Strategy for Energy and the Environment in JR East

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Key Presentation Take-Aways

(1) Summary, process of the company
(2) JR East Group Management Vision V
(3) Station activities in the past
(4) Energy-saving stations “ecoste”
(5) Saving energy and recycling wastes

(1) Summary, process of the company

Summary, process of the company

<History>

- In April 1987, East Japan Railway Company (JR East) was established through division and privatization of the public Japanese National Railways.
- Initial aim of privatization was to maintain stable railway management.

Background of JNR Reform

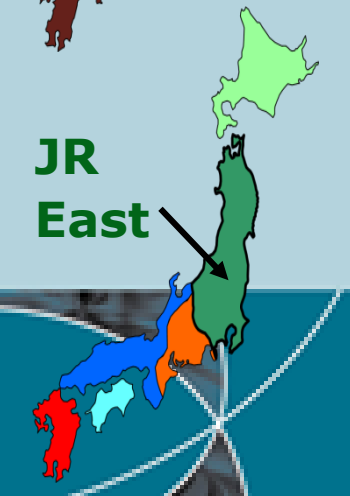
- JAPANESE NATIONAL RAILWAYS
  - ◆ Factors of JNR bankruptcy

(1) Limitations inherent in public corporations

(2) Inflexibility of nationwide uniform organization

→ Unable to respond to changes in the operating environment → Bankruptcy

In April 1987



JNR, a public corporate entity operated under a nationwide uniform management system, was divided into seven private entities: six regional passenger rail companies and one rail freight company.

Major figures of our company

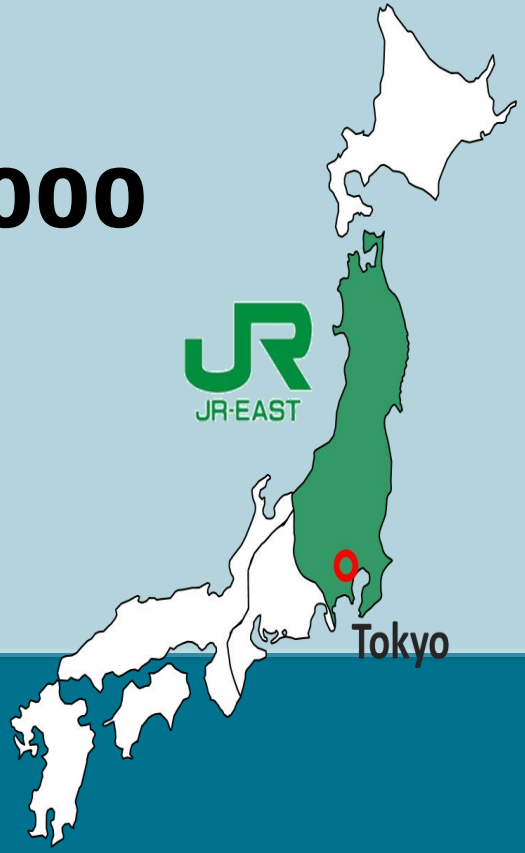
Passenger line network :**7,474.2km**

Total number of passengers per day :**17.10million**

Number of stations :**1,700**

Average number of trains per day :**13,000**

Number of employees :**60,000**



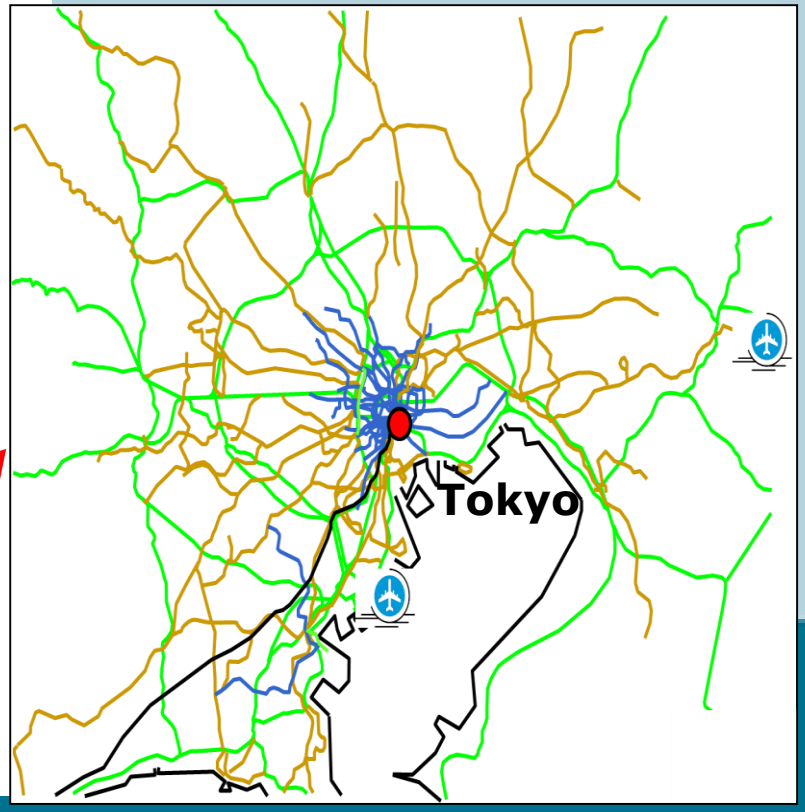
Outline of JR-EAST

SERVICE AREA (COMPETITIVE SITUATION)

V
S

10 large railway companies

(2,500 km railway network within 50 km radius)



JR East
Other
Subway

(except Shinkansen)

Characteristics of JR-East

VERTICAL MANAGEMENT STRUCTURE

We own our all rail infrastructure, operating and maintaining it as a fully integrated railway model.

Operation and Maintenance



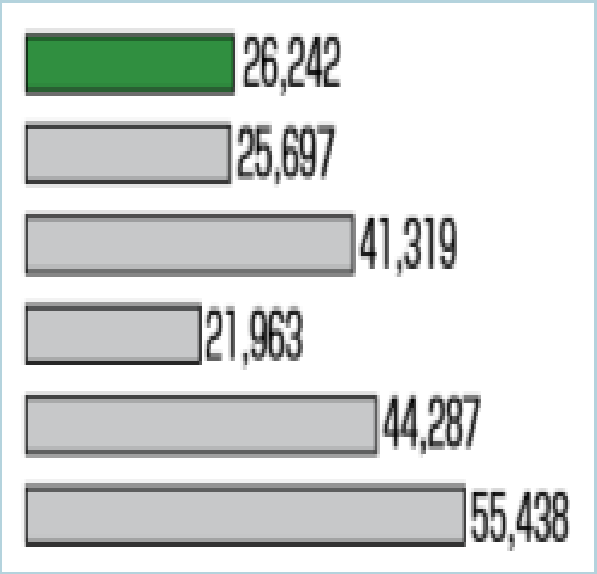

JR-EAST

Infrastructure




Financial comparison

【Operating Revenues】



(US $ million)

JR East

IAG

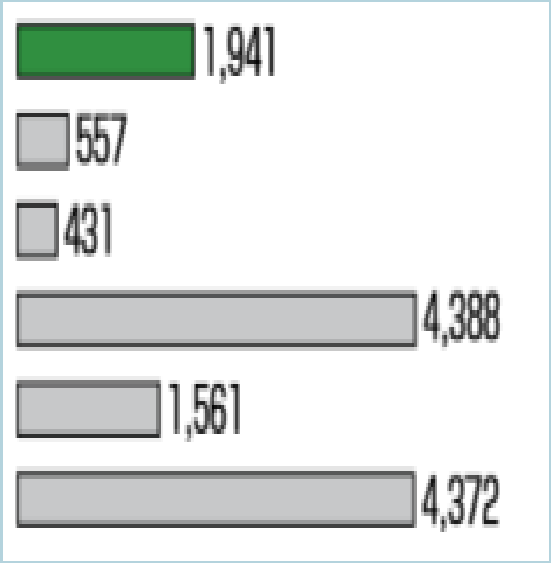
Lufthansa

Union Pacific

FedEx

UPS

【Net Income】



(US $ million)

(2) JR East Group Management Vision V

JR East Group Management Vision V

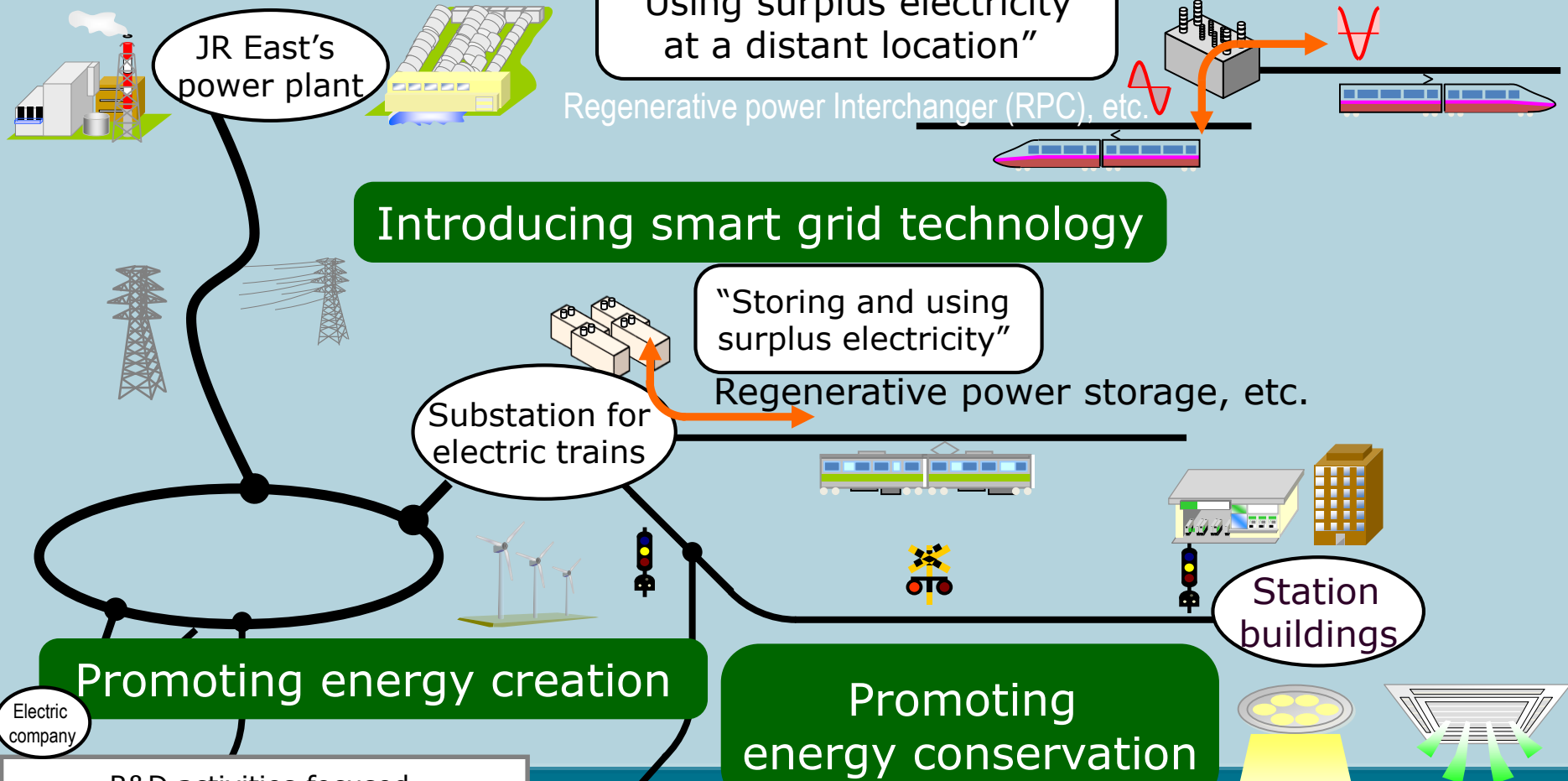
Energy and environmental strategies

<Promoting energy creation>

<Promoting energy conservation>

<Introducing smart grid technology to railway power systems>

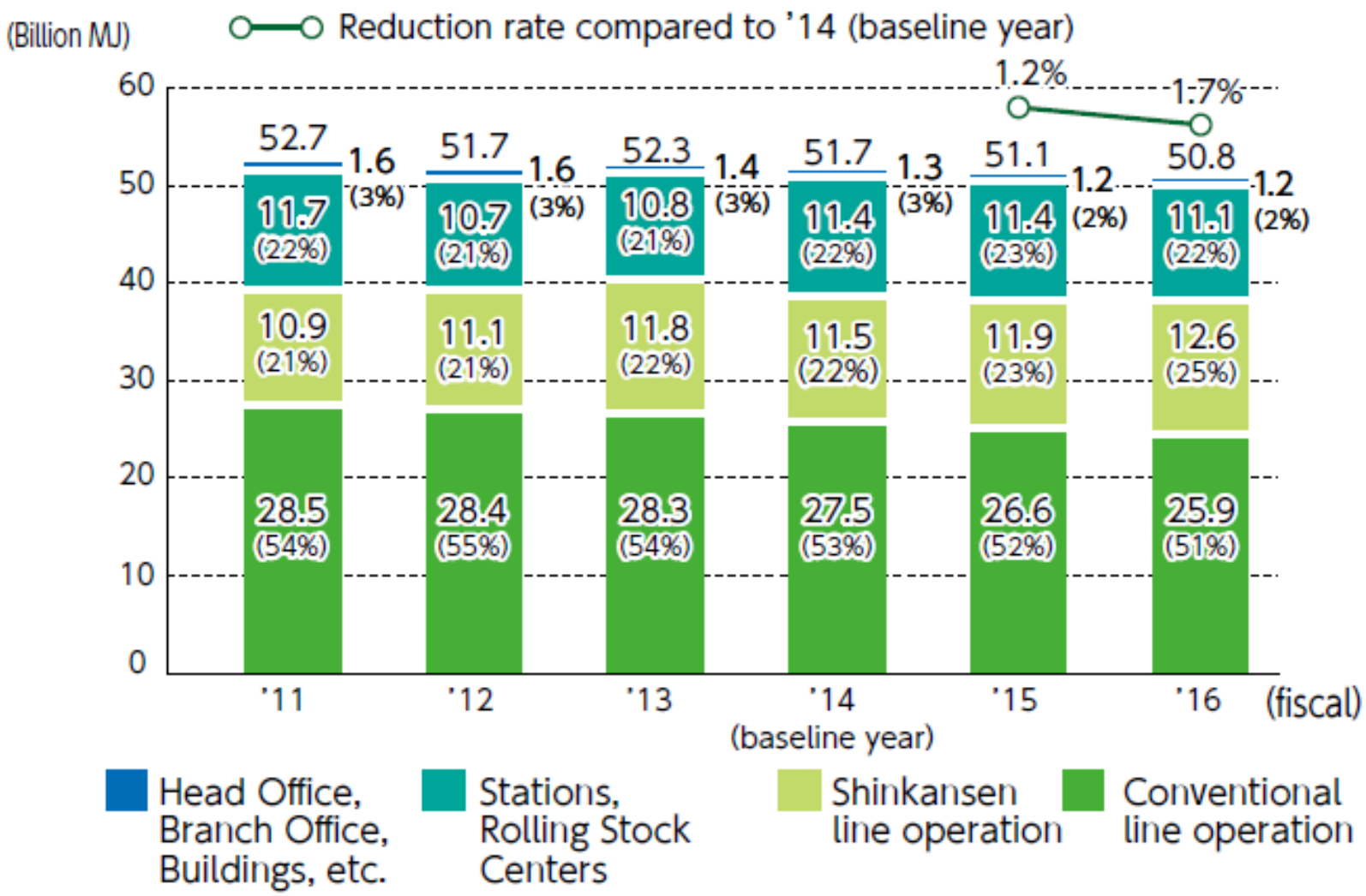
Energy and environmental strategies



Environmental Targets

Item	Targets to be met by FY2021
Energy consumption from railway business activities	**8% reduction** (MJ: relative to FY2011 level) (52.7 billion MJ ⇒ 48.5 billion MJ)
CO_2 emissions per unit of electricity generated by JR East's own power plants	**30% improvement** (kg-CO_2/kWh: relative to FY1991 level) (0.457 kg-CO_2/kWh⇒0.320 kg-CO_2/kWh)

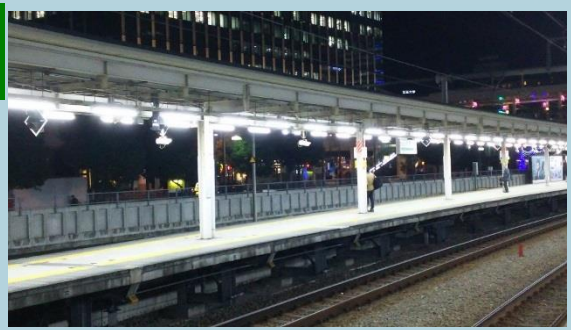
Composition of energy consumption by JR East



(3) Station activities in the past

Past activities at stations (Promoting energy conservation)

Introducing LED lighting for platform



Introducing flat screen LED information displays

Traditional product

The fluorescent lighting

Flat screen LED information displays

LED lighting

Actions for energy saving

Past activities at stations (Promoting energy conservation)

Platform (Left : Nikko Station / Right : Osaki Station)

Items	FY2020 target	FY2015 result	FY2016-FY2020
Introduction of LED lighting (FY2014 to FY2020)	36,000 LED lightings (out of 244,000) 83 mil MJ reduction	Total 9,000 LED lightings 18.5 mil MJ reduction	Abt. 5,400 LED lightings (per year) (planned)

Past activities at stations (Promoting energy creation)

Solar power system over the Tokaido line at Tokyo station

Year and month installed
February 2011
Panel area
Approx. 3,846 m^2
Power output
453kW

Other solar power systems installed at stations:
・Tokyo station Shinkansen line platform (March 1993)
・Takasaki station Shinkansen line platform (March 2001, February 2004)

(4) Energy-saving stations “ecoste”

What dose “ecoste” stand for ?

Environment Earth

Conscious

Station of

East Japan Railway Company

energy-saving stations “ecoste”

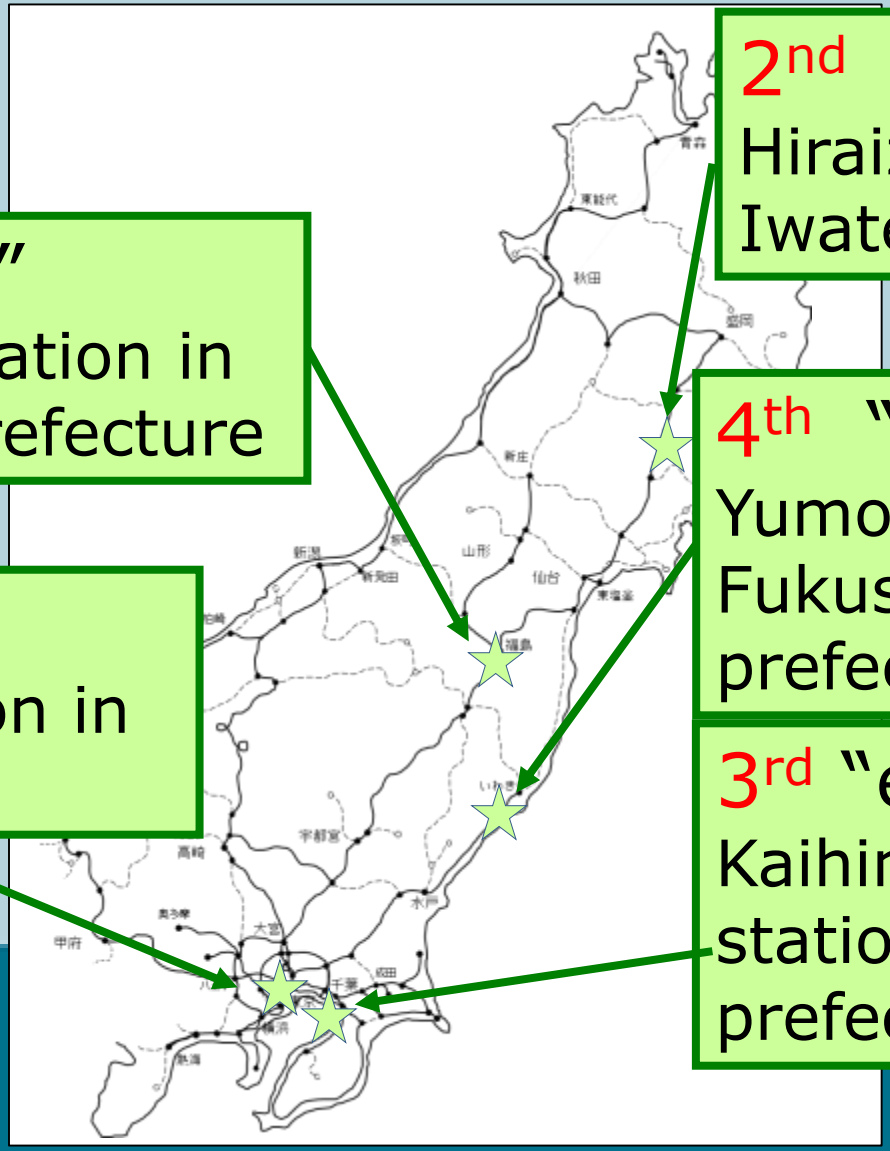
- “Ecoste” model stations introduce various technologies for environmental preservation, including energy conservation and use of renewable energies, aiming to appeal to passengers.

- We will create ”ecoste” in different areas making use of regional characteristics.

“ecoste” ~Four pillars~

	Four pillars
1	Energy conservation :Promoting more advanced energy conservation
2	Energy creation :Actively implementing renewable energy
3	ECO-Awareness :Preparing facilities that make users eco-aware
4	Environmental Harmonization :Creating vitality through an environment that is in harmony with people

In-service “ecoste” stations



2nd “ecoste”
Hiraizumi station in Iwate prefecture

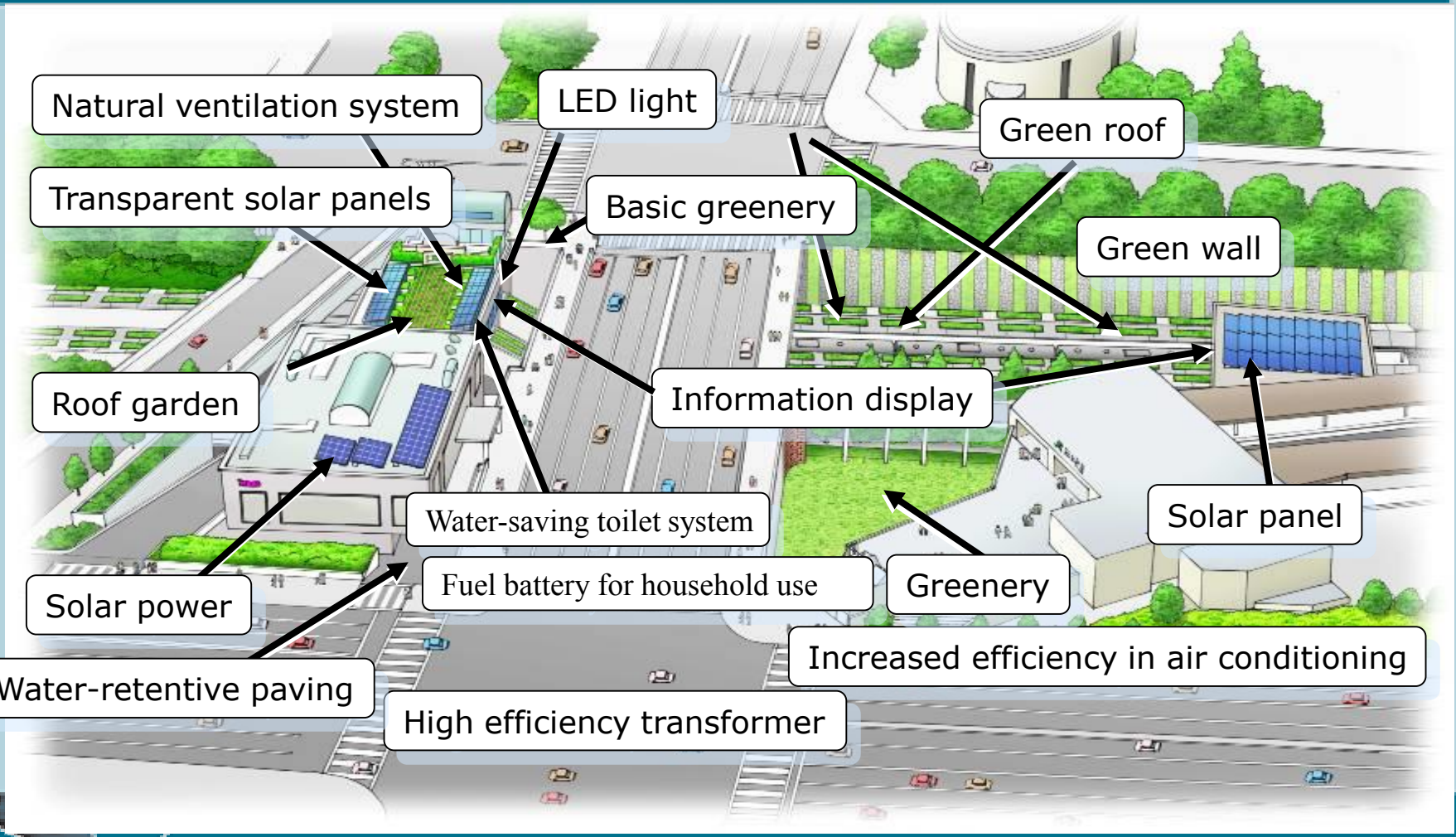
5th “ecoste”
Fukushima station in Fukushima prefecture

4th “ecoste”
Yumoto station in Fukushima prefecture

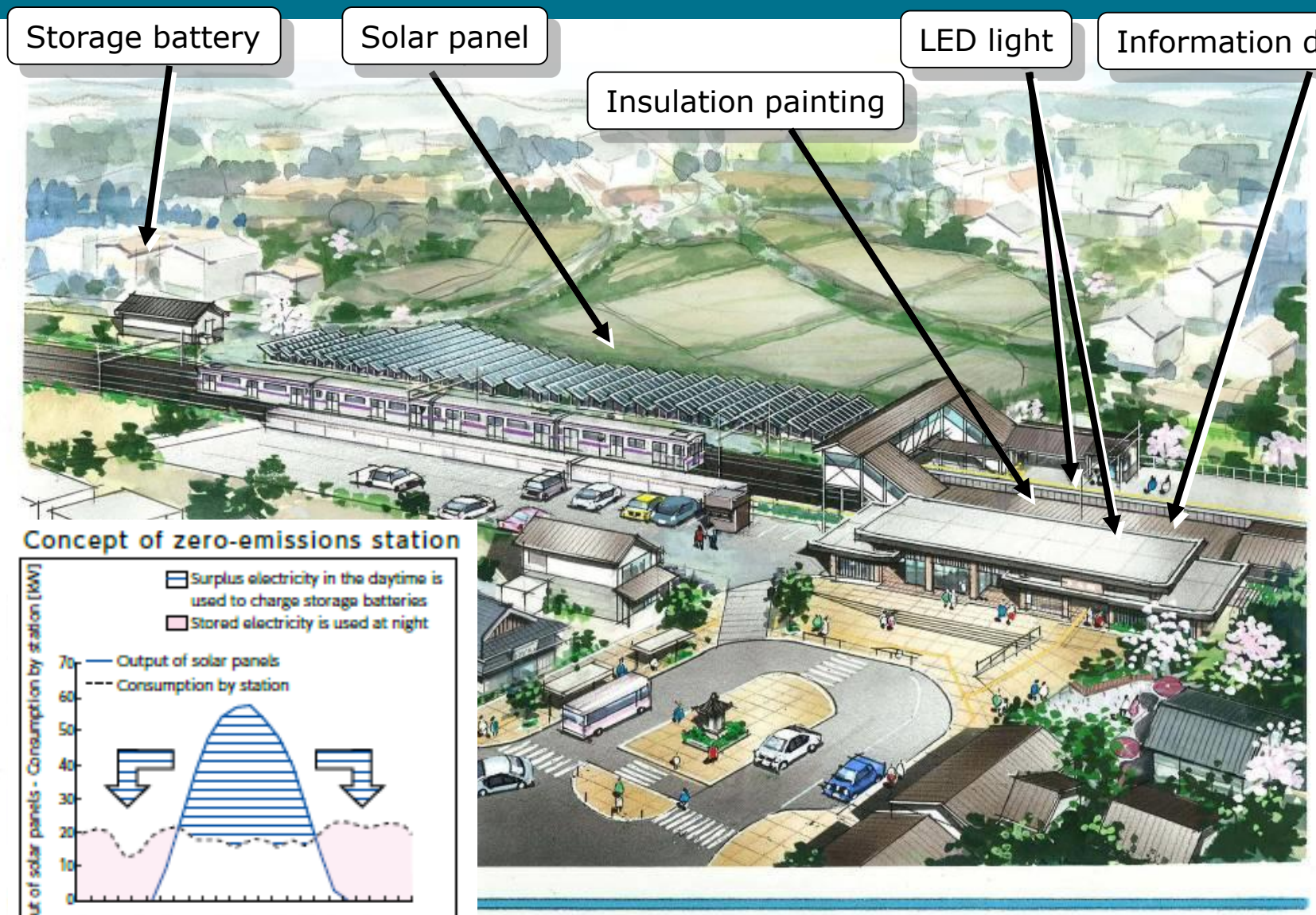
1st “ecoste”
Yotsuya station in Tokyo

3rd “ecoste”
Kaihin-Makuhari station in Chiba prefecture

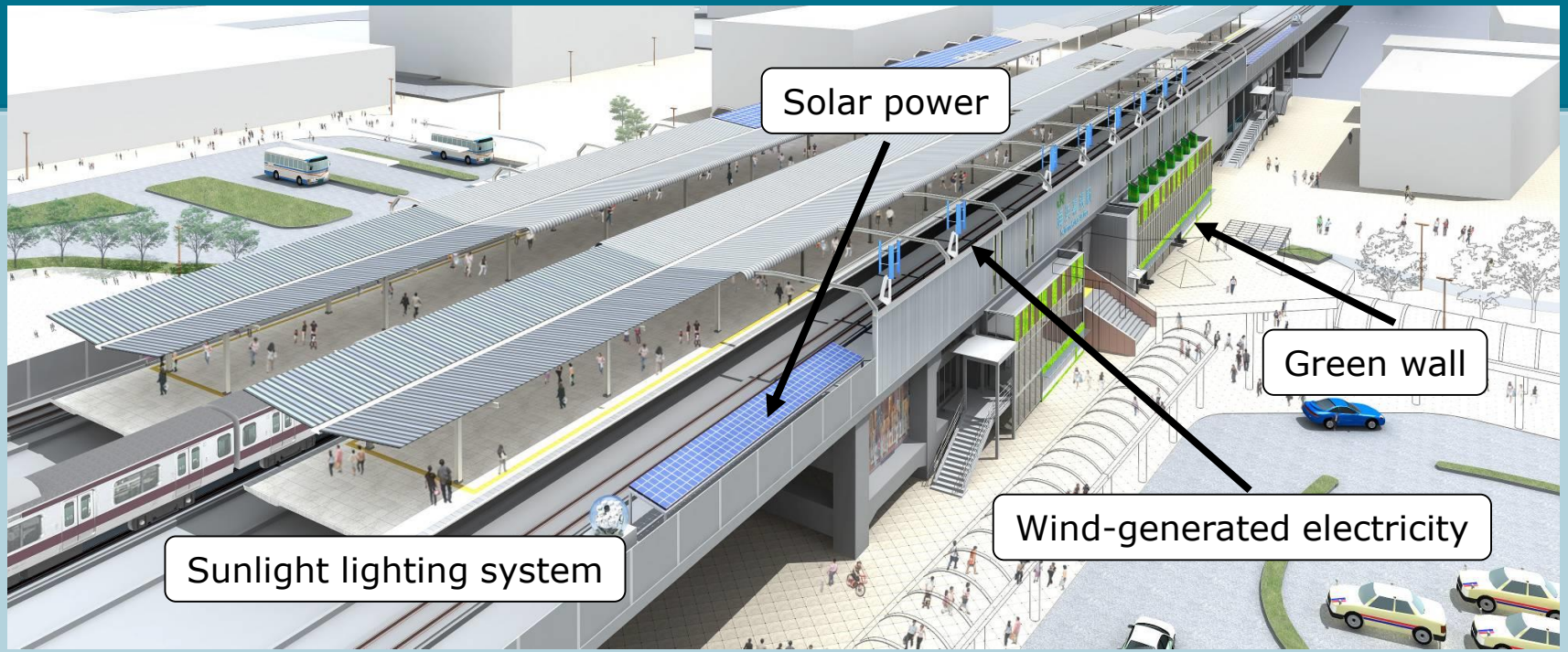
1st ecoste model station - Yotsuya Station on JR Chuo Line

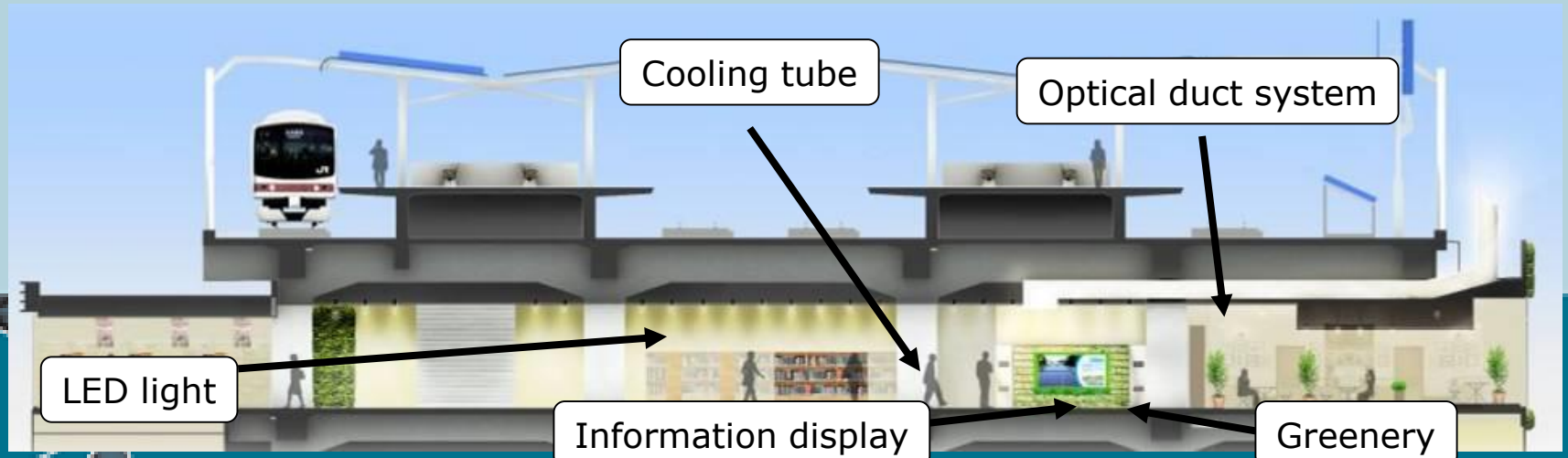


2nd ecoste model station (Hiraizumi)



3rd ecoste model station (Kaihinmakuhari)

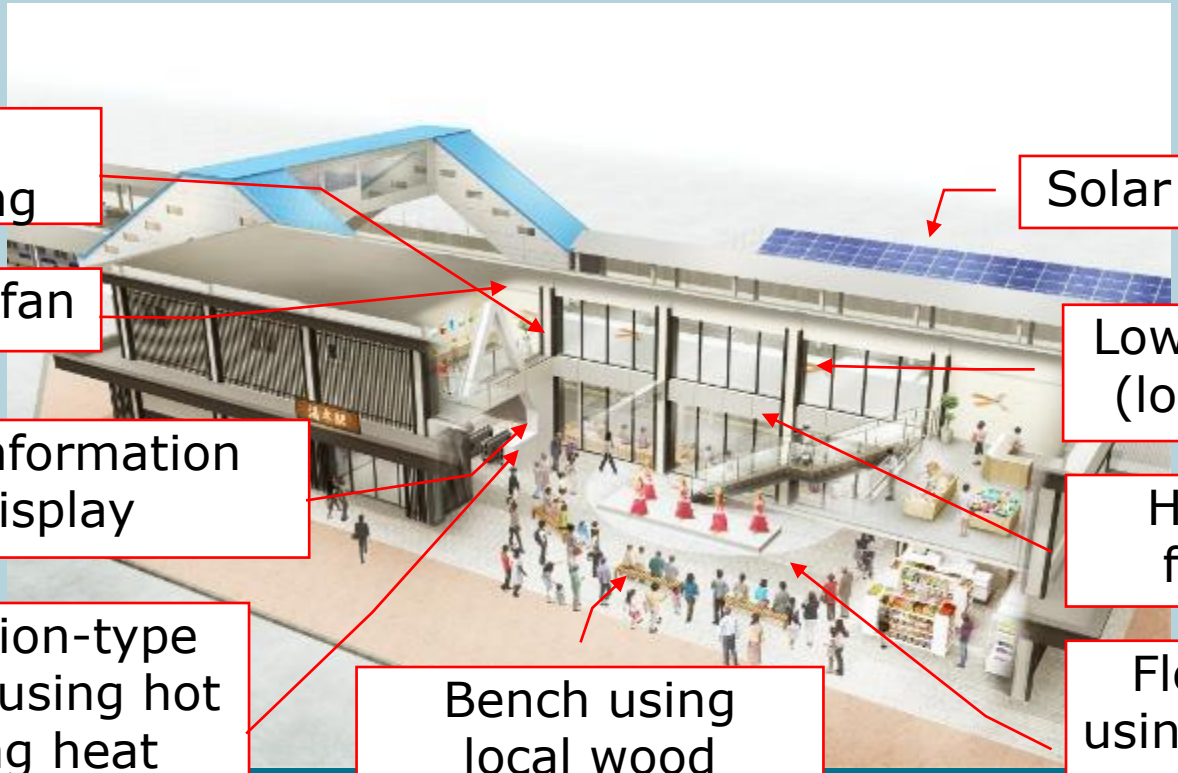




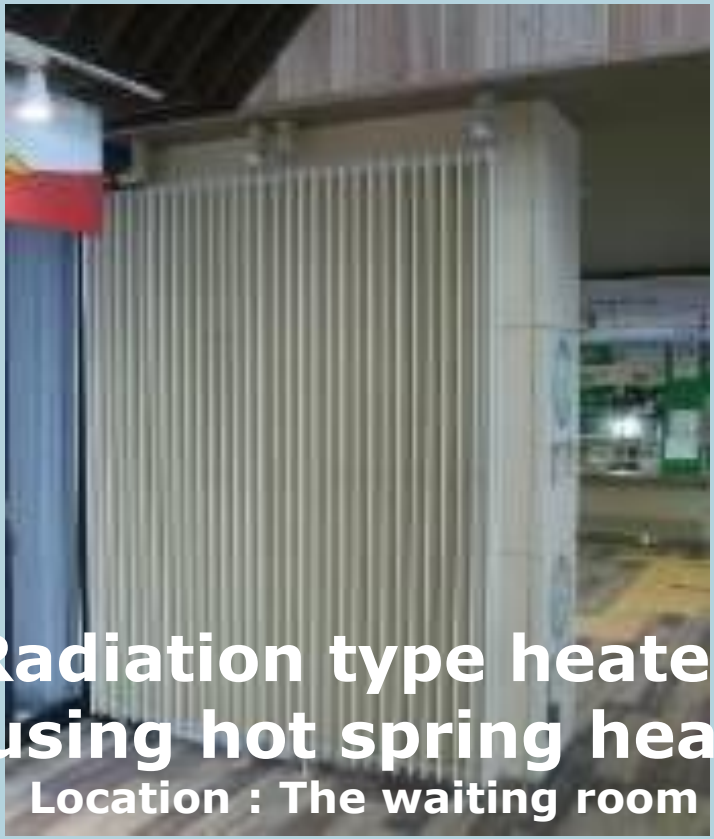
4th ecoste model station (Yumoto)

Concept : The utilization of community resources

(hot-spring heat, local wood, solar power)



4th ecoste model station(Yumoto)



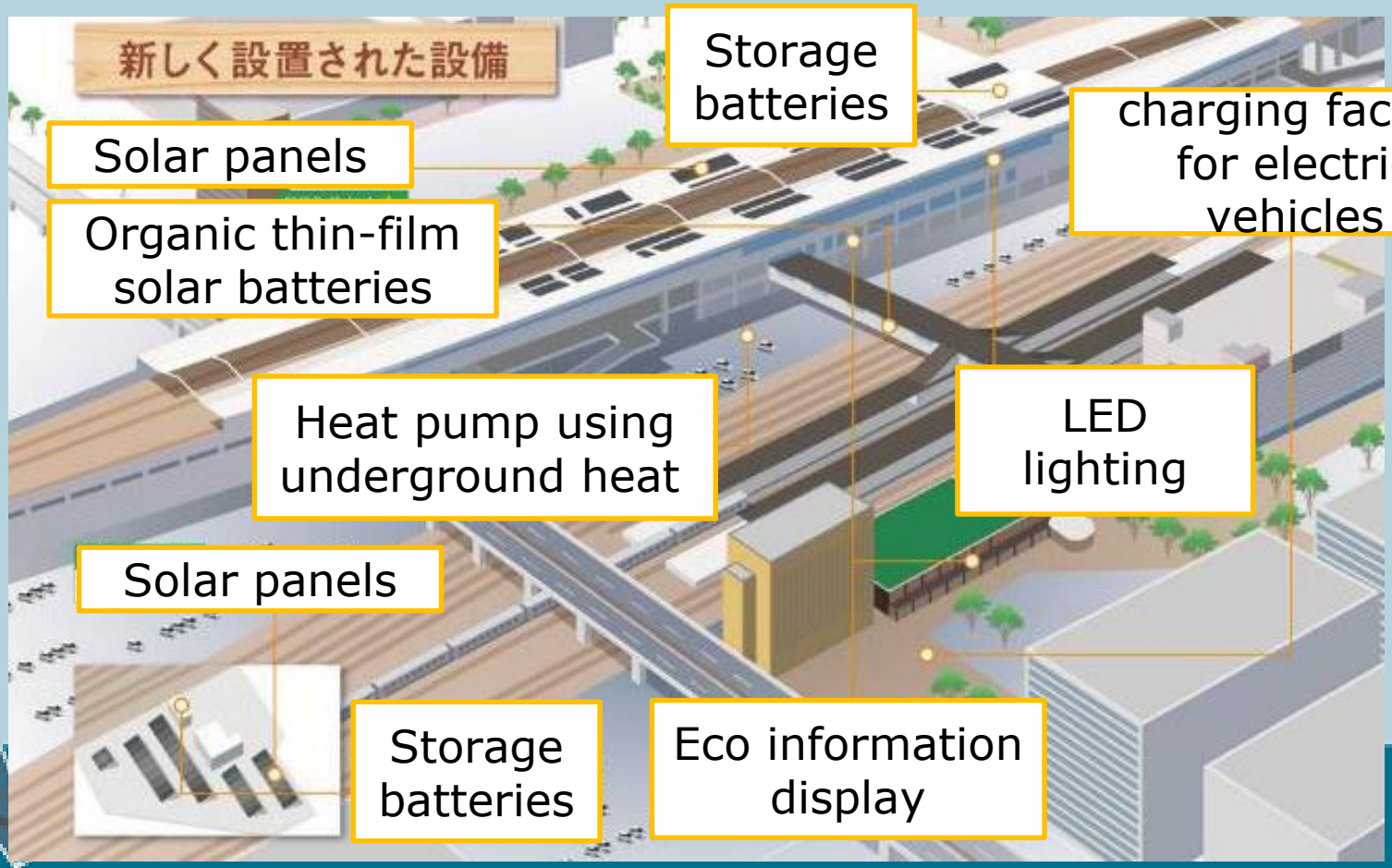
Radiation type heater using hot spring heat
Location : The waiting room

Foot bath using hot spring
Location : Platform

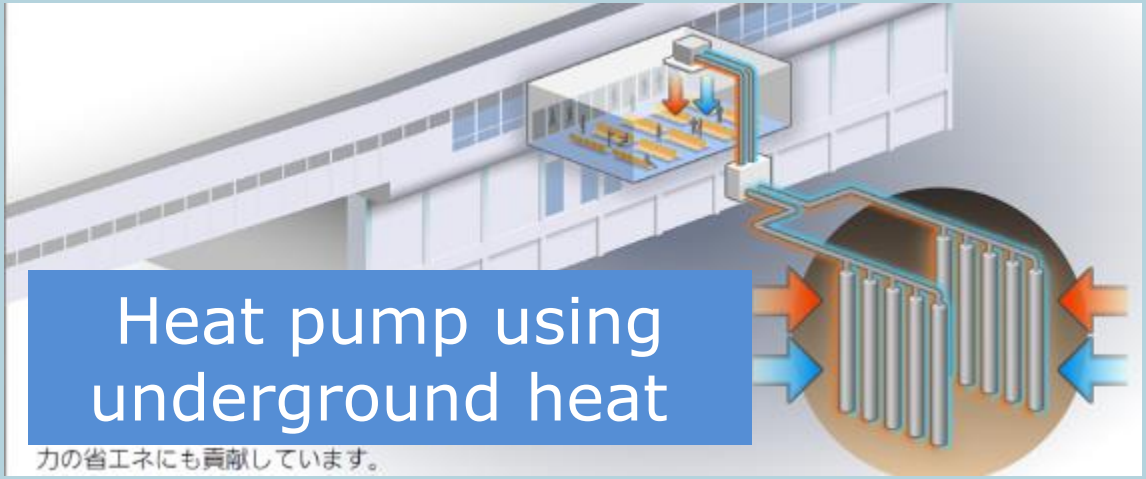
Solar panels
Location : Beside the rail track.

5th ecoste model station(Fukushima)

Concept : Collaboration with Fukushima prefecture



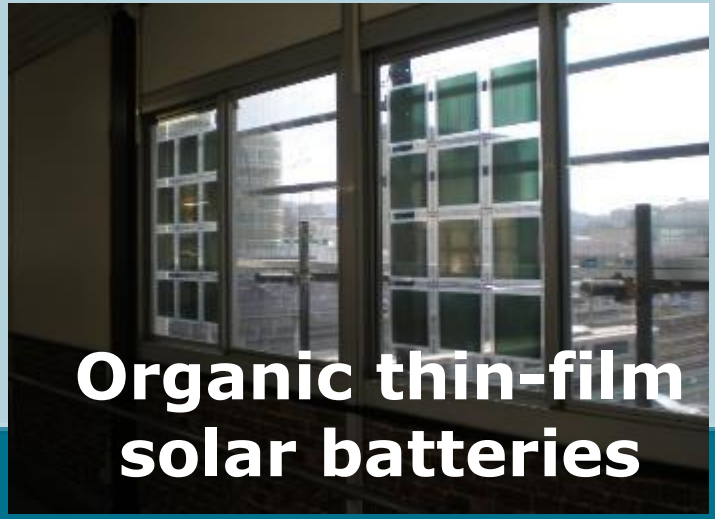
5th ecoste model station(Fukushima)



Heat pump using underground heat

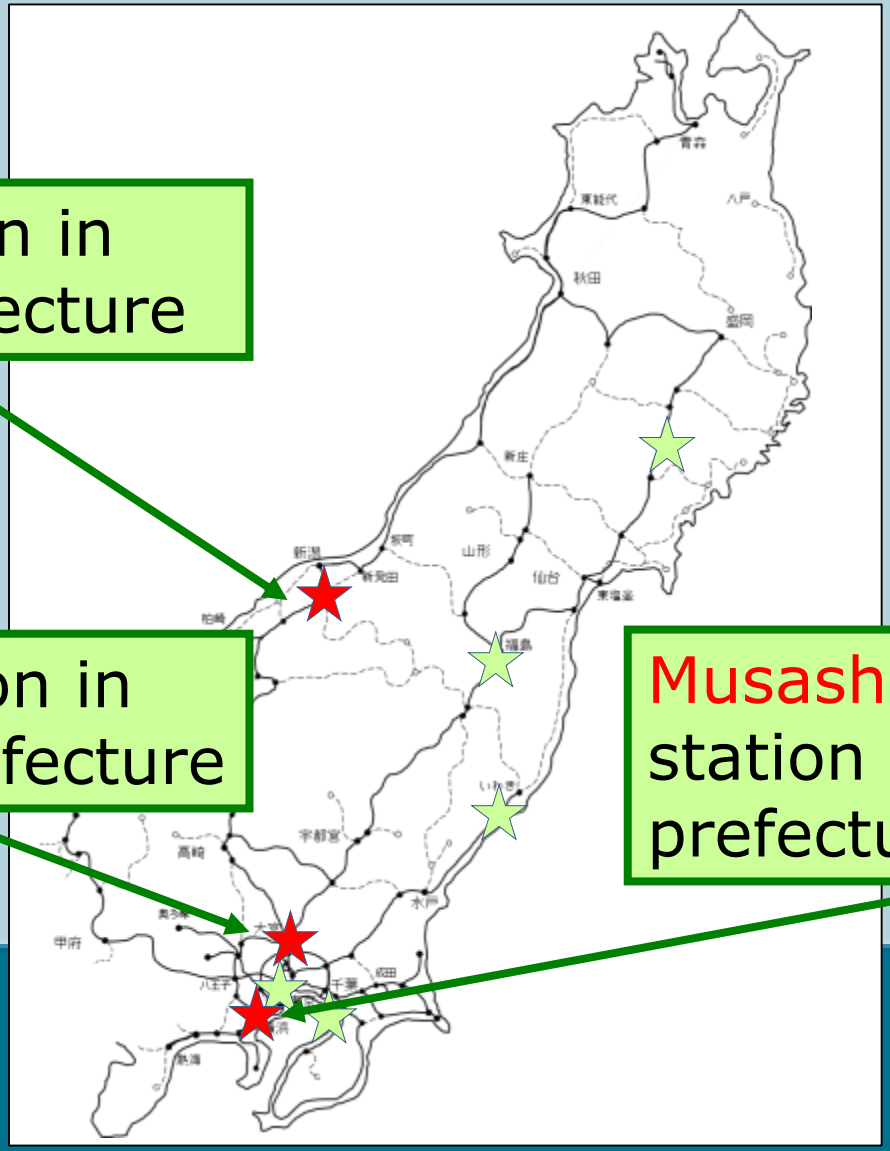
Heat pump (under construction)

Solar panels
Location：platform roofs



Organic thin-film solar batteries

New “ecoste” stations



Niitsu station in Niigata prefecture

Urawa station in Saitama prefecture

Musashi-Mizonokuchi station in Kanagawa prefecture

New ecoste model station (Urawa)

CO2 emissions reduction target: ▲40% （relative to 2015 level）

Energy Management System

LED lighting

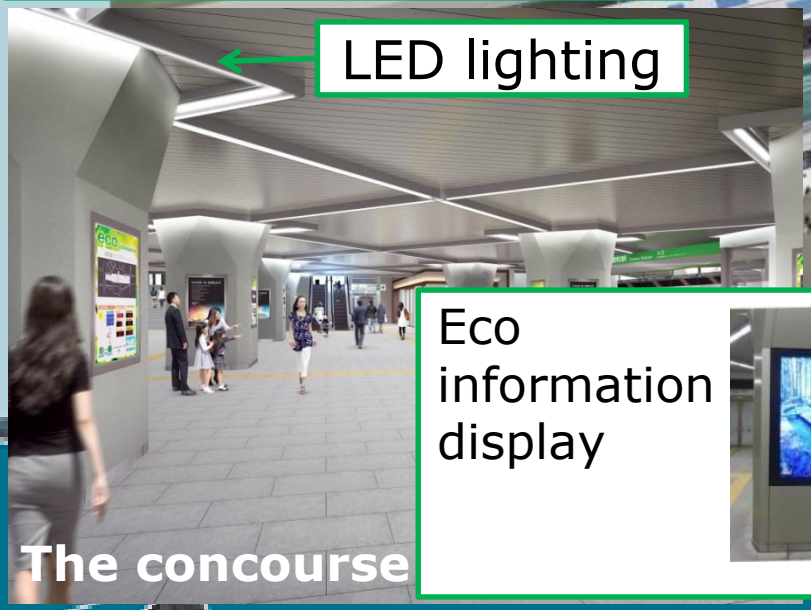
Solar panels

LED lighting

Sprinkler system on the platform

“Eco bench”

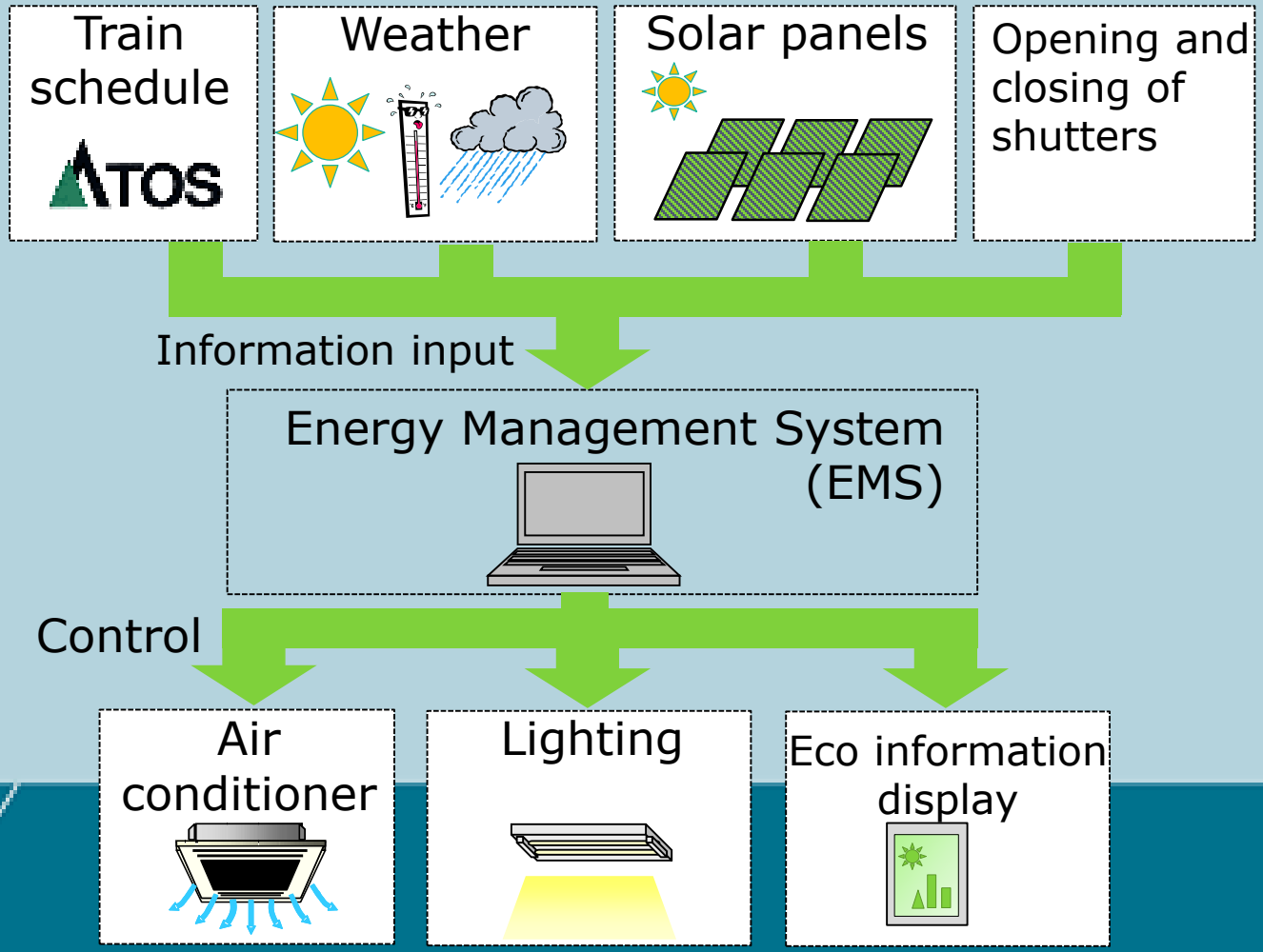
Eco information display



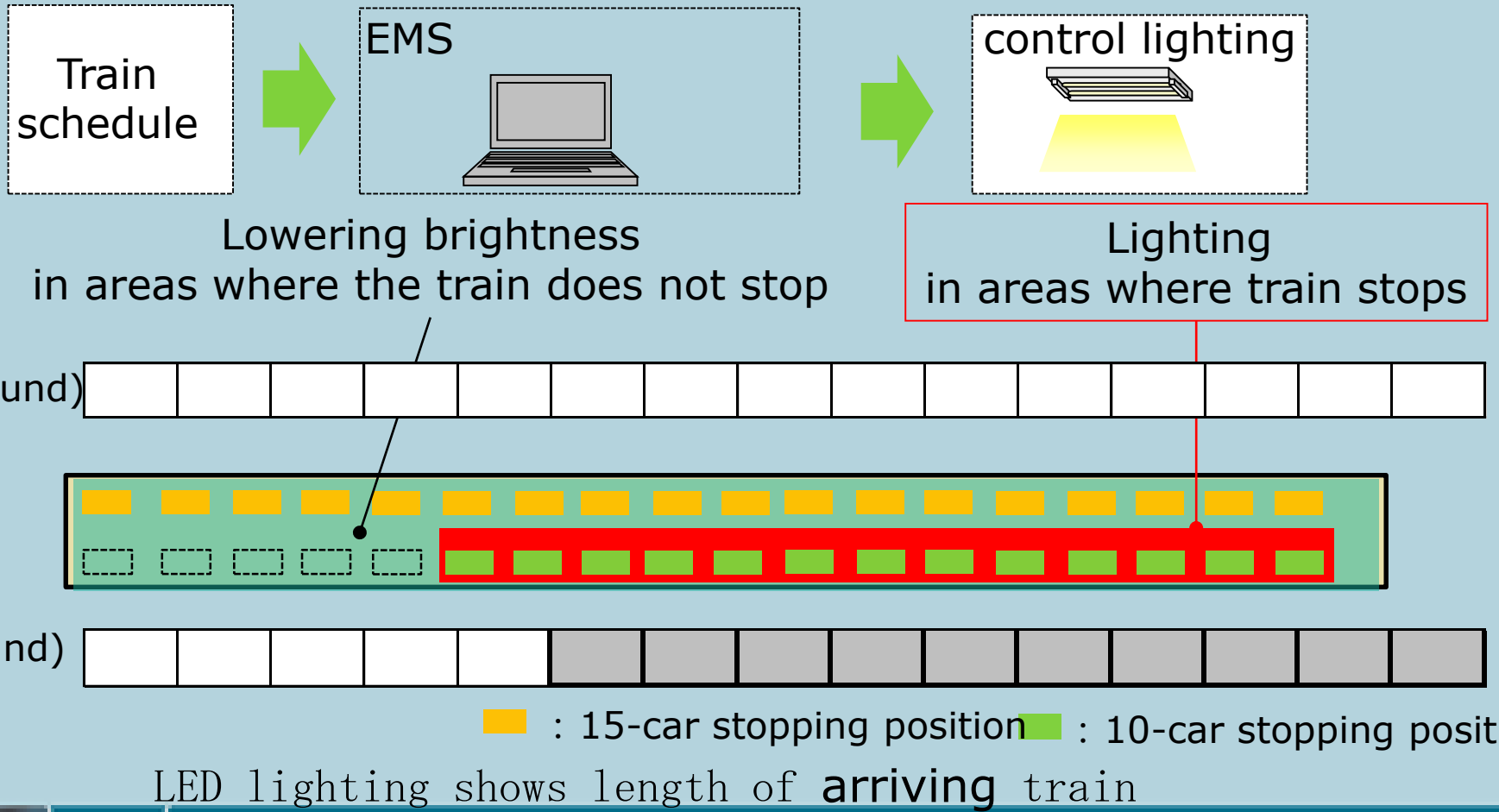
The concourse

Concept of Urawa "ecoste" : Energy Management System

Energy management system configuration



Control of lighting on the platform in conjunction with trains

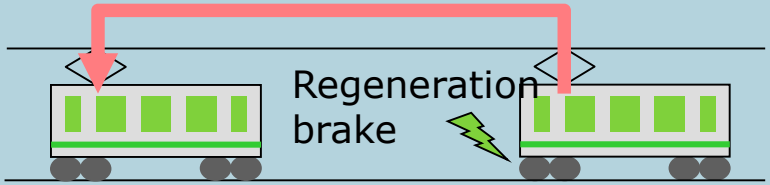


LED lighting shows length of arriving train

Concept of Niitsu “ecoste”
:Effective utilization of regenerative power

【Current】

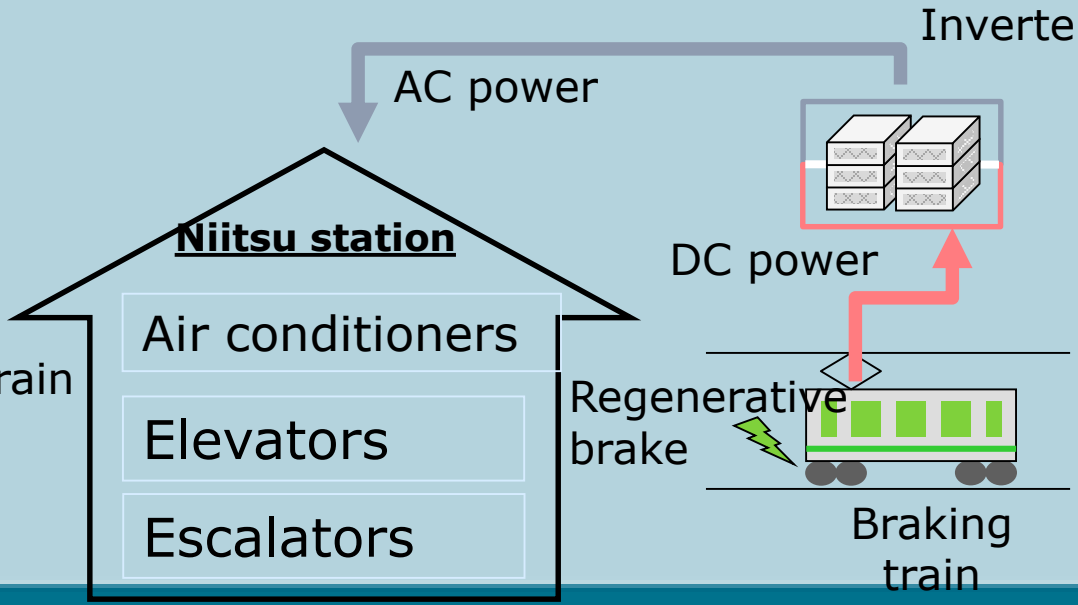
Regenerative system power for train running in vicinity



※Lost as heat when there is not a train running in the vicinity

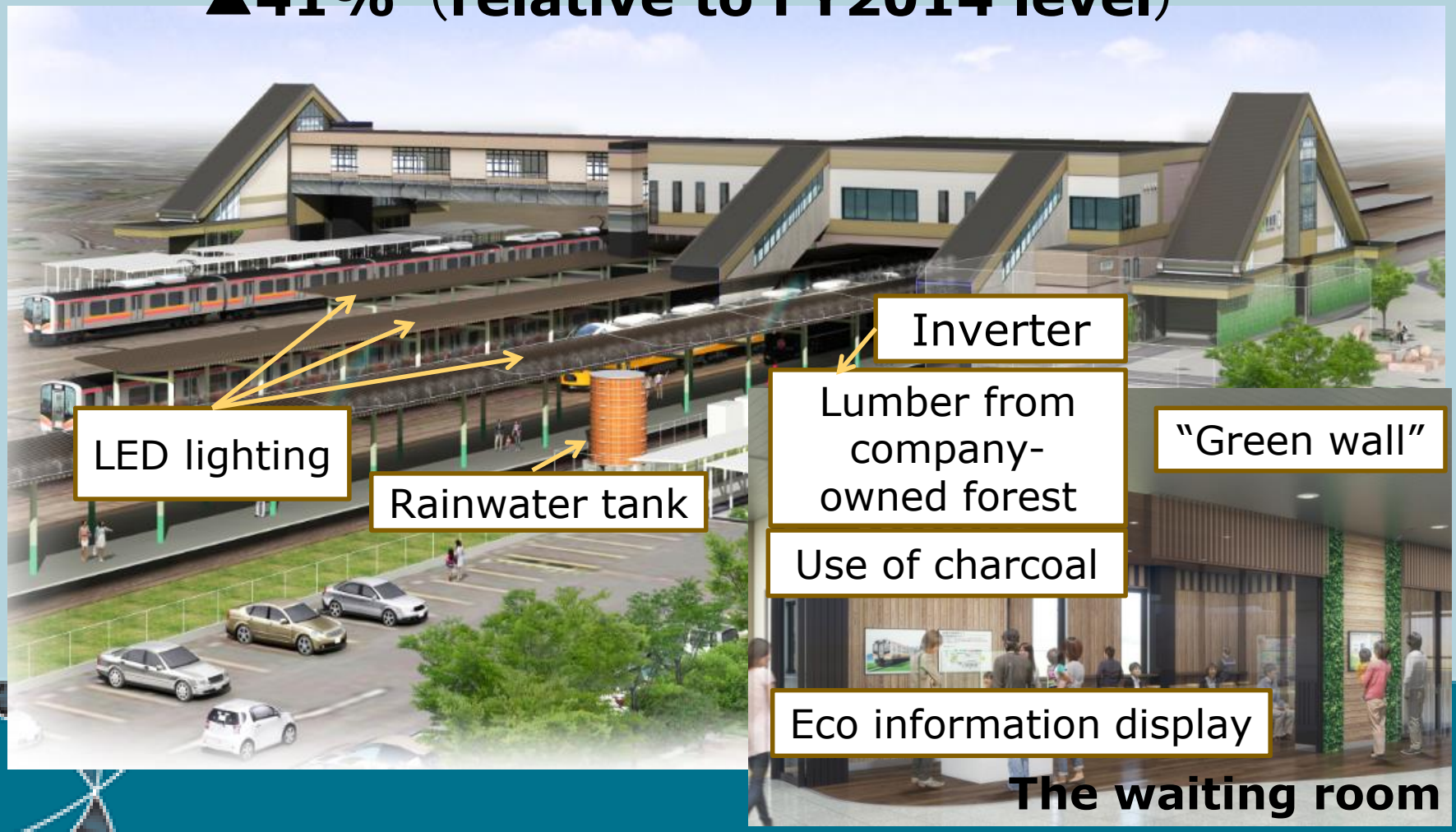
【Future system】

Regenerative power for station equipment even without running train in vicinity



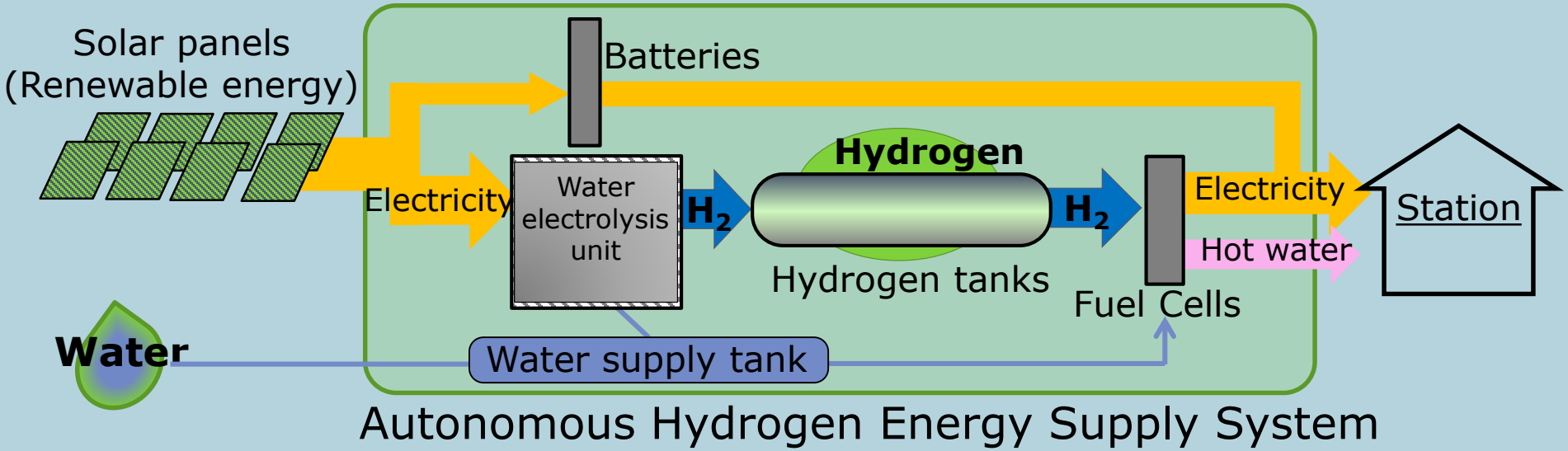
New “ecoste” model station (Niitsu)

CO2 emissions reduction target:
▲41%（relative to FY2014 level）



New "ecoste" model station (Musashi-Mizonokuchi)

Concept : **CO2-free** hydrogen



Autonomous Hydrogen Energy Supply System

In the future

We will create more new “ecoste” in different areas, making use of regional characteristics.

We will make use of knowledge provided by our existing “ecoste”.

(5) Saving energy and recycling wastes

Reducing energy consumed for train operations

Creation of Renewable Energy Hub in Northern Tohoku

Solar light

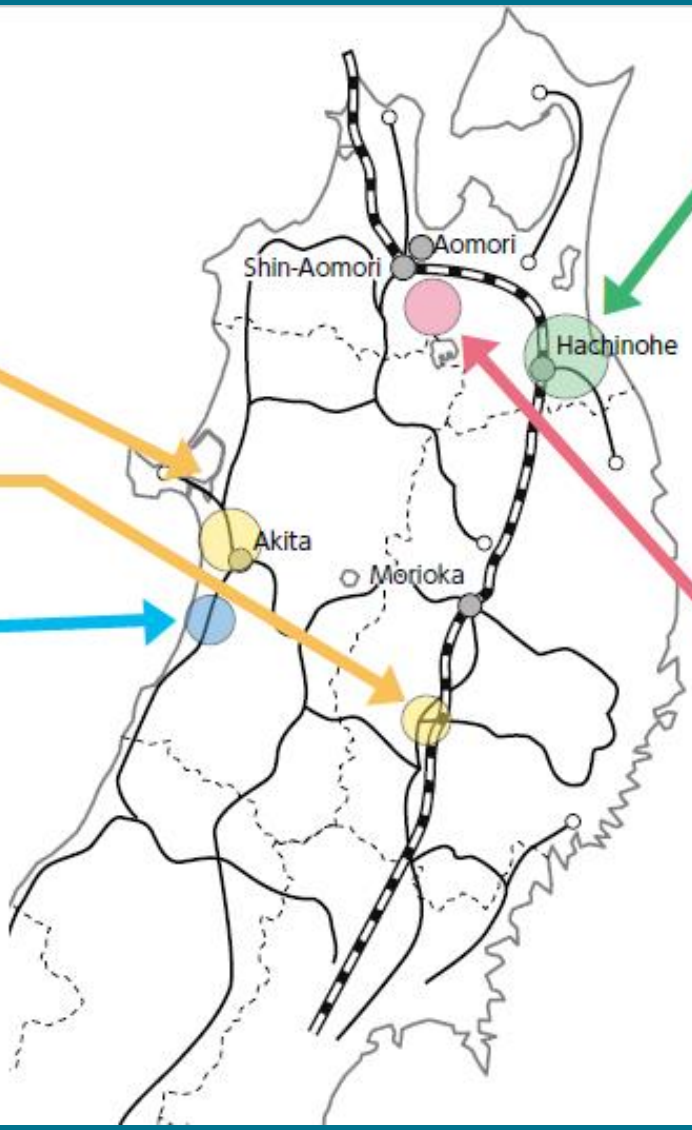
Akita Izumi solar power plant
Power generation output Approx. 1.3 MW
(Began use in March 2016)

Hanamaki Atago solar power plant
Power generation output Approx. 0.3 MW
(Began use in February 2015)

Wind

Abundant wind resources along shorelines, etc

Between Michikawa and Shimohama on Uetsu Main Line



Biomass

Abundant forest resources and railway forest of the Tohoku region

Hachinohe biomass power plant
Power generation output Approx. 12 MW (Use scheduled to begin in December 2017)

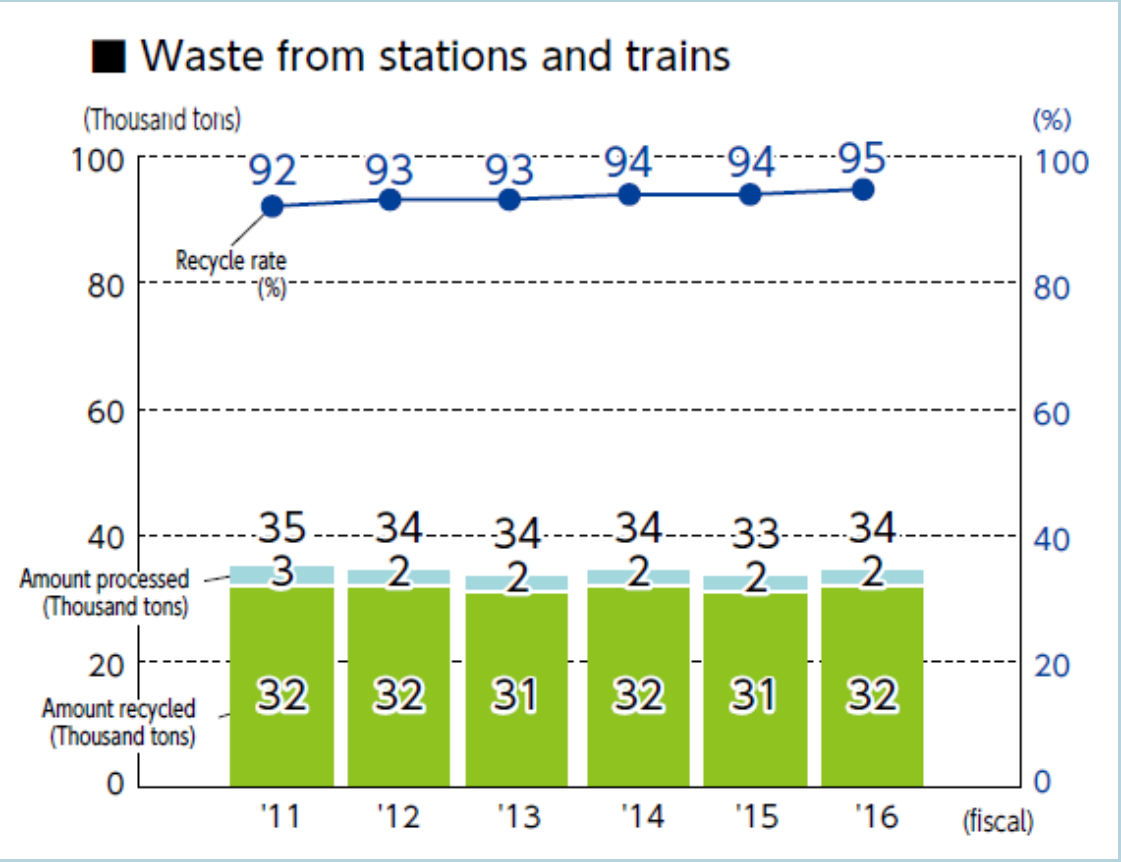
Geothermal

Abundant geothermal resources in the Tohoku region's volcanic areas

Hakkoda northwest region geothermal resource development survey

JR Akita Shimahama Wind Power Station

Recycling waste collected from stations and trains



More than 90% recycled

Recycling waste collected from stations and trains

Recycling waste PET bottles into various things

Reducing and recycling tickets

The used tickets are recycled to which of the following?

①Note Book

②Toilet Paper

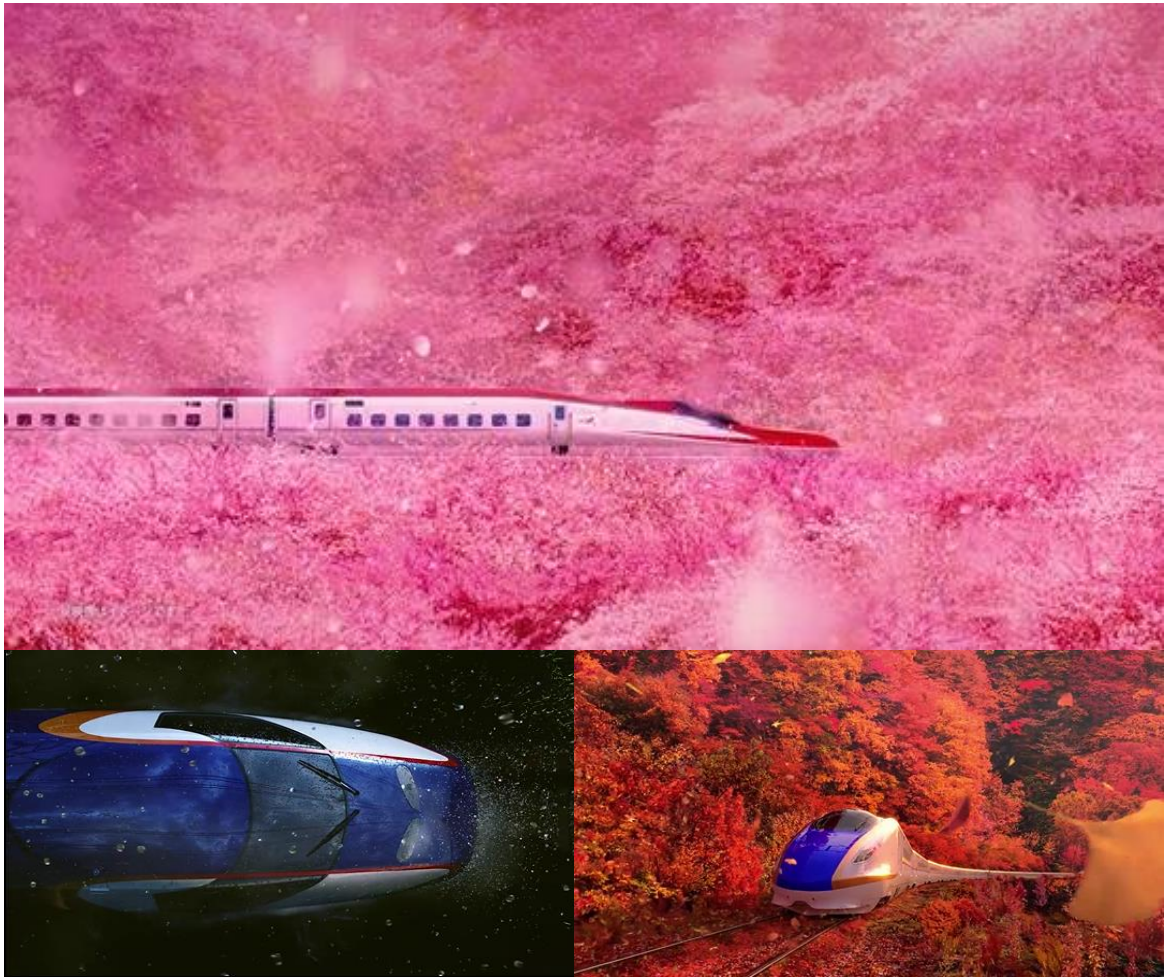
③Office papers

The Answer is

②Toilet Paper

100% recycled

Thank you for your attention



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