



# Annual Environmental Report 2001



**EAST JAPAN RAILWAY COMPANY**

Committee on Ecology

## Message from the Management

With the 21st century heralded as the “century of the environment,” corporate entities and citizens alike must respond to environmental concerns, such as prevention of global warming, achievement of a sustainable society, and reduction of environmental pollutants. The JR East Group’s core business is the rail industry. The railway business consumes enormous amounts of energy, and generates massive amounts of waste, including trash discarded by passengers on trains and at railway stations.

Recognizing our environmental obligations, JR East initially established our Committee on Ecology in 1992. Over the intervening years we have mandated a variety of initiatives, such as the reduction of CO<sub>2</sub> emissions and improved recycling of waste material. These efforts are based on our philosophy regarding the promotion of ecological activities and our dedication to reconciling business operations and environmental protection activities. In November 2000, JR East Group announced our New Frontier 21 medium-term business plan. One of the plan’s key points calls for the promotion of environmentally conscious management as an “environmentally advanced” corporate group. In line with that vision, we have expanded our ecology targets.

In 1996, we began publishing an annual environmental report, in order that the general public might acquire a greater awareness of our relationship with the environment and of the environmental activities in which we are engaged. In this, the sixth edition of the *Annual Environmental Report*, we have made every effort to enrich the content of this document. Among other new information in the report, calculations of economic effects have been included in the overview of environmental accounting which was first introduced in the last report. We have also had our report reviewed by a third party, Asahi & Co., in hopes of enhancing its credibility.

JR East remains committed to the implementation of environmental conservation activities on a higher level. Our aim is to make railways more friendly to the environment. We will also make every effort to make our railways more convenient, so that passengers may maximize their superior environmental benefits. Naturally, input from the general public will play a significant role in this process. We welcome your honest opinions regarding the activities outlined in our *Annual Environmental Report*.

大塚 陸毅

Mutsutake Otsuka  
President and CEO  
East Japan Railway Company



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This edition of the JR East *Annual Environmental Report* presents data for East Japan Railway Company itself, on a nonconsolidated basis, during the fiscal 2000 reporting period (April 1, 2000 through March 31, 2001). A certain amount of information concerning our group companies is also contained in this report.

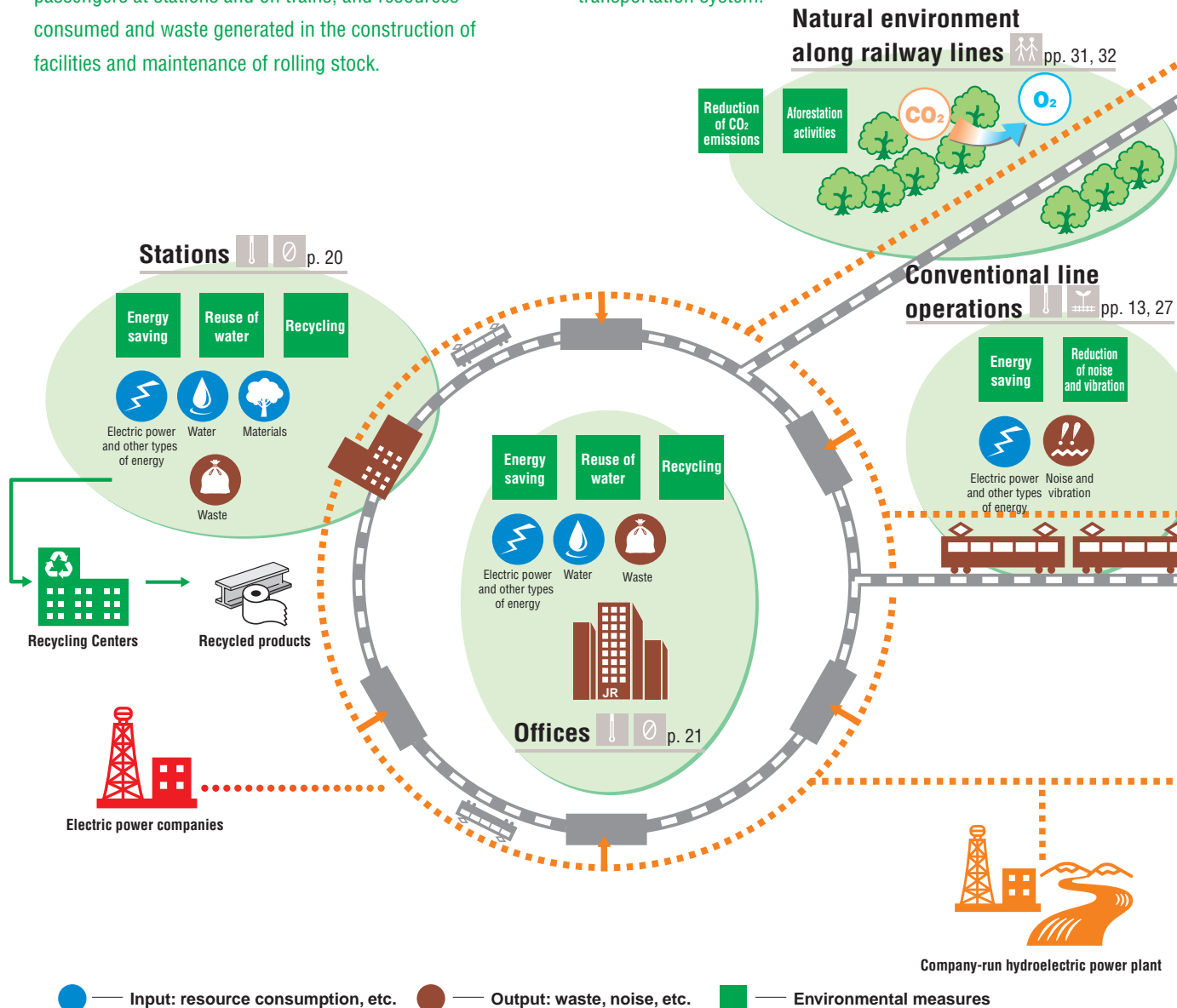
# Environmental Impact of JR East's Business Operations/Measures

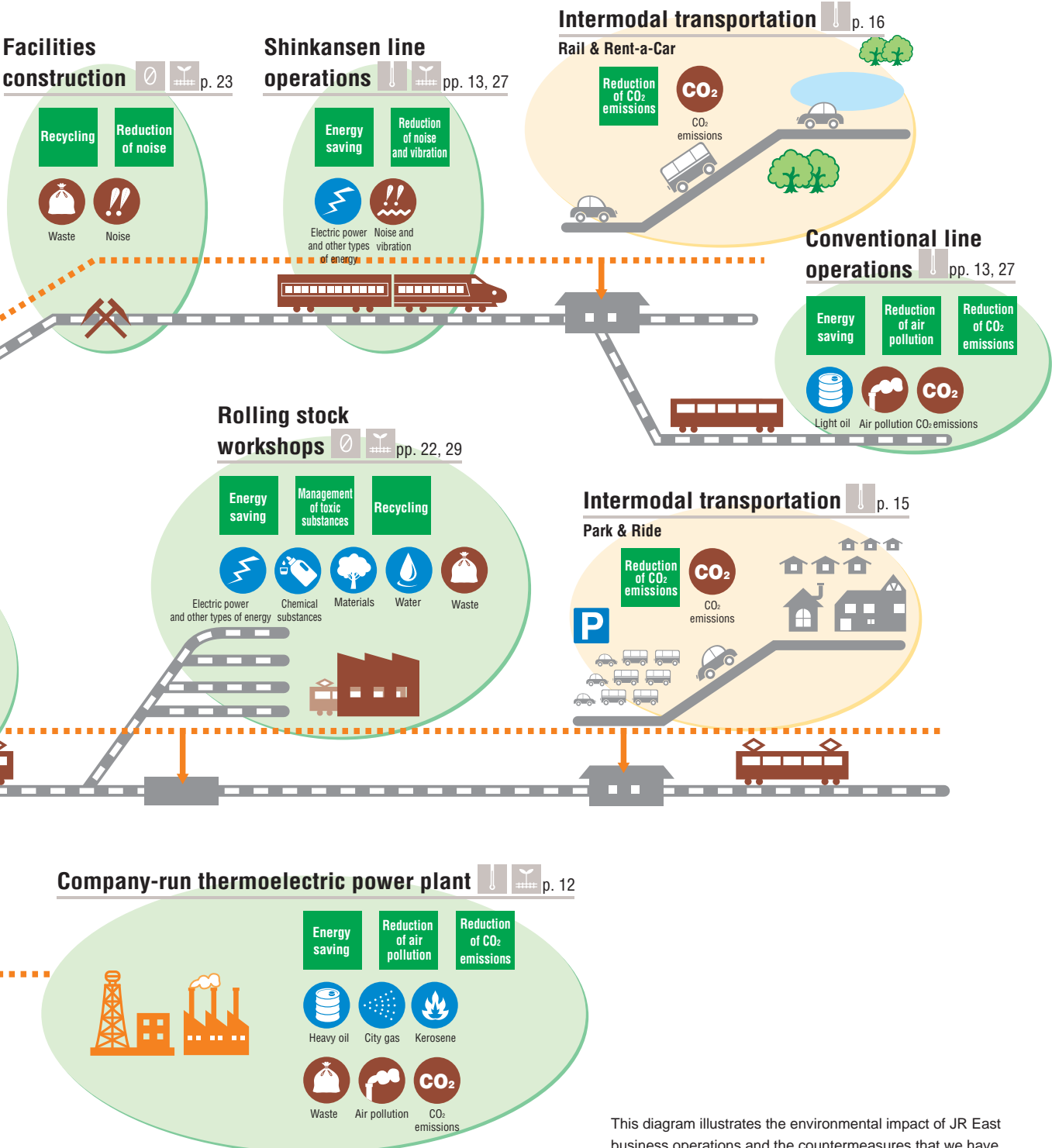
JR East operates in the eastern half of Japan's main island, Honshu, which includes the metropolitan Tokyo area. We are responsible for approximately 7,500 km of railway lines, 1,700 stations, and 13,000 units of rolling stock. We are proud to offer a variety of services affecting many aspects of daily life, with a focus on railway transportation.

Regarding the environmental impact of our operations, rail transportation inherently consumes a large amount of energy, while generating a significant amount of noise and vibration. Also of concern are refuse discarded by passengers at stations and on trains, and resources consumed and waste generated in the construction of facilities and maintenance of rolling stock.

As for global warming, CO<sub>2</sub> emissions by Japan's transportation sector, including railways, are increasing every year. As an organization that occupies a significant position in passenger transportation, we at JR East Group are well aware of our responsibilities in regard to the reduction of CO<sub>2</sub> emissions.

JR East is therefore working to minimize the environmental impact of our operations, and to make our railways more convenient, so that the public can maximize the environmental advantages of our extensive public transportation system.





This diagram illustrates the environmental impact of JR East business operations and the countermeasures that we have adopted. Details are explained in this report.



# 1. Environmental Management System

In 1992, JR East established the Committee on Ecology as a means of tackling a variety of global environmental issues, and set forth our Basic Philosophy and Policy on the Promotion of Ecological Activities. In 1996, we established guidelines pertaining to the environmental impact of our business operations, together with ecological goals to be met by fiscal 2001. In November 2000, as we were nearing our initial target date and because we had already met some of our objectives, we

revised environmental targets to be achieved by fiscal 2005.

These revised targets are set to coincide with the culmination of New Frontier 21, JR East Group's medium-term business plan, which features the promotion of environmentally conscious management as one of its key components. As such, New Frontier 21 represents our determination to redouble the efforts of our entire group to better protect the environment.

## Basic Philosophy and Policy on the Promotion of Ecological Activities

(established in May 1992)

### Basic philosophy

**The entire JR East Group, working together,  
will diligently strive to reconcile environmental  
protection with its business activities.**

### Basic policy

**To contribute to customers' lives and local communities  
by providing a comfortable environment**

**To develop and provide the technology needed  
to protect the global environment**

**To maintain an awareness of environmental protection and  
raise the environmental awareness of our employees**



## Activity guidelines and goals for the promotion of ecological activities

(established in March 1996)

### Activity guidelines

- 1** We work to prevent the waste of precious energy and to reduce CO<sub>2</sub> emissions—a known source of global warming—by enhancing our energy efficiency and introducing cleaner forms of energy.
- 2** We ensure the proper management and processing of environmental pollutants and ozone-depleting substances, in compliance with laws and regulations. Moreover, we do our best to reduce the usage and generation of these substances, and to adopt environmentally responsible substitutes when they are available.
- 3** We ensure the appropriate processing of various types of waste generated at our offices, establishments, stations, trains, etc. We strive to recycle waste and reduce the generation thereof, and to use more recycled and resource-saving products to minimize our burden upon the environment.
- 4** We respect the natural environment as a nurturer and source of life, and therefore, we endeavor to reduce noise and vibration caused by train operations, thus achieving a harmonious relationship with the communities we serve.
- 5** We work to make railways a more attractive and environment-friendly form of transportation.

### Goals to be met by fiscal 2005 (based on figures from fiscal 1990; partially revised in February 1998 and revised in November 2000)

- A 20% reduction of CO<sub>2</sub> emissions in general business activities
- Realization of an energy-saving railcar ratio of 80%
- A 30% reduction of CO<sub>2</sub> emissions in proportion to unit electric power generation at company-run thermoelectric power plant
- A 15% reduction in energy consumption for train operations in proportion to unit transportation volume
- An 85% reduction in number of large-size refrigerating machines using specific chlorofluorocarbons (CFCs)
- Realization of a 36% recycling rate for waste generated at stations and on trains
- Realization of a 75% recycling rate for waste generated in rolling stock workshops
- Realization of an 85% recycling rate for waste generated in construction projects
- Realization of a 100% rate for usage of recycled paper as office stock
- Reduction of noise to less than 75dB in designated residential areas along the Tohoku and Joetsu Shinkansen Lines\*
- A 60% reduction of NO<sub>x</sub> emissions at company-run thermoelectric power plant
- Implementation of specific environmental protection activities on an annual basis

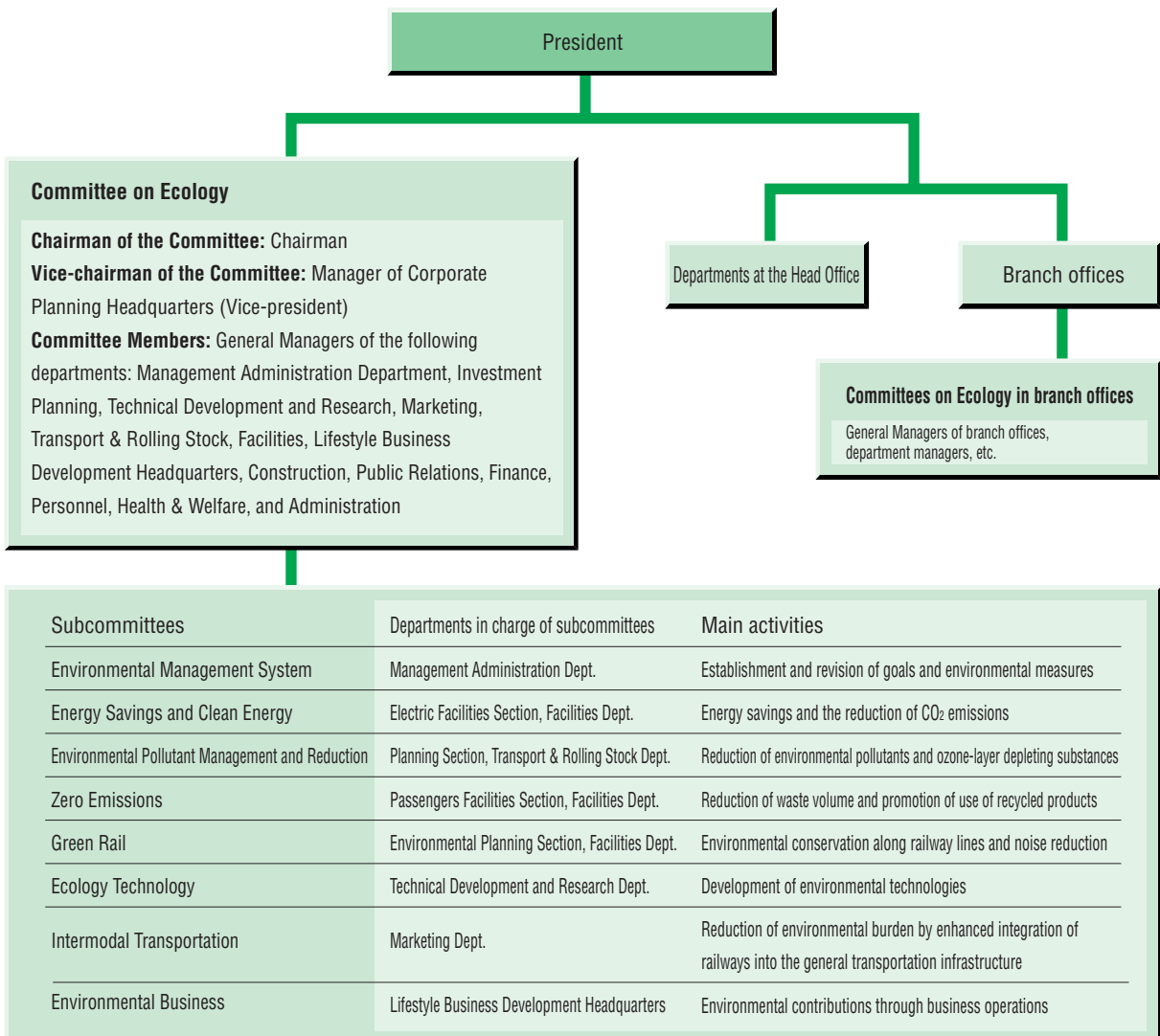
\*Projected for achievement by fiscal 2002

## Structure for the implementation of environmental activities

JR East, in conjunction with our Committee on Ecology, has established a basic policy on environmental issues and is energetically implementing a variety of activities. A cross-departmental organization within the company itself, the Committee consists of managers from each department, and is chaired by the Chairman of JR East. The Committee maintains an office within the Management Administration Department and a number of subcommittees, each of which is charged with a specific issue and led by a chief supervisor from the respective business section. The Committee is involved in various activities, including the examination of the

environmental impact of our business operations, the establishment of goals regarding our environmental activities, the implementation of conservation initiatives, confirmation of the degree to which goals are achieved, and oversight by executive staff.

In fiscal 1998, each of our branch offices established its own Committee on Ecology, consisting of a branch manager and relevant department managers. In fiscal 2000, several of our branch offices began publishing their own environmental reports to track the progress of their environmental activities.





**ISO 14001**

In 1999, our Niitsu Rolling Stock Manufacturing Factory obtained certification under ISO 14001, the international standard for environmental management systems in business and industry. Three other facilities obtained certification in fiscal 2000.

In March of 2001, our Kawasaki Thermoelectric Power Plant, Oi Rolling Stock Workshop, and Niigata Mechanical Technology Center—each engaged in operations with the potential of generating a significant environmental burden—received ISO 14001 certification. We will continue our efforts to obtain certification, primarily at our rolling stock workshops.

Among our Group companies, East Japan Eco Access Co., Ltd. received certification in November 1999. It was followed by three Lumine Co., Ltd. buildings—the corporate headquarters, the Yokohama Store, and the Machida Store—in December 2000.

**Internal audits**

JR East is in the process of implementing systems for monitoring environmental activities based on the PDCA (Plan-Do-Check-Action) cycle. At our rolling stock workshops, for example, external instructors are hired to train internal auditors, who then conduct regular audits of specific environmental activities. We plan to implement this type of program company-wide in the months to come.

**Environmental risk management**

We have compiled emergency response manuals for our thermoelectric power plant and rolling stock workshops. These manuals are used in study groups intended to thoroughly familiarize workers with risk control procedures. We also conduct on-site training exercises on handling potential leaks of fuel, organic solvents, or other chemicals which may occur in boilers and chemical storage rooms.

**Environmental education**

The success of our environmental efforts as a company requires that our employees have an appropriate awareness with regard to environmental issues. We therefore provide environmental education for all our new recruits and new management staff (on-site supervisors, including stationmasters). In addition, our monthly in-house magazine *JR Higashi* also covers environmental topics in every issue, including environmental problems and specific company-wide ecology activities.

**Environment-related accidents, etc.**

In fiscal 2000, we did not experience a single instance of environment-related accidents and were levied no related fines.



Kawasaki Thermoelectric Power Plant



ISO 14001 certificate for our Kawasaki Thermoelectric Power Plant



JR Higashi: in-house magazine

Environmental education programs implemented during fiscal 2000		
• Training for new on-site supervisors	14 times	300 people
• Training for new assistant supervisors	2 times	40 people
• Training for new management staff	3 times	70 people
• Training for implementation managers	Once	180 people
• Training for new recruits	5 times	1,440 people
• Environmental seminars	9 times	620 people



## Environmental accounting

### Summary table of environmental conservation activities

	Category	Environmental conservation costs (unit: ¥billion)		Item
		Investment	Expenses	
<b>1</b> Environmental conservation activities along railway lines (pollution prevention)	<ul style="list-style-type: none"> <li>Noise reduction measures along Shinkansen and conventional lines (construction of sound barriers, introduction of PC sleepers and continuous-welded rails, etc.)</li> <li>Reduction of environmental pollutants from company-run Kawasaki Thermoelectric Power Plant</li> <li>Renovation of large-size incinerators; elimination of small-size incinerators</li> <li>Appropriate management and treatment of organic solvents etc., based on PRTR regulations</li> </ul>	3.17	6.58	<ul style="list-style-type: none"> <li>Reduction of noise to less than the Tohoku and Joetsu</li> <li>NOx emissions at company-run</li> </ul>
<b>2</b> Global environmental conservation activities	<ul style="list-style-type: none"> <li>Introduction of energy-saving rail cars</li> <li>Energy conservation at stations and office buildings (introduction of co-generation, solar power generation)</li> <li>Promotion of intermodal transportation (Park &amp; Ride, Rail &amp; Rent-a-Car, etc.)</li> </ul>	65.62	–	<ul style="list-style-type: none"> <li>CO<sub>2</sub> emissions in general</li> <li>CO<sub>2</sub> emissions in proportion to run thermoelectric power plant</li> <li>Ratio of energy-saving railcars</li> <li>Energy consumption for train transportation volume</li> <li>Number of large-size</li> </ul>
<b>3</b> Resource-recycling activities (zero emissions program)	<ul style="list-style-type: none"> <li>Reduction and recycling of waste generated at stations and on trains (categorized collection, establishment of recycling centers, etc.)</li> <li>Recycling of train tickets and passes</li> <li>Recycling of waste generated at rolling stock workshops and in construction projects</li> <li>Recycling of newsprint collected at stations, and introduction of recycled office paper, etc.</li> </ul>	–	5.06	<ul style="list-style-type: none"> <li>Recycling rate for waste</li> <li>Recycling rate for waste</li> <li>Recycling rate for waste</li> <li>Usage rate of recycled paper as</li> </ul>
<b>4</b> Environmental management	<ul style="list-style-type: none"> <li>Implementation of environmental management by Committees on Ecology at JR East Head Office and branch offices</li> <li>Acquisition of ISO14001 certification for Kawasaki Thermoelectric Power Plant, Oi Workshop, and Niigata Mechanical Technology Center</li> </ul>	–	0.17	
<b>5</b> Research and development of environment-related technologies	<ul style="list-style-type: none"> <li>Development of next-generation AC Train commuter trains (energy savings and recycling)</li> <li>Development of technologies for noise reduction</li> <li>Development of measures to eliminate engine idling for diesel railcars</li> </ul>	0.01	0.51	
<b>6</b> Social activities	<ul style="list-style-type: none"> <li>Implementation of Afforestation Alongside Railway Tracks program</li> <li>Implementation of ecology campaigns</li> <li>Publication of environmental reports</li> <li>Environmental advertisements</li> </ul>	0.09	0.47	<ul style="list-style-type: none"> <li>Specific environmental preserva</li> </ul>

#### How environmental conservation costs and effects are determined

- Data refers to East Japan Railway Company itself, on a nonconsolidated basis.
- "Environmental conservation costs" covers only those that can be identified through our current system of management, etc.
- Categorization of activities is based on the guidelines set forth by the Ministry of the Environment of Japan.
- For activities that are multipurpose and have a significant environmental effect, the stated amount refers to total costs spent on behalf of those specific activities. (The cost for pollution prevention includes all the expenses for the introduction of continuous welded rails and PC sleepers, as long as they are considered to have contributed to enhanced functionality. The cost for global environmental conservation includes the total amount invested in energy-saving railcars.)
- Expenses do not include depreciation costs.
- Expenses for the processing of waste generated at stations and trains (within the category of resource-recycling costs) is calculated in the following manner: First, a model is set up for the cleaning of

- stations and trains. Second, a percentage occupied by waste recycling and processing is calculated, in proportion to the content of the entire model. By multiplying the cleaning expenses for stations and trains by this percentage, the amount of the said expenses is obtained.
- The amount of expenses for the processing of waste generated through construction work and by rolling stock facilities (under the category of resource-recycling costs) is calculated by multiplying the waste volume in fiscal 2000 by the standard unit price in each waste category and location.
- Economic effect is calculated based on real and quantifiable benefits generated by reduction of electricity and maintenance costs and by the sale of assets; other methods of calculation are under consideration. Regarding investments in facilities such as energy-saving railcars and cogeneration, calculation is based on one year's worth of cost savings in the year of the capital investment multiplied by the legally accepted depreciation lifespan of the facility. (If a facility was launched during the fiscal year, a year's worth of cost savings were assumed for the sake of accounting).
- The "cost of facilities" of the "environmental conservation costs" includes outlays to secure such facilities carried over from previous fiscal years.

**Reference**

Amount of facilities investment for the period ¥222.30 billion  
 Total amount of research and development costs for the period ¥13.37 billion\*

\* Includes research contracted (¥5.62 billion) to the Railway General Research Institute based on the Agreement on Research Activities, etc., concerning research and development in fundamental fields.

Targets			Environmental conservation effects		Economic effects (¥billion)	Reference in Environmental Report
	Reference value (fiscal 1990)	Target value	Actual achievements in fiscal 2000			
75dB in designated residential areas along Shinkansen Lines	–	100% (to be completed in 2002)	40% improvement	–	–	Environmental conservation along railway lines <b>pp. 26–29</b>
thermoelectric power plant	994t	60%	58%	414t	–	
business activities	2.76 million t-CO <sub>2</sub>	20%	12%	2.44 million t-CO <sub>2</sub>	35.15	Global environmental conservation <b>pp. 10–17</b>
unit electric power generation at company-	726 g-CO <sub>2</sub> /kWh	30%	25%	544 g-CO <sub>2</sub> /kWh		
operations in proportion to unit	–	80%	59%	–		
refrigerating machines using specific CFCs	20.6 MJ/ car-km	15%	4%	19.7 MJ/car-km		
office stock	82 units	85%	63%	30 units		
generated at stations and on trains	–	36%	35%	–	0.31	Zero emissions programs <b>pp. 18–25</b>
generated at rolling stock workshops	–	75%	67%	–		
generated by construction projects	–	85%	73%	–		
office stock	–	100%	97%	–		
					–	Environmental management system <b>pp. 4–9</b>
					–	<b>pp. 13, 22, 27</b>
tion activities	-		-	12 locations 20,000 trees planted 2,000 people participated	–	Environmental efforts in society <b>pp. 30–33</b>

**[Breakdown of economic effects]**

**2. Global environmental conservation activities**

Item	Environmental conservation costs		Environmental conservation effects		Economic effects		Legally mandated lifespan (years)
	Investment (¥ billion)	Cost of facilities (¥ billion)	Reduction in CO <sub>2</sub> emissions (1,000 t)		(¥ billions)		
			Per annum	Lifespan	Per annum	Lifespan	
Low-energy commuter trains	34.65	34.65	38	494	2.43	31.53	13
Cogeneration	0.93	1.27	6	90	0.24	3.60	15
Solar power generation	0.07	0.07	0	0	0.00	0.02	10
<b>Total</b>	<b>35.65</b>	<b>35.99</b>	<b>44</b>	<b>584</b>	<b>2.67</b>	<b>35.15</b>	–

**3. Resource-recycling activities**

Item	Environmental conservation costs	Economic effects
	Expenses (¥ billions)	Per annum effect (¥ billions)
Processing of waste products from workshops and construction projects	2.17	0.31



## 2. Global Environmental Conservation

Disruption of the global environment has become an important concern for all of us. Global warming—recognized to be caused by greenhouse gases such as CO<sub>2</sub>—could have a seriously detrimental impact on our future, in terms of both time and space. The effects of further global warming include a change in global climate patterns, which will in turn effect ecosystems worldwide.

The Kyoto Protocol, ratified at the Third Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in 1997, aims to reduce global CO<sub>2</sub> emissions by 5.2% of 1990 levels between 2008 and 2012, with target reductions of 6%, 7%, and 8% for Japan, the U.S., and Europe, respectively.

As the unit of CO<sub>2</sub> emission from railways in proportion

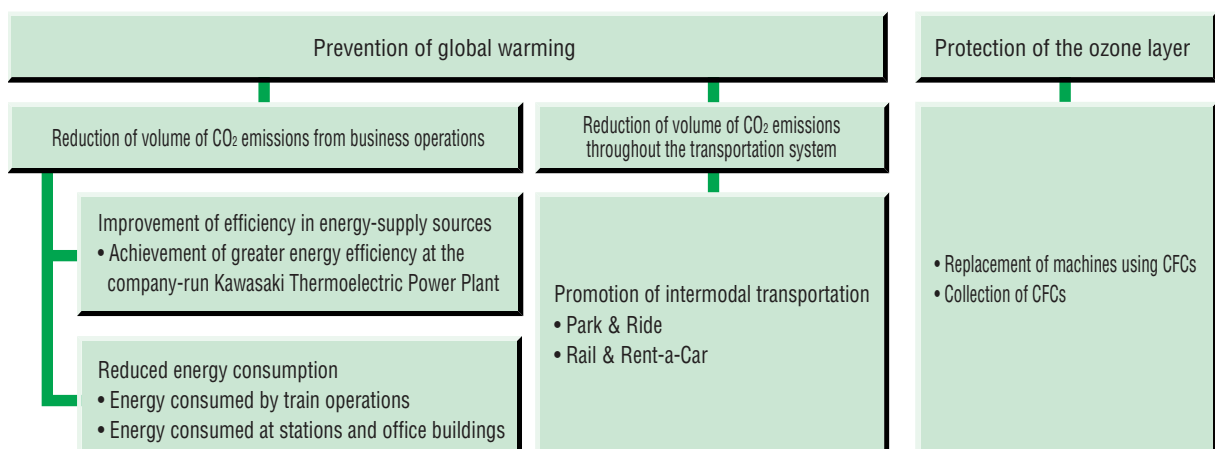
to transportation volume is low in comparison to other means of transportation, railways are considered a relatively environmentally friendly means of getting from one point to the next. Moreover, electric trains do not actually emit any CO<sub>2</sub> in operation, since their power source is electricity.

In spite of this, the volume of energy consumed by JR East totaled 59 billion MJ (equivalent to 1.53 million kl of crude oil) in fiscal 2000, resulting in indirect emission of a significant volume of CO<sub>2</sub>—an amount equivalent to 0.2% of Japan's total emissions. By stepping up our efforts to reduce energy consumption and CO<sub>2</sub> emissions, JR East is contributing to the prevention of global warming.

### Goals and progress

Item	Target value (to be met by fiscal 2005)	Fiscal 2000		Reference value (figure from fiscal 1990)
		Actual achievement	Value achieved	
CO <sub>2</sub> emissions in general business activities	20%	12%	2.44 million t-CO <sub>2</sub>	2.76 million t-CO <sub>2</sub>
CO <sub>2</sub> emissions in proportion to unit electric power generation at company-run thermoelectric power plant	30%	25%	544 g-CO <sub>2</sub> /kWh	726 g-CO <sub>2</sub> /kWh
Ratio of energy-saving railcars	80%	59%	—	—
Energy consumption for train operations in proportion to unit transportation volume	15%	4%	19.7 MJ/car-km	20.6 MJ/car-km
Number of large-size refrigerating machines using specific CFCs	85%	63%	30 units	82 units

### JR East's efforts on behalf of global environmental conservation





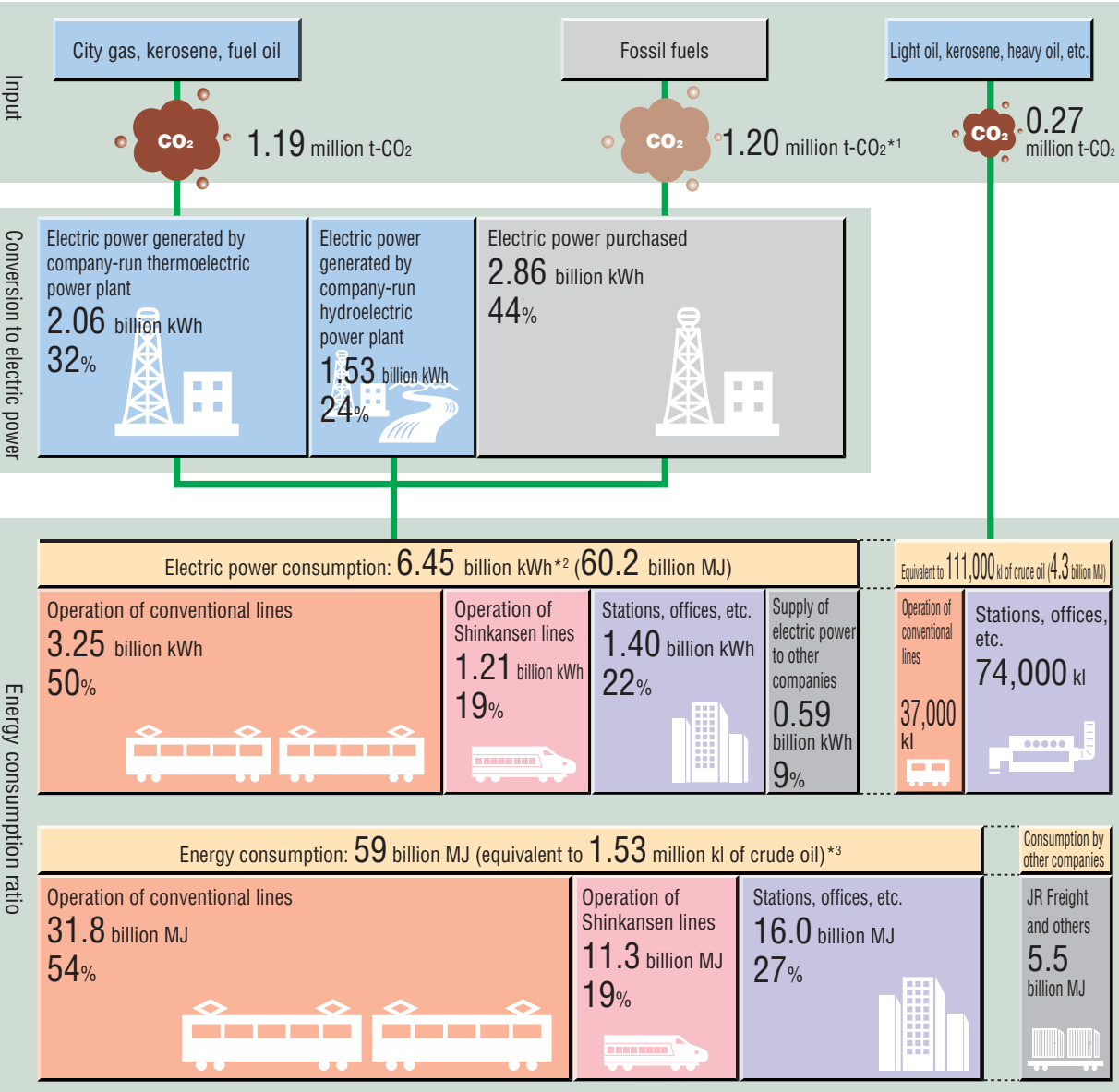
## Energy supply and consumption by JR East

The supply of energy for JR East consists of electric power, which is generated by the company-run Kawasaki Thermoelectric Power Plant (Kawasaki, Kanagawa Prefecture) and Shinanogawa Hydroelectric Power Plant (Ojiya, Niigata Prefecture), along with electric power purchased from power

companies and other types of fuel.

Electric power and fuel are used for train operations, as well as for lighting apparatus and air-conditioning equipment at our stations and offices. We also supply electric power to other companies, such as Japan Freight Railway Company (JR Freight), which also run on our tracks.

### Energy map for JR East



\*1 As figures represent a historical comparison, the Federation of Electric Power Companies Japan CO<sub>2</sub> emission coefficient for fiscal 1990 is used; substitution of the fiscal 1999 coefficient would result in a figure of 1.06 million tons.  
 \*2 Equivalent to the annual electric power consumption of 1.82 million households (34% of the households in the Tokyo Metropolis). (*Electric Power Annual*, Federation of Electric Power Companies Japan)  
 \*3 Equivalent to 1.23 times the estimated capacity of the Tokyo Dome stadium.

## Energy savings/Reduction of CO<sub>2</sub> emissions

### Volume of energy consumption and CO<sub>2</sub> emissions

Electric power accounts for 93% of the total energy consumed by JR East, with 56% of this electric power supplied by our own power plants. It is therefore essential that we enhance the efficiency of these plants and reduce energy consumption in our trains, stations, and offices. By doing so, we can reduce energy consumption for our business operations and achieve a corresponding reduction in CO<sub>2</sub> emissions. Through measures such as these, energy consumed through JR East's business operations in fiscal 2000 was 59 billion MJ (equivalent to 1.53 million kl of crude oil), while the volume of CO<sub>2</sub> emissions was 2.44 million tons, a 4% reduction from the previous fiscal year. Compared to the figures from fiscal 1990, the total CO<sub>2</sub> emission volume decreased 12%, and the volume of energy consumption stayed at the same level.

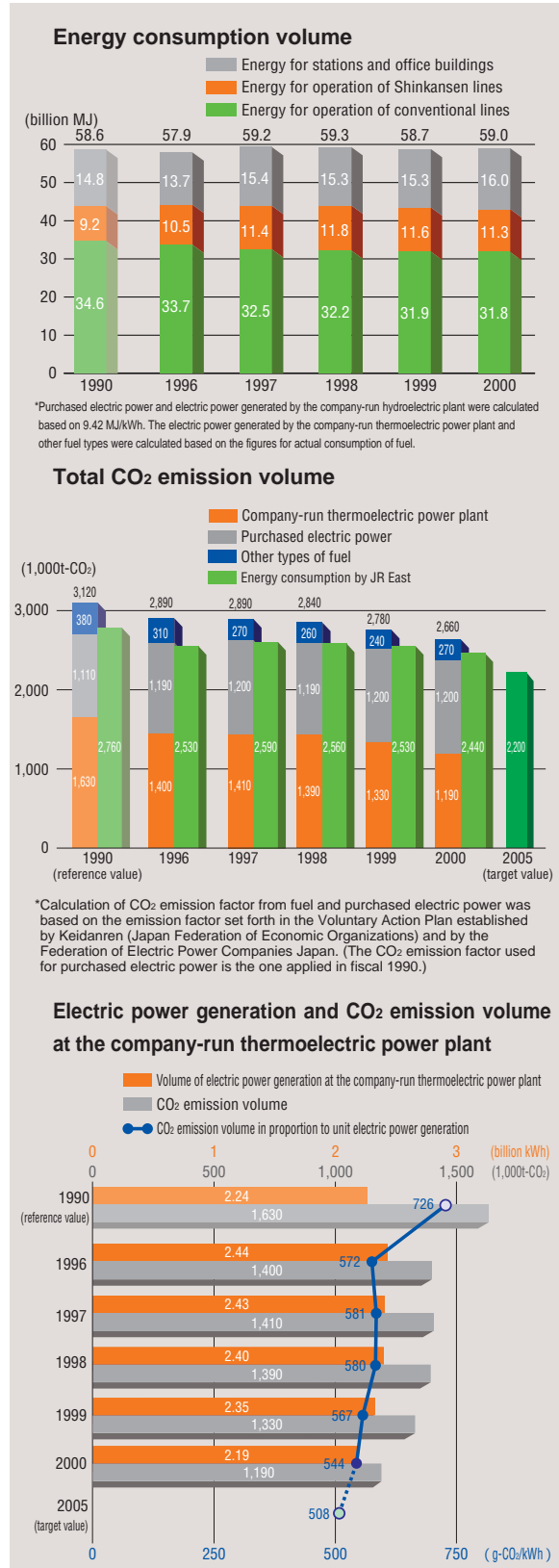
### Achieving greater energy efficiency at our thermoelectric power plant

We are in the process of replacing the four power-generating units at our Kawasaki Thermoelectric Power Plant with combined-cycle units\*. Unit No. 2 was replaced in fiscal 1993, followed by No. 3 in fiscal 1999. By optimizing the operation of these power-generating units, CO<sub>2</sub> emissions in fiscal 2000 totaled 1.19 million tons while the emission volume in proportion to unit electric power generation was 544 g-CO<sub>2</sub>/kWh. This figure represents a 25% reduction from levels recorded in fiscal 1990.

\* Combined-cycle power-generating unit: A power-generating unit that combines gas turbines (turbines are rotated by gas combustion) and steam turbines (heated steam is used to rotate turbines).

### Effective use of hydropower generation

Our Shinano River Hydroelectric Power Plant is a clean source of power that generates very limited emissions of such substances as CO<sub>2</sub>, NO<sub>x</sub>, and SO<sub>x</sub>. In fiscal 2000, volume of electric power increased by 8% over fiscal 1999, contributing to JR East's efforts to cut CO<sub>2</sub> emissions.



### Reducing energy consumption in train operations

Train operations account for fully 73% of JR East's energy consumption. In order to reduce this energy requirement, we are in the process of introducing energy-saving railcars such as the E231 series for local trains on the Sobu, Utsunomiya, and Takasaki lines. As a result, in fiscal 2000, the energy required to move one rail car one kilometer declined to 19.7 MJ.

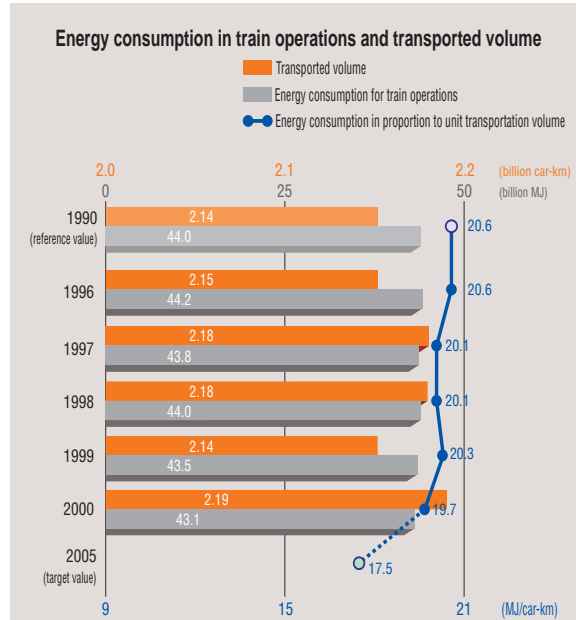
On our conventional rail lines, we operate several types of energy-saving railcars such as the new 205 series on the Yamanote Line, and VVVF cars such as the E231 series on the Sobu and other lines. By reducing weight and using regenerative brakes\*<sup>1</sup>, the new model cars reduce operating power consumption to 66% of such older models as the 103 series. VVVF cars likewise reduce operating power consumption to just 47% of older models through the use of VVVF inverter control\*<sup>2</sup>. We are also developing next-generation AC Train commuter trains, designed to further reduce energy consumption.

In order to reduce energy consumption, we also have introduced new types of diesel railcars such as the Kiha 100 and 110 series, featuring lighter bodies and new engines, and refitted older railcars with new fuel-efficient engines.

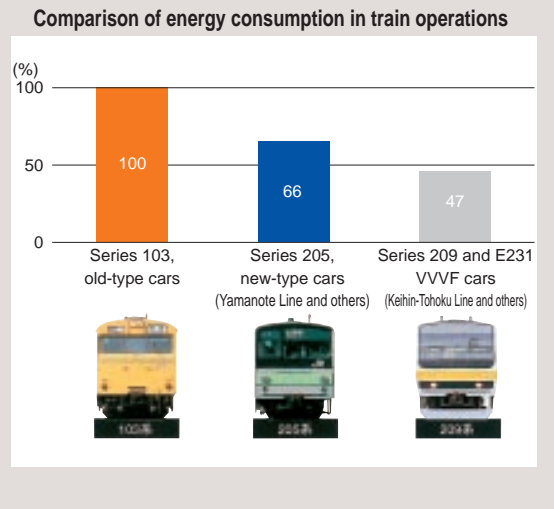
As of the end of March 2001, energy-saving railcars accounted for 59% of our rolling stock.

\*1 Regenerative brake: A brake that uses a motor to generate electric power during application for subsequent use as electricity.

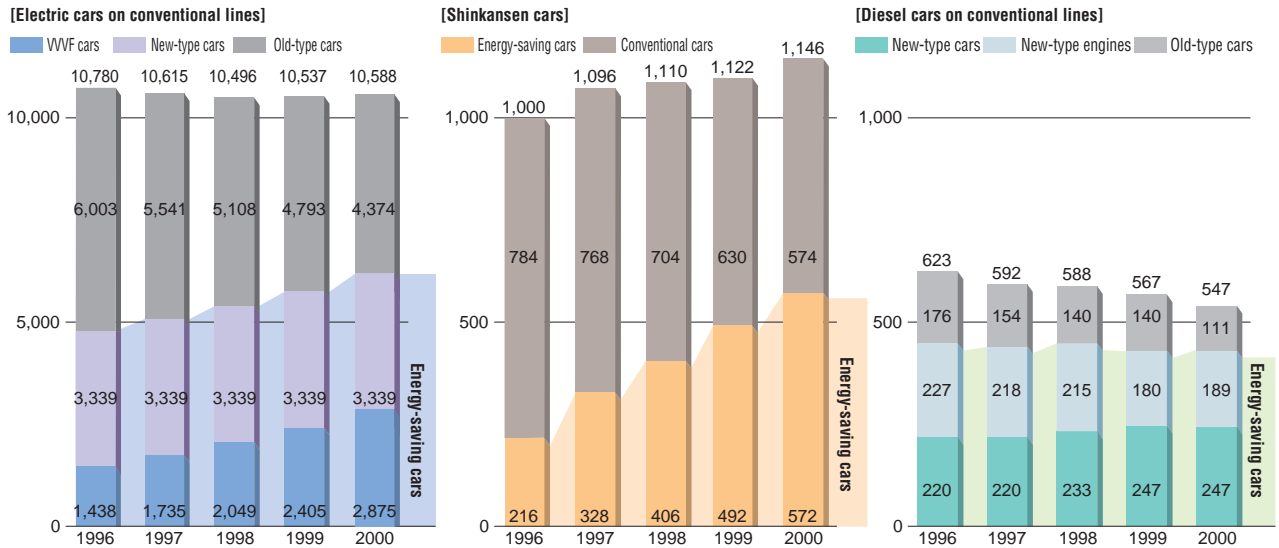
\*2 VVVF inverter control: VVVF stands for "variable voltage variable frequency," an inverter that can efficiently control train speed.



Energy-saving cars (E231 Series)



## Introduction of energy-saving cars

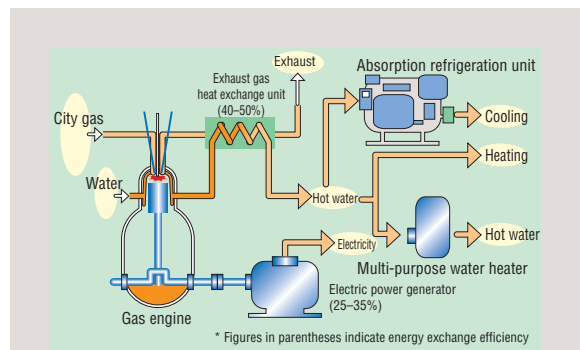


## Energy savings at stations and office buildings

We are working to introduce more energy-efficient facilities and enhance the productivity of our existing machinery to ensure reduction of energy consumption at stations and office buildings.

Furthermore, as a means of bringing more efficiency to energy-supply systems at stations and other facilities, we have introduced cogeneration systems at the Machida Station building, Sendai Station building, and the General Training Center (Shirakawa, Fukushima Prefecture) among others, and have introduced gas heat pumps at four stations, including Shinjo Station on the Yamagata Shinkansen Line.

Photovoltaic generators have been installed on the roof of the Shinkansen platform at Tokyo Station and on the roof of the training building at the General Training Center. A photovoltaic generator has also been integrated into the material of the roof over the Shinkansen platform at Takasaki Station.



Cogeneration system



Photovoltaic generator units





**Reduction of CO<sub>2</sub> emissions throughout the transportation system**

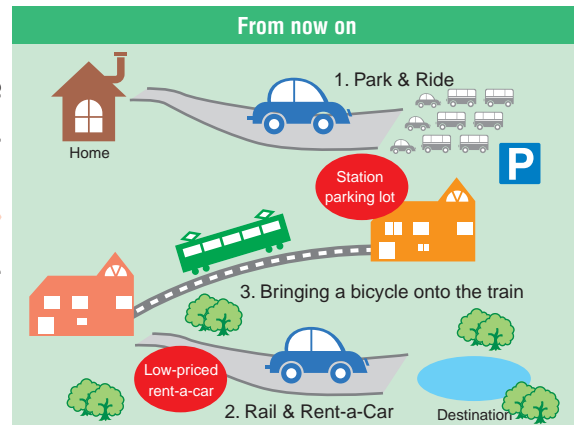
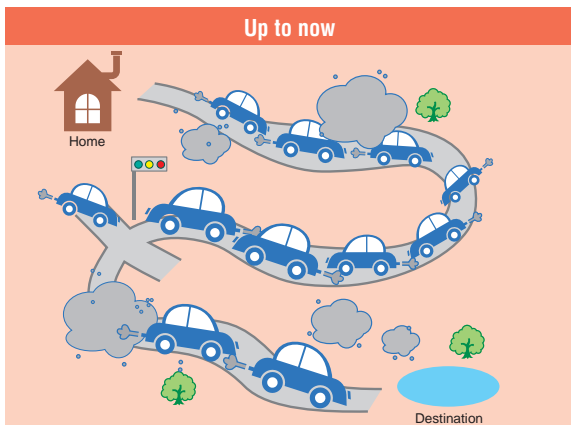
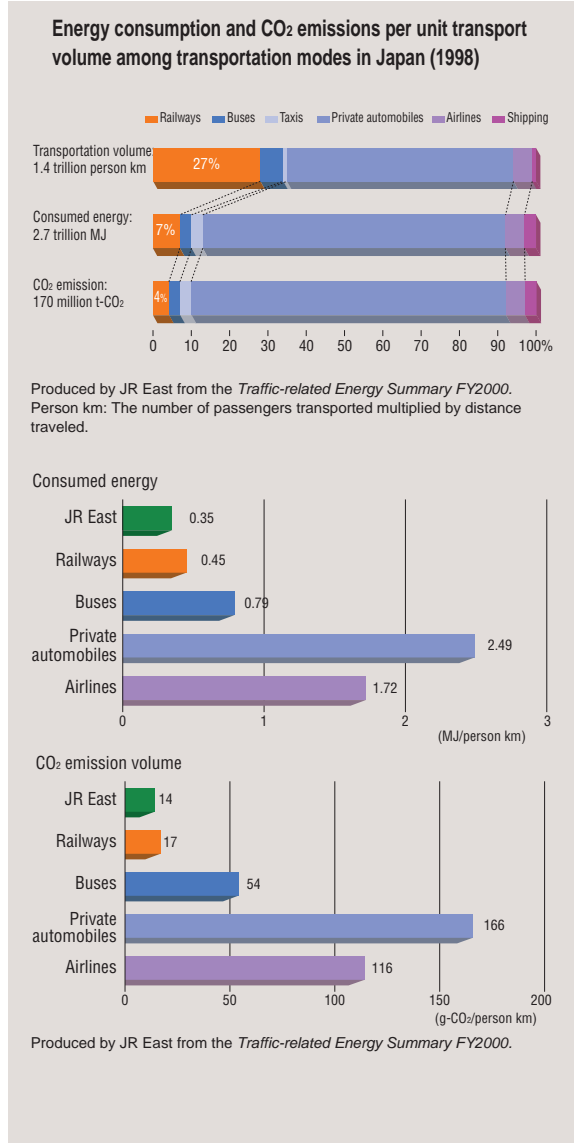
Railways account for 27% of all the transportation of people within Japan. Despite that high share, energy consumption and the CO<sub>2</sub> emission volume account for just 7% and 4%, respectively. As such, railways impose less of an environmental burden than other modes of transportation. Figures for unit transportation volume also support this point. JR East has consistently implemented measures to enable it to transport people with even less stress on the environment.

**Intermodal transportation**

While railways are environmentally superior to automobiles, they are unable to closely satisfy the requirements of individual users, as routes and destinations are fixed. JR East is therefore promoting intermodal transportation that integrates automobile use before and after using rail services.

**1) Park & Ride**

JR East is promoting the Park & Ride concept of having users drive to their local rail stations in their own automobiles, park, then ride trains to their final destinations. Park & Ride parking lots are available for use free of charge, or at a discount, by customers with express tickets. In fiscal 2000, JR East alone prepared 1,500 parking spots. Since 1994, we have prepared a total of 4,800 parking stalls. In addition, parking lots have been also set up with the cooperation of municipalities along rail lines.

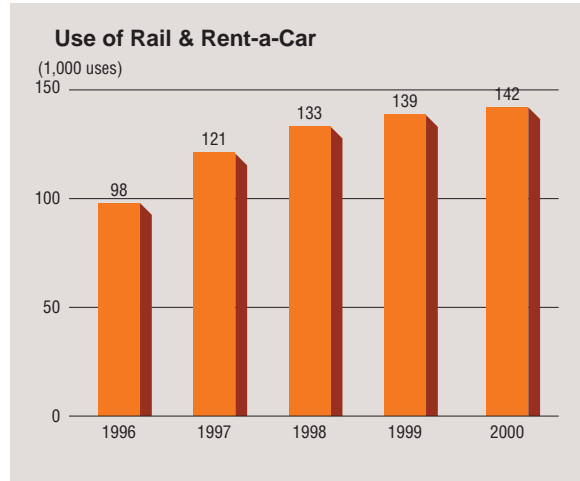


Choosing a means of transport that offers reduced environmental burden

Image of intermodal transportation

## 2) Rail & Rent-a-Car

JR East is promoting a Rail & Rent-a-Car travel program that combines the use of rail with reasonably priced rental cars. Customers who buy JR tickets and rent-a-car tickets at the same time, and who satisfy certain requirements, are offered discounts on both the rail and car rental portions. In 1995, JR East began offering its Torenta-Kun discount car rental service which was priced at roughly half the typical market rate. Also, as an endeavor to further reduce environmental impact, we are introducing eco-friendly hybrid automobiles at a few rent-a-car offices in our rail stations.



Rail & Rent-a-Car

## 3) Bringing bicycles onto the train

JR East recommends that customers make their train trips more fun and environmentally friendly with the use of bicycles. In November 1998, we developed and marketed the Traincle lightweight bicycle, which is collapsible for easy storage in a coin-operated locker. Furthermore, we revised our business regulations concerning the charge for carrying collapsible bicycles onto trains. This means our customers can now bring bicycles onto the trains for free. All that is required is that the bicycle be placed in a bag.



Traincle

## Ozone layer-depleting substances and other greenhouse gases

### Replacement of facilities reliant on specific CFCs

Certain types of CFCs used as coolants in the air-conditioning systems of large buildings are said to destroy the earth's ozone layer. The same could be said for halon gas, which is used in the fire extinguisher systems of facilities such as substations.

JR East is replacing its old facilities with ones that are free of specific CFCs and halon gas. In particular, we are systematically replacing large-size refrigeration machines with high-efficiency, specific CFC-free models. Accordingly, the number of large, specific CFC-based refrigeration machines went from 82 in fiscal 1990 to 30 in fiscal 2000, a drop of 63%.

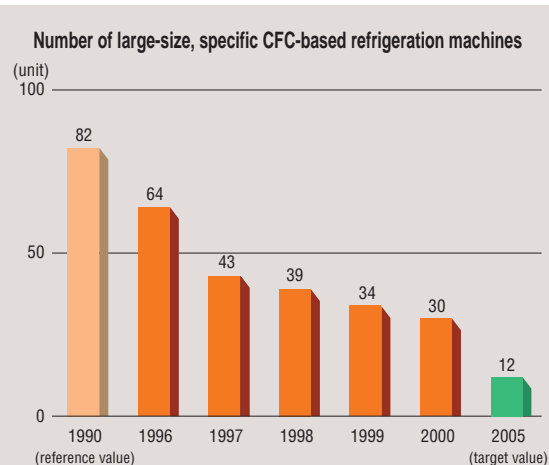
Halon, used as a fire extinguishing agent, is recovered in coordination with the Halon Bank Promotion Committee when dismantling halon-using facilities. We no longer use halon when installing new fire extinguishing systems.

### Railcar air-conditioning systems

For the air-conditioning systems of our railcars, some diesel cars are equipped with specific CFC-based air-conditioning systems. Other than those railcars, however, we have switched over to new CFC substitutes. When dismantling railcars and air-conditioning systems, we recover all leftover CFCs. On new railcars, we use CFC substitutes that have minimum impact on the ozone layer, such as R407C.

### Other greenhouse gases

Apart from CO<sub>2</sub>, JR East also uses HFCs (hydrofluorocarbons) for air conditioning in trains, and PFCs (perfluorocarbons) and SF<sub>6</sub> (sulfur hexafluoride) in trains as well as for power generation and conversion. The use of such substances is restricted, however, within tightly packaged products, so there is normally no emission into the air. Nonetheless, we are extremely careful when using these products. We endeavor to prevent leakage during maintenance operations and scrapping, at which time discarded containers are processed in the appropriate manner.



Equipment to collect CFCs and CFC substitutes used in trains



### 3. Zero Emissions Program

The end of the 20th century marks the close of an era of mass-production and mass-consumption. Now, we stand at the threshold of a new era, a significant step forward in the realization of a recycling-oriented society. Now that we are aware of the planet's own capacities, which have suffered significant depletion, it is no longer acceptable to dissipate resources and generate massive amounts of waste.

Passengers discard huge quantities of refuse at JR East stations and on trains, while from our maintenance and

scrapping operation of rails, trains, and other structures large quantities of waste are also generated.

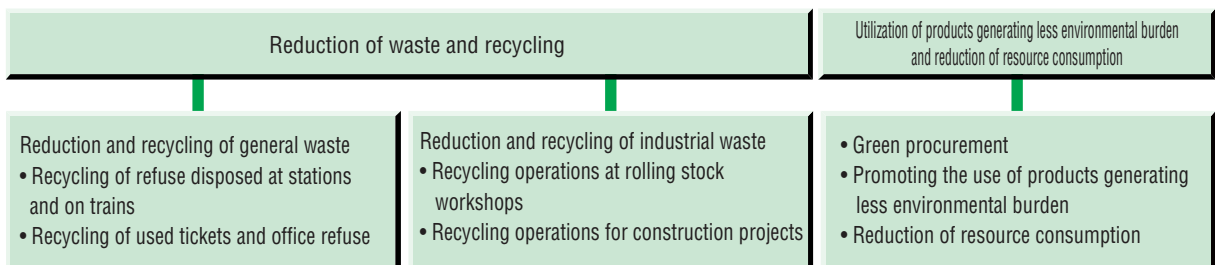
As a means of achieving a true recycling-oriented society, in addition to treating such waste in a manner compliant with laws and regulations, JR East makes every effort to reduce the total volume of waste generated in the course of our operations.

We are also striving toward the achievement of zero emissions (no non-recycled waste products). The active use of recycled products plays a key role in these efforts.

#### Goals and progress

Item	Target value (to be met by fiscal 2005)	Actual achievement in fiscal 2000
Recycling rate of waste generated at stations and on trains	<b>36%</b>	<b>35%</b>
Recycling rate of waste generated at rolling stock workshops	<b>75%</b>	<b>67%</b>
Recycling rate of waste generated through construction projects	<b>85%</b>	<b>73%</b>
Usage rate of recycled paper as office stock	<b>100%</b>	<b>97%</b>

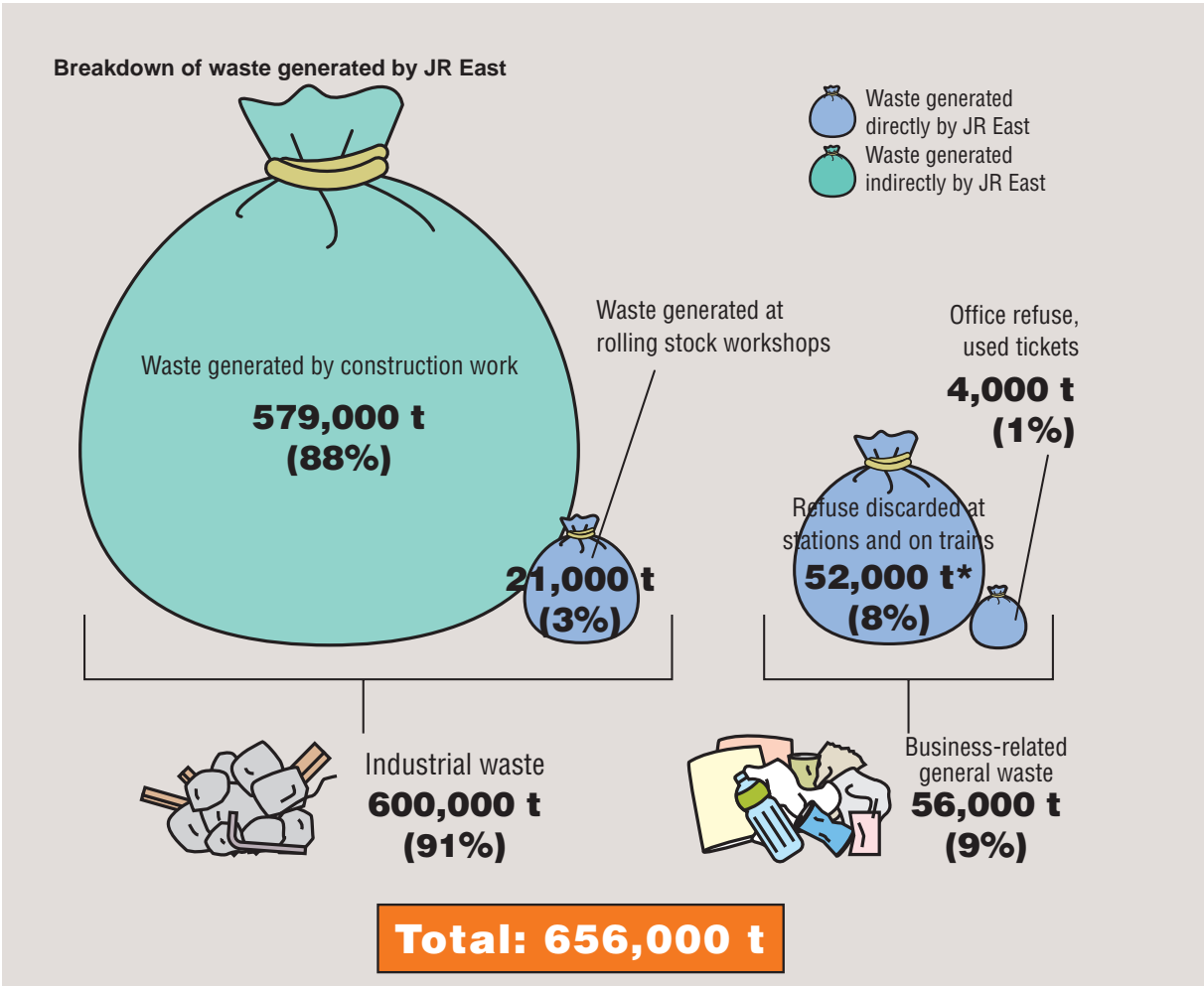
#### JR East's efforts toward zero emissions



## Waste generated by JR East

### Waste reduction and recycling

The volume of waste generated directly and indirectly by JR East's business operations amounted to 656,000 tons in fiscal 2000. Of that, the waste directly generated by JR East included 52,000 tons of refuse discarded by passengers at stations and on trains, 21,000 tons of industrial waste generated by maintaining and scrapping railcars, 3,000 tons of refuse generated at our offices, and 1,000 tons of used tickets. Waste generated indirectly by our operations consists of 579,000 tons of waste that arise from maintenance and construction work on rail lines and buildings. We are making every effort to reduce the volume of this waste and to implement systems to promote efficient recycling of resources.



\* Comparable to the general waste created by a population of 130,000 (approximately 1% of the population of the Tokyo Metropolis).  
 Source: Ministry of the Environment press release dated June 22, 2001

## Reduction and recycling of business-related general waste

### Recycling of refuse generated at stations and on trains

JR East carries approximately 16 million passengers daily, and the volume of refuse they produce amounts to approximately 52,000 tons a year. A large portion of that consists of recyclable material such as newspapers, magazines, and steel and aluminum cans.

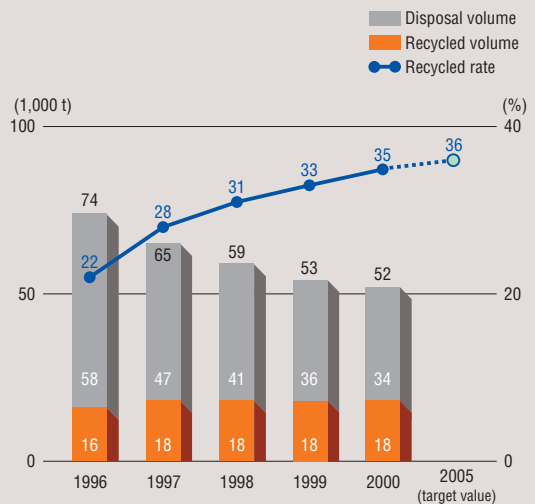
We are now busy installing refuse bins categorized for the efficient collection and separation of recyclable waste. These bins carry the designations “Newspapers and Magazines,” “Cans, Glass Bottles, and PET Bottles,” and “Others,” and passengers are asked to follow those indications. In this way, we try to place the collected recyclable matter like used paper, steel and aluminum into a recycling loop. In fiscal 2000, a certain number of these triple bins were replaced with quintuple bins for separating five categories of refuse. These measures have produced a 35% recycling rate for refuse generated at stations and on trains in fiscal 2000.

### Recycling centers

Recycling centers have been built at Ueno Station, Omiya and Shinkiba in order to deal with large volumes of waste generated in the Tokyo metropolitan area. At our recycling centers in Ueno Station and Omiya, we collect and process nearly 5,700 tons of cans, glass bottles, and PET bottles that are collected in the Tokyo and Saitama areas. We then separate them into their respective categories, and place them on the proper recycling routes.

The Shinkiba Recycling Center gathers newspapers and magazines discarded at stations throughout the Tokyo area. In fiscal 2000, approximately 3,100 tons of used paper went through separation and processing here.

### Refuse generated at stations and on trains



Categorized refuse bins are labelled for five types of waste.



Omiya Recycling Center

### A group-wide effort

JR East is promoting zero emissions in a consolidated, group-wide effort. For example, our recycling centers are operated by East Japan Eco Access Co., Ltd. We also implement a variety of conservation and recycling efforts in our retail sales and hotel businesses.

### Recycling of used train tickets and passes

Train tickets were traditionally considered difficult to recycle, because many of them had a magnetic steel powder coating on the back. However, new technology has made it possible to separate the steel powder from paper fiber, enabling used train tickets to be reborn as recycled paper. In fiscal 2000, 99% of approximately 800 tons of used tickets were recycled into toilet paper used in Yamanote Line stations and in the Head Office, cardboard paper, employee business cards, and other items.

It has also become possible to recycle magnetic passes, which are made of PET resin, through the application of a new technology that removes the imprinted surface layers. We are currently working to refine this technology for practical use.

We are also moving ahead with ticketless technologies to reduce the volume of tickets and rail passes. In 1991, JR East introduced prepaid IO Cards, which enable passengers to use automated ticket gates without purchasing individual tickets. The service area for this card system was expanded in 1999, and IO Cards have been in use on conventional express lines since July 2000.

In fiscal 2001, we plan to launch a new type of IC card-based combination ticket/train pass named Suica. These rewritable cards can be renewed and used repeatedly, thus greatly reducing the volume of discarded train passes.

### Recycling of office refuse

JR East separates office refuse according to category. Disposal of such materials into designated bins allows us to place paper, metals and glass into appropriate recycling loops. In fact, we recycled 52% of the approximately 2,800 tons of refuse generated during fiscal 2000.

### Examples of group-wide efforts

- Shopping bags were made more difficult to tie at the top, making it easier to sort the refuse at the time of collection. (Higashi Nihon Kiosk Co., Ltd.)
- The packaging of boxed meals was simplified to reduce waste. (Nippon Restaurant Enterprise Co., Ltd. [NRE])
- Leftover food scraps from boxed-meal cooking centers are turned into compost for use at NRE's organic farm. (NRE)
- Leftovers at restaurants are turned into compost for sale to gardeners. (Granduo)
- Disposable paper cups, etc. have been replaced by chinaware. (JR East Food Business Co., Ltd.)
- Protective Styrofoam packaging of cargo is dissolved and disposed. (station buildings)
- Rooftop flea markets are held. (station buildings)
- Shampoo and other toiletry liquids packaged in reusable bottles instead of disposable sachets. (hotels)
- For multi-day stays, sheets and towels are changed only at guest's request. (long-stay hotels)



Composted food scraps are transformed into fertilizer



Suica IC card-based rewritable ticket/train pass



Categorized refuse bins at JR Head Office



## Reduction and recycling of industrial waste

### Recycling of waste generated at rolling stock workshops and construction projects

Maintenance of rolling stock generates waste such as metals, glass, rubber, cloth, wood chips, wastepaper, and waste oil, while construction, renovation, and maintenance of railway-related facilities generates waste that includes metals (rails and electrical wire, etc.), sleepers, concrete, mixed industrial refuse, and sludge.

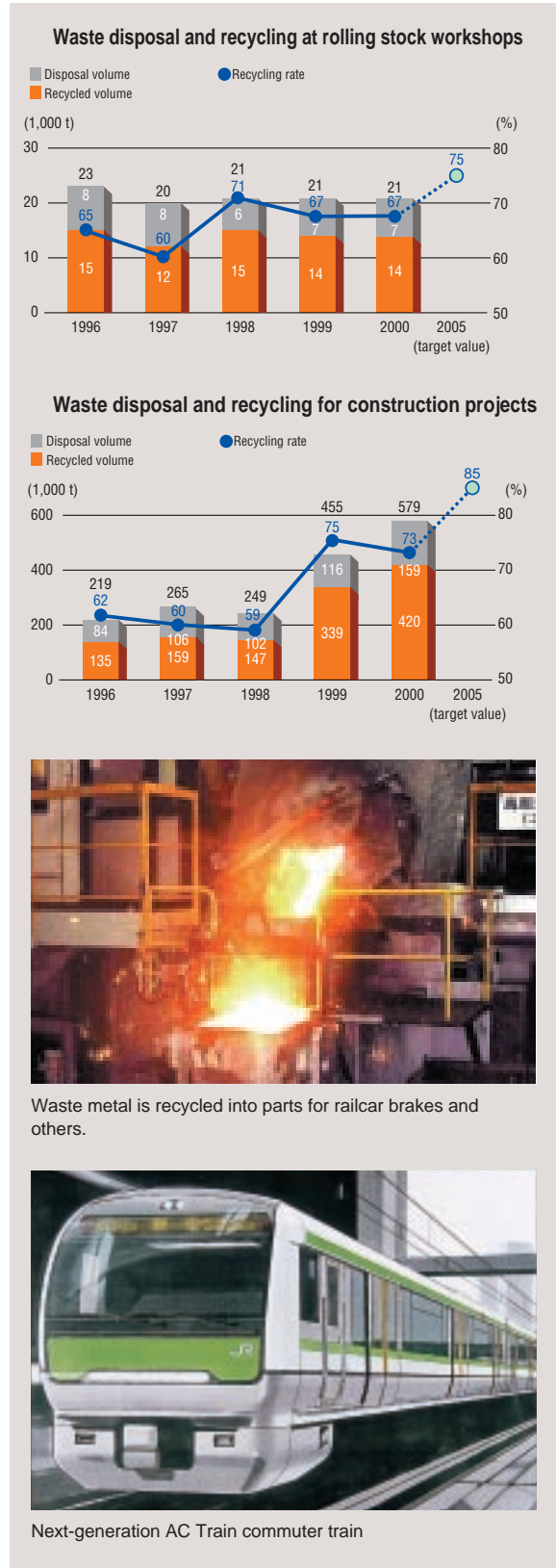
To minimize such waste from maintenance and construction, we are working to repair and reuse items whenever possible, and to secure recycling routes. We also act to preempt waste generation by selecting appropriate construction methods and materials during the design stage.

### Improvement of recycling rate at rolling stock workshops

We scrapped a total of 613 cars during fiscal 2000, primarily the 103 Series commuter cars and the 200 Series Shinkansen cars. The recycling rate for the 200 Series cars is 92%.

The E231 Series, introduced on our Sobu Line and other routes, replaces the urethane resin previously used for seats with materials such as polyester resin that offer a greater degree of recyclability. Aluminum has been substituted for fiber reinforced plastic (FRP) wherever feasible. These are just a few examples of our preemptive efforts to promote recycling from the design stage.

We are also planning to secure a recycling route for used glass recovered from railcars, and to improve the recycling rate for waste metals via more thorough collection and separation. We are now in the process of examining the possibility of FRP recycling, too. In fact, we are making significant efforts to realize 100% recyclability for our next-generation AC Train commuter trains now under development. To achieve this, every possible aspect of resource efficiency and recyclability is being examined in the design phase.





### Improved recycling rate for construction projects

Though not a direct product of our operations, waste from construction projects nonetheless accounts for 88% of the waste generated directly and indirectly by JR East, a fact that spurs our efforts to reduce and recycle waste from this source. Specifically, we share information on recyclable construction methods from initial design phase to aim to reduce waste as well as establish recycling plans that are reflected in the blueprints and specifications for each construction project.

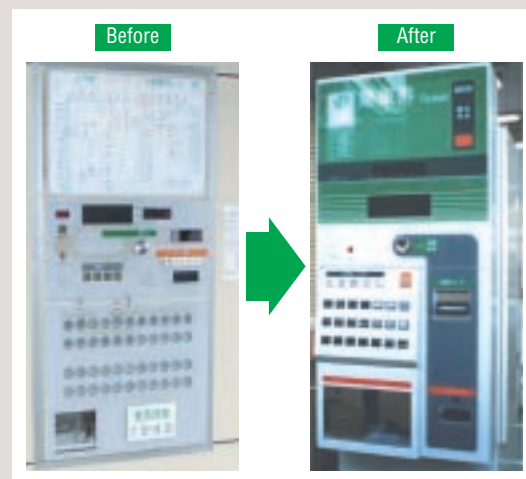
Our Tokyo Ballast Processing Center, located within the Tokyo Freight Terminal (Shinagawa, Tokyo), processes ballast and waste concrete into paving aggregate. This facility processed approximately 35,000 m<sup>3</sup> of waste in fiscal 2000. The Center was shut down in January 2001, with future recycling of construction waste to be handled by the expanded Totetsu Kogyo Co., Ltd. plant, also located within the Tokyo Freight Terminal.

### Recycled ticket-vending machines

Currently, JR East is in the process of replacing ticket-vending machines which were manufactured approximately 20 years ago. In the process, we have developed a technology for the recycling of parts and materials—a process that allows us to use such materials to produce new vending machines. Through the combination of reused parts and recycled materials, we have achieved an 80% recycling rate (by weight) for these new machines. In fiscal 2000, we began introducing these recycled ticket-vending machines in stations with a relatively few types of tickets and a low volume of ticket sales.



Tokyo Ballast Processing Center



Recycled ticket-vending machine



## Utilization of environmentally friendly products and reduction of resource consumption

### Green procurement

Green procurement refers to purchasing of goods and materials in consideration not only of their cost and quality but of their environmental impact as well. The promotion of green procurement, among companies and consumers alike, serves to raise environmental awareness on the part of suppliers, encouraging them to develop more environmentally friendly products and distribution methods. Ultimately, the purpose of green procurement is to build a society based on harmonizing with the environment rather than burdening it.

JR East established guidelines for green procurement in February 1999, and we promote responsible procurement organization-wide. These guidelines also call upon our suppliers to cooperate in the use of recycled materials and the promotion of environmentally responsible management.

### Promoting the use of environmentally friendly products

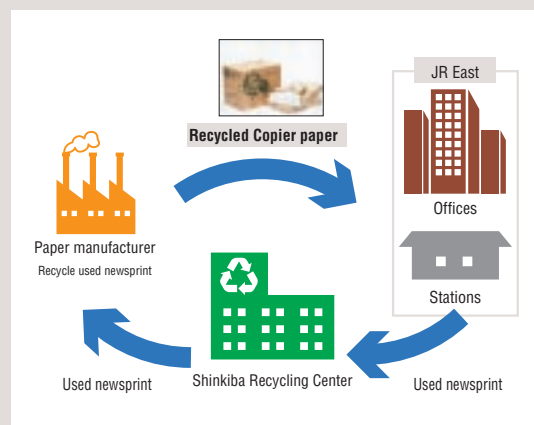
Given our use of various types of paper in business operations, we are making great efforts to maximize the use of recycled paper. Old newspapers gathered at stations throughout the Tokyo area are consolidated at the Shinkiba Recycling Center and sent out for reprocessing as copier paper. Including this paper produced from newsprint collected at train stations, 97% of all the copier paper used in JR East offices in fiscal 2000 was recycled stock. Beginning in 2001, we will also start to use recycled paper for archiving data, including records of ticket sales.

We have also introduced various products selected for their reduced environmental impact. Refuse bags were developed by compounding polyethylene and a powder made from used newspaper. To be recycled this way, newspaper collected at stations is powdered to a particulate size equivalent to cigarette smoke. These bags are used for refuse collection at our stations, and are also used as official refuse bags in the cities of Tama and Kawasaki.

When employees replace their uniforms, the new uniforms are made with textiles produced from used PET bottles. In April 2000, material used for our VIEW Card credit cards was changed to chloroethene-free PET-G. Ballast and concrete generated from construction work is used for roadbed materials, and we use recycled tiles—made from glass bottles discarded at stations and on trains—for passageways and platforms in stations.



Recycled copier paper made of newspaper, collected at stations



A recycling loop



Recycled uniforms made from used PET bottles



Recycled paving tiles made from glass bottles (platform at Hitachi-no-Ushiku Station)

### Reduction of resource consumption

JR East is taking steps to reduce the amount of resources obtained through purchasing. For example, our rolling stock workshops are switching to reusable plastic or metal containers for parts and items from suppliers rather than using traditional wooden crates or cardboard boxes. This program is implemented with the cooperation of our many suppliers.

To reduce the amount of printed matter in circulation, our offices are linked with in-house e-mail and electronic messaging networks. We have also made double-sided output the default setting on our copying machines to minimize the use of copier paper.

### Reuse of water

JR East undertakes a variety of measures to conserve water. For example, at our rolling stock workshops, where relatively high volumes of water are used, the cleansing water for painting and other processes and bath water are recycled. We also treat our waste water before releasing it into the sewage system.

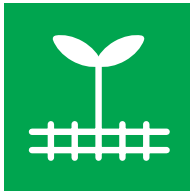
We are also aggressively promoting water reuse at our Head Office, branch offices, and station buildings. For example, rainwater collected from rooftops of buildings and platforms and waste water from kitchens are purified and reused as toilet water.

Our water-conservation activities go even farther, encompassing thorough, company-wide investigations of water leakage, and the use of water-saving toilets and spigots.

#### Examples of water reuse

Location	Type of water
Head Office building	Rainwater and used water
Tokyo Branch Office building	Rainwater
Hachioji Branch Office building	Rainwater
Yokohama Branch Office building	Rainwater
Oimachi Station building	Rainwater
Ebisu Station building	Rainwater
Tachikawa Station building (Granduo)	Rainwater and used water
Tokyo Station	Rainwater
Akabane Station	Rainwater
Shinagawa Station	Rainwater
Saitama-Shintoshin Station	Rainwater





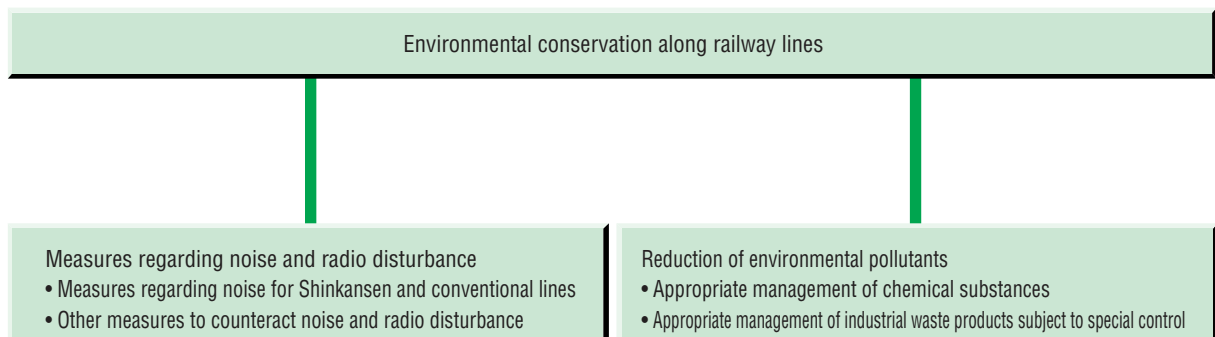
## 4. Environmental Conservation along Railway Lines

Noise, vibration, and radio disturbance are among the effects of JR East operations on the environment along railway lines. Our thermoelectric power plant generates air pollutants, and various chemical substances are used in maintenance operations for railcars and business establishments as well. Aware of the need to mitigate these effects, we are engaged in developing the necessary measures to minimize the impact of our operations on the environment along our railway lines.

### Goals and progress

Item	Target value (to be met by fiscal 2005)	Results in fiscal 2000		Reference value (figure from fiscal 1990)
		Actual	Achievement	
NOx emissions at company-run thermoelectric power plant	<b>60%</b>	<b>58%</b>	414t	994t
Reduction of noise to less than 75dB in designated residential areas along the Tohoku and Joetsu Shinkansen Lines	<b>100%</b> (to be completed fiscal 2002)	<b>40% completed</b>	–	–

### JR East's efforts to promote environmental conservation along railway lines





## Measures regarding noise and radio disturbance

### Noise reduction along Shinkansen lines

The environmental criterion set forth by the Ministry of the Environment (former Environment Agency) regarding noise generation by Shinkansen cars limits peak noise level (Lmax) during operation, and is one of the world's strictest environmental standards. We have initiated various programs to meet these standards, including the construction and height extension of soundproofing walls, installation of sound-absorbent materials, installation of covers for pantographs, and implementation of measures to prevent flattening of wheels.

Our successful suppression of noise to levels of 75 dB or below for all “densely populated areas\*” and “areas comparable to densely populated areas\*” has been verified by the Ministry of the Environment. Currently, we are working toward a similar achievement for all “residential areas\*,” which we plan to complete by fiscal 2002. By fiscal 2000, we had already accumulated results and accomplished our objectives for 40% of the target area. For the Nagano Shinkansen Line, which went into operation in October 1997, the former Environment Agency confirmed that the criterion had been met in all applicable areas along the line.

Noise-reduction efforts in other areas include the use of rail-smoothing cars for the reduction of noise generated by uneven rails, and the introduction of new pantographs that generate significantly lower wind noise on the Akita and Yamagata Shinkansen Lines. We are also in the process of developing a single-arm pantograph and insulator designed to minimize noise. We plan to install these new units on the Shinkansen extension to Hachinohe.

\* Based on the number and density of homes, neighborhoods along rail lines are classified as “densely populated areas,” “areas comparable to densely populated areas,” and “residential areas.”

### Noise reduction along conventional lines

The former Environment Agency established Guidelines on Anti-Noise Measures for New Construction or Major Renovation of Conventional Railways in December 1995. The objective of those guidelines was to regulate “equivalent noise level (Leq)” —a fundamentally different environmental criterion from that applied to the Shinkansen—under which frequency and duration of sound generation is incorporated in the evaluation of noise level. In the future, when planning construction of new conventional lines or major renovations to existing lines, we will include noise-reduction as a criterion from the initial design stage.



Triangular-peaked soundproofing device minimizes noise while preserving the view from railcar windows.



A Speno rail-grinding car



Single-arm pantograph and insulator designed to minimize noise

JR East is also working to reduce noise along existing lines through the use of continuous welded rails\*<sup>1</sup> and PC sleepers\*<sup>2</sup> and the reduction of railcar weight. Among the other noise-reduction efforts we are engaged in are reducing the noise produced by steel girders and developing railcars with quieter motors.

\*<sup>1</sup> Continuous welded rails: Each rail is at least 200 meters long

\*<sup>2</sup> PC sleepers: Sleepers made of pre-stressed concrete that are stronger than steel-reinforced concrete

### Other measures to reduce noise and radio disturbance

We do our utmost to reduce noise and vibration caused by construction, railway maintenance, and other operations, which must occasionally be performed during nighttime hours. Local residents are always informed in advance when such night work is scheduled. We are also striving to reduce the need for nighttime work through the replacement of existing roadbeds with highly stable TC-type roadbeds which require less maintenance work.

Along Shinkansen lines, television interference is sometimes caused when pantographs bounce over overhead wires. We are in the process of implementing measures to control such television interference for affected households.

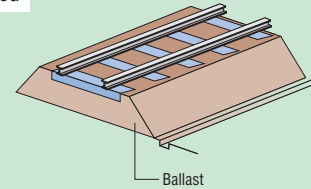
### Reduction of environmental pollutants

#### Air pollutants

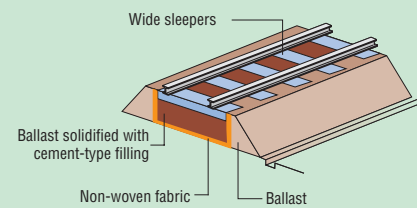
The company-run thermoelectric power plant at Kawasaki generates a significant volume of air pollutants. In that regard, we are converting fuels and renewing equipment to reduce NOx and SOx emissions and improve the facility's energy consumption efficiency. In 2000, NOx emission volume was 414 tons, SOx emissions 9.1 tons, and soot and dust emissions were 27.6 tons. Volumes of SOx, soot and dust emissions increased over the previous year, a fact that can be attributed to fuel mix and operating conditions. Though the current volume of emissions is well within regulatory limits, we are examining ways to achieve further reductions.

We are also working on replacement engines for diesel railcars, and on ways to enhance the function and durability of our low-pollution engines.

Conventional roadbed

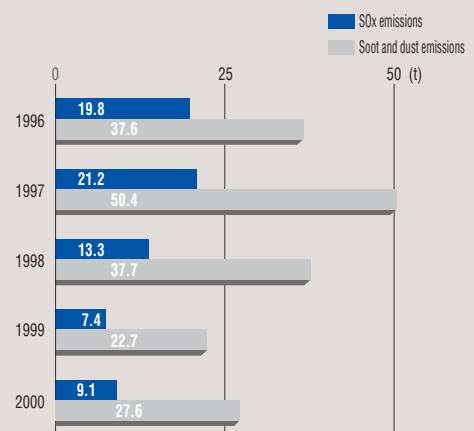
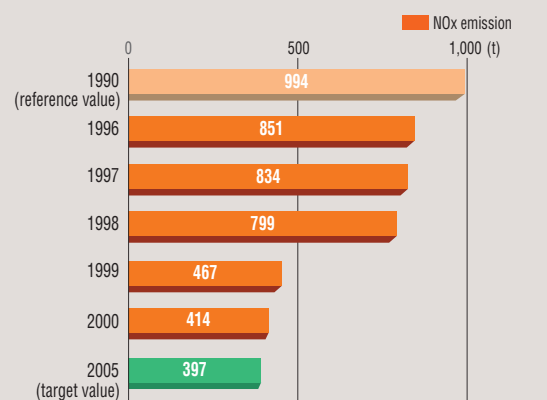


TC-type low-maintenance roadbed



TC-type low-maintenance roadbed introduced to reduce labor spent in maintenance work

Volume of NOx and other emissions from company-run thermoelectric power plant



\* Data for volume of NOx and other emissions refers to totals for the entire calendar year (January 1 to December 31).

### Incinerators

Under certain conditions, incinerators may generate dioxin. Currently, a portion of the refuse discarded at JR East's stations and on trains, as well as waste generated in business offices, is burned in our own incinerators. Careful monitoring and temperature control enables us to keep emissions below base-line values, but we are also in the process of consolidating and improving these incinerator operations. Virtually all of our incinerators with a capacity of less than 200 kg/h were taken out of service within fiscal 2000, while those with a capacity of 200 kg/h will be consolidated and renovated in an all-out effort to increase efficiency and minimize emissions.

### Appropriate management and reduction of toxic substances

Chemical substances used in our business operations include organic solvents used for railcar painting at rolling stock workshops and herbicides used for weeding along railway tracks.

We used 693 tons of organic solvents in fiscal 2000, which were disposed of in an appropriate manner. In conjunction with the implementation of PRTR regulations in April 2000, we have initiated a system to carefully monitor the nature and volume of regulated substances transported and disposed of. We have also introduced paint-free cars on our commuter lines, with such cars accounting for approximately 46% of our rolling stock.

Weeds growing on and along railway tracks can seriously interfere with the safety of train operations. To control weeds, we used 328 tons of herbicides during fiscal 2000. In consideration of environmental impact, we only use herbicides with the lowest possible ratings for both mammalian and aquatic toxicity. We also take care to use minimum amounts and limit the area for application of herbicides.

### PCBs

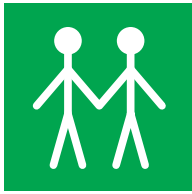
PCBs (polychlorinated biphenyls) have been used as insulation for high-voltage transformers and condensers in railcars, substations, and other facilities. As equipment using PCBs becomes obsolete, it is removed and stored in warehouses managed in accordance with strict regulations, under the supervision of personnel in charge of industrial waste materials subject to special controls. At present, the total weight of such materials in storage at JR East facilities is approximately 2,000 tons.

In accordance with special legislation outlining appropriate methods for processing PCB-contaminated wastes enacted in July 2001, we are working to develop safe yet effective methods of decontaminating this stock of PCB-contaminated waste within the shortest possible period of time.

### Treatment of sewage from train washrooms

To put a stop to environmental damage caused by disposal of waste directly onto rail lines, we have been working on the installation of sewage-treatment equipment in train washrooms and at base rail yards. Installation of treatment equipment on the last 47 diesel railcars was completed in fiscal 2000, and all electric railcars, diesel railcars, and passenger cars are now equipped with enclosed washroom waste collection facilities.





## 5. Environmental Efforts in Society

Nature is preserved in abundance along our approximately 7,500 km of railway lines. This includes the forests established to protect rail lines against the ravages of snow and wind. Protection of the natural surroundings is one of our most significant undertakings.

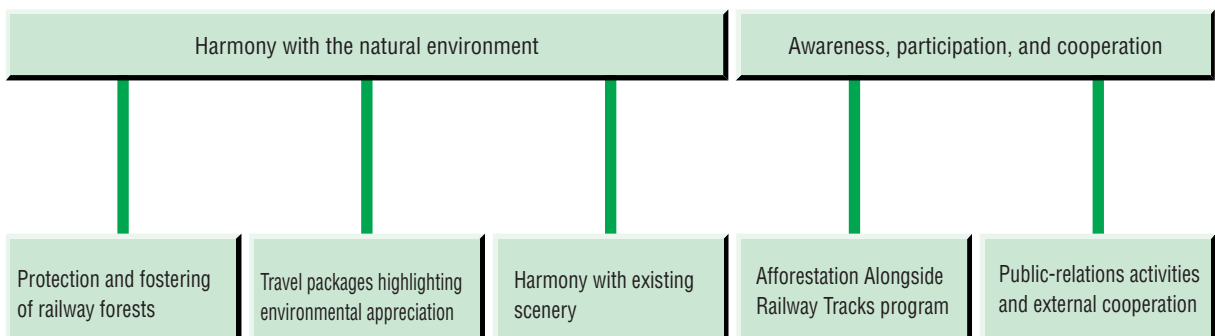
Yet, in our corporate effort on behalf of environmental conservation, it is also imperative that employees,

including those at our group affiliates, are also aware of environmental issues, and that we appeal to our 16 million daily passengers regarding the importance of environmental conservation. JR East is thus working to expand the circle of environmental awareness through a variety of means and occasions.

### Goals and progress

Item/Target value	Actual achievements in fiscal 2000
Implementation of specific environmental protection activities on an annual basis	<b>12 locations</b> <b>20,000 trees</b> <b>2,000 participants</b>

### JR East's environmental efforts in society





## Harmony with the natural environment

### Rediscovering the railway forests

Forests serve a variety of functions. In fact, since the early days of the Japanese railway industry's development, they have spared railways from all sorts of natural disasters. Over a century ago, in 1893, our first railway forest was established between Mizusawa and Aomori on the Tohoku Honsen Line to protect trains from drifting snow. From that point on, railway forests have been planted in various locations as a means of protection against snowstorms and landslides. Currently, we maintain approximately 4,400 hectares of railway forest comprising approximately six million trees. These forests not only contribute to the natural surroundings, they also have the capacity to absorb 17,000 tons\* of CO<sub>2</sub>, a full 0.6% of the annual JR East emission volume. We have made it our mission to protect and foster these forests.

\* Calculation based on "Assessment of public benefit of forest lands," Forestry Agency press release, Sept. 6, 2000

### Natural environment and travel

Travel and first-hand experience are perhaps the best means to understand the importance of our environment. JR East offers a variety of travel plans highlighting the theme, "Communication with Nature." We also include communication with the local community among the concepts for our New Journey travel packages and are working to establish accommodations for longer stays in cooperation with local communities. We believe that reconciliation between environmental protection and community revitalization can only be achieved through the maximization of local environment, people, culture, and resources. We will continue devising travel programs that bring forth the timeless charm of nature while emphasizing the fundamental importance of environmental conservation.

### Harmony with the existing scenery

The construction and major renovation of railways requires that we harmonize as much as possible with the existing scenery. To that end, we have adopted various measures for buildings and other structures to reconcile structural safety and durability and harmonization with the environment.

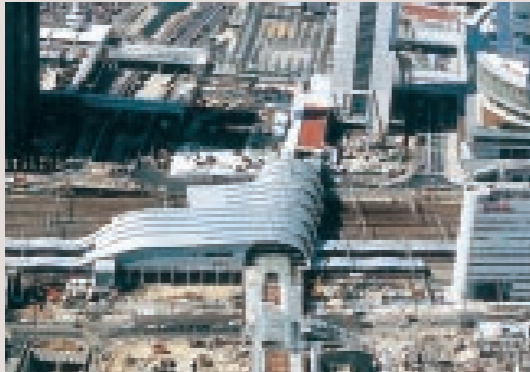
In 2000, our Saitama-Shintoshin Station was honored with a Good Design Award and the 2000 Sai-no-kuni Saitama Prefecture Scenic Award. Shinjo Station on our Yamagata Shinkansen Line was the recipient of the Ministry of Transport Railway Bureau Chief Award, administered by the Association of Railway Architects.



Railway forest

#### Examples of travel packages highlighting encounters with nature

Package Name	Duration	Participants
The Shirakami Mountains	(April–November)	804 participants
Let's Walk in Nature	(April–November)	1,477 participants
Forest Hot-spring Travels	(April–March)	1,044 participants
Village of Nature in Hokkaido	(July–August)	102 participants
Fukushima Expedition	(July–August)	538 participants
Trekking in Yamagata	(July–August)	353 participants
Yamagata Vacation	(July–September, January–March)	481 participants



Saitama-Shintoshin Station



## Awareness, participation, and cooperation

### Afforestation Alongside Railway Tracks program

JR East is conducting a number of activities designed to encourage environmental awareness among a broad segment of the population. One such activity is our Afforestation Alongside Railway Tracks program, initiated in 1992, through which we conduct tree-planting activities along railway lines throughout the JR East service area on an annual basis. This is a volunteer activity by the employees of JR East and group companies that also enjoys the participation of local residents. Donations collected by employees of JR East and group companies are also contributed to support this program.

### Making railways more accessible for all

In step with the aging of Japanese society and accelerating globalization, JR East is working to make its railways reassuringly safe for not only physically challenged people, but also people unfamiliar with rail services. For example, in line with the Traffic Barrier-free Law that was enacted in November 2000, we are equipping train stations with elevators and escalators. As a rule, elevators will be fitted on all platforms with minimum elevations of five meters at stations accommodating at least 5,000 passengers daily (approximately 390 stations). Likewise, escalators will be installed on all platforms with minimum elevations of five meters at stations accommodating at least 10,000 passengers daily (approximately 300 stations). Energy-saving escalators designed to start up automatically when passengers step on have also been installed at stations with relatively infrequent arrivals and departures.

Train station notices of arrival times, connections, and other information are being switched over to easy-to-understand designs with large text and pictograms. We are also installing multipurpose toilets that are easy to use for people in wheelchairs, senior citizens, and people accompanied by infants.



Afforestation Alongside Railway Tracks program



A station escalator

### Public-relations activities and external cooperation

Between March and April 2001, JR East conducted an ecology campaign to raise environmental awareness among our passengers. As one element of the campaign, we designated one train on the Yamanote Line as an Eco-train 2001 in a joint project with WWF (World Wildlife Fund) Japan. This special train featured first and last cars decorated with designs that represented the recurring cycles of natural ecosystems. Posters on the theme of environmental protection were displayed in all eleven of the train's cars.

We are also conducting other public-relations activities via a variety of media to promote public understanding of our environmental efforts and encourage a greater level of awareness among society at large.

### Environment-related communication activities

JR East maintains an ecology page on its website (<http://www.jreast.co.jp/eco/>) that outlines the contents of its *Annual Environmental Report*. The report may also be downloaded entirely or in sections in PDF format files. The site also welcomes the opinions of readers by e-mail ([eco@jreast.co.jp](mailto:eco@jreast.co.jp)).

Questionnaires are also included with the *Annual Environmental Report* to solicit feedback. Thanks to these questionnaires and via e-mail, we received a significant amount of feedback in the last fiscal year. In producing this document, we tried to accommodate the requests of our readers to make it easier to understand.

As always, we hope that you will take the opportunity to inform us of opinions or questions you may have about this *Annual Environmental Report* or specific environmental activities.



Eco-train 2001



Newspaper advertisements



# History of JR East's Environmental Activities

1992	April	Committee on Ecology established
	June	Commemorative tree planting conducted for the 5th anniversary of JR East (conducted each year since then as the Afforestation Alongside Railway Tracks program)
	August	Trial collection of three-category refuse started in Sugamo Station on the Yamanote Line
1993	May	Recycling of used train tickets started at the Chiba Branch Office
1994	February	Recycling Center opened at Ueno Station (for automated sorting of cans and bottles)
	February	Three-category refuse collection started in 36 stations (Yamanote Line and others)
1995	February	Recycling of used train tickets started in the Tokyo metropolitan area
	March	First antinoise measure initiative for Shinkansen lines completed
	April	Ecology education instituted for all new recruits
	April	Torenta-Kun discount rent-a-car program introduced as part of Park & Ride program
1996	March	Quantitative environmental goals established in each business area, including reductions in volume of CO <sub>2</sub> emissions
	March	First <i>Annual Environmental Report</i> published (published annually since this year)
1997	March	Recycling equipment introduced at Minami-Akita Operations Center
	September	First attendance at the International Union of Railways (UIC) Environment Coordinators Meeting (subsequent annual attendance)
	October	Recycling facilities go into operation at Nagano Rolling Stock Center and Tokyo Station
	December	Participation in the COP3 together with the UIC
1998	March	Second antinoise measure initiative for Shinkansen lines completed
	September	Production and sales of polyethylene refuse bags with used-paper content initiated
	November	The Shinkiba Recycling Center opened (for collection and sorting of used newspapers and magazines)
1999	February	Niitsu Rolling Stock Manufacturing Factory obtained ISO 14001 certification
	March	The Omiya Recycling Center opened (for automated sorting of cans and bottles)
	April	Power generator unit No. 3 at the Kawasaki Thermoelectric Power Plant put into operation
	May	Introduction of recycled copier paper, made of old newspaper collected from stations
	June	Light cars introduced as rental cars (K and SK classes)
	November	East Japan Eco Access Co., Ltd. obtained ISO 14001 certification
	December	Ecology campaign (eco-train operation on Keihin Tohoku Line and others)
2000	April	Uniforms made from used PET bottles introduced
	September	Environmental accounting figures included in <i>Annual Environmental Report</i>
	November	Ecology targets expanded under New Frontier 21 medium-term business plan
	December	Lumine Co., Ltd. obtained ISO 14001 certification for corporate headquarters, Yokohama Store, and Machida Store
2001	March	Ecology campaign (eco-train operation on Yamanote Line and others)
	March	Oi Workshop, Kawasaki Thermoelectric Power Plant, and Niigata Mechanical Technology Center obtained ISO 14001 certification

## History of Environmental Honors

1992	September	The Highest Award, the Eighteenth Kanto General Meeting for Promotion on Energy Conservation, organized by the Energy Conservation Center
1994	October	The Minister of Transportation's Award for Distinguished Service in Recycling Promotion, organized by the Recycling Promotion Council, given to the Tokyo Regional Head Office
1995	October	Poster category of the Fifth Awards for Environmental Advertisements and the Director of Environmental Agency's Awards, organized by the Japan Eco-Life Center and sponsored by the Environmental Agency
1997	April	Environment-Friendly Companies and Social Contributions category, organized by Ibaraki Prefecture, given to the Mito Branch Office
	April	The Sixth Global Environment Award, organized by the <i>Japan Industrial Journal</i> with special assistance from WWF Japan
	June	The First Environmental Action Plan Award, the Director of the Environmental Agency's Award, organized by the National Association of Environmental Conservation and sponsored by the Environmental Agency
	November	Special Award by the Director of the Cleaning Department of the Tokyo Metropolitan Government, given to the Tokyo Regional Head Office
	November	Poster category, the Seventh Awards for Environmental Advertisements and the Director of Environmental Agency's Awards, organized by the Japan Eco-Life Center and sponsored by the Environmental Agency
1998	April	The First Green Reporting Award for Excellent Environmental Report, organized by Toyo Keizai, Inc. and the Green Reporting Forum
2000	May	Improvement and Rationalization category, the Shimoji Prize, Awards for Superior MH Equipments and Systems, organized by the Japan Material Handling Society, given to East Japan Eco Access Co., Ltd.
2001	May	The Fourth Green Reporting Award for Excellent Environmental Report, organized by Toyo Keizai, Inc. and the Green Reporting Forum

# Independent Review Report



Asahi & Co

A Member Firm of Arthur Andersen

## Independent Review Report on the "Annual Environmental Report 2001"

To the Board of Directors of East Japan Railway Company

### 1. Purpose and Scope of our Review

We have reviewed the "Annual Environmental Report 2001" (the "Environmental Report") of East Japan Railway Company (the "Company") for the year ended March 31, 2001. The review consisted of performing certain procedures as described below in relation to the collection, compilation and calculation of the information included in the Environmental Report. As this is the second year of our review, any indicators for years prior to the year ended March 31, 2000 were not subject to these procedures.

Our work does not constitute an audit or examination. We therefore do not express an opinion on the accuracy or completeness of the indicators or databases used to compile the information or the representations made by the Company in the Environmental Report.

### 2. Procedures Performed

We have performed the following review procedures agreed to by the Company's management;

1) Obtained the environmental information supporting the environmental performance indicators and the environmental accounting indicators for the purpose of understanding the processes and the procedures of the Company for collecting the data information used to compile the Environmental Report.

2) With respect to the environmental performance indicators and the environmental accounting indicators in the Environmental Report, tested quantitative accuracy of the indicators on a sample basis and compared them on a sample basis with the supporting data compiled from the information collected by the Company.

3) With respect to the descriptive information in the Environmental Report other than the indicators referred to in the above procedures, interviewed the Company's responsible personnel, made an on-site inspection of a factory and compared such descriptive information with the data collected by the Company or the data found in certain published materials.

### 3. Results of the Procedures Performed

As a result of the procedures performed;

1) We are not aware of any material modifications that should be made to the environmental performance indicators, or the environmental accounting indicators in the Environmental Report in order for them to comply with the Company's policies and procedures for gathering and reporting such information.

2) We are not aware of any material modifications that should be made to the descriptive information other than the indicators in the Environmental Report to be consistent with the information the Company collected and other information we obtained.

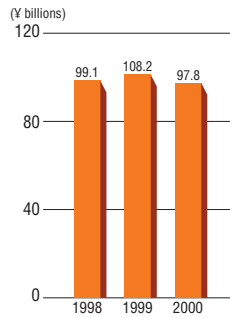
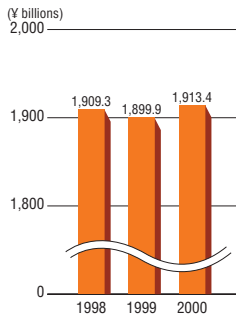
A handwritten signature in black ink that reads "Asahi &amp; Co".

Tokyo, Japan  
July 31, 2001

# Corporate Profile (as of March 31, 2001)

Corporate name	East Japan Railway Company
Address	2-2 Yoyogi 2-chome, Shibuya-ku, Tokyo, Japan
Established	April 1, 1987
Capital	¥200.0 billion
Net sales	Recurring profit

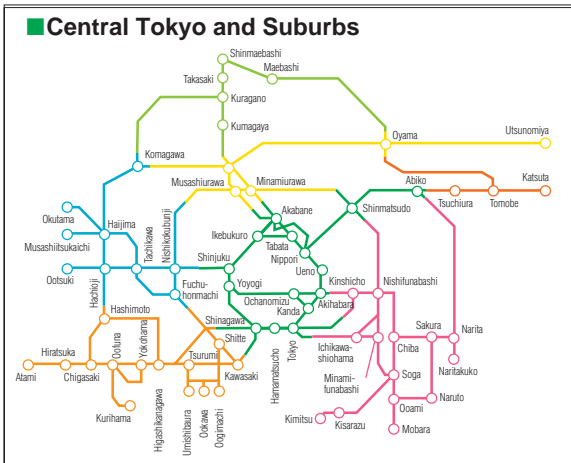
Number of employees	73,959
Passenger line network	7,538.1km Shinkansen lines 956.3km Conventional lines 6,581.8km
Number of stations	1,709
Average daily train runs	12,464 (based on the schedule set in December 2000)



Passengers served daily	16.06 million
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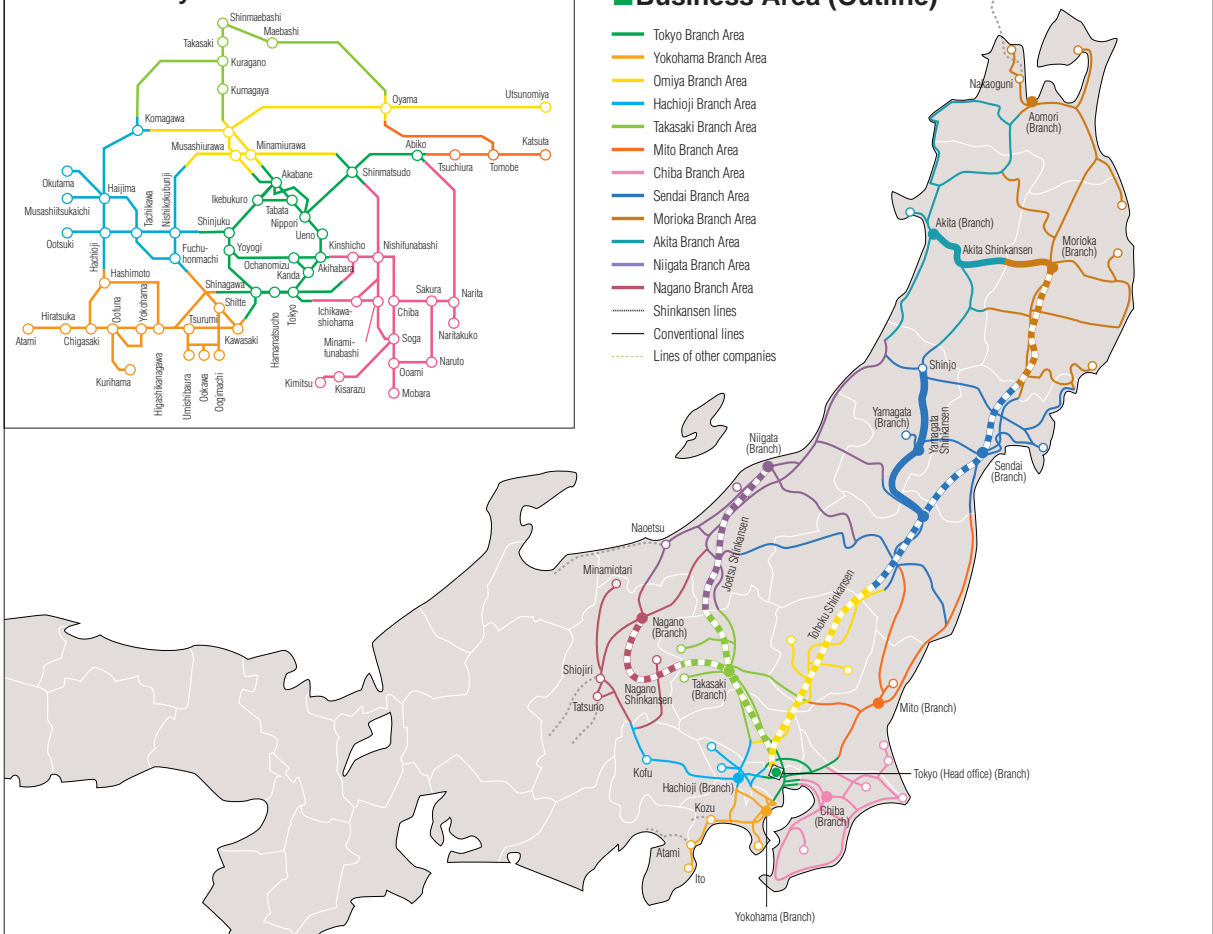
Business description	Transportation, sales of goods, real-estate leasing, and others
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Facilities	12 branch offices; seven rolling stock maintenance workshops; one rolling stock manufacturing factory; one thermoelectric power plant; one hydroelectric power plant
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## Business Area (Outline)

- Tokyo Branch Area
- Yokohama Branch Area
- Omiya Branch Area
- Hachioji Branch Area
- Takasaki Branch Area
- Mito Branch Area
- Chiba Branch Area
- Sendai Branch Area
- Morioka Branch Area
- Akita Branch Area
- Niigata Branch Area
- Nagano Branch Area
- Shinkansen lines
- Conventional lines
- Lines of other companies



## **Annual Environmental Report 2001**

Published August 2001

East Japan Railway Company

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