

# Annual Environmental Report 2000

## Message from the Management

Today, with the 21st century fast approaching, the JR East Group takes a serious and well-considered approach to issues of global environmental concern. For example, CO<sub>2</sub> emission volume, particularly that involving railways and other members of the transportation sector in Japan, is increasing year after year. Given that we play such a significant role in passenger transportation, it is imperative that we at JR East take a proactive view of this important issue.

JR East established the Committee on Ecology in 1992, the year in which the United Nations Conference on Environment and Development (the Earth Environment Summit) was held in Rio de Janeiro, Brazil. Over the intervening years, we have implemented a variety of activities through the Committee, based on our philosophy regarding the promotion of ecological activities. This reflects the sincerity of our endeavors with regard to reconciling business operations and environmental protection.

Additionally, 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 the environmental activities with which we are involved.

This document is the fifth edition of the *Annual Environmental Report*. We have made every effort to enrich the content of the report, notably through the implementation of environmental accounting (descriptions of environmental conservation costs and benefits) so that our environmental efforts could be more fully understood. We have also had our report reviewed by a third party, Asahi & Co., in order to enhance its credibility.






JR East will continue its dedication to the fair disclosure of environmental information, as well as to the enhancement of environmental conservation activities. Comments from the general public will play a part in this process. Through our effort to make railways more convenient and environment-friendly, we will do our best to provide the greatest possible degree of environmental conservation.



*Mutsutake Otsuka*

Mutsutake Otsuka  
President and CEO  
East Japan Railway Company

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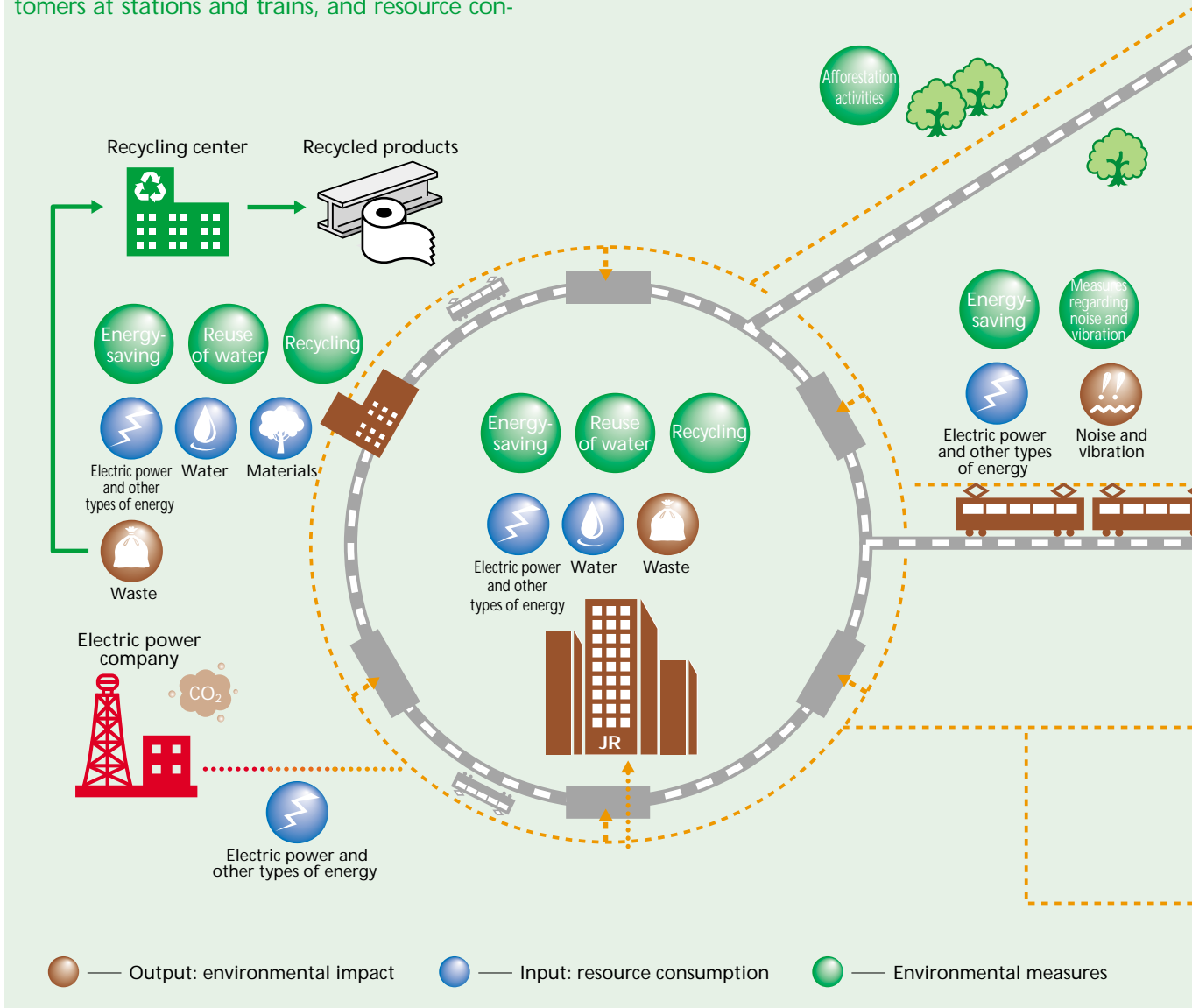
# Environmental Impact of JR East's Business Operations/Measures

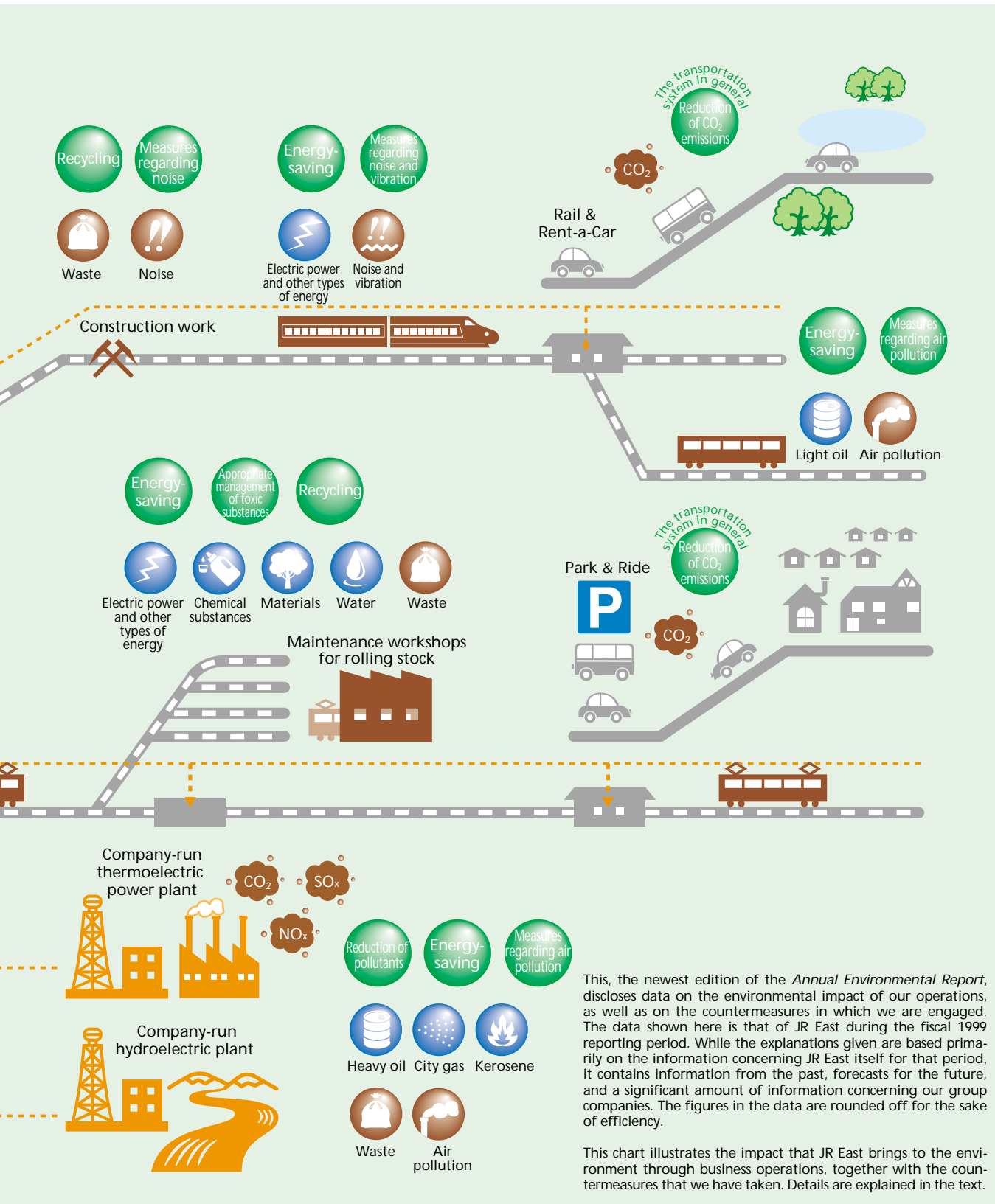
JR East operates in the eastern half of Japan's main island, Honshu, which includes the metropolitan Tokyo area. We have approximately 7,500 km of railway lines, 1,700 stations, and 13,000 units of rolling stock. On that basis, we are proud to offer a variety of services for many aspects of daily life,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

Various elements of environmental impact are considered with respect to our operations. Inherently, a large amount of energy is required in train operations. Added to this is the noise and vibration caused by trains, refuse disposed by customers at stations and trains, and resource consumption and waste generation in the maintenance of our trains, facilities, and equipment.

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

JR East is therefore working to minimize the aforementioned factors of environmental impact, and to make railways more convenient to use so that the public can maximize their advantages and environmental friendliness.





This, the newest edition of the *Annual Environmental Report*, discloses data on the environmental impact of our operations, as well as on the countermeasures in which we are engaged. The data shown here is that of JR East during the fiscal 1999 reporting period. While the explanations given are based primarily on the information concerning JR East itself for that period, it contains information from the past, forecasts for the future, and a significant amount of information concerning our group companies. The figures in the data are rounded off for the sake of efficiency.

This chart illustrates the impact that JR East brings to the environment through business operations, together with the countermeasures that we have taken. Details are explained in the text.



# 1. Environmental management system

JR East established the Committee on Ecology in April 1992 as a means of tackling a variety of worldwide environmental issues, and in May of that year, we set forth our Basic Philosophy and Policy on the Promotion of Ecological Activities. Then, in March 1996, we established guidelines as a means of dealing with environmental impact caused by our business operations, together with goals to be met by fiscal 2001.

## Basic philosophy and policy on the promotion of ecological activities (Established in May 1992)

### Basic philosophy

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

### Basic policy

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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;  
partially revised in February 1998)

### 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 conformance with laws and regulations. Moreover, we do our best to reduce the usage and generation of these substances, and to use environmentally responsible substitutes wherever possible.
- 3 We ensure the appropriate processing of various types of waste generated at our offices, establishments, stations, trains, etc. We strive to recycle them 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 2001 (based on figures from fiscal 1994)

- T A 10% reduction off CO<sub>2</sub> emissions<sup>(\*)1</sup> in general business activities
- T A 10% reduction off CO<sub>2</sub> emissions in proportion to the unit electric power generation by the Company-run thermoelectric power plant
- T A 10% reduction of energy consumption for train operations, in proportion to the unit transportation volume
- T A 60% reduction in large-size refrigerating machines using specific CFCs
- T A 40% reduction in NO<sub>x</sub> emissions at the Company-run thermoelectric power plant
- T Realization of a 70% recycling rate for waste generated from construction work and in workshops
- T Realization of a 30% recycling rate for waste generated at stations and trains
- T Realization of a 95% rate for usage of recycled paper as office stock
- T Planting of 30,000 trees annually
- T Measures to limit noise to 75 dB in designated residential areas along the Tohoku and Joetsu Shinkansen lines<sup>(\*)2</sup>

The goals are subject to revision when it is considered necessary due to the degree of their achievement, technological development, etc. We are planning to revise them during the fiscal year 2000.

\*1: The figure from fiscal 1990 was used as a basis for comparison, in accordance with the COP3.

\*2: This is projected for achievement by fiscal 2002.

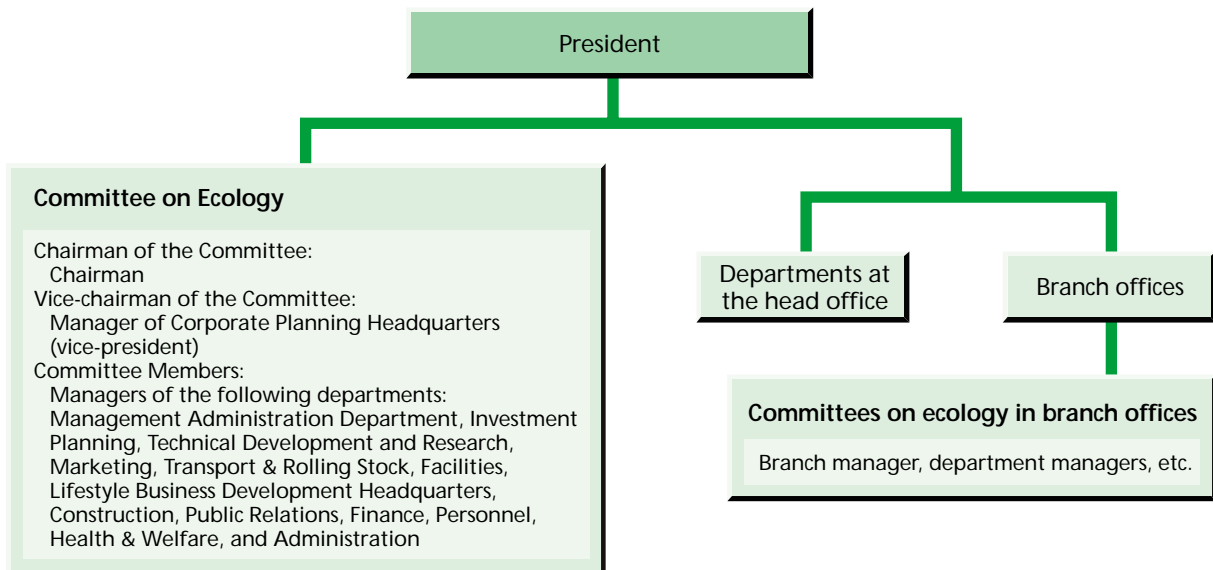


## Structure for the implementation of environmental activities

JR East, with the Committee on Ecology at its center, has established a basic policy on environmental issues and is energetically moving forward with various activities. The Committee is a cross-departmental organization within the Company itself, consists of managers from each department, and as such is led by the chairman. The Committee maintains an office within the Management Administration Department, and oversees a number of subcommittees, each of which is charged with a specific issue and led by a chief supervisor from the respective business section. Through the Committee's initiative we conduct various activities,

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

Each of our branch offices established its own Committee on Ecology in fiscal 1998. These committees consist of a branch manager and department managers. Therefore, we have created a structure enabling us to deal with environmental concerns in proportion to the actual conditions present in each locality.



Subcommittees	Subcommittee chairman	Main activities
Environmental Management Systems	Manager, Management Administration Dept.	The Setting up and revision of goals and environmental measures
Energy-savings and Clean Energy	Electric Facilities manager, Facilities Dept.	Energy-savings and the reduction of CO <sub>2</sub> emissions
Environmental Pollutant Management and Reduction	Planning manager, Transport & Rolling Stock Dept.	Reduction of environmental pollutants and ozone-depleting substances
Zero Emissions	Passengers Facilities manager, Facilities Dept.	Recycling and reduction of waste and use of recycled products
Green Rail	Environmental Planning manager, Facilities Dept.	Environmental conservation along railway lines and noise problems
Ecology Technology	Manager, Technical Development and Research Dept.	Development of environmental technologies
Intermodal Transportation	Manager, Marketing Dept.	Reduction of environmental burden throughout society by uniting railways into a general transportation infrastructure
Environmental Business	Manager, Lifestyle Business Development Headquarters	Environmental contributions through business operations



## ISO 14001

In February 1999, our Niitsu Rolling Stock Plant, which manufactures energy-saving cars (notably the E231 series for the Sobu and other lines) obtained certification under ISO 14001, the international standard for environmental management in business and industry. It was the first such achievement for the production section of a railway company in Japan. The Company-run Kawasaki thermoelectric power plant, Oi Workshop (a facility for the maintenance of railway cars), and Niigata Mechanical Technology Center—each representing a significant environmental burden—are currently conducting operations intended to ensure ISO 14001 certification as a means of systematically promoting environmental conservation.



Niitsu Rolling Stock Manufacturing Factory



ISO 14001 registration certificate for our Niitsu Rolling Stock Plant

## Environmental education

The promotion of our environmental efforts as a company requires that our employees have the right awareness and values with regard to environmental issues. We therefore provide education on ecology to all our new recruits and new management staff (on-site supervisors, including stationmasters). Occasionally we give out information concerning environmental issues, as well as our efforts to grapple with them, via the publication of *JR Higashi*, our in-company information magazine.

### Training programs that contained education on ecology during 1999

- T Training for new on-site supervisors
- T Training for new management staff
- T Training for senior leaders
- T Training for new recruits (university graduates)
- T Training for new recruits (junior college, vocational school and high school graduates)
- T Training for new recruits (medical care)
- T Training on the estimation and evaluation of environmental impact



JR Higashi in-house magazine



## Environmental accounting

### Summary table of environmental conservation activities (environmental conservation costs, effects, and chief

Environmental conservation activity category	Environmental conservation costs			Benefits of environmental	
	Main costs of environmental conservation activities (unit: ¥ billion)		Details of main costs	Reduction of environmental	
	Investment	Expenses		Item	Targeted value <sup>(*)</sup>
<b>1</b> Environmental conservation activities along railway lines (costs associated with pollution prevention)	2.76	7.33	TMeasurement and monitoring of air and water quality TMeasures regarding noise generated by Shinkansen and conventional lines TMeasures regarding radio disturbance TMeasures regarding dioxin emitted by incinerators, etc.	T75 dB measures in "residential areas" along the Tohoku and Joetsu Shinkansen lines TReduction of NO <sub>x</sub> emitted by the Company-run thermoelectric power plant	100% (to be completed in 2002) A 40% reduction
<b>2</b> Global environmental conservation activities (costs associated with global environmental conservation)	58.17	—	TIntroduction of energy-saving cars TRenovation of the Company-run thermoelectric power plant TMeasures regarding CFCs, etc.	TTotal CO <sub>2</sub> emissions from business operations TVolume of CO <sub>2</sub> emissions in proportion to the unit electric power generation by the Company-run thermoelectric power plant TEnergy consumption for train operations, in proportion to unit transportation volume TNumber of large-size refrigerating machines using CFCs	A 10% reduction <sup>(**)</sup> A 10% reduction A 10% reduction A 60% reduction
<b>3</b> Resource-recycling activities (resource-recycling costs)	—	4.99	TProcessing and recycling of waste generated at stations and trains TProcessing, recycling, etc. of waste generated at rolling-stock workshops and through construction work, etc.	TRecycling rate for waste generated at stations and trains TRecycling rate for waste generated at rolling-stock workshop and through construction work TUsage rate for paper recycled as office stock	30% 70% 95%
<b>4</b> Environmental management (management operation costs)	—	0.17	TPersonnel expenses for the Committee on Ecology, etc.		
<b>5</b> Research and development of environment-related technologies (R&D costs)	0.07	0.40	TDevelopment of energy-saving cars TDevelopment of noise-mitigation technologies, etc.		
<b>6</b> Social activities (costs associated with social activity)	0.09	0.24	TAfforestation activities TEnvironmental reports, environmental advertisements, etc.	TAfforestation activities	30,000 trees annually

#### How environmental conservation costs are determined

<sup>1</sup> The data covered is that of JR East itself, on a non-consolidated basis.

<sup>2</sup> "Environmental conservation costs" covers only those that can be grasped through our current system of management, etc.

<sup>3</sup> Categorization of activities is based on the guidelines set forth by the Environmental Agency of Japan.

<sup>4</sup> For an activity that is multipurpose and has a significant environmental effect, the stated amount refers to total costs spent on behalf of that activity. (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 cars.)

<sup>5</sup> Expenses do not include depreciation costs.

<sup>6</sup> The expense amount 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.

<sup>7</sup> The amount of expenses for the processing of waste generated through construction work and by rolling-stock maintenance facilities (under the category of resource-recycling costs) is calculated by multiplying the waste volume in fiscal 1999 by the standard unit price in each waste category and location.





## 2. Efforts regarding global environmental conservation

Disruption of the global environment has become an important concern for us all. Global warming—believed 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 overall climate, which will in turn effect the worldwide ecosystem and bring about a rise in sea levels.

The emission of large volumes of CO<sub>2</sub> into the air—a result of the use of fossil fuels—places the blame for global warming on us, the citizens of our environment. Therefore, while the products of industry and technology have produced real and lasting benefits, it is undeniable that they have created problems that, unless they are resolved, will forever impact life on the planet earth. Therefore, the difficulty of

global environmental issues lies in the fact that we are assailants and victims at the same time.

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, notably the automobile (see page 34), railways are in relative terms an environment-friendly means of getting from one point to the next. Moreover, electric trains do not emit any CO<sub>2</sub> in operation, since their power source is electricity.

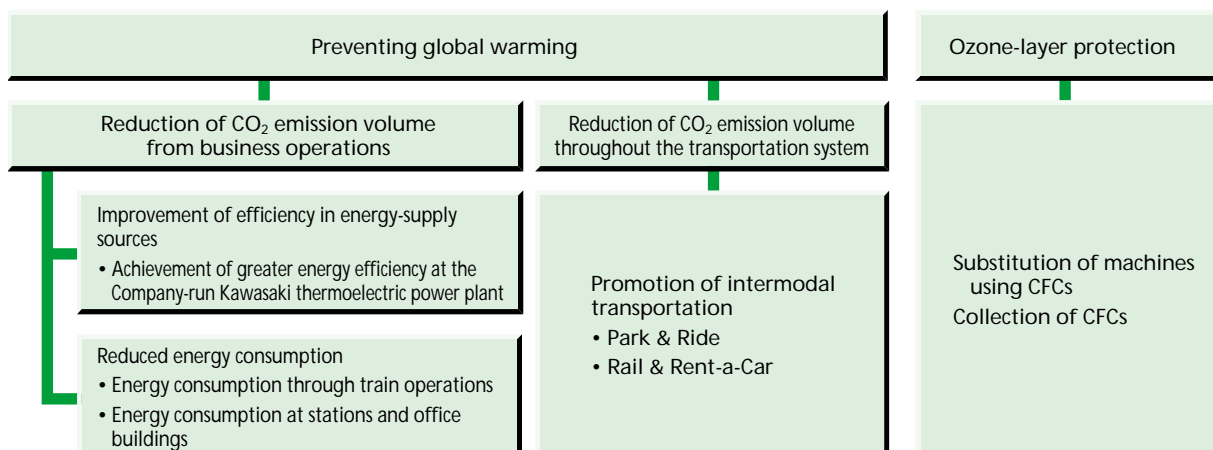
The volume of energy consumption by JR East, however, has reached 58.7 billion MJ (worth 1.52 million kl of crude oil) in fiscal 1999. This means that, however indirectly, we still emit a large volume of CO<sub>2</sub>. JR East is striving to prevent further global warming through reductions in energy consumption and CO<sub>2</sub> emission.

### ■ Goals and progress

Item	Goal (for achievement by 2001)	Figure from fiscal 1999		Reference value (figure from fiscal 1994)
		Actual achievement	Value achieved	
Total CO <sub>2</sub> emission volume from business operations	▲10%	▲ 8%	2.53 million t-CO <sub>2</sub>	2.76 million t-CO <sub>2</sub>
CO <sub>2</sub> emission volume in proportion to unit electric power generation by the Company-run thermoelectric power plant	▲10%	▲ 2%	567 g-CO <sub>2</sub> /kWh	581 g-CO <sub>2</sub> /kWh
Energy consumption for train operations, in proportion to unit transportation volume	▲10%	▲ 1%	0.345 MJ/passenger-km	0.347 MJ/passenger-km
Large-size refrigeration machines using CFCs	▲60%	▲53%	34 units	73 units

\*The basis of comparison for the total CO<sub>2</sub> emission volume is the figure from fiscal 1990, in accordance with the COP3.

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

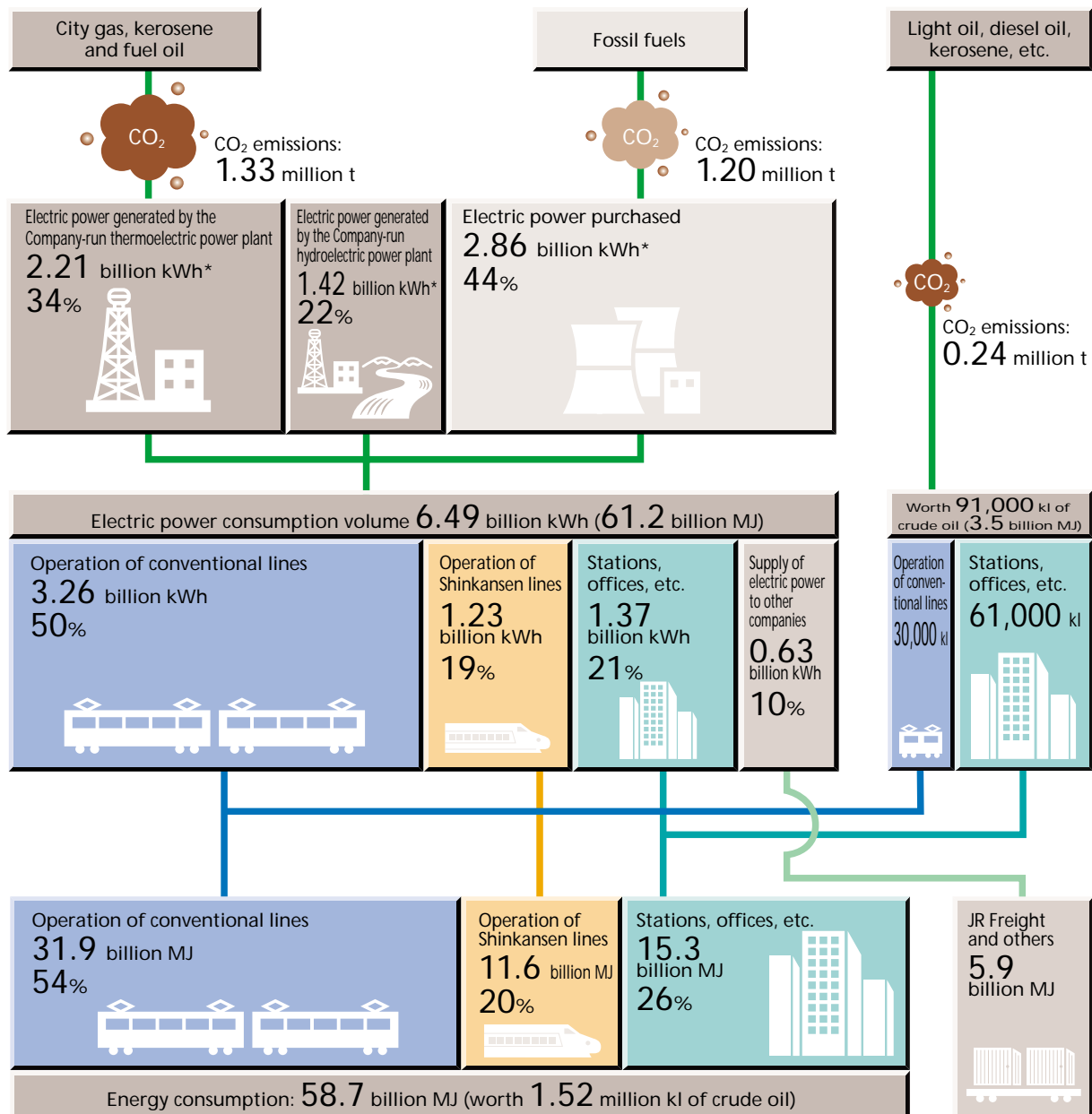


## Energy supply and consumption by JR East

The supply of energy for JR East consists of electric power, which is generated by the Company-run Kawasaki Thermoelectric Power Plant and Shinanogawa Hydroelectric Plant, 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 JR Freight, which run on our tracks.

### Energy map for JR East



\*Volume refers to the amount of electric power consumed.

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

### Trend in the volume of energy consumption and CO<sub>2</sub> emission volume

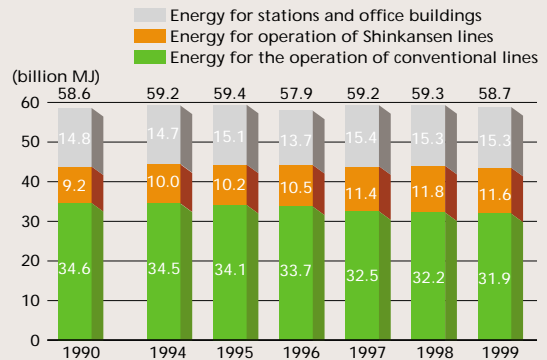
Electric power accounts for 94% of the total energy consumed by JR East, 56% of which is supplied by our power plants. It is therefore essential that we enhance the efficiency of these plants and reduce energy consumption in our trains and offices. By doing so, we can reduce energy consumption for our business operations and achieve a corresponding reduction in CO<sub>2</sub> emissions. Through measures such as these, the energy consumed through JR East's business operations in fiscal 1999 was 58.7 billion MJ (equal to 1.52 million kl of crude oil), while the volume of CO<sub>2</sub> emissions was 2.53 million t. Compared to the figures from fiscal 1990, the total CO<sub>2</sub> emission volume decreased 8% (\*1), and the volume of energy consumption stayed at the same level.

(\*1) The CO<sub>2</sub> emission factor from purchased electric power was calculated by using the emission factor applied by the Federation of Electric Power Companies Japan in fiscal 1990. Given the fiscal 1998 emission factor, the figure becomes 14%.

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

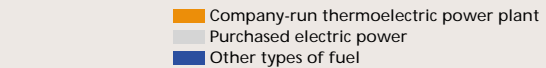
The Kawasaki Thermoelectric Power Plant run by JR East is in the process of replacing its old power-generating units with combined-cycle units employing steam power and gas turbines. In April 1999, we completed the replacement of unit No. 3, one of four units at the plant. On the basis of this replacement the thermal efficiency of unit No. 3 jumped from 34% to 46%. Accordingly, the annual CO<sub>2</sub> emission volume from our thermoelectric power plant was 1.33 million t, while the emission volume in proportion to unit electric power generation was 567 g-CO<sub>2</sub>/kWh, meaning a 2% decrease compared to the figure for fiscal 1994. In fiscal 2000, when unit No. 3 shifts into operation, we expect to see a further reduction in the volume of CO<sub>2</sub> emission.

#### Trend in energy-consumption volume



\*Purchased electric power and electric power generated by the Company-run hydroelectric plant were calculated based on 9.42 MJ/kWh. The electric power generated by the Company-run thermoelectric power plant and other fuel types were calculated based on the figures for actual consumption of fuel.

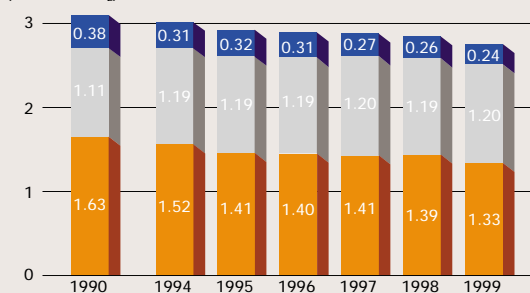
#### Trend in total CO<sub>2</sub> emission volume



Volume of energy consumption by JR East

Year	1990	1994	1995	1996	1997	1998	1999
Company-run thermoelectric power plant	2.76	2.73	2.63	2.53	2.59	2.56	2.53
Purchased electric power	3.12	3.02	2.92	2.89	2.89	2.84	2.78
Other types of fuel							

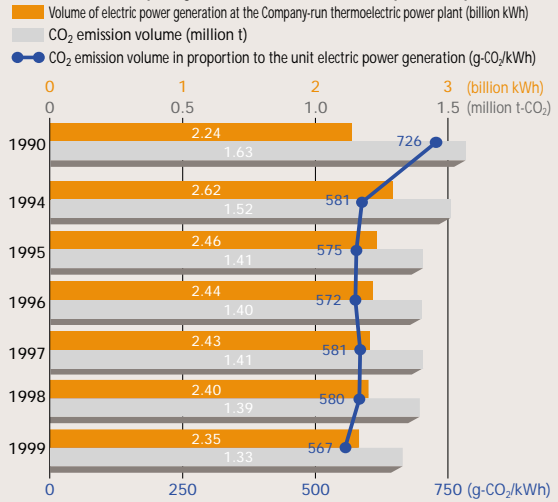
(million t-CO<sub>2</sub>)



\*Calculation of CO<sub>2</sub> emission factor from fuel and purchased electric power was based on the emission factor set forth in the Voluntary Action Plan established by Keidanren (Japan Federation of Economic Organizations) and by the Federation of Electric Power Companies Japan. (The CO<sub>2</sub> emission factor used for purchased electric power is the one applied in fiscal 1990.)

\*Includes the supply of electric power to JR Freight and others.

#### Electric power generation and CO<sub>2</sub> emission volume at the Company-run thermoelectric power plant



### Reducing energy consumption in train operations

JR East is in the process of introducing energy-saving cars, including the E231 series used for local trains on the Sobu Line, as a means of reducing energy consumption in train operations. This accounts for 74% of JR East's total energy consumption.

The volume of energy required to transport one passenger a distance of 1 km was 0.345 MJ in fiscal 1999. However, while certain factors might serve to decrease energy consumption—such as the introduction of energy-saving cars and improved efficiency in energy-supply sources—the actual volume of energy consumption basically unchanged due to the increase of operation energy for the Shinkansen lines including the opening of the Nagano Shinkansen Line and the decrease in transported volume. Therefore, energy consumption in proportion to unit transportation volume decreased by 1% compared to 1994, failing to achieve the decrease of 10% we had targeted.

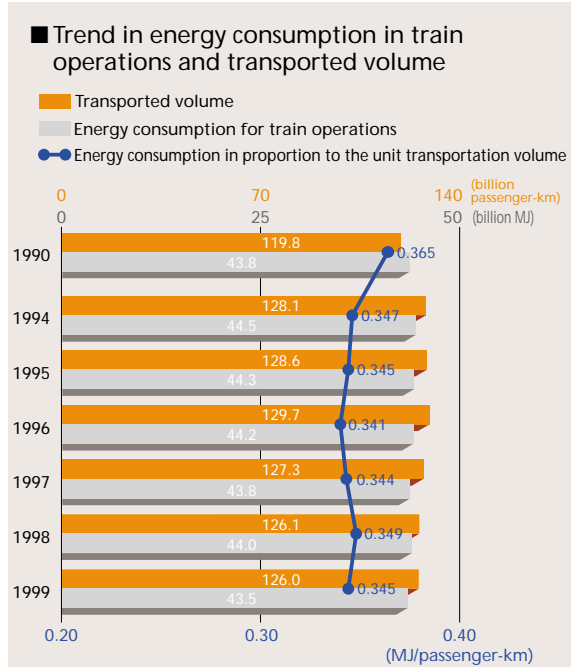
We were able to achieve a significant reduction in energy consumption among our energy-saving cars as compared to our old models, due to their reduced weight and the application of regenerative brakes (\*1), VVVF inverters (\*2) and other technologies.

The 209 Series used on the Keihin-Tohoku Line and E231 Series used the Sobu Line consume just 47% of the energy volume traditionally required (i.e., that of the 103 Series), while the 205 Series running on the Yamanote Line and others consumes 66% of the energy volume traditionally required.

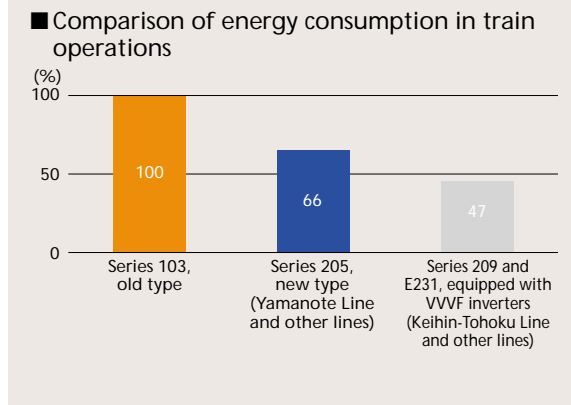
JR East has been removing the old engines used in our diesel railcars and replacing them with new engines that consume less energy. We are also introducing newer, lighter diesel railcars, including the Kiha 100 Series, the 110 Series, and others. Overall, the rate of introduction for energy-saving cars, as of the end of March 2000, is an impressive 55%. We are striving toward further achievements in energy savings as well, notably through the introduction of next-generation commuter trains—known as AC trains—which are currently in development.

(\*1) Regenerative brake: A brake that generates electric power via a motor during application for subsequent use as electricity.

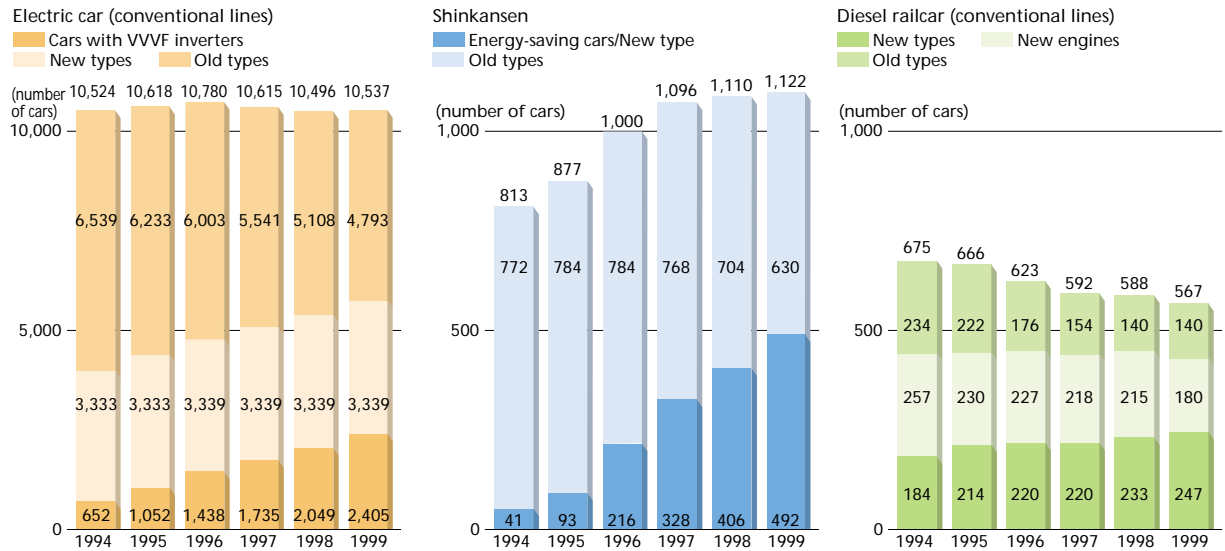
(\*2) VVVF inverter: VVVF stands for "variable voltage variable frequency," an inverter that can efficiently control train speed.



Energy-saving cars (E231 Series)



## ■ Trend in introduction of energy-saving cars



## Energy savings at stations and office buildings

To ensure reduced energy consumption at our stations and office buildings, we are working to introduce more efficient facilities and enhance the productivity of our existing machinery.

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

Soon, we will be installing a photovoltaic generator set on the roof of the Shinkansen platform at Tokyo Station (32 kW) and on the roof of the training building at the General Training Center (30 kW). The installation of another photovoltaic generator is being planned for integration into the roofing material itself. This system will be capable of generating 100 kW of electric power, concurrent with the implementation of the extension of the roof over the Shinkansen platform at Takasaki Station.

We are also conducting basic examinations of a storage system for electric power; a system that can utilize the electric power generated when the trains are stopped. This is all part of our search for technologies that will further the cause of energy-efficient operation.



Co-generation system



Photovoltaic generator set

The General Training Center, which opened in April 2000



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

**Intermodal transportation**

Considering the subject of public transportation, we at JR East believe that it is very important that all of society endeavor to reduce CO<sub>2</sub> emissions. Although the automobile is much more mobile than the railway, the latter is obviously more advantageous in terms of the environment (see page 34).

JR East therefore offers intermodal transportation, combining the merits of transportation in its various mode. For example, one would use a car to reach the nearest train station, and then take a train to the station nearest one's chosen destination. After that, a rental car could supply an added measure of freedom and convenience, taking you directly to the final address.

**1. Park & Ride**

JR East has provided 143 stations with parking lots, which collectively have a capacity for 23,500 cars. These lots are available for free or at a discount—as can be arranged either independently by us or in cooperation with local municipalities. In the vicinities of five stations located between the Yamagata and Shinjo stations of the Yamagata Shinkansen Line (which reopened in December 1999 with an extended section), we provided parking lots for 2,770 cars in cooperation with the municipalities located along the line. From this point forward we will be dedicated to providing our commuters with quality parking accommodations.

The diagram is divided into two parts. The top part, titled 'Up to now...', shows a winding road starting from a house labeled 'Home' and ending at a pond labeled 'Destination'. A blue car is driving on the road, emitting a cloud of exhaust. The bottom part, titled 'From now on...', shows a more efficient route. It starts at 'Home' with a blue car. Step 1, 'Park & Ride', shows the car parked in a 'Large parking lot in front of a station' (marked with a 'P' sign). Step 2, 'Rail & Rent-a-Car', shows a green train taking the commuter to the 'Destination'. Step 3, 'Bringing a bicycle onto the train', shows a bicycle on the train. A 'Low-priced rent-a-car' is also shown near the destination.

**Up to now...**

Home

Destination

**Choosing a means offering reduced environmental burden**

**From now on...**

Home

1. Park & Ride

Large parking lot in front of a station

3. Bringing a bicycle onto the train

Low-priced rent-a-car

2. Rail & Rent-a-Car

Destination

Image of intermodal transportation

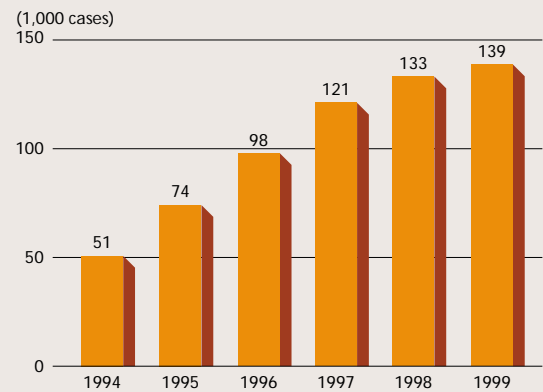
Parking lot at Shinjo Station

## 2. Rail & Rent-a-Car

JR East offers the Rail & Rent-a-Car program, with which one can easily combine train and rental car service. To make it even more accessible, we are busy improving the productivity of our reservation system. Fees are being reduced, too.

The number of customers using our Rail & Rent-a-Car program in fiscal 1999 increased by a factor of 2.7 times compared to fiscal 1994, prior to the existence of our Torenta-Kun discount car rental program.

■ Trend in use of Rail & Rent-a-Car



Rail & Rent-a-Car

## 3. Bringing a bicycle onto the train

JR East recommends that customers make their train trips more fun and environment-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-depleting substances and other greenhouse gases

### Replacement of facilities reliant on CFCs

JR East is replacing its old facilities for ones that are free of CFCs and halon gas. For example, we are systematically replacing our large, CFC-based refrigeration machines with high-efficiency, CFC-free models. Accordingly, the number of large, CFC-based refrigeration machines went from 73 in fiscal 1994 to 34 in fiscal 1999, a drop of 53%.

### Air-conditioning facilities

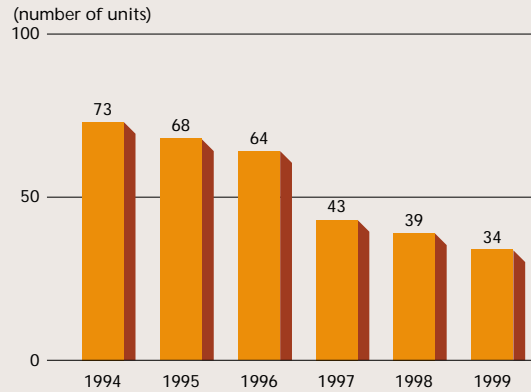
Given that most of the air-conditioning facilities used on our trains use a CFC substitute (R22), we recover it at the time they are scrapped.

Our old diesel railcars were equipped with CFC-based air-conditioning facilities, but beginning in fiscal 1993 our new cars have used CFC substitutes (R134a) that do not negatively impact the ozone layer. Air-conditioning facilities equipped in the E231 Series, in operation since fiscal 1999, also use a cooling medium (R407c) that does not cause ozone-layer depletion.

### Other greenhouse gases

Apart from CO<sub>2</sub>, we also use 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. However, the use of such substances is restricted within the tightly packaged products, so there is usually no emission into the air. Nonetheless, we are extremely careful not to cause emissions. We prevent leakage during maintenance operations and scrapping, at which time they are processed in the appropriate manner.

■ Trend in the number of large, CFC-based refrigeration machines



Equipment collecting CFCs and CFC substitutes used in trains



### 3. Efforts regarding zero emissions

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. It is truly a 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.

Customers deposit huge quantities of refuse at the stations and trains of JR East, while from our maintenance and scrapping operation of

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

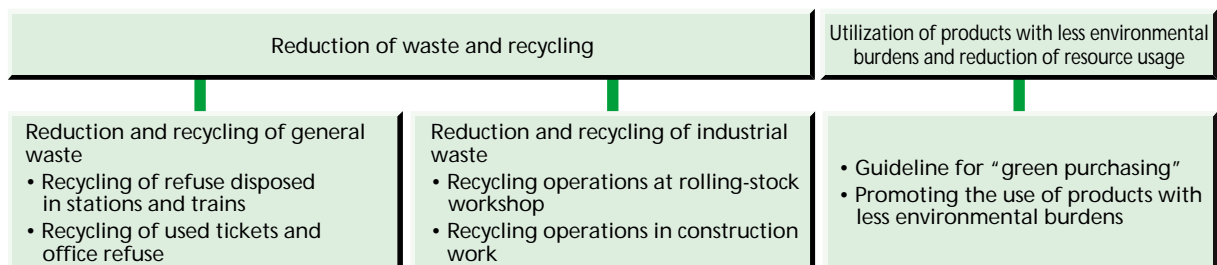
Therefore, as a means of achieving a true recycling-oriented society, JR East endeavors to reduce waste volume, above and beyond the processing stage, so that it can be treated in a manner compliant with laws and regulations.

We are also striving toward the achievement of zero emissions by recycling generated waste. The use of recycled products plays a key role in that effort.

#### ■ Goals and progress

Item	Targeted value (to be met by fiscal 2001)	Actual achievement in fiscal 1999
Recycling rate of waste generated at stations and trains	30%	33%
Recycling rate of waste generated at rolling-stock workshops and through construction work	70%	74%
Usage rate of recycled paper as office stock	95%	91%

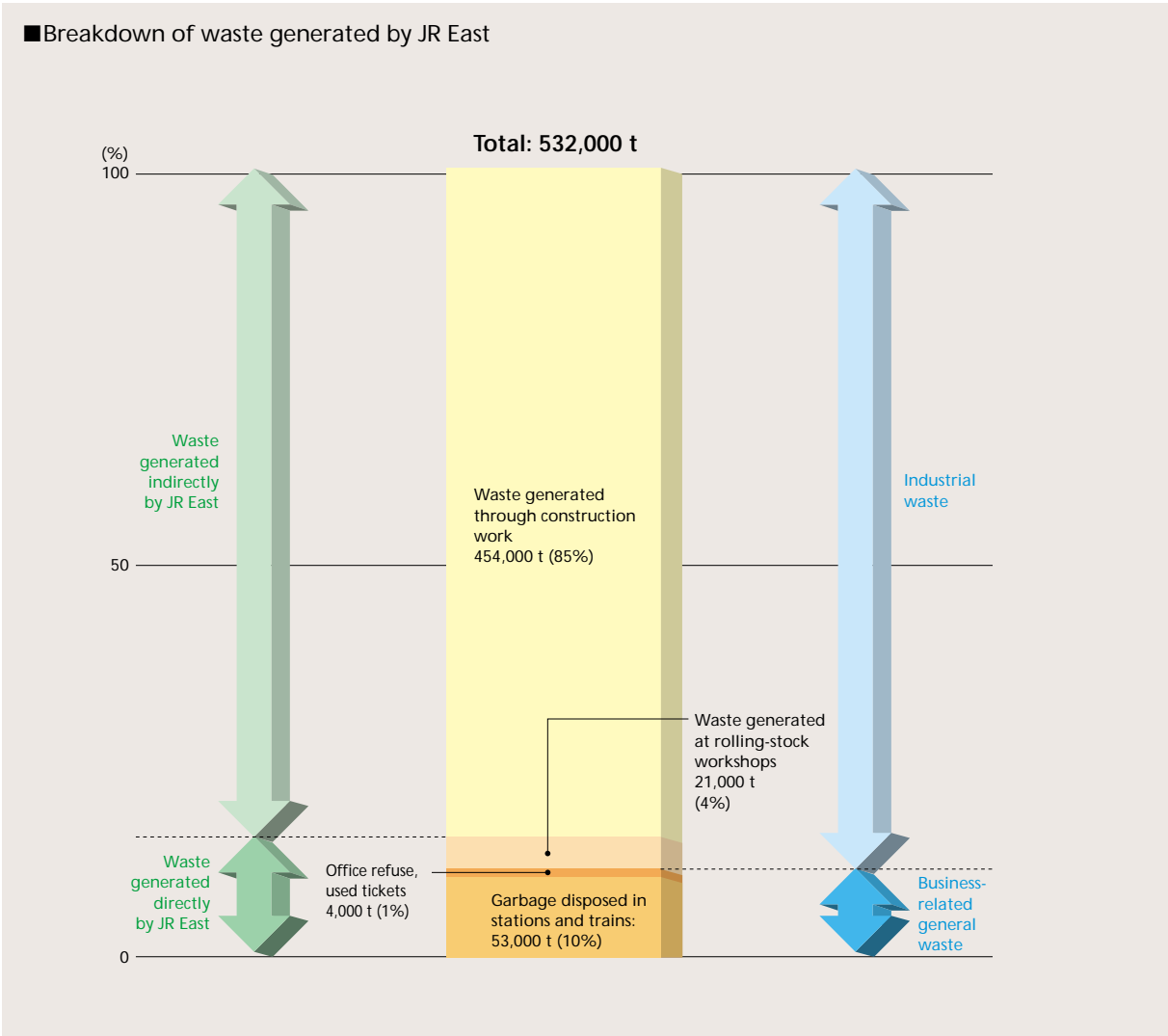
#### ■ JR East's efforts regarding zero emissions



## Waste generation by JR East

### Waste reduction and recycling

The volume of waste generated directly and indirectly by JR East's business operations amounted to 532,000 t in fiscal 1999. Of that, 53,000 t (10% of the total) was refuse disposed by customers in stations and trains, while 476,000 t (89%) was industrial waste generated from maintenance and the scrapping of rails, trains, and other structures. The remaining volume consisted of 3,000 t of refuse generated at offices and 1,000 t of used tickets. JR East is trying its best to reduce the generation of waste, and is furthering that effort with the establishment of a recycling system.



## Reduction and recycling of business-related general waste

### Recycling of refuse disposed in stations and trains

JR East carries approximately 16 million customers daily, and the volume of refuse they produce amounts to approximately 53,000 t 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 customers are asked to follow those indications so that separation can be made that much easier. In this way, we are trying to place the collected recyclable matter like used paper, steel and aluminum on recycling routes. This measure has produced a 33% recycling rate for refuse generated in stations and trains in fiscal 1999.

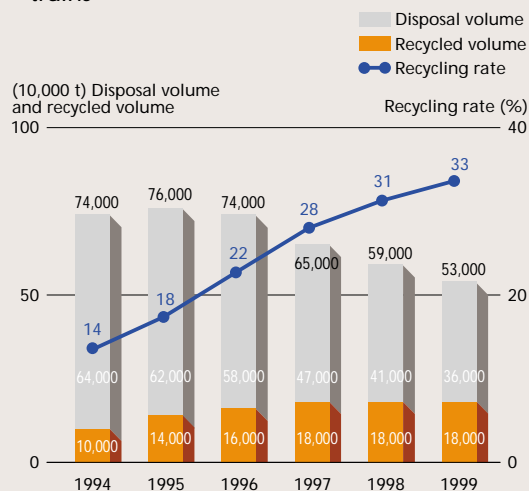
### Recycling centers

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 the recycling centers in Ueno Station and Omiya, we collect and process the nearly 6,000 t of cans, glass bottles, and PET bottles that are disposed 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 disposed at stations throughout the Tokyo area. Each year approximately 4,500 t of used paper goes through separation and processing here.

These recycling centers are operated by our group affiliate, East Japan Eco Access Co., Ltd.

### Trend in refuse generation at stations and trains



“Categorized refuse bins” placed on the platform for the promotion of refuse recycling



Omiya recycling center

### A group-wide effort

JR East's Subcommittee on Zero Emissions is looking into the possibility of further reducing refuse generation in the stations and trains, and is studying the establishment of a recycling system. This will involve the cooperative efforts of the companies that sell goods to customers in our stations and trains, as well as the janitorial contractors.

#### Cases of group-wide effort

Higashinihon Kiosk Co., Ltd.; Nippon Restaurant Enterprise Co., Ltd. (NRE); and other companies are making a concerted effort to deal with environmental issues.

- T Selection of materials for beverage bottles in consideration of recycling  
Efforts to select clear or brown glass bottles as often as possible
- T Plastic bags for easy sorting  
Conversion to plastic bags that are hard to tie at the top, in order to make it easier to sort them out during refuse collection.
- T Composting of the kitchen refuse generated at boxed-meal factories  
Composting of refuse generated through cooking for use in NRE's experimental organic farm.
- T Simpler boxed-meal packaging  
Reduction of refuse volume through simpler packaging for key boxed-meal products.

### Recycling of used train tickets and passes

Train tickets were traditionally considered hard to recycle, because many of them had a magnetic steel powder coating on the back. However, a new technology made it possible to separate the steel powder from paper fiber, and thus, used train tickets can now be reborn as recycled paper. In fiscal 1999, 96% of the approximately 900 t of used tickets were recycled into toilet paper, 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 planning to begin the recycling of certain used passes in fiscal 2000.

### Recycling of office refuse

JR East separates its office refuse according to category. The disposing of such materials into designated bins allows us to place paper, metals and glass on the appropriate recycling routes. In fact, we recycled 50% of the approximately 3,000 t of refuse generated during fiscal 1999.



East Japan Eco Access Co., Ltd., which conducts cleaning operations in the stations of JR East and runs the Company's recycling centers, obtained ISO 14001 certification in November 1999.



NRE's organic farm



Used train tickets are recycled into toilet paper.



Categorized refuse bins at the JR head office



## Reduction and recycling of industrial waste

### Recycling of waste generated at rolling-stock maintenance facilities and through construction work

New construction, renovation and maintenance work for railway-related establishments generates waste that includes metals (rails and electrical wire, etc.), sleepers, concrete, and sludge.

The work required to maintain rolling stock also generates waste, including metals, glass, rubber, cloth, wood chips, wastepaper, and waste oil.

To minimize waste, we are working to repair items where possible, and to secure recycling routes. Moreover, we act to preempt waste generation by selecting appropriate construction methods and materials during the design stage. The volume of waste generation in fiscal 1999 was 476,000 t, due to the increase in certain types of waste (sludge) as a result of increased construction. We nevertheless achieved a recycling rate of 74%.

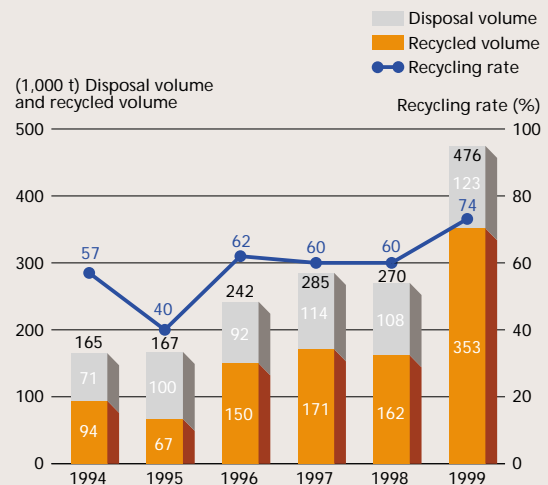
### Improvement of recycling rate in rolling-stock workshop

We scrapped a total of 517 cars during fiscal 1999. Currently, we are scrapping units from the 103 Series commuter cars and the 200 Series Shinkansen cars. Their recycling rate is 91%.

Traditionally, we used urethane resin for seats in the E231 Series, which was employed on the Sobu Line and others. Now, however, we are applying other materials that offer a greater degree of recyclability. This includes the replacement of urethane resin for polyester resin and the conversion from FRP (fiber reinforced plastic) to aluminum for use in some parts. Again, this is part of our preemptive effort to reduce waste in the design stage.

We are also planning to secure a recycling route for the glass formerly used in 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 a great effort to realize 100% recyclability for the next-generation AC commuter trains now under development. To achieve that, every possible aspect of resource efficiency and recyclability is being examined in the design phase.

■ Trend in disposal volume and recycling rate of waste products generated from construction work and at rolling-stock maintenance facilities



In the Nagano Rolling Stock workshop, waste metal is recycled into parts for railcar brakes and others.



### An improved recycling rate for construction work

Regarding the waste generated from facilities installation and maintenance, we endeavor to share relevant information with recycling centers and establish a promotional plan for construction recycling. This will then be reflected in its building specifications and execution scheme.

Our Tokyo Ballast Processing Center, located within the Tokyo Freight Terminal, features a plant for the manufacturing of paving aggregate, where approximately 37,000 m<sup>3</sup> of ballast, waste concrete and concrete sleepers was processed in fiscal 1999. The plant will be enhanced to accommodate the expansion of recycling operations.

### Recycled ticket-vending machines

Currently, JR East is in the process of replacing outdated ticket-vending machines, which were manufactured approximately twenty years ago. In the process, we have developed a technology for the recycling of parts and materials—a process that allows us to transform such materials via the production of 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 will begin introducing recycled ticket-vending machines.



Tokyo Ballast Processing Center



Recycled ticket-vending machine



## Utilization of environment-friendly products and reduced resource consumption

### “Green Purchasing”

The term “green purchasing” refers to the acquisition of goods and materials in consideration not only of their costs and quality but their environmental burden, as well. Through the propagation of “green purchasing” among companies and consumers alike, this practice will raise environmental awareness on the part of prod-

uct suppliers, who will then work to develop more environment-friendly products and methods of distribution. Ultimately, the purpose of “green purchasing” is to build a society that harmonizes with the environment rather than burdening it.

JR East established its Guidelines for “Green Purchasing” in February 1999.

### JR East’s Guidelines for “Green Purchasing”

Established in February 1999

- 1. Foreword** JR East conducts various ecological activities with a view toward reconciling business operations with the need for environmental preservation. Accordingly, when obtaining the goods and materials we need, we give priority to products posing less of an environmental burden.  
Guidelines for “Green Purchasing” describes JR East’s basic stance with regard to the purchase of products offering a reduced environmental risk. We therefore ask that our suppliers respect such guidelines and cooperate with us toward the realization of a more efficient, environmentally responsible society.  
Please note, however, that the guidelines depict general items only. More detailed descriptions for different product types are given in specification sheets and others provided elsewhere by JR East.
- 2. Scope** The guidelines apply to products that JR East procures directly.
- 3. Definition** Definitions of terms used in the guidelines are described below, and are also prescribed in JISQ 14001/ISO 14001.  
Product assessment: It is specified in Section 7 of Ministerial Ordinance No. 55 (October 1991) for the Law for Promoting Utilization of Recycled Resources (the Recycling Law). This refers to the whole action in the design phase of a product, being implemented for the reduction of environmental burden. It begins with examinations of possible environmental burden generated at each stage the product enters, from the procurement of parts and materials to production, distribution, use, recycling, disposal, etc., and ends with the implementation of changes necessary to perfect the product’s final design.
- 4. Guidelines** Suppliers are encouraged to establish an environmental management system.  
Suppliers are encouraged to prepare and practice product-assessment methods.
  - a. Materials**
    - i. Selection of materials: As component materials for the product, the utmost effort should be made to select materials that afford easy recycling.
    - ii. Minimal number of material types: The number of material types to be used for the product should be reduced to a minimum.
    - iii. Chemical substance management: For products, parts and materials, substances (such as PCBs) subject to legal regulations should not be used.
  - b. Resource savings**
    - i. Use of recycled materials: As component materials for the product, recycled materials should be used as much as possible.
    - ii. Weight reduction: The product’s size and weight should be reduced to the maximum extent possible.
  - c. Ease of disassembly and processing**  
The utmost effort should be made to structure the product so that it can be easily disassembled into reusable parts, recyclable materials, etc.
  - d. Indication**  
For the purpose of recycling, the product and its constituent parts should have an indication, as detailed as possible, of component materials.
  - e. Energy savings**  
The utmost effort should be made to reduce the product’s energy consumption, i.e., electric power and fossil fuel.
  - f. Packaging materials**  
Materials should be prepared in consideration of the following as much as possible;
    - i. Packaging materials should accommodate repeated use.
    - ii. Recycled materials should be used for packaging materials, and their volume should be minimal as well.
    - iii. Packaging materials should have an indication, which will not fade easily, of component materials.
  - g. Disposal**  
The product should be designed so that it has the least possible environmental impact when it is disposed.
  - h. Recycling and disposal method**  
Information concerning the product’s recycling and disposal methods should be disclosed, as detailed as possible, upon request from JR East.
  - i. Others**  
The above guidelines are subject to revision when necessary due to changes in social conditions, technology development, new discoveries, etc.

Promoting the use of environment-friendly products

Given our use of various types of paper in business operations, we are making a great effort to maximize the use of recycled paper.

Old newspaper disposed in stations throughout the Tokyo district is gathered at the Shinkiba recycling center. It is then processed there into copier paper, and is eventually put to use in the offices of JR East. Ninety-one percent of the copier paper we used in fiscal 1999 was recycled stock, including the aforementioned newspaper collected from train stations.

We have also introduced various products into our operations for the purpose of reduced environmental burden. We developed refuse bags by compounding polyethylene and a powder made from used newspaper. To be recycled this way, newspaper collected in stations is powdered to a particulate size equivalent to cigarette smoke. These bags are used for refuse collection in our stations, and are used as official refuse bags in the cities of Tama and Kawasaki. Furthermore, we are replacing employees' uniforms for new ones made from used PET bottles.

In April 2000, we changed the material to be used for the VIEW Card, our credit card, to chloroethene-free PET-G. We use the ballast and concrete generated from construction work for roadbed materials, and we use recycled tiles—made from glass bottles disposed in stations and trains—for passageways and platforms.

Reuse of water

JR East is constantly increasing the use of rainwater and used water. It is used as toilet water following collection from the head office, branch offices, station buildings, roofs of platforms, etc., whereupon it is processed for purification.

Our water-conservation activities go even farther, including examinations of possible leakage, the use of water-saving toilets, water-saving spigots and the reuse of bath water for other purposes.



Recycled copier paper made of newspaper, collected in stations



Recycled uniforms made from used PET bottles

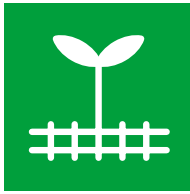


Recycled paving tiles made from glass bottles (train passageway at Ueno Station)

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 Tachikawa)	Rainwater and used water
Tokyo Station	Rainwater
Akabane Station	Rainwater
Shinagawa Station	Rainwater
Saitama-Shintoshin Station	Rainwater





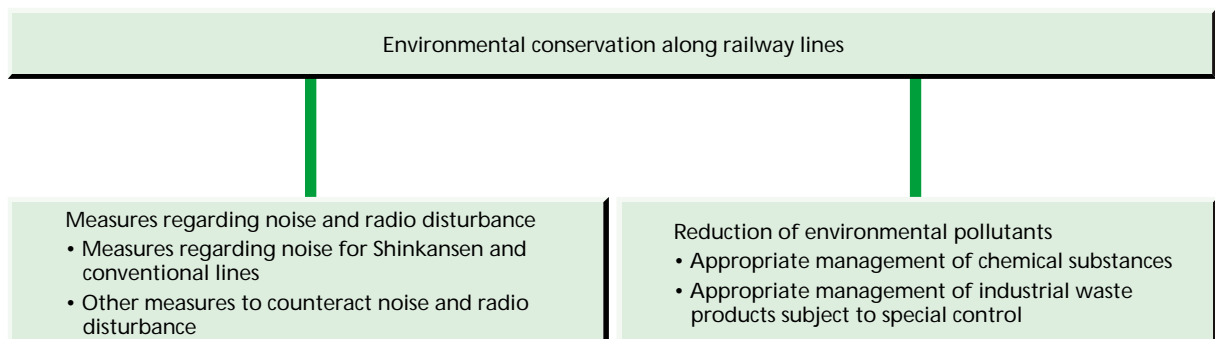
## 4. Environmental conservation efforts along railway lines

The train operations of JR East have various effects on the environment along railway lines, including noise, vibration and the radio disturbance. In addition, our thermoelectric power plant generates air pollutants. Various chemical substances are used in maintenance operations for railcars and business establishments, as well. Given our awareness of environmental impact along our railway lines, we are taking the necessary measures to minimize them.

### ■Goals and progress

Item	Targeted value (to be met by fiscal 2001)	Results in fiscal 1999		Reference value (figure from fiscal 1994)
		Actual achievement	Actual value measured	
NO <sub>x</sub> emission volume from the Company-run thermoelectric power plant	▲40%	▲47%	467 t	873 t
75 dB measures in "residential areas" along the Tohoku and Joetsu Shinkansen lines	100% (to be completed in 2002)	22% completed		—

### ■JR East's environmental conservation efforts along railway lines



## Measures regarding noise and radio disturbance

### Measures regarding noise for Shinkansen lines

The environmental criterion set forth by the Environmental Agency regarding noise generation by Shinkansen cars limits their peak noise level (Lmax) during operation and is one of the world's strictest environmental criteria. We have taken various measures to meet this criterion, including the construction and height extension of soundproof walls, installation of sound-absorbent materials, installation of covers for pantographs, and the flattening of wheels.

The fact that we have achieved noise levels of 75 dB or below for all the "densely populated areas" and "areas comparable to densely populated areas" has been duly confirmed by the Environmental Agency. Currently we are working toward a similar achievement for residential areas, which we plan to complete by fiscal 2002. In fact, by fiscal 1999, we had already accumulated the results and accomplished our target for 22% of the subject area. Concerning the Nagano Shinkansen Line, which went into operation in October 1997, the Environmental Agency has already confirmed that the criterion was met for the entire area along the line.

Noise-reduction efforts go forward in other areas, as well. This includes the use of rail-smoothing cars for the reduction of noise generation from rails, and the introduction of new technologies to the Akita and Yamagata Shinkansen lines, i.e., the application of new pantographs that generate substantially less wind-related noise.

### Measures regarding noise for conventional lines

The Environmental Agency established the Guidelines on Anti-Noise Measures for New Construction or the Major Renovation of Conventional Railways in December 1995. The objective of those guidelines was to regulate "equivalent noise level (Leq)," being a fundamentally different environmental criterion from that applied to the Shinkansen. Under this criterion the frequency and duration of sound generation is incorporated in the evaluation of noise level. Henceforth, when we plan to construct new conventional lines or perform major renovations on existing lines we will, in compliance with the guidelines, include noise-reduction as a criterion from the design stage forward.



The Dancette noise-insulation structure, which cancels noise through interference.



The Speno rail-grinding car

JR East is working to reduce noise in existing lines through the use of continuous welded rails and PC sleepers and weight reduction in railcars, among other things. We are also active in the development of technologies for noise reduction, as well as those relating to the design of low-noise cars.



### Other measures regarding noise and radio disturbance

We do our utmost to reduce the noise and vibration caused by construction and railway maintenance, etc., which must occasionally be performed during nighttime hours due to limited time availability. However, in such cases, we always give prior notice to the local residents. We are also striving to reduce the amount of nighttime work through the replacement of existing tracks with TC-type labor-saving models or tracks using elastic ballast, both of which require less maintenance work.

Along Shinkansen lines, television interference is sometimes caused by overhead wires and pantograph bounces. We are now implementing measures to control television interference for affected households.

### Air pollutants

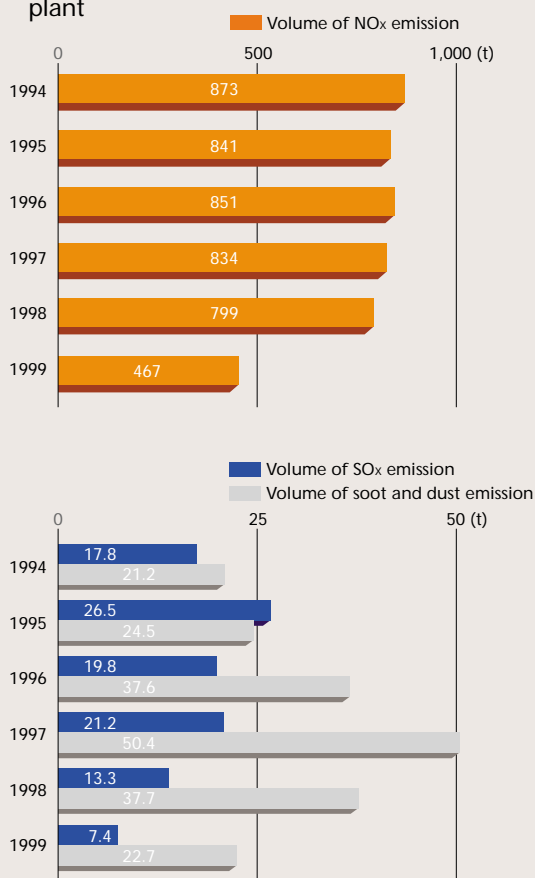
The Company-run thermoelectric power plant at Kawasaki generates a large volume of air pollutants. In that regard, we are busy converting fuels and renewing equipment to reduce NO<sub>x</sub> and SO<sub>x</sub> emissions and improve the facility's efficiency of energy consumption. In 1999, the NO<sub>x</sub> emission volume was 467 t, SO<sub>x</sub> emission 7.4 t, and soot and dust emission 22.7 t.

We are also working on the introduction of new engines for diesel railcars, along with examinations of function and durability with regard to our low-pollution engines.



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

#### ■ Trend in volume of NO<sub>x</sub> emission and others, from the Company-run thermoelectric power plant



\*The displayed data of NO<sub>x</sub> emission volume and others, from the Company-run thermoelectric power plant refers to the total for the entire calendar year (January 1 to December 31).

## Reduction of environmental pollutants

### Measures regarding incinerators

It has been pointed out that incinerators will under certain conditions generate dioxin. Currently a portion of the refuse disposed in JR East's stations and trains, as well as waste generated in business offices, is burned in our own incinerators. In response, we are now consolidating these incinerators and are planning to abolish by January 2001 the ones having incineration capacity of less than 200 kg/h. This will be achieved through an effort to reduce waste volume and out-source incineration operations. Moreover, we will consolidate our incinerators having capacities of 200 kg/h or more, along with equipment renovation and other significant measures.

### Appropriate management and reduction of toxic substances (such as chemical substances)

The chemical substances used in our business operations include those found in the organic solvents used for the railcar painting at rolling-stock maintenance plants and herbicides used for weeding on railway tracks.

We used 510 t of organic solvents in fiscal 1999, which we later disposed of in an appropriate manner. We have also introduced paint-free cars to our commuter lines, and such cars now account for approximately 40% of our rolling stock.

Heavy weed overgrowth on railway tracks can seriously interfere with the safety of train operations, so to control it we used 338 t of herbicides during fiscal 1999. However, in consideration of environmental impact we only use herbicides with toxins categorized as "low mammalian toxicity, category-A fish toxicity." Moreover, we use only the minimum amount necessary and strive to limit the area of sprinkling so that other plants will not be affected.

### PCBs

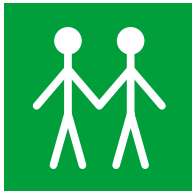
We have been using PCBs as insulating oil for high-voltage transformers and condensers in railcars, transformation units and so forth. However, we remove PCB-using machinery as soon as it becomes obsolete, bringing the total weight of such removal to approximately 2,000 t. This equipment is stored in warehouses and managed in a manner appropriate with legal regulations, including the placement of personnel in charge of industrial waste subject to special control.

Formerly only method allowed for PCB processing was combustion. Now, however, following revision of the Enforcement Ordinance for the Waste Management Law, it is allowed to process such materials chemically, as well. The Railway Technical Research Institute is now developing a processing technology that uses a combination of microbes and ultraviolet rays. We are considering the use of various processing methods in the future upon confirmation of their safety level.

### Treatment of sewage from train washrooms

We have been working on the installation of sewage-treatment equipment in washrooms in trains. The installation has been completed for all passenger railcars equipped with washrooms. Forty-seven diesel railcars are scheduled to receive similar procedures by the end of fiscal 2000.





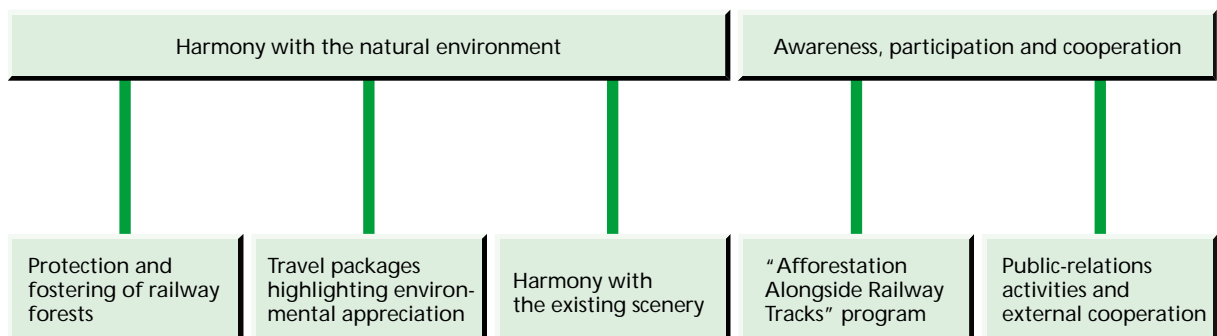
## 5. Environmental efforts in society

Nature is, of course, preserved in abundance along our railway lines, totaling approximately 7,500 km. This includes the railway forests we have established as a protection against the ravages of snow and wind. In fact, 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 our group affiliates and employees be aware of environmental issues, and that we appeal to our 16 million daily customers regarding the importance of environmental conservation. JR East is widening the circle of environmental awareness through a variety of means and occasions.

### ■ Goals and progress

Item	Targeted value	Actual achievements in fiscal 1999
"Afforestation Alongside Railway Tracks" program	30,000 trees annually	12 locations 20,000 trees 3,000 participants

### ■ 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 established in various locations as a means of protection against snowstorms and landslides. Currently, we maintain approximately 4,400 hectares of railway forest comprising approximately 6 million trees, thus contributing to the wondrous abundance of nature. We believe it is our mission to protect and foster these forests.

### Natural environment and trips

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 the theme of "communication with the local community" among the concepts for our "New Journey," 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 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 take various steps, including observation and examination for the reconciliation of structural safety and durability and harmonization with the environment. Our efforts are paying off, too. In 1999, the vicinity south of Shinjuku Station, which contains our head office building and the Shinjuku Southern Terrace mall, was given the Urban Landscape Award and the Special Award from the Society of Building Contractors.



Railway forest

#### Examples of "Travel packages highlighting environmental appreciation"

Romantic Adatarata	168 participants
Let's Walk in Nature	10,847 participants
Cole Blossoms Journey	140 participants
Firefly Viewing Tour	416 participants
The Shirakami Mountains	237 participants
Village of Nature in Hokkaido	111 participants



Vicinity south of Shinjuku Station, standing in harmony with its environment (center: the JR head office building)



## Awareness, participation, and cooperation

### “Afforestation Alongside Railway Tracks” program

JR East is conducting a number of activities designed to encourage environmental awareness among the broadest sectors of the population. Among them is the “Afforestation Alongside Railway Tracks” program, through which we conduct tree-planting activities along railway lines. This program has been at work since 1992, with a view to planting 30,000 trees each year. This is a volunteer activity by the employees of JR East. Yet, it also enjoys the participation of local residents. Furthermore, employees of our affiliate companies contribute by donating money for such activities.

### Public-relations activities and external cooperation

JR East conducted a campaign for ecology between December 1999 and January 2000 in order to raise environmental awareness among our customers. During this campaign, we designated one train on the Keihin-Tohoku Line, for which the 209 Series (our energy-saving railcars) has been introduced, as an “eco-train.” Inside the train, we exhibited posters of winners and other entrants of a composition and poster contest entitled “Let’s Protect Our Earth,” which was organized by Children’s Club for the Earth, along with our own awareness messages. Additionally, we design-wrapped the entire bodies of the first and last railcars to express our messages in visual terms.

We are now conducting other public-relations activities in order to enhance the public’s understanding of our environmental efforts. In so doing, we will help bring all of society to a greater level of awareness and action.



“Afforestation Alongside Railway Tracks” program



Eco-train, run between December 1999 and January 2000

# History of JR East's Ecological Activities

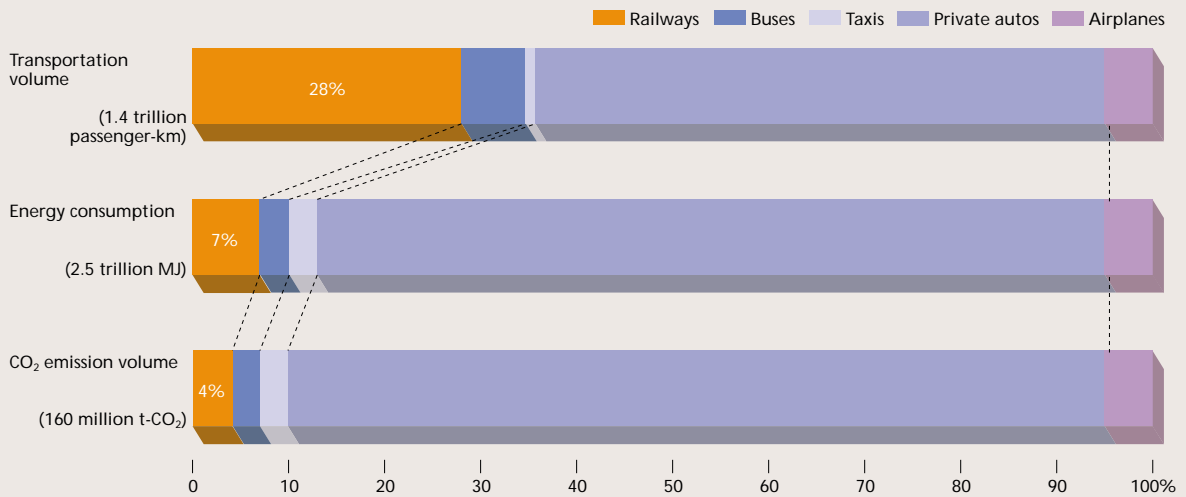
1992	April	Committee on Ecology established
	June	Commemorative tree-planting conducted for the 5th anniversary of JR East (conducted each year since then as the "Afforestation Alongside Railway Tracks" program)
	August	Trial collection of three-category refuse started in Sugamo Station on the Yamanote 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) Three-category refuse collection started in 36 stations (Yamanote Line and others)
	February	Recycling of used train tickets started in the Tokyo metropolitan area
1995	March	The first Shinkansen anti-noise measure initiative completed
	April	Ecology education instituted for all new recruits Torenta-Kun discount rental-car program introduced
	March	Quantitative environmental goals established in each business area, including reductions in volume of CO <sub>2</sub> emissions First <i>Annual Environmental Report</i> issued (repeating each year since then)
1997	March	Recycling equipment shifts into gear at the Minami-Akita operations center
	June	Tree-planting conducted by new recruits (repeated every year since then)
	September	Attendance at the International Union of Railways (UIC) Environment Coordinators Meeting (attending each year since then)
	October	Nagano Rolling Stock Center and recycling equipment go into operation at Tokyo Station
	December	Participation in the COP3 together with the UIC
1998	March	Second anti-noise measure initiative for Shinkansen lines completed
	September	Production and sales of polyethylene refuse bags with used-paper content
	November	The Shinkiba recycling center opened (for collection and sorting of used newspapers and magazines)
1999	February	Niitsu Rolling Stock Plant 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 started operating
	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 the ISO 14001 certification
	December	The extended Yamagata Shinkansen Line (to Shinjo Station) started operating; parking lots provided along the line Campaign for ecology (eco-train operation and others)
	April	Uniforms made from used PET bottles introduced VIEW Card base material changed to chloroethene-free PET-G

## 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 given to the Tokyo regional head office and organized by the Recycling Promotion Council
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, given to the Mito branch office and organized by Ibaraki Prefecture The Sixth Global Environment Award, organized by the Japan Industrial Journal 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 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 with support from Deloitte Touche Tohmatsu
2000	May	Improvement and Rationalization category, the Shimoji Prize, Awards for Superior MH Equipments and Systems, given to East Japan Eco Access Co., Ltd., and organized by the Japan Material Handling Society

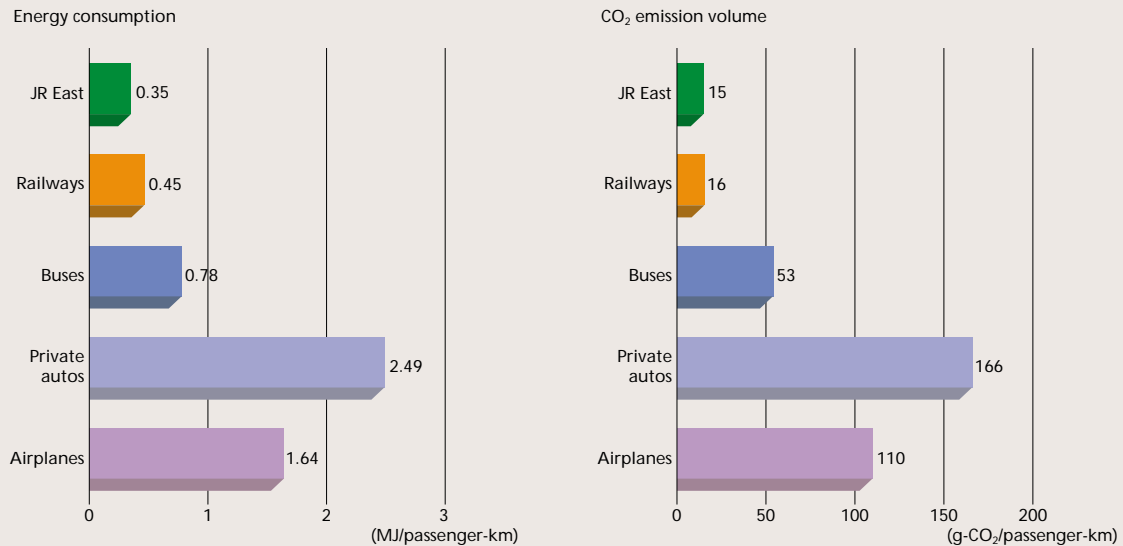
# The Role of Railways in the Passenger-Transportation Market

■ Comparison among different means of transportation in Japan's passenger-transportation sector (FY1997)



Prepared by JR East based on the Survey on Transportation-Related Energy Consumption (FY1999 edition)  
 Passenger-km: a unit indicating the number of passengers multiplied by the length of distance

■ Energy consumption and CO<sub>2</sub> emission volumes in proportion to the unit transportation volume of each means of transportation in Japan



Prepared by JR East based on the Survey on Transportation-Related Energy Consumption (1999 edition)  
 Figures for JR East are from the year 1999. Others are from the year 1997.

# Independent Review Report



Asahi & Co

A Member Firm of Arthur Andersen

Independent Review Report on the "Annual Environmental Report 2000"

To the Board of Directors of East Japan Railway Company

## 1. Purpose and Scope of our Review

We have reviewed the "Annual Environmental Report 2000" (the "Environmental Report") of East Japan Railway Company (the "Company") for the year ended March 31, 2000. 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 first 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 data bases 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.

*Asahi & Co.*

Tokyo, Japan  
September 19, 2000

# Corporate Profile (as of March 31, 2000)

## Corporate name

East Japan Railway Company

## Address

2-2 Yoyogi 2-chome, Shibuya-ku, Tokyo, Japan

## Founding year

April 1, 1987

## Capital

¥200.0 billion

## Sales proceeds

¥1,899.9 billion

## Profit for the period

¥60.3 billion

Number of employees: 75,426

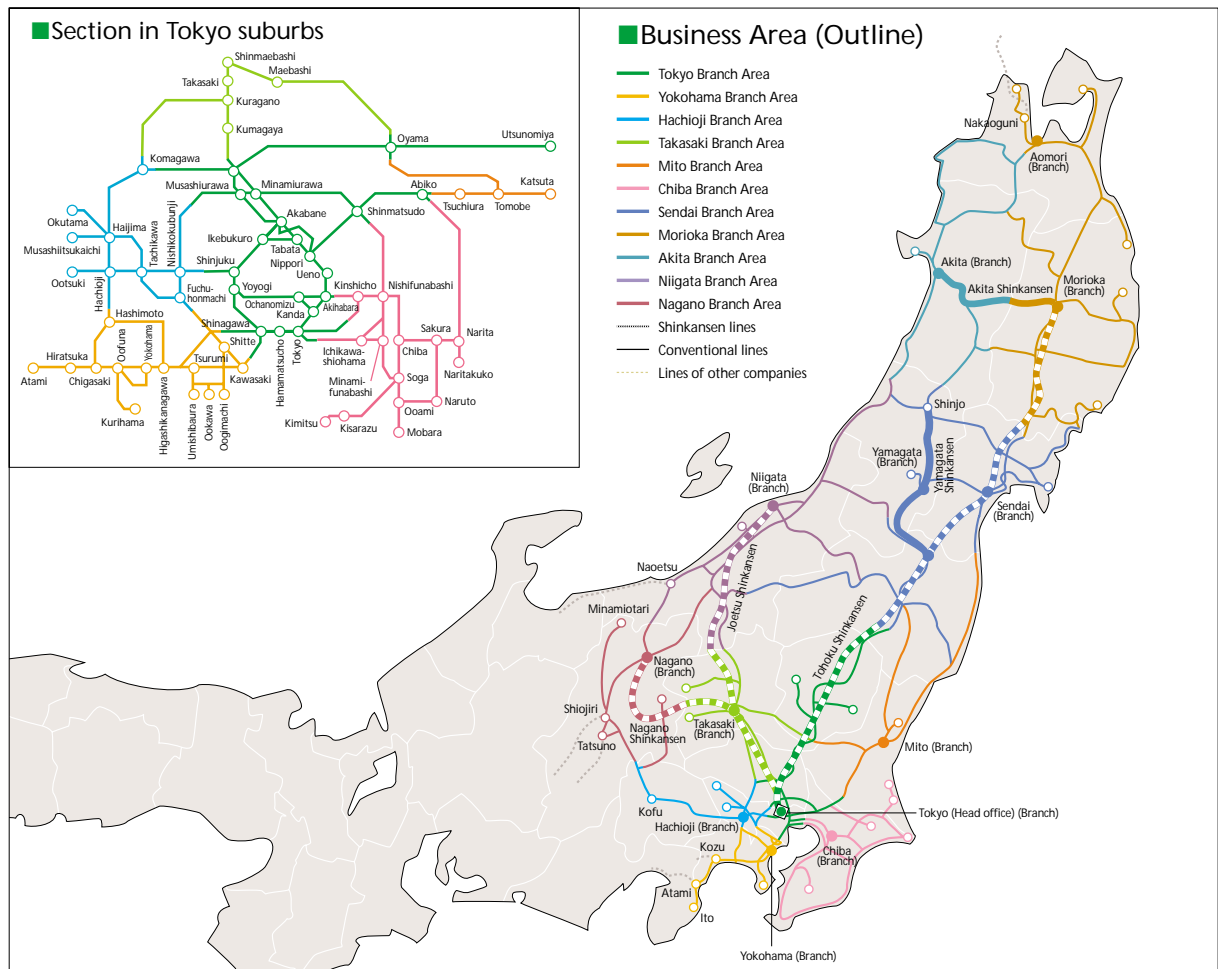
Passenger line network: 7,538.1 km  
 Shinkansen lines: 956.3 km  
 Conventional lines: 6,581.8 km

Number of stations: 1,708

Average daily train runs:  
 12,321 (based on the schedule set  
 in December 1999)

Passengers served daily: 16.1 million

Business description: Transportation, sales of  
 goods, real-estate leasing,  
 and others



## **Annual Environmental Report**

Published October 2000

East Japan Railway Company  
Committee on Ecology

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