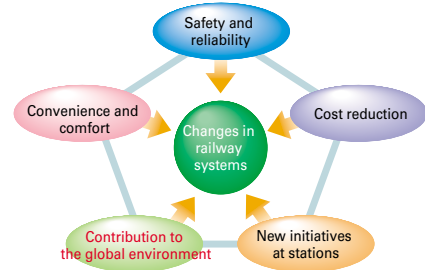


Research and development contributing to environmental conservation

JR East is committed to contributing to environmental conservation through research and development, and has set "Contribution to the Global Environment" as one of the five fundamentals of our R&D initiatives.

Specifically, our main R&D initiatives related to environmental conservation are the creation of new energy-saving systems; the promotion of resource circulation efforts by considering 3R (reduce, reuse, and recycle) in designing and manufacturing; and the conservation of the environment along railway lines by reducing noise and environmental pollution.

In this column we present the latest examples of new energy-saving systems.



Five fundamentals of research and development

Operation of the world's first diesel hybrid railcar in the Shinshu region

In July 2007, the world's first diesel hybrid railcars, the Kiha E200 Type, entered service on the Koumi Line. Diesel hybrid railcars operate efficiently by using electricity generated by a diesel engine to charge a battery which reduces emissions and by regenerative brakes, which charge the battery when braking.

Efficiency in tests was approximately 20% better than a standard diesel railcar*. The diesel hybrid railcar is quiet when idling at a station (approx. 30dB). Hazardous substances in the exhaust, such as NOx and graphite, are reduced by approximately 60%.

*Results are based on test runs on level ground. On the Koumi Line, which has steep grades, efficiency improved by approximately 10%.



The world's first diesel hybrid railcar operating on the Koumi Line

For the future, the world's first fuel-cell hybrid railcar

Hopes are rising for fuel cells as an electricity-generation technology with low environmental impact. Fuel cells feature high electricity-generation efficiency, and the only by-product generated through their reactions is water.

JR East is currently proceeding with research and development of fuel cell systems for railway applications. In 2006, we began test runs of the world's first fuel-cell hybrid railcar. In spring 2007, we started test runs on operational lines. The fuel-cell railcar is currently being tested at around 100km/h. We continue to develop control, safety, and other technologies, and are advancing to meet future challenges.

There are still many challenges to overcome with fuel cell technology, and it will take some more time before its commercially viable application, but we are committed to the development of this technology with an eye on the future.



Test runs of the world's first fuel-cell hybrid railcar started

Turning the commuter rush into energy: a power-generating floor

We are working on research and development of a "power-generating floor" which generates electricity from the vibration caused by people walking on it. Pressure of footsteps on the floor is transformed into electricity by piezoelectric elements under the floor. From October to December 2006 the power-generating floor was installed on the passageway at the Tokyo Station Marunouchi North Exit ticket gate, as a demonstration experiment. The output is small and it is still in the development phase; we are working on this development as one of our new challenges.



Demonstration experiment at Tokyo Station



Mechanism of the power-generating floor