Action by JR-West to Reduce CO_2 Emissions



West Japan Railway

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Madrid

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Overview of JR-West

JR-WEST

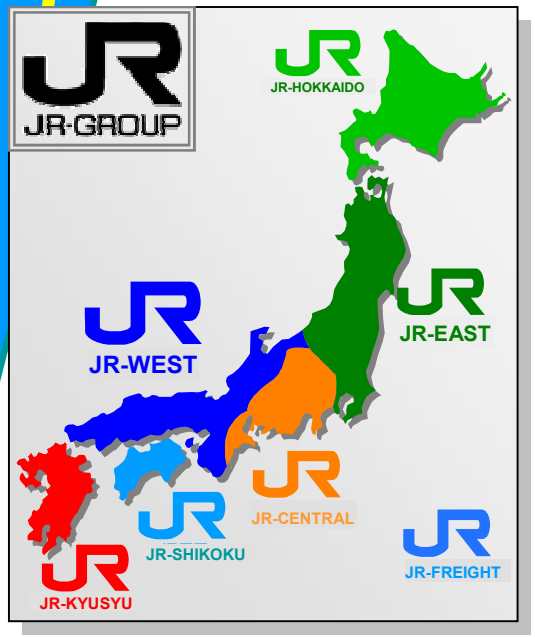
Sanyo-Shinkansen

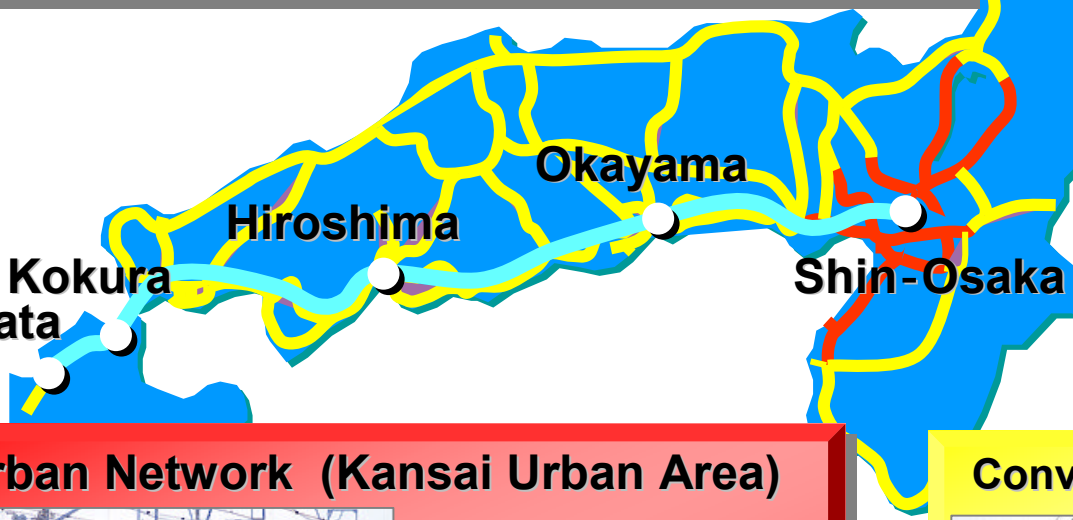
Operating km:
644km

No.of train:
290 train/day

No. of Car:
874 cars

(Data 2008.4.1)





Urban Network (Kansai Urban Area)

Operating km:
635.5 km

No.of train:
4800 trains/day

Conventional Line（Other Than Kansai Urban Area）

Operating km:
3744.5km

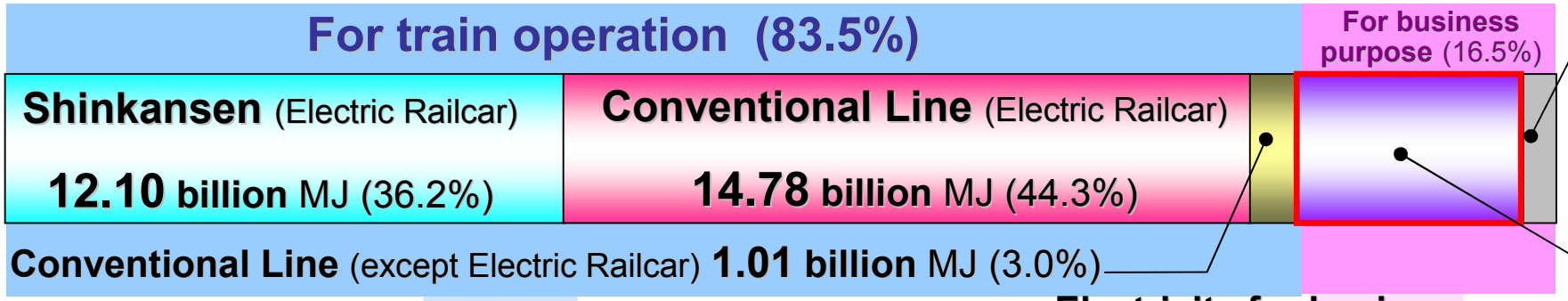
Actual Condition of JR-West Energy Consumption Volume

JR-WEST

FY 2008 Energy Consumption Volume

Group Total 33.39 billion MJ

Fuels for Industrial Use
(Automobile for business use, kerosene, etc.)
660 million MJ (2.0%)



Electricity for business purpose
(Lighting at station and company premise, air-conditioning, etc.)
4.84 billion MJ (14.5%)

Energy for train operation saving measures

1. Introduction of energy-saving rolling stock
2. Replaced by high-efficiency transformer
3. Tie feeding between up and down line
4. Optimized regenerative brake
5. Hybrid power feeding
6. Hybrid diesel railcar
7. Energy-saving operation
8. Diesel railcar idling stop

Energy for business purpose saving measures

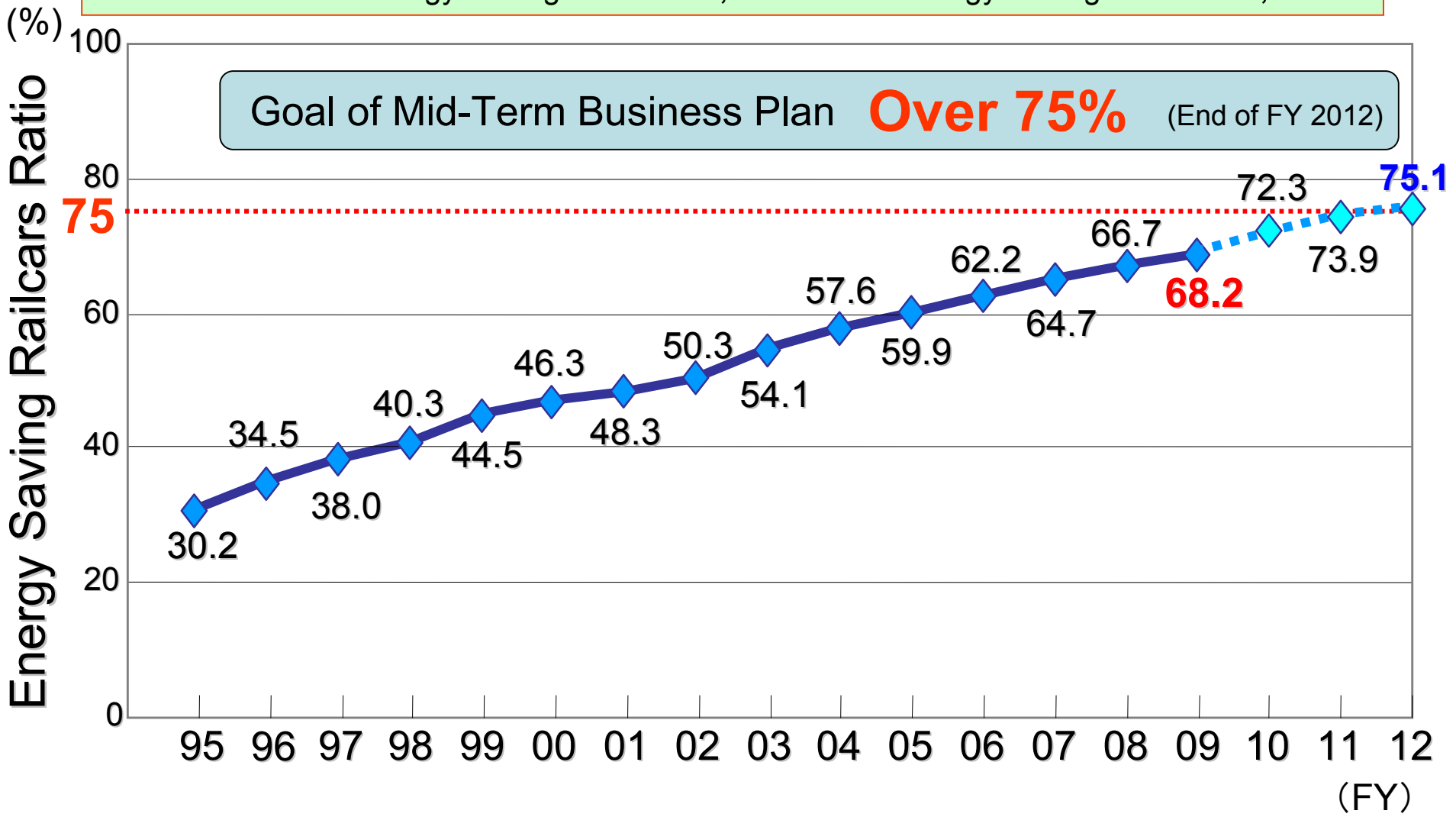
1. High-efficiency lighting in station and office building
2. Use of energy-saving elevator and escalator

Transition of Introduction Ratio for Energy Saving Railcars

JR-WEST

End of FY **2009** Energy-Saving Railcars: 4,251 Non Energy-Saving Railcars: 1,986

End of FY **2012** Energy-Saving Railcars: 4,731 Non Energy-Saving Railcars: 1,570



Transition of Energy Saving Railcar Ratio

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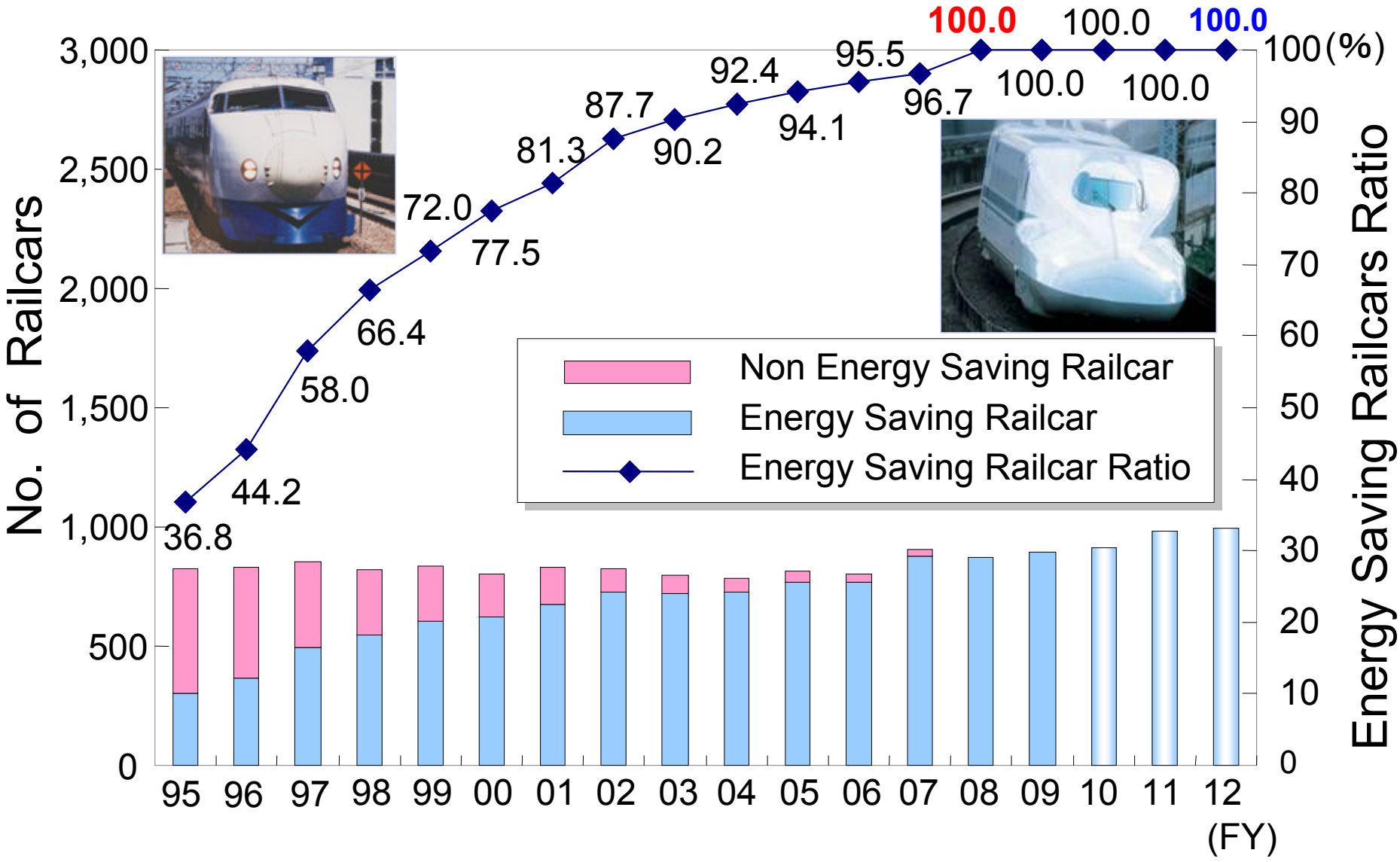
Transition of Energy Saving Railcar Ratio (Shinkansen TEC)



Transition of Energy Saving Railcar Ratio

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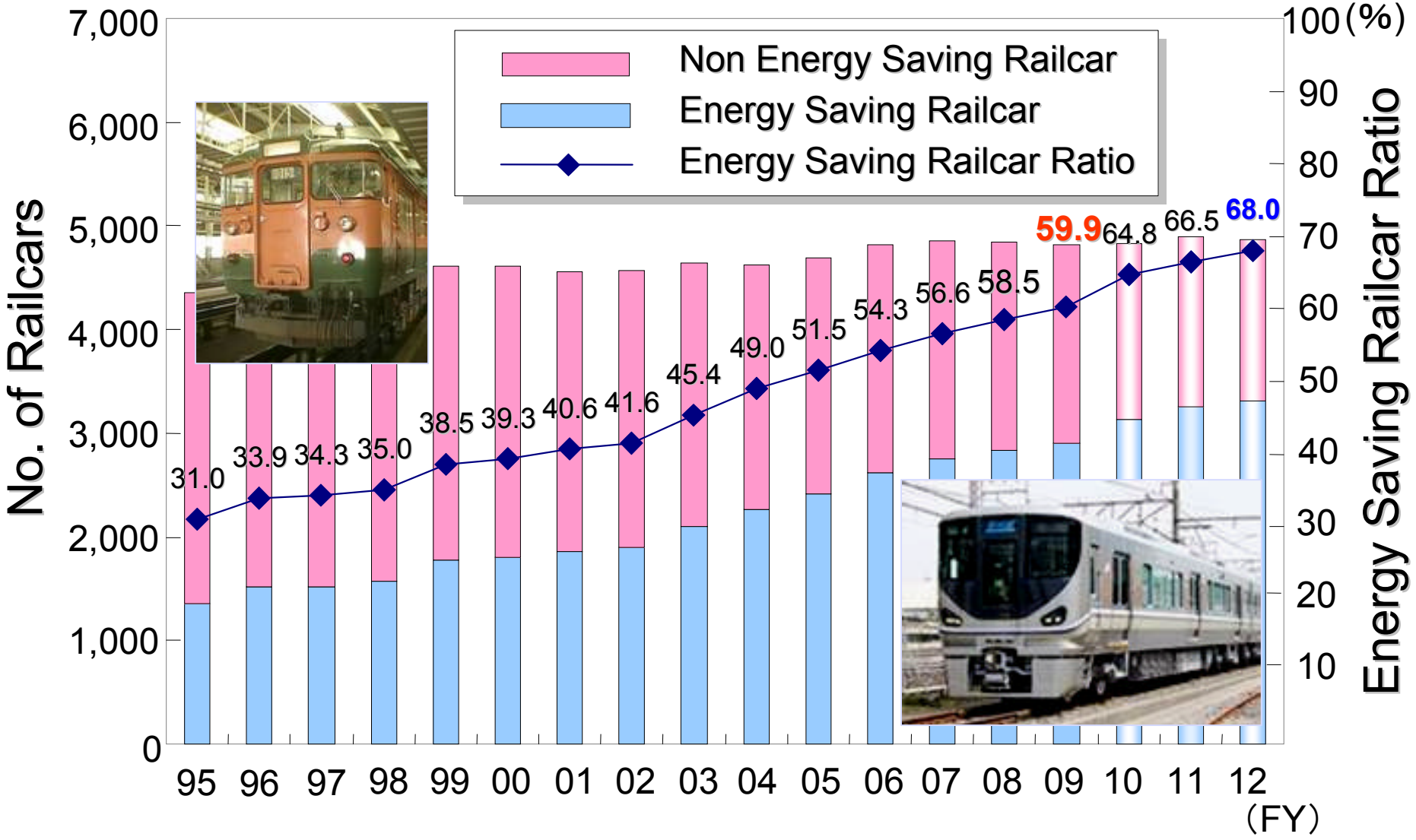
Transition of Energy Saving Railcar Ratio (Conventional Line EC,EL)



Facility of Tie Feeding System between Up and Down Line

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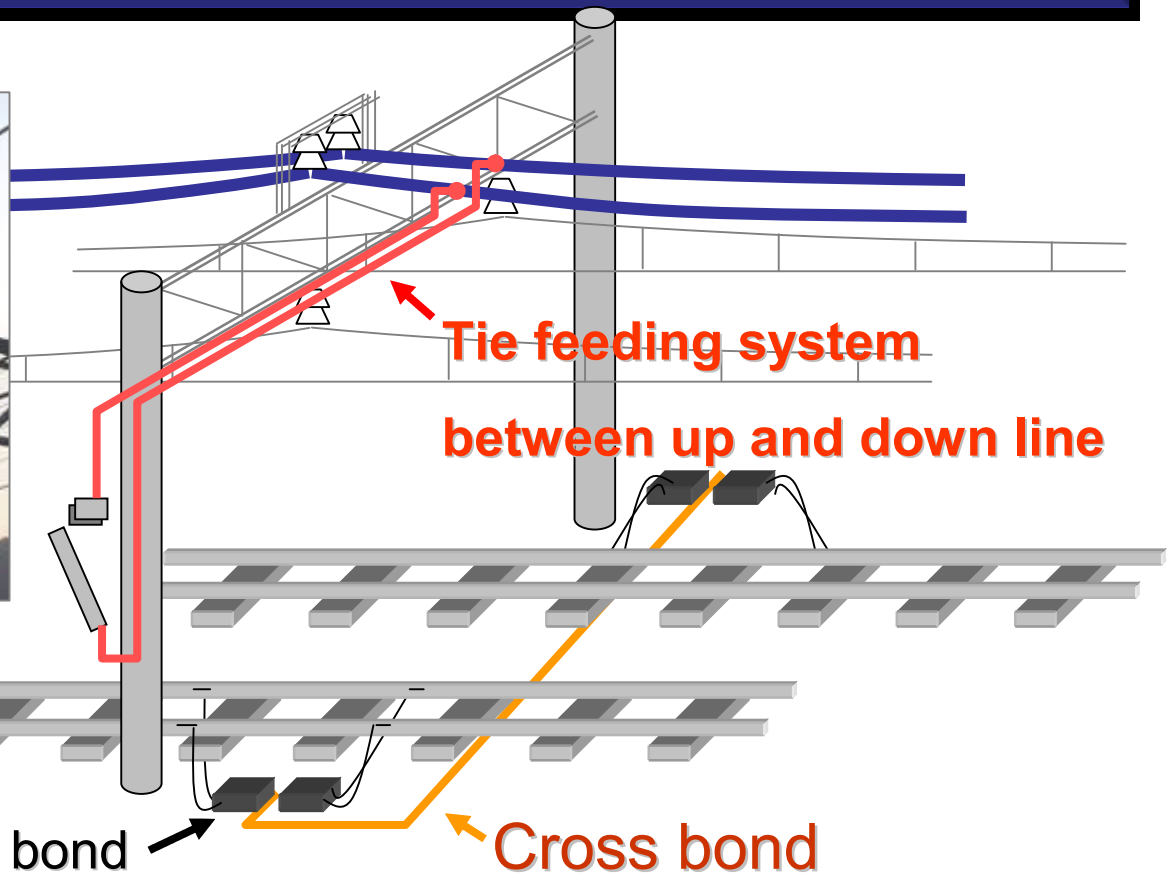
Tie feeding system between up and down line
:System connecting the feeder of up and down line in-between substations

Cross bond :System connecting the rail of up and down line through impedance



Comparison of the flow of regenerative electricity

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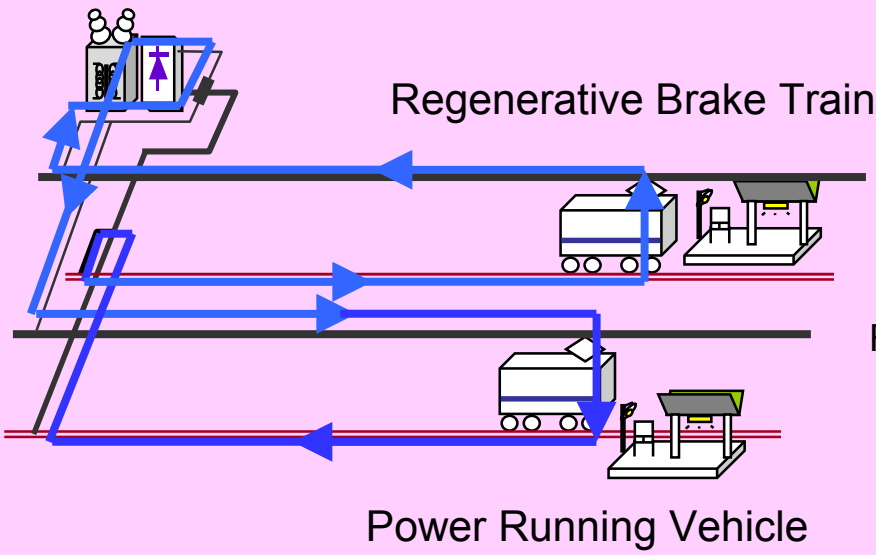
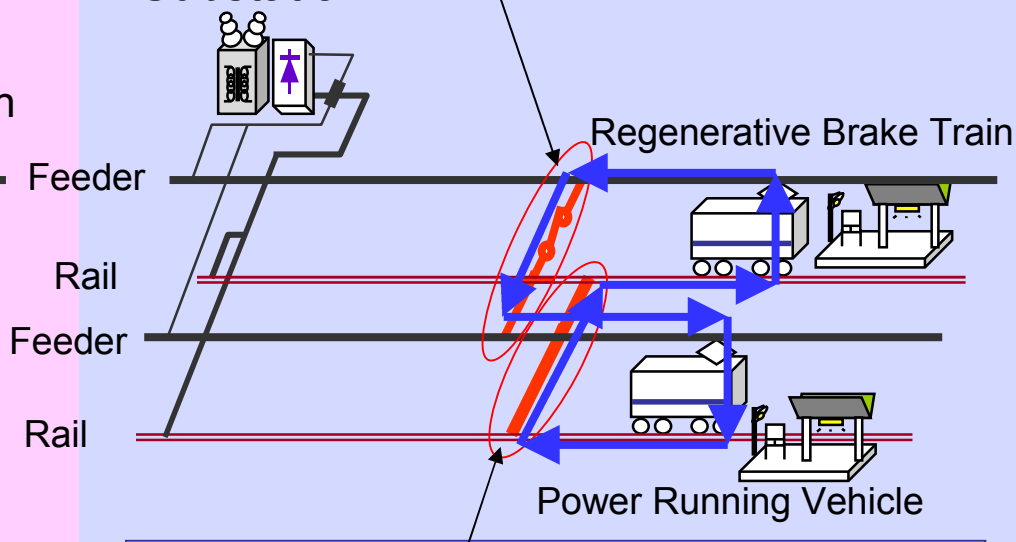
Current System



Tie feeding system between up and down line + Cross bond

Tie feeding system between up and down line
(Connects feeder in up and down line)



Cross bond
(Connects the rail in up and down line)

: The flow of electricity from Regenerative Train

Actual Condition of Electricity Consumption in Station buildings

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Present Situation

Power used at stations overall & usage by category (breakdown) unknown

→ No measurements at other companies

What effect energy-saving equipment and measures would have on stations overall is unknown

Clarify power used at stations (overall & breakdown)

Purpose

Determine priority of energy-saving measures (Station energy-saving measures for lighting, air-conditioning or other areas?)

Summary of Measurement

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Selection of Station…

- ○Stations where we cannot figure out power usage
- ○Elevated stations with 1 or 2 platforms

(Platforms for local trains with 7 railcars)

Nada Station

Station Building
Total Floor Space: 500 m^2

Volumes of entrainment and detrainment: 45,000/day

Number of Trains: 305/day

Station Building Layout

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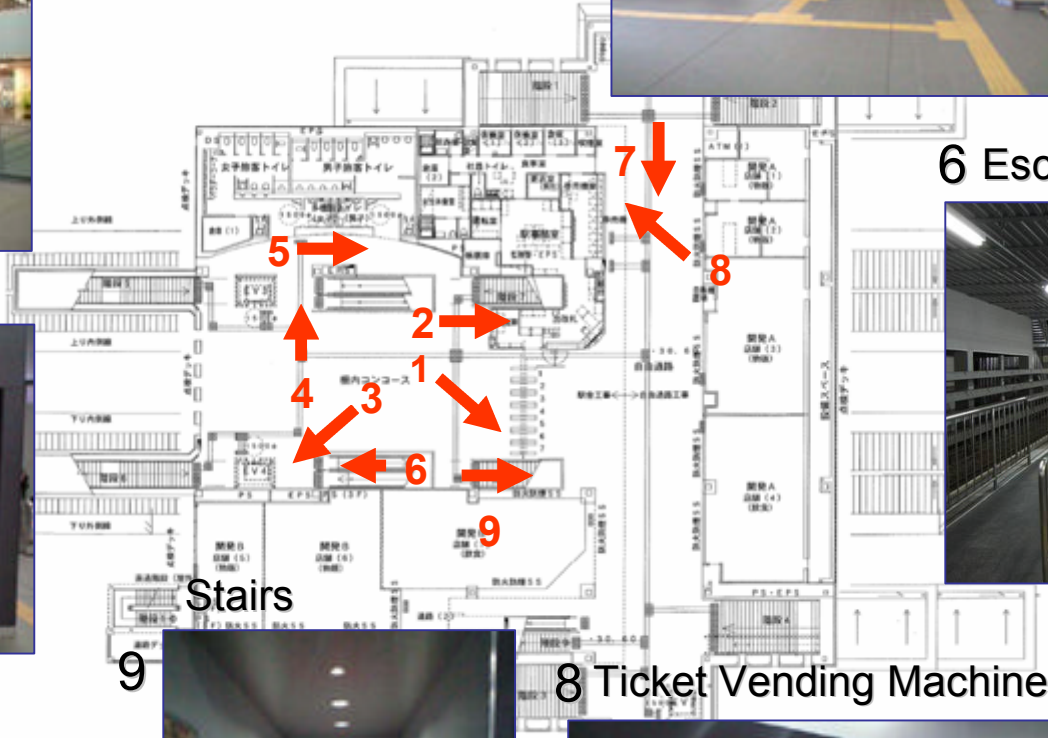
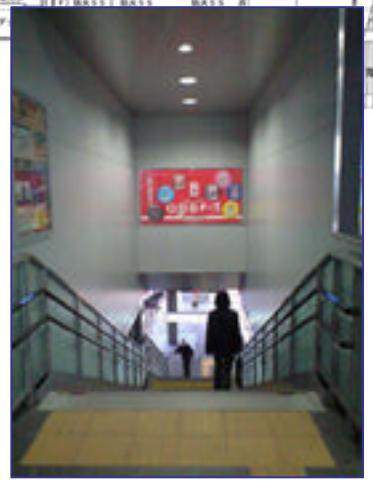
1 Automatic ticket gate

2 Fare adjustment

3 Elevator(1)



9 Stairs

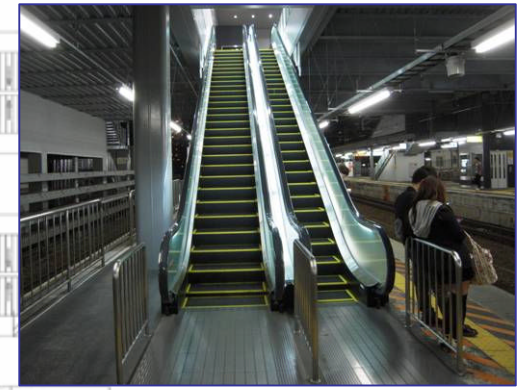


4 Elevator(2)

8 Ticket Vending Machine

5

6 Escalator



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Survey of power use at Nada station

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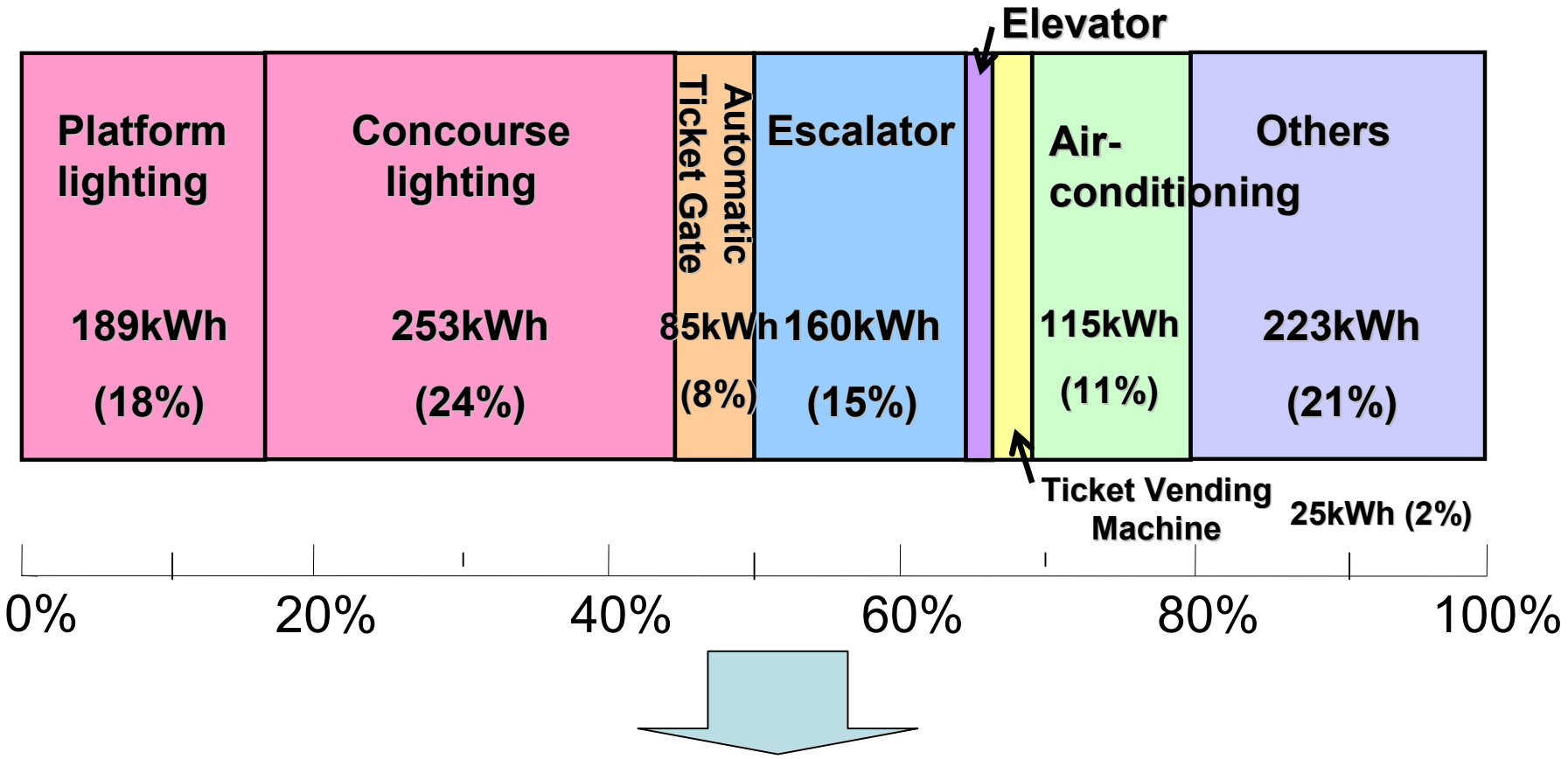
Estimated annual energy use at mid-size stations : Approx. **1053** kWh/day

385,000 kWh/year



Utilize for energy-saving measures at station

Transition of basic unit for energy (compared with 1995)

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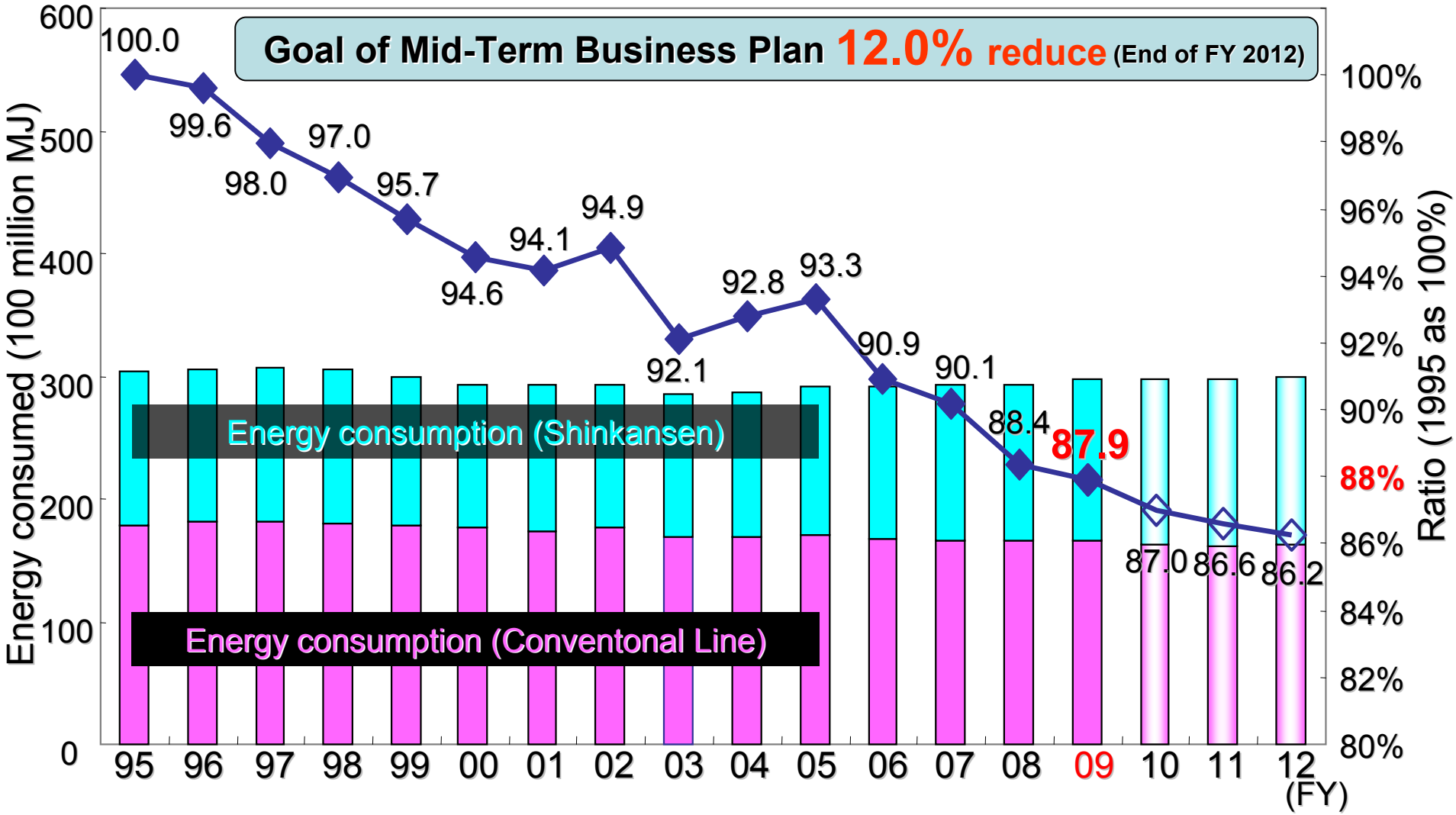
$$\text{Basic Unit} = \frac{\text{Energy Consumption (Electricity, Kerosene)}}{\text{Car Kilometer}}$$



Eco renewal of Osaka station

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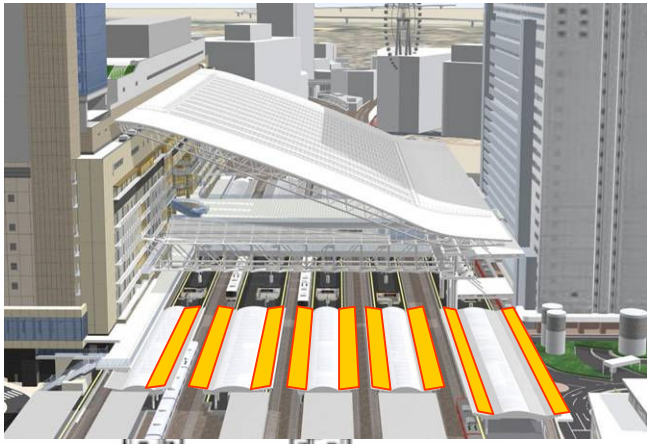

Thank you for your attention !

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