

Yokohama City Action Plan for Global Warming Countermeasures



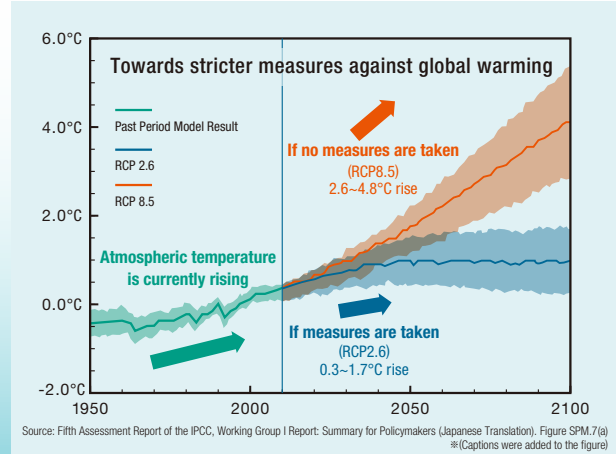
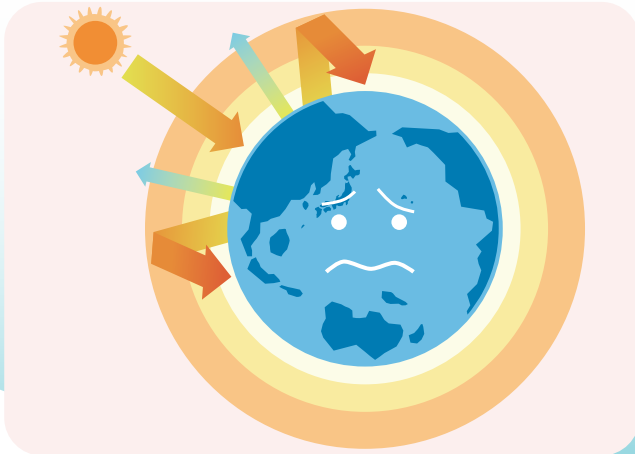
Zero Carbon Yokohama

Global Warming Current Situation and National and International Actions



What causes Global Warming?

Carbon Dioxide, the most abundant of the greenhouse gases (GHGs) in the atmosphere, is generated when fossil fuels such as oil, coal, and natural gas are burned. These GHGs keep the atmosphere at the optimum temperature for humans to live. However, if the GHGs concentration increases too much, the balance of temperature on Earth is broken and the atmospheric temperature begins to rise. In the last 100 years, the global average temperature has increased by 0.7°C, while Japan's average temperature has increased by 1.14°C.



To prevent these changes in climate and their related damages, it is necessary

Mitigation Measures

Suppressing the emission of GHGs causing global warming

Measure Example Energy saving measures, introduction of renewable energy

Japan's Legal Frame

Long Term Low Emission Development Strategy (Long term strategy)

(Required to be formulated by the year 2020)

The preparation of this strategy is a requirement for the countries that ratified the Paris Agreement. It is a strategy to set a pathway for global warming countermeasures aiming at the year 2050.

Act on Promotion of Global Warming Countermeasures

Law that aims at the prevention of global warming, and defines the responsibility and role of the nation, local government, companies, and citizens within that frame. (Promulgation: October, 1998. Revised in May, 2016)

Government Plan for Global Warming Countermeasures (Cabinet Approval: May, 2016)

Plan created according to article 8, paragraph 1 of the Promotion of Global Warming Countermeasures Act. It is Japan's plan to promote global warming countermeasures in an integrated and planned manner. The plan is based on the Paris Agreement, adopted in the COP21 in December 2015, and Japan's Intended Nationally Determined Contribution (INDC) (Submitted to the Climate Change Framework Treaty Secretariat in July 2015), which was the prerequisite to the adoption of the Paris Agreement.

Local Govt. Local Government Action Plan

(The preparation of regional plans for the suppression of GHGs emissions was made mandatory in the May, 2008 revision of the Act on Promotion of Global Warming Countermeasures)

Plan created according to article 21 of the Promotion of Global Warming Countermeasures Act. There are 2 types of plans, those related to the suppression of GHGs emissions by offices and business work in the prefectures, cities and villages (Article 1 Paragraph 1), and those for the suppression of GHGs emission per region (Article 21 paragraph 3).

International Framework

Paris Agreement (Adopted in December 2015, enforced in November 2016)

- Replaces the Kyoto Protocol. New International Framework to reduce GHGs emissions from 2020 and on.
- First time in history that all nations come together and fairly agree to participate.
- Turning point to achieve balance between the anthropogenic GHGs emissions and removals by sinks of GHGs in the second half of this century.
- The 2°C goal was set as worldwide common long-term goal. The need to pursue efforts to keep temperature rise at 1.5°C was also mentioned.
- All participating nations, including the biggest emission contributors, submit and renew their reduction goals every 5 years.
- All signatory nations create long-term strategies for economic development that allows reduction and elimination of GHGs emissions.
- Each nation's mitigation long-term goals, adaptation planning process and implementation, and adaptation reports are submitted and periodically updated.

Reflection of Scientific Knowledge



The effects of Global Warming are already becoming visible!

In recent years, natural disasters due to abnormal atmospheric phenomena such as hurricanes, heavy rains, draughts, and heatwaves, have been occurring worldwide. In Japan too, extreme weather phenomena such as powerful typhoons and heavy rains can be seen. As global warming progresses, these phenomena are expected to increase, and it is feared that there will be health damages due to heat strokes, and enormous damages to crops.

Effects on Natural Disasters, Health, and Damages to Crops



Torrential Rains



Larger Typhoons



Heatstroke



Damages to Crops

Adaptation Measures

Coping with the effects of climate change to minimize and avoid damages

Measure Example Measures against wind and water damage, measures against heatstroke

Climate Change Adaptation Act

Law aiming at the adaptation to the effects of climate change. It defines the responsibility of the nation, local government bodies, businesses and citizens within that frame. (Promulgation: June, 2018)

Government Climate Change Adaptation Plan (Cabinet Approval: November, 2018)

Plan according to the Climate Change Adaptation Act, article 7, paragraph 1. It promotes the creation of policies for adaptation to global warming in an integrated and planned manner.

※Preceding the enactment of the Climate Change Adaptation Act, adaptation measures were already been promoted by the National Plan for Adaptation to the Impacts of Climate Change that was formulated in November 2015.

Local Govt. Regional Climate Change Adaptation Plan

Plan according to the Law for Climate Change Adaptation Act, article 3, paragraph 2. It states that the prefectures, cities and villages have to create a plan for adaptation to climate change, that answer to the natural, economic and social conditions of each region.

IPCC (Intergovernmental Panel on Climate Change) Report

5th Assessment Report (Released in 2013~2014)

- ☑ There is no doubt about the warming of the climate system.
- ☑ In order to suppress climate change a major cut down of GHGs emissions is necessary.

Special Report on Global Warming of 1.5°C (Released in 2018)

- ☑ Regional climate characteristics (temperature, precipitations, etc.) differences between present-day and global warming of 1.5°C, and between 1.5°C and 2°C.
- ☑ A large portion of the effects of climate change can be avoided by keeping global warming at 1.5°C instead of 2°C.

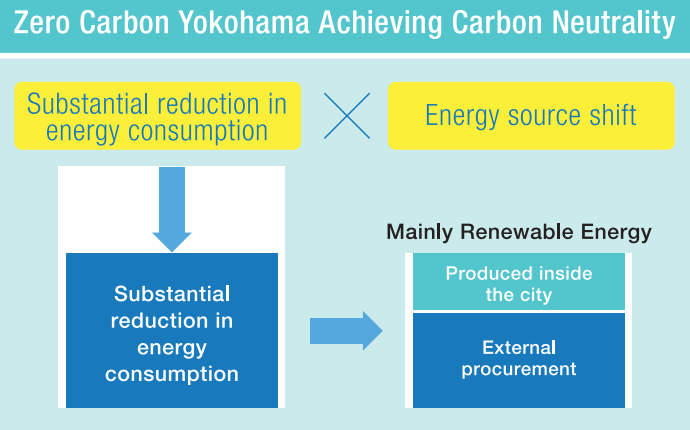
Yokohama City's Aim

We Aim to Realize Carbon Neutrality by 2050

In light of the world's trend after the adoption of the Paris Agreement, and the intensification of the effects of climate change, Yokohama city has set the higher goal of achieving Carbon neutrality. The words used to describe such goal are "Zero Carbon Yokohama". The realization of Zero Carbon Yokohama cannot be achieved following our current line of action. It will be necessary to gather wisdom and to innovate in technology, socio-economic systems, and life styles. In the Action Plan, we clearly state the orientation towards Carbon neutrality in order to push forward the shift towards a decarbonized economy and innovation efforts from businesses and citizens.



**Zero Carbon
Yokohama**



Yokohama City Future Vision



A City that Materializes the Sustainable Major City Model

- Achieving large scale CO₂ reduction by using the elevated social civic power and other particular features of Yokohama city.
- Shifting towards a decarbonized economy that uses the technical capabilities of the municipal facilities, businesses and research organizations in the city.
- Establishing lifestyles and business activities towards decarbonization.
- Cooperate locally and overseas, and lead worldwide efforts against global warming.



A city that actions towards decarbonization by citizens and businesses are widespread

- The citizens select naturally, products and services that promote carbon neutrality, such as ZEH.
- The businesses take activities towards carbon neutrality as a business chance. They invest in energy saving facilities and equipment, ZEB, etc. , and seek to expand these technologies globally.
- The city receives guests from inside and outside the city, and continues to transmit the Sustainable Major City Model.



A city that materializes city planning focused on decarbonization and circularity

- Along with the replacement of large amounts of cars with EV and FCV, accessibility is improved through the public transportation network.
- The renovation of infrastructure and large scale residential complexes is used as opportunity to implement measures.
- Utilization of full-scale self-sustained distributed energy (such as renewable energy), promotion of recycling and zero emissions, and local utilization of residual energy.



A city that uses renewable energy mainly and smartly

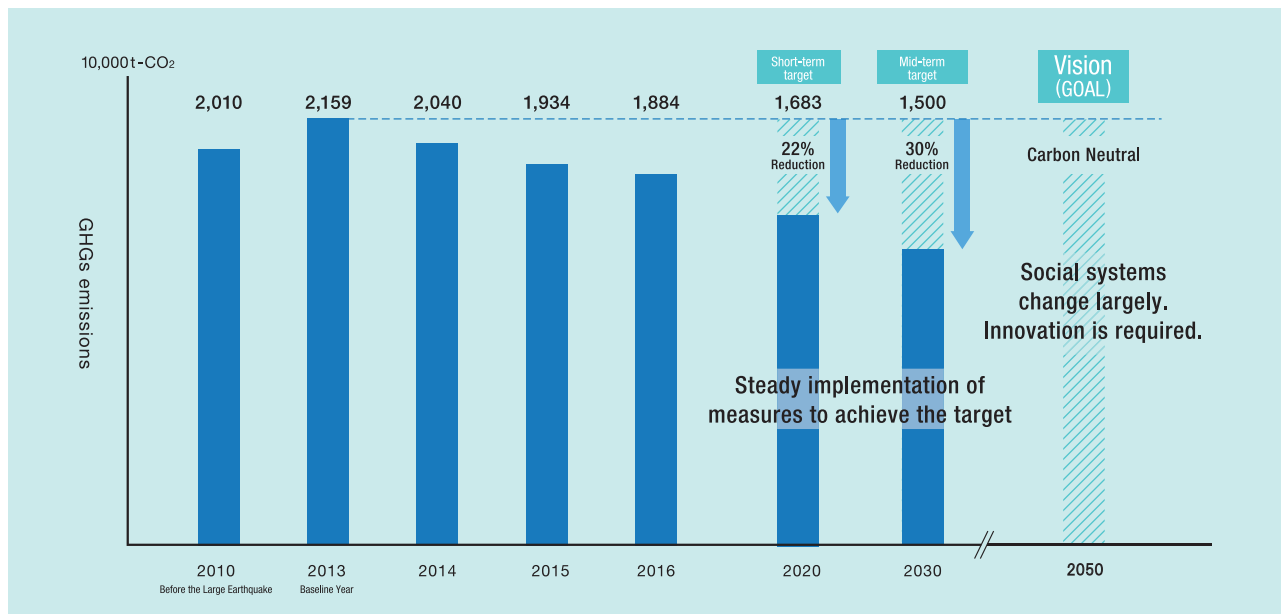
- Introduction of renewable energy into the city region, local production and consumption, and collaboration with regions that have abundant renewable energy resources.
- Selection of low carbon electricity and energy management through AI, and IoT.
- Utilization of Hydrogen and novel technologies like Carbon Capture and Storage (CCS) and Carbon Capture and Utilization (CCU).



A city that adapts to the effects of climate change

- Following the concept of "self, mutual, and public help", all related entities collaborate to reduce and avoid damages during natural disasters.
- Maintaining of infrastructure for rivers and sewer systems, preparation of hazard maps, development of urban areas, communities and human resources that are strong against disaster.
- Increasing the resilience of the city.

GHGs Emission Reduction Target



3C to Realize the Future Vision

In order to realize Yokohama's future vision, individual efforts are not enough. It is indispensable to put to use the knowledge that Yokohama has amassed, and expand the city's unique efforts. To achieve this, 3 approaches have been set (3C), and considering them, several policies and measures will be spread.

Choice

As a large consumer, the choices of the citizens and businesses of Yokohama city have great impact on the supply side.

Creation

Creation of innovation through the maximum expression of social civic power, and enterprise power that comprises the knowledge and technology of the private sector inside the city.

Collaboration

Promotion of efforts at global scale through collaboration between cities inside and outside of Japan, collaboration between industry and academia, collaboration between regions with renewables, etc.

Specific Initiatives Undertaken by Yokohama City

CASE
01

COOL CHOICE YOKOHAMA



Under the catch phrase “COOL CHOICE YOKOHAMA”, Yokohama city, in collaboration with each related entity, develop a new movement for global warming countermeasures. In this movement, strategic PR and raising awareness projects is carried out to make the selection of life styles, business models, products and services aimed at carbon neutrality, far more comfortable and abundant. In doing so, all related entities come together and advance with the city as one.

YES (Yokohama Eco School)

Under the brand of “Yokohama Eco School (YES)”, the municipality supports a learning place that offers seminars and events about measures against global warming and eco life-styles that are being put to practice by civil organizations, companies, universities and local authorities. Through YES, the city aims at ingraining in each citizen a lifestyle set towards decarbonization.

Promotion of Low-Carbon Electricity Supply and Selection

Yokohama city will introduce a new system aimed at electricity retailers who supply electricity to the city. Through this system, the electricity retailers will be required to provide information such as their emission factors, and renewable energy introduction ratio. By making such information publicly available, and by continuing to carry out raising awareness activities, the city will proceed to create schemes that allow citizens and companies to actively choose low-carbon electricity.

CASE
02

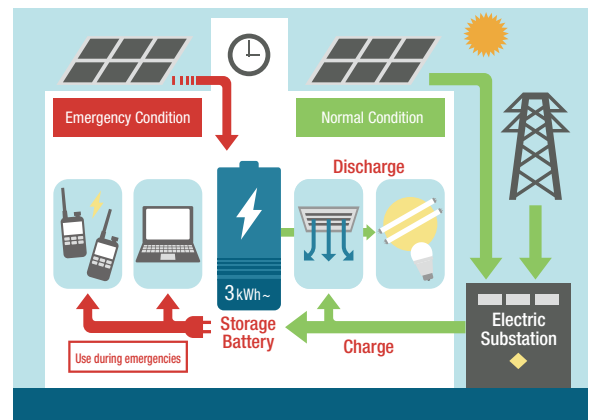
Yokohama Smart City Project (YSCP)



Through the cooperation between Yokohama city and the Yokohama Smart Business Association (YSBA), the Yokohama Smart City Project (YSCP) implementation got started. The project promotes measures such as the use of renewable and unused energy, decentralized and self-reliant electricity and heating, and energy management of residences, buildings, and local areas.

Building a Virtual Power Plant (VPP)

In order to respond to the electricity demand peak, Yokohama city is pushing forward the construction of a “Virtual Power Plant (VPP)”, a system that brings together a large number of storage batteries installed within the city, and uses them as one single power generation plant. Through collaboration between public entities studies will be done for an urban VPP project that makes use of various resources inside the city, such as public and private facilities, and the electric vehicle whose introduction is now being promoted.



CASE
03

Promotion of Technology, Products, Financing and Investment for the Environment



Yokohama city will support efforts that contribute to cutting-edge technology for enhanced low carbon productivity, and efforts towards adaptation measures. Also, the city will devise an industry-academia-government collaboration that makes use of the technical capabilities, AI, IoT, etc. of the companies and research organizations available in its jurisdiction. At the same time, the city will collaborate with financial institutions to plan researches, study groups, and courses in small and medium size enterprises ,about environmental management in order to create and share information, and to promote investment.

Transition Towards a Decarbonized Economy

Yokohama city will continue to consider the mid and long term directionality to follow in order to realize the efforts towards carbon neutrality that are now required to respond to the global changes that have come along with the enforcement of the Paris Agreement. In light of this, Yokohama city will foster policies that aim at carbon neutrality while improving the quality of life of its citizens and maintains and strengthens the competitiveness of businesses. At the same time, cooperation between academia and industry will continue in order to sort fundamental information required for the transition towards a decarbonized economy that fits Yokohama city. The municipality will also focus on policies for investment promotion, regulations, market creation, among other measures that will foster sustainable innovation.

CASE
04

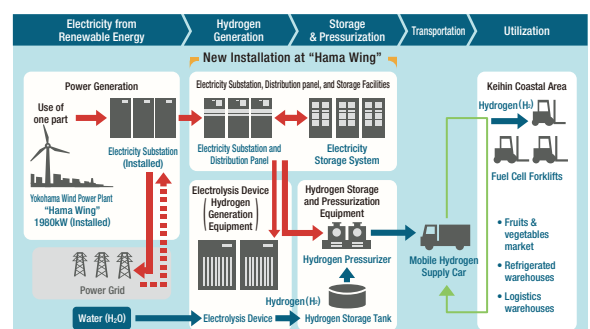
Utilization of Hydrogen Energy



Aiming at the realization of a society where hydrogen is used in everyday life in all areas, such as industry, businesses, residences and transportation, the city of Yokohama plans to actively introduce and utilize hydrogen energy through cooperation between companies and the municipality.

Demonstration Project in Keihin Coastal Area

Yokohama city is carrying out a demonstration project to build a supply chain that utilizes hydrogen energy. The supply chain concept consists in utilizing the wind power generated within the Yokohama City Wind Power Plant (Hama Wing) site for the electrolysis of water to produce CO₂ free hydrogen, and to provide a storage and pressurization system. Later, the hydrogen produced there will be carried in special vehicles to retailers, factories and warehouses located in Yokohama and Kawasaki cities, and that have introduced fuel cell fork lifts and can make use of the hydrogen.



CASE 05

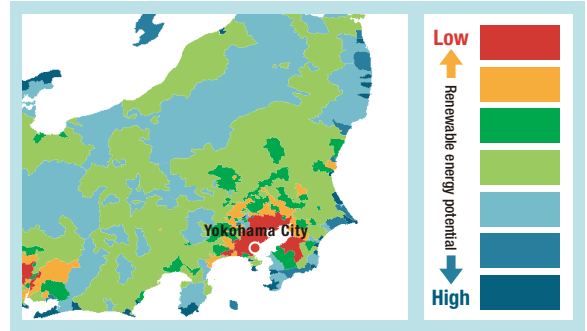
Smart Use of Renewable Energy



Regarding renewable energy (RE), along with the introduction of RE for the city and local production-consumption, Yokohama city is proceeding strategically to promote collaboration with other regions and taking steps to strengthen the collaboration with the companies committed to RE100 located within the city.

Considering the Introduction of Renewable Energy Through Regional Cooperation

It cannot be said the Yokohama city's renewable energy potential is high. Along with planning for the maximum possible RE introduction within the city, it is also necessary to collaborate with regions that have abundant RE resources. The blue region shown in the figure on the right, represents areas with high RE potential.



CASE 06

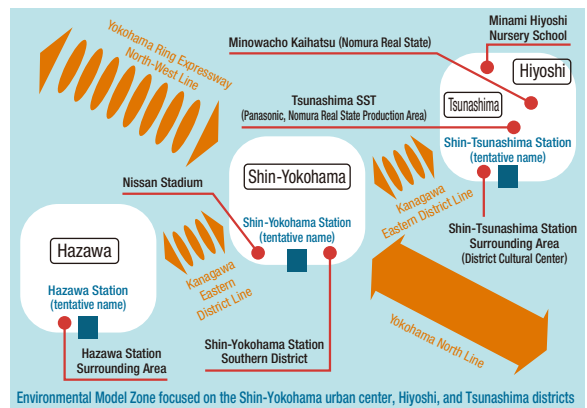
Low-Carbon City Planning in Areas



Regarding the urban central areas and suburbs model zones, Yokohama city will continue to plan the development of Environmental Model Zones that balance highly convenient city functions and carbon reduction. The concept is to build and share among all stakeholders a future vision based on the characteristics and natural environment of the region. The zones will be developed focusing on the installation of full-scale distributed and self-reliant electrical and heating energy among other measures.

Setting and Development of Environmental Model Zones

The area comprised by Shin-Yokohama, Hiyoshi and Tsunashima districts will be set as a new Environmental Model Zone. Yokohama city will cooperate with main stakeholders in the region, such as companies and organizations, and will support the growth of the region from an environmental point of view, while providing relevant information. Taking advantage of the incoming Rugby World Cup 2019 and Tokyo Olympics and Paralympics 2020, the city will use the Environmental Model Zones efforts to promote externally the city as an "inland gateway that welcomes guests from all over the world".



CASE 07

Strengthening the Adaptation Measures



The city will provide maintenance for agriculture and the natural environment, apply measures to handle damages from wind, floods, and mudslides, reduce heat strokes and infection spreading risk. Overall, more effective measures in all fields will be promoted. At the same time, mitigation measures used so far, such as energy saving and power peak-cuts, will continue to be spread and applied by each related entity, serving also as measures to tackle the effect of climate change on energy demand and supply. Yokohama city will promote the stimulation of industries related to adaptation measures inside the city. With this, the city aims at the creation of a virtuous cycle between environment and economy.

Use of Green Infrastructure

In recent years, local heavy rains as a result of climate change, the reduction of green spaces due to urban development, and the "heat island" phenomenon (specific to urban areas), are affecting in many ways the livelihood of citizens and city functions. To adapt these climate change effects, the city will push forward cross-cut measures that make use of green infrastructure (percolation boxes to store and percolate rainwater, use of parks, farmlands, and forests for storage and percolation of rainwater, and maintenance and refurbishing of planters and waterside posts).

CASE 08

Cooperation among Cities and International Information Dissemination



As the role of cities to tackle global warming ascends, strengthening all kind of collaborations, from city- local region networks to overseas cities networks, and sharing experiences and knowledge, is of tremendous importance. Yokohama city will continue to participate with entities such as the "Kyutokenshi" (National Capital Region Nine Government Summit Council), ICLEI, and C40, to strengthen cooperation between leading cities. Through international technical cooperation, and attendance to international conferences, the city will establish global recognition, and lead the world in the field of environment.

Promoting Cooperation with Overseas Cities

In order to contribute to the solution of the global scale problem that global warming represents, in addition to cooperation with overseas cities, Yokohama city will participate in international technical cooperation, and attend international conferences, to establish global recognition, and lead the world in the field of environment.



SDGs (Sustainable Development Goals)

In September 2015, in the United Nations Sustainable Development Summit, the 2030 Agenda for Sustainable Development setting the international development goals by the year 2030, was adopted. The 2030 Agenda set the Sustainable Development Goals (SDGs) consisting of 17 goals and 169 targets aiming to solve worldwide problems from poverty, to climate change, biodiversity, energy, among many other various issues that must be addressed in order to build a sustainable society.



SDGs FutureCity Yokohama

Realizing a city that creates new value and prosperity through its economy, culture, and the arts, with the environment at its heart.

In order to solve the worldwide common problems that have arisen from the people's livelihoods taken up by the SDGs, not only the country, but also worldwide entities are required to take initiative. Aiming to achieving the SDGs, regional vitalization and an attractive city planning, the government of Japan identifies local governments that are currently carrying out cutting-edge efforts towards those goals. The national government selects these local governments as "SDGs FutureCities", and supports them in their efforts.

Project to Create a Yokohama - Type "Major City Model" through "Collaboration"

"YOKOHAMA SDGs Design Center"

