Strategy for Energy and the Environment in JR East

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East Japan Railway Company
Tokyo, JAPAN
★Summary, process of the company
★JR East Group Management Vision
  “Move Up” 2027
★Energy conservation and CO₂ reduction, and “ECOSTE”
★Progress of introducing renewable energy
★Biodiversity
  ~Hometown Forestation Program~
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.
Major figures of our company

Passenger line network: **4634.7 miles** (7,457.3 km)
Total number of passengers per day: **17.50 million**
Number of stations: **1,666**
Total number of trains per day: **12,227**
Number of employees: **56,445**

*1...As of July 2017
*2...As of March 2017
*3... As of April 2017, only Regular employees
Characteristics of JR-East

VERTICAL MANAGEMENT STRUCTURE

We own our all rail infrastructures, operating and maintaining it as **a fully integrated railway model**.
JR East Group Management Vision
“Move Up” 2027
3. Basic Policies of “Move Up” 2027

Stories to create values: From the provision of services with railway infrastructure as our basis to the introduction of new values to society, focusing on the affluence of everyone in their daily lives.

30 years since the company’s establishment

- Railway infrastructure, technologies and knowledge
- Upgrading of services through the evolution of railways
- Rehabilitation and revitalization of railways

10 years from now

- **Affluent lives for all people**
  - Creating new services by introducing technologies and knowledge from outside the company, by utilizing a multilayered “real” network and stations as hubs for interaction
  - Offering new values to society by staying ahead of changes in the business environment

1. Drastic changes and diversification in social structures due to the decreasing birth rate and population and aging of the population
2. Changes and diversification in values related to what it means to work and be affluent
3. Changes in our living environment due to technological innovations such as AI and IoT
4. Acceptance of new values through globalization of economy and society
JR East Group Management Vision
“Move Up”2027

3. Basic Policies of “Move Up” 2027

- There is an urgent need to qualitatively reform, revolutionize and develop transportation services mainly by railways.
- Further allocate management resources to lifestyle services and IT & Suica businesses, developing them as our new growth engine.

Consolidated operating revenues
(Transportation:non-transportation)

Approx. 2.95 tril. yen
(7:3)

Increasing earning power by expanding businesses in the lifestyle services, IT & Suica services

Approx. 2.0 tril. yen
(9:1)

Accelerating growth of the lifestyle services, IT & Suica businesses

Investment in the evolution of railways (Creating new business opportunities for Ekinaka, Suica, etc.)

Making sales and creating profit mainly through the railway business

Lifestyle services, IT & Suica

Transportation services

The company’s establishment → 30 years since the company’s establishment

FY2018 → 10 years from now

Around 2027

(6:4)
Energy and environmental strategies

- Prevention of global warming
- Diversification of energy

Realization of low-carbon society (decarbonization)
Development of “Smart Trains”

**Smart trains**

**Environment**
- Development of fuel-cell railcars using hydrogen as energy

**Services**
- Realization of next-generation ticketing systems and touch-less and gate-less ticketing
- Realization of next-generation Shinkansen (360 km/h)

**Safety**
- Improving security and safety by utilizing sensor technologies for platforms and level crossings

**Train operations**
- Realization of driver-less operations
- Speedy recovery of train service delays by ICT at times of transportation disorder

**Maintenance**
- Introduction of robots for maintenance
- Utilization of drones to understand situations at disaster and accident sites
- Realization of smart maintenance to respond to the condition of facilities and rolling stock
## Environmental Targets

<table>
<thead>
<tr>
<th>Item</th>
<th>Targets to be met by FY2031</th>
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<tbody>
<tr>
<td>Energy consumption from railway business activities</td>
<td><strong>25% reduction</strong> <em>(MJ: relative to FY2014 level)</em></td>
</tr>
<tr>
<td>CO₂ emissions volume from railway operation</td>
<td><strong>40% reduction</strong> <em>(kg-CO₂/kWh: relative to FY2014 level)</em></td>
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</table>
Composition of energy consumption by JR East
Reducing energy consumed for train

We are putting into service more new-generation energy efficient railcars, with features such as regenerative brakes, and **Variable Voltage Variable Frequency (VVF) inverters**.
The accumulator railcar train

Oga Line
Series EV-E801(2017) (ACCUM)

Karasuyama Line
Series EV-E301(2014) (ACCUM)
“Delivering lectures on request” in the actual train

- January, 2018 at Karasuyama Line, in “ACCUM”
• “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.
What does “ecoste” stand for?

Environment Earth Conscious Station of East Japan Railway Company ➔ ECOSTE!
<table>
<thead>
<tr>
<th></th>
<th>Four pillars</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Energy conservation</strong>&lt;br&gt;: Promoting more advanced energy conservation</td>
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<tr>
<td>2</td>
<td><strong>Energy creation</strong>&lt;br&gt;: Actively implementing renewable energy</td>
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<tr>
<td>3</td>
<td><strong>ECO-Awareness</strong>&lt;br&gt;: Preparing facilities that make users eco-aware</td>
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<td>4</td>
<td><strong>Environmental Harmonization</strong>&lt;br&gt;: Creating vitality through an environment that is in harmony with people</td>
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In-service “ecoste” stations

7th Niitsu (kinetic energy Buttery)
6th Urawa (Energy Management System)
1st Yotsuya (LED light, Roof garden)
9th Kobuchizawa (Solar Heat)
8th Musashi-Misonokuchi (Hydrogen)
10th Oga (Wind Power Generator)
2nd Hiraizumi (Solar panel)
5th Fukushima (Thin Solar Panel)
4th Yumoto (Hot Spring Heat)
3rd Kaihin-Makuhari (Small Wind Power Generator)
The 1st ecoste model station
- Yotsuya Station JR Chuo Line

- Natural ventilation system
- LED light
- Green roof
- Green wall
- Basic greenery
- Information display
- Greenery
- Solar panel
- Increased efficiency in air conditioning
- Solar power
- Fuel battery for household use
- Water-saving toilet system
- Rooff garden
- Transparent solar panels
- Water-retentive paving
- High efficiency transformer
The 1\textsuperscript{st} eco
tecte model station
- Yotsuya Station JR Chuo Line
The latest ecoyte model station - Oga Station (JR Oga Line)

Namahage Statues (Traditional character of Akita Prefecture)

Wind Power Generation Station

Catenary pole for charge to ACCUM

Accumulator railcar train EV-E801 series

The Main Building of Staton
The latest ecoiste model station
- Oga Station (JR Oga Line)
Progress of introducing renewable energy

- **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)

- **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)

- **Wind**
  - Abundant wind resources along shorelines, etc.

- **Geothermal**
  - Abundant geothermal resources in the Tohoku region’s volcanic areas
  - Hakkoda northwest region geothermal resource development survey
Biodiversity
~Hometown Forestation Programs~

October, 2017 Naruko-Onsen, Osaki City, Miyagi Prefecture
Biodiversity ~Hometown Forestation Programs~

Reception of Furukawa station

Nearby hot spring (2018 plan)

Nearby hot spring "Naruko-Onsen"

Naruko-Onsen station (hot spring especially for foot)
Thank you for your attention!

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