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ADB Partnership Forum
Innovation for Resilient and Smart Communities

Role of Innovative Technologies and Solutions to Develop Resilient and Smart Communities

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Yasuo Tanabe
Vice President and Executive Officer
Hitachi, Ltd.

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Contents

1. Overview of Hitachi

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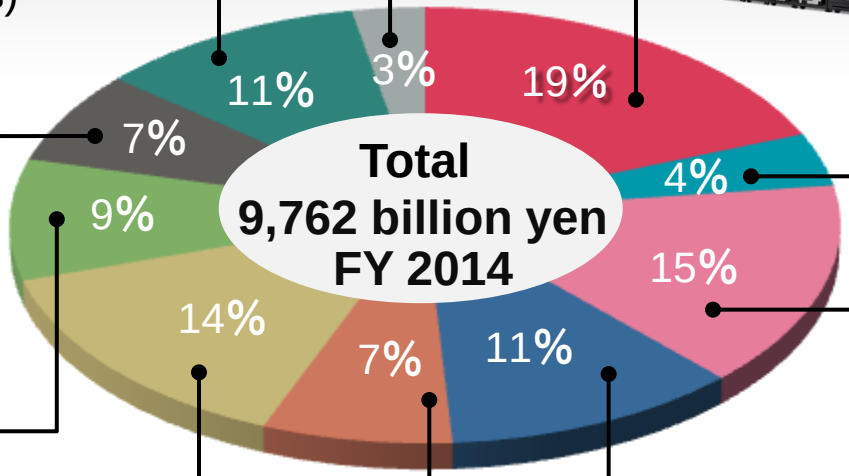
Financial Services

Other (Logistics & Other services)

Information & Telecommunication Systems

Smart Life & Ecofriendly Systems



Power systems

Automotive Systems

Social Infrastructure & Industrial Systems

Electronics Systems & Equipment

Construction Machinery

High Functional Materials & Components

*Figures are on a consolidated basis

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Serving the world with our social innovation business

SOCIAL INNOVATION – IT'S OUR FUTURE

"IT" × "Social infrastructure"

3-1. Concept of Smart City

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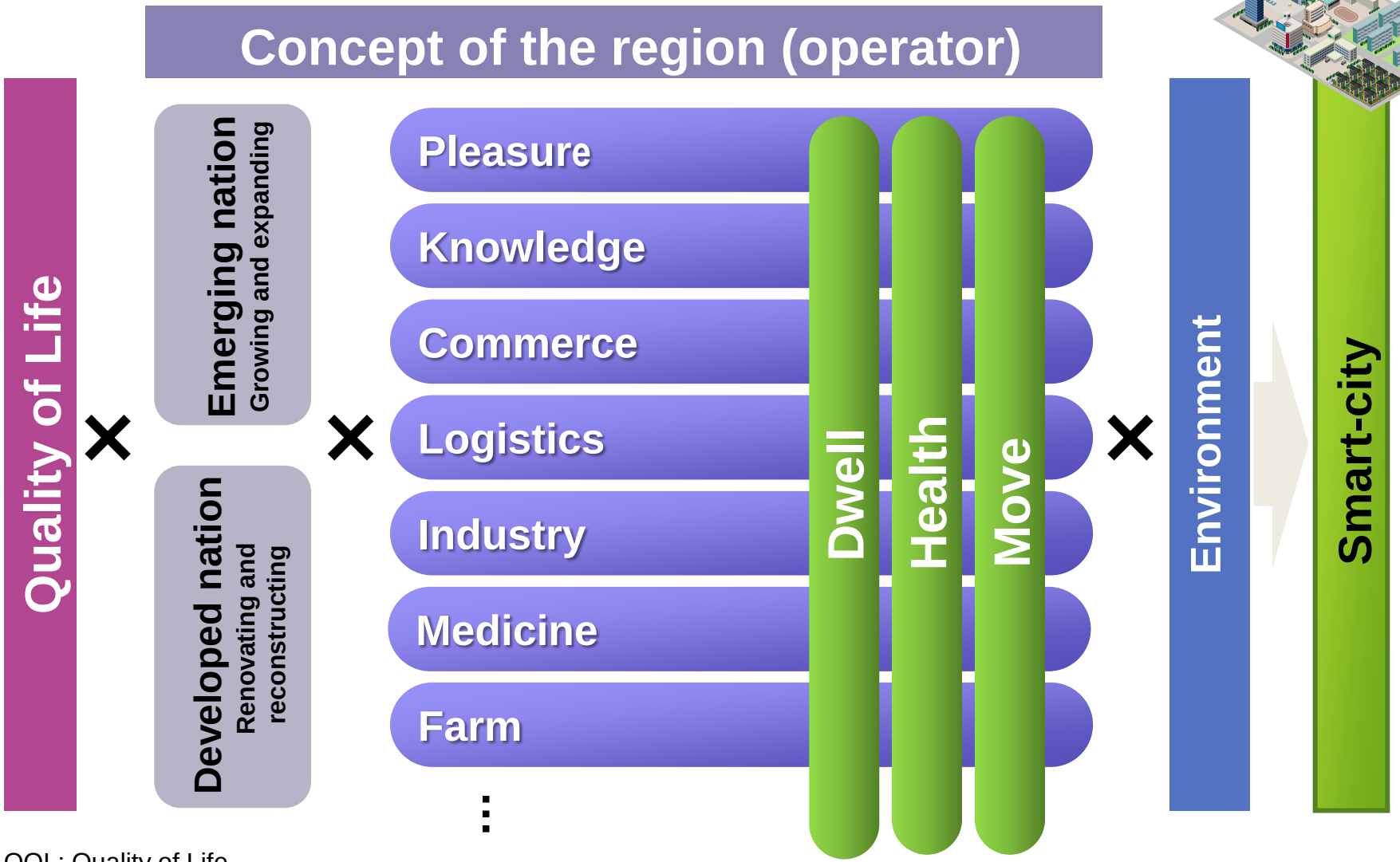
- The operator formulates a concept with varied needs and public opinions taken into account and materializes an optimum urban image.



QOL: Quality of Life

3-2 . Parties' Role in Smart City

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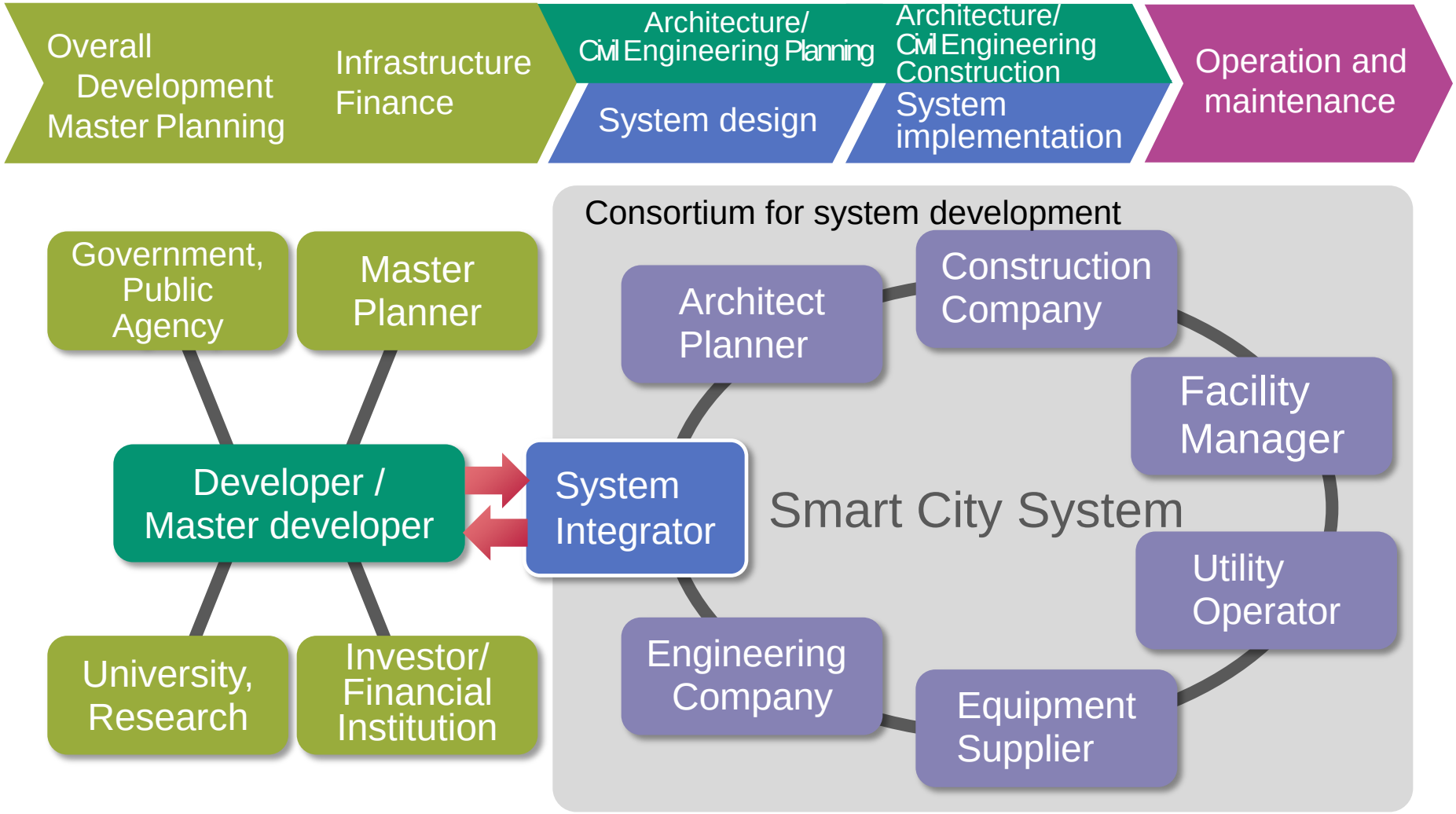
- Technology Integrator is the key player to develop and manage the entire system by the intimate partnership with the developer.



3-3. Hitachi's Participation in Smart City Development

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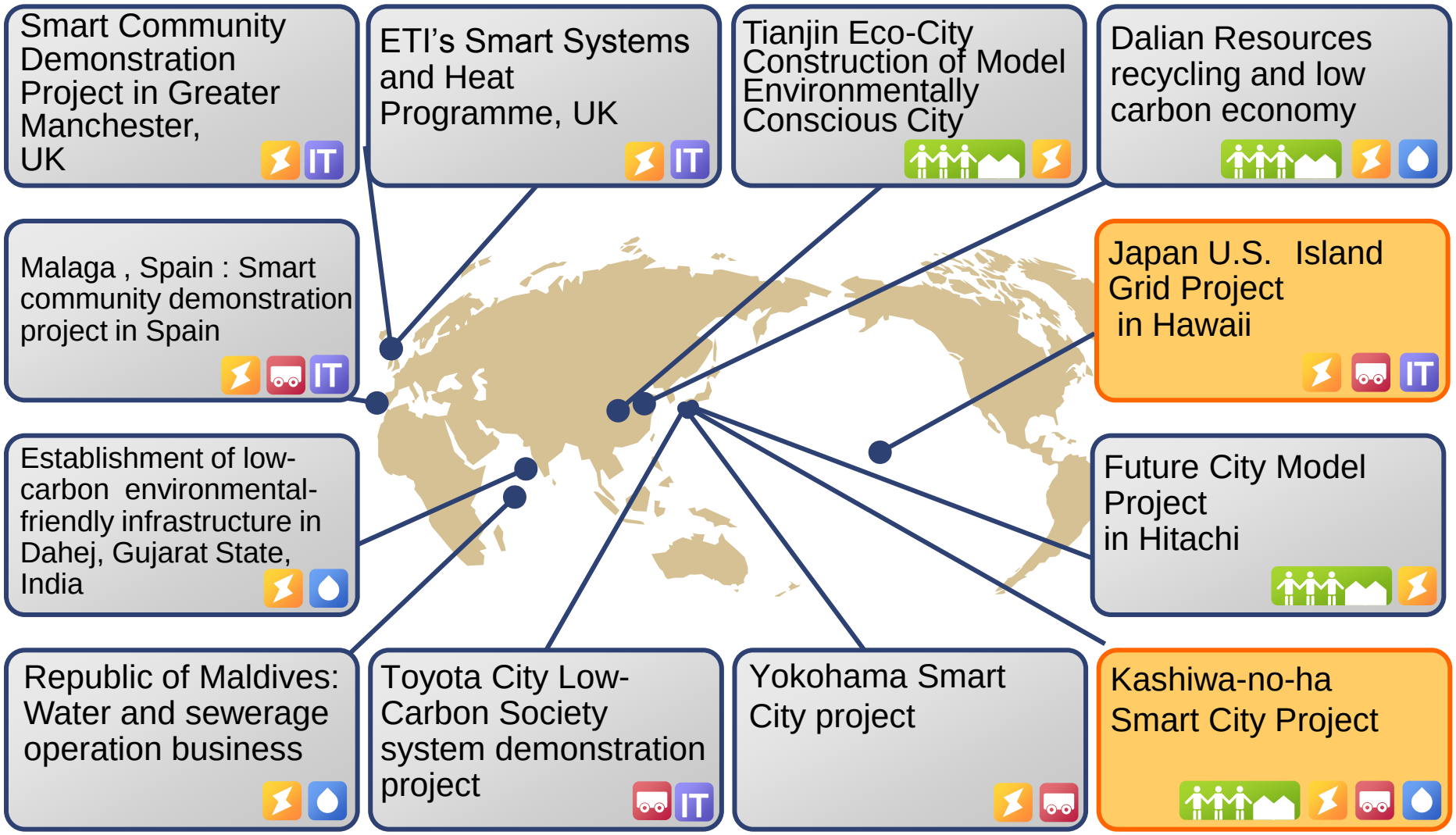
- Participating to the leading projects all over the world



ETI：Energy Technologies Institute

3-4. Kashiwa-no-ha Smart City Project (1)

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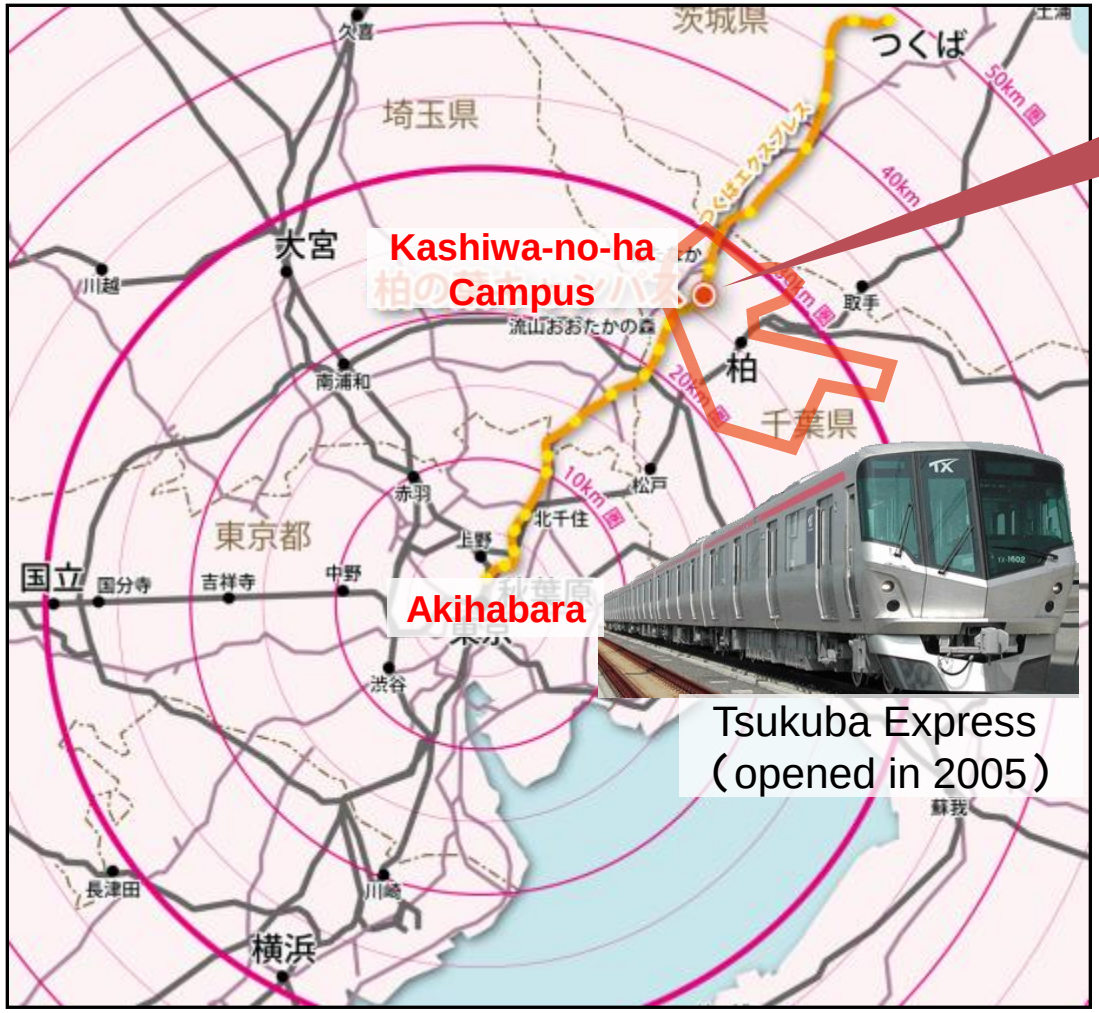
Kashiwa-city: population 400k,
Kashiwa-no-ha Campus City: 25km from central Tokyo, 30min. via Tsukuba Express (from Akihabara)



Tsukuba Express
（opened in 2005）

Kashiwa-no-ha Campus

A land readjustment project area covering roughly 273 hectares and with a planned population of 26,000

Developed from scratch

- Leveraging advanced knowledge and technologies
- A social experiment in which residents are participating

3-5. Kashiwa-no-ha Smart-City Project (2)

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- An advanced, world-leading problem-solving model

SMART CITY PROJECT

1 Environmental-Symbiotic City

2 City of Health and longevity

3 City of New industry Creation

Harmony with the environment × Technology × Community

AEMS: Area Energy Management System
BCP: Business Continuity Plan
LCP : Life Continuity Plan

Hitachi's "Area Energy-Management Solution"

AEMS	Electric interchange facilities
Area energy-management Provision of information to users	Electric interchange BCP and LCP measures

*Source: Mitsui Fudosan Co., Ltd.

AEMS can bring forth an integral management of creating, saving and storing energies in an entire community.

3-6. Kashiwa-no-ha Area Energy Management System

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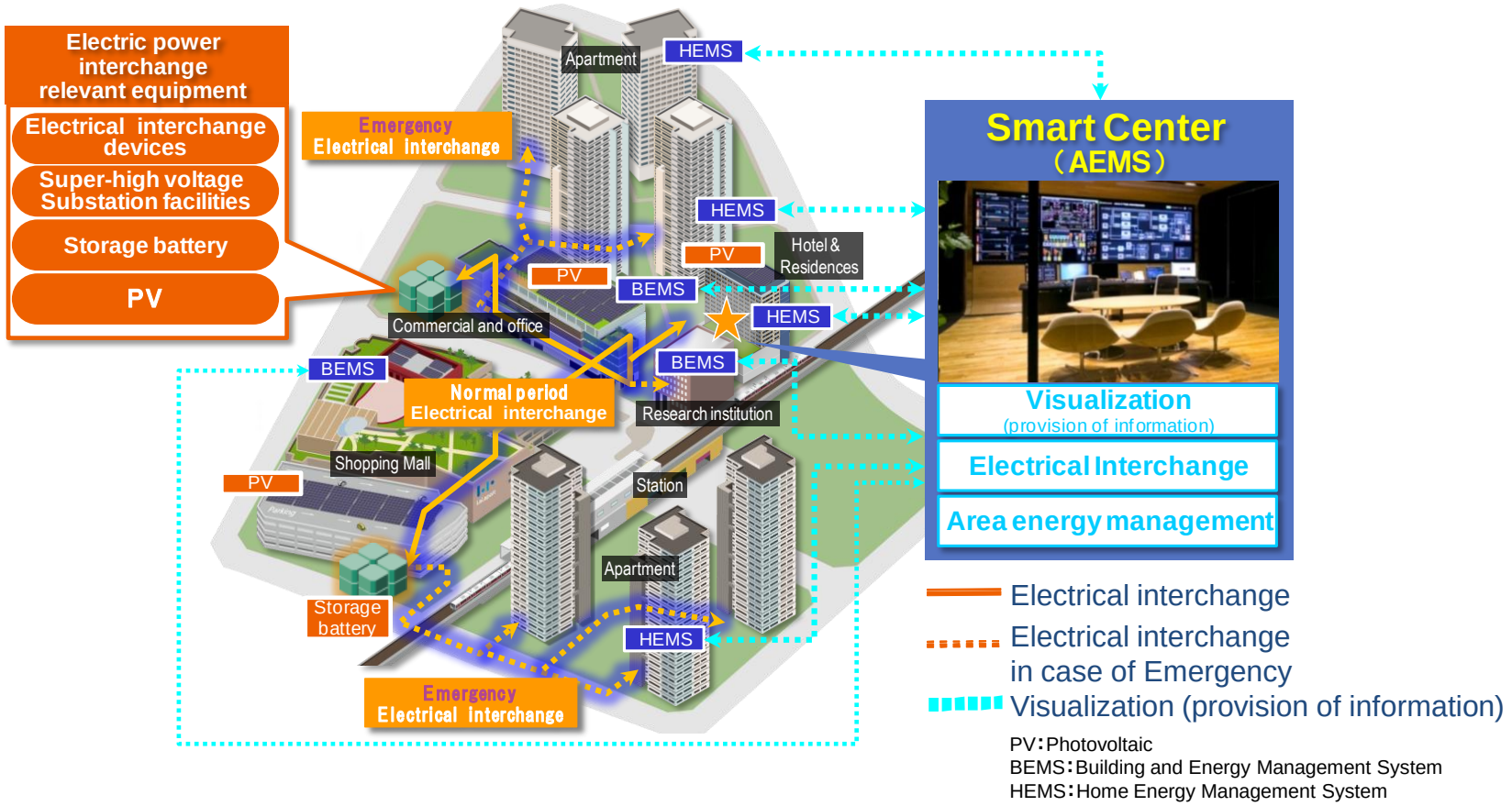
- "Smart Center" manages private electric power line/network and regional energy.
  - Visualizes the usage of energies such as electricity, water and gas.
  - Creates Electric power interchange across different blocks within the community.



- "Kashiwa-no-Ha Smart Center" has begun operations from May, 2014.
- Aiming to provide new services by utilizing Big Data.

3-7. JUMPSmartMaui: Locations of equipment

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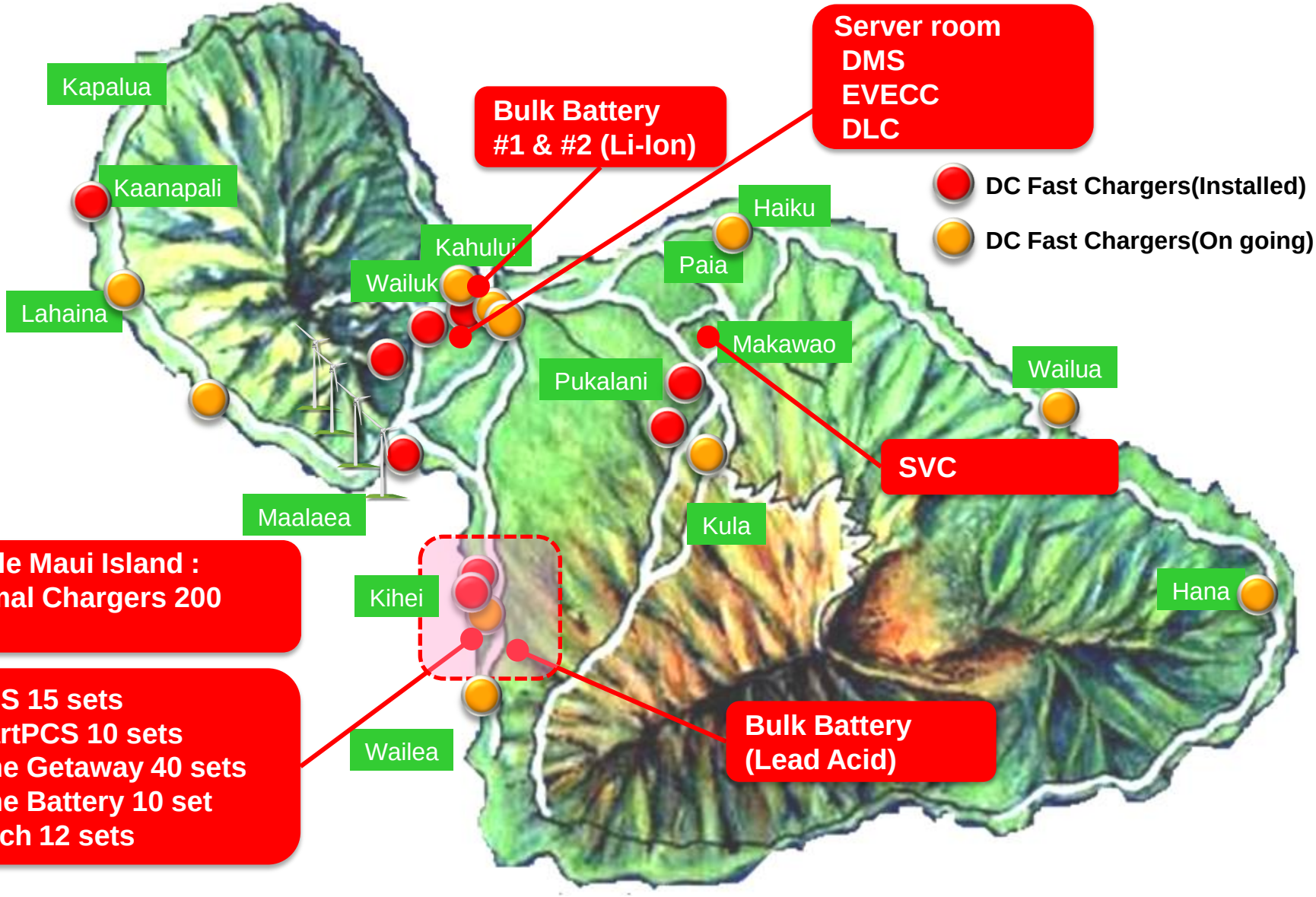

3-8. JUMPSmartMaui: Hierarchical configuration

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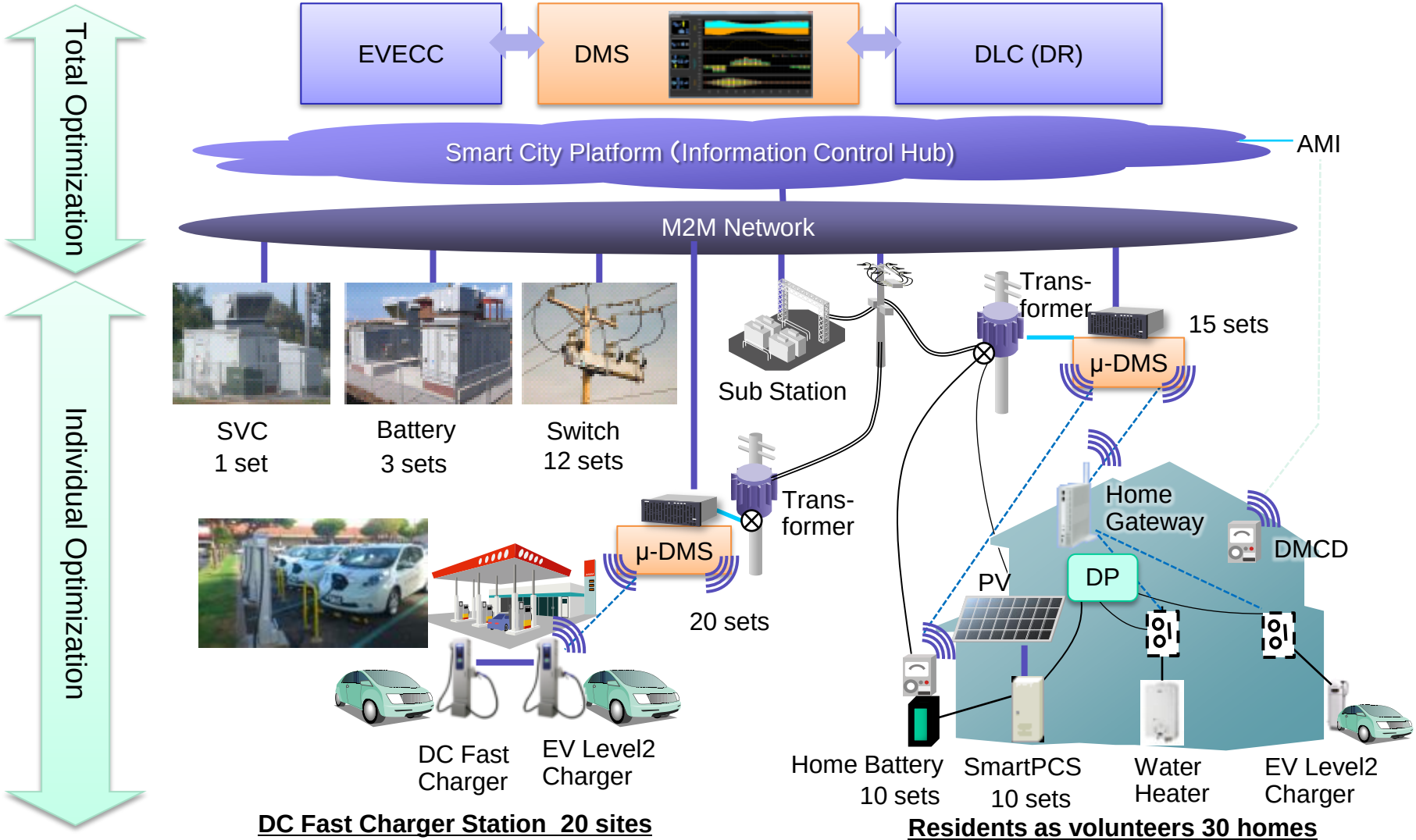

EVECC: EV Energy Control Center
DMS: Distributed Management System
DLC: Direct Load Control
DR: Demand Response

AMI: Advanced Metering Infrastructure
M2M: Machine to Machine
SVC: Static Var Compensator
DMCD: Data Measuring & Communication Device

DP: Distribution Panel
PV: Photovoltaic
PCS: Power Conditioning System

3-9. POC for Technology Solutions

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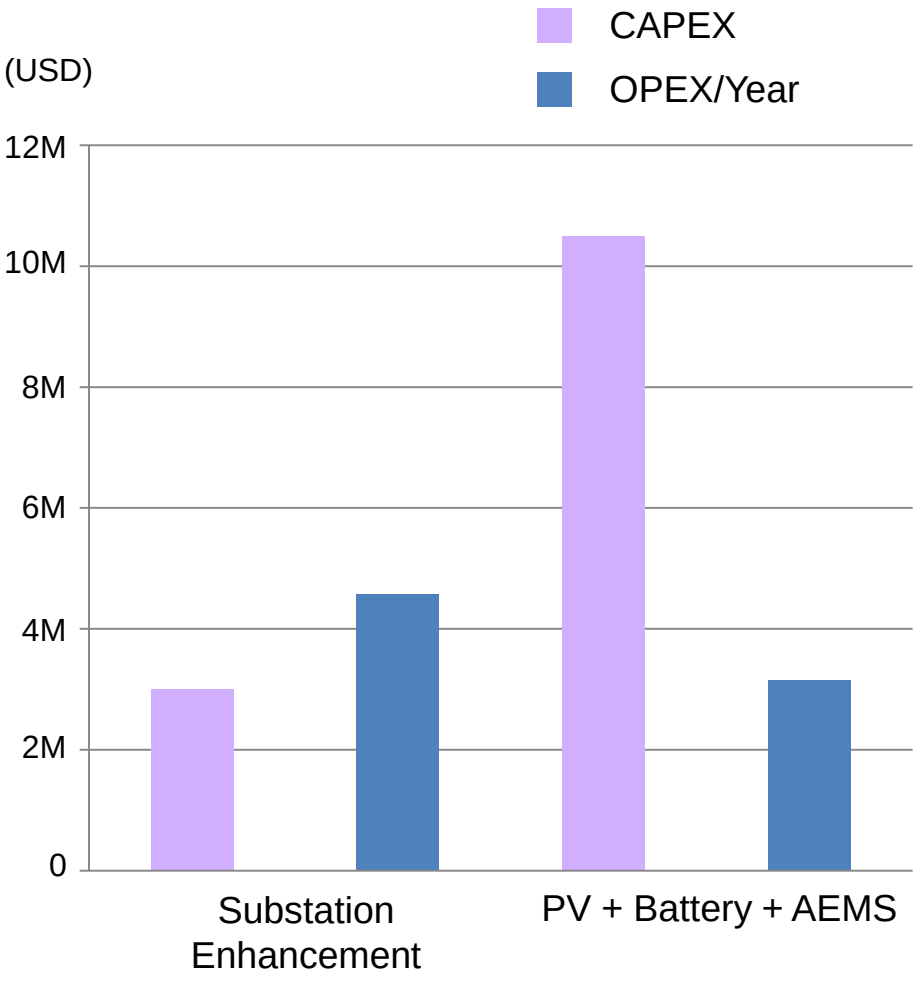
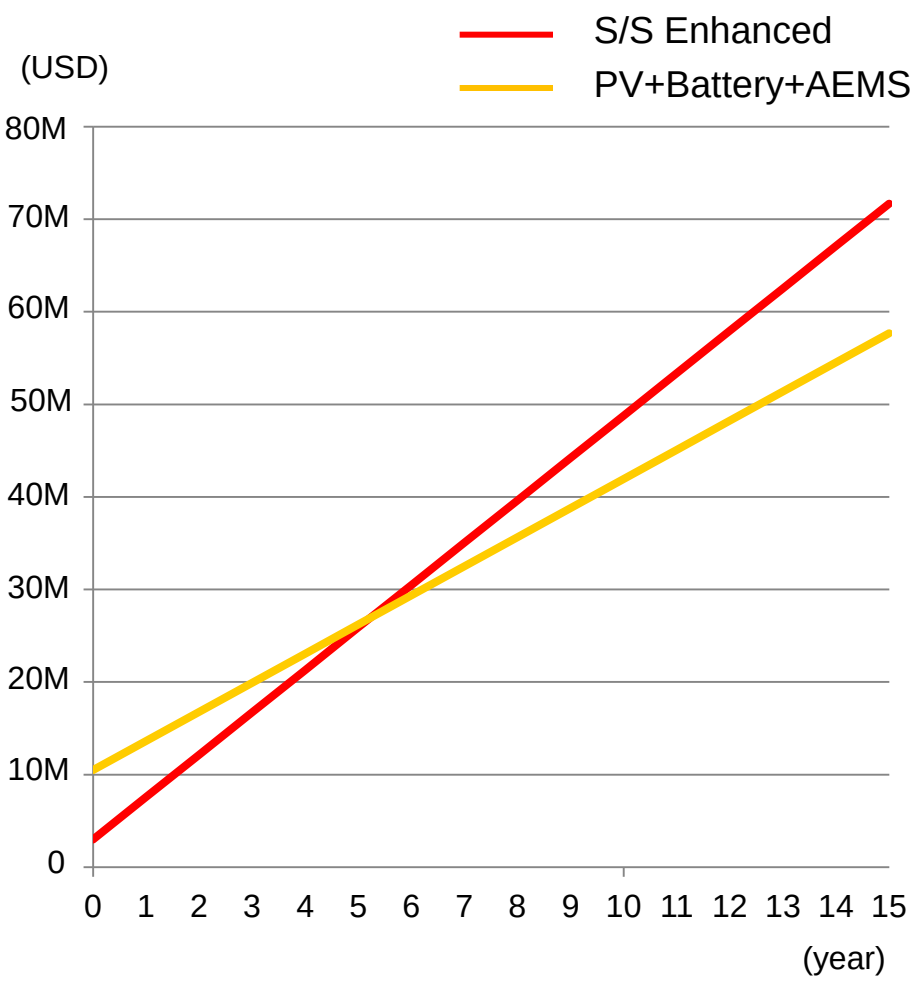
Cost Comparison between Substation Enhancement and PV+Battery+AEMS





4-1. Outline of Hitachi Rail Business

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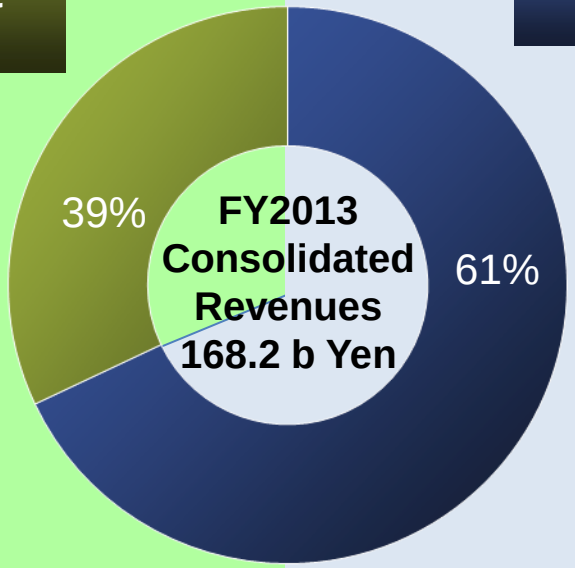
- **The sole total rail system integrator in Japan**
- **Annual Revenue of 168.2 billion Yen**
- **Focus on Europe, China, and Emerging markets**
  (Brazil, India, and Southeast Asia)

Transport management & control systems

Traffic management systems/
power management systems

Signaling /
Train control systems

Power supply systems



Rolling stock systems

Express

High-speed

Monorails

Commuter / Metro

Traction System

Air-conditioning
equipment

Maintenance service

4-2. Human Behavior Analysis Solutions

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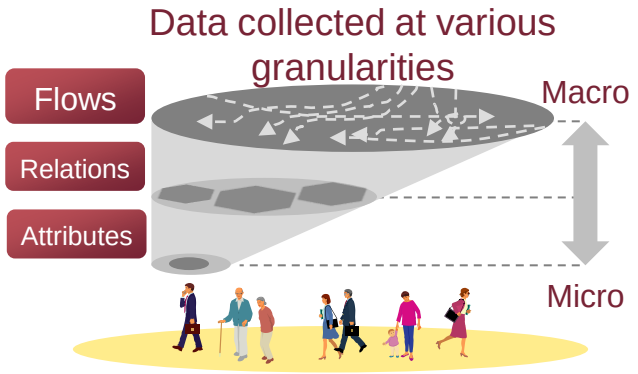
Human behavior is made visible and analyzed from various perspective in accordance with the objectives. Total support, from acquisition to application, is provided for data related to people.



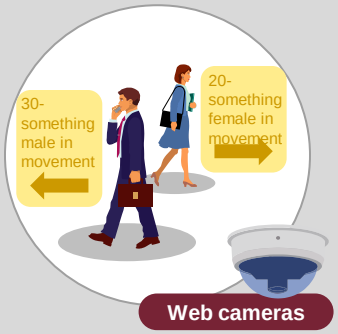
Visualization of "Flows"

- Flow of people
- Passage frequency
- Stagnant locations
- Amount of people
- Behavior, etc.

Visualization of "Relations"

- Individual behavior
- Communication
- Interpersonal connections
- Group formation, etc.

Visualization of "Attributes"



- Gender
- Age group
- Amount of people
- Movement direction, etc.

Cross-analysis with Peripheral Information

Utilization of the data possessed by Hitachi and partners.
Cross-analysis with regional and related information serves to expand the breadth of data utilization.

Secure Meister Support

Having expertise in the flow of people, the Data Analytics Meister can provide support for high-level data analysis.

◀ Macro ····· Data that can be collected ····· Micro ▶

4-3. Road Transport Management Solution

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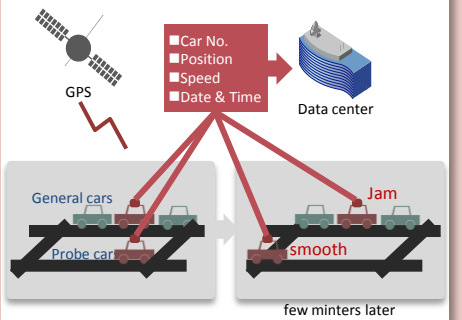
Perceive real time traffic situations by low investments and short term system construction.
Utilize quantitative traffic data as a means of dynamic traffic control and efficient road planning.

Collect Traffic information

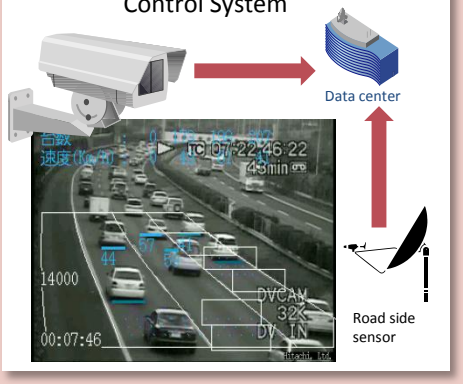
Probe System

Traffic Data Collection and Processing



Traffic counter

Road Surveillance and Control System

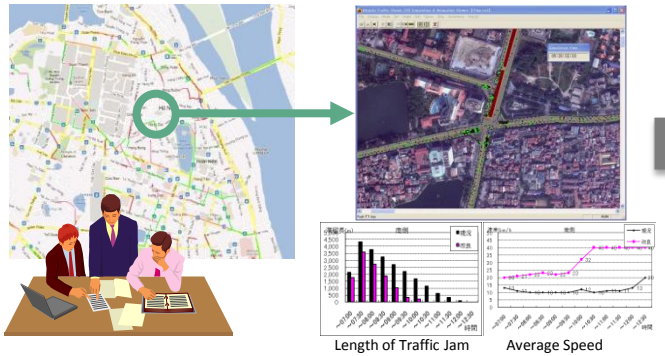


Planning and Control

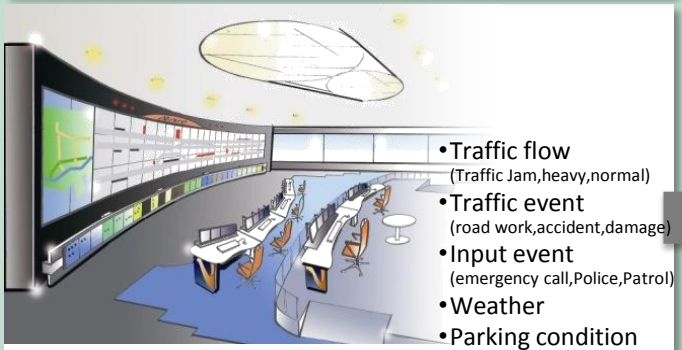
Transport Planning

Visualization of Traffic Jam information

Simulation



Traffic Control(Real-time)

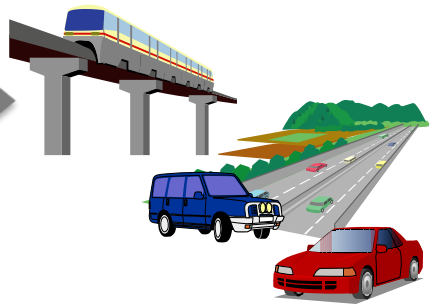


- Traffic flow (Traffic Jam,heavy,normal)
- Traffic event (road work,accident,damage)
- Input event (emergency call,Police,Patrol)
- Weather
- Parking condition information
- Traffic prediction

Infrastructure and System Improvements

Develop infrastructure

Infrastructure Construction
- Road Construction
- Public Transport



Provide Traffic information

- VMS (Variable message sign)
- Web (PC,Smartphone)
- Police,Fire works

5. Hitachi's Intelligent Water System

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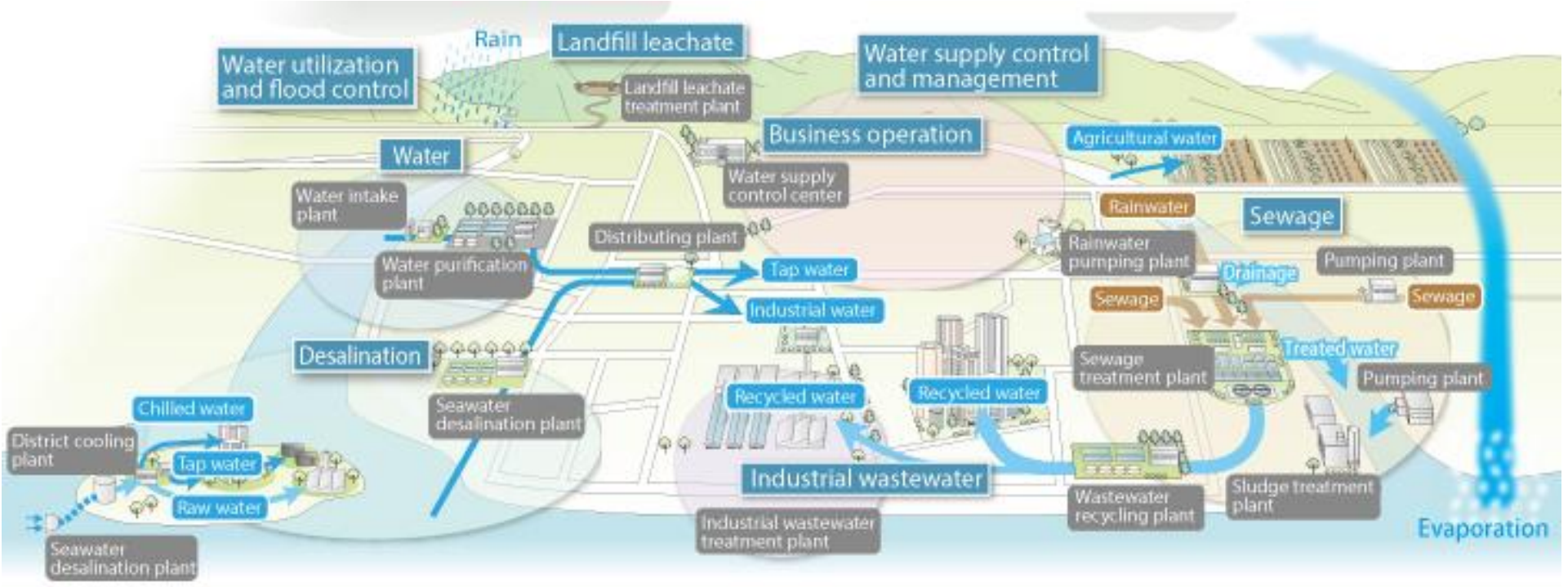
Intelligent Water System to contribute to the creation of safe, secure and comfortable water environment.



6. Challenges

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- How to measure performance
  - Value for money? Quantitative or qualitative?
  - Energy efficiency? CO2 emission?
  - QOL? Productivity?
- How to Finance
  - PPP?
  - Government / Public Sector role is critical
- How community stakeholders to be inclusive
  - Close consultation is key
  - Public parties should be the leader
- How to manage risk
  - During whole life cycle of city development
  - Relationship between parties with trust and respect

ADB's Support is Welcome


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