

Using Renewable Energy for Our Trains

About half of the JR East trains in the Tokyo area run on electricity generated by hydroelectric power plants, which has lower environmental impact. JR East uses the hydraulic power of the Shinano River to generate electricity in its own power plant in Niigata Prefecture.



Kenji Naito

General Manager
Shinanogawa Power Station

“During the peak hours in the morning and at night we use a balancing reservoir to increase power generating efficiency.”

The Shinano River starts off in Kobushigatake in the Oku-Chichibu mountain range and flows into the Japan Sea. The abundant water of the river provides JR East with around 1/4 of its total electricity needs. As for Tokyo metropolitan area, this electricity makes up 50% of its electricity consumption used for trains, lighting, and air conditioning of stations, etc.

JR East runs three hydraulic power plants in Kawanishi Town and Ojiya City in Niigata Prefecture. The Senju Power Plant, Ojiya Power Plant, and Shin-Ojiya Power Plants started generating electricity in 1939, 1951 and 1990, respectively. These three power plants generated a total of 1.78 billion kWh during FY 2003.

In addition, JR East owns its own electric power-cables and substations. Generated power is relayed via electric power-cables through the Tanigawadake Mountains to Musashisakai A.C. (alternative current) Substation in Tokyo, located 200 km to the south of the power station, and distributed from there to be used as a power source for trains via a number of local substations.

▶ Shinanogawa Power station has a total generating capacity of 449,000 kW.



▶ Miyanaka Intake Dam takes the water needed to generate electricity

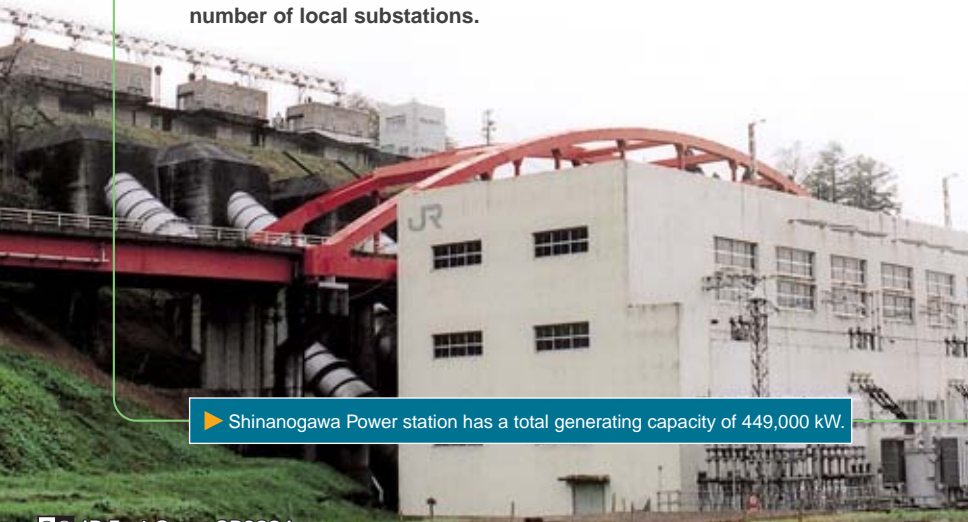
Kenji Naito, the general manager of the power station, says, “Accurate forecasts of water amounts at these hydraulic power plants are essential since some of the electricity is used to serve the railway’s passengers.” The output at Kawasaki Thermoelectric Power Plant, which generates about 1/3 of power needs, is adjusted depending on hydroelectric power plant output to maintain the proportion of clean energy at the highest possible level. To estimate the next day’s energy production, rainfall data along the Shinano River as well as its tributaries is added to the precipitation data to forecast the amount of available water. Such forecasts are also required to maintain the water level of Miyanaka Intake Dam. The amount of water taken from the dam is adjusted to maintain a stable water level.

Power generation via natural means involves constant care such as to clean up floating debris and other rubbish that the river water carries into the dam. Driftwood arriving at the dam used to be discarded is now recycled as wood chips and compost.

Now that you know where the electricity for your commuter trains comes from, you will probably feel different when you ride them next time.



▶ Hydroelectric power, a source of energy with lower environmental impact, makes reliable train services possible.



▶ The general control station controls all the machinery of a hydroelectric power plant and forecasts the generating capacity of the plant based on precipitation data.