

What is the JR East Group doing to prevent global warming?

In our efforts to reduce our CO₂ emissions, the JR East Group pursues the efficient use of energy and the effective use of natural energy. We also promote intermodal transportation with the aim of reducing CO₂ emissions from all forms of transportation.

Measures to prevent global warming

Energy supply and consumption

The electricity consumed by JR East for train operations as well as lighting and air conditioning at stations and in offices is supplied from two sources: JR East's own power plants and electric power companies. Besides electricity, we also use diesel fuel and kerosene for diesel train operation and air conditioning at stations and in offices.

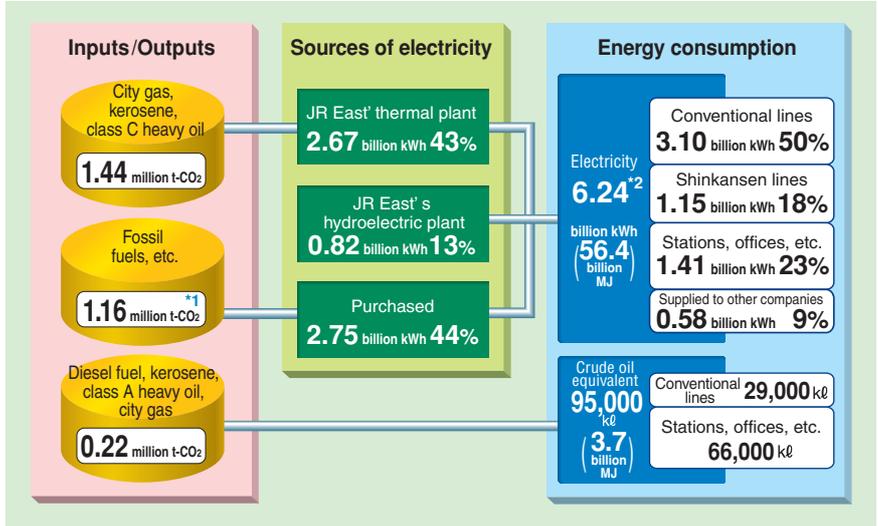
Thanks to our efforts to use energy efficiently, our energy consumption has been on a decline.

CO₂ emissions and reduction measures

Although our CO₂ emissions had steadily declined, JR East emitted 2.58 million tons of CO₂ in fiscal 2005, up 0.38 million tons compared with the lowest level in fiscal 2003. Unfortunately, this is near-equivalent to our CO₂ emissions in fiscal 1997. It is mainly because the Niigata-Chuetsu Earthquake caused great damage to our hydroelectric plant, a power station that supplies electricity to the Tokyo Metropolitan Area, and forced us to suspend its operation. Despite the partial resumption of the plant's operation in February 2005, the negative aspects of this suspension still remained throughout fiscal 2005.

As a result of our efforts to reconstruct the damaged facility, our hydroelectric plant started full-scale operation in March 2006. We are determined to continuously implement a wide range of CO₂ reduction measures, while putting priority on the reduction in energy for train operation, which accounts for 72% of the total energy we consume.

Energy flows of JR East

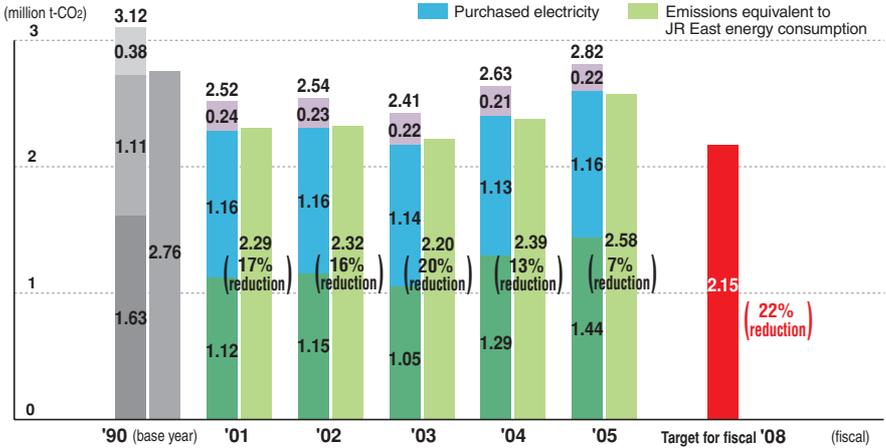


Trends in energy consumption



Note: Energy consumption is calculated based on the assumption that electricity purchased and generated at JR East's hydroelectric plant is constantly consumed at a rate of 9.42 MJ/kWh. Energy consumption by JR East's thermal power plants and other fuels' consumption is calculated based on actual fuel consumption.

Trends in total CO₂ emissions



Note: The CO₂ emission factors for fuels and purchased electricity used here are from the Japan Business Federation's "Voluntary Action Plan on the Environment," and the Federation of Electric Power Companies of Japan.

***1 1.16 million t-CO₂**
In order to enable a yearly comparison, the CO₂ emission factor for fiscal 1990 set by the Federation of Electric Power Companies of Japan is used here. If the CO₂ emission factor for fiscal 2005 is used, the figure becomes 1.17 million t-CO₂.

***2 6.24 billion kWh**
Electricity consumed by JR East (exclusive of those supplied to other companies) is 5.66 billion kWh, which is equivalent to the annual electricity consumed by 1.51 million households.

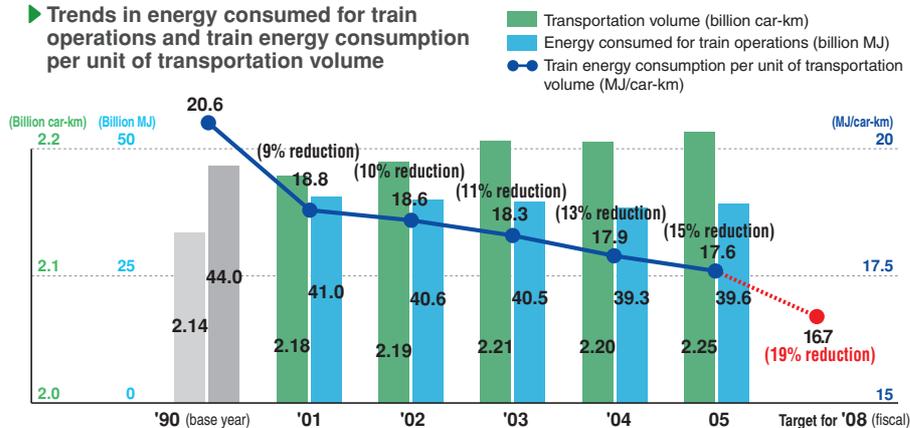
Reducing energy consumed for train operations

As of the end of fiscal 2005, JR East had 9,944 energy-saving railcars in operation. This accounts for 81% of all trains we own.

We further introduced advanced energy-efficient railcars, such as trains with regenerative brakes, which can convert movement energy during deceleration into electric energy, and trains with Variable Voltage Variable Frequency (VVVF) inverters, which can control a motor without wasting electricity.

These energy-saving measures regarding train operation in fiscal 2005 made it possible for us to reduce energy consumption per unit of transportation volume by 15% compared with fiscal 1990.

Trends in energy consumed for train operations and train energy consumption per unit of transportation volume



E231 series: VVVF railcars that are mainly used as commuter or suburban trains.



E2 series: VVVF railcars used for *Asama* or *Hayate* Shinkansen trains.



E233 series: New railcars scheduled to be in operation on the Chuo Line in December 26.

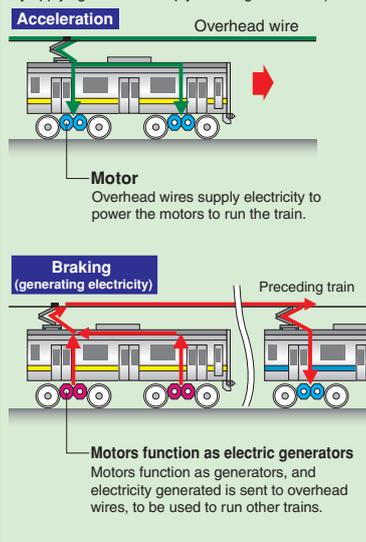
Trends in energy-efficient railcars



Mechanism of regenerative brake

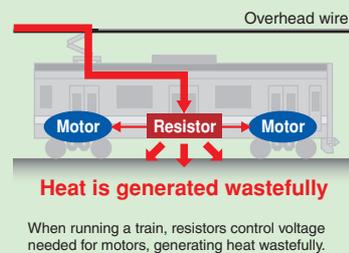
A regenerative brake can generate electricity during braking

Motors of an energy-efficient railcar function as electric generators when brakes are applied, and electricity generated in this process is later sent to the overhead wires, making it possible to use energy efficiently. (In the case of conventional trains, energy generated by applying brakes is simply discharged as heat.)

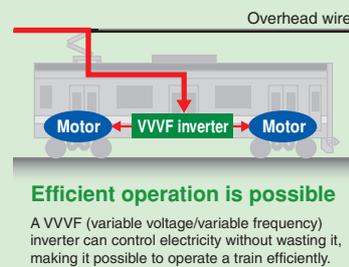


Mechanism of VVVF inverter train

Conventional train



VVVF inverter train



Reducing CO₂ emissions through intermodal transportation

Intermodal transportation

A railway is a highly energy-efficient mode of transportation with low environmental impacts, but railways alone cannot completely satisfy the transportation needs of the people. Thus, JR East is working to reduce CO₂ emissions of the entire transportation system by promoting intermodal transportation^{*1}—combining railways with other modes of transportation.

Park-and-ride schemes

We are currently promoting the park-and-ride scheme, under which we provide parking spaces near railway stations so that our customers can drive their cars from home to nearby stations and use our trains from there. By the end of March 2006, 122 JR East stations had a total of 12,000 parking spaces^{*2}.

With this scheme, we are making efforts to encourage more people to use trains for some parts of their travel, instead of using their car for the complete trip.



A parking lot owned by Kofu Station Building Co., Ltd. near Kofu Station is now utilized under the park-and-ride scheme.

Rail and car rental

Since 1995, JR East has offered a car rental service called “Train-ta-kun,” with about a half of normal car rental charges. This service allows our customers to use rental cars as a means of transportation from the station of arrival to the final destination. We are also selling a service called “Rail & Rent-a-Car,” which offers discounts on both train fares and car rental fees. Furthermore, we strive to provide services that facilitate a shift from car-only travel to car-and-train travel, by

renting compact and other types of cars, offering attractive rates, and installing car navigation systems as standard equipment in rental cars.

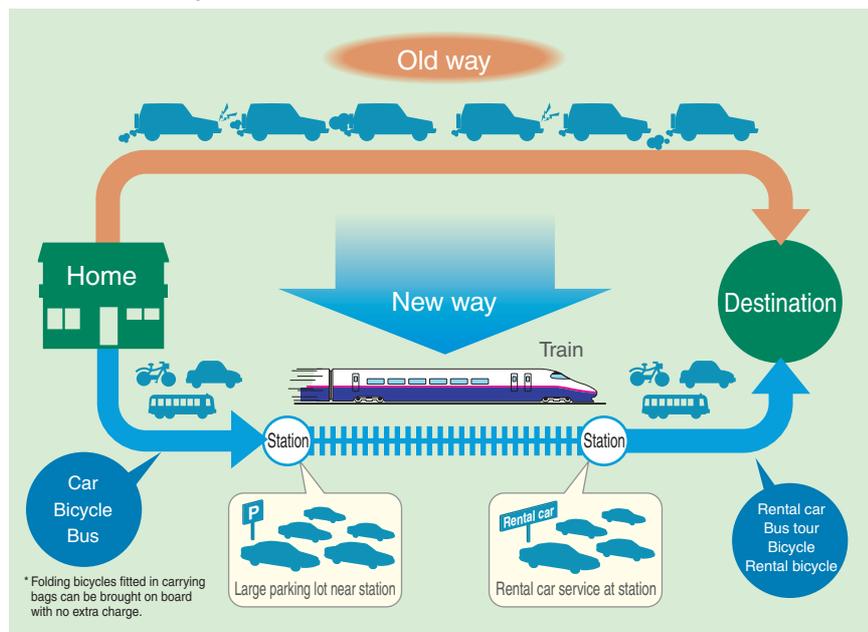
Optimal combination of transportation for travel tours

In collaboration with travel agencies, we started to offer new types of bus tours leaving the Tokyo Metropolitan Area, which enable tourists to travel some part of their tour routes by Shinkansen trains, in an effort to avoid traffic congestion as well as to reduce environmental impacts.

Travel packages and railways

JR East is putting our energy to offer travel packages that use trains as a means of transportation with lower environmental impacts, while capitalizing on rich natural and tourist resources in various regions. We propose a wide range of travel options that do not solely depend on automobiles. Examples include car rental plans that allow travelers to enjoy a train journey while benefiting from the mobility of rental cars, and sightseeing plans by taxi in cooperation with local businesses.

Intermodal transportation



Collaboration with various parties

In order to effectively make a shift from automobiles to other modes of transportation with low CO₂ emissions by encouraging the use of public transportation, it is vital for both users and public transportation operators to make collaborative efforts. For this reason, the national government launched the Management Council for the Promotion of Public Transportation in July 2005, which was joined by JR East and other public transportation operators, as well as companies and government ministries and agencies. The council met three times in fiscal 2005 in order to discuss how the public transportation system should meet the commutation needs of company employees in local regions.

*1 Intermodal transportation

Transportation systems that allow a person to get from a given point to a final destination by connecting different modes of transportation. This differs from the term “multi-modal transportation,” which simply indicates that there are multiple options for transportation.

*2 12,000 parking spaces near 122 stations

The figure represents the total number of parking spaces near our stations, including those owned by JR East, operated by our Group companies, and run in collaboration with local municipalities.

Reducing CO₂ emissions in supplying electricity

Load dispatch command function

JR East's demand for electricity fluctuates throughout the day, peaking during rush hours. To efficiently obtain electricity supply under such conditions, we control the supply of electricity by effectively combining various sources of energy*1—electricity generated at our thermal and hydroelectric plants and electricity purchased from outside sources—in accordance with fluctuating electricity demand. Our load dispatch command function plays a vital role in monitoring and controlling the supply of electricity in real time to optimize our use of energy.

Our thermal power generation

JR East operates a thermal power plant in Kawasaki City, Kanagawa Prefecture, with a total output of 655,000 kW. We have reduced CO₂ emissions per unit of electricity generated at the plant by 26% since fiscal 1990, by gradually replacing its current four generation units with more efficient combined-cycle power generation units*2, and by optimizing plant operations.

In June 2006, we replaced kerosene with natural gas as fuel for the No.3 generation unit, in our efforts to further reduce its CO₂ emissions.

Hydroelectric power generation

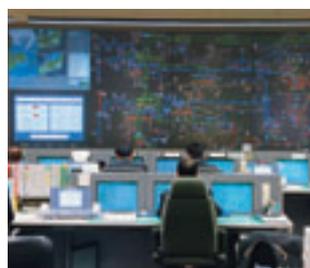
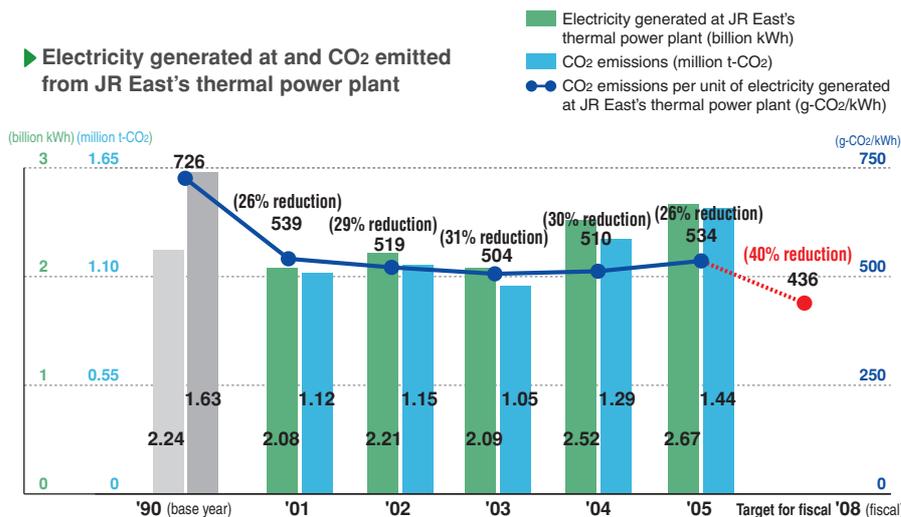
Hydroelectric power is recognized as a clean energy source that does not emit greenhouse gases. JR East has a hydroelectric plant on the Shinano River (Ojiya City/Tokamachi City, Niigata Prefecture), with a total output of 450,000 kW. The plant generates 1.4 to 1.8 billion kWh yearly.

Although the damage caused by the Niigata-Chuetsu Earthquake lowered the plant's power generation capability to as low as half the normal level in fiscal 2005, our reconstruction efforts enabled it to restart full-scale operation in March 2006.

Utilization of natural energy

JR East also utilizes natural energy such as solar and wind power. Photovoltaic (PV) panels have been installed at Tokyo Station, Takasaki Station, the JR East General Education Center, and the JR East Research and Development Center. In March 2004, we doubled the number of PV panels at Takasaki Station. Our Group companies have also installed PV panels at some facilities and station buildings. The Kokubunji L Terminal Building in Kokubunji City, Tokyo, for example, also has a windpower generator and PV system to produce electricity for lighting.

Electricity generated at and CO₂ emitted from JR East's thermal power plant



Our load dispatch command function monitors and controls the supply of electricity in real time.



Fuel for No. 3 generation unit at the Kawasaki Thermal Power Plant was completely switched from kerosene to natural gas in June 2006.



The Shinanogawa Hydroelectric Power Station restarted full-scale operation after earthquake damage was repaired.



PV panels installed on the roof of the Shinkansen platforms at Takasaki Station.

*1 JR East's sources of electricity supply in fiscal 2005

JR East's thermal power plant: 43% (31%)
JR East's hydroelectric plant: 13% (25%)
Purchased electricity: 44% (44%)

Figures in parentheses represent actual percentages for fiscal 2003 when there was no earthquake damage.

*2 Combined-cycle power generation unit

A power generation unit that combines gas turbines propelled by combustion gas with steam turbines driven by steam from exhaust heat.