Annual Environmental Report 2001

EAST JAPAN RAILWAY COMPANY

Committee on Ecology

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.

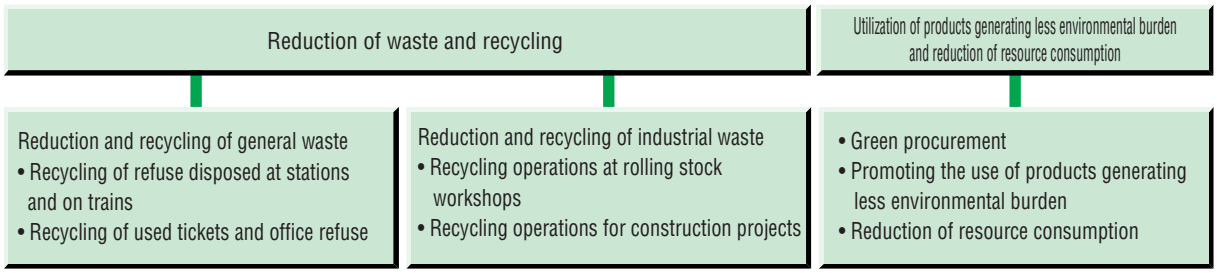
As a means of achieving a true recycling-oriented society, in addition to treating such waste in a manner compliant with laws and regulations, JR East makes every effort to reduce the total volume of waste generated in the course of our operations.

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	**36%**	**35%**
Recycling rate of waste generated at rolling stock workshops	**75%**	**67%**
Recycling rate of waste generated through construction projects	**85%**	**73%**
Usage rate of recycled paper as office stock	**100%**	**97%**

■JR East's efforts toward zero emissions

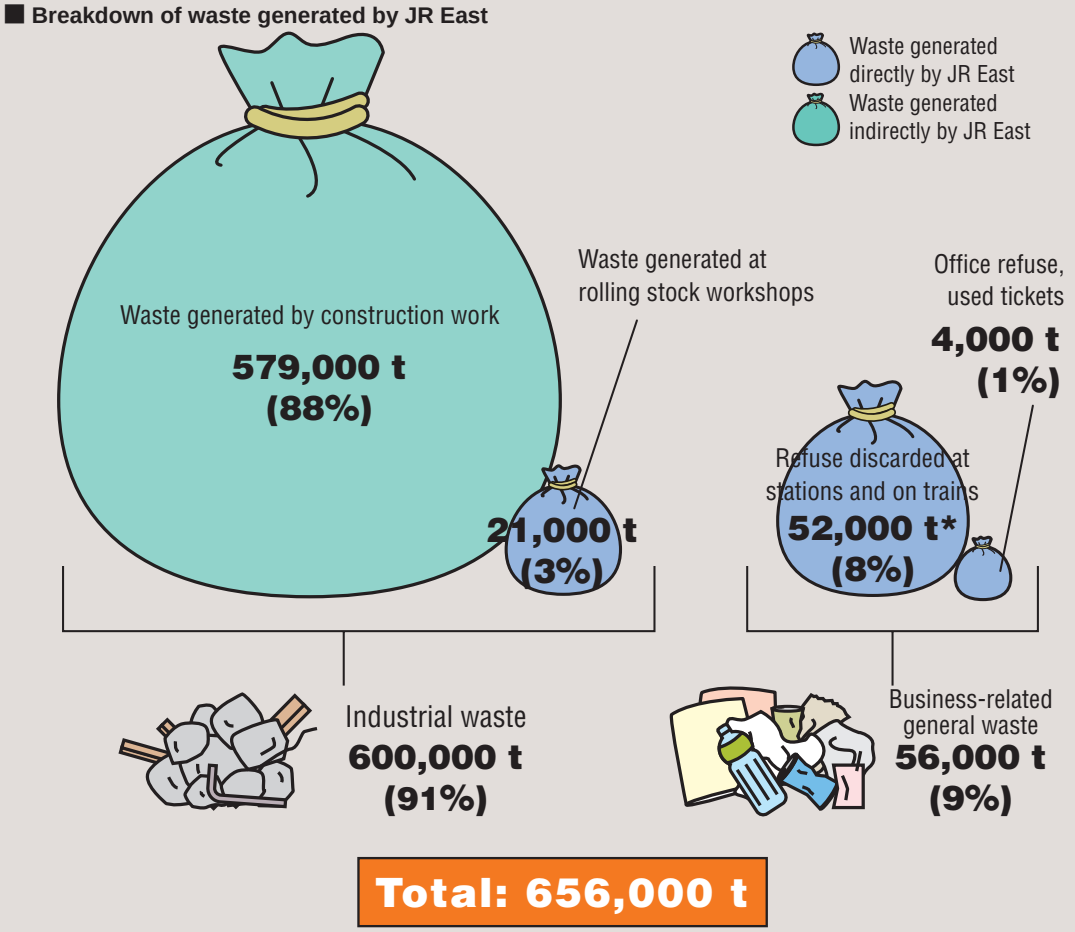


Waste generated by JR East

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.

■ **Breakdown of waste generated by JR East**



* 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.

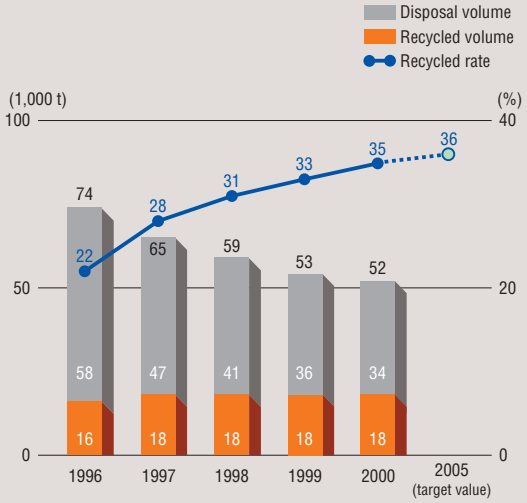
We are now busy installing refuse bins categorized for the efficient collection and separation of recyclable waste. These bins carry the designations “Newspapers and Magazines,” “Cans, Glass Bottles, and PET Bottles,” and “Others,” and passengers are asked to follow those indications. In this way, we 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.

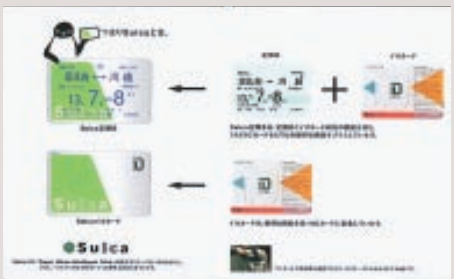
Recycling of office refuse

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.

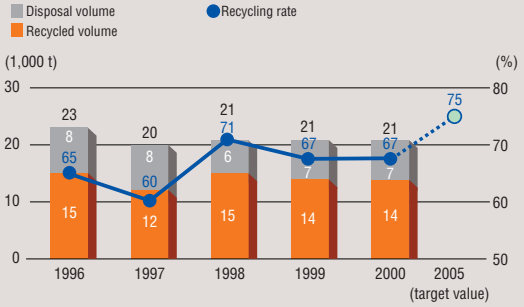
Improvement of recycling rate at rolling stock workshops

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%.

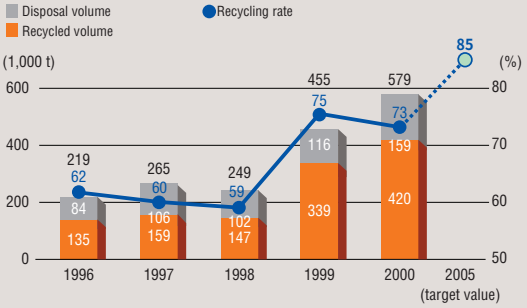
The E231 Series, introduced on our Sobu Line and other routes, replaces the urethane resin previously used for seats with materials such as polyester resin that offer a greater degree of recyclability. Aluminum has been substituted for fiber reinforced plastic (FRP) wherever feasible. These are just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

■Waste disposal and recycling at rolling stock workshops



■Waste disposal and recycling for construction projects



Waste metal is recycled into parts for railcar brakes and others.

Next-generation AC Train commuter train

Improved recycling rate for construction projects

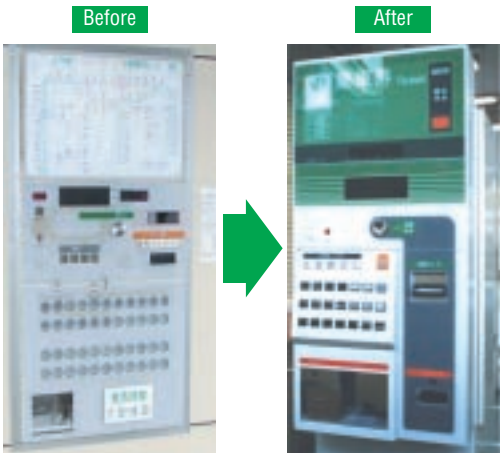
Though not a direct product of our operations, waste from construction projects nonetheless accounts for 88% of the waste generated directly and indirectly by JR East, a fact that spurs our efforts to reduce and recycle waste from this source. Specifically, we share information on recyclable construction 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^3 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.

Tokyo Ballast Processing Center

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.



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.

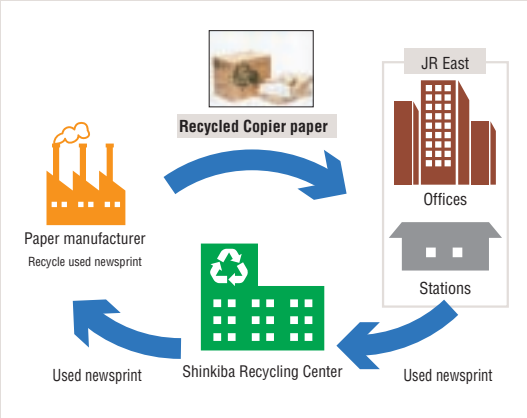
Promoting the use of environmentally friendly products

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