



World's first diesel hybrid railcar on the Koumi Line

[Environment]

Responsibility for global environmental issues

Two approaches toward ecological preservation

The Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report published in 2007 concluded that one cause of global warming was human activity. The report stated that greenhouse gas emissions must be reduced by between 50% and 85% by 2050 if we are to avoid serious ecological problems.

We must remember that railways are already highly energy-efficient modes of transportation with low environmental impact. But JR East, with its daily passenger load of 16 million, uses a vast amount of energy (equivalent to the electricity consumed by 1.45 million ordinary households), and the volume of waste generated at stations and on trains is huge that it is about the same volume as would be produced by 110,000 people.

Against this background, JR East is carrying out environmental preservation activities from two approaches: the establishment of a railway system with lower environmental impact, and the development of an easier-to-use railway system. Activities under the first approach include introduction and promotion of energy saving railcars which will reduce our railcar-driving energy consumption, which currently accounts for 70% of the company's total energy consumption; establishment of waste recycling routes; and JR East Eco Activities, in which the company's 2,000 workplaces work on environmental impact reduction initiatives that are closely related to their tasks and the workplace environment.

Regarding the second approach, for example, we have been promoting the use of park & ride and rent-a-car services in order to utilize the environmental advantages of railways and contribute to the environmental impact reduction of the overall transportation system. Furthermore, to increase the convenience of railways themselves, we are working toward seamless railway usage, in

ways such as establishing Shonan-Shinjuku Line service and introducing Suica cards.

Research and Development Contributing to Environmental Preservation

In July 2007, the world's first diesel hybrid railcar, the fruit of JR East's research and development, was introduced on the Koumi Line. Compared to traditional diesel railcars for non-electrified sections, the hybrid railcar can save approximately 20% of energy* and realizes approximately a 60% reduction of toxic material in emission gases. Furthermore, as the next leap forward, we have commenced research and development of fuel cell hybrid railcars. Running tests are now being conducted.

JR East will continue to actively solve technological problems in order to reduce environmental impact, and will strive to achieve an acceptable balance between our business activities and environmental preservation and to upgrade our technical levels.

In Harmony with the Natural Environment

Throughout the JR East service area, we operate 7,527 km of railway lines and thus we naturally have a deep relationship with the natural environment. For example, there are still many railway trees that were planted during the Meiji Era (1868 - 1912) to protect lines from snow and wind. With the advance of urban development along railway lines in recent years, however, there are places where this need for disaster prevention forestation has been reduced, but JR East recognizes the intrinsic value of rich tree-planted areas. In the future, we will continue to strive to find the best way to preserve railway trees and work toward the harmonization of railways with the natural environment.

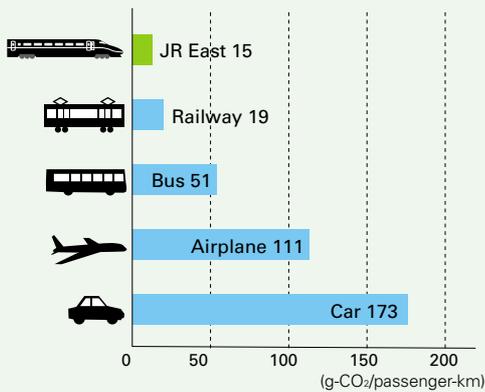
*Approximately 20% energy conservation: result of running tests on flat ground. Approximately 10% on the Koumi Line with its large number of gradients.

Electricity consumption by train series

103 series train = 100%



CO₂ emissions by mode of transportation



Source: "Transportation and Environment," Foundation for Promoting Personal Mobility and Ecological Transportation



Start of fuel cell hybrid railcar running tests



JR East recycling center where station-generated waste from the Tokyo metropolitan area and trains is sorted and compressed



Railway trees can also play a role in environment preservation

Aiming for a trusted JR East - Our initiatives



Getting over a world-first hurdle is our greatest challenge

Masahito Nakagami
Chief
Rolling Stock Electricity Technology Group
Advanced Railway System Development Center
Research & Development Center of JR East Group

I am involved in the development of fuel cell hybrid railcars. As this project is without precedent anywhere in the world, there were many factors that required careful attention, such as maintaining stable performance of the fuel cells, optimizing the hybrid control of fuel cells and batteries, renovating the railcars, and conducting accident-free running tests. Fuel cell technology is still in its infancy and there are several issues that apply specifically to railcars; nevertheless it is our technological team's ardent desire to ultimately achieve the commercialization of fuel cell hybrid railcars. The main reason for our desire for success is that if we can develop hydrogen-powered railcars, we will contribute to a reduction in greenhouse gases and thereby greatly benefit the global environment. After clearing legal issues, we are now at the stage where we are conducting running tests on commercial lines. We are also researching the safety of installing high-pressure hydrogen tanks on railcars and examining hydrogen filling facilities and methods.



What the 22nd Century will inherit

Hisashi Tsuyuki
Deputy Manager
Railway Disaster Prevention Group
Facilities Department
JR East Head Office

I am in charge of making plans for the maintenance and reinforcement of facilities designed to protect railways from natural disasters.

At JR East, we have various types of disaster prevention facilities, and railway trees are one of the most valuable methods. Railway trees, currently totaling 4,200ha, function to prevent avalanches, reduce the impact of snow storms, deplete blown sand, stop landslides, and dissipate winds.

What is more, as well as still fulfilling their original disaster prevention roles, railway trees are also valuable assets as we strive to further protect the natural environment.

JR East pledges to maintain railway trees for both natural disaster prevention and environmental preservation. Thus we hope to enrich the greenery alongside our tracks.

I hope to be in the position to draft plans that will enable the railway trees planted by our predecessors in the 19th Century to be passed down to our descendants in the 22nd Century.