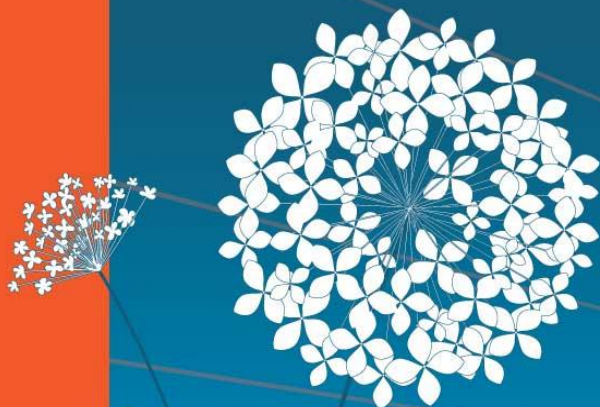




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UIC ENERGY EFFICIENCY DAYS 2014



The Voice of Members:

*Best practice in energy efficiency
from all over the world*

**Hitoshi Hayashiya,
Manager of Electric & Signal Network system department,
JR-East**

Background -After the Earthquake-

- The Great East Japan Earthquake on March 11, 2011: M9.0, S.I.7
- Electricity consumption restriction and planned blackouts around Tokyo
- We are making effort to realize more eco-friendly railway transportation.

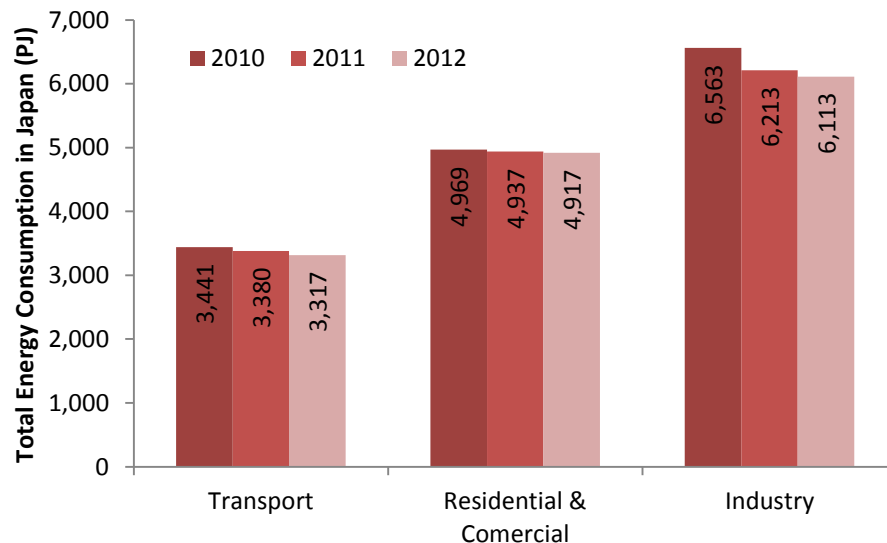


Fig.1 Total Energy Consumption in Japan

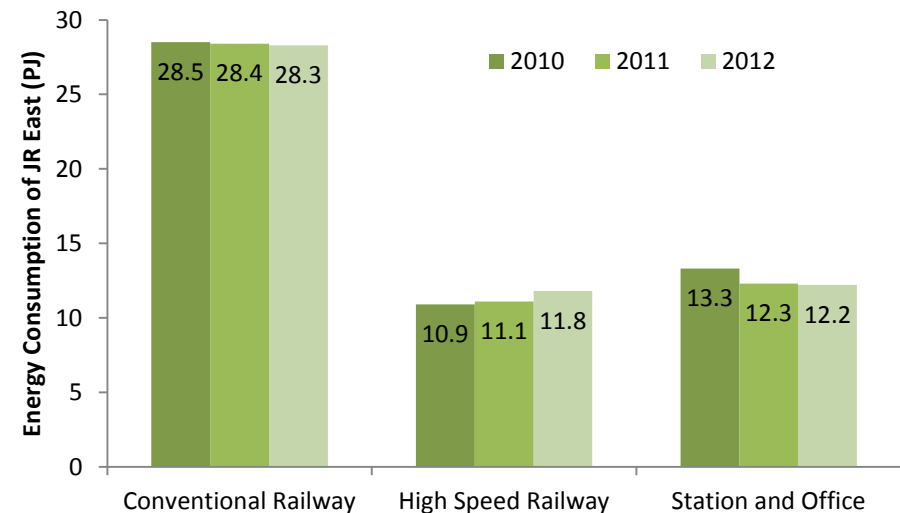


Fig.2 Energy Consumption of JR East

Eco-Friendliness of Railway Transportation

- CO₂ emission from railway was 1/9 of car, 1/6 of airplane in Japan (2007)
- Electric energy consumption of JR East group was 5.82TWh (2012)
- Japanese trend in traction power supply system (fixed installations)
 - Introduction of renewable energy
 - Utilization of regenerative power
 - Energy saving at station

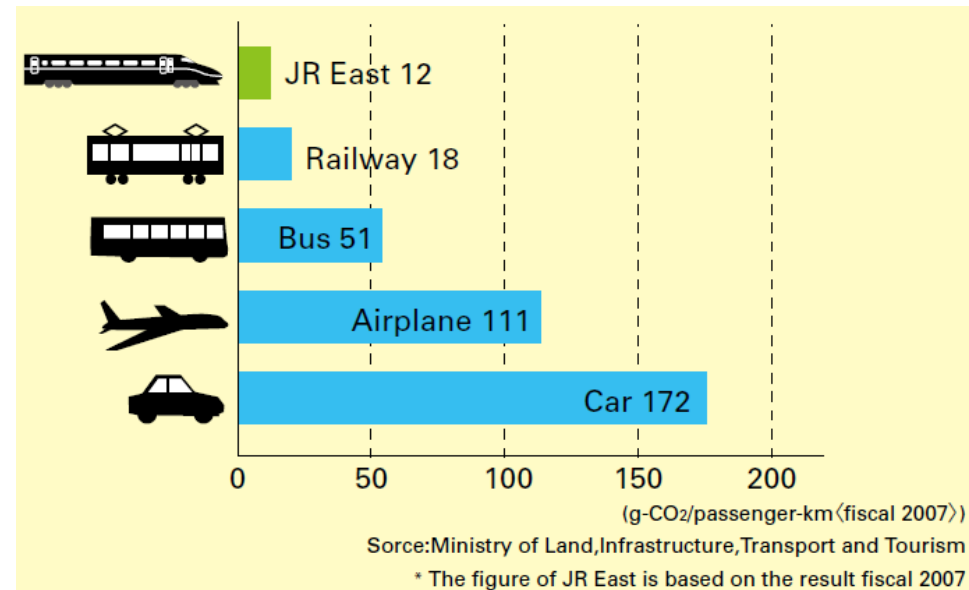
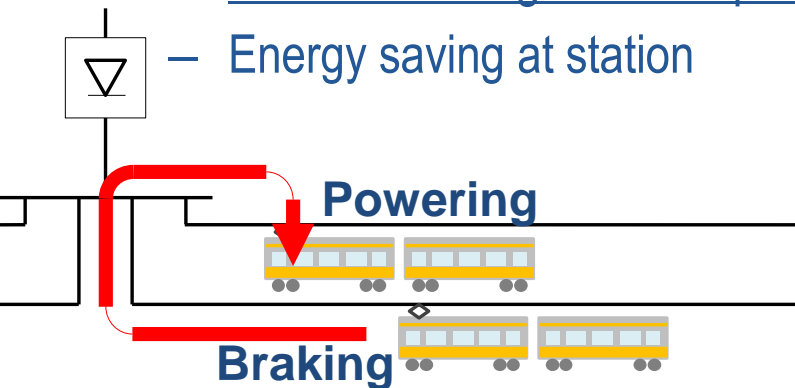


Fig.3 CO₂ emissions by mode of transportation

Regenerative Energy Utilization in d.c. Railway

- Purposes of energy storage system: voltage drop compensation, avoiding regenerative brake cancelling, emergency power source, and energy saving

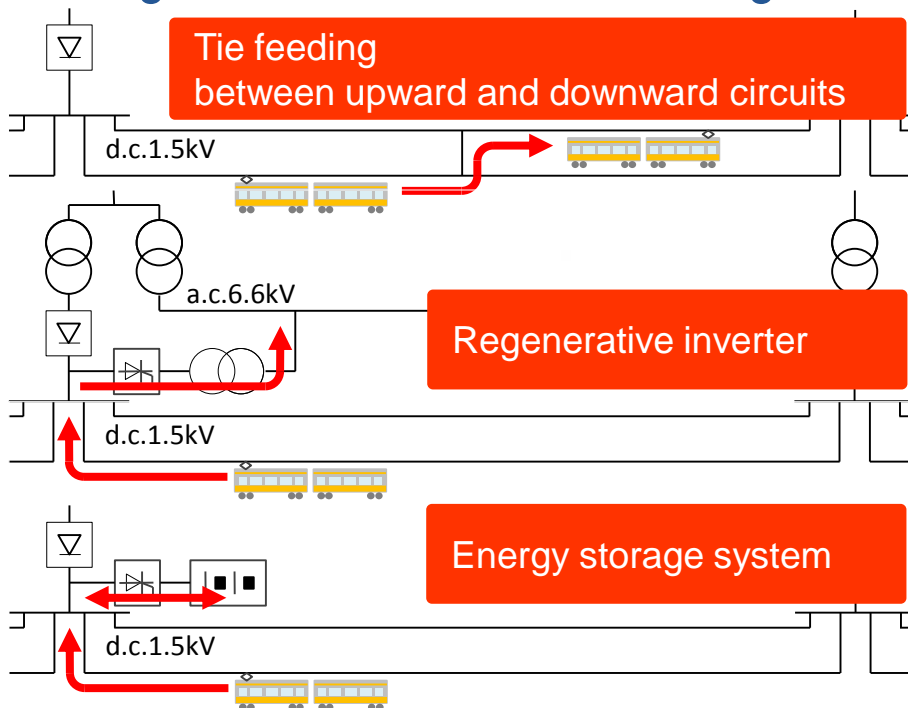


Fig.4 Solutions for regenerative energy utilization

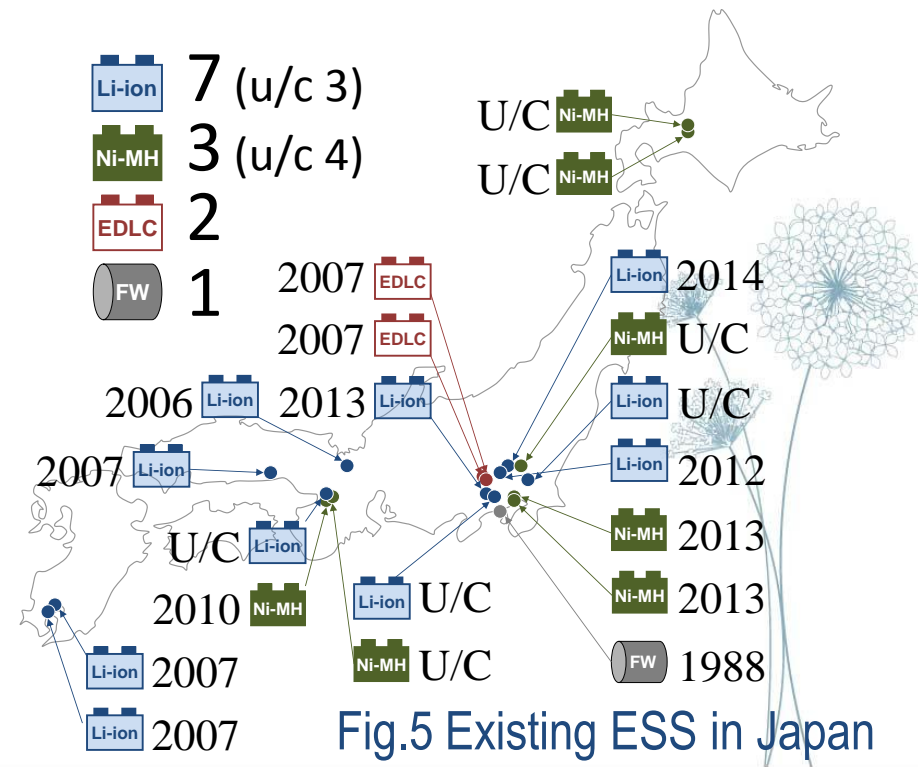


Fig.5 Existing ESS in Japan

Li-ion Battery at HAIJIMA

- Started operation on Feb. 20th, 2013 / Effect: 1MWh/day (5% of total)
- 2nd battery at OKEGAWA and 3rd battery under planning

