

Railway Technical Development on Environment

Following research and development are being pursued to construct a railway system with high priority on environment.

◎ Organizing energy management

With a view to reducing energy needed to operate trains we are engaged in development of storage battery-driven electric car system and in studying actual consumption of operating energy. We are also engaged in efforts to reduce energy at stations, offices and General Rolling Stock Center.

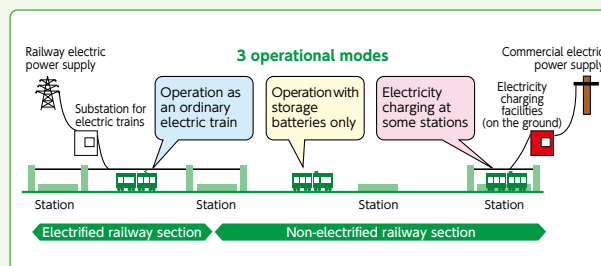
◎ Application of energy saving technology to railway operation

We are engaged in research to apply to railways such highly energy-efficient technologies as photovoltaic power generation, other renewable energy and heat pumps. We are also engaged in research of multiple-use technology.

As specific examples, we are working on the following research and development themes.

■ Development of a storage battery train system: NE Train (new energy train) Smart Denchi-kun

We are studying application of new motive energy to railways through a trial NE Train (New Energy Train). At present, to reduce burden on environment in non-electrified sections, we are making efforts at development of a "storage battery-driven electric car system," which is a hybrid of overhead lines and storage batteries.



Constitution of Storage Battery-driven Electric Car System

In this system trains receive electric power from overhead lines in electrified sections and run while storing it in the storage batteries and in non-electrified sections, the trains run with power stored in the batteries. This system results in reduction of CO₂ as well as of noise compared with the conventional diesel cars. At present we are conducting running tests and rapid charging tests with a trial car, NE Train Smart Denchi-kun, in which this system is installed.



NE Train Smart Denchi-kun

■ Study on effective use of regenerated energy

Energy efficiency can be enhanced by making effective use of regenerated energy which is produced when a train applies brakes.

In order to accurately measure the regenerated energy, we have placed electric energy meters on the train as well as on the substation to conduct simultaneous measurement. In this way we plan to grasp the flow of energy, analyze it to clearly identify the issues involved and work toward improvement.

■ Making energy flow visible at Tokyo Station

We are proceeding with the development of a system to make energy flow visible, using Tokyo Station as a model.

The conventional equipment system has been mostly focused on monitoring for the sake of security. By taking in information on energy conservation and making it visible, we are building a more efficient energy management system.



Energy flow visualization system at Tokyo Station