

INTRODUCTION

The city of Yokohama was first established just 150 years ago as a sleepy hamlet of just 100 homes. Today, or 150 years later, the city has grown into one of Japan's largest municipalities with a population of about 3.7 million. The Port of the first in modern Japan to open its doors to foreign trade. Yokohama's DNA has been imprinted with the ideal of "Openness". "Openness" here means that the city has been receptive of many ideals and has constantly incorporated these ideals to produce new concepts and visions. Since the start of its history, Yokohama has incorporated a wide range of technologies and cultures acquired through to help the city achieve growth. For the last 150 years the city has also coped with natural disasters, war and explosive population growth, making it only one of the few major cities in the world to have dealt with and overcome these

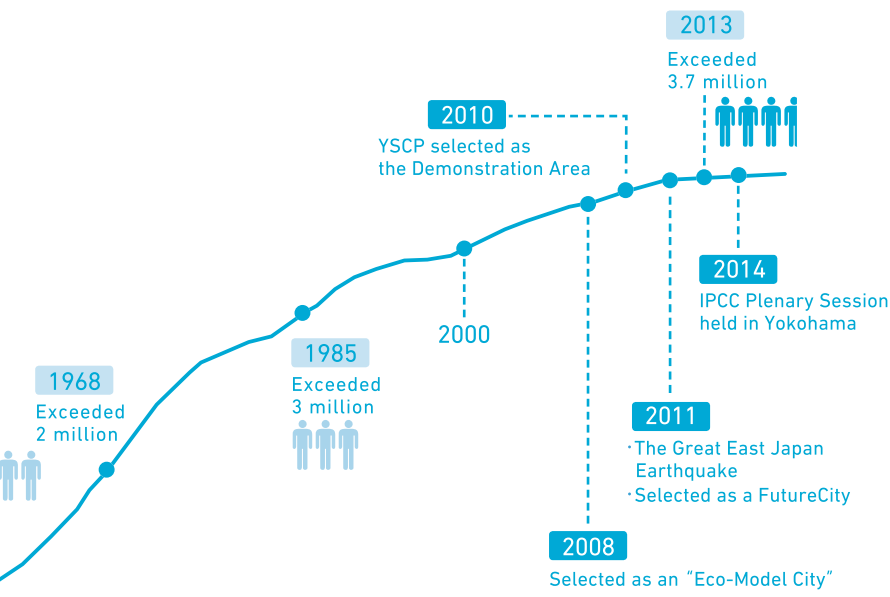
challenges. The history of Yokohama has been one of sustainable urban planning. Today, Yokohama is faced with even greater challenges, such as the rapid aging of its population and energy issues in the wake of the Great East Japan Earthquake. Under these circumstances, Yokohama was selected to be a "FutureCity" by the national government. In this capacity, it is making an all-out effort together with its citizens to tackle social issues such as super-aging society and reduction of CO₂ emissions as well as economic growth. At the same time, the city believes that its mission and role in history in this the 150th anniversary since the opening of the Port of Yokohama is to deliver its long-standing expertise in sustainable development grounded in the universal concept of "Openness" to Japan, including the disasters-stricken areas, and the world.

Yokohama's Climate Change Prevention Measures

Yokohama's most recent major climate change prevention measures for sustainable city development

- 2003.01 Formation of the Yokohama G30 Plan (Goal to reduce waste by 30% was achieved in 2005. In 2009, waste was reduced by 42%)
- 2008.07 Selected as an "Eco-Model City"
- 2008.10 Participated in C40 (see page 11)
- 2009.07 YES opening (see page 10)
- 2010.01 YGV project launch (see page 9)
- 2010.04 YSCP selected as the Next Generation Energy Infrastructure and Social System Demonstration Area. (see page 5)
- 2011.01 Formation of the Yokohama 3R夢 (SURIMU) Plan
- 2011.03 Energy conservation awareness has increased since the Great East Japan Earthquake.
- 2011.03 Formation of the Yokohama City Action Plan for Global Warming Countermeasures
- 2011.12 Selected as a FutureCity (see page 3)
- 2012.10 Held Asia Smart City Congress
- 2013.03 Signed joint memorandum of agreement with Barcelona for cooperation as a Smart City
- 2013.10 Launched Choi-Mobi Yokohama, a one-way car sharing service (see page 10)
- 2014.03 IPCC Plenary Session held in Yokohama
- 2014.03 Revised Yokohama City Action Plan for Global Warming Countermeasures

HISTORY OF YOKOHAMA SUSTAINABLE CITY DESIGN



HISTORY

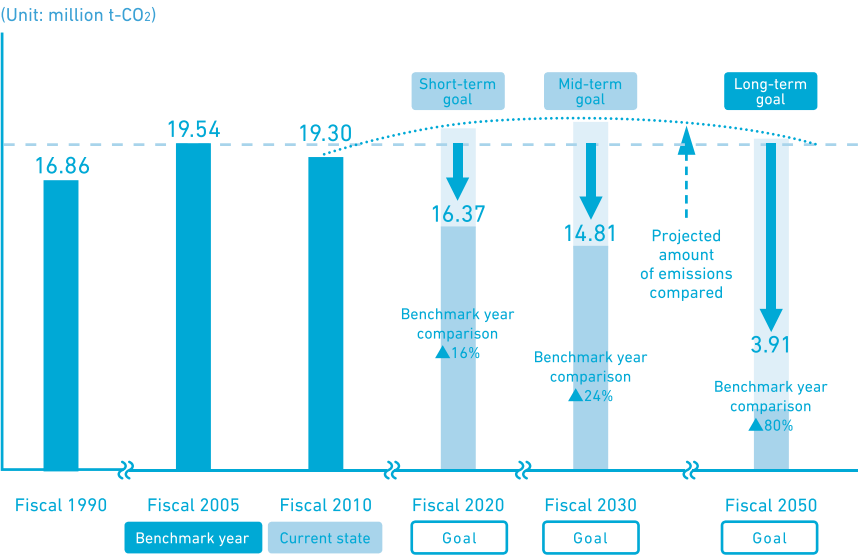
Yokohama City Action Plan for Global Warming Countermeasures

In Japan, it has been confirmed that flood damages caused by record rainfalls and incidences of heat strokes have increased due to global warming. In Yokohama too, the rise in average temperatures and the effects of the heat-island phenomenon are becoming increasingly more noticeable. We will work together with everyone in Yokohama, citizens and businesses alike, to implement anti-global warming measures in order to significantly reduce emissions of greenhouse gasses, so that we may pass on our limited resources and Yokohama's rich environment to the "future" that belongs to our children.

Basic policies of the plan

- Implement pioneering efforts that contribute to the making of the Future City and improve people's lives
- Build a low carbon and smart economic society that achieves a thoroughly efficient use of energy
- Promote local generation and consumption of energy to avoid excessive dependence on nuclear power generation or fossil fuels
- Disseminate a low carbon business model that leads Yokohama's growth and nurture related industries
- Proactively push forward reduction efforts that draws forth the power of citizens and the private sector

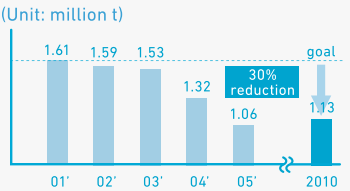
Ongoing targeted reduction for the amount of greenhouse gas emission



G30→3R夢(SURIMU)Plan

Five years ahead of schedule, the goal of the Yokohama G30 Plan, that is, to reduce waste by 30% by fiscal 2010 compared to fiscal 2001, was achieved through cooperation with citizens and business enterprises. At present, the city is promoting a decrease in the total quantity of refuse and recyclable resources based on the Yokohama 3R夢 (SURIMU) Plan, which emphasizes "reduce" (curtailment of derivation). "Reduce, Reuse and Recycle"

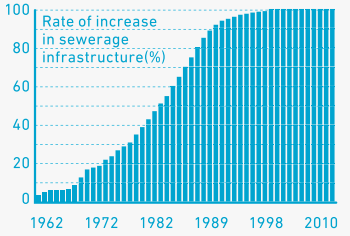
Garbage reduction performance of the Yokohama G30 plan



Rate of Increase in Sewerage Infrastructure

Since the period of high economic growth, population growth and rapid industrial buildup have lead to increased wastewater from homes and businesses, in turn affecting the water quality of rivers and the ocean. In response to the pressing needs of the community, sewerage systems have been put in place in short timeframes, which has also greatly benefited water quality.

Trend in rate of increase in sewerage infrastructure for this city



FUTURECITY YOKOHAMA

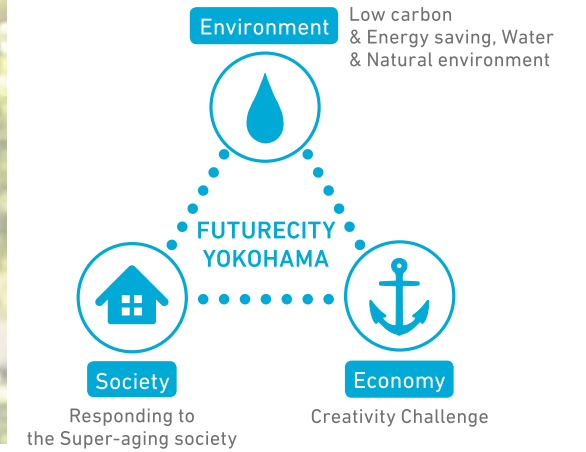


The FutureCity Yokohama initiative aims to create a vibrantly well balanced and prosperous city that everyone wants to live in by tackling diverse challenges including issues related to the environment and the super-aging society.

The population of Yokohama has grown by 3.5 times in the last 60 years, and the volume of energy consumption continues to increase accordingly. Moreover, in relation to the problem of the super-aging society, it has been estimated that the number of elderly people over the age of 65 will reach one million by 2029. In order to build a stimulating city amidst such a situation, it is

crucially important to revitalize the economy.

To comprehensively solve such issues, FutureCity Yokohama will focus its efforts on five areas, namely "low carbon and energy saving," "water and natural environment," "responding to the super-aging society," "creativity," and "challenge." The synergetic effect prompted by an improvement in those five areas will not only elevate the city's value in the three aspects of the environment, society, and economy, but it will also lead to the realization of a city that "everyone wants to live in," and "everyone is full of vitality," ultimately resulting in a higher standard of life.



Model project for a sustainable residential district project

Suburban areas are facing falling birth rates and population aging, and a number of other problems are also surfacing. Yokohama is taking diverse approaches for the development of communities in which all residents can continue to live in their familiar neighborhoods with peace of mind. These approaches are being implemented in four model zones: the northern side of Tamaplaza Station in Aoba Ward, the periphery of the Yokodai district in Isogo Ward, the periphery of Tokaichiba-cho in Midori Ward, and the area along the Sotetsu Izumino Line. In the zone

on the northern side of Tamaplaza Station, all sorts of projects are proceeding based on collaboration among local residents, Tokyu Corporation, universities, and other private enterprises and parties. These projects concern the building of communities in which different generations support each other, networks for childcare and child-raising, total district care systems for coordination in medical and nursing services, and resident-centered smart communities.

Minato Mirai 2050 Project

The Minato Mirai 21 district, which was built into one of Yokohama's showplace districts over a period of 30 years, constitutes a case of community development that deftly employs cultural and tourism assets, waterscapes, and greenery. This new project is aimed at further improvement, incorporating new elements such as energy-saving measures

and business-life continuity planning (BLCP) while applying the fruits of verification tests for the most advanced energy-related technology such as YSCP (see pages 5-8). Our goal is emergence of the world leading "FutureCity" district, one that will enthral the world with a focus on factors such as energy, mobility, activity, ecology, and ICT.

Resident creation project
This project is aimed at the development of vibrant and rewarding communities where different generations of residents support each other. The local residents are leading efforts to collect proposals for projects and support their implementation.

Project for energy conservation in the home
This project involves whole communities in the conservation of electricity and other forms of energy, and it reduced CO₂ emissions in fiscal 2013 by an amount equivalent to that absorbed by 4,700 cedar trees.

Greenery to bequeath a pleasant environment to coming generations

Safe, environmentally friendly, and economical energy

Community activities that stimulate the creativity of residents

Mobility to assure free movement and encourage urban activity

Project for a Yokohama for elderly people playing an active role

Aspiring to be a vibrant society that allows all members to remain fully active, Yokohama is striving to help citizens enjoy themselves while improving their health and taking part in society on an ongoing basis. The project acts to promote health and prevent the need for nursing through, for example, a scheme for accumulation of points along with related activities. November 2014 will see the start of the Yokohama Walking Point Program for promotion of health through walking.



Smart residence and smart way of living project

This project aims to diffuse energy-saving homes and lifestyles that meet the needs of environmental issues and the super-aging society by using the point of view of "dwelling," which is the basis of civic life. Models have been created for applying eco-renovations to existing houses and we also hold consulting sessions on how to introduce energy-saving measures to people's homes.



Enhancing support for families raising children and for the development of young people

We will endeavor to create places for preschoolers and their parents to be and thrive, as well as to help young people to become independent by providing individual consultation and places to be, and by implementing work experience and employment training schemes.



Making the sea clean and beautiful

We will endeavor to reduce greenhouse gases by improving the conditions of the habitat of sea animals through, for example, the Yokohama Blue Carbon project (see page 9) and land development in the shallow-water zones around the Port of Yokohama. We will also work on purifying water by introducing advanced treatment at water reclamation centers and improving the combined sewer system.



Strengthening the international competitiveness of the Port of Yokohama

We will stimulate the economy and people's lives in the hinterland by boosting the international competitiveness of the Port of Yokohama through functional enhancements of coastal facilities, collection of cargo from extensive areas, and the promotion of an efficient management of the coastal area.

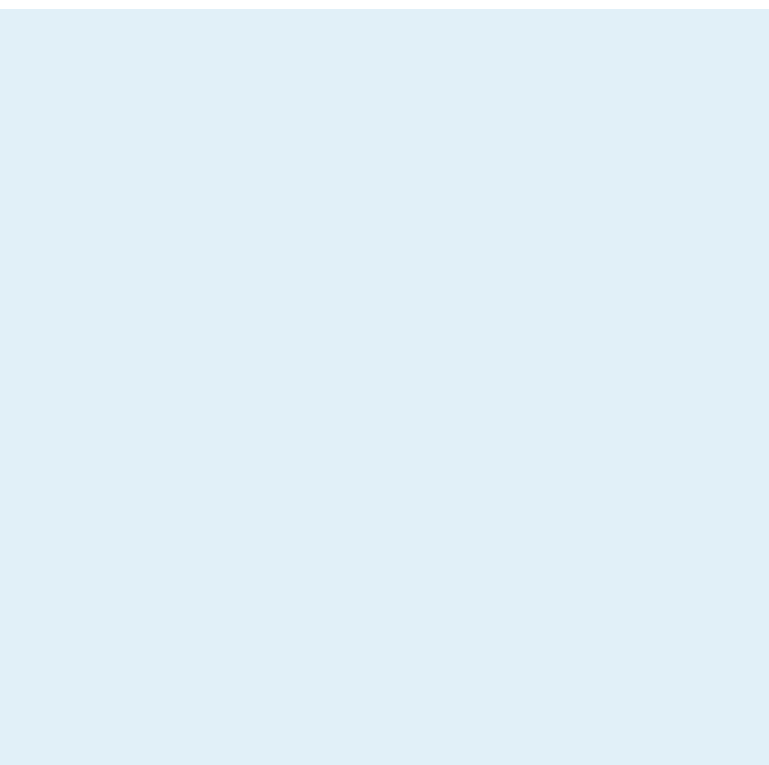


Bring out the Yokohama brand through high quality culture and art

Through the Yokohama Triennale and other regular art festivals in keeping with the city's personality as well as the Culture City of East Asia event, Yokohama is publicizing its appeal to all visitors from Japan and around the world while enhancing its vibrancy and stimulating its economy.



Wim Delvoye, "Flatbed Trailer," 2007
Collection of MONA, Australia
Photo: Ken Kato



HEMS

A test of energy-saving action conducted with the participation of 3,500 HEMS households

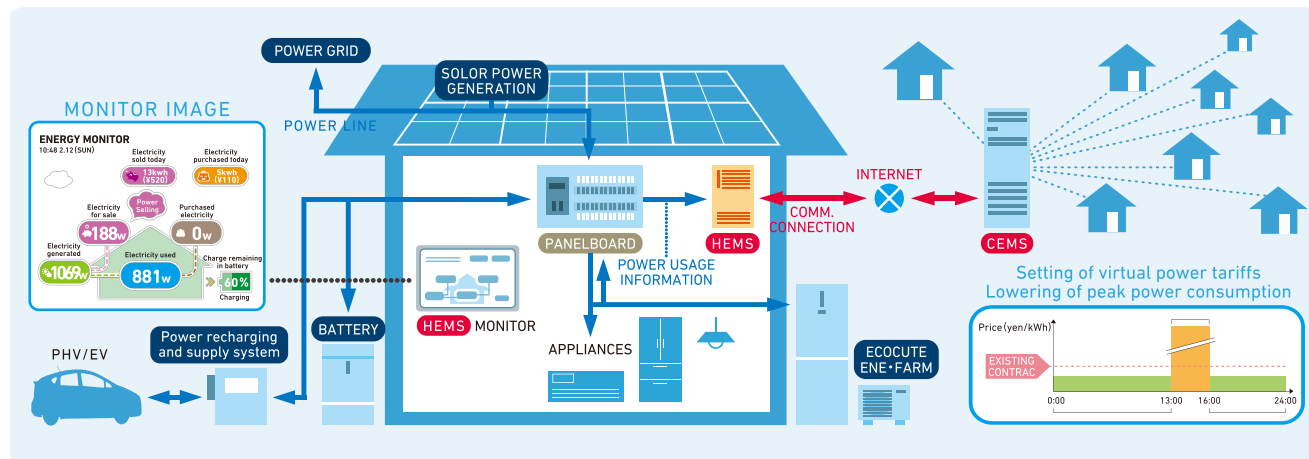
In the YSCP, home energy management systems (HEMS) were installed in about 4,200 households in Yokohama over the past four years.

In fiscal 2014, a test was conducted using about 3,500 of these systems to assess their ability to save energy. This test (the largest of its kind in Japan thus far) centered on demand response (DR)* practices.

* Demand response: programs for reducing electricity usage during peak periods, in accordance with supply-side requests.

Objectives of the demonstration

- (1) Use of the results obtained in the energy-saving test to ascertain the attributes of households capable of saving energy without difficulty and to build an effective energy-saving model for diverse urban lifestyles
- (2) Contribution to the establishment of flexible power tariff schemes promoted by the national government to control the power demand without lowering the levels of comfort in living and to assure a stable supply of power in the community



COLUMN 1 Voices of citizens who have installed HEMS

- The use of HEMS enabled us to learn how much power was being used in real time and heightened our awareness of the need to save energy.
- It is important to obtain the cooperation of the entire family in order to save energy, but it was difficult to do so.
- I hit on the idea of first cooling the room down with the air-conditioning system, and then turning the system off and using a fan thereafter.
- In summer, we made it a rule to set the air-conditioner thermostat no lower than 28°C.

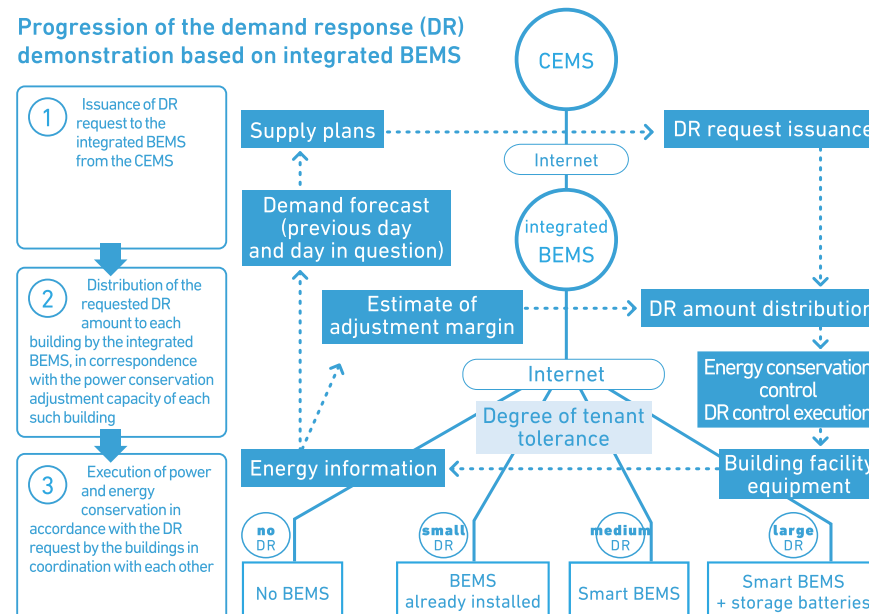
BEMS & integrated BEMS

Energy optimization from single buildings to two or more buildings

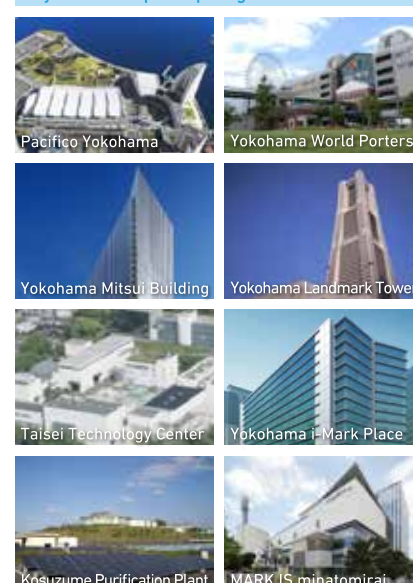
The YSCP incorporates an integrated BEMS system for the management of several BEMS. More specifically, the system manages buildings with different characteristics (e.g., large-scale office buildings equipped with energy generation & storage equipment and commercial buildings) as a group, and is part of a demand-response demonstration aimed at shaving power peaks.

In addition to office buildings and commercial buildings, the fiscal 2014 demonstration has secured the participation of municipal facilities such as water purification plants and water reclamation centers, for a total of 29 buildings. It therefore anticipates the installation of such systems throughout the city.

Progression of the demand response (DR) demonstration based on integrated BEMS



Major facilities participating in the demonstration



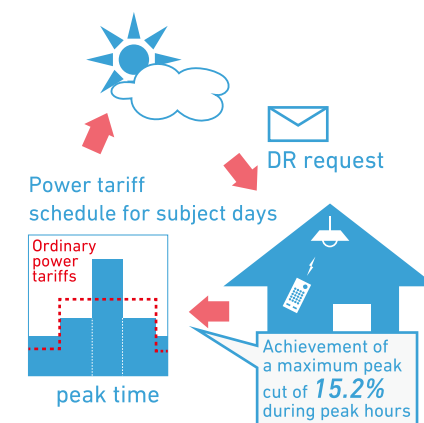
"Maximum effective use of finite energy" Shift from large-scale demonstrations in large cities to actual installation



Results of the demand response (DR) demonstration

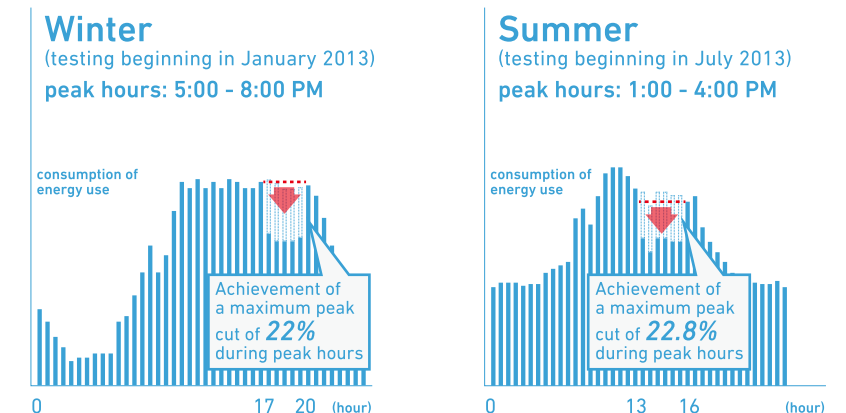
Residential sector DR demonstration

1,900 households (FY2013)



Building sector DR demonstration

16 locations (office buildings and commercial buildings, FY2013)

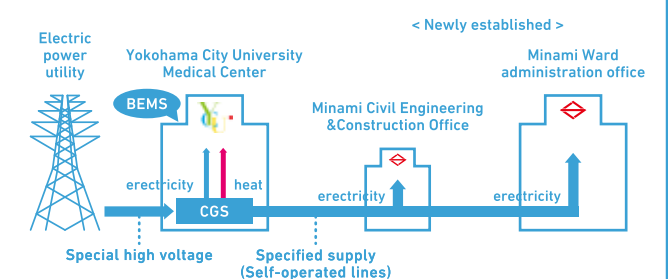


Achievement of community energy management based on specified supply

In step with the relocation and reorganization of the Minami Ward Office, efforts are being made to promote power coordination, based on specified supply*, between Yokohama City University and Minami Ward. The goal is community energy management with excellent effects in disaster-mitigation, environmental, and economic terms.

The supply rests on installation of the latest type of CGS** in the Yokohama City University Medical Center, which is adjacent to the new Minami Ward Office. While generating power and making effective use of waste heat, the CGS will engage in power coordination with the Office using self-operated lines***. In addition, BEMS will be used for optimal control of the heat and power supply. The overall system will therefore be one of area-wise energy utilization.

As this indicates, fusion with the knowledge acquired through the YSCP will improve not only energy creation but also energy security in each district, and assist the building of low-carbon cities while reducing costs.



- * Specified supply: a provision for supply of generated power to a specified party having a close relationship with the generator.
- ** Cogeneration system (CGS): a system that generates electricity with gas-fueled engines or other means and enables use of the waste heat from generation as thermal energy for air conditioning, etc.
- *** Self-operated lines: power lines installed by a party that is not an electric power utility, for supply of power.

The Yokohama Smart Business Council (tentative name): An organization to promote deployment of verification test results to cities in Japan and other countries

To assist the emergence of "FutureCity" Yokohama is striving for development of sustainable communities. With a view to promoting application of the YSCP results to cities in Japan and other countries, it will institute an organization tentatively named the Yokohama Smart Business Council, which will involve coordination of the government and private sector. Through this mission, which will be undertaken in collaboration with private enterprises, the Council will spread the technology and knowhow acquired in Yokohama to other cities in Japan and around the world.



YOKOHAMA GREEN VALLEY

Yokohama Green Valley is a concept to rapidly promote greenhouse gas reductions and economic revitalization by developing industry from the perspective of the "environment" and to improve environmental education through collaboration with citizens, using the city's coastal area as a model. Taking

Kanazawa Ward as a model district, the initiative will eventually involve the entire city and culminate in recognition of Yokohama as Japan's foremost example of a low-carbon, environmentally-minded city in fact as well as name.

From Three Points of View

① Implementation of Energy Policies

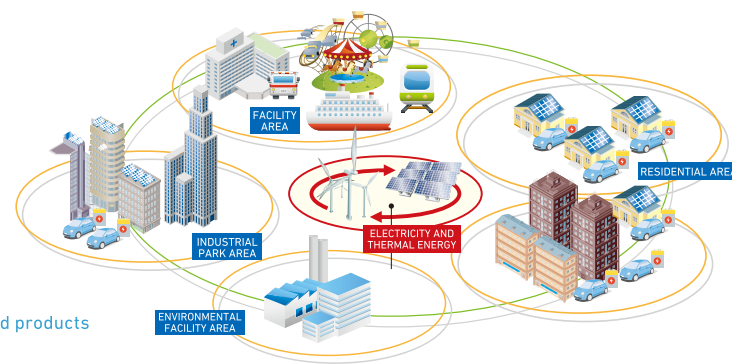
- Understanding local energy supply and demand
- Promotion of energy management in each community
- Transition to a low-carbon society through utilization of electric vehicles, for transportation
- Utilization of unused energy such as waste heat from plants, and formation of thermal usage network

② Development of Environmental and Energy Industries

- Finding matches for each company's environmental technologies and products
- Support for manufacturers on development of products that contribute to realization of a low-carbon society
- Promotion of energy conservation in manufacturing processes
- Promotion of new business approaches for a low-carbon society

③ Establishment of Environmental Education Center

- Environmental education through collaboration with universities in the city
- Deployment of environmental education programs
- Inviting visitors for tours to social infrastructure environmental facilities

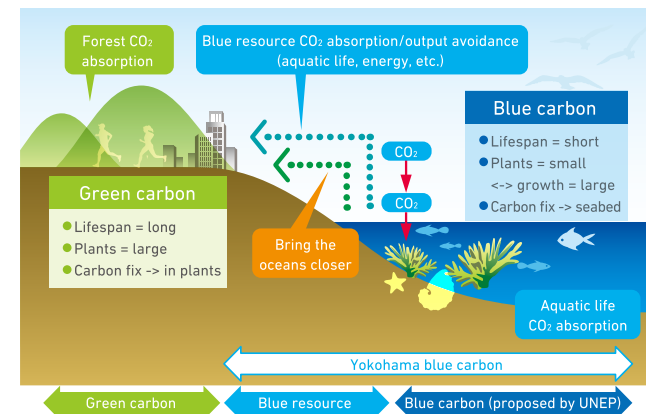


Kanazawa Ward, the model district, is located at the southern end of Yokohama and contains housing tracts, industrial estates, public facilities, and a university, amid a setting of green hills and waterfront. In short, it is a compact collection of all the elements that go into Yokohama's unique character.

Case Examples

① Implementation of Energy Policies

Yokohama blue carbon project



Action for global warming using ocean resources. International symposium with ideas exchanged among attendees relayed domestically and abroad.



Energy monitoring (visualization)

Amount of energy consumption by companies, households, amusement facilities, etc. is "visualized" to promote energy efficiency.



② Development of Environmental and Energy Industries

"PIA messe" event for technology exhibition

Holding of the PIA Messe, an event for technology exhibition and interchange, by companies situated in the Kanazawa Ward waterfront zone



③ Establishment of Environmental Education Center

Environmental education event

With the theme, "fostering kids living with the environment", industry, academia, and government cooperate with citizens to provide education on the environment.



Green Kids



Wakame seaweed harvest event

COLUMN 2 Low carbon city development that is able to cope with disaster

- Benefiting from the Ministry of the Environment's Green New Deal fund -

To ensure an independent and deliverable energy supply and promote city development that is effective against disaster and as a global warming strategy, a fund established by the Ministry of the Environment can be used to install solar paneling and batteries at social welfare facilities, which serve as shelters to seniors, physically challenged persons, and others who are vulnerable during a disaster, thereby promoting the supply of energy during disasters as well as energy efficiency at other times (scheduled at 40 locations by the end of FY 2015).

MOBILITY MEASURES FOR A LOW CARBON CITY



In order for Yokohama to be a low carbon city, it is important that the transportation sector, contributing to about 20% of CO₂ output, becomes low-carbon. It is important for traffic vehicles themselves, including automobiles and railway, to become low-carbon, and for all those involved to cooperate in a comprehensive manner to put in place low-carbon traffic

infrastructure and increase awareness among those who use transportation. As a municipality bearing traffic and environment administration responsibilities, Yokohama is active in areas including deployment of EVs and subsidizing charging facilities, promotion of railway projects and public transportation usage, and popularization and education of eco-driving.

Choi-Mobi Yokohama

This is a one-way car sharing service implemented by Nissan Motor Co., Ltd. and the City of Yokohama, mainly in the city's central districts. It was launched in October 2013 and is slated to continue until September 2015. Its objectives are to promote low-carbon transportation, heighten the quality of urban life and mobility, and promote tourism. Effectiveness as a low-carbon means of mobility for tourism/ business/ life and feasibility as a business model will be looked at.



baybike

Launched in 2014, baybike is a program of community bicycles unfolding in the central districts of Yokohama. Its objective is to help people get around more easily in these districts and to reduce CO₂ emissions. At present, it is operating with 35 cycle ports (rental and return points) and 400 bicycles.



Smart One-Way Car Sharing (smaco)

In September 2014, Mercedes-Benz Japan Co., Ltd. and two other companies began offering smaco, a one-way car sharing service utilizing electric vehicles. Customers can rent and return the vehicles at eight locations in the city. The service is verifying the effects that extensive one-way car sharing could have on curtailing the use of private automobiles when neither necessary nor urgent.



FCV: Fuel Cell Vehicle

These vehicles use electricity generated by the chemical reaction of hydrogen and oxygen to power their engines. During operation, they emit only water, and offer a running distance and a refueling time that are about the same as those of gasoline-fueled vehicles. Moreover, they would make excellent sources of power supply in the event of a disaster. Yokohama is striving to encourage the spread of FCVs.



The JHFC Yokohama-Asahi Hydrogen Station

YES [YOKOHAMA ECO SCHOOL]



In Yokohama City, as part of the multiple efforts to reduce garbage, starting with G30 Plan and with the cooperation of the citizens and businesses, we have been implementing the various measures. And now, using Yokohama's characteristic "citizens' power", we are increasing efforts regarding environmental issues.

YES (Yokohama Eco School) is a project with public participation. Activities including lectures, events and workshops on environmental and global warming issues conducted by NPOs, business owners and universities are linked by the "YES" brand in order to extend the network of learning and action to the entire city. Major programs include short seminars on FM radio and open lectures held through collaboration with universities.



YES page on facebook by YES partner volunteers

<https://www.facebook.com/YES.yes.yes.YOKOHAMA>

YES partnership

NPOs, business owners and universities, who are playing active roles in Yokohama City, have participated in YES as YES partners and have held lectures, events and workshops.



YES partner sharing meeting



Lecture program Kanagawa University de YES

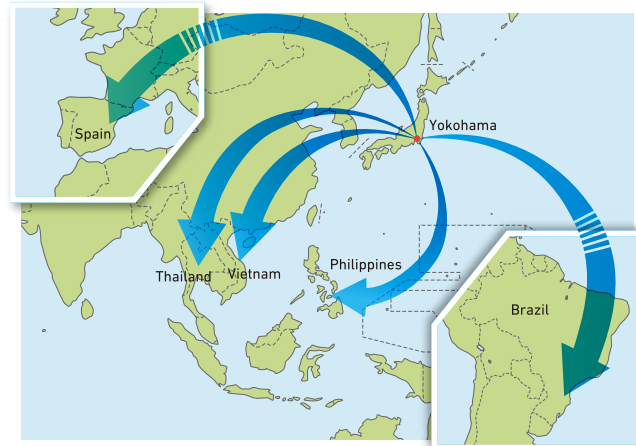
Achievements in FY 2013

Number of lectures held: 431
Total number of participants: Approx. 35,000
Number of registered YES partners: 133 organizations

YOKOHAMA CITY'S GLOBAL NETWORK

Yokohama City has refined its policies and contributed to international activities by presenting its advanced initiatives (such as FutureCity and the Yokohama Smart City Project) and city development know-how and by stepping up collaboration with companies and municipalities, both at home and abroad. Especially in recent years, the city has been enhancing initiatives for Asian countries, which have been seeing remarkable growth.

It is also advancing its global warming prevention measures through collaboration with organizations such as CITYNET (the Regional Network of Local Authorities for the Management of Human Settlements), Japan International Cooperation Agency (JICA), and C40 (the Large Cities Climate Leadership Group).



Through the Yokohama Partnership of Resources and Technologies (Y-PORT) Project of international technical cooperation based on public-private partnership, Yokohama is supporting and conducting a promotional campaign for the development of business overseas by firms in the city. As a part of this project, Yokohama hosts the Asia Smart City Conference with the cooperation of the Japanese government and international institutions. The Conference attracts the participation of mayors from newly emerging economies in Asia as well as international institutions. The participants exchange ideas on smart city technology and knowledge in areas such as renewable energy and low-carbon community development. Sharing the forerunning approaches being taken in Yokohama, the Conference is aimed at strengthening partnership among cities in Asia and informing cities and institutions throughout the whole world about sustainable modes of urban development.

Yokohama is discussing the advisable shape of sustainable cities of the future with the city of Curitiba, which was selected as an Eco² city, and it is starting a related project together with the Japan International Cooperation Agency (JICA).



Asia Smart City Conference

Joint memorandum of agreement with Barcelona, Spain

Signed joint memorandum of agreement for Smart City cooperation with Barcelona, Spain, in March of 2013, to build stronger cooperation and promote action through combined public-private effort, as a part of efforts with cities abroad in Smart City.

Details of cooperation
Energy management, promotion of "open data" using ICT, waste processing, information exchange such as by city promotion



Worldwide recognition

In recognition of its achievements in reconciling environmental and economic considerations as advocated by the World Bank, Yokohama is the only Japanese city that was selected to be an Eco² City. It likewise won the award in the city category in the World Smart Cities Awards ceremony at the Smart City Expo World Congress 2011 held in Barcelona, Spain. In addition, it was given the Global Green City Award at the Berlin High-level Dialogue held last year in Berlin, Germany, and a Special Mention award in the Lee Kuan Yew World City Prize 2014, which is presented to cities that have made an outstanding contribution to the creation of livable, vibrant, and sustainable cities. As these awards evidence, Yokohama continues to receive high ratings internationally for its approaches.



Lee Kuan Yew World City Prize 2014

Y-PORT project

Although cities in developing countries are continuing remarkable development, they are also facing large-city issues including population concentration, infrastructure shortages, and environmental issues. To aid with resolving these issues, through cooperation with enterprises (including small and medium enterprises), the city is proceeding with the Yokohama Partnership of Resources and Technologies (Y-PORT), which makes use of the city's city development know-how and the high-level technology of private-sector enterprises.



Main initiatives
•City development advisory
•Yokohama city promotion
•Aid for overseas expansion of enterprises in the city

Sharing experience in low-carbon urban development with Bangkok

Yokohama signed the Memorandum of Understanding on Technical Cooperation on Sustainable Urban Development with the city of Bangkok in October 2013 and is now engaged in related intercity cooperation. It is participating in a project for formulation of Bangkok master plan on climate change with the assistance from the Japan International Cooperation Agency (JICA). Through this project, it is transferring knowhow in areas such as methodology for preparation of action plans to mitigate global warming, effective initiatives, and verification techniques, and thereby supporting Bangkok's transformation into a low-carbon city.



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Yokohama Climate Change

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<http://www.city.yokohama.lg.jp/ondan/english>

YOKOHAMA CLIMATE CHANGE PREVENTION MEASURES PROJECT

Aiming for a New Environment and Future

