環境未来都市・横浜の都市づくり
Urban Development of “FutureCity” Yokohama

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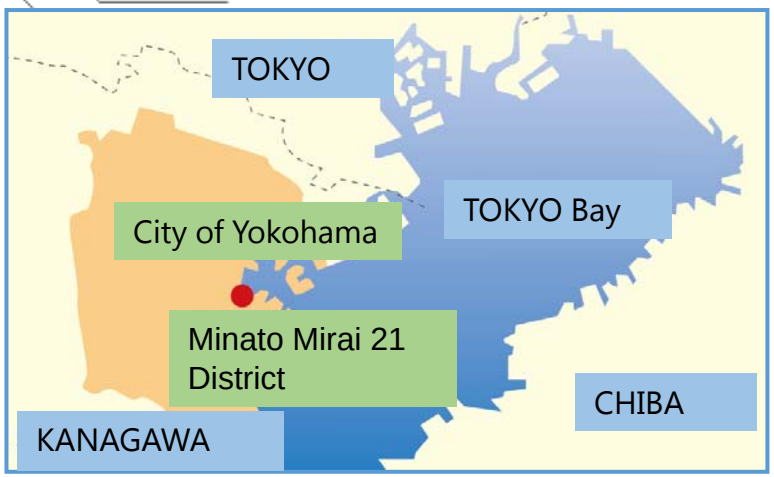
Yokohama, a City Selected Worldwide

"FutureCity"Yokohama

- **Ranked No. 1 among cities in terms of the willingness of residents to live there** (Regional Brand Survey/Brand Research Institute, Inc.)
- **Ranked No. 3 in terms of desirable cities in which to live** (Desirable Cities in Which to Live 2017/Recruit Sumai Company Ltd.)
- In 2016**, a record 81 million people came to the Minato Mirai 21 Area**
- Selected as a case study city for the "Sustainable Urban Development Policies in Aging Societies Project" conducted by **the OECD**
- Awarded a Special Mention at **the Lee Kuan Yew World City Prize**
- Received an Energy Smart Community Initiative (ESCI) Best Practices Award from **APEC**
- Won the **C40 Cities** Award 2016 for "Clean Energy"

Yokohama Overview

- Area: about 435 ㎢
- Population: about 3.7 million
  (second-highest nationwide,
  after the Tokyo Ward area)
- Number of business establishments:
  about 120,000
  (fourth-highest nationwide)
- Number of employees:
  about 1.42 million
  (third-highest nationwide)



Yokohama,
one of Japan's
leading cities

1. Challenges that Yokohama has overcome
2. Challenges that currently confront the city
3. Steps being taken in the environmental field to help resolve such challenges

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History of Yokohama

"FutureCity"Yokohama

1859 Port of Yokohama Opened

Initially：Small Village
→Yokohama became Japan's international port town.

1923 Great Kanto Earthquake

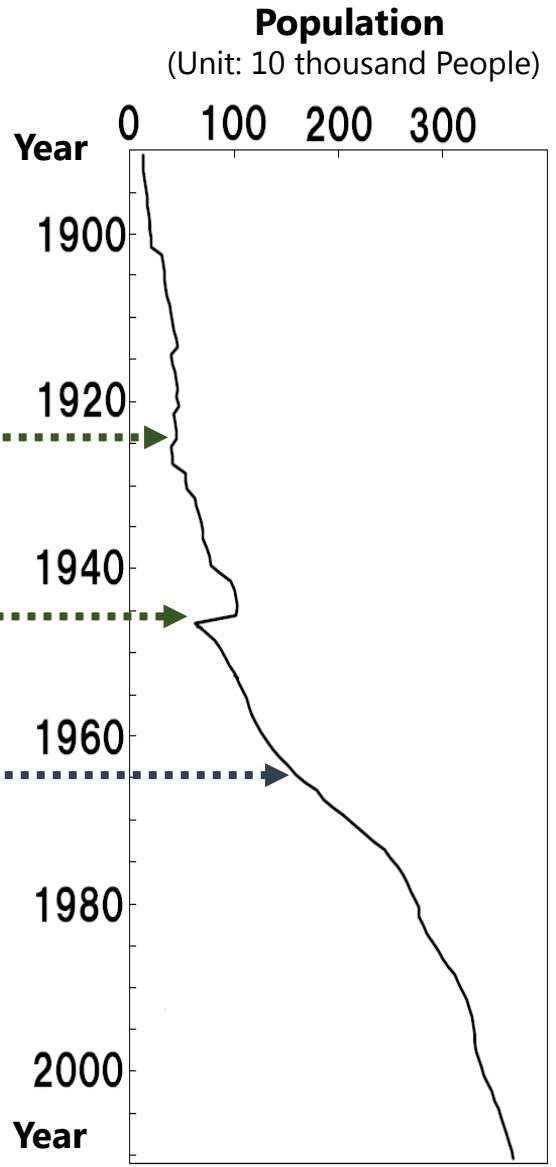
Yokohama sustained devastating damage, but through the recovery efforts, the fundamental framework for today's urban area was developed.

1945 Bombing of Yokohama

Key areas in central Yokohama were occupied by the US forces.

1965- Economic growth

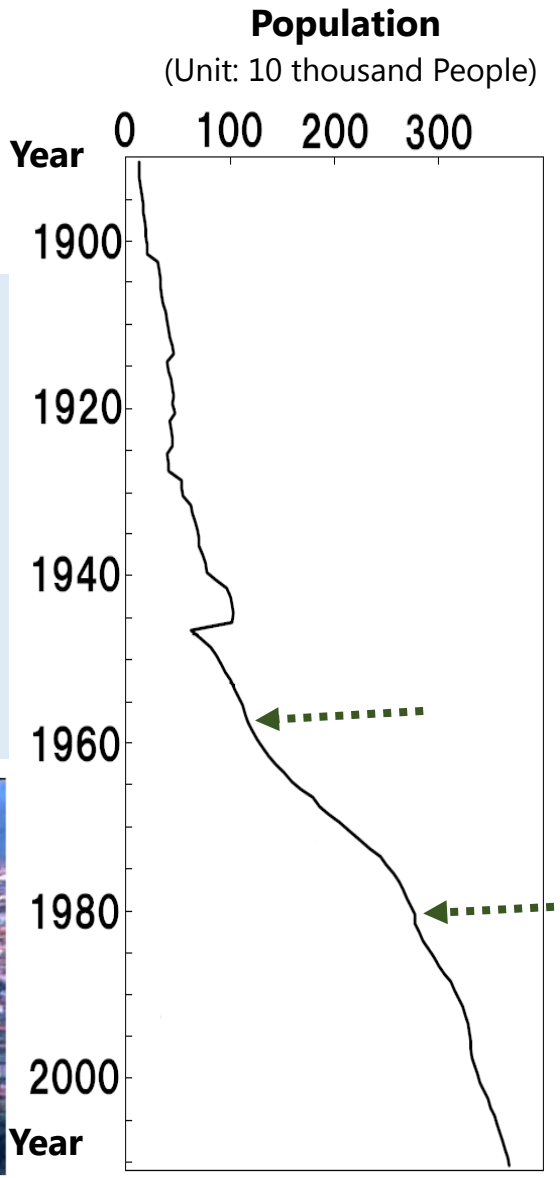
Migration from rural areas →urban sprawl
→ **Rapid deterioration of residential environment**



Population doubled in the 20 years

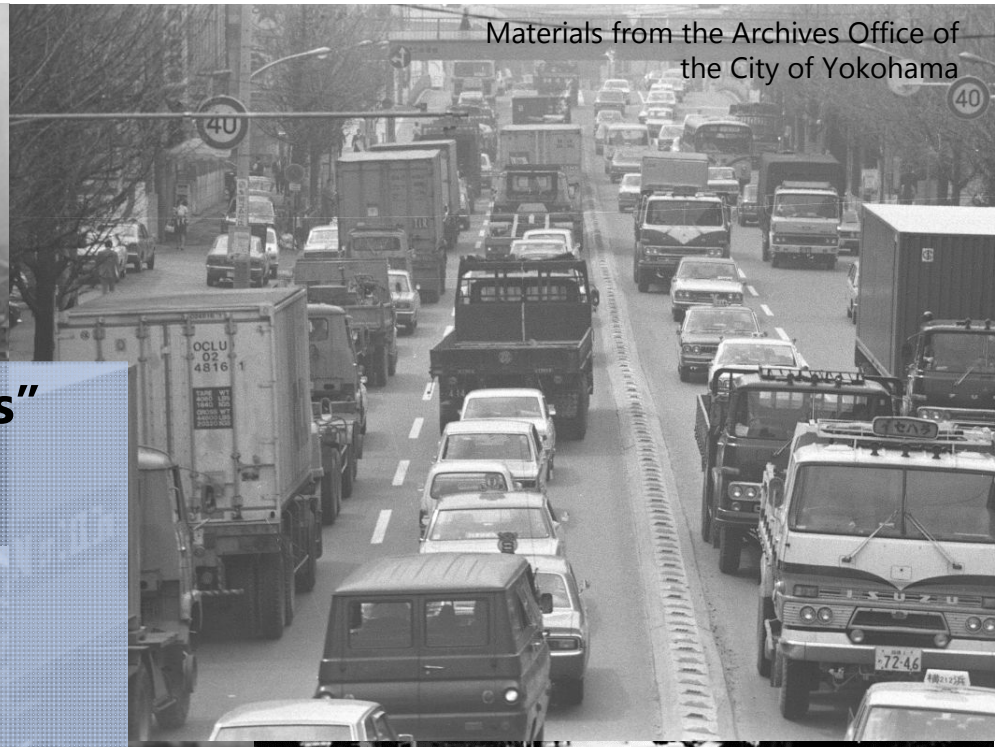
from 1960 to 1980 (from 1.37 million to 2.77 million people)

1. Housing problems, indiscriminate development
   (rising urban sprawl, a dramatic reduction in greenery)
2. Slowness in developing social assets
   (schools, roads, sewers)
3. Environmental problems
   (urban waste,
   mixing together of residential and industrial areas)



Yokohama's "5 Major Challenges"

"FutureCity"Yokohama



Materials from the Archives Office of the City of Yokohama

Yokohama's "5 Major Challenges"

- Environmental disruption
- Waste
- Roads and Traffic
- Water Resources
- Public Areas

Transportation Bur[illegible] of the City of Yokohama

Yokohama's "6 Major Projects"

"FutureCity"Yokohama

Yokohama's "6 Major Projects"

- Reinforcement of Central Urban Area
- Land Reclamation of the Kanazawa Ward Shore
- Kohoku New Town Development
- Installing a high-speed railway
- Building a highway
- Construction of the Yokohama Bay Bridge

An example of public and private cooperation

"FutureCity"Yokohama

J-Power Isogo thermal power station

Growth of advanced environmental efforts through public and private cooperation to achieve strength

Japan's first pollution control agreement between a municipality and a corporation

The prevention of pollution is being promoted by the City of Yokohama through its closure of an agreement with a private corporation for stricter pollution control criteria than those set by the national government.

Currently, as an environmental protection, including measures for greening and those against global warming, the City has agreements with more than 20 businesses in various industries, promoting revitalization of the economy and preservation of the environment.

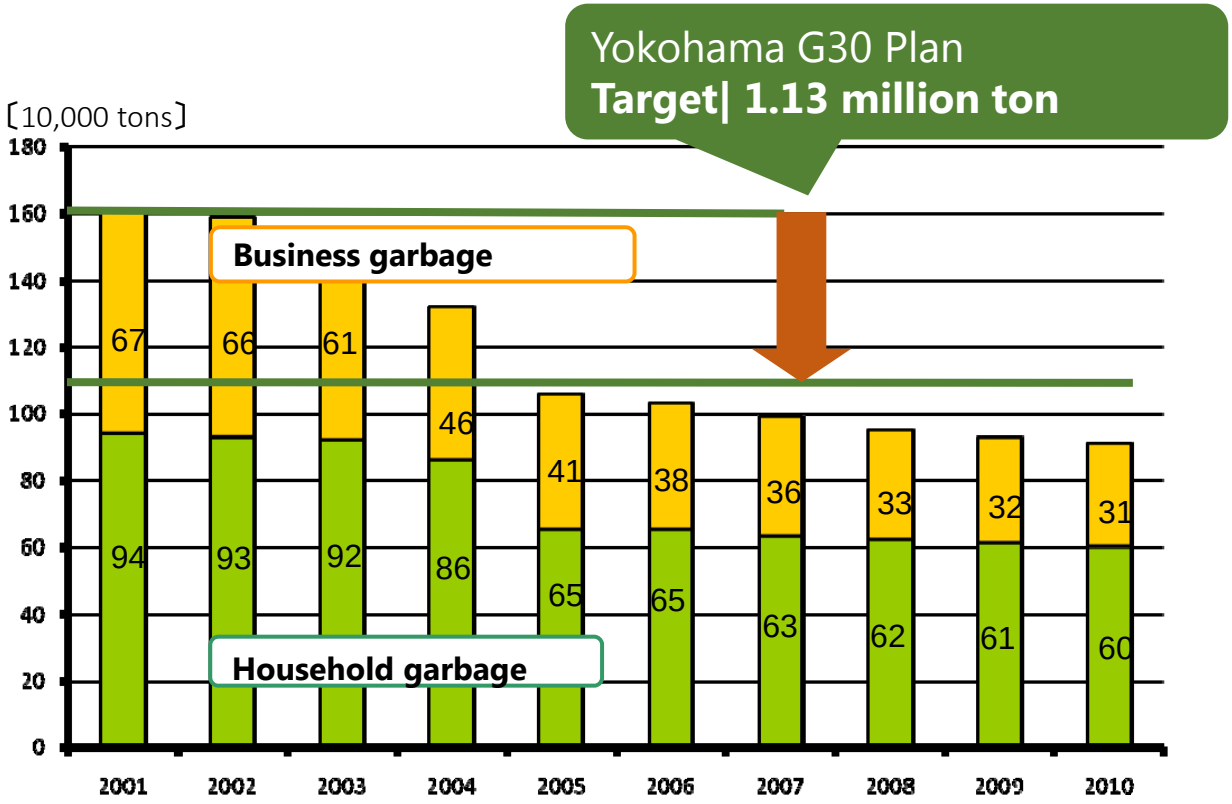
Photo: J-POWER (Electric Power Development Co., Ltd.)

For environment Improvement “Yokohama G30”

“FutureCity”Yokohama

Problem | Waste emissions increasing faster than population

Target | Cut waste emissions by 30% by 2010 (from 2001 level)



Urban Development in Yokohama

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1970 | Green Coverage approx. 50%

1980| Green Coverage approx. 40%

2009| Green Coverage approx. 31%

The Yokohama Green-Up Plan

Forest Conservation

Farmland Conservation

Greenery Promotion

Yokohama Green Tax

Individuals: 900 yen per year in addition to residential tax
Companies: 9% of the annual corporate inhabitant tax levy

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Challenges to Overcome for Yokohama's Future

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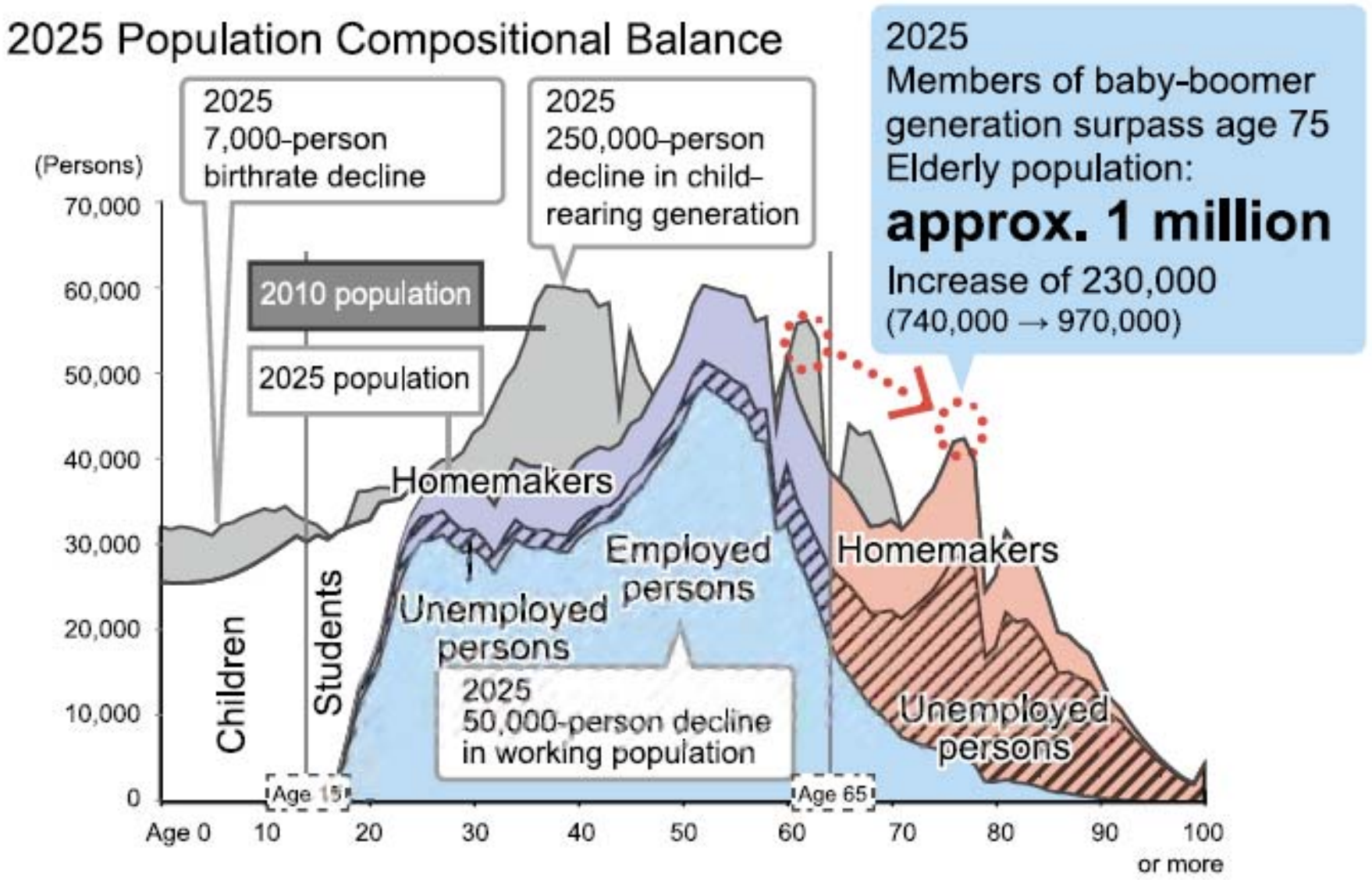
- Declining Birthrates Combined with Aging Population and Shrinking Working-age Population
- Degradation of Urban Instructure and Housing Stock
- Environmental and Energy-related Problems etc.

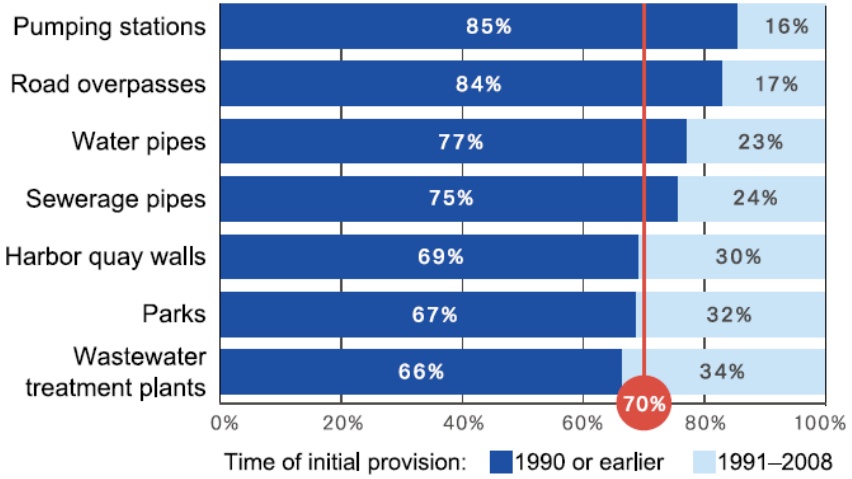
2025 Population Compositional Balance



Major Changes in the Urban Environment

"FutureCity"Yokohama

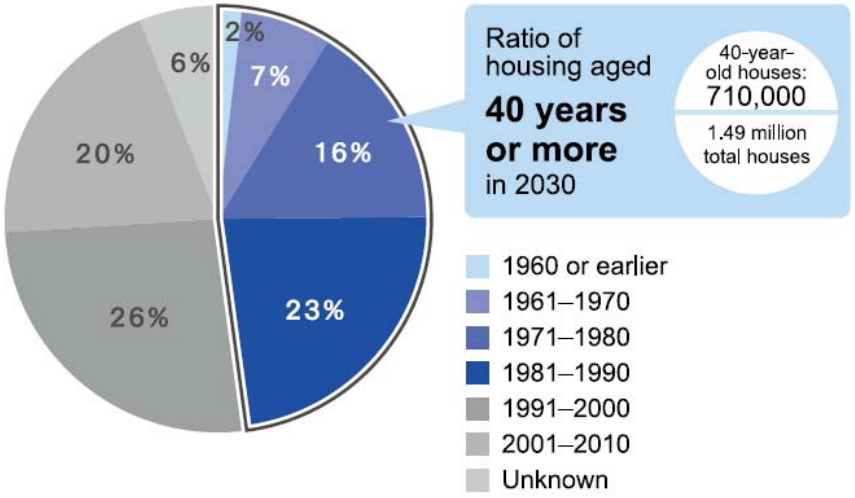
Degradation of Urban Infrastructure



By 2030, approx. **70**% of urban infrastructure will reach or surpass **40** years of age from time of initial provision

It needs **3.3 trillion** yen as maintenance cost for coming 20 years.

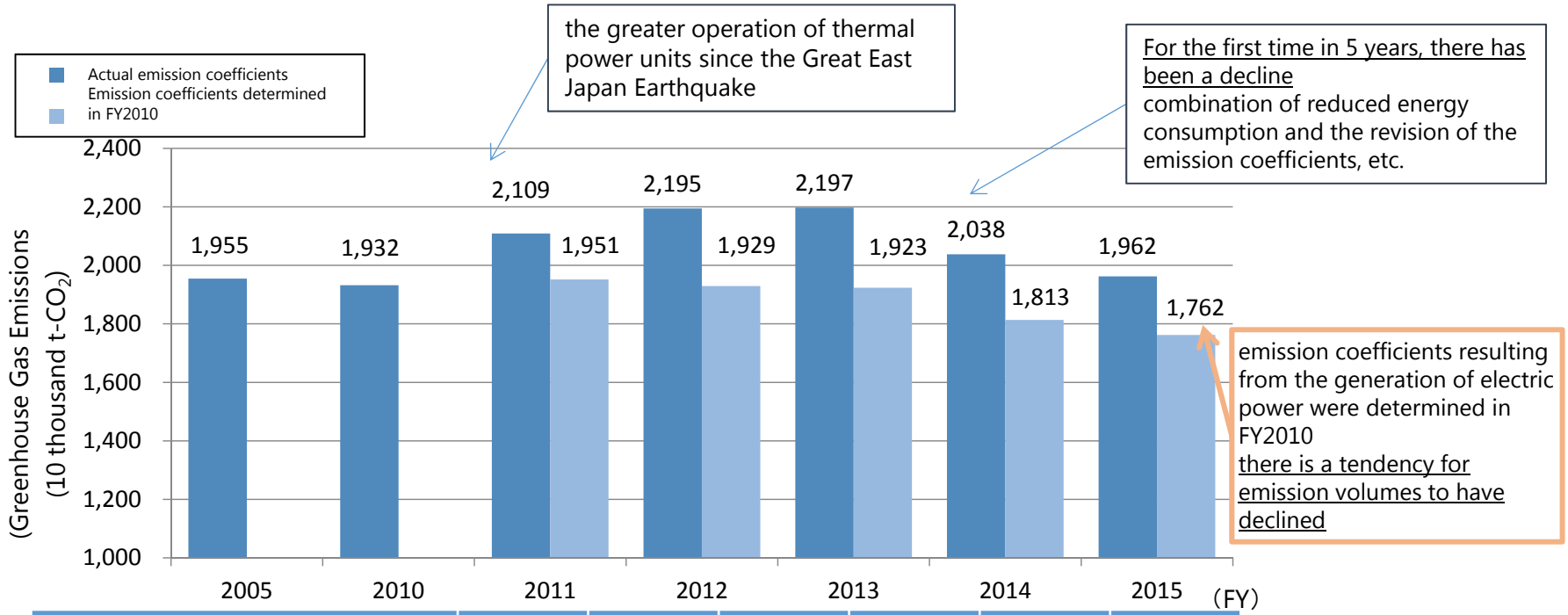
Degradation of Housing Stock



About half of the housing in Yokohama will reach at least **40** years of age by 2030

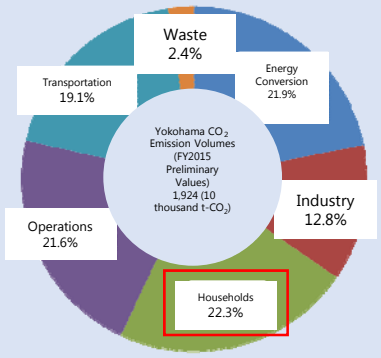
Yokohama's Greenhouse Gas Emissions

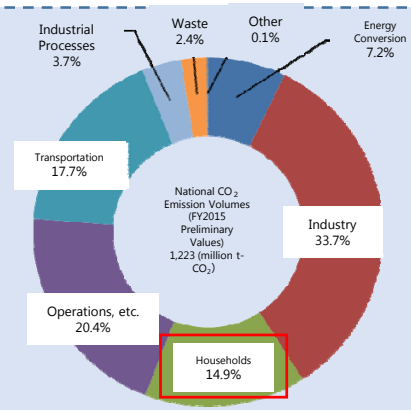
"FutureCity"Yokohama



FY	2010	2011	2012	2013	2014	2015
Emission Coefficients (kg-CO_2/kWh)	0.375	0.464	0.525	0.531	0.505	0.500

(Preliminary Values)





Comparison of CO_2 Emissions by Category

With a population of 3.73 million people, Yokohama is megacity

↓

Compared to the situation nationwide, the ratio of household CO_2 emissions is high

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International Developments

COP21
（December, 2015/Paris)

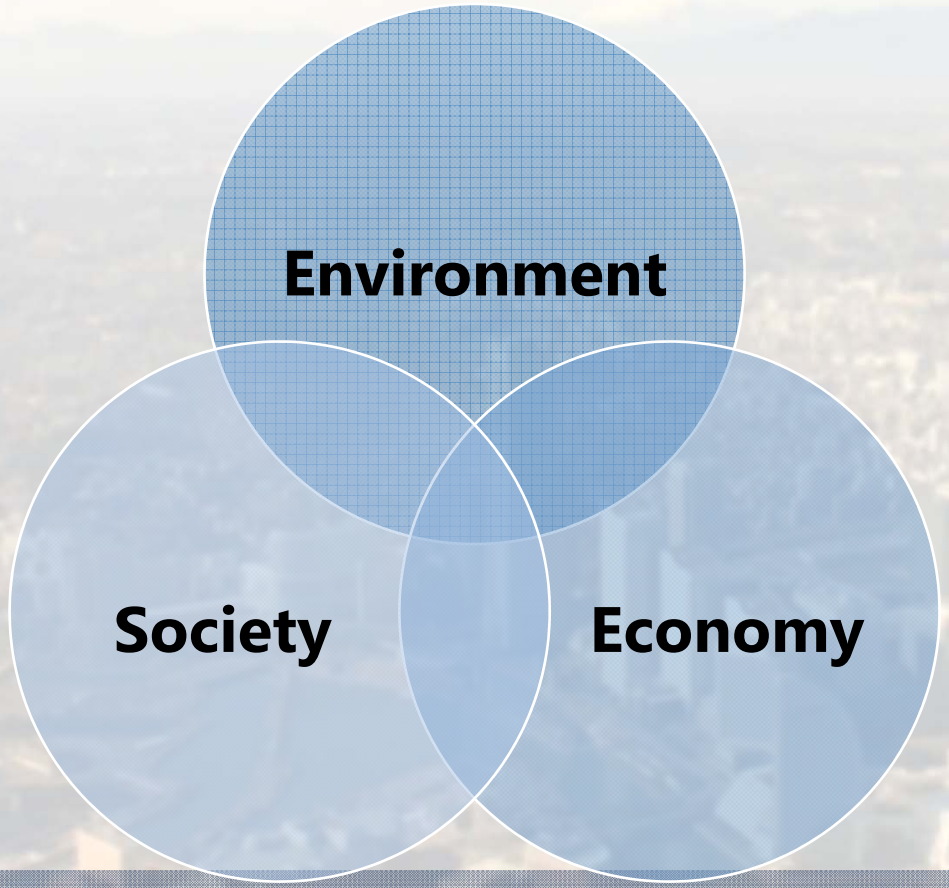
- In addition to aiming to cap temperature increases to a level “less than 2℃” above what was experienced prior to the Industrial Revolution, COP21 aims to keep working so as to cap the level of any temperature increases to “less than 1.5℃”

Sustainable Development Goals
(September, 2015)

- In continuing to promote economic growth as a means by which to eradicate poverty, while addressing on one-hand broad-ranging social needs such as social welfare and employment opportunities, steps are being taken to promote policies that act to address climatic change and environmental protection

FutureCity Yokohama

Vibrantly well balanced and prosperous city that everyone wants to live in



Increase the value of the city from the above 3 perspectives, and by doing so raise the quality of people's lives

Creating FutureCity

"FutureCity"Yokohama

Environment

Low-carbon Energy-saving

Create a smart city covering the entire city of Yokohama, greatly reducing CO2 emissions

Water/natural environment

Provide support for overseas deployment of water and sewage technologies / create rich environments in which people enjoy nature

Super-aging Society

Realize bonds that tie all generations together in the familiar and comfortable areas around them

Regional society vitalization

Creativity

Create cultural and artistic activity / an MICE city

Challenge

Reinforce growth industries through technical and management innovation in companies located in the city

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Target reduction for greenhouse gas emissions

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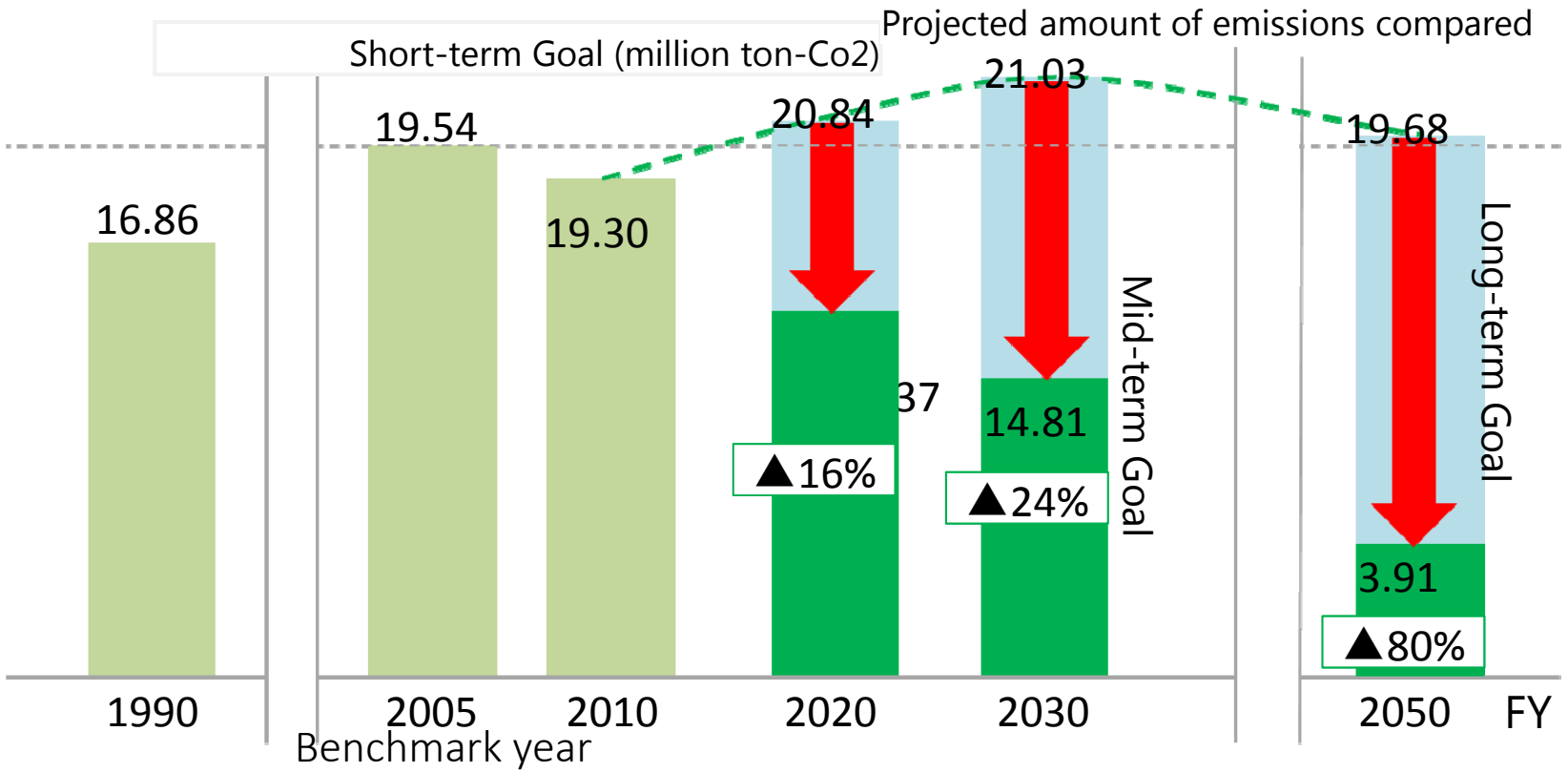
- Increase of GHG emissions

  Rapid population growth (3.5 times that of 60 years ago)

  →Population in Yokohama expected to increase until 2020

Estimated GHG emissions in Yokohama



Yokohama Smart City Project (YSCP)

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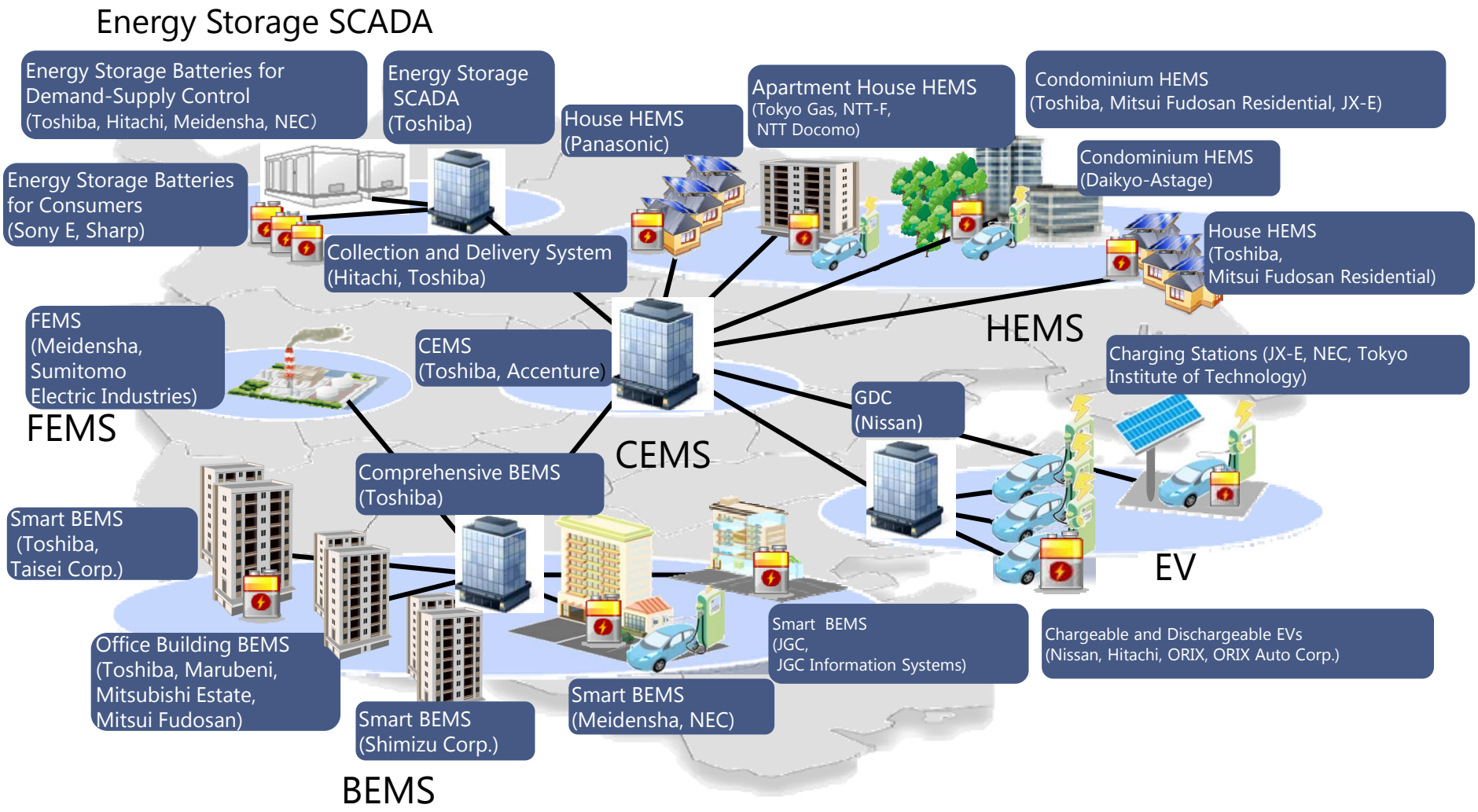
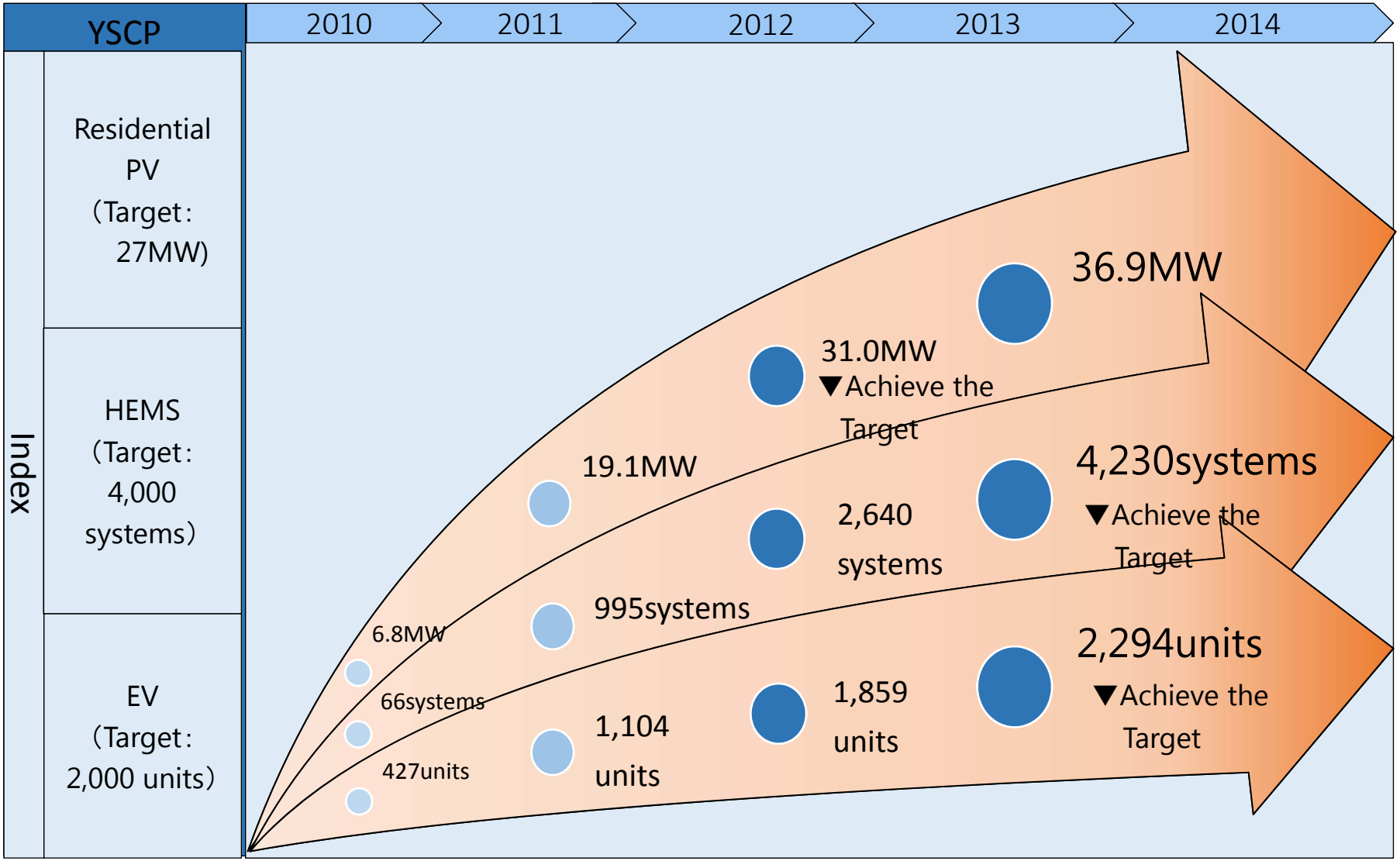
Goal（~2013）/ Result（2010~2014）
HEMS (Home energy management system) (4,200/4,000) PV（37MW/27MW) EV（2,300/2,000）



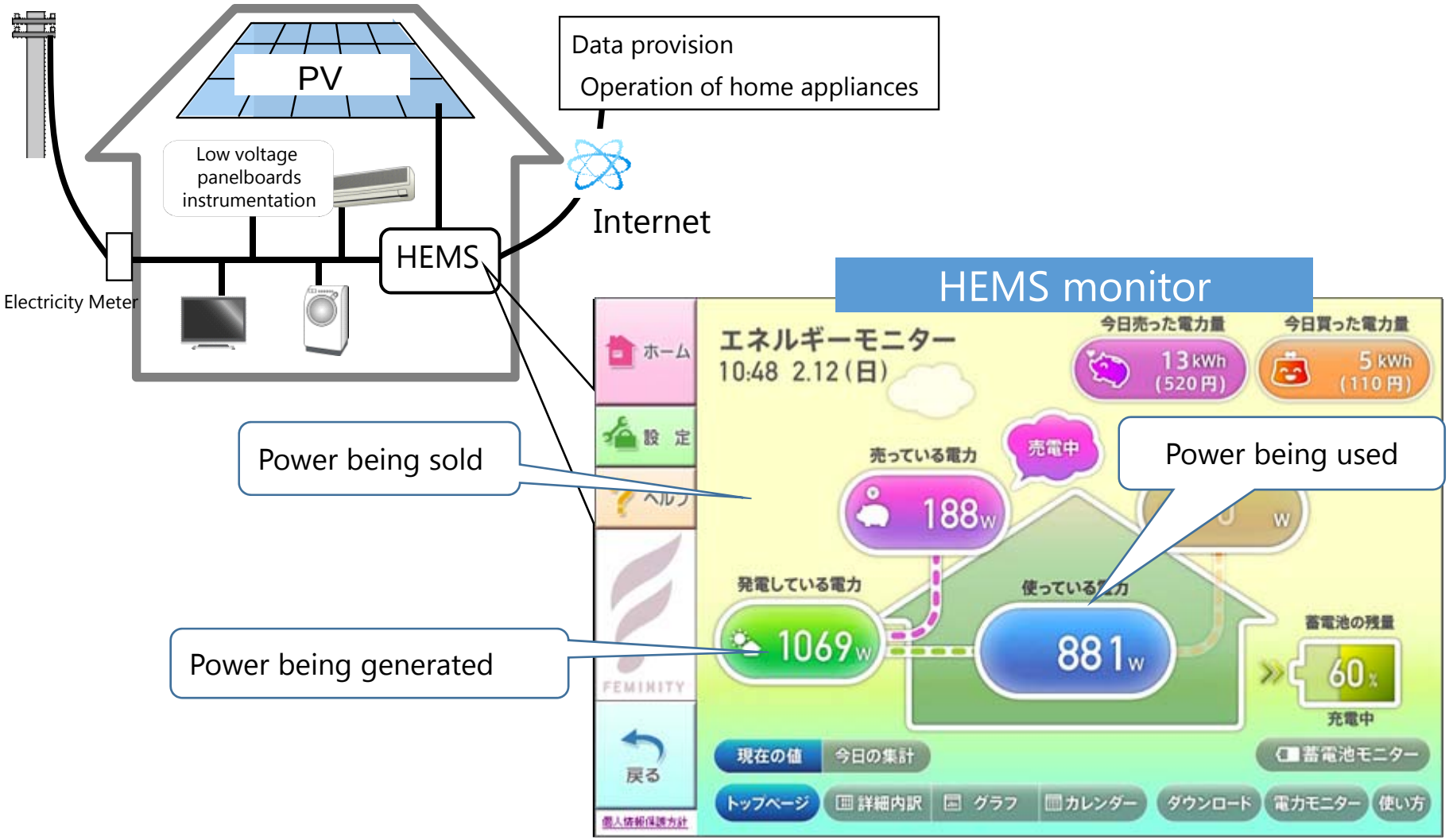
Whole Schedule and Status of Achievement



The Workings of Home Energy Management System

"FutureCity"Yokohama

Maximum peak saving of **15.2%** was confirmed with a demand response.



Home Energy Management System user residents

"FutureCity"Yokohama

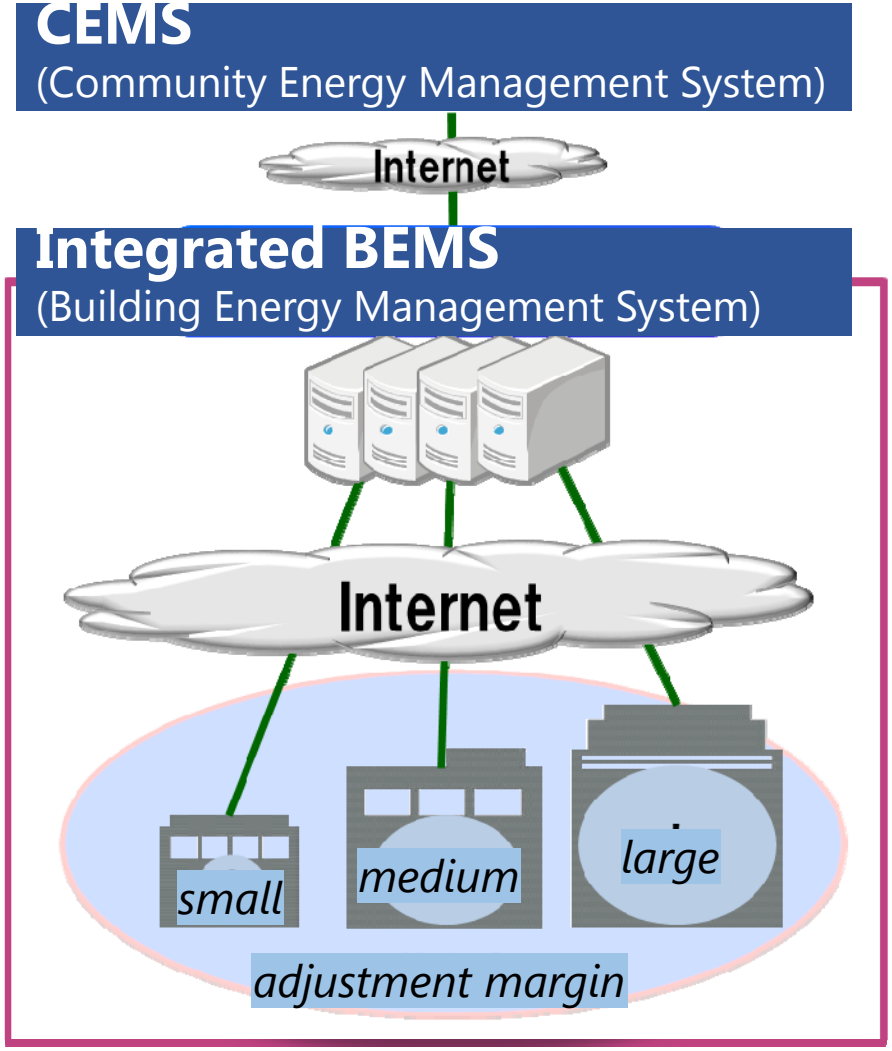
- This unnamed family pays close attention to energy-saving everyday
- The family joined the project on March 13, 2013, and installed an HEMS and PV power generation system.
- With the HEMS terminal, it is easy to understand the energy generated and sold because it is on display; it helped to raise awareness in the children."The children get excited to find the system 'selling' energy when they come home from school."
- The mother of the family also appreciates the benefits of the HEMS: "It helps me to realize how much energy I use when doing housekeeping activities like vacuum cleaning."

Working with these types of **citizens with high awareness**, Yokohama has achieved 4,000 cases of HEMS installations

The Workings of Building Energy Management System

"FutureCity"Yokohama

Maximum peak saving of **22.8%** was confirmed with a demand response.



Major facilities participating in the demonstration

Moving Towards the Implementation of the YSCP

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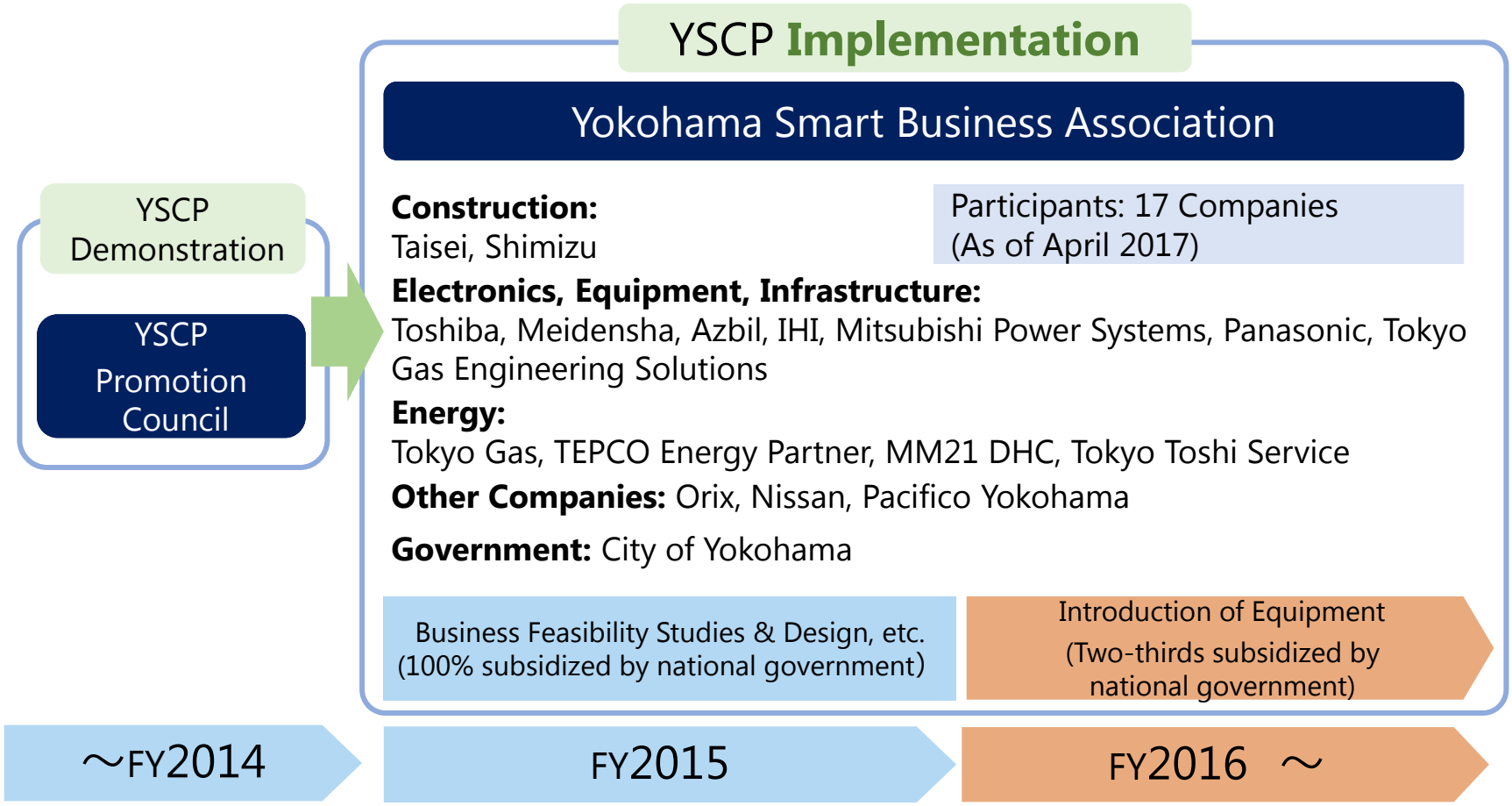
- To utilize the know-how developed through the YSCP demonstration, in aiming to realize an energy-circular city with excellent disaster-resilience, environmental performance and economic viability, a new PPP organization "YSBA" was established in April of 2015.
- YSBA is now undertaking the implementation of YSCP.



Virtual Power Plant Construction Business

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Tie-Up Between Yokohama, TEPCO Energy Partners and Toshiba

Establishment of storage batteries at elementary and junior high schools in Yokohama

For constructing "virtual power stations," a basic agreement concerning the "Smart Resilience & Virtual Power Plant (VPP) Construction Business" was concluded by the parties (July 6th, 2016).

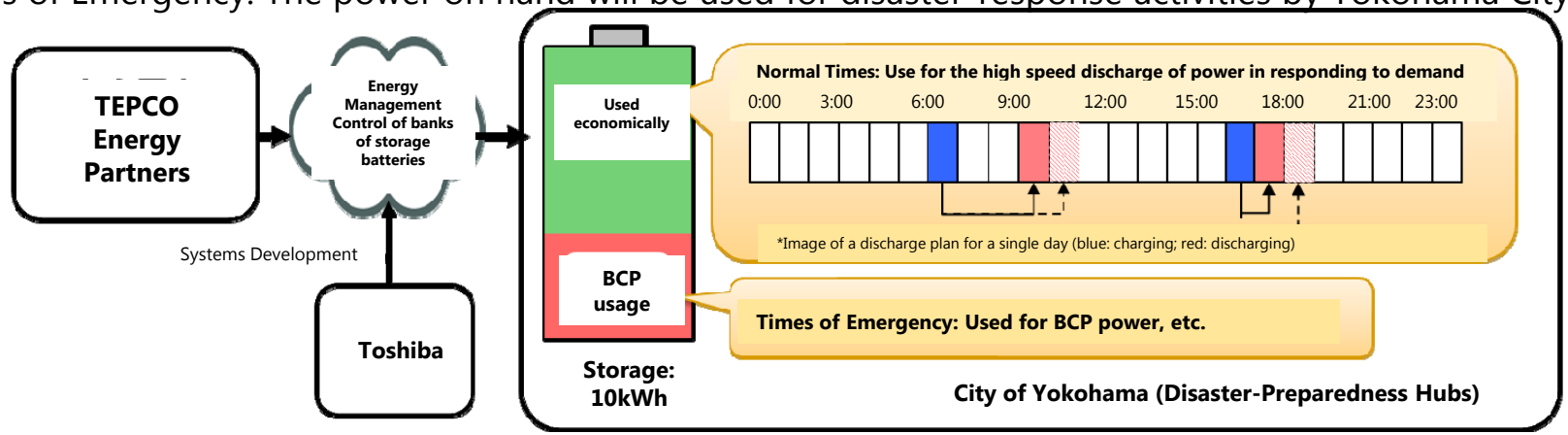
TEPCO TOSHIBA Leading Innovation OPEN YOKOHAMA

Project Details

Establish storage batteries in the grounds of elementary and junior high schools in Yokohama, locations designated as disaster-preparedness hubs.

Normal Times: TEPCO Energy Partners will use these facilities to regulate power supplies.

Times of Emergency: The power on hand will be used for disaster-response activities by Yokohama City.



Low Carbon Hydrogen Pilot Project

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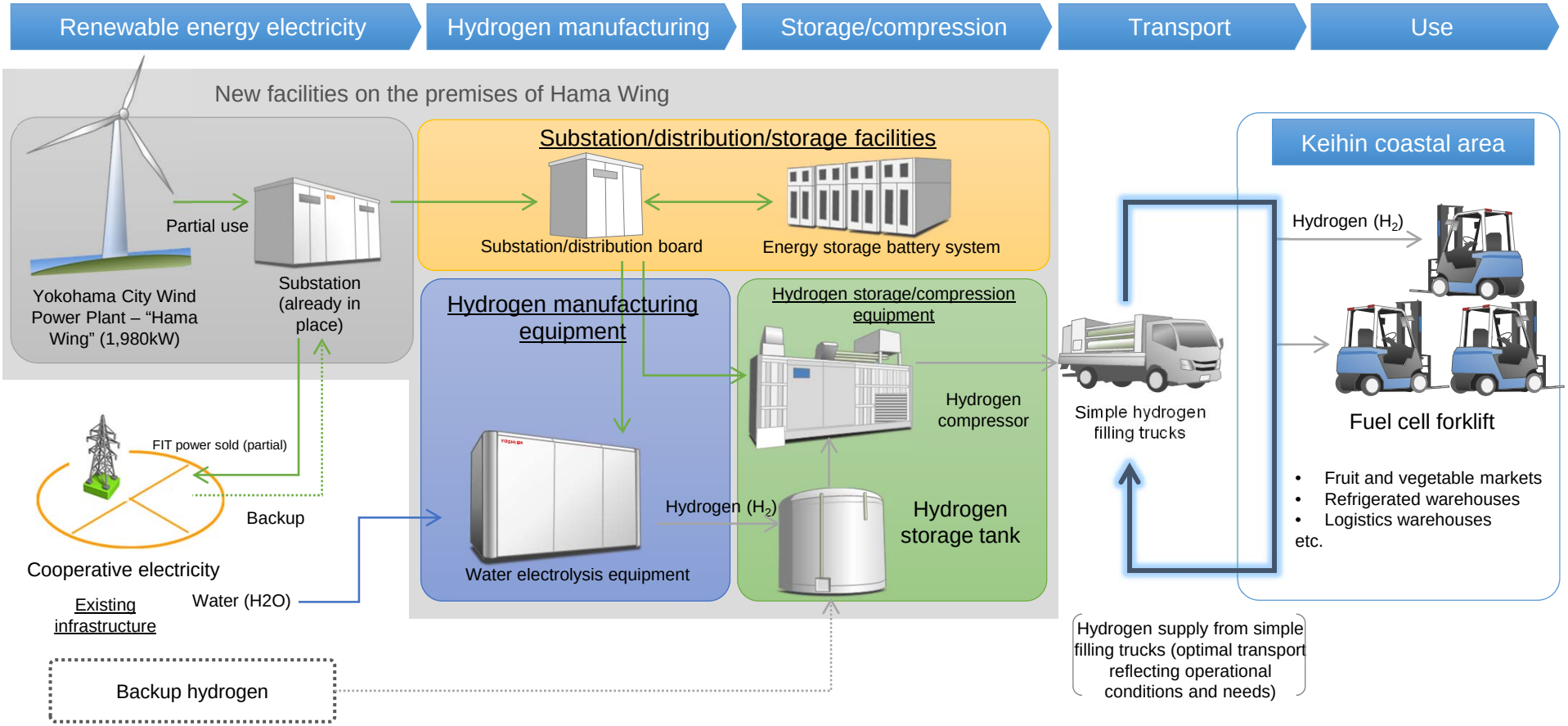
We are considering introducing this technology in the Keihin coastal area through a partnership between related companies and municipalities.

- In addition to CO_2-free hydrogen manufacturing using electricity generated by the Yokohama City Wind Power Plant, we will launch an initiative to build and demonstrate an integrated system from storage to transport to use.
- Our aim is to contribute to future regional development and global warming countermeasures.



Community energy management based on specified supply

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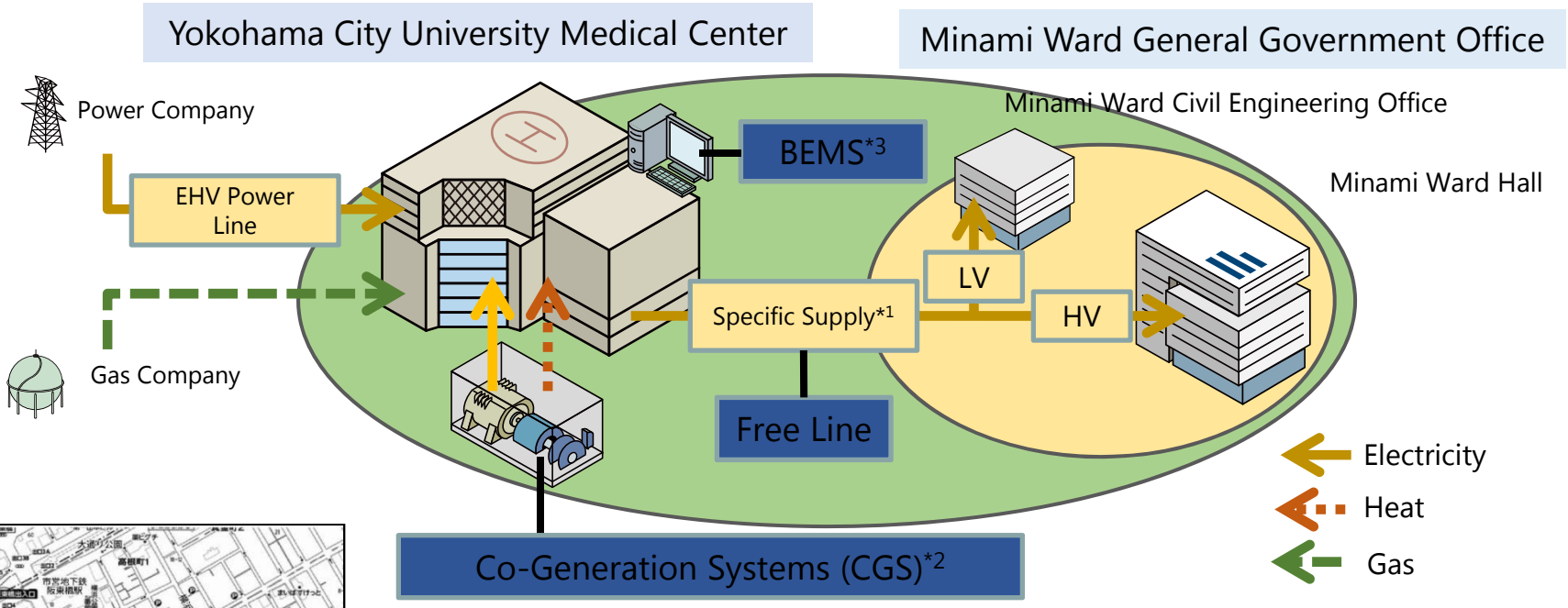
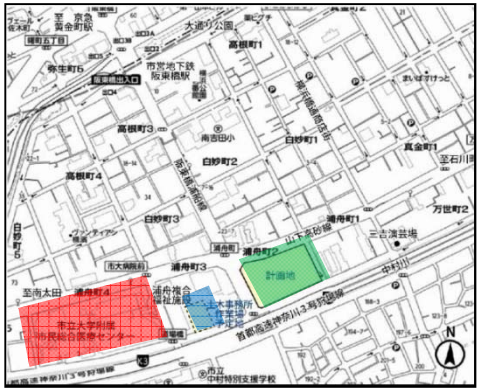
- Disaster-preparedness will be improved through energy cooperation between hospitals and the new ward hall.
- While both introducing co-generation and undertaking highly-efficient operations, steps will be taken to utilize waste heat, to reduce CO_2 emissions, and to reduce costs.
- Obsolete heat sources will be replaced, and optimized energy control achieved through BEMS.





*1 Specific Supply | Electricity is supplied to specified partners with close ties.
*2 CGS | While gas engineering is used to generate electricity, the heat resulting from such processes is utilized to regulate the demand such as air conditioning.
*3 BEMS | Using BEMS, waste heat is used effectively and regional energy controlled in an optimized manner.

Tie-Ups with Various Stakeholders

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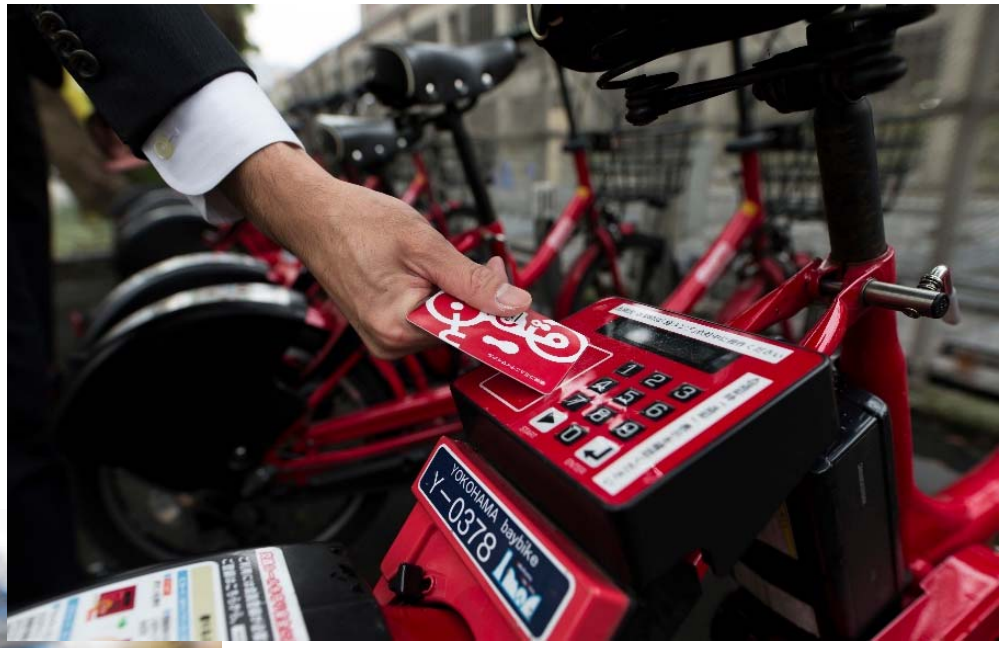
Establishment of a mobile hydrogen filling station at IKEA's Kohoku store

Operation of Choimobi Yokohama

Cooperation with C40 and ICLEI

Participation in Earth Hour

Conclusion



Smart Illumination Yokohama 2016 // Photo：AMANO STUDIO