



Safety



Society



Environment

Environmental Management

Management of Environmental Goals

FY2031 goals

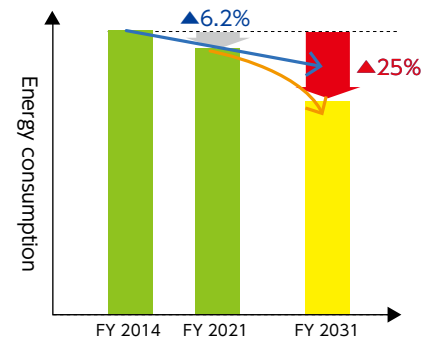
Since 1996, JR East has been conducting environmental conservation activities with a focus on specific goals. With the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) held in December 2015 adopting the Paris Agreement which will be a new international framework for global warming countermeasure after 2020, we have set environmental goals which plan to be achieved in FY2031.

Category of environmental conservation activities	Performance indicators	Targets to be met by FY2031
Measures to prevent global warming	Energy consumption from railway business activities	25% reduction (compared to FY2014)
	CO ₂ emission volume from railway operations	40% reduction (compared to FY2014)

Concept for goals determination

25% reduction of energy consumption for railway operations (compared to FY2014)

To achieve the FY2021 goals which aim to reduce energy consumption for railway operations by 6.2% when compared to those of FY2014, we have promoted activities such as the introduction of energy saving trains and LED lighting. Towards realizing the FY2031 goals, we pursue achieving a reduction of 25% energy consumption for railway operations (compared to FY2014) by accelerating reduction pace up to FY2021 through activities such as installation of power storage facilities, self-consumption of renewable energy, increasing the introduction of E235 series trains. In addition, we aim to achieve further system innovation such as enabling energy-saving automated operation.



40% reduction of CO₂ emission volume from railway operations (compared to FY2014)

In terms of CO₂ emission goals, based on the assumption that power company emission factors will be 0.37 kg-CO₂/kWh in FY2031, we set goals which convert a 25% reduction of energy consumption into CO₂ emission volume.

**Note: External Assurance on environmental performance and environmental accounting data**

KPMG AZSA Sustainability Co., Ltd. has been engaged to provide external assurance on a set of selected environmental performance and environmental accounting indicators so that the reliability of the data is ensured. The particular indicators that are assured are marked with a ☆ for clarity.

State of progress toward FY2021 goals**FY2021 Goals**

Energy consumption of the railway business has been steadily reduced by conducting activities such as the introduction of energy saving trains and others. In accordance with the nation's FY2031 goals, the baseline year was set as FY2014.

figures in parentheses are in comparison to FY2014

Category of environmental conservation activities	Performance indicators	Unit	Reference value (FY2014)	FY2021 goal	FY2017 result
Measures to prevent global warming	Energy consumption from railway business activities	Billions of MJ	51.7	48.5 (6.2% reduction)	50.2 [☆] (2.9% reduction)
	Electricity consumption for train operation (Shinkansen lines)	kWh/car-km	2.49	2.36 (5.1% reduction)	2.44 [☆] (2.0% reduction)
	Electricity consumption for train operation (conventional lines)	kWh/car-km	1.59	1.46 (8.3% reduction)	1.49 [☆] (6.0% reduction)
	Energy consumption at branch offices, etc.	kL/m ²	0.0407	0.0366 (10.0% reduction)	0.0376 [☆] (7.6% reduction)

Progress of Environmental Measures

Category of environmental conservation activities	Performance indicators	FY2021 goal	FY2017 result
Measures to prevent global warming	Implementation of more ecoste Model Stations	Total of 12 Stations	Total of 6 Stations
	Switching Platform and Concourse Lighting to LEDs	Total of 36 thousand units (reduction of 83 million MJ)	Total of 21 thousand units (reduction of 44 million MJ)
	Improving Efficiency of Large-scale Air-conditioning Systems	Total of 10 Locations (reduction of 82 million MJ)	Total of 6 Locations (reduction of 57 million MJ)

Annual Targets through FY2021

Category of environmental conservation activities	Performance indicators	Goal	FY2017 result
Measures to prevent global warming	Reduction Rate of Energy Consumption Intensity of Each JR East Group Company	Every year 1% reduction in each group company	2.2% reduction by all group companies
Measures for resource circulation	Recycling rate for waste generated at stations and on trains	94%	93% [☆]
	Recycling rate for waste generated at General Rolling Stock Centers, etc.	96%	95% [☆]
	Recycling rate for waste generated in facility construction projects.	96%	92% [☆]
	Implementation Rate of Recycling by Group companies	100%	100%
Environmental management	Setting of numeric targets by Each JR East Group Company	Targets to be revised continually	Established

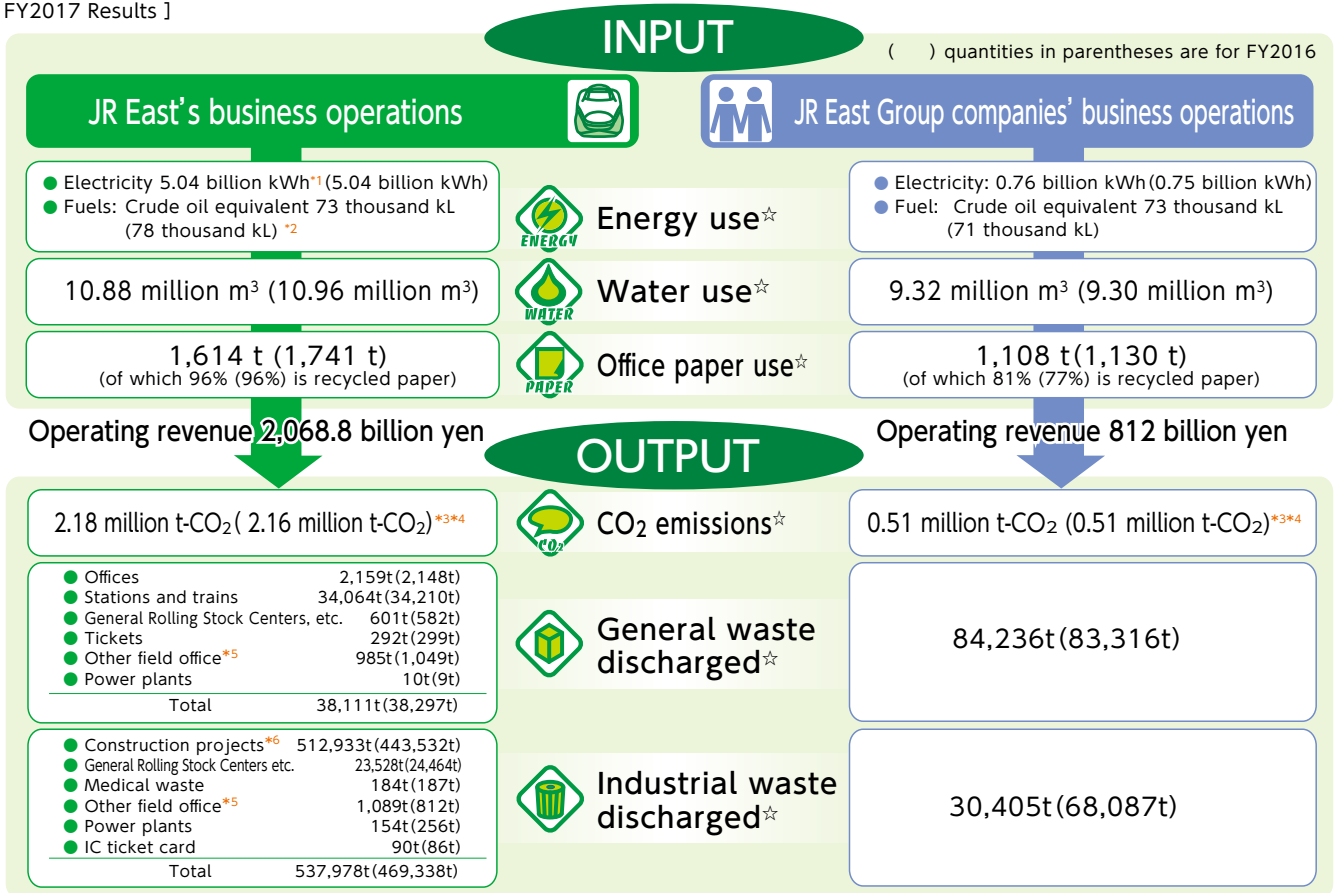
■ Targets for Group companies



Progress of Environmental Management by Entire Group

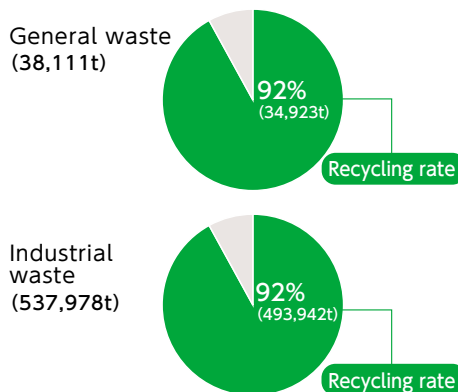
JR East Group's environmental impact

[FY2017 Results]

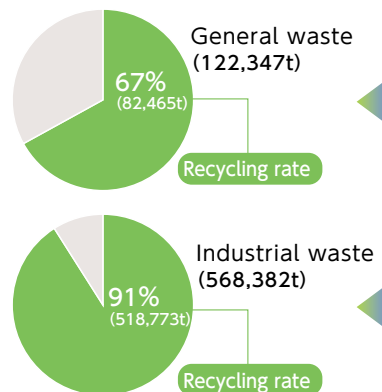


*1 Electricity: Both electricity generated in JR East's power plants and used internally and electricity purchased from electric companies are included. Please refer to the "JR East Energy flow map" on page 106 for details about electricity generation and use. *2 Fuels: Natural gas and other fuels used for generating electricity in JR East's thermal power plants are not included. *3 CO₂ emissions by Scope: Scope 1 emissions of the entire Group is 1.51 million tons CO₂ and Scope 2 emissions 1.69 million tons CO₂. (please see page 107) *4 CO₂ emissions attributable to electricity provided from external suppliers are calculated based on the adjusted emission coefficient of each power company. *5 Other field office: Technical centers that perform maintenance, and other locations such as train crew depots. *6 Construction projects: Waste generated by our construction projects, for which contractors legally become the waste-discharging entities, is included in industrial waste.

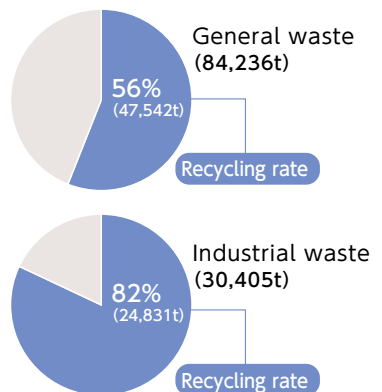
JR East recycling rate*



Entire JR East Group recycling rate*



Group companies recycling rate*



Definition of waste disposal

- Waste includes salable waste.
- Recycling includes thermal recycling* where general waste is treated at incineration plants etc. and industrial waste is incinerated as intermediate treatment for heat recovery.

* Thermal recycling is a recycling method in which the heat arising from the incineration of waste is used to create steam and hot water, which in turn are used to generate electricity and for hot-water supply.



Progress of Environmental Conservation Activities at Each Workplace

■ Creating an environment-conscious culture

JR East believes it is important to promote environmental activities with clear goals established for the entire JR East Group, and to have every employee actively involved. We are expanding the scale of our environmental activities by promoting "JR East Eco Activities" at each work place, developing leaders through environmental education, and sharing recognition of outstanding environmental efforts through the presentation of awards.

■ Implementation of environmental education

For effective environmental management, it is essential that all employees have appropriate knowledge on environmental issues. We provide environmental education lectures to our employees in training in order to develop environmental activists in the local organization of JR East and group companies. Through these lectures, we aim to expand the scale of our environmental activities. In FY2007, to enhance environmental activities at each group company, we began holding JR East Group Environmental Management Promotion Conferences for people in charge of environmental matters in those companies.

[Environmental education & training system]

Education of environmental-activity promoters at local organizations of JR East and group companies

Environment management expert training

- Persons trained: those responsible for environment at local organizations, etc.
- Objective: improvement of ability in environment-related matters as trainers to field offices, etc.
- Number of participants: 20

Environment countermeasures of Shinkansen practical training

- Persons trained: those responsible for environment at each Branch Office
- Objectives: learning of basic knowledge about relevant rules and regulations for noise and vibration
- Number of participants: 10

JR East Group Environmental Management Promotion Conference

- Persons participating: those in environmental departments at all group companies (twice a year)
- Objective: promotion of environmental management for the entire JR East Group

Implementation of training and lectures in Branch Offices

■ Internal environmental audits

At our General Rolling Stock Centers and others which obtained ISO 14001 certification, in-house auditors are trained through external training programs, and conduct routine audits at the centers in order to evaluate environmental activities.

[ISO14001-certified facilities]

Certified facilities	Year and month of certification
<JR East>	
Kawasaki Thermal Power Plant	Mar-01
Tokyo General Rolling Stock Center	Mar-01
Omiya General Rolling Stock Center	Feb-02
Shinkansen General Rolling Stock Center	Nov-02
Koriyama General Rolling Stock Center	Dec-03
Nagano General Rolling Stock Center	Feb-05
Akita General Rolling Stock Center	Jul-05

Certified facilities	Year and month of certification
<Group companies>	
East Japan Eco Access Co., Ltd.	Nov-99
Nippon Restaurant Enterprise Co., Ltd. (CK headquarters)	Sep-02
JR East Mechatronics Co., Ltd.	Mar-08
East Japan Marketing & Communications, Inc.	Aug-08
JR East Rail Car Technology & Maintenance Co., LTD.	Dec-10
Japan Transport Engineering Company	Oct-14



Safety



Society



Environment

Environmental Communication

Development of Environmental Education by Delivering Lectures on Request

In the fiscal year ending March 2010, to contribute to the development of a sustainable society, JR East initiated environmental education programs for children. They will lead the next generation and they need to understand environmental issues and their relationship to society. The program aims to help children understand the environment and life through materials related to railways. In FY2017, the program was implemented at 81 schools, primarily elementary schools, in the JR East area. From FY2014, JR East employees working in each area are visiting neighboring schools for the programs.



Delivering Lectures

TICKET
TO
TOMORROW

What I learned from a delivery session

Misaki Kasuya

Conductor, Toyoda Transportation Depot, Hachioji Branch Office

As a conductor, I work on the Chuo Line between Tokyo and Otsuki. In my daily duties, I focus on thoroughly conducting basic procedures as a conductor and making easy-to-understand on-board announcements to provide safety and peace of mind for our passengers.

When I delivered a lecture at a neighborhood school, I spoke on the theme of railways which is familiar to students and explained how we utilize information-related systems and how JR East tackles environmental issues. Through this session, I was involved in the education of neighborhood children, and it was a valuable experience. At the same time, in serving the railway infrastructure myself, I reaffirmed the importance of working on environmental issues.

I would like to continue my efforts in further improving safety measures and service quality by utilizing an even more convenient information network.



Holding Environmental Events

We exhibit at the Eco Life Fair hosted by the Ministry of the Environment and stage events with other companies, for the purpose of explaining JR East's environmental preservation activities, and communicating directly with customers. In November 2016, we held an event in collaboration with NTT Group which successfully appealed to a large number of customers through a variety of activities, including panel displays introducing both companies' environmental initiatives, participatory events that enabled people to learn about the environment while having fun, and model exhibits

Initiatives for: environmental activities of the Shinanogawa Power plant

In July, 2016, we opened the "Citizen house; Ojiya Shinanogawa Hydroelectric Plant House" as a part of popularization activities for the Shinanogawa Hydraulic Power Plant to give the opportunity to learn about the mechanism of hydraulic power generation which is a source of clean energy.

On top of that, we continue the release of juvenile salmon as a part of initiatives to harmonize water usage and the river environment of the Shinanogawa River with the people of the local community.



Ojiya Shinanogawa Hydroelectric Plant House

Public Relations on Environmental and Societal Activities

To present JR East's activities for the environment and society in an accurate, easy-to-understand manner, we have continued to publish our Environmental Report since 1996 (the title was changed to "Sustainability Report" in 2002 and "CSR Report" in 2013). We also communicate about our environmental activities through various media outlets, as well as JR East's websites, posters and pamphlets.



Environmental Accounting and Environmental Management Indicators

In FY2017, our environmental conservation costs amounted to approximately 15.7 billion yen in investments and 20.4 billion yen in expenses. By introducing new type of cars, we estimate we will reduce CO₂ emissions by about 17 thousand tons per year.

JR East has its own Environmental Management Indicator to assess the relation between our business activities and environmental impacts. These are calculated by dividing CO₂ emissions, which are a major factor in our environmental impacts, by operating profits, which represent our economic value added. A smaller value of the indicator means that we are making a smaller impact on the environment to create the same economic value added. For FY2017 the value of the indicator was 5.61t-CO₂ /million yen, compared to 9.45t-CO₂ /million yen for FY1991.

[Environmental accounting for fiscal year ended March 2017☆]

():FY2016

Category	Environmental conservation costs (billion yen)		Environmental conservation benefits in relation to environmental targets		Economic benefit of environmental conservation activities (billion yen)
	Investments	Expenses			
Environmental conservation (pollution prevention) activities along railway lines	4.80 (5.17)	12.72 (8.40)	—		—
Global environmental conservation activities	10.88 (5.87)	—	Energy consumption from railway business activities	50.2 billion MJ	12.82 (13.58)
			Electricity used for railway operations per unit of transport volume	Shinkansen 2.44 kWh/car-km	
				Conventional Lines 1.49 kWh/car-km	
Energy consumption per unit of floor area at branch offices, etc.	0.0376 kL-crude oil equivalent/m ²				
Resource circulation activities	—	5.64 (5.01)	Recycling rate for waste generated at stations and on trains	93%	1.05 (0.92)
			Recycling rate for waste generated at General Rolling Stock Centers, etc.	95%	
			Recycling rate for waste generated in construction projects	92%	
Environmental management	—	0.35 (0.38)	—		—
Environmental research & development	—	1.62 (1.40)	—		—
Social activities	—	0.03 (0.03)	—		—
Total	15.68 (11.04)	20.36 (15.23)			13.87 (14.51)

Notes

Capital investment for the period: 426.5 billion yen
 Total R&D costs for the period: 17.9 billion yen (Consolidated)

The above table's relations with the table for Targets and Results are as follows:

- "Environmental conservation activities along railway lines" = "Environmental activities along railway lines" and "Chemical substance management"
- "Global environmental conservation activities" = "Measures to prevent global warming" and "Chemical substance management"
- "Resource circulation activities" = "Measures for resource circulation"
- "Environmental management" = "Environmental management" and "Environmental communication"
- "Environmental research & development" = "Research & development"
- "Social activities" = "Environmental communication"

(Notes on calculation of environmental conservation costs and benefits)

Environmental conservation costs

- Data are for East Japan Railway Company only .
- Environmental conservation costs are mainly based on data available in the current management system.
- To date, we have declared the total amount of investments in energy-saving rolling stock, but starting from FY2016, we do not declare amounts corresponding to upgrades of aging rolling stock.
- Expenses do not include depreciation charges.
- In the costs for resource recycling activities, expenses for treating waste generated at stations and train cars, based on a model for cleaning stations and trains.
- In the costs for resource recycling activities, the expenses for treating waste generated through

construction projects are calculated by multiplying waste volume for FY2017 by standard unit costs for the type of waste in that region.

Environmental conservation benefit

- Environmental conservation benefits are calculated based on figures set as our environmental targets.
- Economic benefit of environmental conservation activities
- Economic benefit of global environmental conservation activities is calculated by multiplying annual savings (estimates are used in some cases) in electricity and repair costs resulting from the introduction of energy-efficient trains by the expected useful life, to determine useful-life economic benefit.
- Income from the sales of waste generated at General Rolling Stock Centers and through construction projects is included in economic benefit of resource circulation activities.

Environmental Management Indicator

$$= \frac{\text{Environmental Impacts}}{\text{Economic Value Added (EVA)}} = \frac{\text{CO}_2 \text{ emissions (t-CO}_2\text{)}}{\text{Operating profit (million yen)}}$$

[JR East's Environmental Management Indicator☆]

