

Development of Environmental Technology

Research and development contributing to environmental conservation

JR East has set “contributing to the Global Environment” as one of the four fundamentals of our R&D initiatives and is committed to the research and development for creating environmentally friendly stations. Specifically, our main R&D initiatives are related to environment assessment using Life Cycle Assessment (LCA), the promotion of resource circulation efforts by incorporating 3R (reduce, reuse, and recycle), and “Applications of new energy systems” such as fuel cells and the power-generating floor system.

Diesel-powered, electric-motor-driven hybrid railcars and new resort trains

The Kiha E200 Type cars, which entered service on the Koumi Line in July 2007, are the world’s first diesel-powered, electric-motor-driven hybrid railcars. A similar hybrid system will be employed on new resort trains that will enter service in the fall of 2010. This is expected to reduce fuel consumption by about 10% and nitrogen oxide (NOx) exhaust emissions by about 60%, in comparison with current trains. Also, the level of noise when idling at stations and when accelerating on departure is expected to be lower by 20-30dB.



The world’s first diesel hybrid railcars operating on the Koumi Line



New resort train (concept)

Development of fuel-cell hybrid railcars

JR East is proceeding with research on railway systems using fuel cells, a technology with low environmental impact. They feature highly efficient electricity generation and emit only water as a byproduct. Completing the world’s first fuel-cell hybrid railcar in 2006, we confirmed its basic performance in test runs at up to 100 km/h and identified issues yet to be resolved. Currently, we are engaged in research on improving the efficiency of the fuel cells and producing and refueling with hydrogen. There are still many challenges to overcome with fuel cell technology, but we are committed to the development of it, with an eye to the day when it will be commercially available.



Test run of fuel-cell hybrid railcar

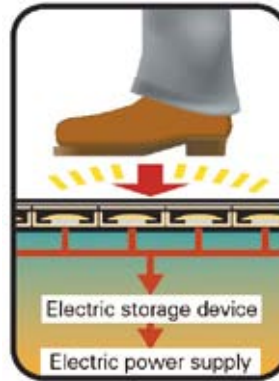
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Experimenting with power-generating floors

The third demonstration of a power-generating floor system, with increased capability, has been carried out. The system generates electricity from the pressure of people walking on it. The test was conducted in a passageway at the Tokyo Station Yaesu North Exit ticket gate area from December 2008 to February 2009. Electricity generation is from the vibrations caused by the deformation of piezoelectric elements under the floor as people walk on it. We will continue our research and development for further improvement of power generation efficiency and endurance.



Demonstration experiment at Tokyo Station



Mechanism of the power-generating floor system

Professor Mika Takaoka of Rikkyo University Inspects a Diesel Hybrid Railcar

On April 10, 2009, we asked Professor Mika Takaoka of Rikkyo University to inspect the Kiha E200 diesel hybrid railcar, which entered service in July 2007 on the Koumi Line. We explained its environmental superiority and safety.



Mr. Mitsuyoshi Yokota, Assistant office chief, Koumi Line Operations Office, explains the car to Prof. Takaoka.