

## Biological diversity and environmental technical development



### Shinano River Hometown Forestation Program

In 2004, in order to protect biological diversity and to contribute to a sustainable society, JR East began the Hometown Forestation Programs. To revitalize existing forest, the programs plant various kinds of trees native to each region close together, in a state similar to what would exist naturally.

On June 26th, 2010, with the cooperation of Niigata Prefecture and Tsunan Town, we held the Shinano River Hometown Forestation Program to plant 16 different kinds and a total of 17,000 saplings in the region. Additionally, JR East is implementing tree planting programs based in each area and is committed to continuing the activity in the future.

### Development of railway trees

Along the JR East railway lines, we have railway trees planted to shield the tracks from blowing snow and wind. The first railway forest was created in 1893 for disaster prevention. As living disaster prevention facilities, railway forests are playing their roles.

JR East now owns approximately six million railway trees on a total of about 4,200 hectares along our lines at 1,208 locations. The trees absorb 17 thousand tons of CO<sub>2</sub>, equivalent to 0.7% of the CO<sub>2</sub> that JR East emits. In this way, they also contribute to preserving the environment.

In 2008, after fundamentally reviewing the role of railway trees from the viewpoints both of disaster prevention and environmental preservation, we launched a new project to plant trees to replace those that will require replacement over the coming 20 years.



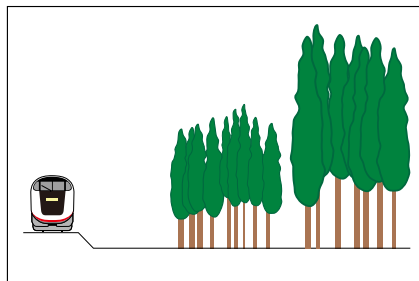
Jinguji No. 2 railway forest on the Ou Main Line  
(forest to protect against blizzards)



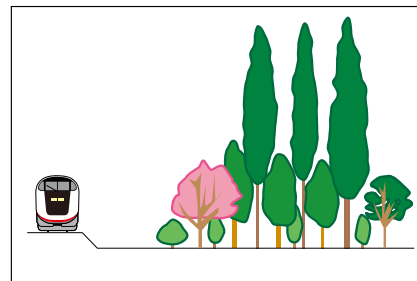
Tenoko No. 6 railway forest on the Yonesaka Line  
(forest to protect against snow slides)

### Railway trees – From single to multi-variety trees

Conventional railway trees were of a single variety, primarily cedar trees, because another function, in addition to protecting against natural disasters, was to generate profits through the production of timber. This has recently been less successful, however, in the face of declining demand for domestic timber. In future tree replacement, we will plant several varieties suitable for the local climate and develop them to be more sustainable and ecologically resilient.



Conventional railway trees  
(single variety such as cedar trees)



New railway trees  
(mixture of different varieties of trees)

### Planting new railway trees

Ceremonies for the planting of new railway trees were held in the Kakizaki No. 1 railway forest between Kakizaki and Yoneyama on the Shin-etsu Main Line on September 27, 2008, in the Okitama No.2 forest on the Ou Main Line between Okitama and Takahata on July 26, 2009, and in the Jinguji No.2 railway forest on the Ou Main Line between Jinguji and Kariwano on May 22nd, 2010. With kind advice and guidance from ecologist and Professor Emeritus Akira Miyawaki of Yokohama National University, several varieties of native trees (potential natural vegetation) were selected and planted. Many local residents and participants from organized tours participated in the ceremonies, and discovered how the trees they planted would grow to become useful as living railway disaster prevention facilities.

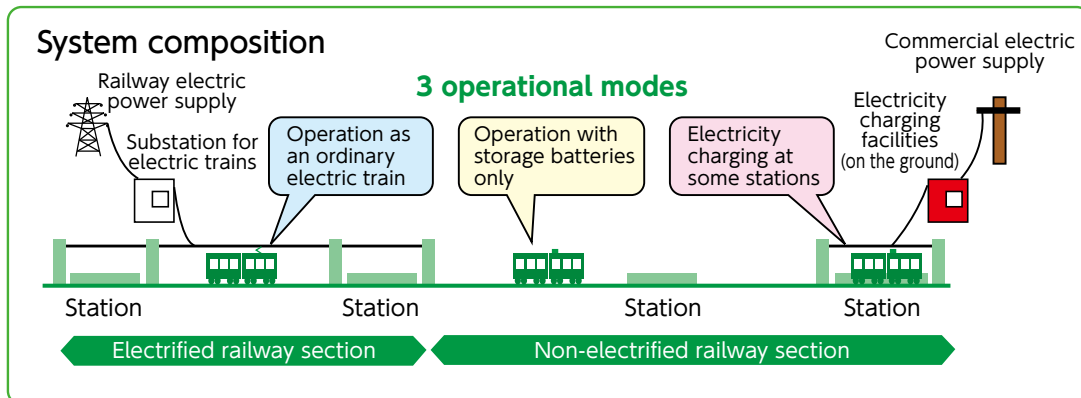
## Progress in technological development

### Research and development aimed at a reduction in environmental impact

Upholding our contributions to the global environment as one of the four pillars of our research and development, JR East is working on research and development to reduce its environmental impact by establishing new energy management. Our efforts include: the development of hybrid railcars with storage batteries, endeavors to realize environmentally harmonized stations, and a consideration for the utilization of energy saving technology and natural energy.

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

To reduce our environmental impact, JR East is considering the application of new motive energy to our railways through the testing of our test railcar, NE Train (New Energy Train). Currently, as a measure to reduce environmental impact in non-electrified railway sections, we are developing a storage battery train system, a hybrid system to utilize both electricity from overhead wires and that from storage batteries. The train operates in electrified railway sections while receiving its electrical supply from overhead wires and charging its storage batteries. In non-electrified railway sections, it operates on the electricity of the storage batteries. The system contributes to reductions in both CO<sub>2</sub> emissions and noise, when compared with traditional diesel cars. In September 2009, JR East completed construction of the NE Train, *Smart Denchi-kun*, with this system and has begun running tests for further verification.



NE Train, *Smart Denchi-kun*



Battery module



On-board monitor