

# Development of “ecoste”, eco-friendly stations

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## Subject

### 1. Summary of our company

Our company, JR East is representative of Japanese railway companies. We have 1700 stations in Eastern Japan and the total area of our structures is 770 million square meters. We have various types of stations, from large-scale terminal stations to compact local stations. With new technical innovations and social changes, our customers and communities' expectations have changed as well. So, we have continued efforts in developing next-generation stations.

### 2. Eco-friendly stations “ecoste”

“ecoste” model stations introduce various technologies for environmental preservation, such as solar power generation, LED lighting, heat-blocking paint and others. These technologies are effective in conserving energy and using clean renewable energies. We call stations with such technologies “ecoste”. By producing “ecoste”, we want to raise our eco-friendly profiles in society, and appeal to our customers.

### 3. “ecoste” Four pillars

“ecoste” has four pillars. We carry out various efforts in line with these 4 basic pillars. The first is “Energy conservation” Promoting more advanced energy conservation, such as LED lighting, water-saving lavatories, etc.

The second is “Energy creation” Activity implementing renewable energy, such as solar power generation, wind power generation etc. The third is “Eco-Awareness” Preparing facilities that make users eco-aware. Such as, an Eco-information display board that shows the effects of environmental technologies.

The fourth is “Environmental Harmonization” Creating vitality by harmonizing people and their environment. Such as greenery in surrounding areas, pocket park on station rooftop and others.

### 4. In service “ecoste” stations

We have developed and renovated 5 stations upgraded to “ecoste”.

To explain their development, I will divide these 5 stations into two categories.

The first is “Pioneer model” including 3 “ecostes” that opened between 2012 and 2013. The station names are “Yotsuya”, “Hiraizumi” and “Kaihinmakuhari”.

The other type is “Developed model” including 2 “ecostes” that opened in 2015, named “Yumoto”, “Fukushima”.

### 5. Environmental technologies of pioneer model “ecoste”

This is a list of environmental technologies in the “ecoste” pioneer model.

We made a point of introducing new technologies, so we incorporated a number of technologies in balance with these four pillars. This is the pocket park of the 1<sup>st</sup> “ecoste”, and these are the solar power generator by the tracks of the 2<sup>nd</sup> “ecoste”,

This is a wind power generation on the rooftop of the 3<sup>rd</sup> "ecoste", and these are photos of a sunlight condensing and dispersing system using light ducts above of the concourse of the 3<sup>rd</sup> "ecoste". After the opening of these "ecoste", we checked the effect of these environmental technologies.

#### 6. The effect of pioneer model "ecoste"

In the 1<sup>st</sup> "ecoste" (Yotsuya station), the CO2 emissions were reduced approximately 40% compared to 2008. The 2<sup>nd</sup> "ecoste" (Hiraizumi station), the number of zero emission days from 2012 to 2014. So approximately 50% of the target of "zero emission" was achieved. "Zero emission" means that solar power covers all energy that is used in the station. In the 3<sup>rd</sup> "ecoste" (Kaihinmakuhari station), CO2 emissions were reduced approximately 60% compared to 2010.

By these results, we made out that the "ecoste" pioneer model has had stable results in the reduction of CO2 emissions.

#### 7. Environmental technologies of developed model "ecoste"

We made sure that the advanced type of "ecoste" has stable results in reducing CO2 emissions. So it is the time to consider more possibilities of "ecoste".

We are paying attention to possibilities for making it more effective according to regional characteristics in "ecoste" projects. So in addition to the technologies that were introduced in pioneer type of "ecoste". We adopted new technologies making it more effective according to regional features. Such as hot springs, underground heat, and local community policies.

#### 8. 4th "ecoste" model station (Yumoto)

The station is the gateway to a famous hot spring village with a long history located in Fukushima prefecture. The surrounding area has rich natural resources of hot springs and mountains. So we installed footbath and heaters using hot spring, and used local wood materials for furniture and station signs. These efforts not only reduce environmental burden but also improve regional developments and customer service.

#### 9. 5th "ecoste" model station (Fukushima)

Fukushima station is located in Fukushima prefecture where seriously damaged by the great earthquake and the nuclear-power plant accident in 2011. The biggest purpose of this "ecoste" was to enhance the capacity of the station to accommodate people who cannot return home in emergency situations, by installing renewable energy systems such as solar power generation and ground source heat pump with cooperation from the Fukushima prefectural government. This is a model case in which we achieved strong collaboration with local communities.

#### 10. The next "ecoste"

For the "ecoste" pioneer model, we focused on installation of environmental technologies in stations. And after making sure of the stable results of "ecoste" pioneer models, we start to consider the possibilities of leveraging regional characteristics in the "ecoste" developed models. We are aiming for the development of an "ecoste" that is closer to the heart of the local and makes use of environmental technologies. So we will try to make more efficient use of regional characteristics in various ways in the future.