asphalt pavement. The pavement retains water in rainy weather and is cooled by evaporation in good weather, reducing the pavement temperature.



Cooling function of “Road-Cool”

“Road Tough” Temporary Road Material

Temporary road material made from steel slag. Because compaction is easy, trucks and heavy equipment can use roads immediately after construction, even on reclaimed land and soft ground in humid areas. Features include excellent wear resistance and resistance to rutting.



Construction of road using Road Tough

Use in Restoring Shoreline Environments

“Marine Block” Artificial Reefs for Seaweed/coral Breeding

(steel slag carbonated block)

Artificial block produced by absorbing CO₂ in steelmaking slag. Because the main component is calcium carbonate, same composition as shells and coral, artificial reefs are highly stable in seawater, and make excellent breeding habitats for seaweeds and coral.



Marine Block

“Marine Stone” Submerged Embankment

Submerged embankment/breakwater material using steelmaking slag. Because steelmaking slag provides minor elements necessary for life, Marine Stone habitats are superior to natural stone. Marine Stone is also a promising material for submerged embankments for controlling current conditions.



Marine Stone

“Marine Base” Sand-capping Material

A sand-capping material which is made from granulated blast furnace slag. Covering the sea bottom with organic material (sludge) suppresses elution of phosphorus and nitrogen, which cause eutrophication, and prevents occurrence of hydrogen sulfide, which causes blue tide. The material size is suitable for bottom-dwelling organism habitats.



Marine Base

“Artificial Stone”: Natural Crushed Stone Substitute

(steel slag hydrated block: Ferro-Foam)

Artificial Stone is a hydration-hardened material made by mixing pulverized powder and other additives in steel slag, and is now being adopted as a material for port and harbor construction.



Artificial Stone

Reducing Environmental Loads: JFE Steel

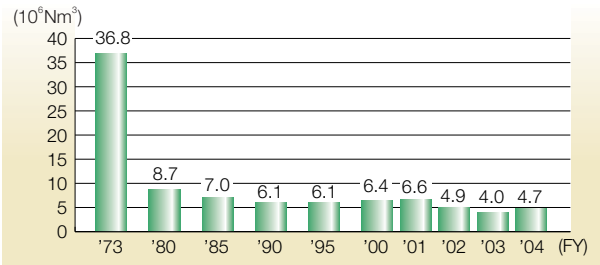
Preserving the Environment

Air Quality Preservation

Reducing sulfur oxide (SOx) emissions

To reduce emissions of sulfur oxide (SOx), JFE has adopted low-S fuels and introduced the high-efficiency flue gas desulfurization system. In 1976, the company installed a high-efficiency sintering flue gas desulfurization plant using the ammonium-sulfate process*1, which was unprecedented in the world, at East Japan Works (Keihin), achieving a broad reduction in SOx. In FY2002, two new desulfurization plants were constructed at West Japan Works (Fukuyama) for sintering furnace. Although SOx emissions in FY 2004 increased by 0.7 (10⁶Nm³) from FY 2003 to 4.7 (10⁶Nm³) by the increase of steel production, this was 13% of the level in FY 1973.

Transition of SOx emissions

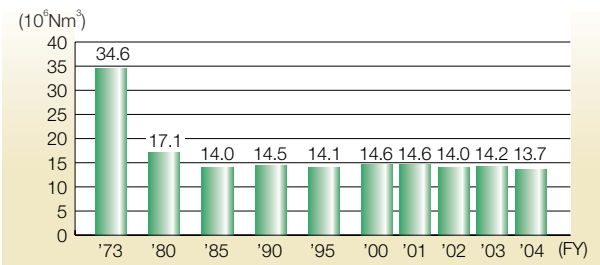


Reducing nitrogen oxide (NOx) emissions

JFE Steel has actively installed flue gas denitration systems to reduce NOx emissions. Sintering flue gas denitration systems, which decompose NOx into nitrogen and water, were installed at East Japan Works (Chiba) in 1976 and East Japan Works (Keihin) in 1979, greatly reducing NOx emissions. Among other measures, JFE Steel has also reduced NOx emissions by adopting low-NOx burners such as the regenerative burner for reheating furnaces.

In FY2004, NOx emissions were maintained at 13.7 (10⁶Nm³), reduced by 0.5 (10⁶Nm³) from the FY2003. This was 40% of the level in FY1973, or a reduction of more than half.

Transition of NOx emission



Reducing dust

Dust is mainly generated in yards and conveyors for raw materials. Sprinkling in ore and coal yards, sealed conveyor connections, and other measures prevent dust generation. In FY2004, a windbreak fence was erected at the coal yard in West Japan Works (Kurashiki) to strengthen dust scattering control. At coke ovens, sintering furnaces, blast furnaces, BOFs, and other dust-generated facilities, high-performance dust collectors minimize airborne dust.



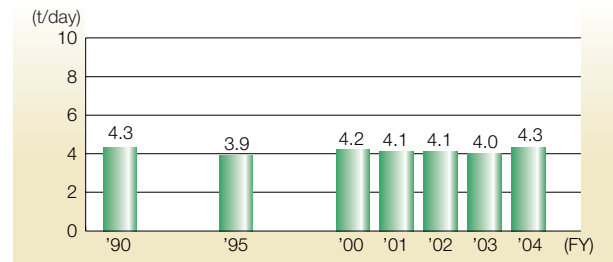
Windbreak fence in West Japan Works (Kurashiki)

Water Quality Preservation and Water Recycling

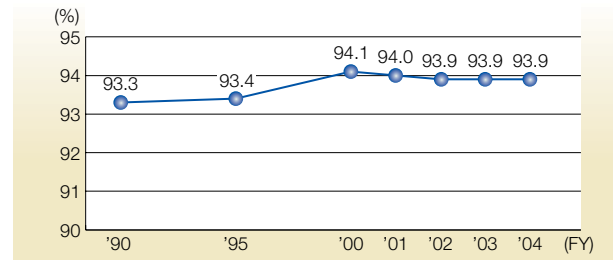
Large quantities of water are used in steel manufacturing. JFE Steel performs complete purification treatment by various methods, including biological, physical, and chemical treatments, depending on the properties of the water after use, and has adopted circulating use and cascade use*2 of water, maintaining a high circulation rate*3 of approximately 94% of industrial water consumption. For release into public waters, wastewater is given thorough purification treatment. For example, wastewater containing organic substances is given biological treatment by activated sludge, followed by coagulant sedimentation, filtration, and activated carbon adsorption.

For a detailed explanation of the effluent abnormality at East Japan Works (Chiba), see pages 7 to 10.

Transition of COD



Transition of industrial water recirculation rate



*1) Ammonium-sulfate process:

Flue gas treatment method which combines deammonification of coke oven gas and desulfurization of sintering flue gas. Research was carried out jointly by 9 steel companies (existing at the time) in 1971-1972, and practical application was achieved in 1976.

*2) Cascade use:

Multi-stage (cascade) use, in which use of resource is not completed in one step, but rather, the resource with its properties altered by use or waste discharged is used in a different application, followed by further use in another application.

*3) Circulation rate :

Circulation rate (%) = [Total consumption - Received industrial water]/Total consumption

Reducing Environmental Loads: JFE Steel

Control of Chemical Substances

In its FY2004 report under Japan's PRTR Law (Pollutant Release and Transfer Register Law), JFE Steel reported on 38 substances which it handles in quantities of 1 ton/year or more (0.5 ton/year for Class 1 designated chemical substances).

Reported amounts of releases into the air and public waters were reduced by approximately 70 tons from FY2003, reaching 764 tons in FY2004. The total of releases/transfers as waste, including on-site landfill disposal and transfers outside the company, rose by approximately 50 tons from FY2003,

reaching to 1,103 tons. As a result, the grand total of releases/transfers amounts to 1,868 tons, reducing 25 tons from FY2003.

JFE Steel gives priority to reducing releases beginning with substances having high toxicity and large release amounts. In FY2004, releases of dioxins were reduced by approximately 3 g-TEQ from FY2003, to 8.8 g-TEQ.

JFE Steel will continue its voluntary efforts to reduce releases and transfers of chemical substances.

Substances reported under PRTR (FY2004, JFE steel business*)

(Unit: tons; dioxins: g-TEQ)

No.	Substance	Releases				Transfers		
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Off-site	
1	Zinc compounds (water-soluble)	0	6.0	0	0	0	0	
16	2-aminoethanol	0	3.2	0	0	0	0	
25	Antimony and its compounds	0	0.1	0	0	0	0.1	
30	Bisphenol A type epoxy resin (liquid)	0	0	0	0	0	0	
40	Ethylbenzene	45	0	0	0	0	0	
43	Ethylene glycol	0.5	0.1	0	0	0	4.9	
60	Cadmium and its compounds	0	0	0	0	0	0	
63	Xylene	318	0	0	0	0	3.3	
68	Chromium and chromium (III) compounds	0.03	0.5	0	306	0	108.3	
69	Chromium (VI) compounds	0	0.4	0	0	0	3.1	
85	HCFC-22	0	0	0	0	0	4.0	
100	Cobalt and its compounds	0	0	0	0	0	0	
102	Vinyl acetate	0	0	0	0	0	0	
108	Inorganic cyanide compounds	0	1.1	0.4	0	0	0	
132	HCFC-141b	69	0	0	0	0	0	
145	Dichloromethane	20	0	0	0	0	0	
177	Styrene	1.0	0	0	0	0	0	
178	Selenium and its compounds	0	0.03	0	0	0	1.2	
179	Dioxins	8.8	0.00003	0	0.01	0	0	
198	Hexamethylenetetramine	0	0	0	0	0	0	
200	Tetrachloroethylene	25	0	0	0	0	0	
224	1,3,5-Trimethylbenzene	4.3	0	0	0	0	0	
227	Toluene	67	0	0	0	0	2.5	
230	Lead and its compounds	0	0	0	0	0	0.0008	
231	Nickel	0	0	0	0	0	0	
232	Nickel compounds	0.02	1.1	0	98	0	62	
253	Hydrazine	0	0	0	0	0	0	
283	Hydrogen fluoride and its water-soluble salts	0	63	0	0	0	0	
299	Benzene	64	0	0	0	0	0	
304	Boron and its compounds	0	17	0	0.0002	0.0001	0.3	
307	Poly(oxyethylene) alkyl ether	0	2.0	0	0	0	0	
308	Poly(oxyethylene) octylphenyl ether	0	4.2	0	0	0	0	
309	Poly(oxyethylene) nonylphenyl ether	0	29	0	0	0	0	
310	Formaldehyde	0	0	0	0	0	0.04	
311	Manganese and its compounds	0.07	17	0	381	0.001	125	
345	Mercaptoacetic acid	0.01	0	0	0	0	0	
346	Molybdenum and its compounds	0	5.7	0	3.2	0	0.3	
353	Tris(dimethylphenyl) phosphate	0	0	0	0	0	0	
Total		614	150	0	788	0	315	
		Total releases			1,552	Total transfers		315

Rational/Efficient Transportation of Steel Products

JFE Steel believes that reducing CO₂, NO_x, and SPM*² through improved fuel efficiency in steel product transportation is an important issue. The company is therefore promoting a modal shift*³ aimed at reducing environmental loads in physical distribution, for example, by operating trucks and ships efficiently and selecting transportation modes rationally.

*1) Steel business:

The scope of the data totaled at the right includes East Japan Works (Chiba and Keihin), West Japan Works (Fukuyama and Kurashiki), and Chita Works, but excludes the Steel Laboratories.

*2) SPM:

Suspended Particulate Matter. Fine particulates under 10 μ m (1 μ m = 1/1000mm) contained in boiler and automotive exhaust gases etc., which remain suspended in the atmosphere for long periods and tend to accumulate in the lungs and windpipe when inhaled, and to affect respiratory apparatus.

*3) Modal shift:

Shift in transportation modes from truck to rail or ship to improve transportation efficiency and reduce environmental loads.

Environmental efforts in physical distribution

Viewpoint of improvement	Specific measures
1) Modal shift	<ul style="list-style-type: none"> Shift to marine transport of traditional overland products by improving transportation lots
2) Reduction of tractor exhaust gas	<ul style="list-style-type: none"> Positive introduction of new low-exhaust gas vehicles Response to stronger environmental regulations on SPM, etc., particularly in urban areas
3) Introduction of larger vehicles and control system	<ul style="list-style-type: none"> Introduction of 160 tons carrier and special large-scale trucks Development/introduction of automatic truck dispatching system, optimizing trailer transportation efficiency
4) Others	<ul style="list-style-type: none"> Increased recycling ratio of in-ship retaining materials and simplified packaging

Reducing Environmental Loads: JFE Engineering

Reducing Environmental Loads in Business Activities at JFE Engineering

Preventing Global Warming

In 1997, the Japan Society of Industrial Machinery Manufacturers (JISM) established a "Voluntary Action Plan for the Environment by the Industrial Machinery Industry". It called for positive, voluntary efforts to prevent global warming by the industry as a whole, targeting an annual improvement of 1% in unit CO₂ emissions (CO₂ emissions per unit of production) until 2010.

Based on these circumstances, JFE Engineering implemented Environmental Management Systems suited to the functions and features of business at each of its works and is making efforts to prevent global warming.

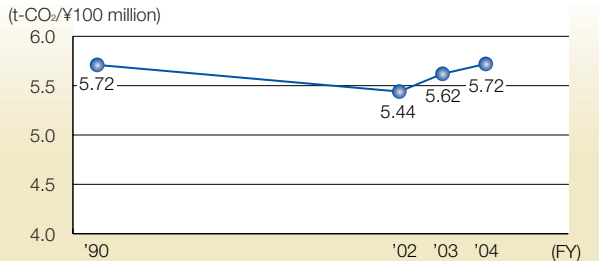
In the office division, efforts include power conservation activities such as turning off lights during the lunch break and turning off personal computers when not in use, together with check patrols. Power consumption in the office division in FY2004 showed a 16% decrease from FY1997 at Tsurumi Center and a 14% decrease from FY1999 at Tsu Works.

In the production division, reduction of power consumption per unit of weight processed is used as an internal target. Tsurumi Center and Tsu Works achieved their reduction targets. In spite of a decrease in total power consumption, Shimizu Works did not meet its target, due to low production efficiency associated with a low operating rate in the 1st half of the year.

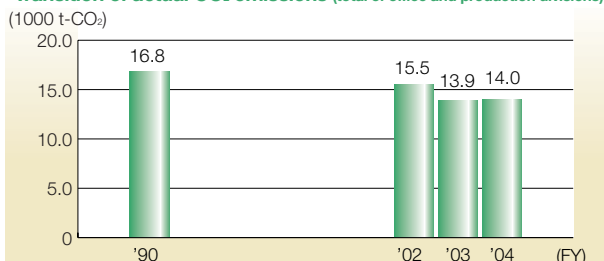
As a result of these activities, combined CO₂ emissions for FY2004 from the production division and office division were on the same level as in FY2003, at 14.0 thousand tons (17% reduction from FY1990). On the other hand, due to a decline in sales revenues, CO₂ emissions per ¥100 million of sales in FY2004 increased by 2% in comparison with FY2003, rising to 5.7 ton/¥100 million (same as FY1990 level).

During the 8-month period beginning in August 2004, JFE Engineering conducted a trial aimed at determining the CO₂ emissions at 11 construction sites. The results showed total CO₂ emissions of 4,695 tons. In the future, the company will expand its efforts to quantify CO₂ emissions at construction sites.

Transition of unit CO₂ emissions



Transition of actual CO₂ emissions (total of office and production divisions)



Reducing Generation/Discharge of Waste

In the office division, Tsurumi Center and Tsu Works reduced the landfill disposal rates for waste to below the target values through educational activities (on-site broadcasting, posters, etc.) and expansion of sorted recycling. Shimizu Works reduced the amount of landfill disposal waste but did not achieve its target for the landfill disposal rate.

In the production division, Tsu Works achieved its target for reducing the amount of landfill disposal by reducing waste generation and more complete sorting, but Tsurumi Center and Shimizu Works did not achieve their targets.

In site construction work, efforts for reducing the landfill disposal waste, including sorting/volume reduction/recycling of wastes, are continued. As a result, landfill disposal rate of construction site waste was 24%, achieving the target value of 40% or less.

Reduction of wastes in office division

Office waste landfill disposal rate (unit)	Target	Actual
Tsurumi Center (%)	46	40.5
Shimizu Works (%)	36	38.7
Tsu Works (%)	16	5

Reduction of wastes in production division

Works (unit)	Target	Actual
Tsurumi Center (million yen/yr)	8.0	8.8
Shimizu Works (t/1000 hrs)	0.96	1.28
Tsu Works (t/1000 hrs)	0.10	0.08

Reduction of construction site waste

Works (unit)	Target	Actual
Landfill disposal rate of construction site waste	40	24

Control and Reduction of Chemical Substances

JFE Engineering complies with the PRTR Law by reporting releases and transfers to the national government through local governing bodies and is carrying out in activities to reduce releases/transfers of controlled substances including paints, solvents, and gasoline.

Substances reported under PRTR (FY2004)

(Unit: kg)

No.	Substance	Releases				Transfers	
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Off-site
1	Zinc compounds (water-soluble)	0	0	0	0	0	798
30	Bisphenol A type epoxy resin	0	0	0	0	0	2,447
40	Ethylbenzene	20,351	0	0	0	0	1,120
63	Xylene	54,655	0	0	0	0	4,166
227	Toluene	33,902	0	0	0	0	3,107
230	Lead and its compounds	0	0	0	0	0	1,268
232	Nickel compounds	0	0	0	0	0	118
311	Manganese and its compounds	0	0	0	0	0	9,984
Total		108,908	0	0	0	0	23,008
		108,908				23,008	

Reducing Environmental Loads: Kawasaki Microelectronics

Reducing Environmental Loads in Business Activities at Kawasaki Microelectronics

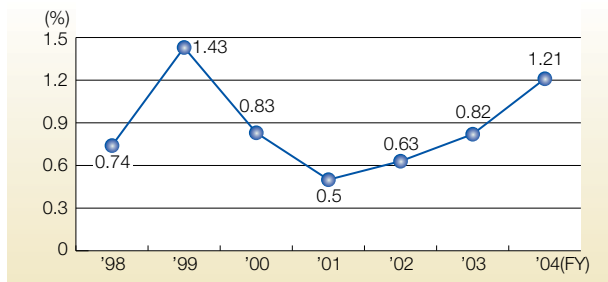
Preventing Global Warming

Utsunomiya Works, which is Kawasaki Microelectronics' only production facility, is engaged in two types of activities to achieve the targets set by four electrical machinery/electronics industry associations.*1 These are energy saving activities and PFC gas*2 emission reduction activities.

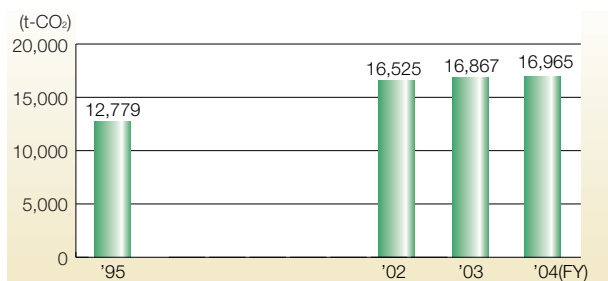
In energy saving activities, Utsunomiya Works uses the "energy saving rate"*3 as an index for quantifying results. In FY2004, the works targeted an energy saving rate of 1% or more and achieved a reduction of 1.2% as a result of four main improvement items: (1) use of low pressure loss-type reverse osmosis membrane for deionized water production equipment, (2) use of energy saving-type vacuum pumps for semiconductor manufacturing equipment, (3) introduction of inverter control for pumps in deionized water production equipment, and (4) increase in the treatment capacity of product inspection devices.

PFC gases are employed in dry etching in the semiconductor manufacturing process and in plasma cleaning of equipment. Although Utsunomiya Works uses only a small amount of these substances, their warming factors are large. For this reason, the works is making ongoing efforts to reduce emissions of PFC gases. In FY2004, consumption of CF₄ gas was reduced by 15% in comparison with FY2003 by optimizing use amounts. On the other hand, by CO₂ conversion, C₂F₆ accounts for approximately 70% of the total emissions of PFC gases used by Utsunomiya Works. Therefore, in the future, the works intends to adopt substitutes for C₂F₆.

Transition in energy saving rate



Transition in CO₂ emissions



Reducing Generation/Discharge of Waste

Since FY1998, Utsunomiya Works has made active efforts to recycle industrial wastes. In FY2001, the recycling rate exceeded 98% and has remained on a high level since then.

After Utsunomiya Works achieved a recycling rate of 98.2% in FY2001, recycling was essentially saturated, with the remainder consisting of specially-controlled industrial wastes which are difficult to recycle. Therefore, in FY2001, the Works began activities to shift recycled wastes to more valuable substances. In FY2004, valuable non-ferrous metals increased from 0.9 tons to 3.6 tons. As a result, the amount of metal scrap requiring treatment as industrial waste decreased from 5 tons in FY2003 to 2.1 tons in FY2004. Valuable plastic and ferrous substances also increased by 45%, from 7.3 tons in FY 2003, to 10.6 tons in FY2004. Although valuable substances still comprise a small amount in comparison with total industrial waste (1910 tons in FY2004), the Works is achieving steady progress in reducing generation/release of industrial waste through sorting activities in the works.

Control and Reduction of Chemical Substances

Prior to FY2001, Utsunomiya Works used 20 chemical substances covered by the PRTR Law. Adoption of substitutes began in FY2002. The works has now succeeded in replacing a total of 8 PRTR substances, including 4 in FY2002 and 2 each in FY2003 and FY2004. Utsunomiya Works now uses 12 substances covered by the PRTR Law, but only 2 are subject to reporting requirements. By amount, "hydrogen fluoride and its water-soluble salts" accounts for 75% of all object chemical substances handled by the works. In FY2004, Utsunomiya Works reduced consumption of fluoric acid by 45% by improving the cleaning process using this chemical.

Substances reported under PRTR (FY2004)

(Unit: kg)

No.	Substance	Releases				Transfers	
		Air	Public waters	Soil on-site	Landfill on-site	Sewerage	Off-site
172	N,N-dimethylformamide	64	13	0	0	0	2,717
283	Hydrogen fluoride and its water-soluble salts	161	1,412	0	0	0	1,464
Total		225	1,425	0	0	0	4,181
		1,650				4,181	

*1) Four electrical machinery/electronics industry groups:

Japan Electrical Manufacturers Association, Japan Electronics and Information Technology Industries Association, Communications and Information Network Association of Japan, and Japan Business Machine and Information System Industries Association.

*2) PCF (per fluorocarbon) gas:

General name of gas consisting of only carbon and fluorine

*3) Energy saving rate:

Kawasaki Microelectronics defines the index showing the energy saving improvement effect as "percentage energy saving effect for the year relative to power consumption in the works as a whole." The equation used to calculate the energy saving effect is as follows:

For each object equipment, assuming former energy consumption is A (kWh/yr) and energy consumption after improvement is B (kWh/yr), the energy saving effect is C = A - B (kWh/yr). The effect of multiple energy saving projects carried out during the year are D = ΣC (kWh/yr). If energy consumption in the works as a whole is E (kWh/yr), the energy saving ratio = D/E (%).

Reducing Environmental Loads: JFE Urban Development

Reducing Environmental Loads in Business Activities at JFE Urban Development

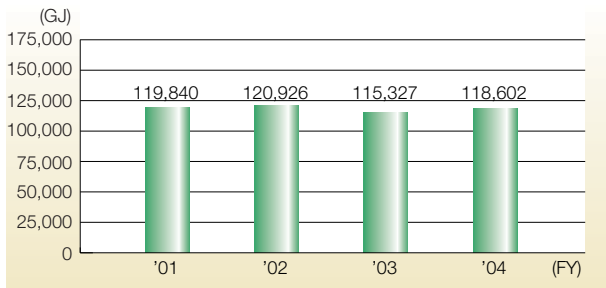
In office building projects, the largest environmental loads are usually thought to occur in the operation/management stage. For this reason, JFE Urban Development not only incorporated energy saving measures in its major Orto Yokohama Project (Shin-Koyasu Station, Yokohama) from the planning and design stage, but also considers energy consumption, flue gas, and waste in management and operation. JFE is making every effort to provide an attractive environment for the residents themselves and for everyone in the area.

Preventing Global Warming

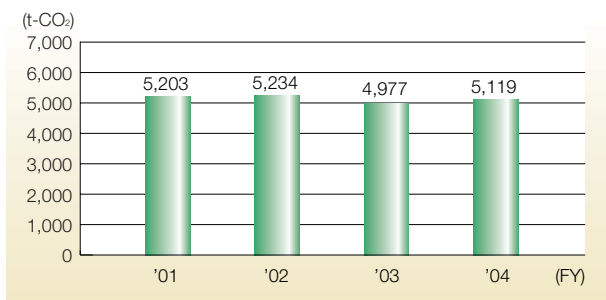
In the Orto Yokohama Project, energy consumption was reduced by introducing a cogeneration system using low-CO₂ emission city gas.

In FY2004, Orto Yokohama achieved a 1.0% reduction in energy consumption from FY2001, when the project was opened.

Transition of energy consumption



Transition of CO₂ emissions



Environmental Protection Measures (Air)

Because city gas is used to supply power and heat at Orto Yokohama, releases are limited to combustion gas from city gas. Flue gas is controlled under an agreement with Yokohama City.

Reducing Generation/Discharge of Waste

The residential buildings in Orto Yokohama discharge household waste. Yokohama City is promoting “Yokohama-wa-G30” activities aimed at reduction/segregated collection of household wastes, and recognized the efforts of the Orto Yokohama Viewpolis Management Association to sort and reduce wastes with a commendation in October 2003.



“Yokohama-wa-G30” Certificate of Commendation

Creating Attractive Environments

Greening of public spaces is also an important part of JFE’s Orto Yokohama Project. Greening activities for the artificial ground have been recognized with the Minister of Land, Infrastructure and Transport’s Prize. In the future, JFE Urban Development will continue its efforts to ensure proper management of greenbelts in order to provide a pleasant leisure environment for persons living or working in the complex, as well as visitors and neighboring residents, and is also contributing to the creation of a new urban environment which prevents the heat-island effect and other big-city problems.



Greening of artificial ground

Environmental Report II

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Contributing through Products/Technologies: JFE Steel

Contributing through Steel Products

High Tensile Strength Automotive Steel Sheets (HITEN)

JFE Steel was among the first steel makers to grapple with the development of HITEN for automotive weight reduction, and has developed and supplies new HITEN products based on its own unique technologies.

HITEN is extremely effective for both weight reduction and crashworthiness of automobiles because the same strength can be secured with thinner material.

For example, "SFG HITEN," which offers extremely high formability and attractive surface appearance, was the first 390 MPa*1 and 440 MPa grade steel sheet in the world used in auto side panels, enabling a 10 kg weight reduction, while 980 MPa HITEN sheets manufactured with JFE Steel's proprietary continuous annealing process are used in the center pillar, seat frame and various reinforcing members, reducing weight by 15-20 kg. JFE Steel has also developed and commercialized many other high quality, high strength steel sheets for a wide range of applications, including "NANO HITEN" (p. 42) and "BHT steel sheets."*2



Center pillar of 980 MPa grade HITEN steel sheet

***1) MPa:**

Unit of tensile strength. 390 MPa grade steel sheets can withstand a load of 40 kg/mm². Similarly, 440 MPa and 980 MPa can withstand loads of 45 kg/mm² and 100 kg/mm², respectively.

***2) BHT steel sheet:**

High strength hot rolled steel sheet utilizing strain aging hardening. Products display high formability during press forming and a large increase in strength after paint baking.

<http://www.jfe-steel.co.jp/en/products/sheets/cold/index.html>
<http://www.jfe-steel.co.jp/en/products/sheets/hot/index.html>

Non-oriented Electrical Steel Sheets for High Efficiency Motors/ Grain-oriented Electrical Steel Sheets for High Efficiency Transformers

JFE Steel has developed and is producing "Non-oriented Electrical Steel Sheets for High Efficiency Motors," which were developed to achieve low iron loss*3 in motors, and thereby reduce power loss, particularly by reducing high frequency iron loss.

JFE Steel also developed and is producing "Grain-oriented Electrical Steel Sheets for High Efficiency Transformers". With excellent magnetic properties, these products achieve energy savings while reducing transformer noise by increasing magnetic flux density and suppressing the magnetostriction.

JFE Steel's non-oriented electrical steel sheets, "JFE Super-Core," have also been adopted in hybrid cars as parts for the step-up converter reactor, and are contributing to preventing global warming by improving automotive fuel economy.



Non-oriented electrical steel sheets for high efficiency motors



Grain-oriented electrical steel sheets for high efficiency transformers

***3) Iron loss:**

Energy loss by power consumption as heat due to magnetic hysteresis and eddy current in the cores of motors and transformers.

<http://www.jfe-steel.co.jp/en/products/electrical/index.html>

High Heat-resistance Ferritic Stainless Steel for Exhaust Manifolds: "JFE-MH1"

To meet the needs of improved fuel economy and cleaner exhaust gas now demanded in automobiles, it has become necessary to increase the temperature of the engine exhaust gas and ensure that the exhaust gas reaches the catalytic converter without temperature drop, even in the "cold start" period immediately after the engine is started. This means that exhaust system materials must have high heat resistance and a small heat capacity, as well as excellent formability when manufacturing parts with complex shapes.

As an exhaust manifold material, JFE Steel developed a new ferritic stainless steel, JFE-MH1, which offers a combination of high heat resistance (high temperature strength, high temperature fatigue and thermal fatigue properties) and high formability. The heat-resistance temperature of JFE-MH1 is 50°C higher than that of the conventional material, making it possible to maintain a high exhaust gas temperature, while the reduced thickness/weight reduction realized by its high formability contribute to improved fuel economy. Thickness reduction

in the exhaust manifold also results in a lower heat capacity, which prevents reduced exhaust gas purification performance by the catalytic converter due to the low exhaust gas temperature during cold starts. JFE-MH1 makes an important contribution not only to preventing global warming by improving auto fuel economy (CO₂ reduction), but also to reducing environmental loads by improving exhaust gas purification.



Exhaust manifold using JFE-MH1

Contributing through Products/Technologies: JFE Steel

New Alloy Steel Powder for Automotive Parts

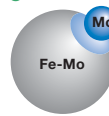
JFE Steel has developed a new alloy steel powder which enables sintering at comparatively low temperatures in general-purpose sintering furnaces by optimizing the contents of alloying elements and their adding methods, resulting in reduction of residual pores, which influence the rolling contact fatigue strength.

When compacted to a green density of 7.3 Mg/m³, sintered under general sintering condition (temperature: 1,130°C), and given a carburizing heat treatment*1, this new alloy steel powder provides rolling contact fatigue strength of 3.5 GPa (measured with a 6-ball system), which is equal or superior to that of conventional alloy steel powders for high temperature sintering/carburizing (Conventional alloy steel powder: 3.4 GPa with a high temperature sintering at 1,250°C). This new alloy steel powder not only has the advantage of reducing sintering energy consumption by eliminating the need

for high temperature sintering by the sintered part maker, but can also enable high production efficiency in the manufacture of sintered parts with high rolling contact fatigue strengths through the application of high productivity general-purpose sintering furnaces.

By making it possible to produce sintered parts with high rolling contact fatigue strength, even with general-purpose sintering furnaces, this new alloy steel powder is also expected to contribute to wider use of these sintered parts.

•Particle structure of new alloy steel powder for high contact fatigue strength applications



*1) Carburizing heat treatment :

Heat treatment process for increasing the surface hardness of sintered parts by diffusion of carbon into the surface layer of the steel by heating in an atmosphere containing CO or CH₄ (methane).

<http://www.jfe-steel.co.jp/en/products/ironpowders/youto.html>

Production of Highly Efficient Solar Cell Wafers

Although the manufacturing process for solar cells consumes energy to some extent, power generation is CO₂-free. Thus, life cycle CO₂*2 emissions are low, at 1/14 to 1/18 the levels in thermal power generation. Solar cells have therefore drawn attention as a means of preventing global warming and depletion of fossil fuels. In addition to heightened environmental awareness in recent years, many nations have adopted preferential policies to encourage the use of solar power, resulting in large worldwide growth in the demand for solar cells. Since August 2004, JFE Steel has scaled up its production capacity of solar cell wafers to 130 MW/year, which shares its 10% production of the world market.

Purity exceeding 99.9999% is secured in JFE Steel silicon ingots/wafers by applying contamination prevention technology, and thanks to the homogeneous solidification structure realized with casting technology, solar cells made from JFE's SOG silicon established a world's highest level of conversion efficiency *3 of 16% in multi-crystalline silicon.



Silicon ingot manufacturing plant

*2) Life cycle CO₂:

Total CO₂ emissions generated in all processes from extraction of resources to manufacture of generating equipment and fuel transmission, as well as in the combustion of fuel for power generation.

*3) Conversion efficiency:

Ratio (%) expressing conversion of light energy to electrical energy by solar cells. For example, if 1 kW/m² of light (energy of sun in clear weather) on a 1 m² solar cell area produces 100 W of electrical power, conversion efficiency = 10%.

Corrosion-resistant Steel Plate for Crude Oil Tankers: "NAC5"

In tankers transporting crude oil, which is Japan's main energy source, hydrogen sulfide, salts, and other substances in crude oil create an extremely corrosive environment in the tanks. For this reason, preventing corrosion of tanks and hull is an important challenge.

As a corrosion-prevention measure for crude oil tankers, JFE Steel developed and commercialized a corrosion-resistant steel, "NAC5" (New Anti-Corrosion No. 5), for crude oil tanker upper deck plates utilizing knowledge obtained in its research on low alloy corrosion-resistant steels to date. NAC5 realizes the necessary anti-corrosion performance, while also considering economy, by using a zinc primer in combination with the developed steel.

Although heavy painting of the tank interior is also used as an anti-corrosion measure for crude oil tankers, pollution of the surrounding environment by painting during initial construction and repainting during repairs is a worry. These problems can be avoided by applying NAC5, as tank upper deck plates demonstrate the necessary anti-corrosion performance without painting or repainting. It is also known that local corrosion (so-called pitting)

may occur in tank bottom plates, depending environmental conditions. However, JFE has discovered that coating the tank bottom plates with a zinc primer is effective in preventing pitting corrosion. Because NAC5 reinforces the effect of the zinc primer, expanded application of NAC5 in bottom plates is also expected.

NAC5 enhances the navigational safety of crude oil tankers and contributes to a stable energy supply, and is also making an important contribution to preserving the environment and reducing environmental loads by simplifying/eliminating painting and preventing oil spill accidents.



Crude oil tanker

<http://www.jfe-steel.co.jp/en/products/plate/catalog/c1e-006.pdf>

Chromate-free Coated Steel Sheets

In the view of reduction of environmental load and consideration of workers' health, JFE Steel developed a coated steel sheet which contains no chrome (VI) to replace chromate coated steel sheets. Because simply substituting other heavy metals for chrome (VI) reduces corrosion resistance, the same performance as in conventional products is secured by a composite film with a unique design consisting of a special organic resin and inorganic substance. In addition to reduce environmental load, this product also offers excellent corrosion resistance, electrical conductivity, paint adhesion, fingerprint resistance, and lubricating properties.

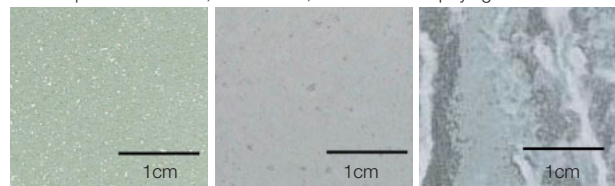
In order to secure high long-term use reliability in electric appliances made from Chromate-Free Coated Steel Sheets, a test method for accurately evaluating corrosion resistance in actual service environments is indispensable. JFE Steel therefore began development in 2001 and established an independent Accelerated Corrosion Test for Electric Appliances (ACTE^{*4}) in November 2003. This test method accurately reproduces corrosion phenomena in coated steel sheets in actual service environments, which had been difficult with the conventional salt spray test, and

is useful in appropriate development and selection of coated steel sheets.

This product is now used in internal panels of appliances and vending machines, internal components of OA equipment and copiers, chassis of televisions, VTRs, and audio equipment, and other parts, and an expanded range of applications is expected.

Corrosion of chemically coated steel sheets

Comparison of ACTE, on-site test, and saltwater spraying test



ACTE On-site test Saltwater spraying test
(Exposure test at Okinawa)

^{*4} ACTE:

Abbreviation for Accelerated Corrosion Test for Electric Appliances.

<http://www.jfe-steel.co.jp/en/products/sheets/denki-aen/index.html>

550 N/mm² TMCP Steel Products for Building Construction: "HBL385B/HBL385C"

JFE Steel developed the 550 N/mm² TMCP steel products HBL385B/HBL385C as materials for building structural use in a wide range of buildings from medium to ultra-high rise. These products offer the most outstanding ratio of economy to steel strength (unit cost/design strength). The weight of the steel frame can be reduced by as much as 15% by designing members with a small cross-section or reduced material thickness, taking advantage of the high design strength of 385 N/mm². These materials contribute to reducing environmental loads by improving transportation efficiency and shortening steel frame manufacturing and welding time.



550 N/mm² TMCP steel products for building construction

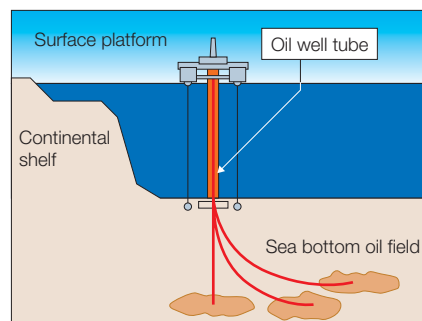
<http://www.jfe-steel.co.jp/en/products/plate/youto03.html>

Martensitic Stainless Steel Tubes/Threaded Joints

To meet increasing demand for natural gas as a form of clean energy, deep oil and gas fields have been developed in recent years. Oil well tubes, or OCTG (oil country tubular goods), must have the strength to withstand high temperature/pressure and possess corrosion resistance against CO₂ in natural gas, while threaded joints must provide airtightness under the high compound loads associated with inclined/horizontal drilling.

With conventional OCTG, damage to the oil or gas well due to corrosion was a concern. Chemical inhibitors were used to prevent corrosion but caused environmental loads. JFE Steel therefore developed and supplies "Martensitic Stainless Steel Tubes," such as "13%Cr Steel Tubes," and threaded joints with excellent airtightness for use with these tubes. These products satisfy strength and corrosion requirements and reduce inhibitor use, and are widely employed as OCTG for

natural gas development. By reducing environmental loads through extension of the life of oil and gas wells, they are contributing to a stable supply of natural gas.



Structure of sea bottom oil well

<http://www.jfe-steel.co.jp/en/products/pipes/octg/index.html>

● Contributing through Products/Technologies: JFE Engineering

Contributing through Engineering Technologies and Products

JFE Engineering's Technologies and Products – Reducing Environmental Loads in Living and Industrial Society in Diverse Applications from the Everyday to Global Scale

JFE Engineering has expanded its engineering businesses to include clean energy, water, soil, and waste treatment and recycling engineering projects, all of which are indispensable to society, and provides society with a wide variety of technologies and products which contribute to realizing a low environmental load society and constructing a recycling-oriented society.

In familiar settings, JFE Engineering supplies technologies and products including photocatalyst systems which decompose the viruses that cause in-hospital infection and formaldehydes responsible for sick-house syndrome, and clathrate hydrate slurry (CHS) latent heat air-conditioning systems which reduce energy consumption in large-scale air-conditioning equipment like that used in office buildings.

Various kinds of waste are generated in everyday life and industrial activity. JFE Engineering is actively engaged in recycling businesses which help to create a recycling-oriented society that effectively utilizes these wastes. As features of JFE Engineering's recycling businesses, landfill disposal is reduced to the absolute minimum by applying steel manufacturing technologies in combination with engineering technologies, and every effort is devoted to effective utilization of resources. JFE Engineering also supplies a variety of high efficiency power generating systems which use wastes ranging from municipal solid waste (MSW) to wood chips, food waste, livestock excrement, etc. JFE's power-related businesses are not limited to waste-based technologies, but also include wind power as a form of renewable clean energy.

JFE technologies are contributing to purification of the familiar environment. Examples include high efficiency removal of nitrogen and phosphorus from sewage and wastewater, prevention of eutrophication of rivers and coastal areas using JFE's Bio-Tube System, and prevention of water quality deterioration in bays using the seawater exchange-type hybrid caisson, which utilizes the power of waves to exchange water in bays.

●List of JFE Engineering's Products/Technologies Reducing Environmental Loads

●Reducing Environmental Loads

- Gas-Clean DX
- High Clean DX (Flue gas/fly ash dioxin treatment)
- Bio-Tube System (Advanced sewage treatment system)
- Seawater exchange-type hybrid caisson
- Measures for dam bank sand/lake & river water purification
- Photocatalyst air purification system

●Supply of energy saving equipment

- Gas engine cogeneration system
- Clathrate hydrate slurry (CHS) latent heat air-conditioning system

●Waste detoxification and recycling

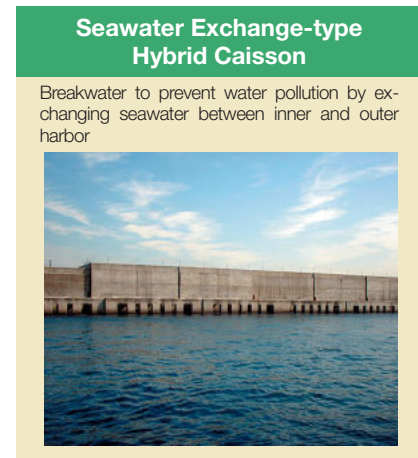
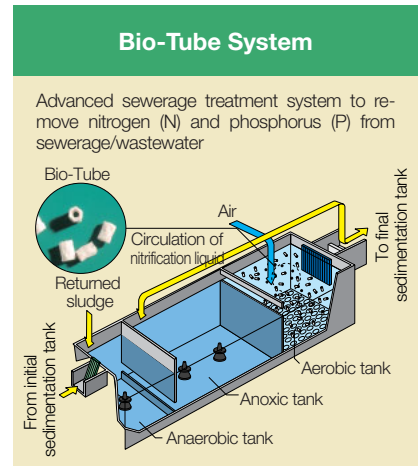
- High-temperature gasifying & direct melting furnace
- JFE THERMOSELECT gasifying & melting furnace
- Electric resistance and plasma-type ash melting furnaces
- Hyper 21 Stoker System
- Circulating fluidized bed (CFB) boiler turbine power generation
- Sewerage sludge methane fermentation
- BIGADAN process biogas system
- Wood biomass gasification power generation system

●Recycling technologies and business

- Waste plastic recycling for BF feed
- NF Board
- Home electric appliance recycling
- Food waste recycling
- Used fluorescent tube recycling

●Clean energy

- Wind power generation business



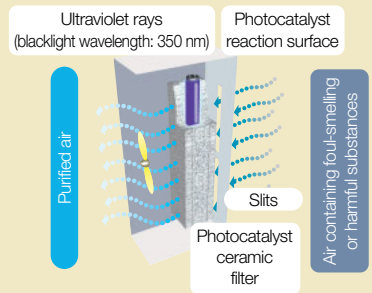
Clathrate Hydrate Slurry (CHS) Latent Heat Air-conditioning System

Energy savings in air-conditioning systems applying latent heat medium



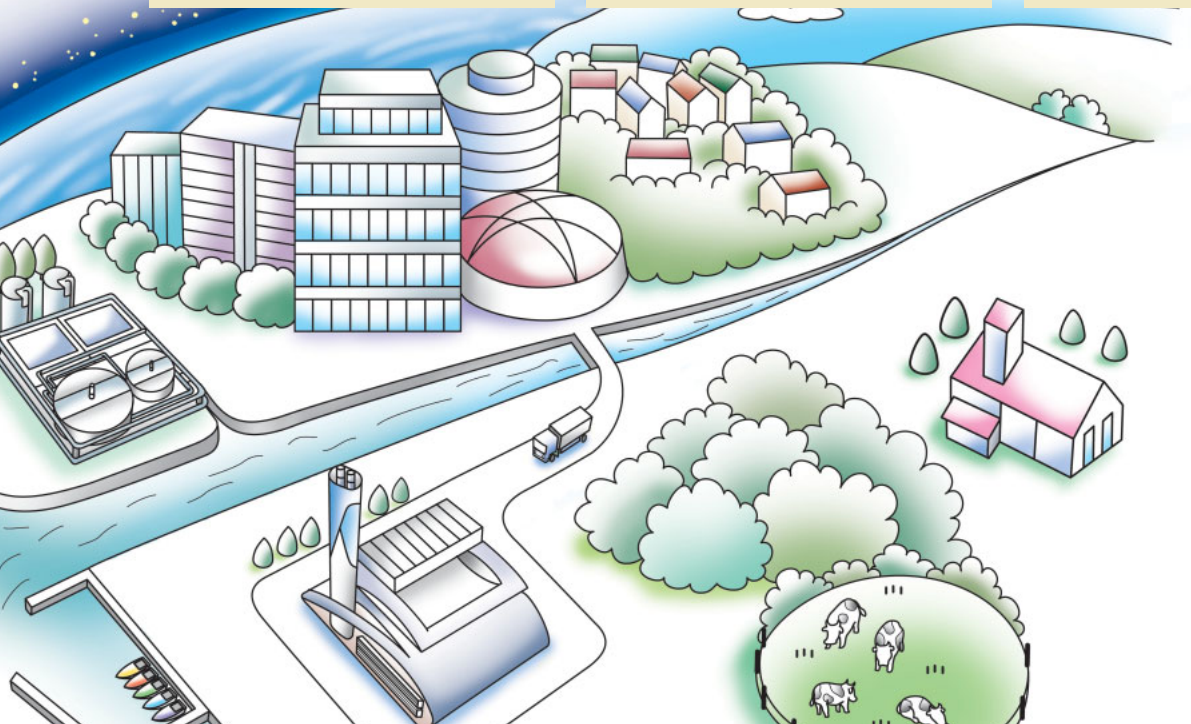
Photocatalyst Air Purification System

Decomposes formaldehyde, which causes sick-house syndrome, and prevents in-hospital infection



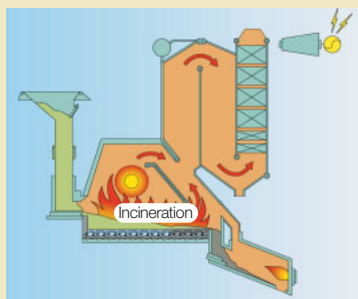
Wind Power Generation Business

Supply of total engineering for wind power generation



Hyper 21 Stoker System

Clean power generation system using municipal waste as fuel



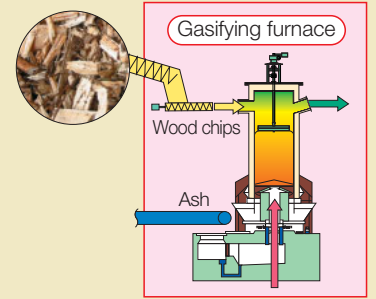
BIGADAN Process Biogas System

System to convert organic waste such as livestock and food waste to heat and power by methane fermentation



Wood Biomass Gasification Power Generation System

Supply of highly efficient power and heat energy by gasification of wood chip

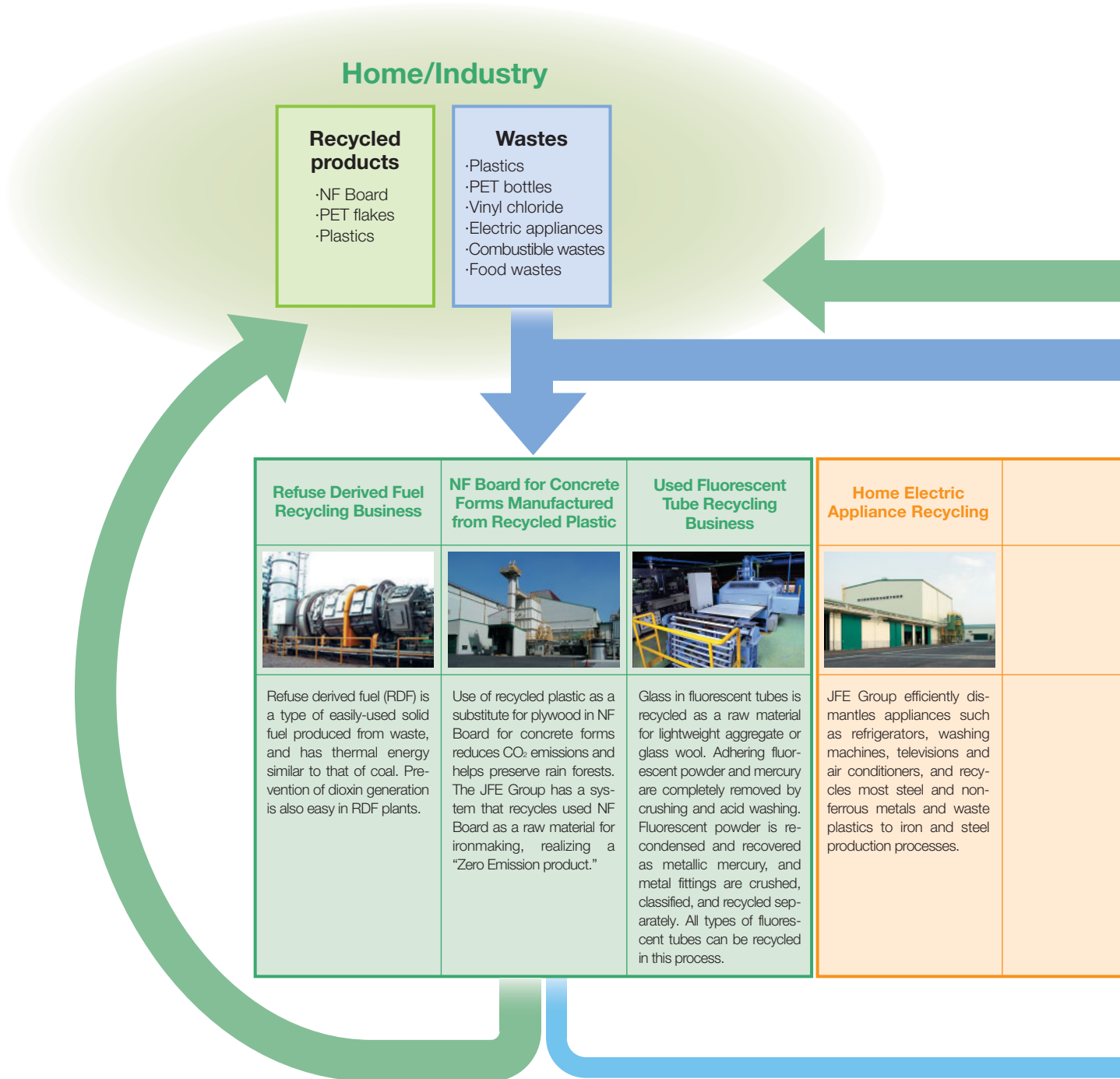


● Contributing through Products/Technologies

Supporting a Recycling-oriented Society

The JFE Group is engaged in a variety of waste recycling businesses based on a fusion of steel manufacturing technologies and engineering technologies. Through advanced use of steelworks' infrastructure, the JFE Group has created a system for efficient mass recycling of waste, including use of waste plastic as blast furnace feeding material. Its recycling businesses closely related to local society includes sorting/collection of waste plastic, recycling of waste as solid fuel, and recycling of used dry-cell batteries and fluorescent tubes. Thus, as a key feature of all recycling businesses of the JFE Group, various wastes are received and treated appropriately, depending on the type of waste, and landfill disposal is reduced to the absolute minimum by a combination of treatment and effective use in the steel works. The JFE Group's recycling businesses are truly supporting recycling-oriented society.

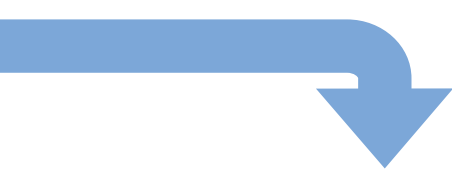
<http://e-solution.jfe-holdings.co.jp/cycle/cycle.html> (Japanese Only)



•Primary Recycling Business at JFE

Operation		Started in	Capacity
Waste fluorescent tube recycling		April 1995	6,000 t/yr
Waste plastic recycling for BF feed		October 1996	50,000 t/yr
Waste gasifying & melting recycling	(1)Chiba	April 2000	50,000 t/yr
	(2)Kurashiki	April 2005	160,000 t/yr
RDF gasifying power generation	Fukuyama	April 2004	9,600 t/yr
Plastic containers & packaging for BF feed		April 2000	120,000 t/yr
Plastic containers & packaging gasifying		April 2001	30,000 t/yr
Waste PET bottle recycling		April 2002	10,000 t/yr
Concrete form boards from recycled resin		Sept. 2002	2 million units/yr
Packaging plastic sorting & compacting	(1)Nagoya	Aug. 2000	60,000 t/yr
	(2)Sendai	Dec. 2000	20,000 t/yr
	(3)Hiroshima	April 2004	40,000 t/yr
	(4)Yokohama	April 2005	31,000 t/yr
Can/PET bottle sorting & compacting	Kawasaki	Sept. 2003	5,500 t/yr
RDF recycling	(1)Haibara Town, Nara Pref.	Nov. 2000	2,500 t/yr
	(2)Nogi Town, Tochigi Pref.	Dec. 2002	5,500 t/yr
Home electric appliance recycling		April 2001	800,000 units/yr
Dry cell battery recycling by non-ferrous metal melting furnace		March 2002	1,500 t/yr
Dry cell battery recycling by electric furnace		March 2003	1,000 t/yr
Food waste recycling		Aug. 2003	8,000 t/yr

Steel products



Vinyl Chloride Recycling	Recycling by Waste Gasifying & Melting	Food Waste Recycling	Waste Plastic Recycling for BF Feed
			
The JFE Group has developed a technology for separating chlorine (Cl) from vinyl chloride itself, for example, in pipes and gutters. The separated Cl is also recycled as hydrochloric acid (HCl), which are used in pickling process of steel sheets. The rest hydrocarbon is also used as an ironmaking material.	Using the JFE THERMO-SELECT waste gasifying & melting furnace, the Chiba Recycling Center at East Japan Works (Chiba) completely recycles industrial waste, as well as waste plastic containers and packaging as gas for the steelworks.	Chiba Biogas Center at East Japan Works (Chiba) uses the BIGADAN process Biogas System to produce gas for the works from food waste by methane fermentation. Residue from the process is recycled to the JFE THERMOSELECT plant at the Chiba Recycling Center, achieving zero-emission 100% recycling.	The JFE Group currently recycles waste plastics by converting industrial waste plastic and plastic packaging into raw material (substitute for coke) for its ironmaking. Waste plastic recycling for BF feed makes an important contribution to reducing CO ₂ emissions and saving coal in steel production process.

Steelworks

- BF
- BOF
- Power generating plant
- Pickling line

Reducing material Scrap Hydrochloric acid Gas

Contributing through Products/Technologies

Supporting Next-generation Clean Energy

The JFE Group is contributing widely to society by developing a variety of eco-energy technologies and businesses such as recycling-based power generation, wind power, and others based on advanced, high efficiency energy utilization technologies cultivated in its steel and engineering businesses. The JFE Group is also pioneering the development of dimethyl ether (DME), which has attracted strong interest as a new form of clean energy for the 21st century.

The “Leading Contender” for Next-generation Clean Energy: “DME”

DME is a form of next-generation clean energy which generates absolutely no sulfur oxides (SOx) or particulate matter (PM) during combustion. Among other advantages, it can be produced from a wide variety of hydrocarbon feedstocks such as natural gas, coal, coal-mine methane, and biomass. Because DME is non-toxic, it is expected to find application in many fields, including power generation (gas turbine, boiler, diesel, fuel cell), industry, home use, and transportation (diesel and fuel cell vehicles).



DME station



Pilot plant for DME direct synthesis process (100 tons/day; Kushiro, Hokkaido)

JFE’s “DME Direct Synthesis Process”

Since 1989, the JFE Group has been engaged in research on a direct synthesis process for DME as an original technology. In 2003, construction of a 100 tons/day DME direct synthesis pilot plant was completed. This is the largest DME plant currently in operation anywhere in the world. R&D on production technologies capable of providing a low-cost supply is now in progress, aiming at commercialization.

Expanding the Applications of DME

To expand the applications of DME, the JFE Group is conducting R&D on potential fields of use which take advantage of the unique features of DME. Examples include a revolutionary large-scaled distributed power generation system using DME-fueled diesel, which dramatically reduces emissions of environmental pollutants while maintaining thermal efficiency equal or superior to conventional oil-fueled diesel system. DME-fueled diesel automobiles are also being developed. Long-distance road tests of DME-fueled diesel vehicles have already been completed successfully. In February 2005, a DME station was constructed and tests of practical use of DME crane trucks began in East Japan Works (Keihin).

In the Keihin Coastal Industrial Area, JFE is conducting a test of actual use of various equipment utilizing DME with the participation of several partners, and Japan’s National Traffic Safety and Environment Laboratory (NTSEL) is promoting the development of a DME car as a low-pollution vehicle which satisfies the stricter automobile exhaust gas regulations to be imposed in 2009.

<http://www.jfe-holdings.co.jp/en/dme/index.html>

•Trial use of DME in Kawasaki Coastal Industrial Area

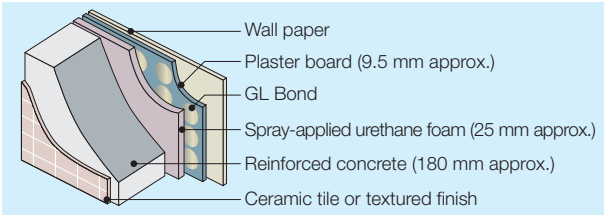


● Contributing through Products/Technologies: JFE Urban Development

People-friendly, Environment-friendly Construction Technologies

Wall Structure with Excellent Heat Insulation Performance

Heat insulation performance is enhanced by spraying insulating material (thickness: 25 mm approx.) inside exterior walls. The effects of outdoor heat/cold are reduced, contributing to decreased air-conditioning energy consumption.



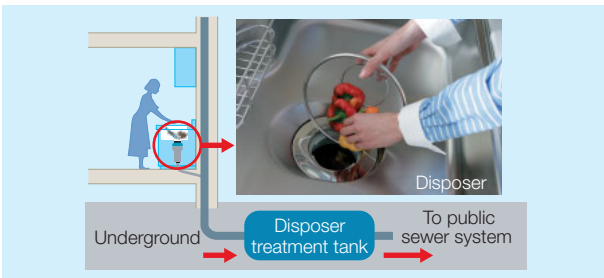
Concept of exterior wall

Wastewater Treatment System with Disposer

Raw kitchen garbage ground by the garbage disposal unit installed under the sink, together with kitchen wastewater, is purified by the disposer wastewater treatment device before release into the public sewer system. By simultaneously treating garbage and kitchen wastewater, the disposer system reduces pollutant loads and garbage generation.

•Reduction of loads in kitchen wastewater

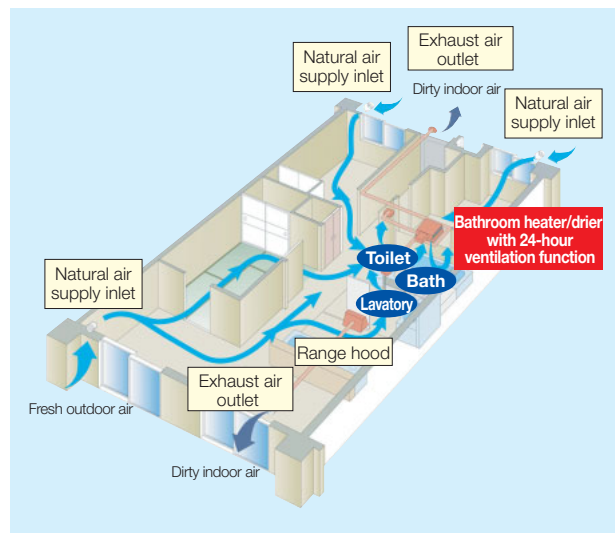
Item	Reduction	Reduction rate
BOD	18 g → 10.5 g	40% (approx.)
SS	12 g → 10.5 g	12% (approx.)
n-hexane extract	2.1 g → 1.05 g	50% (approx.)



Concept of disposer wastewater treatment system

24-hour Low Air Flow Rate Ventilation System

Ventilation is a key measure for preventing sick-house syndrome. JFE has adopted a 24-hour low air flow rate ventilation system which discharges dirty indoor air and replaces it with fresh air, creating a low flow rate air current in the dwelling as a whole. This prevents indoor contamination by chemical substances, condensation, mold, insect infestation, and other problems. People-friendly building materials are also used, including a non-formalin-type wall-paper adhesive which does not generate formaldehyde.



Concept of 24-hour low air flow rate ventilation system

•Environment-friendly Urban Design

JFE is providing environment-friendly space which creates new value, as seen in the Yamanouchi Pier Redevelopment Project underway at the Yamanouchi Pier in Yokohama, the Orto Yokohama Project at Shin-Koyasu Station (also in Yokohama), the Techno Hub Innovation Kawasaki (THINK) Science Park for corporate research and development, and other projects.

<http://www.jfe-ud.co.jp/> (Japanese Only)



Cotton Harbor Towers in Center Zone of Yamanouchi Pier Redevelopment Project (artist's conception)

Research & Development of Environmental Technologies

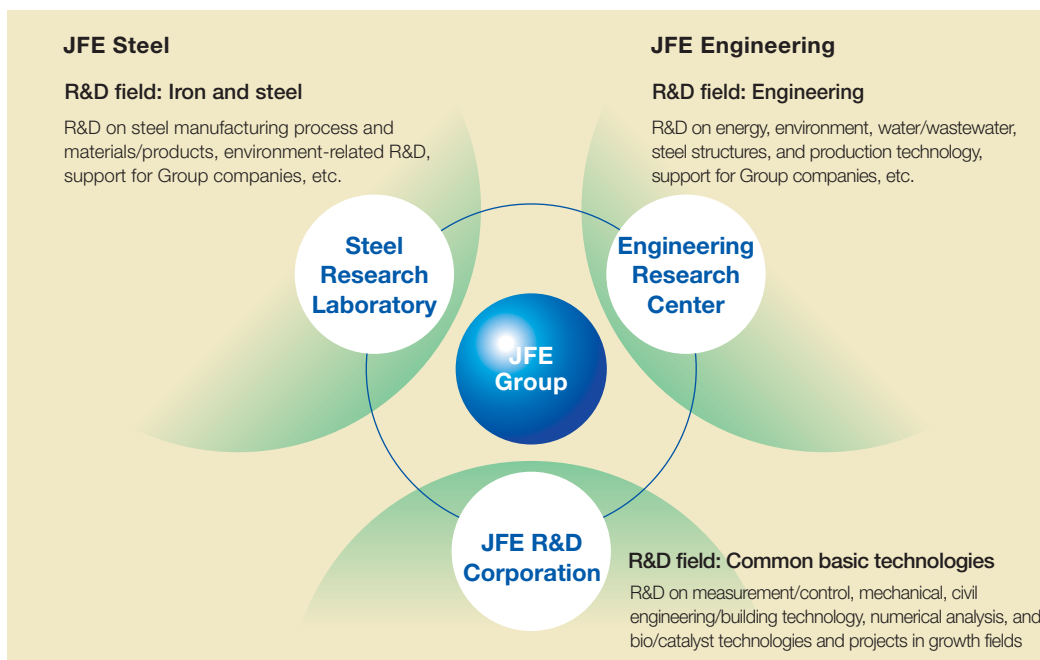
Research & Development of Environmental Technologies

JFE Group organized the three-laboratory system in April 2003 with the Steel Research Laboratory, the Engineering Research Center, and JFE R&D Corporation.

The Steel Research Laboratory and the Engineering Research Center were organized in JFE Steel and JFE Engineering respectively with the aim of integrating the three functions of development, manufacturing, and sales. To maximize synergies in the JFE Group as whole, R&D on basic technologies common to steel and engineering is concentrated in JFE R&D Corporation.

The goals of R&D in the JFE Group are to develop “Only 1” and “No. 1” products/technologies, and JFE Group is conducting advanced R&D on environmental technologies such as for preventing global warming and zero-emission as well as on topics which will provide the foundation for future businesses.

•JFE Group R&D Organization



New Low-CO₂ Sintering Process (Steel Research Laboratory)

In the steel manufacturing process, pig iron is produced by chemically reducing iron ore, using carbon raw material as a reducing agent. The JFE Steel Research Laboratory is grappling with the development of technologies which reduces CO₂ generated in this process, and has already developed various ironmaking processes which are effective in reducing CO₂ generation, including a “waste plastic recycling system for blast furnace feed” which utilizes waste plastic as a reducing agent and a “blast furnace natural gas blowing” which uses natural gas as a reducing agent for iron ore.

JFE researchers have also developed an innovative partial-reduction sintering process which is expected to substantially reduce consumption of reducing agents in the blast furnace. In the new process, iron ore is partially reduced in the sintering process in which fine iron ore is agglomerated before charging into the blast furnace. The possibility of producing partially-reduced ore has already been confirmed in a continuous sintering simulator which simulates the actual equipment, and development of a practical technology which considers productivity requirements is now underway.



Continuous sintering simulator

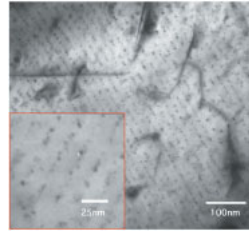
<http://www.jfe-steel.co.jp/en/research/syoukai.html#syoukai05>

“NANO HITEN” (Steel Research Laboratory)

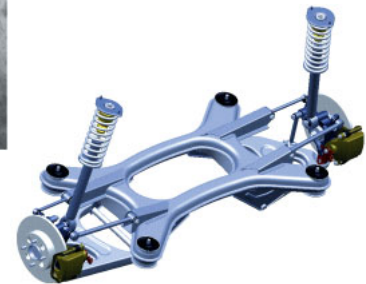
Steel products are contributing to the prevention of global warming in every area of society. Technical development to improve the steel products, for example, by weight reduction and longer life of car, is necessary for reducing CO₂ emissions when products made from steel are used in the society. The Steel Research Laboratory has developed a variety of environment-friendly products such as high tensile steel sheets (HITEN) and electrical steel sheets to contribute to the improvement of the global environment.

In the field of automotive materials, the JFE Steel Research Laboratory developed NANO HITEN to improve fuel economy by reducing automobile body weight. NANO HITEN is an outstanding product which broke through the limit of the size of precipitates (order of 10⁻⁶m) applied in the conventional HITEN, realizing the microstructure with the nanometer size precipitation (10⁻⁹m). Because NANO HITEN offers a combination of high strength and excellent formability, it is possible to reduce the thickness of steel sheets even further than with the con-

ventional HITEN while maintaining crashworthiness of automobiles. NANO HITEN contributes to improve fuel economy by enabling auto body weight reduction. JFE is now engaged in R&D on NANO HITEN products with higher performance.



Nano size precipitates in NANO HITEN



Example of parts using NANO HITEN

<http://www.jfe-steel.co.jp/en/research/syoukai.html#syokai09>

Research & Development of Gas Purification Technology for Biomass Gasification Process (Engineering Research Center)

The gas formed in the biomass gasification process contains dust and tar. A technology for removing these substances is a key point for the development of gas purification technology for this process to realize high efficiency power generation.

The Engineering Research Center has developed unique gas purification technologies including a tar removal technique using high-functional carbonaceous materials for woody biomass, and a dust removal technique using ceramic filters for mixed biomass (woody biomass, food waste, paper, agricultural residue, sludge, etc.). (This is a joint research with NEDO).



Gas purification test plant

Technology for Optimization of Logistics Network in Waste Recycling (JFE R&D Corporation)

To encourage recycling of plastic containers and packaging and regional waste treatment plans, JFE R&D Corporation constructed a support system for efficient recycling and planning/operation of regional networks of treatment centers based on a demonstration of cost/environmental impacts by collection/treatment optimization evaluation. After selecting appropriate locations from among candidate treatment facility areas,

- (1) The proper treatment area and treatment amounts of respective candidate facilities are decided,
- (2) A total treatment center network for various types of waste including burnable waste, containers and packaging waste, and others is created, and

- (3) Quantitative information (collection cost, number of trucks, etc.) is evaluated to determine the most efficient logistics system and service routes.

Through this process, it is possible to make proposals for the construction of regional recycling networks and collection/treatment operating plans which minimize environmental impacts and costs. Operating plans for so-called “inverse logistics” (return of used products for recycling, as opposed to “supply chain logistics”) are particularly difficult to create. This JFE technology realizes high efficiency in inverse logistics, reducing CO₂ generation in the recycling process.

<http://www.jfe-steel.co.jp/research/giho/006/11.html>

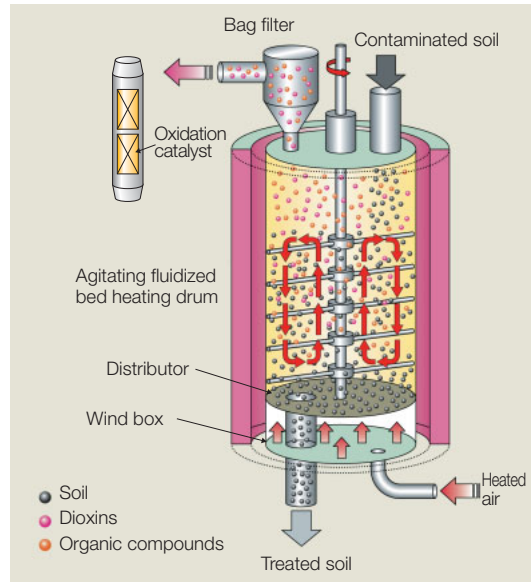
R&D of Environmental Technology

Removal of Dioxins from Contaminated Soil by “High Clean DX” (Engineering Research Center)

The Engineering Research Center has developed a technology for removal of dioxins from contaminated soil using the “High Clean DX” which has already been commercialized as a technology for removal of dioxins from fly ash.

In the High Clean DX system, other organic compounds are removed from soil simultaneously with dioxins by heating under a flow of high temperature air. Organic compounds including dioxins are desorbed and/or volatilized to the gas phase, and are then decomposed by the catalyst with high oxidation activity. Because this technology employs an agitating fluidized bed heating drum with extremely high heating efficiency, power consumption for heating is reduced and a compact equipment design is possible. Removal of dioxins contained in bottom sediment from closed water bodies is also possible.

This technology has received a high evaluation as an environmental purification device and was awarded the WASTEC Organizing Committee Chairman’s Special Award in 2004.



Structure of High Clean DX

http://www.jfe-eng.co.jp/en/en_r_d/en_r_d_env.html

List of Research and Development Projects

Development Completed (Already Commercialized)		Under Development
<ul style="list-style-type: none"> ● Preventing Global Warming <ul style="list-style-type: none"> · Non-oriented electrical steel sheets for high efficiency motors · Grain-oriented electrical steel sheets for high efficiency transformers · High tensile strength steel sheets (NANO HITEN) (780 MPa grade) · High purity silicon ingot for solar cells · Environment-friendly regenerative burner · Clathrate hydrate slurry (CHS) latent heat air-conditioning system · Circulating fluidized bed (CFB) furnace for sewage sludge ● Building a Recycling-oriented Society <ul style="list-style-type: none"> · High-temperature waste gasifying & direct melting · JFE THERMOSELECT gasifying & melting · Electric resistance municipal waste incinerator ash melting · Plasma ash melting · Next-generation stoker furnace (Hyper 21 Stoker System) · JFE hybrid activated carbon · Waste plastic recycling system for BF feed · Waste-to-resource recycling system · RDF*1 (Refuse Derived Fuel) carbonizing system · Effective use of landfill site/gasification and melting of disposed waste · Acid fermentation system of sewage sludge · NF board (Flame plastic board for concrete) 	<ul style="list-style-type: none"> ● Reducing Environmental Loads <ul style="list-style-type: none"> · Free-cutting steel without Pb · Chromate-free coated steel sheets · Fly ash dioxin treatment (High Clean DX) · Reducing technology for dioxins in flue gas (Gas-Clean DX) · Environment-friendly high-efficiency arc furnace (ECOARC) · Advanced sewage treatment system using microorganism carriers (Bio-Tube, Pegasus) · Lake & river purification equipment (River-Float) · Accelerated oxidizing treatment system (AOP more) · Simulation of biological reactions · Soil contamination 3-D imaging system · Slag recycling technologies · Low-dioxin combustion control system · Waste incinerator operation training simulator · Dioxin precursor analyzer · New dioxin analysis method · Automatic monitoring system for heavy metals 	<ul style="list-style-type: none"> ● Developing Clean Energy <ul style="list-style-type: none"> · Mass production technology for new clean energy source – DME · High efficiency fuel cell – SOFC · Natural gas hydrate ● Building a Recycling-oriented Society <ul style="list-style-type: none"> · 100% recycling technology for waste stainless steel pickling acid · Biomass CFB gasification and power generating technology · High efficiency power generation using waste · High efficiency methane fermentation system ● Preventing Global Warming <ul style="list-style-type: none"> · New low-CO₂ sintering process · High tensile strength steel sheets (NANO HITEN) (980 MPa grade, etc.) · Slag recycling technology (Marine Block) · Innovative ironmaking technology using Float Smelter ● Reducing Environmental Loads <ul style="list-style-type: none"> · Low-sludge biological water treatment technology · Ballast water treatment technology · Polluted soil purification system

*1) RDF (Refuse Derived Fuel):

Solid fuel made from flammable waste after crushing and compression forming

International Cooperation

International Cooperation through Environmental Technologies

Problems related to energy and greenhouse gases (GHG), as represented by global warming, have become the focus of intense concern as global level issues. As a good citizen in the world community, JFE has carried out numerous energy saving and GHG reduction projects which contribute to sustainable growth in the developing nations.

The technologies and know-how which JFE Group companies have supplied to date are making important contributions to both economic growth and environmental protection in the developing nations. JFE also envisions active participation in CDM*¹ and JI*² projects in the future as part of its commitment to transferring and popularizing environmental technologies across national borders.

*1) CDM:

Clean Development Mechanism. Mechanism supporting sustainable development and achievement of targets of the Framework Convention on Climate Change by signatory developing nations and achievement of quantitative targets by signatory advanced nations. Under CDM, the developing nation receives a monetary profit from implementation of projects which reduce emissions of GHG, and the advanced nation uses the reduction achieved by the project to achieve its target.

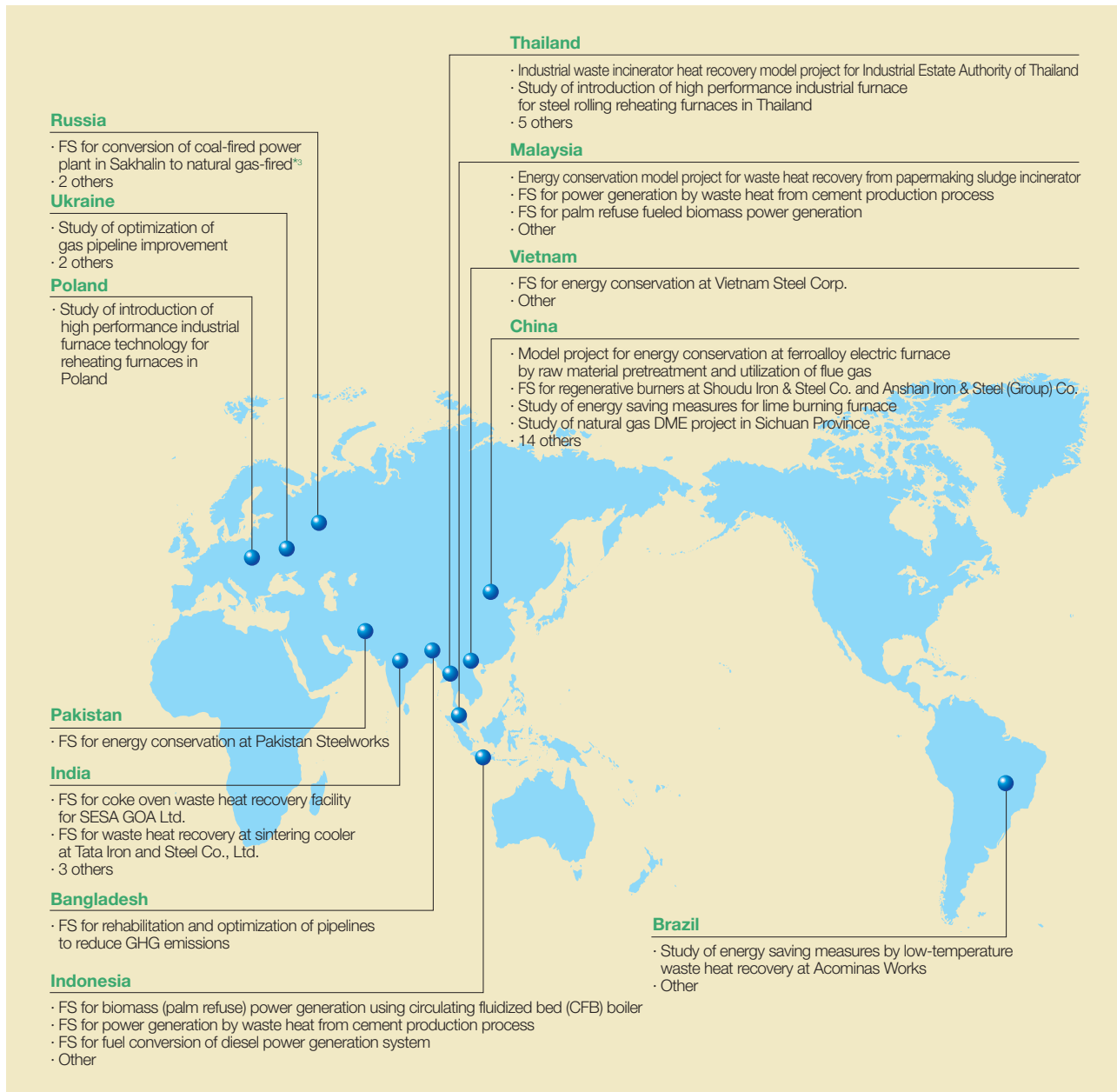
*2) JI:

Joint Implementation. Mechanism for achieving the target quantitative values for emissions of global warming gases as specified under the Kyoto Protocol. In cases where a signatory advanced nation carries out a reduction project in another advanced nation, part of the emission reduction achieved by the project is counted as a reduction in the first nation.

*3) FS:

Feasibility Study. Study or survey implemented to determine feasibility of the project or business.

World Map of International Cooperation Projects by JFE Group



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JFE Group Standards of Business Conduct

All JFE Group executives and employees will faithfully adhere to the following Standards of Business Conduct in all facets of corporate activities. These standards were created to embody the Corporate Vision of the JFE Group and go hand-in-hand with the Corporate Values.

Senior executives are to take the lead in communicating these standards to employees throughout the group and in creating effective systems and mechanisms to ensure adherence to corporate ethical standards.

Senior executives shall be directly involved both in the resolution and implementation of measures to prevent the recurrence of any violations of these standards. They shall disclose information about violations in a timely and accurate manner both inside and outside the group, shall clarify the authority and accountability involved and shall deal rigorously with offenses.

1. Provide quality products and services

Earn the trust and regard of customers by endeavoring to provide quality products and services based on superior technology and by fully respecting and protecting the privacy of personal and customer information.

2. Be open to society at large

Endeavor to communicate with shareholders and the broader community, and actively disclose corporate information.

3. Coordinate and cooperate with the community

Actively contribute to the community as a good corporate citizen in a spirit of coordination and cooperation.

4. Globalize

Endeavor to achieve mutual understanding with people around the world, working from global perspectives and respecting local cultures and customs.

5. Exist in harmony with the global environment

Contribute to the achievement of better living standards and the creation of societies that exist in harmony with the global environment.

6. Maintain proper relations with government and political authorities

Endeavor to build and maintain sound and proper relationships with government and political authorities.

7. Respond appropriately to anti-social elements

Firmly resist all elements and organizations that threaten social order and stability, and refuse all illegal and improper demands.

8. Respect human rights

Respect all employees and members of the general public as individuals and refrain from any and all discrimination in corporate activities.

9. Provide challenging work environments

Provide employees with attractive, safe and challenging work environments.

10. Comply with laws and ordinances

Comply with all applicable laws and ordinances, endeavor to compete fairly and freely, refrain from illegal business activities, promote sound business practices, and be faithful and sincere in all activities and dealings.

Community Involvement

Governance and Compliance

Management Organization

To enable us to construct the most effective operational and executive systems, we have adopted a holding-company structure for consolidated management of the JFE Group through centralized governance. The group holding company, JFE Holdings, is responsible for group-wide strategy, risk management and external accountability. We employ “corporate officer” systems to separate decision-making and execution, clarify lines of authority and responsibility and accelerate the execution process itself.

Internal Governance and Risk Management Mechanisms

Regarding matters of joint concern to the JFE Group, such as the environment, technological development and IT issues, we hold group meetings that cut across divisional boundaries to generate synergy through greater efficiency and total group strength.

Each group company has standards for determining the degree of confidentiality for specific information, and for applying corresponding levels of security management. These standards determine how information is handled within the company in question and the conditions under which it can be shared with other companies.

In risk management, corporate officers are tasked with identifying potential risk management issues for each division they oversee. Important issues are brought before the Management Committee and other bodies for deliberation.

Compliance Mechanism

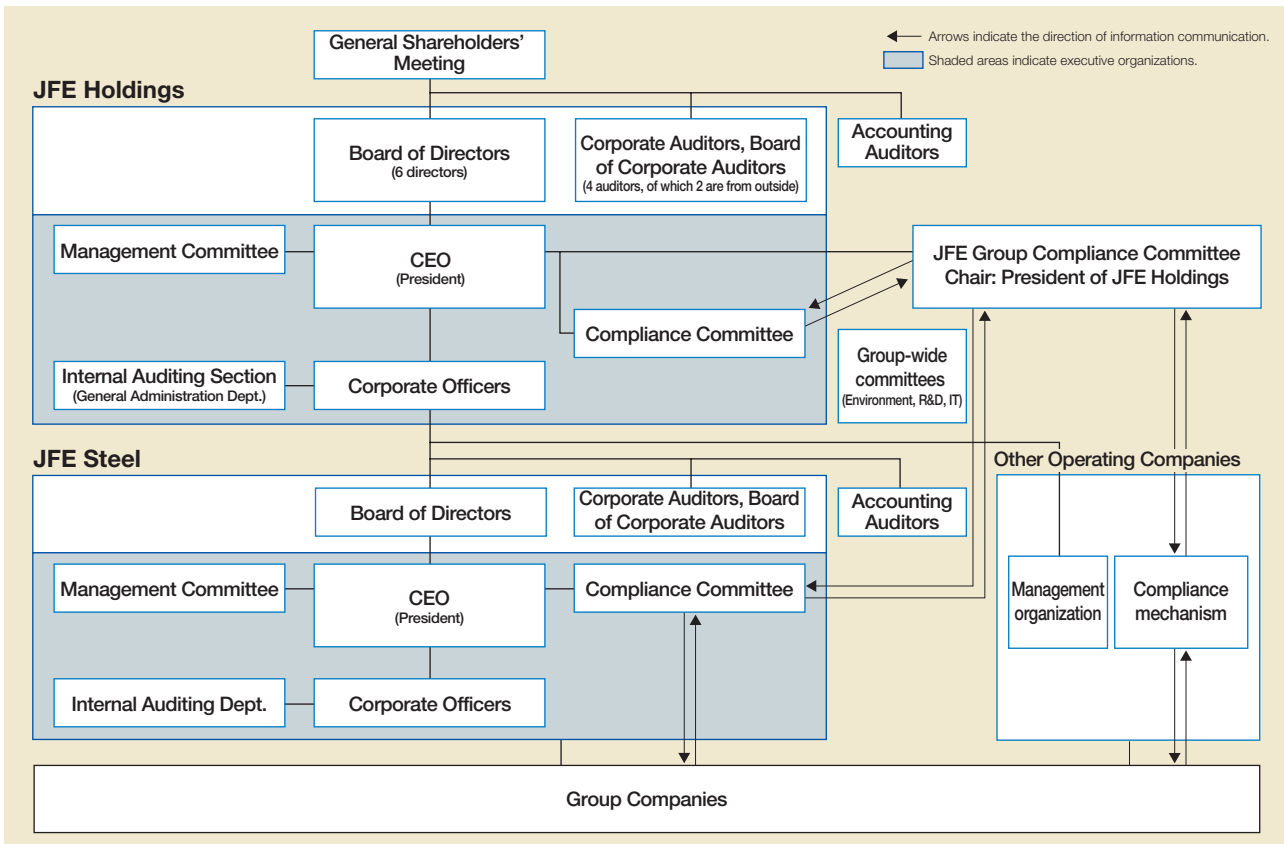
Given that compliance is at the heart of corporate social responsibility, JFE’s corporate vision and code of conduct make compliance one of the highest priorities of management.

The JFE Group Compliance Committee, a key mechanism for supervising and furthering appropriate business, is chaired by the president of JFE Holdings and meets quarterly to discuss the group’s basic policies and other important issues, as well as to monitor compliance. JFE Steel, JFE Engineering and other operating companies have similar compliance committees to oversee their specific activities.

In addition, a Corporate Ethics Hotline enables employees to communicate important compliance-related matters directly to senior executives.

In April 2005, JFE Steel established a CSR Section to better address the entire range of ethical and social issues related to the company, including compliance, the environment, safety, human rights and working conditions.

• Management Organization and Compliance Mechanism



Community Involvement

Philanthropic Activities

Support and Funding by the JFE 21st Century Foundation

The JFE 21st Century Foundation was established in 1990 with a view to achieving public transparency and fostering shared prosperity with society at large. The Foundation provides funding support for surveys and technical research for developing the steel industry and related industries, and engages in projects for regional development and international cooperation related to the steel industry.

• Supporting technical research at universities

In FY2004, the JFE 21st Century Foundation provided 25 projects with grants of two million yen each. From a total of 205 grant applications from 69 universities nationwide, the Foundation selected 16 research projects related to steel technology, and nine related to environmental technology. Of the latter, four projects concern energy technologies, four concern environmental protection and remediation, and the other is about biomass technology. All are promising areas of research with prospects for commercialization in the near future. In the 14 years since its inception, the Foundation has provided a total of 540 million yen in research grants to 267 projects.

• Publishing and donating science books

As one of its FY2004 initiatives, the JFE 21st Century Foundation published two science books on steel and the history of steel-making in Japan^{*1}, with the aim of stimulating scientific interest in steel among school pupils and the general public. The books were donated to middle schools, high schools, and public libraries primarily in regions where the JFE Group has production centers (approximately 1,500 recipients in total).

In addition, the Foundation donated a collection of winning entries from a creative writing competition for Japanese children living overseas, which it has helped fund since its inception in FY1991. The competition is sponsored by the Japan Overseas Educational Services and supported by the Ministry of Foreign Affairs and Ministry of Education, Culture, Sports, Science and Technology among others. Entitled "Learning from the Earth," the collection was gifted to elementary and middle schools, to public libraries and other institutions.

For these activities, the Foundation received letters of appreciation from seven cities and towns including Yokohama City.



JFE 21st Century Foundation website
<http://www.jfe-21st-cf.or.jp/>
 (Japanese Only)



Some of the donated books

Support for Practical Education

The JFE Group participates actively in local activities and places importance on close contact with the community.

JFE Steel's Chita Works holds a number of events, including craft courses for local elementary students and the Handa Community Industrial Festival hosted in conjunction with Handa City, the Chamber of Commerce and Industry, and Japan Agricultural Cooperatives.

JFE Engineering's Tsu Works supports various activities for students at technical high schools in the prefecture, such as helping run a robotics competition, providing educational materials on welding materials and other subjects free of charge, and hosting seminars on leading-edge technology.



Chita crafts class



Robotics competition

*1) "Tatara-Japanese traditional steelmaking technology" and "Iron & steel-Old but still progressing material"

Support for Sports Activities

JFE Steel's East Japan Works (Keihin) hosted the JFE Excite Match, a home game for the J League Kawasaki Frontale soccer team to which neighboring residents and youth sports groups were invited, and participated in the "Community Circle," a major sports tournament held in a neighboring region which attracted more than 2,000 people.

The East Japan Works (Chiba) held numerous sports tournaments, including a family volleyball tournament and children's baseball games, with a total of 4,000 local residents and other people participating. The Chita Works held a JFE Junior Soccer Christmas Cup tournament in which 36 elementary-school teams took part from within and outside Aichi Prefecture.



Volleyball tournament



JFE Junior Soccer Christmas Cup

Support for Cultural Activities

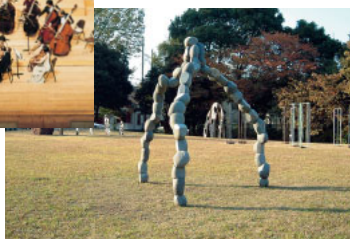
The JFE Group supports local cultural and arts activities, assisting in building a fulfilling local community.

Since 1991, we have supported the Kurashiki Music Festival held by the Kurashiki Cultural Promotion Foundation. In FY2004, performances by finalists in the Tchaikovsky Competition delighted audiences.

Another event was the Kawasaki Contemporary Sculpture Exhibition 2004, held within the Techno Hub Innovation Kawasaki (THINK) managed by JFE Urban Development. This outdoor sculpture exhibition is a project that challenges and breathes new life into practical design concepts from the perspective of a coastal industry complex, and explores the Kawasaki built environment from various angles while deepening relationships with the community.



Kurashiki Music Festival



Kawasaki Contemporary Sculpture Exhibition 2004

Open-day Events at the Steelworks

For the enjoyment of local residents, JFE Steel holds open-day events every year at each of its steelworks.

In FY2004, a total of four festival days were held, with more than 300,000 people taking part. For example, the West Japan Works held a JFE West Japan Festival in Fukuyama (153,000 participants) and a JFE West Japan Festival in Kurashiki (100,000 participants).

JFE Steel has also established Visitors' Centers in its steelworks to encourage better understanding of its operations, and some 500,000 local elementary and middle school students and the general public tour the facilities annually. The company also makes its gymnasiums and athletic grounds available to local community groups.



JFE West Japan Festival in Kurashiki



Touring a steelworks

Support for Local Welfare Organizations

JFE Engineering's Tsurumi Engineering and Manufacturing Center participates in the Tsurumi Coastal Festival. It also sells recyclable goods collected at the center and donates the proceeds to the Tsurumi Social Welfare Association.

Disaster Relief

The JFE Group gave 23.7 million yen to the victims of the Niigata Chuetsu earthquake and contributed 20 million yen to supporting victims of the Indian Ocean tsunami.

Community Involvement

Employee Relations

Hiring Practices

The JFE Group uses fair and equitable selection criteria in hiring staff. In our recruitment activities, proper attention is paid to class timetables out of respect for school education.

By actively recruiting mid-career workers, JFE Group endeavor to recruit a wide range of talented personnel.

• JFE Steel labor force as of end of March, 2005

Total employees*	13,846(male 12,869; female 977)
Average age	42.9
Average length of service	22.4 years

* Excludes 9,887 employees on transfer to subsidiaries.

• JFE Steel recruitment in FY2005

234 new employees entered the company in April 2005.

Another 48 mid-career and other personnel joined in FY2004.

Equal Opportunity Employment Practices

The JFE Group is dedicated to creating a working environment that allows every employee to use his/hers abilities and gain job satisfaction. Our personnel and salary system ensures that staff abilities and performance are evaluated fairly and that employees are treated appropriately. A curriculum covering various types of training has been set up so that every employee can further their skills and knowledge on an ongoing basis.

JFE Group is constantly improving its childcare and nursing leave schemes, and its employment, health and welfare programs, so that staff can work with peace of mind.

Re-employment of Older Workers

JFE Steel provides a wide range of work opportunities to older employees who have excellent skills and technical abilities. The company has extended employment by two years at present, by actively re-employing as "senior experts" those who want to keep working beyond retirement age. Further development of the re-employment scheme is planned, in line with revisions to the Law for Stabilization of Employment for Older Persons.

• JFE Steel re-employment at April, 2005

Number of re-employed staff 263

Employment of People with Disabilities

The JFE Group puts a great deal of effort into supporting the employment of people with disabilities.

JFE Steel has established two special subsidiaries, JFE Apple East Corp. and JFE Apple West Corp., at its two steelworks as one way of actively getting disabled people into jobs, and is focused on creating workplaces that are easy to work in.

JFE Engineering promotes employment of people with disabilities at its special subsidiary, Mie Data Craft Co., Ltd. The company is also building barrier-free workplaces and dormitories.

• JFE Steel disabled employment rate

June 2003	1.66%
June 2004	1.73%
June 2005	1.86%



Barrier-free entrance



Barrier-free toilet

<http://www.mdc-web.com/> (Japanese Only)

Human Rights Education System and Policies

Each operating company in the JFE Group has a staff member assigned to planning and implementing human rights education. These duties are carried out on a full-time or part-time basis, depending on the size of the company.

At JFE Steel, a Human Rights Education Committee set up under the Compliance Committee is in charge of instilling respect for human rights. The basic policies behind that effort include (1) sustained implementation of a human rights education program within the company; and (2) guaranteed equal opportunity of employment and fair personnel management.

JFE Steel aims to foster employees who have a proper understanding and awareness of the whole range of human rights issues and can behave ethically as company employees and as members of society. The company actively promotes role-specific and workplace-based training, and strives to ensure its corporate practices in all employment and personnel management affairs are fair and impartial.

• JFE Steel human rights education program

Type of training	Attendees	Number of courses held
Director and executive training	Directors and general managers	1
Role-specific training	New entrants, new managers, etc.	32
Works-specific training	Directors, managers, staffs, etc.	22
Campaign leadership training	Managers, group companies, etc.	8
Group company training	Managers and staffs	9
Total		72

Total attendees 2,800 approx.

Sexual Harassment Prevention

The JFE Group has a number of initiatives to prevent sexual harassment. Rules are stipulated in the work regulations, courses are held, posters are displayed, and male and female counseling services have been set up at each production center.

Other Educational Activities

The JFE Group distributes messages from management during Human Rights Week utilizing its corporate intranets. We have also held a human rights slogan competition (3,356 entries) and published human rights educational material on our website.

Industrial Health and Safety

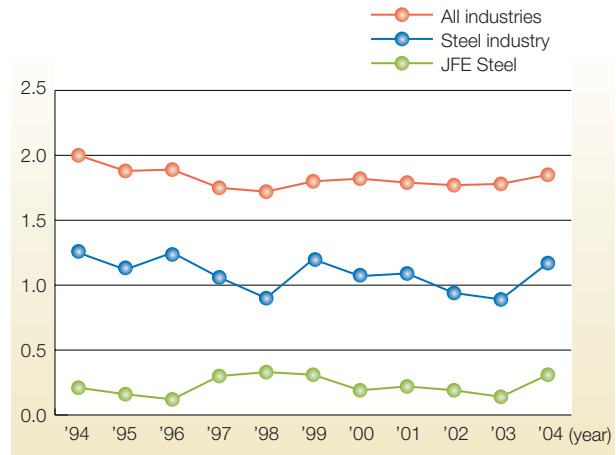
There is no question that ensuring safety is fundamental to the manufacturing industry and is the basis of corporate viability.

Since its establishment, JFE Steel has been fully committed to safety practices in line with our basic philosophy that all accidents are preventable and must be prevented absolutely.

The rate of accidents causing absence from work has been on the decline at JFE Steel since 1998. Unfortunately, the rate worsened in 2004 over the previous year, but we are implementing improvements at all levels, including plant and equipment, work practice, and human factors. We are making ongoing efforts to raise everyone's risk awareness and to create safe workplaces free of industrial accidents.

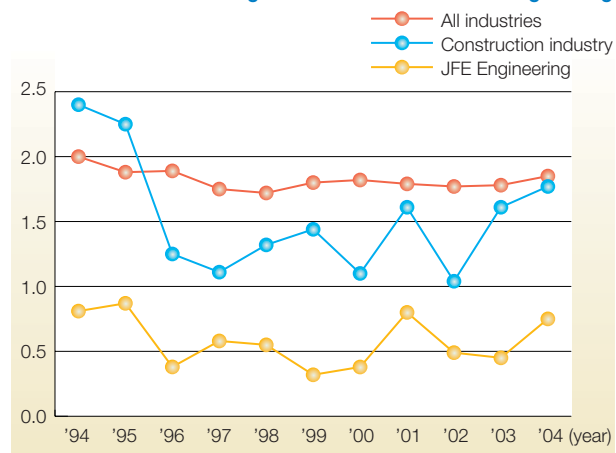
JFE Engineering is endeavoring to create safe working environments at its manufacturing plants and to prevent accidents at construction sites.

• Rate of accidents causing absence from work at JFE Steel



Note: Figures up to 2002 for JFE Steel are the totals for the Steel Divisions of the former Kawasaki Steel Corp. and NKK Corp.

• Rate of accidents causing absence from work at JFE Engineering



Note: Figures up to 2002 for JFE Engineering are the totals for the Engineering Divisions of the former Kawasaki Steel Corp. and NKK Corp.

Community Involvement

Customer Relations

Privacy Policy

In accordance with the Personal Information Protection Law, which came into force in April 2005, the JFE Group formulated the following JFE Group Privacy Statement on measures to protect personal information across the whole Group, and is working to further improve its management system.

JFE Group Privacy Statement

JFE Holdings, Inc. and the JFE Group companies in Japan ("the JFE Group" hereinafter) have formulated the following policies on the handling of personal information to facilitate the smooth and appropriate administration of Group operations.

1. Basic policies on the protection of personal information

- 1) The JFE Group will, in light of the growing use of personal information resulting from advances in data communications, endeavor to protect the rights and interests of the individual while also respecting the utility of the personal information it holds.
- 2) The JFE Group will observe the "Law concerning the Protection of Personal Information" and all other relevant laws and ordinances, and will endeavor to adhere to both the spirit and the letter of the law as it protects personal information.
- 3) The JFE Group will endeavor to appropriately protect personal information by formulating internal rules on the management of personal information and by informing, educating and training its employees on these rules and on all applicable Japanese laws and ordinances. The JFE Group will also review and improve this privacy statement and internal rules on an on-going basis.

2. Policies regarding the collection and use of personal information

- 1) Designation of purposes, appropriate collection and use activities
The JFE Group will, when handling personal information, endeavor to designate the purpose of use as specifically as possible and will not collect or use personal information beyond this purpose without the prior consent of the individual. The JFE Group will not use falsehoods or other illicit means to collect personal information.
- 2) Appropriate safety management
The JFE Group will endeavor to maintain the accuracy of the personal information it has collected and will take necessary and appropriate measures to prevent illicit access to personal information, disclosure, loss or modification of personal information and other forms of damage and injury. It will also provide necessary and appropriate supervision to employees and service providers handling personal information to ensure that personal information is managed in a safe and appropriate manner.
- 3) Provision to third parties and joint use with third parties
The JFE Group will not furnish personal information to third parties without the prior consent of the individual. In the event that the JFE Group uses personal information jointly with third parties, it will notify the individual and/or publish all matters required by applicable Japanese laws in advance.
- 4) Disclosure, correction, suspension of use and handling of complaints
The JFE Group will deal appropriately and as required by applicable Japanese laws with requests from the individual for the disclosure, correction, addition, deletion or suspension of use of personal information regarding him or her. The JFE Group will also deal appropriately and speedily with complaints regarding the use of personal information.

3. Contact

All inquiries regarding the handling of personal information should be addressed to the General Administration Dept. of JFE Holdings or to the responsible departments listed on the websites etc. of individual JFE Group companies.

Authentication System Based on Finger Vein Biometrics

To further strengthen the protection of personal information, JFE Urban Development has installed security doors that use a biometric authentication system (based on blood vessel patterns in the finger) at all entrances to the four rooms where customer information is stored. The system enables personal information to be managed more safely. It provides better security than the numeric keypad normally used, and access logs can be recorded.



Authentication system based on finger vein biometrics

Customer Center

The JFE Group seeks to enhance customer satisfaction and has several measures to foster better communication with customers. One such measure is the establishment of a Customer Center by JFE Urban Development. Replacing the former contact point for condominium after-sales services, the Customer Center provides a full range of services in rapid response to customer needs. It is also putting in place new initiatives that have come out of direct communication with customers.



Customer Center

•Customers' Solution Laboratory: Working with customers to create future automotive steel materials

In August 2005, the Customers' Solution Laboratory opened within the JFE Steel Research Laboratory. Conceived as an R&D marketing center for the automotive segment, the laboratory is Japan's first co-work facility for forging the future of automobiles, encompassing disassembled vehicles, parts and materials, in collaboration with engineers at participating automakers. As well as providing an opportunity for auto engineers to exchange ideas and co-develop technologies with the researchers at JFE Steel Research Laboratory, the facility holds great promise as a crucible for developing new processing technologies to explore the potential of steel materials.



Customers' Solution Laboratory

● Environment-friendly Products and Technologies

Preventing Global Warming



■ JFE EWEL

Technology which improves the toughness of steel plates in large heat input (high efficiency) welding. Contributes to high efficiency construction of tankers carrying low-CO₂ emission LPG and safe transportation of LPG.

<http://www.jfe-steel.co.jp/en/products/plate/youto01.html>

Preventing Global Warming

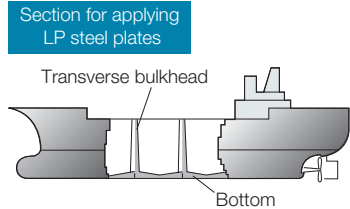


■ 9%Ni Steel for Cryogenic Service

Natural gas, which generates little CO₂ when burned, is transported and stored at cryogenic temperatures (-163°C or lower). JFE's steel for cryogenic service contributes to safe transportation/storage of LNG.

<http://www.jfe-steel.co.jp/en/products/plate/youto05.html>

Preventing Global Warming



■ Longitudinally-Profiled (LP) Steel Plates

Plates with continuous change of thickness in the longitudinal direction. By reducing the number of weld lines in steel structures, LP plates reduce CO₂ emissions by reducing energy consumption in welding.

<http://www.jfe-steel.co.jp/en/products/plate/catalog/c1e-001.pdf>

Preventing Global Warming



■ SP-700 (High Strength Titanium Alloy)

Automotive connecting rods made from JFE's high strength Ti alloy SP-700 reduce automobile weight, thereby improving fuel economy.

<http://www.jfe-steel.co.jp/en/products/titanium/index.html>

Preventing Global Warming



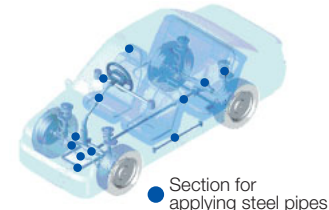
■ High Strength Steel for Penstocks

Hydro power is a typical example of renewable energy. JFE Steel supplies high strength steel for penstocks with the high strength necessary for hydro power generation, helping to realize high generating efficiency.

<http://www.jfe-steel.co.jp/en/products/plate/youto07.html>

Preventing Global Warming

Reducing Environmental Loads

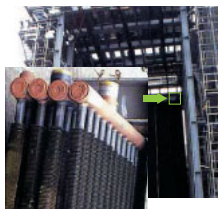


■ Automotive Steel Pipes

JFE Steel's unique HISTORY Pipes and other high formability ERW steel pipes contribute to automotive weight reduction by providing high strength in combination with high formability, and also have excellent recyclability.

<http://www.jfe-steel.co.jp/en/products/pipes/catalog/e1e-002.pdf>

Preventing Global Warming



■ High Cr Boiler Tubes

Taking advantage of the respective properties of carbon steel, alloy steels, and stainless steel, JFE Steel produces boiler tubes which reduce CO₂ emissions in natural gas-fired thermal power generation.

<http://www.jfe-steel.co.jp/en/products/pipes/catalog/e1e-011.pdf>

Preventing Global Warming

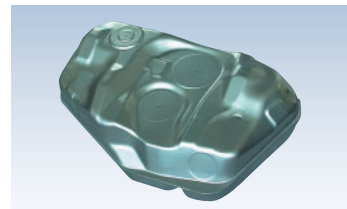


■ Martensitic Stainless Steel for Disk Brakes: JFE410DB

Material which eliminates the need for tempering after quench hardening of stainless steel for motorcycle disk brakes. Contributes to preventing global warming by saving energy necessary for tempering.

Preventing Global Warming

Reducing Environmental Loads



■ High Corrosion-resistance/Ultra-high Formability Ferritic Stainless Steel: JFE-SX1

By applying high strength, high corrosion-resistance stainless steel as material for automotive fuel tanks, fuel economy can be improved by using thinner material (possible due to high strength) and paint consumption can be reduced because painting can be omitted.

Environment-friendly Products and Technologies

For a Recycling-oriented Society



■ Clad Products (Stainless Steel)

Clad products are hybrid steel plates which combine a high strength carbon steel substrate and high alloy steel cladding, such as stainless steel, with excellent corrosion resistance, thereby satisfying both resource saving and high performance requirements. Examples of use include seawater desalination plants, etc.

<http://www.jfe-steel.co.jp/en/products/plate/catalog/c1e-009.pdf>

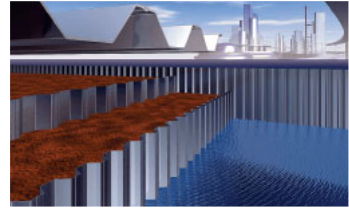
For a Recycling-oriented Society



■ Super KING Construction Method

New foundation construction method which reduces surplus soil discharged at the ground surface while realizing a large bearing capacity by simultaneous excavation/rotating when driving steel pipe piles. Contributes to reduction of environmental loads during construction by reducing surplus soil.

For a Recycling-oriented Society



■ Hat-shaped Steel Sheet Pile 900

New hat-shaped steel sheet pile with an effective width of 900 mm. Contributes to resource saving by reducing the mass of steel per unit of wall area by 7-29%, while also securing performance equivalent to that of wide sheet piles.

<http://www.jfe-steel.co.jp/en/products/shapes/catalog/d1e-501.pdf>

Reducing Environmental Loads



■ Universal Brite – Type E

Reduces environmental loads and total cost by eliminating the painting process with 18l cans and pail cans. Has good resistance to scratching and resistance to a wide range of contents from acid to alkaline.

<http://www.jfe-steel.co.jp/en/products/sheets/catalog/b1e-006.pdf>

Reducing Environmental Loads



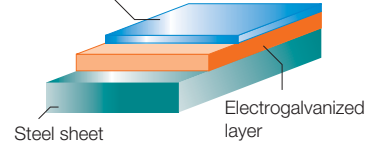
■ Chromate-free Steel Sheet JC

Anticipating trends in environmental regulations, this product features a coating treatment using a chromate-free film which contains no hexavalent chromium. In addition to high corrosion resistance, spot welding is also possible.

<http://www.jfe-steel.co.jp/en/products/sheets/aenmekki/JC.html>

Reducing Environmental Loads

Chromate-free zinc phosphate treatment film



Coating film structure

■ Chromate-free Steel Sheet JP

The optimum product for materials which require high paint adhesion by using a chromate-free zinc phosphate treatment film with excellent paintability. Also has excellent corrosion resistance after painting.

<http://www.jfe-steel.co.jp/en/products/sheets/denki-aen/index.html>

Reducing Environmental Loads

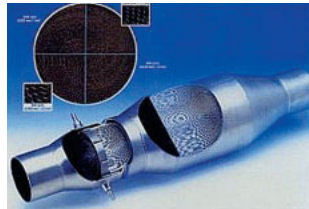


■ High Performance, High Strength Linepipe

For transportation of natural gas, which is a form of clean energy, JFE Steel supplies high strength, high reliability linepipe using UOE and ERW pipe, making full use of the company's state-of-the-art steelmaking and rolling technologies.

<http://www.jfe-steel.co.jp/en/products/pipes/linepipe/index.html>

Reducing Environmental Loads



■ Ultra-high Heat-resistance Ferritic Stainless Steel foil for Metal Honeycomb: JFE20-5USR

Ultra-high heat-resistance material for use in the metal honeycomb of catalytic converters for automotive exhaust gas purification. It has excellent heating-up performance during cold starts, and enables the catalyst to function instantaneously.

Reducing Environmental Loads



■ Steels for Offshore Structures

JFE's steels for offshore structures improve the safety and reliability of offshore structures which are indispensable in the development of undersea resources (crude oil, natural gas), and thereby contribute to preventing marine pollution due to oil spills, etc.

<http://www.jfe-steel.co.jp/en/products/plate/catalog/c1e-010.pdf>

Reducing Environmental Loads



■ Ni-type High Performance Weathering Steel

Featuring high atmospheric corrosion resistance, this weathering steel can be used in bridges without painting, even in the areas with high concentrations of airborne salt. Dramatically reduces environmental loads due to repainting.

<http://www.jfe-steel.co.jp/en/products/plate/06-koucyo.html>

Preventing Global Warming

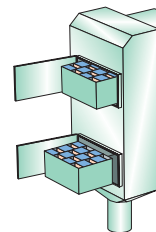


■ Sewage Sludge Methane Fermentation System

Stirring device which plays a key role in the sewage sludge digestion tank. This system secures high efficiency methane fermentation by ensuring good contact between sewage sludge and microorganisms by complete, efficient mixing in the tank.

http://www.jfe-eng.co.jp/en/en_product/en_part_wat.html

Reducing Environmental Loads

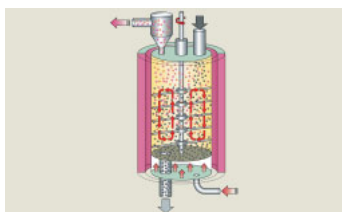


■ Flue Gas Dioxin Treatment Technology: Gas-Clean DX

Compact treatment device which adsorbs and removes dioxins and heavy metals to extremely low concentrations using high performance activated carbon developed exclusively for this system and an activated carbon cartridge with a unique structure.

<http://e-solution.jfe-holdings.co.jp/product/b-184.html> (Japanese Only)

Reducing Environmental Loads



■ Fly Ash Dioxin Treatment Technology: High Clean DX

Volatilizes and separates dioxins and other organic compounds in fly ash at 400°C or higher, and decomposes these substances into harmless water and CO₂ using a high performance oxidation catalyst.

http://www.jfe-eng.co.jp/en/en_r_d/en_r_d_env.html

Resource Recycling

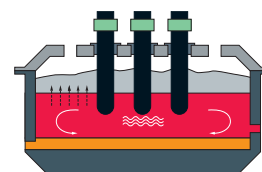


■ High Temperature Gasifying & Direct Melting Furnace

Suitable for a wide range of wastes, this technology makes it possible to reuse landfills by recovering and effectively utilizing buried wastes from landfills in molten slag. High temperature reduction in the furnace also prevents formation of dioxins.

http://www.jfe-eng.co.jp/en/en_r_d/en_r_d_env.html

Resource Recycling



■ Electric Resistance-type and Plasma-type Ash Melting Furnaces

Ash melting furnaces for recycling of incineration ash and reduction of ash volume. Ash melting furnaces employing both methods (electric resistance-type using Joule heat and plasma-type) contribute to realizing a recycling-oriented society.

http://www.jfe-eng.co.jp/en/en_r_d/en_r_d_pla.html

Resource Recycling



■ THERMOSELECT Gasifying & Melting Furnace

Utilizing a process completely different from conventional waste incineration, this revolutionary waste treatment process treats waste by a thermal cracking/gasifying/melting process (gasifying and reforming process), while also producing energy and recovering valuable resources.

http://www.jfe-eng.co.jp/en/en_r_d/en_r_d_env.html

Environment-friendly Housing



■ Grand Scena Johoku Koen

A comfortable condominium building with a variety of advanced eco-equipment including disposer for treatment of kitchen garbage and double-glazing insulating glass (Pair Glass) which has an excellent heat insulating property and prevents condensation.

Environment-friendly Housing



■ Grand Scena Tsudanuma

Surrounded by green, this attractive condominium building features a rooftop "Sky Garden" with a wood deck, lawn, benches, and other amenities.

Environmental Businesses Network of JFE Group Companies

The JFE Group includes approximately 50 companies which supply ecological products and are engaged in environmental businesses ranging from environmental surveys/measurement and support of ISO14001 certification to waste management/recycling, design and construction of environmental plants, and soil remediation. JFE Group companies provide integrated solutions from the initial proposal and planning to introduction, operation, and maintenance of equipment in a wide variety of fields, contributing to a better environment.

Company	Business
Environmental surveys, analysis, and consultation	
JFE Net Corporation	Consultation on development of environmental management systems; ISO-based environmental training; seminars for in-house environmental monitoring personnel; internal environmental auditing.
JFE TECHNO-RESEARCH CORP.	Environmental and energy-related measurement, surveys, and analysis (air and soil quality, etc.); consultation on environmental issues (environmental management systems, ISO14001 certification, PPD of overseas CDM etc.); consigned life cycle assessment; environment information collection and surveys; consigned development and testing; manufacture and operation of experimental devices; management and evaluation of R&D projects; survey and management of patents.
Japan Technomate Corporation	Manufacture of experimental equipment for marine environment remediation (reefs for fish/seaweed farming, slag sand capping, aeration, sea water purification, etc.); implementation and consultation of hydraulic/oceanic experiments and numerical simulations; environmental and energy-related measurements, surveys and analysis (water/atmospheric temperature, wind, wave, airborne salt, corrosion resistance of environmental plant, anti-corrosion measures, inspection/measurement/diagnostics, analytical simulation, etc.); manufacture/maintenance of blades for wind power generation.
Waste treatment and recycling	
JFE URBAN RECYCLE CORP.	Recycling of waste electric appliances under the Appliance Recycling Law (4 designated categories: televisions, air conditioners, refrigerators, washing machines); recycling of household appliances used in business, OA equipment, vending machines, etc.; waste treatment.
JFE KANKYO CORP.	Waste treatment and recycling (waste plastics, wastewater and sludge, waste construction materials, fluorescent lamps, batteries, etc.); collection and transportation of wastes; environmental measurement and analysis, environmental measurement certificates; consultation on waste treatment and recycling.
JFE LOGISTICS CORP.	Marine transportation of waste plastics, industrial wastes and waste construction soil; collection of toner cartridges and fluorescent lamps; transportation of industrial wastes; removal and transportation for recycling of business automation devices; environmental cleanup (industrial washing and cleanup etc.); collection, transportation, and intermediate treatment of industrial wastes; construction, operation, maintenance, dismantling, and washing of environmental equipment.
JFE MINERAL CO., LTD. http://www.jfe-mineral.co.jp/e-mineral/index.html	Recycling of iron and steel making slag (granulated slag, hard slag, BF slag powder); technological development for effective use of slag; development of high-value-added slag products (SCP method for improving soil quality by slag piling, solid slag blocks for marine construction); recycling business (recycling of waste concrete into concrete/asphalt aggregate, recycling of molding sand); soil and underground water pollution surveys and cleanup work; geothermal water surveys and development; production and sale of environment-friendly products (slag sand, magnesium hydrate, etc.).
JFE LIFE CORP.	Collection and transportation of industrial wastes; design, installation, sale, and maintenance of building and industrial air conditioner filter; recovery of chlorofluorocarbon gas from vending machines.
JAPAN RECYCLING CORP.	Industrial waste treatment; recycling of waste containers and packaging; sale of by-products from waste treatment; operation and maintenance of municipal and industrial waste treatment facilities.
DAIWA STEEL CORP.	Intermediate treatment of wastes (melting of dry batteries, etc. in electric furnace).
Environmental plant and equipment	
JFE S-Tec Corporation	Manufacture, installation, and maintenance of waste treatment and water treatment equipment; operation and maintenance of waste incinerators.
JFE PRECISION CO., LTD.	Manufacture, installation, and maintenance of water treatment and waste treatment equipment.
JFE Soldec Corporation	Design of waste treatment equipment; development of planning and operation management support systems for environmental equipment; design of environmental protection systems related to combustion exhaust gas; development, design, and manufacture of VOC treatment systems for responding PRTR; development support for production and use systems related to environment-friendly fuels (DME, hydrogen, palm ester, etc.); energy saving consultation by equipment diagnosis.
JFE Technos Corporation	Manufacture, installation, and maintenance of water treatment and waste treatment equipment; experimental fabrication and testing related to research and development (DME diesel engine, countermeasures for dioxins, etc.).
JFE SHOJI HOLDINGS, INC. http://www.jfe-shoji-hd.co.jp/english/	Overall sales of environmental plants, equipment, commodities, and services; overseas afforestation.
JFE Plant & Service Corporation	Construction, modification, and maintenance of waste treatment and water treatment equipment.
GECOSS CORP.	GSS method for recycling soil generated from soil-cement continuous wall construction, reducing industrial wastes more than 50% than conventional method.
JFE ADVANTECH CO., LTD. http://www.jfe-advantech.co.jp/eng/index.html	Manufacture and sale of measuring instruments for waste treatment facilities, sewage system, and waterworks (industrial weighing scale, measuring devices of water level, quality, flow rate, etc.).

Company	Business
Environmental plant and equipment	
JFE ELECTRICAL & CONTROL SYSTEMS, INC. http://www.jfe-densei.co.jp/english/index.html	Design, installation, and maintenance of electrical systems and instrumentation of waste treatment facilities; design and manufacture of photovoltaic power generation systems; design and installation of energy saving system.
JFE MECHANICAL CORP.	Design, manufacture, installation, and maintenance of environment-related and recycling equipment; manufacture and sale of compact carbonization type incinerators; dismantling of incinerator using technologies of countermeasures for dioxins; design, manufacture, installation, and maintenance of water treatment equipment.
JFE Eletech Corporation	Design and installation of electrical systems and instrumentation of various plants such as water treatment plants and incinerators.
Tohoku Dock Tekko Co., Ltd.	Design, manufacture, installation, and maintenance of waste treatment equipment (incinerators, recycling centers, etc.); design, manufacture and sales of raw garbage treatment plants.
JFE Environment Service Corporation	Consigned operation of environment-related plants such as waste treatment and water treatment equipment.
JFE Koken Corporation	Prevention of soil contamination; restoration of contaminated soil; installation of various water treatment equipment; environment-friendly construction method (no-trenching method).
JFE PIPE FITTING MFG. CO., LTD.	Design, manufacture, and installation of molding sand recycling equipment (energy saving fluidized calcination furnace etc.).
NIPPON CHUZO K.K.	Manufacture and sale of heat and wear resistant castings (grate, etc.) for waste incinerators; molding sand recycling equipment; slag comminutor.
Nippon Chutetsukan K.K.	Design, manufacture, and turnkey execution of water environment engineering projects.
Recycling Management Japan, Inc.	Consigned municipal and industrial waste treatment; operation and maintenance of waste treatment facilities; production and sale of RDF and compost; design, manufacture, and sale of production facilities for RDF and compost fuel.
JFE Mie Tec Service Corporation	Manufacture, installation, trial run, and maintenance of waste/water treatment equipment.
General environmental protection	
JFE G.S. CORP.	Collection and transportation of municipal and industrial wastes; operation and maintenance of waste incinerating plants, etc.; design and execution of landscape planting; environmental measurement and analysis of air and water quality; environmental measurement certificates; waste treatment (recycling); consultation on environmental greening and environmental surveys.
KEIYO CITY SERVICE CORP.	Design and construction of gardens and civil works; maintenance of gardens and planted areas; consultation on environmental greening; green plant leasing; washing of waste collection containers; washing and leasing of restaurant kitchen filter.
FUKUYAMA STEEL TECHNOLOGY CORP.	Collection and transportation of municipal wastes.
FUKUYAMA GENERAL SERVICE CO., LTD.	Recycling of used power cables; landscape planting; environment- and energy-related measurement; energy saving diagnosis; consultation on environmental ISO and energy saving.
MINAMIAICHI TOWN SERVICE CORP.	Design and construction of gardens and civil works; maintenance of gardens and planted areas; consultation on environmental greening; green plant leasing; recycling of vending machines.
Ecological products	
JFE CHEMICAL CORP. http://www.jfe-chem.com/e/index.html	Plastic recycling; gas refining; by-products recovery (ammonium sulfate, liquid ammonia); CO ₂ recovery and reuse (dry ice, etc.); water treatment chemicals (caustic soda, sulfuric acid, iron sulfide, hydrated lime, etc.)
JFE METAL PRODUCTS & ENGINEERING INC.	Development of highly functional architectural and civil engineering products with low environmental loads; environment-friendly construction materials (sound barrier and guardrail using photocatalyst).
JFE GALVANIZING AND COATING CO., LTD.	Development of new applications for coated steel sheets with low environmental loads; production of ecological steel products (raindrop-stain resistant prepainted steel sheet for roofing, siding, and sound insulating, heat insulating prepainted steel sheet, acid resistant prepainted steel sheet).
JFE CIVIL ENGINEERING & CONSTRUCTION CORP.	Environment-friendly construction method (steep slope road widening method: Metal Road).
JFE ROCKFIBER CORP.	Manufacture of rock wool and its products from BF slag (heat-resistant materials, thermal insulation, and sound-absorbing materials for energy saving and better housing environment).
JFE CONTAINER CO., LTD.	Manufacture and sale of reusable drum cans (Eco-drum, S Open drum can); new drum and used drum can recovery service using comprehensive distribution system; manufacture and sale of various high pressure gas containers.
CHIBA RIVERMENT AND CEMENT CORP.	Production of slag powder as mixed cement material, BF cement designated by the Green Procurement Law, and Eco-Mark product (Riverment).
MIZUSHIMA RIVERMENT CORP.	Production of slag powder as mixed cement material, and BF cement designated by the Green Procurement Law.

External Awards Received (since 2000)

National Invention Award

- 2004 Invention Award
Development and application of advanced on-line accelerated cooling process
- 2003 Invention Award
Development of 3-channel polarized light steel sheet surface inspection equipment (Delta-Eye)
- 2001 Prime Minister's Invention Award
Development of producing method of ultra-low carbon steel by combined blowing basic oxygen in RH degasser
- 2001 Invention Award
Development of organic coated steel excellently resistant to corrosion after forming
- 2000 Japan Federation of Economic Organizations Chairman's Invention Award
Environment-friendly regenerative low-NOx combustion technology

Okochi Prize

- 2003 Memorial Production Award
Establishment of waste plastic recycling technology for blast furnace feed
- 2002 Memorial Technology Award
Development and industrialization of critical cooling rate on-line accelerated cooling technology (Super OLAC)
- 2002 Memorial Production Award
Realization of ultra-short period blast furnace refining by innovative large capacity BF relining technology
- 2001 Memorial Technology Award
3-channel polarized light surface inspection equipment (Delta-Eye)
- 2000 Memorial Technology Award
Development of environment-friendly new steelmaking process by zero-slag BOF operation
- 2000 Memorial Production Award
Development of world's first endless hot strip rolling process and commercialization of new products

Iwatani Memorial Prize

- 2002 Development and industrialization of critical cooling rate on-line accelerated cooling technology (Super OLAC)

Ichimura Industrial Award

- 2004 Contribution Award
Development of manufacturing technology of high speed tool steel (HSS) rolls for hot rolling strip finishing mill by centrifugal casting process

Energy Conservation Award

- 2003 Energy Conservation Center Chairman's Award
Development of ETL and TFS base steel sheet detergent for degreasing
- 2000 METI Minister's Award
Development and application of technology utilizing waste plastics as blast furnace feed
- 2000 Energy Conservation Center Chairman's Award
Energy conservation through activities to maximize equipment efficiency of oxygen plant

Excellent Energy Conserving Equipment Award

- 2000 METI Minister's Award
High-speed continuous annealing and heating system applying high-temperature rotary regenerative heat exchanger

New Energy Award (award for new energy equipment for the 21st century)

- 2002 New Energy Foundation Chairman's Award
Floating-type solar power generation system
- 2000 Resources & Energy Agency Director General's Award
Project to produce fuel from wastes by gasifying & melting method in steelworks

Resource Recycling Technology & System Award (Clean Japan Center)

- 2004 Minister's Award
Recycling of waste plastics for blast furnace feed
- 2002 METI Industrial Technology & Environment Bureau Director General's Award
Application of steel slag hydration hardening substance as materials for port & harbor construction
- 2001 Clean Japan Center Chairman's Award
Technology for cascading & recycling of washing chemical fluorine nitric acid
- 2000 METI Industrial Technology & Environment Bureau Director General's Award
Technology for recycling stainless steel making dust using smelting reduction method

Japan Society of Mechanical Engineers Award

- 2002 Japan Society of Mechanical Engineers Award (Technology)
Development and practical application of high-temperature waste gasifying & direct melting furnace
- 2001 Japan Society of Mechanical Engineers Award (Technology)
Continuous rolling mill of steel bar, section, and wire rod

Combustion Society of Japan Award

- 2003 Technology Award
Development of next-generation stoker type waste incineration technology utilizing high temperature air combustion control technology
- 2000 Technology Award
High-temperature waste gasifying & direct melting technology

The Society of Materials Science, Japan Award for Technical Developments

- 2002 Development of hot rolled high strength steel sheet-780 MPa grade NANO HITEN by controlling nano-size ultra minute precipitates

The Society of Chemical Engineers, Japan Technology Award

- 2003 Development of waste polyvinyl chloride resin recycling technology

Surface Finishing Society of Japan Award

- 2002 Technology Award
Environment-friendly high-performance chromium-free steel sheet "Geo-Frontier Coat"

Japan Coating Technology Association Award

- 2003 Technology Award
Development of new coating 55% aluminium/zinc alloy plating with excellent formability (Galflexcolor)
- 2001 Technology Award
Rust stabilization agent for weathering steel CUPTEEN COAT M

Japan Society for the Promotion of Machine Industry Award

- 2001 Chairman's Award
Development of equipment for changing running direction of cold rolled steel sheet by air floatation

Excellent Environmental Equipment Award (Japan Society of Industrial Machinery Manufacturers)

- 2003 Chairman's Award
Fly-ash dioxin volatilizing and separating equipment (High Clean DX)
- 2002 Chairman's Award
Automatic sorting system for plastic bottles
- 2002 METI Industrial Technology & Environment Bureau Director General's Award
Small-scale incinerator using carbonizing & gasifying method (Kawatetsu Machinery Co., Ltd.)

Japan Institute of Energy Award

- 2002 The JIE Award in Technical Division
Development of slurry bed dimethyl ether synthesis technology

Japan Ozone Association Award

- 2002 Technology Award
Practical high-flux filtration system using ozone resistant microfiltration module
- 2000 Recommended Technology Award
Promotive implementation of U-tube ozone contact equipment

Japan Society on Water Environment Award

- 2002 Technology Award
Bio-tube system

Competition for Specialized Greening Technology for Rooftops, Wall Facings and New Green Spaces (Organization for Landscape and Urban Greenery Technology Development)

- 2003 The Minister of Land, Infrastructure and Transport Prize
The first prize for Rooftop Greening Technology ORTO YOKOHAMA

Shinagawa Greening Award

- 2001 CITYWINDS SHINAGAWA GARDEN COURT

The Japan Industrial Techniques Grand Prix

- 2003 The Special Award by The Examination Committee
Development and practical application of new on-line accelerated cooling technology (Super OLAC)

Japan Society for Technology of Plasticity Award

- 2004 Technological Development Prize
Development of energy saving type bearing steel with excellent cold formability
- 2002 AIDA Award
Development of manufacturing technology with high accuracy super heavy wall thickness seamless rectangular steel tube
- 2001 Technological Development Prize
Development of new 3 roll benders for heavy wall thickness medium diameter tubes
- 2000 AIDA Award
Development of manufacturing technology of non-stop forge welding steel tube

Japan Society of Corrosion Engineering Award

- 2004 Technology Award
Pitting corrosion and anti-corrosion mechanism of anti-corrosion steel sheets for automotive use

Recycling Award (NPO Recycle Solutions)

- 2001 First Planning Award
Marine Blocks (carbonated large solid block of slag for use in artificial reefs for seaweed and fish farming)

WASTEC Award

- 2004 Plant category award "Hyper 21 Stoker System"
- 2004 WASTEC Organizing Committee Chairman's special award
"High Clean DX", "MAP Phosphorus recovering technology"

Public Works Research Institute Award

- 2004 Chief Executive award
Ultrasonic flaw detection analysis using phased array method

Japanese Society of Steel Construction Award

- 2004 Achievement award
Development and popularization of hybrid caisson

Eco-Products Award

- 2004 1st Promotion committee chairman's award
Recycled plastic frame "NF Board"

● Third-party Comments



Yuko Sakita
Journalist and Environmental Counselor

Corporations today are strongly expected to take voluntary action toward a sustainable future in which human activities are in harmony with the environment. An environmental report disclosing such actions is a very important platform for information exchange, helping to build a relationship of trust with diverse stakeholders including customers, local communities, related businesses, investors and employees.

Commendable Social Reporting and Disclosure of Negative Information

Two features that stand out in the JFE Group's environmental sustainability report are a willingness to disclose negative information and the inclusion of social reporting.

The environmental problems at the East Japan Works (Chiba), which became progressively evident from investigations by the Chiba Coast Guard Office in December 2004, certainly caused great shock not only to people living in the vicinity but to society at large, which had trusted the company amid heightened concerns for environmental awareness.

I myself was interested to see how the incident would be reported, and noted a more detailed disclosure of events than I had expected, right from the president's message at the beginning of the report. I was relieved to see that the company clearly recognizes its social responsibilities and is taking measures, not only in regard to the falsification of analysis data which delayed discovery of the pollution incidents, but in a comprehensive fashion including staff education. It has taken steps to bolster its environmental management systems at the plant in question and across the company as a whole, and encourages employees to attain the Environmental Pollution Control Operator qualification.

The company's willingness to disclose negative information and regain credibility is highly commendable. However, remediation of the land and sea where inadequately controlled water pollution triggered the problems, and regaining credibility with local residents and others involved, is not something that can be achieved overnight. I would urge the company to tackle the issues seriously on an ongoing basis.

From this perspective, it is noteworthy that a separate section on community relations is included for the first time. The reporting is in accordance with standards such as the Ministry of the Environment's "Environmental Reporting Guidelines 2003" and compliance mechanisms are in place. I hope the company will learn from the problems in Chiba and seek to further strengthen its social responsibility.

Promising Technology-driven Environmental Contribution

On a different note, the environmental content at the heart of this report clearly conveys the company's vision of contributing to society with the world's most innovative technology.

Among the JFE Group's aims of improving the global environment and realizing its environmental policies, measures to mitigate global warming are cited as an important objective in reducing the environ-

mental impacts of its business activities. Given these goals, I am full of admiration for the company's achievement in reducing unit energy consumption through technology development and holding CO₂ emissions to just 0.1% higher than 1990 levels, despite a 19% increase in crude steel production.

However, I would like to see the facts presented in a more understandable fashion. For instance, data and a graph showing the changes in JFE Steel's CO₂ emissions over time would let the reader see the situation clearly at a glance. The 57 million tons of carbon equivalent emitted in FY2004 by JFE Steel and its four affiliated electric furnace steelmakers accounted for approximately 4% of Japan's total CO₂ emissions. For a core business underpinning Japan's industrial sector, that is a huge figure. I applaud the company's aggressive investment in environmental technology development and its success in implementing steelmaking processes that achieve world-beating energy efficiencies and resource recycling rates.

The JFE Group is helping to make automobiles more lightweight by enhancing the quality of the steel sheets it produces, and is reducing CO₂ emissions through the development of wafers for high-efficiency solar cells. The utilization of waste plastics by making use of the steelworks infrastructure, and technologies developed by JFE Engineering to utilize unused forms of energy such as biomass and new energy such as wind power, present a convincing picture of vision and strategies aimed toward realizing a sustainable society. Going forward, I hope the company will redouble its efforts to create a prosperous society through business operations in harmony with the environment as stated in its environmental philosophy.

● Closer Community Relations toward the Future

Although its products are not readily visible to the ordinary consumer, the JFE Group's large steelworks throughout Japan have a significant role to play as a hub of the community and in promoting recycling-oriented regional development.

I hope the company will build closer cooperative ties with local residents, enterprises, and administrative authorities, actively sharing information about the contributions of its steelworks to the community, and that the whole JFE Group will work to improve its contributions to the community and society at large.

Company-wide data on air and water quality management, and on the control of chemical substances, is presented in the report. Nevertheless, if the company were to consider publishing data for each of its production centers, that would undoubtedly aid environmental communication and help build a relationship of trust with the community.

This year, the faces of the JFE Holdings CEO and of the directors of the operating companies appear in the page of the report. The reliability that we read in their expressions is key to building a sense of trust in the company among the community and wider society. In the future, I would be pleased if those working at the company's facilities nationwide succeed in creating an equally apparent relationship of trust.

I would also like to see the environmental report actively utilized as a communication tool, beyond information disclosure alone. By listening to a wide range of outside opinions at stakeholder meetings, not just at its specialized Environmental Management Advisory Council, and by holding meetings to discuss its environmental report with local residents and non-profit environmental organizations at each of its production centers, I hope the JFE Group will pursue a more open management style and achieve even greater consistency between environmental and economic interests.

● Editorial Postscript

This environmental sustainability report was prepared primarily to explain the circumstances of the environmental problems that occurred last year at JFE Steel's East Japan Works (Chiba) and to convey an understanding of the steps we are taking to resolve those problems. We have included a section on community involvement for the first time in the interests of providing

stakeholders with an informative report about the JFE Group. We have tried to present the facts in a readable manner that is easy to understand. While there are still many inadequacies, we appreciate your reading this report and welcome frank comments and opinions about the JFE Group's environmental initiatives.
(Environment Dept., JFE Holdings, Inc.)



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