Kyoto City Global Warming countermeasures program <2021-2030>

京都市地球温暖化対策計画 <2021-2030>

2050 0 To!

March 2021
Kyoto City

In formulating the "Kyoto City Global Warming Prevention Plan <2021-2030>," the city o

Kyoto, Japan, has announced the following

"Thirty years from now, I hope to welcome you in the summer with a lush moss garden."

I want to add color to Kyoto's autumn with the leaves that deepen in color with

each passing day."

The landscape, known as a seasonal word in haiku and a manifestation of the Japanese heart, is changing due to the effects of global warming.

The effects of global warming, such as record-breaking rainfall and heat waves, are threatening even the very foundations of our lives. The global environment is in a state of climate crisis or climate emergency.

Since the Industrial Revolution, the burning of fossil fuels such as coal and petroleum has generated the effects of greenhouse gases such as carbon dioxide, the global average temperature has increased by about 1℃ compared to earlier levels. And scientific projections show that, at the current rate, by 2100 it will have risen further 4℃.

Therefore, we must share with citizens and businesses the sense of crisis that the global environment will be in serious trouble if we do not do something about it, and the goal of taking up the challenge of realizing a "decarbonized society." We must take action together

Twenty-four years ago (1997) the Kyoto Protocol was adopted as the first international commitment to combat global warming in human history. In 2015, the Kyoto Protocol took a giant leap forward into the Paris Agreement, which set a common goal to pursue efforts to reduce the global average temperature increase to 1.5℃ below pre-industrial levels The goal is to pursue efforts to limit the global average temperature increase to 1.5 above pre-industrial levels. Achieving this goal will require "net zero" carbon dioxide emissions by 2050.

In May 2019, the General Assembly of the Intergovernmental Panel on Climate Change (IPCC) met here in Kyoto and adopted the "IPCC Kyoto Guidelines" to support implementation of the Paris Agreement. At the symposium commemorating this meeting, I became the first head of a local government in Japan to announce that we are aiming for "zero emissions by 2050." The movement toward "zero" that started in Kyoto has expanded nationwide and became a national policy in October 2020. What is important is what is to come.

This plan, which outlines measures to be taken over the next 10 years, includes 103 initiatives to change our lifestyles (lifestyles) business activities (business), and the energy and mobility that support these activities to a form that does not emit carbon dioxide. We will promote these initiatives while further coordinating them with the Biodiversity Plan and the Basic Plan to Promote a Recycling-Oriented Society. We will promote these efforts in coordination with the Biodiversity Plan and the Basic Plan for Establishing a Recycling-based Society. In addition, as the new coronavirus infection is raging, we aim to achieve sustainable social and economic development, enrichment of citizens' lives, and conservation of the global environment at the same time by taking proactive measures to combat global warming.

Kyoto has inherited a rich food culture that is healthy and has a low environmental impact, as well as a culture of living in harmony with nature that has been nurtured over its long history of more than 1,200 years, and a tradition of valuing symbolized by Kyoto has made great achievements, such as halving the amount of garbage and reducing energy consumption by 30%, and I am confident that Kyoto can lead the world toward the creation of a sustainable decarbonized society.

Together we will tackle the climate crisis and realize a "prosperous Kyoto where future generations can dream. Conclusion, I would like to express my sincere gratitude to the members of the Kyoto City Environmental Council and all the people involved in the development of this plan, as well as to all the people who provided valuable opinions and suggestions, for their great support.

March 2021

Mayor of Kyoto

門川 大作

eye order

Chapter 1. The State of Global Warming

1 地球温暖化と気候危機 Global Warming and the Climate Crisis

(1) Current status of global warming

Global warming is a phenomenon in which heat-absorbing "greenhouse gases" such as carbon dioxide (CO_2) are emitted as a result of human activities, increasing their concentration in the atmosphere and causing global temperatures to rise.

Since the Industrial Revolution, we have consumed fossil fuels such as coal and oil. It に

Accompanying these emissions are greenhouse gases, which are contributing to global warming.

The 1.5℃ Special Report published by the IPCC[1] in October 2018 に states that the global average temperature in 2006～2015 was 0.87℃ higher than the average に over 1850～1900 period.

How Global Warming Works

Greenhouse gases such as CO_2, methane, and chlorofluorocarbons (CFC alternatives) act as "Earth's clothing," absorbing some of the heat that leaves the Earth's surface when it is heated by the sun's energy and warming the area near the surface. These gases have helped to maintain the Earth's average temperature around 14℃. Without greenhouse gases, the Earth's average temperature would not be as high as it is today. Without greenhouse gases, the average global temperature would be -19℃ に.

As atmospheric greenhouse gases increase, the amount of heat absorbed by the atmosphere as it leaves space increases, causing the earth's surface to become too warm, which leads to global warming. Thus, Earth's Climate is a delicate balance.

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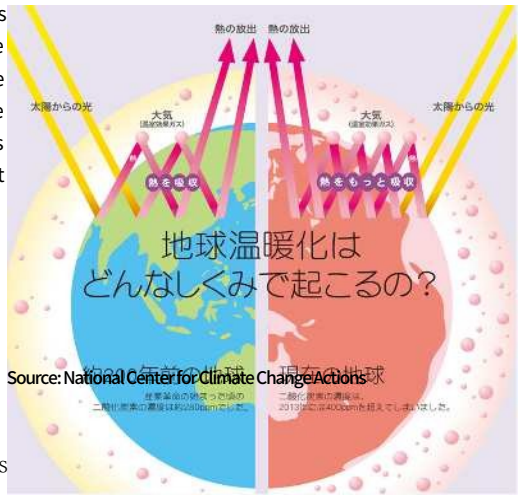

Source: National Center for Climate Change Actions

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(see Figure 1) Impacts of Global Warming and Future Projections

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In recent years, the effects of heavy rainfall, heat waves, and droughts, which are thought to be caused by global warming, have become apparent in many parts of the world.

に The World Meteorological Organization (WMO) に indicates that the average temperature for the decade 2011～2020 was the highest since observations began in 1850. In Japan, global warming has also been observed in recent years, such as heavy rainfall accompanied by linear precipitation zones[2] and record-breaking heat waves.

The weather phenomenon that is believed to be the cause of the problem is occurring frequently.

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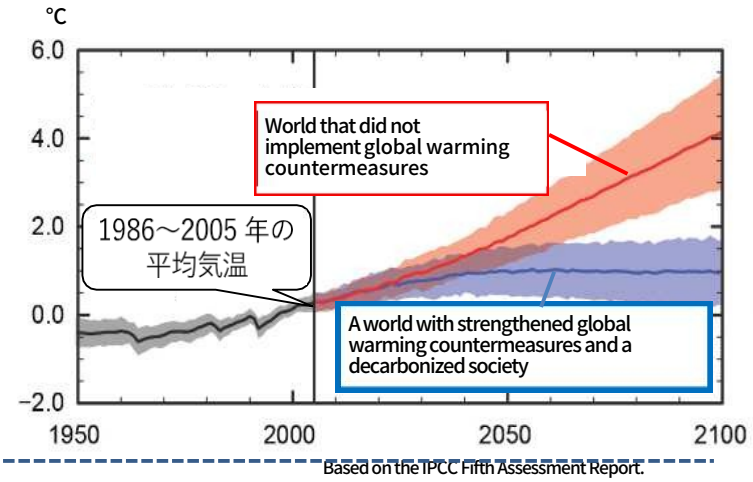
[1] Intergovernmental Panel on Climate Change. It was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to conduct a comprehensive assessment and report on anthropogenic climate change, impacts, adaptation and mitigation measures from scientific, technical and socio-economic perspectives.

[2] A rainfall area with strong precipitation with a linear extension of 50～300 km in length and 20～50 km in width, created by organized cumulonimbus clouds that pass or remain in the same place for several hours, which are formed by a line of developing rain clouds (cumulonimbus clouds) that occur one after another.

According to IPCC projections[ニ]

If this trend continues, the entire world The average temperature in the [ニ] further[ニ] 4℃ will rise until the end of the century, which could have a significant[ニ] impact on our lives.



Based on the IPCC Fifth Assessment Report.

Figure 1: Temperature increase from 1986-2005 average

<Predicted Impact in Japan

Climate Impact Items	Strengthen measures against global warming When a decarbonized society is achieved	Global Warming Prevention If not implemented
average temperature	Approx. 1.4℃ up	Approx. 4.5℃ up
sea surface temperature	Approx. 1.14℃ up	Approx. 3.58℃ up
Frequency of heavy rain	Approx. 1.6 times	Approx. 2.3 times
Coastal sea level	Rise of approx. 39 cm	Approx. 71 cm rise

Based on Climate Change in Japan 2020 (Ministry of Education, Culture, Sports, Science and Technology and Japan Meteorological Agency)

note (supplementary information)

(3) (3) Impacts of Global Warming in Kyoto

In Kyoto, temperatures have increased by about 2℃ per 100 years, due in part to urbanization[ニ], resulting in an increase in extremely hot days and tropical nights and a decrease in winter days. In recent years, the country has also experienced extreme heat, including 14 consecutive hot days (2018, and weather disasters such as the torrential rains of July 30, 2018[ニ].

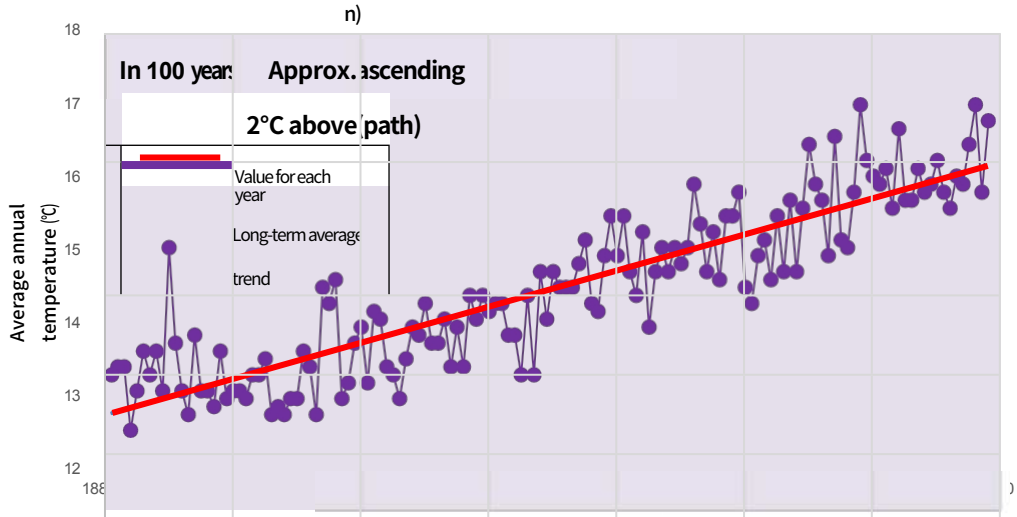


Figure 2: Average temperatures in Kyoto

note (supplementary information) symbol

Urbanization[ニ] Accompanying

eye of a cat

Rand phenomenon

In part due to th influence of

The following is a summary of the results of the survey.

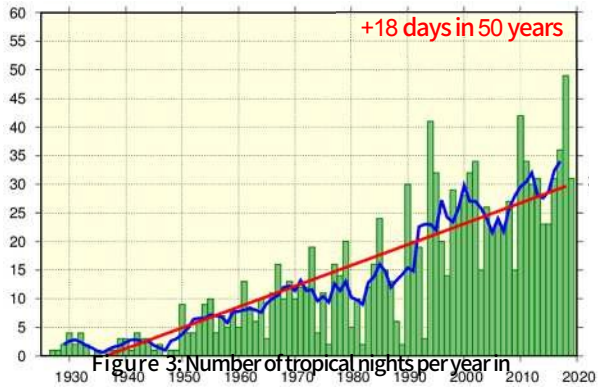


Figure 3: Number of tropical nights per year in Kyoto
(Number of days with a minimum nighttime temperature of 25°C or higher)

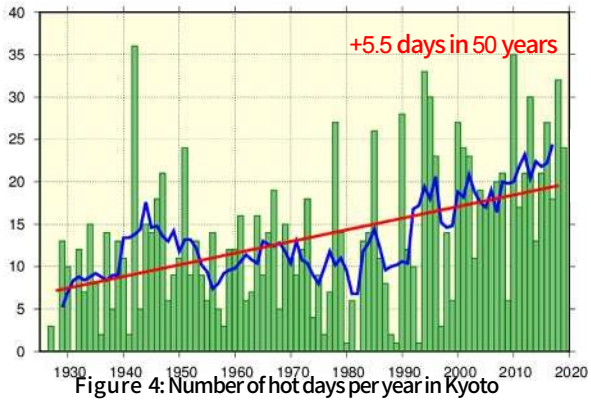


Figure 4: Number of hot days per year in Kyoto
(Number of days with a daily maximum temperature of 35°C or higher)

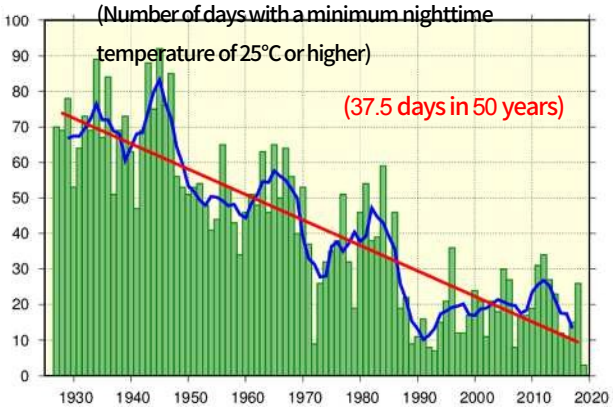


Figure 5: Number of winter days per year in Kyoto
(Daily minimum temperature below 0°C)

Figure 6: Kamo River swollen by the July 2008 torrential rains
(Near Sanjo Ohashi Bridge)

Figures 3 to 5 Bar graphs: values for each year, line: 5-year moving average, straight line: long-term change trend

2 International Trends in Global Warming Countermeasures

In 1997に, the Kyoto Protocol adopted at the Third Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (COP3)に held in our cityに marked a major step forward in the world's efforts to combat global warming.

In December 2015に, the "Paris Agreement" was adopted at COP21に, which states that "efforts shall be pursued to limit the increase in global average temperature since pre-industrial times to well below 2℃ and below 1.5 ℃に" and to achieve aに decarbon society by the second half of the 21st century.

In addition, the IPCC's 1.5℃ Special Reportに published in October 2018に shows that limiting temperature rise to 1.5 ℃にinstead of 2℃ would clearly reduce the impacts ofに global warmingに and would reduce the impact of
1.5℃ or lessに to reduce ☒ to nearly "net zero" carbon dioxide emissionsに by around 2050に

In May 2019に, the IPCC General Assembly was held in our cityに and adopted the IPCC Kyoto Guidelines, which set out the calculation methods for the greenhouse gas emissions of countries essential for the implementation of the Paris Agreement (starting in 2020).

In additionに, the spread of new coronavirus infectionsに has led to economic recovery from the recessionに and, in conjunction with aggressiveに progress on global warming countermeasuresに, the concept of "green recovery" is expanding to simultaneously realize sustainable economic development, a prosperous society, and global environmental protectionに.

Kyoto Protocol

The first international commitment to combat global warming in human history.

December 1997 Adopted at COP3 Adopted at COP3 in December 1997

Effective February 162005.

The GHG emission reduction targets for developed countries for the five-year period from 2008～ to 2012 (e.g., Japan: -6% from 1990 level, EU member countries as a whole: -8% from 1990 level, etc.).

Paris Agreement (1985)

December 2015 COP21 At COP21 in December 2015, the Kyoto

Adopted as a new global framework to address global warming from 2020, after the commitment period of the Protocol. Entered into force in November 2016.

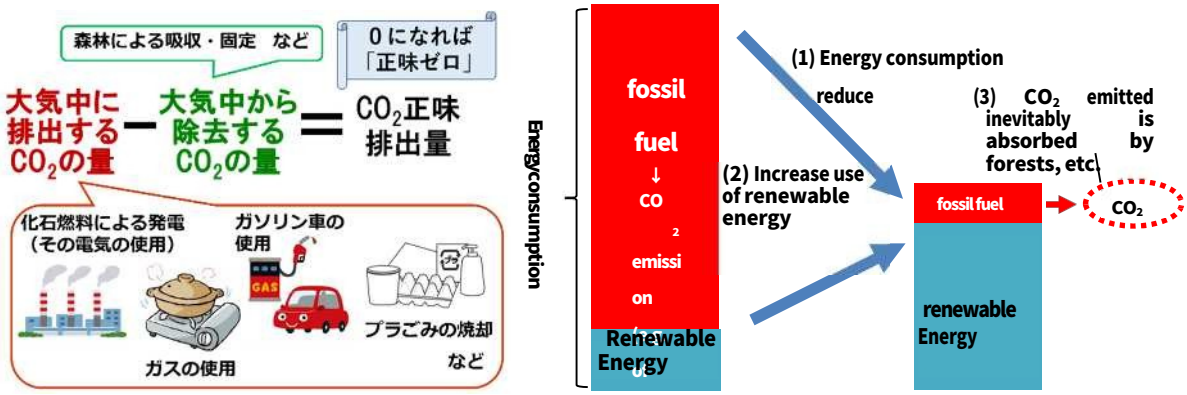
The scope of the program has been expanded from developed countries to 197 countries and regions that are signatories to the United Nations Framework Convention on Climate Change (UNFCCC). This was a major turning point toward reducing greenhouse gas emissions and achieving a society that is no longer dependent on fossil fuels such as coal and petroleum.

<What is net zero carbon dioxide emissions?

○ The amount of carbon dioxide emitted into the atmosphere by human activities such as the burning of fossil fuels (oil, natural gas, gasoline, etc.) and the amount removed by forest absorption and other means is the sum of the two.

○ In order to achieve net-zero emissions, it is necessary to reduce carbon dioxide emissions significantly by promoting thorough energy conservation and converting fossil fuel-based energy to renewable energy, and to remove the remaining emissions by forest absorption and other means.

<Image of achieving net zero



Column What is Green-Recovery?

It refers to a shift to a social and economic model that is more resilient to disasters and infectious diseases through the promotion of climate change countermeasures with a view to a decarbonized society and the conservation of ecosystems and biodiversity.

z In Europe, a reconstruction fund of 750 billion euros (approximately 96 trillion yen) has been established, more than 30% of which will be allocated to measures to achieve a decarbonized society, thus balancing economic recovery from the spread of the new coronavirus and decarbonization. z In the United States, the government has established a fund for the recovery of the economy from the

z In September 2020, China announced its 2060 decarbonization target, and the global economic recovery will lead to a green recovery.

He also stated that he would encourage the United States to promote the development of a new energy policy. In January 2021, the Biden administration will take office in the United States, the second largest emitter of greenhouse gases after China, and will work on economic revitalization and environmental and new energy policies, accelerating the movement toward balancing economic recovery and climate change measures.

Countermeasures

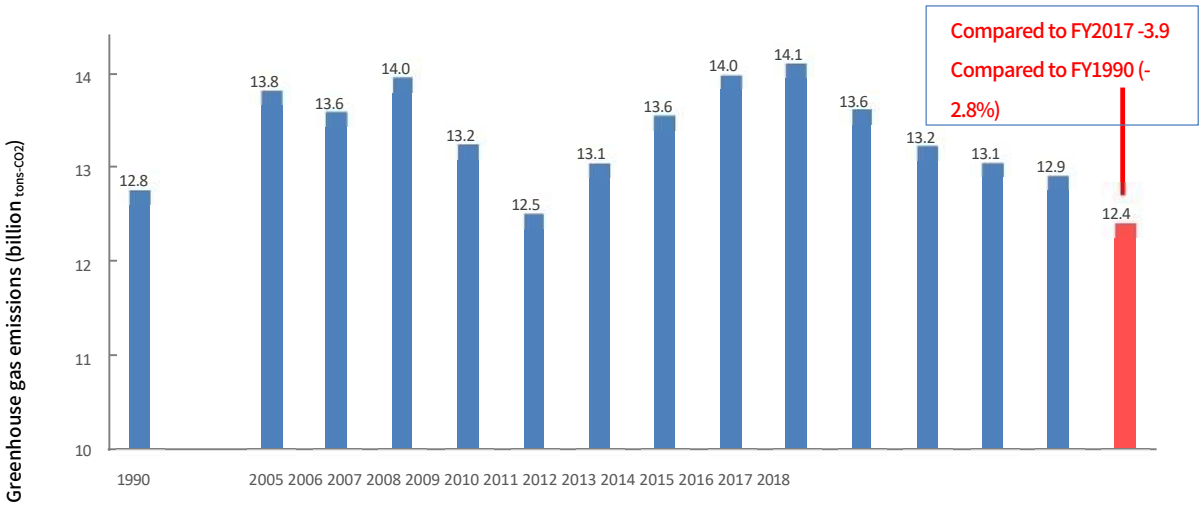
(1) Trends in mitigation measures (greenhouse gas emission control and sink measures)

Following the adoption of the Kyoto Protocol, Japan enacted the "Law Concerning the Promotion of Measures to Cope with Global Warming" and promoted other measures. Since then, Japan has set a target of reducing greenhouse gas emissions by 26% from the FY 2013 level by FY 2030 and formulated a new "Global Warming Prevention Plan" in 2016 to achieve the target.

In June 2019, the Long-Term Strategy as a Growth Strategy Based on the Paris Agreement was formulated, which aims to achieve a decarbonized society as early as possible in the second half of this century.

In addition, in May 2019, starting with the declaration of net zero carbon dioxide emissions by the city in 2050, and the active efforts of the national government, the movement to achieve net zero emissions by 2050 has spread throughout Japan, greatly increasing momentum for the promotion of global warming countermeasures in Japan.

Under these circumstances, in October 2020, the country also announced its goal of achieving net zero greenhouse gas emissions by 2050.



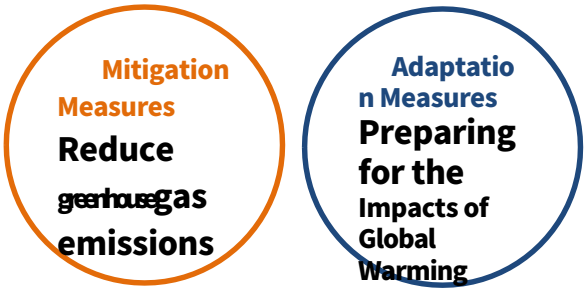
Source: Based on publicly available data from the Ministry of the Environment, Prepared by

Figure 7: Trends in Japan's Greenhouse Gas Emissions

<Global warming countermeasures - mitigation and adaptation measures

According to IPCC, the impacts associated with global warming are projected to be unavoidable even with maximum efforts to reduce greenhouse gas emissions.

Since the global average temperature has already risen by 0.87°C and various impacts have become apparent, "mitigation measures" to reduce greenhouse gas emissions and "adaptation measures" to cope with the effects of climate change must be pursued as two wheels of a cart.



(ii) Trends Related to Adaptation Measures

In order to promote a comprehensive and systematic adaptation strategy that is coordinated across the country, the 2015

November, "Adaptation Plan to the Impacts of Climate Change" was developed.

In addition, in June 2018, the "Climate Change Adaptation Law" was enacted, which clearly positioned the steady promotion of adaptation measures as well.

The Act recognizes the important role of local governments in promoting adaptation measures. The "Regional Climate Change Adaptation Plan" and the establishment of a system of "Regional Climate Change Adaptation Centers" to collect, organize, and analyze information on climate change impacts and adaptation are stipulated as obligations to make efforts.

In addition, November 2018, a "Climate Change Adaptation Plan" was developed to promote stronger adaptation measures in accordance with the law.

<Climate Change Impact Assessment>.

In Japan, the impact of climate change on nature and human society in Japan has been assessed based on scientific knowledge in each field and compiled in the Climate Change Impact Assessment Report (issued in December 2020)

The report describes the various impacts of the long-term changes observed in Japan, such as the rise in average temperatures and the increase in the frequency of heavy rainfall in the country. In particular, in recent years, not only have many weather disasters such as guerrilla storms and typhoons occurred, but in 2018 a record number of people were transported to hospitals for heat stroke due to record-high temperatures. In the future, as climate change progresses, the risk of heavy rain and extreme temperatures is expected to increase.

The impact assessment is based on three perspectives: "significance of impact," "urgency of countermeasures," and "confidence in assessment."

Related Fields	Examples of Major Impacts
natural disaster	Increase in floods and landslides due to an increase in the number of major rainstorms and typhoons
Health & Urban Living	Increase in heat stroke, impact on urban infrastructure and lifelines (water supply, transportation, etc.)
Water Environment and Water Resources	Changes in water temperature and quality, increase in the number of days without precipitation, etc.
Agriculture and forestry	Decrease in the ratio of first-class rice due to high temperatures in paddy rice, poor coloring of apples, etc., increase in pests and weeds, shortage of water for agriculture, etc.
natural ecosystem	Changes in forest composition, biodiversity (distribution of native species, etc.)
Culture, Tourism and Local Industry	Changes in sales of products with seasonal characteristics, impact on production activities of companies using forests, etc.

Chapter 2 Kyoto City's Global Warming Countermeasures to Date

1 History of Kyoto City's Global Warming Countermeasures

Global warming countermeasures in our city began to take off with the COP3 in 1997, when the "Kyoto Protocol" was adopted.

In 2004, we enacted the "2050 Kyoto Zero CO_2 Ordinance (Kyoto City Ordinance on Global Warming Countermeasures)" (hereinafter referred to as the "Ordinance"), the first ordinance in Japan specifically designed to address global warming. In 2004, Kyoto City enacted the first ordinance in Japan specifically designed to combat global warming, the "2050 Kyoto Zero CO2 Ordinance (Kyoto City Ordinance on Global Warming Countermeasures)" (hereinafter referred to as the "Ordinance"), to further promote efforts in

In recognition of these efforts, we was selected in 2009 as an "Environmental Model City" by the national government for its pioneering efforts with high goals and challenges.

In 2010, the ordinance was completely revised to set targets for a 40% reduction of greenhouse gas emissions by FY2030 and a 25% reduction by FY2020 compared to FY, and to strengthen mandatory provisions. In addition, in this revision, the reduction targets and major mandatory provisions are shared with the Kyoto Prefectural Ordinance (enacted in 2005), making it a de facto joint ordinance.

In addition, based on the strong determination not to let the lessons learned from the Fukushima nuclear power plant accident in the Great East Japan Earthquake of March 2011 fade away, as well as the resolution of the city assembly, the city clearly positioned the goal of "a sustainable energy society that does not depend on nuclear power generation" as the foundation of its municipal administration. In December 2017, the "Kyoto Conference on Global Environment 2017" was held to commemorate the 20th anniversary of the Kyoto Protocol.

At the "Kyoto Declaration for a Sustainable Urban Civilization" (KYOTO + 20), the "Kyoto Declaration for a Sustainable Urban Civilization" was announced, which includes the "ideal state of the world's cities in the year 2050" and other ideas.

In addition, in May 2019, at a symposium commemorating the 49th IPCC Annual Meeting in Kyoto, the mayor of Kyoto City expressed his determination to achieve net zero carbon dioxide emissions by 2050 as the first head of a municipality in Japan, and announced an "Appeal for a 1.5℃ Appeal" with the Minister of the Environment and other related parties.

Kyoto Declaration for Building a Sustainable Urban Civilization

＜What the world's cities should look like in 2050

- Symbiosis with nature has been achieved.
- Citizens are undergoing a shift in values and lifestyles.
- The bearers of building a sustainable society are being nurtured.
- Adaptation to the effects of climate change is progressing in tandem with technological innovation.
- A recycling-oriented society is being built.
- Energy autonomy has been realized by cities.
- It combines a reduction in environmental impact with improved convenience.
- Peaceful resolution of social problems Contributing to

Kyoto Appeal for 1.5℃

For decarbonization,

・Promoting efforts based on the "1.5℃ Special Report".

To realize the ideal city of the "Kyoto Declaration".

Shared recognition that, despite the difficulties of combating climate change, a sustainable future can be achieved through the combined efforts of citizens, businesses, local communities, universities, research institutions, NPOs, governments, and others.

We will pursue all possible measures and take concrete actions to achieve "net zero" carbon dioxide emissions by around 2050.

The company has been sending out information to the world on how it is going to do this.

2 これまでの地球温暖化対策の進捗状況

Progress to date on global warming countermeasures

(1) Greenhouse Gas Emissions

Since the COP3 was held in 1997に, the city of Kyoto has been working on global warming countermeasuresに with all Kyoto citizens and businesses, andは has steadilyに reduced greenhouse gas emissions. Since the Great East Japan Earthquake, our dependence on thermal power generation has increased, and the carbon dioxide emission coefficient[3] of electricity has been decreasing.

Emissions had been increasing はworsening に of the global climateが through thorough energy conservation and other measuresに, emissions peaked out in FY 2013に and have been steadily reduced since thenに. Emissions in FY 2018, the latest results, are 18.5% lower than in FY 1990に.

Looking atに by sector, the industrial and transportation sectors have decreased significantly compared to FY. On the other hand, the business and residential sectors have decreased in recent years, but have increased compared to FY1990, partly due to a large increase in the number of offices and households.

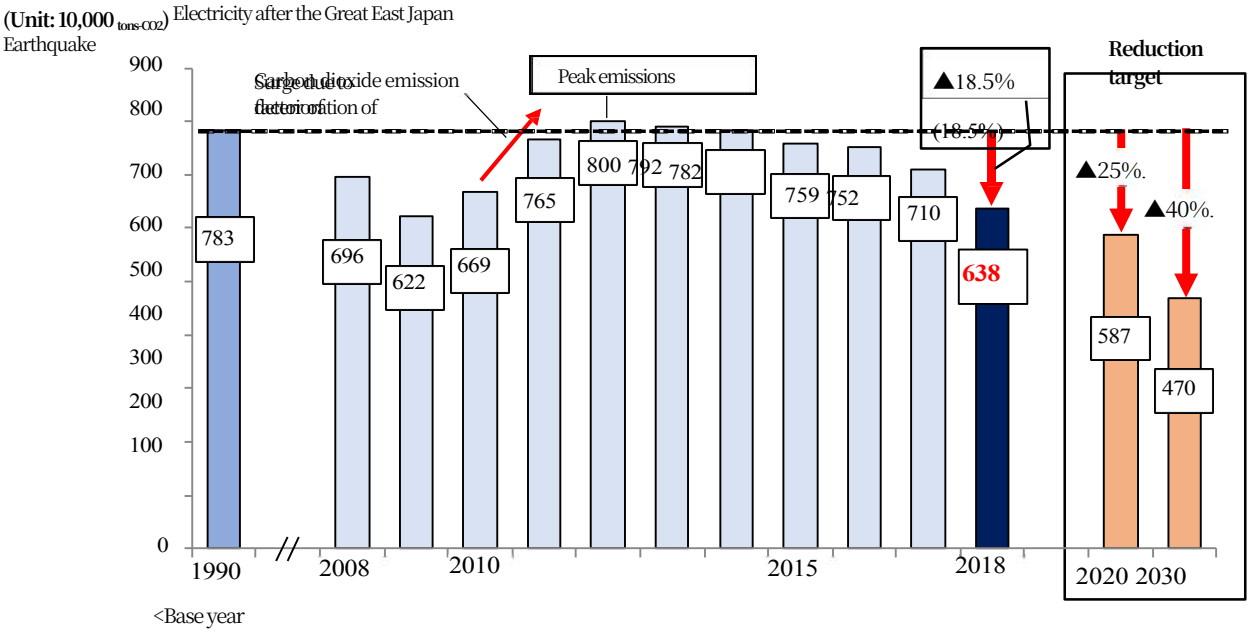
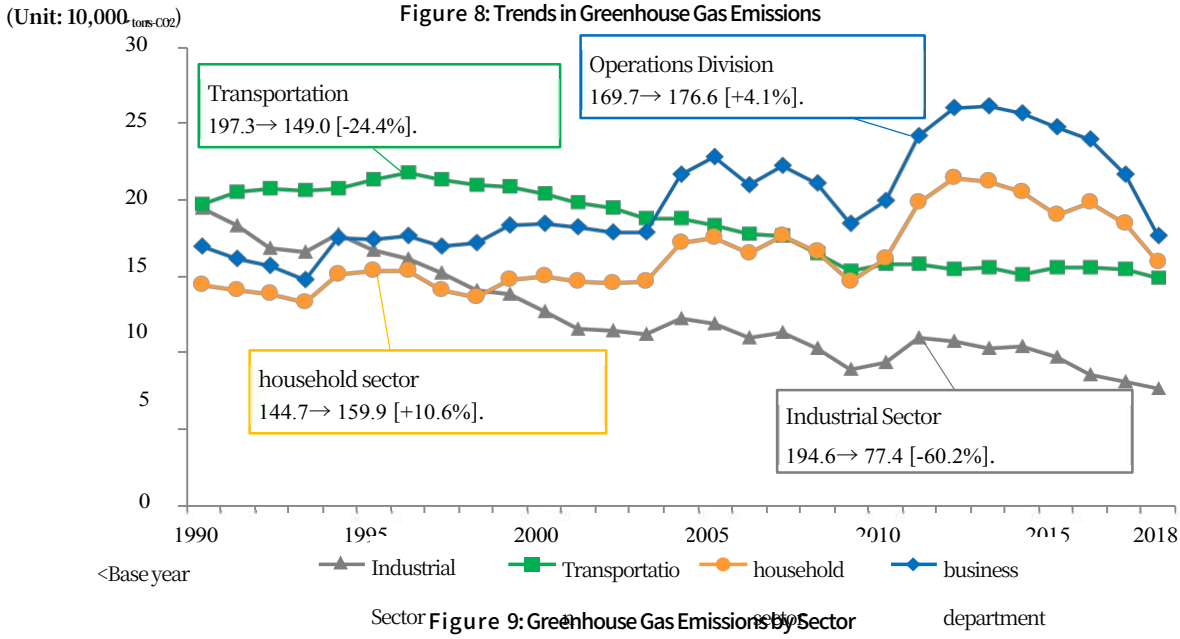


Figure 8: Trends in Greenhouse Gas Emissions



Sector Figure 9: Greenhouse Gas Emissions by Sector department

[3] An indicator that estimates how much carbon dioxide an electric power company emits when producing a certain amount of electricity. Actual carbon dioxide emissions The unit is "kg-CO2/kWh", which is calculated by "÷ electric energy sold" and expressed in "kg-CO2/kWh".

(2) Energy consumption

In fact, more than 80% of emissions of greenhouse gases come from the use of energy such as electricity, gas and fuel oil. Therefore, in order to reduce greenhouse gas emissions, energy consumption must be reduced.

Energy consumption in the city area in 2018 75,202 TJ[4], compared to 1990
This is a 22.7% reduction, the smallest since FY1990. Compared to the peak year of FY1997, a significant reduction of 27.8% has been achieved, and global warming countermeasures, including energy-saving efforts by citizens and businesses, are steadily producing results.

Looking at energy consumption by sector, the industrial sector has remained flat in recent years, but has been on a decreasing trend since FY1990. In the business sector, energy consumption had been increasing since FY, but has been on a decreasing trend in recent years. On the other hand, the residential and transportation sectors have remained flat in recent years.

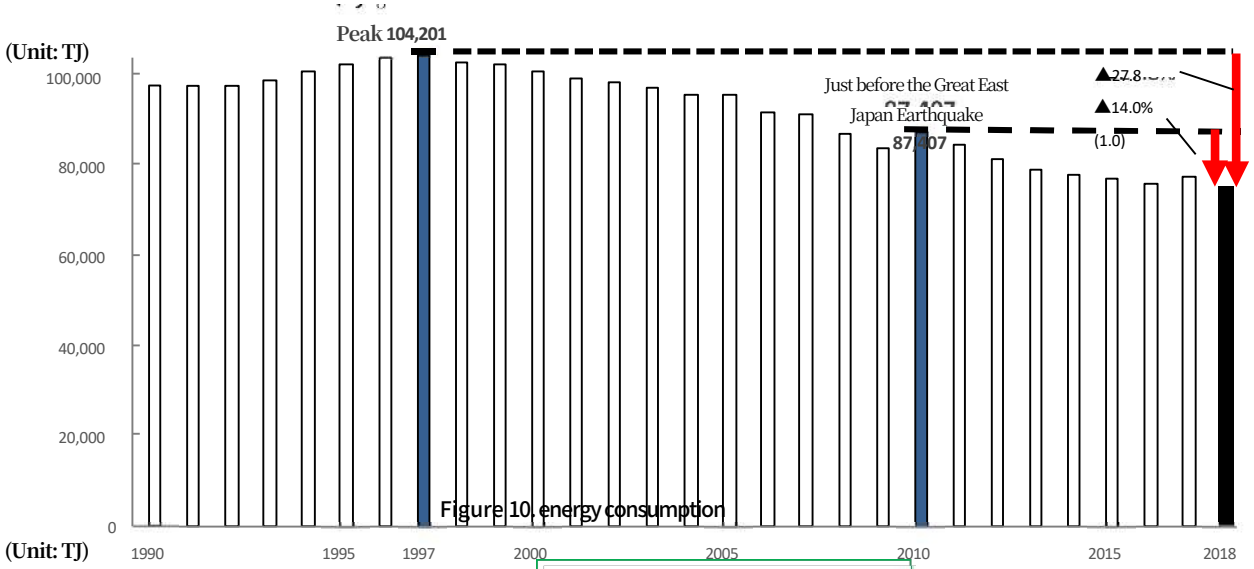


Figure 10, energy consumption

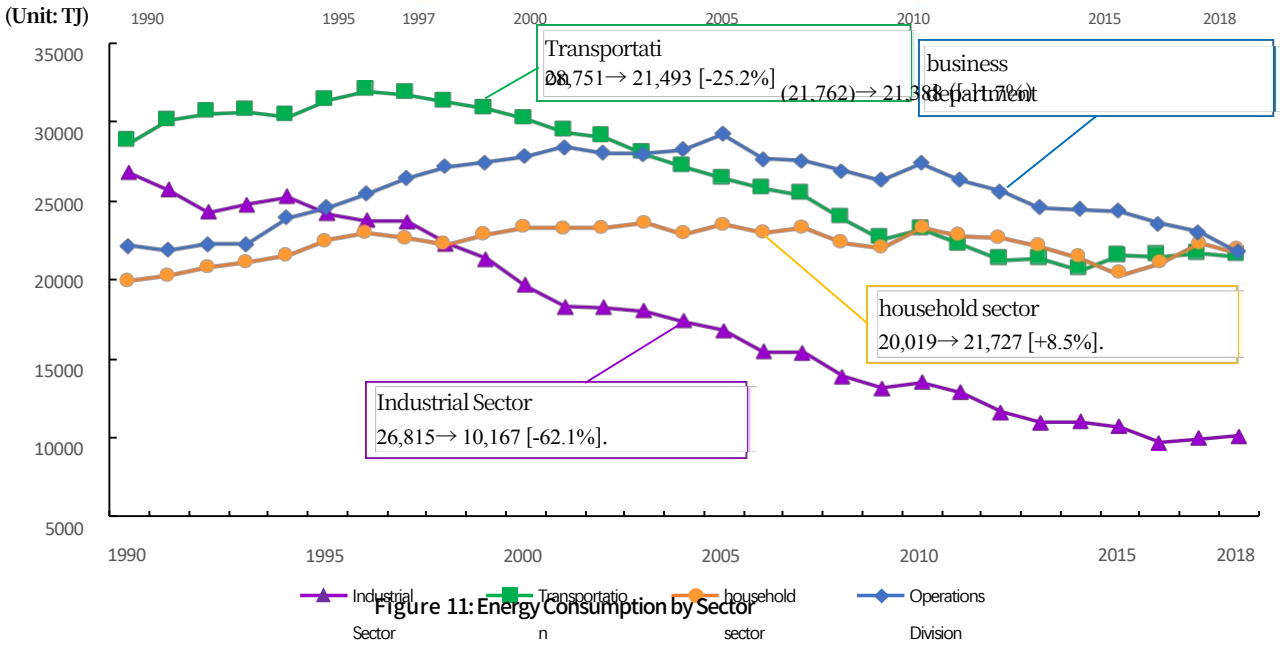


Figure 11: Energy Consumption by Sector

[4] "J (joule)" is a unit of energy. "Tera" in "TJ (terajoule)" is 10 to the 12th power (1 trillion).

(3) (iii) (2) Progress and results of the initiatives listed in the previous plan

All of the 98 specific initiatives listed in previous plan have been initiated at this point. Among them, we have enhanced 10 items, such as the enhancement of eco-school district activities to promote environmentally friendly initiatives on a proactive basis, by adding additional contents from the original project plan.

The following shows the main achievements for each of the six social visions the previous plan.

Table 1: Major Achievements by Social Image in the Previous Plan

picture of society	Main Achievements
Social Image 1 **A town where people and public transportation are prioritized and where walking is fun**	Lower car share due to preferential use of public transportation 2010: 24.3%*1 → 2019 FY:22.3%*2 1 Keihanshin metropolitan area person trip survey 2 Original survey by the city
Social Image 2 **A town that regenerates forests and values "tree culture"**	Increase in forest area (naturally growing forests, cultivated forests) FY2010: 2.92 million ha → FY2018: 2.99 million ha
Social Image 3 **City of energy creation and local circulation**	Increase in solar power generation in the city FY 2010: 49 TJ → FY 2018: 592 TJ* Equivalent to approximately 1% of the city's energy consumption
Social Image 4 **Environment Gentle Lifestyle**	Fostering leaders of a sustainable society (Increase in the total number of participants in the Children's Ecolife Challenge) : approx. 20,000 people → FY2019: approx. 120,000 people
Social Image 5 **Environment Gentle Economic Activity**	Promote energy conservation by large emitters (Results of the Business Emission Reduction Plan System) 1st plan period (2011～ FY2013) -9.0%*2nd plan period (2014 ～ FY2016) -9.9%*3rd plan period (2017～ FY2018): -2.9%* Ratio of average emissions for the period to the base emissions (average emissions for the previous period)
Social Image 6 **Waste Reduction**	Decrease in the amount of refuse accepted by the city FY2000 (peak refuse volume): 820,000 tons → FY 2019: 409,000 tons

Chapter 3. Basic Items of the Plan

1 計画の位置付け
Positioning of the plan

The city passed a revised ordinance at the 2020 city council meeting に, which states that the city aims to achieve a decarbonized society with "net zero carbon dioxide emissions 2050". に This plan is developed as an action plan for the "Decade of Action" which is very important to achieve the long-term goal of "net zero carbon dioxide emissions 2050" に.

It shows the "basic approach","expected reductions by sector" "main actions" of mitigation and adaptation measures to achieve the 2030 reduction target specified in the ordinance に, and also sets out measures to be taken in the long term に to achieve a decarbonized society by 2050 に and then に to connect to it に in the long term.

In addition, the method of progress management such as inspection, evaluation, and review of the measures will be defined.

Column The efforts of the past decade are important.

- According to the IPCC's "1.5°C Special Report," if global warming continues at its current rate, the global average temperature increase could reach 1.5°C as early as the 2030s.
  In order to limit the temperature increase to 1.5°C, it is imperative that global greenhouse gas emissions begin to decline immediately and be significantly reduced as soon as possible.
- In order to achieve net-zero emissions in 2050, it is necessary to take measures for buildings that will be in use for a long time and for social and economic systems to be transformed from an early stage.
- These factors make the next 10 years very important.

(1) location

This plan is positioned as a "Local Government Action Plan (Area Policy)"[5] based on Article 21 of the Law Concerning the Promotion of Measures to Cope with Global Warming に, and as a "Regional Climate Change Adaptation Plan" に based on Article 12 of the Climate Change Adaptation Law に.

It will also be formulated as a "Global Warming Prevention Plan" as stipulated in Article 10 of the Kyoto City Basic Plan and the Kyoto City Basic Environmental Plan に, as well as in Article 10 に of the ordinance.

(2) Relationship to other individual plans

Since all policies should be based on decarbonization に, it is necessary to promote environmental conservation, including biodiversity conservation and the creation of a recycling-oriented society, as well as urban development and industrial development.

promote initiatives in cooperation with related plans in all areas, including business, health and welfare. The following is a list of the most common pr

5 The Law Concerning the Promotion of the Measures to Cope with Global Warming stipulates that local governments shall formulate an action plan for local governments as a comprehensive plan for global warming countermeasures to be implemented by local governments. The regional policy section specifies measures to reduce greenhouse gas emissions in the area, and the administrative business section specifies plans for measures to reduce greenhouse gas emissions in the administrative and business activities of the local government.

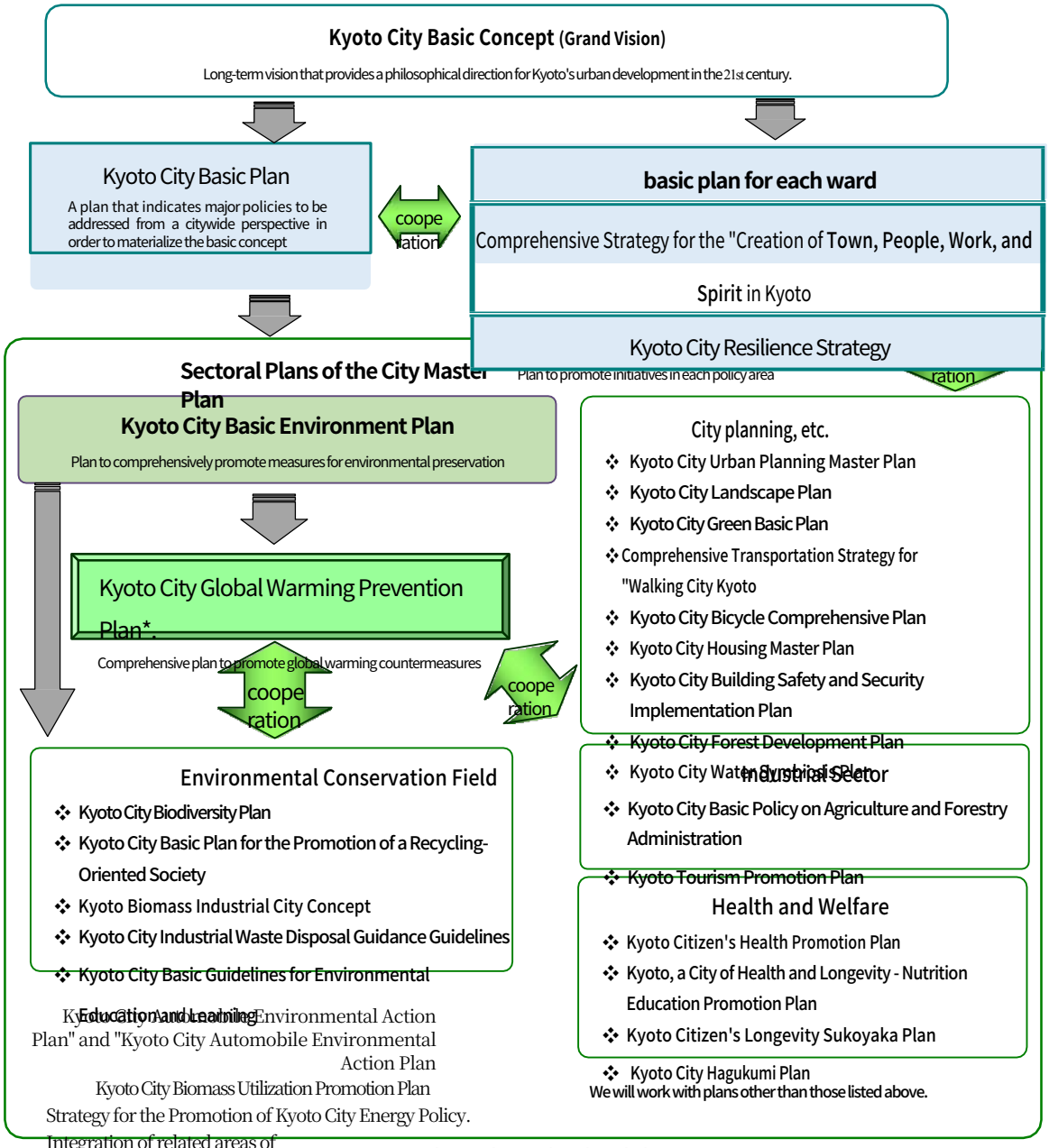


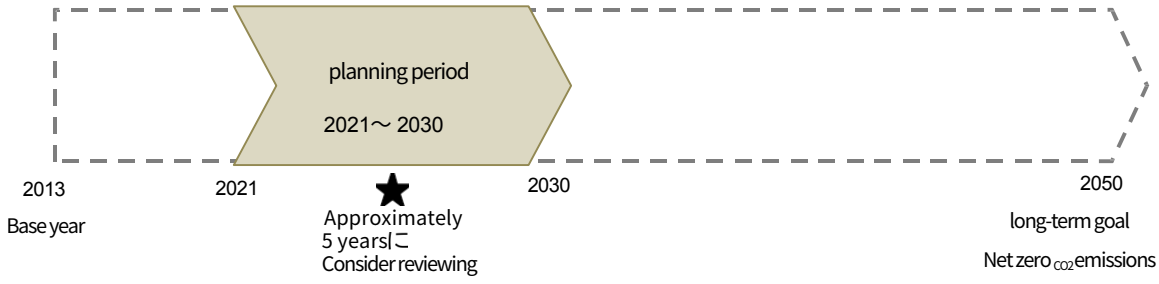
Figure 12. Relationship with Related Plans

2 計画期間及び温室効果ガス排出量の削減目標等 Plan period and greenhouse gas emission reduction targets, etc.

(1) Plan period Plan period

The period shall be **10** years from FY2021 to FY2030.

※The review will be considered approximately every five years in light of changes in social conditions and other factors.



(2) Greenhouse gases to be reduced

The seven greenhouse gases targeted for reduction in the plan are listed in the table below. Greenhouse gas emissions are calculated by calculating the emissions of each of these gases and converting the greenhouse effect to carbon dioxide equivalent (multiplied by the global warming potential [6]).

Table 2: Major Sources of Greenhouse Gas Emissions and Global Warming Potentials, etc.

greenhouse gas		Major emission sources	Global Warming Coefficient	Emissions and composition in the city area (FY 2018) (10,000 tons-CO_2)
Carbon dioxide (CO_2)		Consumption of fossil fuel-derived electricity, gas, and kerosene in homes and offices, and gasoline in automobiles Phosphorus and diesel oil consumption, etc.	1	586.0 (89.6%)
Methane (CH_4)		Rice cultivation, fermentation of organic matter, sewage processing etc.	25	2.6 (0.4%)
Dinitrogen monoxide (N_2O)		Combustion of sewage sludge, sewage treatment (lessening the significance or value of the previous word) the likes of	298	7.6 (1.2%)
Alternative CFCs etc.	hydrofluorocarbon (HFCs)	Commercial air conditioner/refrigerator or Leakage from etc.	2,090 etc.	57.9 (8.9%)
	perfluorocarbon (PFCs)	Semiconductor manufacturing process etc.	7,390 etc.	
	Sulfur hexafluoride (SF_6)	Electrical insulators etc.	22,800	
	Nitrogen trifluoride (NF_3)	Semiconductor manufacturing process etc.	17,200	

(3) (3) Greenhouse Gas Emissions Reduction Targets

Concept of backcasting from net-zero carbon dioxide emissions in 2050 Stand on the goal of **reducing greenhouse gas emissions** from the city area **by at least 40% from the fiscal 2013 level by fiscal 2030.**

The base year has been set as FY1990, but 30 years have passed and the breakdown of emissions has changed significantly. Based on the viewpoint that Japan's target is based on the Paris Agreement and many other cities have also adopted it, we will review the target for fiscal 2013 .

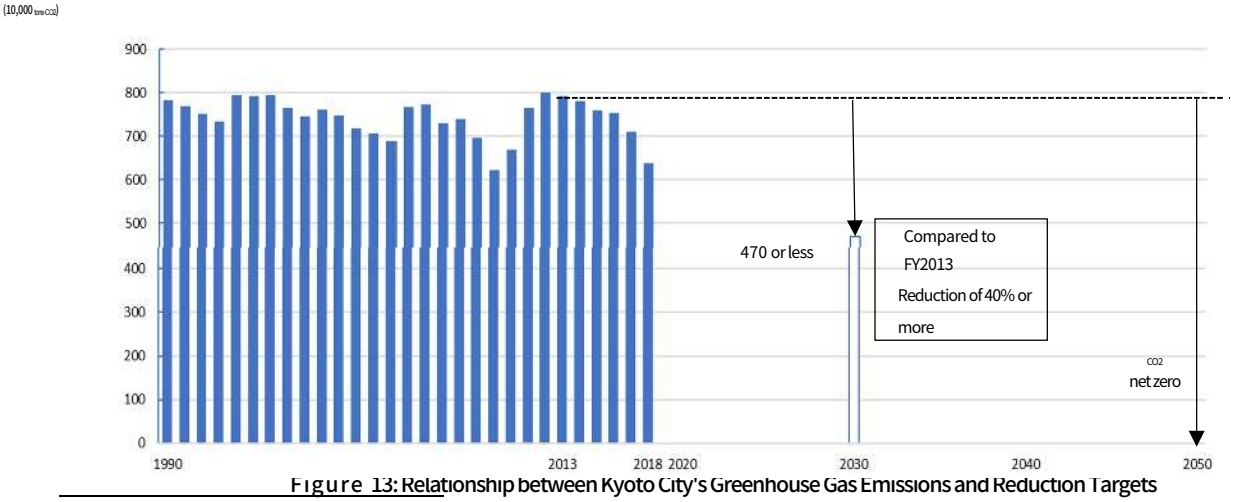


Figure 13: Relationship between Kyoto City's Greenhouse Gas Emissions and Reduction Targets

[6] A number that represents the ability of other greenhouse gases to warm the earth with respect to carbon dioxide.

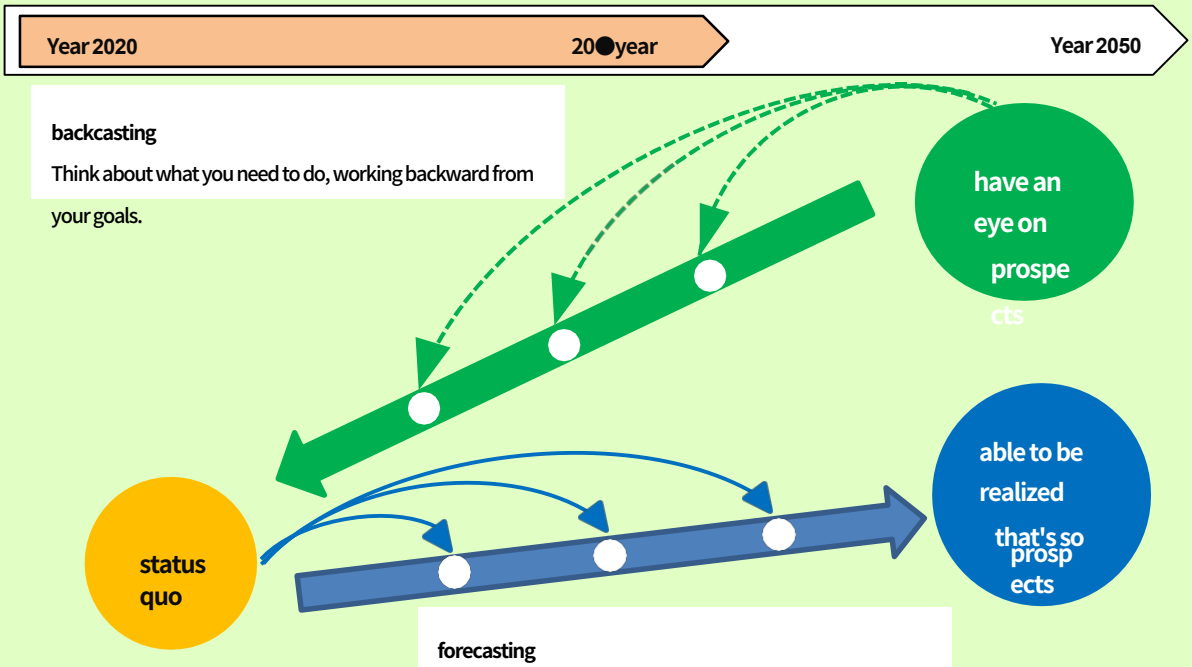
Column Backcasting Concept

Backcasting is the concept of setting a future goal and considering what needs to be done to achieve the goal from that starting point. It is used as a synonym for "forecasting," which is to consider what can be done based on past achievements and the current situation.

It is a way of thinking used to achieve long-term goals, such as the realization of a decarbonized society, and a future that is not an extension of the present. In the case of Kyoto City, the long-term goal is to move from net zero carbon dioxide emissions in 2050 to back

Based on the casting concept, we will reduce greenhouse gas emissions from the city area by 2030 compared to the fiscal 2013 level.

With an interim goal of reducing emissions by 40% or more, we are studying necessary measures and formulating this plan.



Chapter 4. Basic Planning Methods

The goal of "net zero carbon dioxide emissions in 2050" is a lofty target that cannot be reached simply by extending past efforts. 「The effects of global warming」 are becoming more serious, the current situation can be called a "climate crisis" or "climate emergency." 」In order to realize the goal」, it is extremely important to make efforts over the next 10 years. It is necessary for all entities, including citizens and businesses, to share a sense of crisis and their goals, and to promote voluntary and proactive initiatives according to their respective roles.

In order to promote the initiatives for this decade」, we will establish a basic policy on what we aim to achieve in 2050」 and how we will promote global warming countermeasures」 in the future, including the concept of necessary initiatives.

1 The Image of Kyoto in the Year 2050 (2050年の京都の姿 ―目指す社会像―) The Image of Kyoto in 2012 -The Vision of Society

To realize a decarbonized society」, it is important to break away from the dependence on fossil resources and energy that has supported social and economic growth since the Industrial Revolution, and to shift to a culture of living in harmony with nature that Kyoto has cultivated, a tradition of valuing what」 symbolizes」, an enterprising spirit that accepts and digests external stimuli」, and sustainable energy and resource use」. It is important to shift to a lifestyle and social and economic activities that do not emit carbon dioxide based on sustainable energy and resource use.

Based on this, Kyoto's vision for society in **2050** is "an affluent Kyoto where future generations can envision their dreams," where the lifestyle culture and wisdom nurtured in harmony with nature are combined with new technologies and wisdom, and where decarbonization is realized along with improved quality of life and sustainable economic development.

In addition, based on the ideal state of the world's cities in 2050 as set forth in the Kyoto Declaration, which aims to build a sustainable urban civilization, and the six social visions for the year 2030 as set forth in the previous plan (「」), the "state of daily life" in the year **2050** We present "the state of work" and "the state of the city."

「」We will discuss and brush up the contents of the three figures described in this report with various entities in the future, and by sharing the contents of the discussions, we will promote voluntary and proactive efforts by all entities」 and lead to the evolution of measures that will be necessary in the future.

Vision of Kyoto in 2050

By integrating the life culture, wisdom, and new technologies nurtured in symbiosis with nature, decarbonization can improve the quality of life, reduce the burden on the environment, and improve the quality of life of the people.

A "prosperous Kyoto where future generations can dream," achieved along with sustainable economic development.

<The shape of life

residence

residence consumption behavior

link

Comfortable and healthy living is standardized by selecting homes with high environmental performance that generate more energy than they use.

A change in consciousness from "owning" to "sharing" and a style that takes into consideration the global environment and society have taken root, utilizing local resources such as foodstuffs and establishing a lifestyle based on Kyoto's food culture.

Effective use of energy and resources, such as flexible use and local production for local consumption, is spreading among various communities, including local communities.

<The shape of the work

OFFICE

business style

Work

innovation

Offices and buildings with high environmental performance, health, comfort, and energy self-sufficiency become the norm.

Shift away from a "mass production/consumption" business model to one based on sustainable use of resources and energy.

Through the digitalization of the work environment and changes in the concepts of commuting and the office, a time- and location-independent work style has taken root.

New innovations and businesses will be created by universities and businesses utilizing the "wisdom" of Kyoto, contributing to the decarbonization of the world.

<The Town

energy

moving move (i.e. out of the way)

forest

agriculture land

Renewable energy is supplied in various ways through systems to utilize surplus electricity from renewable energy on a regional and community basis and through cooperation with neighboring municipalities that produce a large amount of renewable energy. 100% of the energy used is renewable energy. Hydrogen and other energy sources that do not emit carbon dioxide will be widely used. Energy supply during disasters will be secured, and urban resilience will be improved.

The construction of an advanced transportation system utilizing new technologies such as automated driving and AI will make travel more efficient and comfortable, and the "Walking City Kyoto" initiative, which prioritizes people and public transportation, will progress, creating an attractive and vibrant city that "makes you want to go out".

In addition to timber production, forests are actively used as places for environmental education and recreation, and fully demonstrate their functions such as carbon dioxide absorption and flood control.

Through the promotion of local production for local consumption and support for environmentally friendly agriculture, farmland is properly maintained and managed, contributing to the absorption of carbon dioxide and the conservation of biodiversity.

Safe, secure, and comfortable urban development that contributes to reducing the effects of heat, heavy rain, and other factors by devising building structures, appropriately arranging street trees and green spaces, and other measures.

2 Basic Approach 取組の基本的な考え方

Global warming countermeasures aiming at a decarbonized society will be implemented based on the following basic concepts and measures to achieve them.

(1) Basic approach to future global warming countermeasures

(1) All-Kyoto efforts

We will foster a sense of urgency and a sense of momentum by sharing the vision of a decarbonized society with citizens, local communities, businesses, tourists, and all other entities, including the young generation who will carry the future, and encourage all to act voluntarily and proactively. We will also work with universities, community groups, environmental conservation groups, Kyoto Prefecture, and other organizations to promote all-Kyoto initiatives.

(2) Realize a prosperous Kyoto through global warming countermeasu

We will develop global warming countermeasures that will simultaneously solve social and economic issues and enrich Kyoto's future. We will develop global warming countermeasures that will enrich Kyoto's future by simultaneously resolving social and economic issues.

(iii) Evolving countermeasures

We will continue to collect the latest knowledge, introduce new technologies and systems, and a system that makes carbon dioxide emissions the norm.

④ Strengthen ties with the whole of Japan and t

As the birthplace of the Kyoto Protocol and the IPCC Kyoto Guidelines, Kyoto will strengthen cooperation with the national government and local governments in Japan and abroad to promote international communication and sharing of institutional changes and advanced initiatives in order to lead decarbonization.

(2) How to proceed toward realization

To realize a decarbonized society, we will accelerate energy conservation and dramatically expand the use of renewable energy while taking into account the five perspectives, and we will take firm steps to achieve "net zero" carbon dioxide sinks such as forests, which are essential for achieving a decarbonized society. In addition to such mitigation measures, adaptation measures to reduce the impact of climate change will be implemented in the form of vehicle

We will proceed as both wheels.

(1) Develop measures to transform the four areas of civic life (lifestyle), business activities (business), energy, and mobility that form the foundation these areas.

emissions, it is necessary to shift social and economic activities to those that do not emit carbon dioxide. We will develop measures to achieve this shift in four areas lifestyle, business, energy, and mobility.

② Action Disseminate and share information that connects

In order to shift the behavior of citizens and businesses to be more environmentally conscious, we will establish a new mechanism to access information in daily life and business activities, such as visualization of environmental impacts and effects of initiatives through the use of ICT.

(iii) Long-term perspective: Promote innovation, nurture leaders, and create new

We will pursue all possibilities to steadily achieve the reduction target for FY2030, and with a long-term view toward 2050, we will promote innovation through industry-academia-government collaboration, foster leaders, create new mechanisms, and standardize the elimination of carbon dioxide emissions.

④ **As well as aiming to achieve the SDGs (4)**

Approach to resilience enhancement Promote initiatives based on

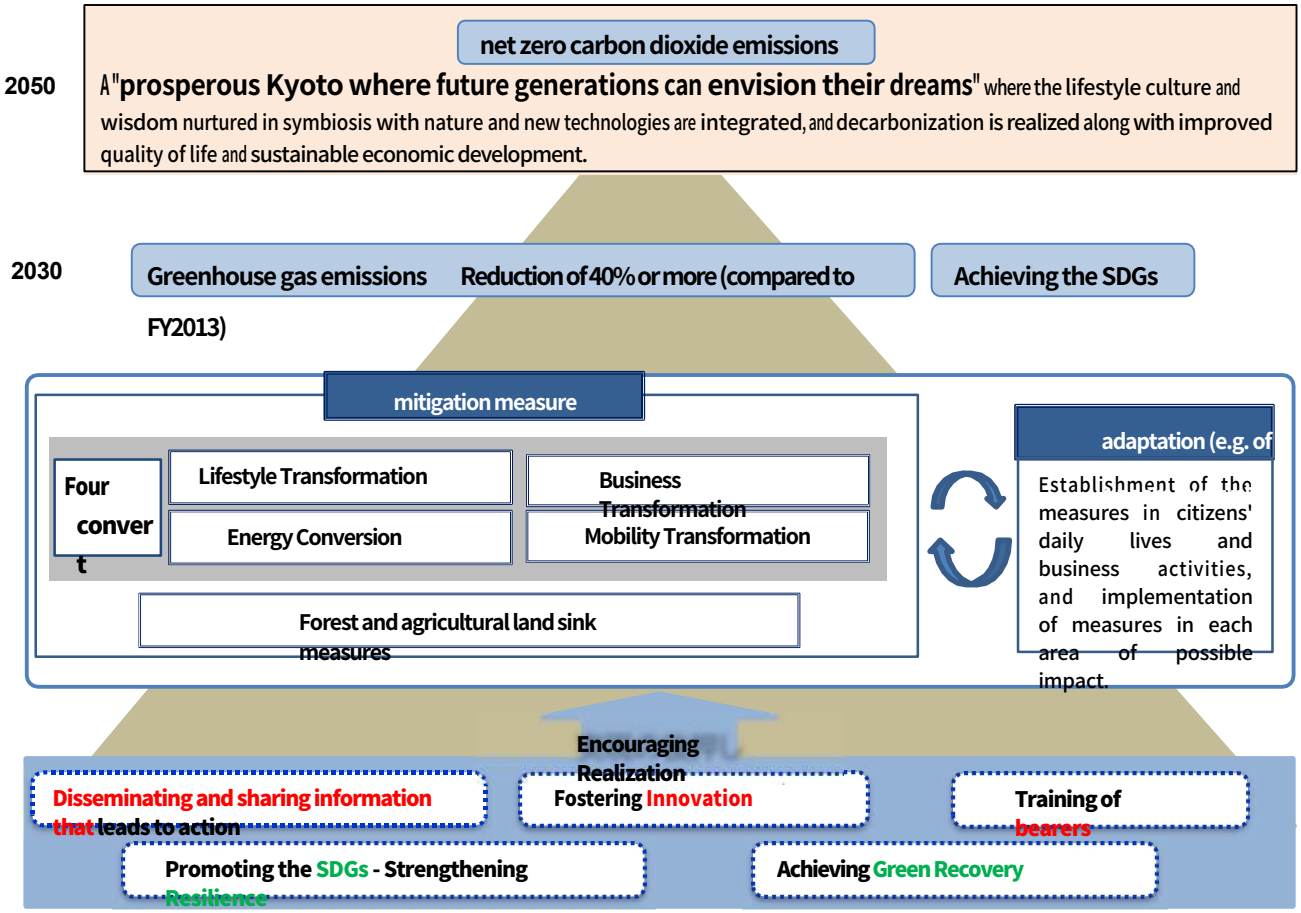
Achieve each of the 17 goals of the SDGs We will promote initiatives that contribute to the achievement of each of the 17 SDGs.

In promoting adaptation measures In promoting adaptation measures, we will not only deal with the effects of climate change, but also enhance the resilience of cities. We will not only deal with the effects of climate change, but also promote measures from the perspective of enhancing the resilience of cities. We will promote measures from the perspective of not only coping with climate change but also enhancing urban resilience.

ⓒ Promoting initiatives based on the concept of green recovery

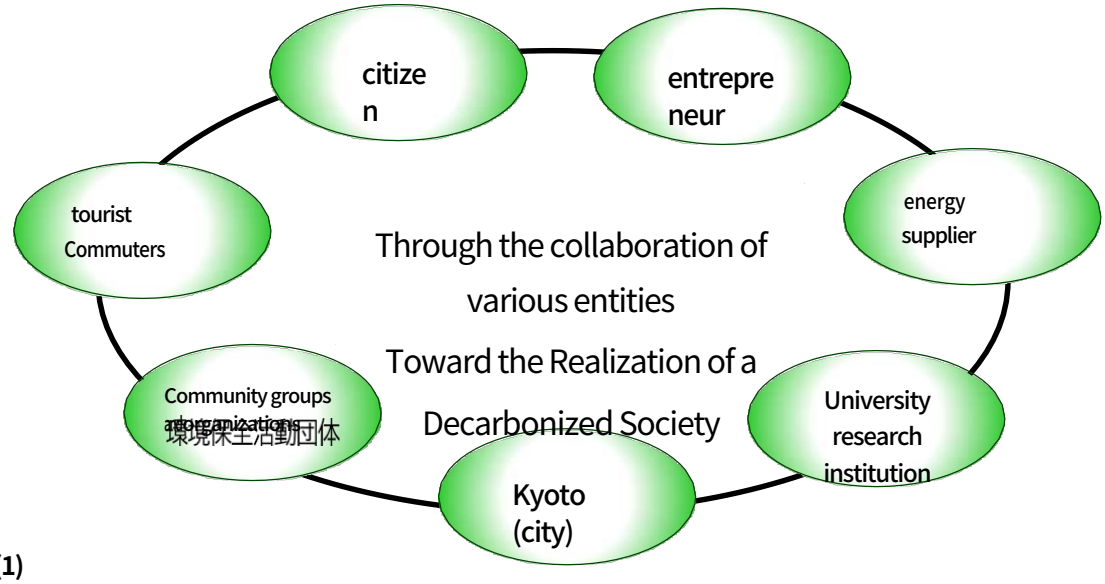
However, in order to build a sustainable society, we should not assume that social and economic activities will be reduced, but rather, we should actively take steps toward the realization of a low-carbon society, incorporating new trends such as digitalization, rather than assuming that social and economic activities will be curtailed. We aim to simultaneously realize sustainable economic development, affluent lifestyles for citizens, and global environmental conservation by moving forward with initiatives to achieve this goal.

＜The whole picture of how to proceed.


2050
net zero carbon dioxide emissions
A "prosperous Kyoto where future generations can envision their dreams" where the lifestyle culture and wisdom nurtured in symbiosis with nature and new technologies are integrated, and decarbonization is realized along with improved quality of life and sustainable economic development.
2030
Greenhouse gas emissions Reduction of 40% or more (compared to FY2013)
Achieving the SDGs
mitigation measure
Four conver t
Lifestyle Transformation
Business Transformation
Energy Conversion
Mobility Transformation
Forest and agricultural land sink measures
adaptation (e.g. of
Establishment of the measures in citizens' daily lives and business activities, and implementation of measures in each area of possible impact.
Encouraging Realization
Disseminating and sharing information that leads to action
Fostering Innovation
Training of bearers
Promoting the SDGs - Strengthening Resilience
Achieving Green Recovery

3 Role of each entity 各主体の役割

To realize a decarbonized society に, various actors including citizens, businesses, and the city will promote measures to combat global warming に through voluntary and proactive efforts に, and will collaborate to promote specific measures in accordance with their necessary roles に in an all-Kyoto manner.



(1)
Citizens

Citizens can play a proactive role in the fight against global warming に by deepening their understanding of global warming issues に and changing their daily lives to be more environmentally に friendly に friendly, including thorough energy conservation, further reduction of waste, energy-efficient appliances and homes, electricity from renewable energy sources, and environmentally and socially に friendly product choices. We will play a proactive role in the fight against global warming.

((2) tourist-tourists-commuters

Tourists and commuters will take measures to contribute to global warming prevention に such as using public transportation and choosing services with less environmental impact in order to reduce the environmental impact of sightseeing and commuting に. In addition, we will also work on local practices に regarding the initiatives に taken in Kyoto.

(3) Businesses

Businesses will play a proactive role in the fight against global warming に by reducing greenhouse gas emissions in all processes of their business activities に and shifting to business practices based on the sustainable use of resources and energy.

We will also work to reduce our environmental impact and increase productivity and corporate value に by, for example, improving the flexibility of our employees' work styles through the use of ICT に. In addition, we will work to に promote innovation that supports the transformation of each field by leveraging our technologies に.

(4) Energy supplier

Energy suppliers such as electricity and gas companies will not only actively provide information on energy supply, energy conservation and renewable energy に in the city, but also provide comprehensive energy services such as promoting energy conservation in cooperation with the community, and actively promote に initiatives to expand the use of renewable energy に.

(5) Community Action Groups - Environmental Conservation Organizations

Local groups will implement community-wide global warming countermeasures by leveraging Kyoto's civic and regional strengths.

Environmental preservation groups will make use of their respective fields of expertise to respond to the diversifying needs of society as well as environmental preservation and global warming countermeasures and promote cooperation and collaboration with citizens, businesses, and government, leading to the participation of more entities and the enrichment and strengthening of the content of their initiatives.

(6) University - Research Institution

Universities and research institutions will further promote measures to combat global warming in cooperation with various entities, including local groups and businesses, by taking advantage of the characteristics of Kyoto as a "university town and student town," where students account for about 10% of the city's population and are full of individuality, charm, and vitality. Through collaboration between industry, academia, and government, we promote R&D and practical application of new technologies in the environment and energy fields, and promote innovation to support the transformation of each field.

Kyoto City

In order to foster momentum for the transition to a decarbonized society and to promote the transition under a government-wide promotion system, Kyoto City will promote support and collaboration for the independent activities of citizens, businesses, community groups, and environmental conservation groups in various fields, and, design systems such as strengthening obligations and creating incentives, and introduce the necessary measures. The following measures will be taken.

In addition, we will strengthen cooperation with the national government and local governments in Japan and abroad to accelerate the creation of innovation and institutional change, and contribute to the national and global countermeasures against global warming by disseminating our city's initiatives in various forums.

Furthermore, since Kyoto City Hall is the largest emitter of greenhouse gases in Kyoto City, we will take the lead in reducing greenhouse gas emissions by introducing and using environmentally and socially friendly products and by using renewable energy in public facilities.

4 Estimated amount of GHG reduction in FY2030 and reduction methods

(1) Estimated amount of greenhouse gas reduction in FY2030

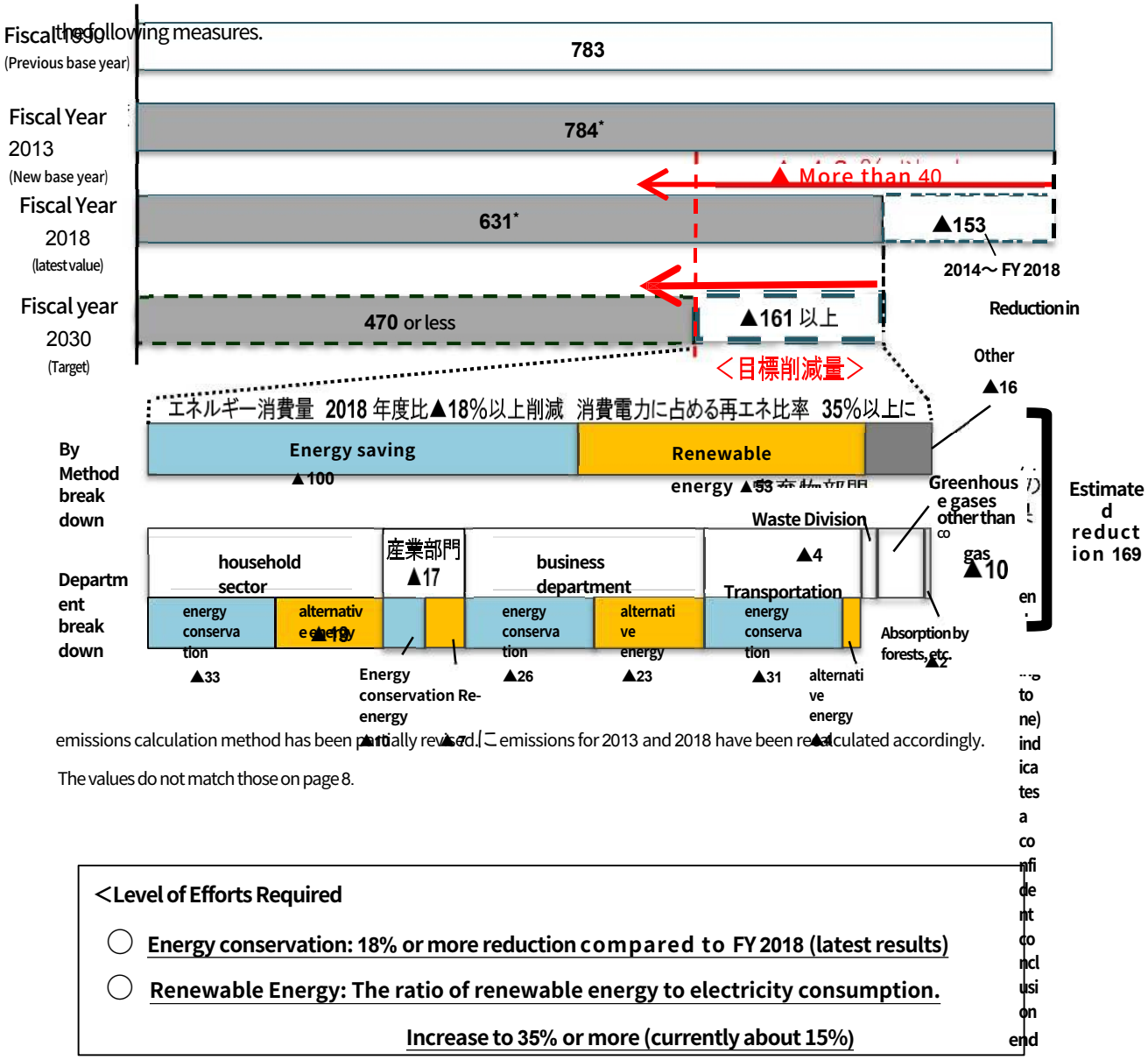
In order to achieve the reduction target for FY2030, Japan needs to reduce more than 3.14 million tons compared to FY 2013. From FY 2013 to FY 2018, the latest actual result, 1.53 million tons have been reduced, and after this, more than 1.61 million tons must be reduced.

To achieve this, we will reduce energy consumption by 18% or more compared to the FY2018 results, while maximizing the introduction of renewable energy and raising the ratio of renewable energy to electricity consumption to 35% or more through the maximum introduction of renewable energy.

Additional measures, including the active introduction of new technologies and mechanisms, should also be taken.

We will further increase the amount of reduction through the following measures.

(Unit: 10,000 tons-CO2)



emissions calculation method has been partially revised. emissions for 2013 and 2018 have been recalculated accordingly.

The values do not match those on page 8.

＜Level of Efforts Required

- ○ Energy conservation: 18% or more reduction compared to FY 2018 (latest results)
- ○ Renewable Energy: The ratio of renewable energy to electricity consumption. Increase to 35% or more (currently about 15%)

Figure 14. Estimation of required and estimated reductions by FY2030

Table 3: Estimated Reductions by Sector

(Unit: 10,000 tons-CO2)

		FY2013 Emissions (Base year)	FY 2018 Emissions (Most recent results)	Estimated value for FY2030	Reduction compared to FY 2018		Reduction compared to FY2013	
					reduction	Reduction rate	reduction	Reduction rate
Greenhouse Gas Emissions ①	household sector	212	160	108	▲52	(32.5%) (32.5%) (32.5%) (32.5%)	▲104	(49.1%) (49.1%) (49.1%) (49.1%) (49.1%)
	Industrial Sector	104	77	60	▲17	(22.1%) (22.1%) (22.1%) (22.1%) (22.1%)	▲44	(42.3%) (42.3%) (42.3%) (42.3%)
	business department	261	177	128	▲49	(27.7%) (27.7%) (27.7%) (27.7%)	▲133	(51.0%) (51.0%) (51.0%) (51.0%)
	Transportation	155	149	114	▲35	(23.5%) (23.5%) (23.5%) (23.5%) (23.5%)	▲41	(26.5%) (26.5%) (26.5%) (26.5%)
	waste	21	23	19	▲4	(17.4%) (17.4%) (17.4%) (17.4%)	▲2	(9.5%) (9.5%) (9.5%)
	alternative CFCs (lessening the significance or value of the previous word) the likes of	54	68	58	▲10	(14.7%) (14.7%) (14.7%) (14.7%)	4	(7.4%) Net income
Amount of reduction 2)(1) 1		23	23	25	2	8.7% (in %)	2	8.7% (in %)
total amount ①-②		784	631	462	▲169	(26.8%) (26.8%) (26.8%) (26.8%)	▲322	(41.1%) (41.1%) (41.1%) (41.1%)
Emission Factors Assumption*2		0.522	0.365	0.27～ 0.28		-		-

1 The amount of carbon sequestration in forests and urban green spaces and in farmland soil was set as the amount of carbon sequestration (previously, the amount of forest absorption, electricity sales from solar power generation, and electricity sales from waste power generation were recorded).

2 The emission factor for electricity in FY2030 is a target value that reflects the effects of the installation of renewable energy facilities in the city and the promotion of the selection of renewable energy electricity, in addition to the assumed values of the electric power company's initiatives.

Table 4: Estimated Reduction Efforts by Approach

(i) Reduce energy consumption ⇒ **Energy savings of 18% or more compared to FY 2018**

	Energy consumption		Energy consumption reduction rate	Greenhouse Gas Emission Reductions
	Fiscal Year 2018	Fiscal year 2030		
household sector	21,727 TJ	16,830 TJ	(22.5%) (22.5%) (22.5%) (22.5%)	(330,000 t-CO2) (330,000 t-CO2)
Industrial Sector	10,167 TJ	9,137 TJ	(10.1%) (10.1%) (10.1%)	100,000 t-CO2 -1,0 million t-CO2
business department	21,388 TJ	18,943 TJ	(11.4%) (11.4%) (11.4%) (11.4%) (11.4%)	(2.26 million t-CO2)
Transportation	21,493 TJ	16,696 TJ	(22.3%) (22.3%) (22.3%) (22.3%)	(3.31 million t-CO2)
total amount	75,202TJ*	61,606 TJ	(18.1%) (18.1%) (18.1%) (18.1%) (18.1%)	1 million t-CO2

(In FY2030, the amount will be allocated to each sector.

(ii) Expansion of renewable energy

⇒ **Increase the ratio of renewable energy to electricity consumption to at least 35% (currently about 15%)**

bout (in sports, etc.)	indicator	Fiscal Year 2018	Fiscal year 2030	Emission reductions compared to FY 2018	remarks
Expand introduction of renewable energy within the city limits	Amount of solar power generation installed	136MW	250MW	20,000 t-CO2	Approximately doubled from the current level
Promoting the Selection of Renewable Energy Electricity	Percentage of contracts citywide	Almost 0	10% (of the total)	(0.2 million t-CO2)	long vowel mark (usually only used in katakana)
Electric Power Company Initiatives	Percentage of electricity supplied from renewable energy sources	Approx. 15	25%.	▲310,000 t-CO2	Increase the ratio of non-fossil power sources as required by the Act on the Upgrading of the Energy Supply Structure
total amount				(530,000 t-CO2) (530,000 t-CO2)	

(iii) Guideline for Efforts to Reduce Greenhouse Gas Emissions in Other Sectors (Unit: 10,000 tons-CO2)

department	bout (in sports, etc.)	Fiscal Year 2018	Fiscal year 2030	Emission reductions compared to FY 2018

(1) Reduction Method

In order to achieve the reduction target for FY2030に, we aim to achieve the reduction target of 1.61 million tons or more compared to FY2018に necessary to achieve the reduction target for FY2030, based on the assumption of the national plan for global warming countermeasures, etc., we will pursue all possibilities and implement comprehensiveに measuresに, and set the estimated reductions by sector and by action methodに as follows, and promote mitigation measures as described in Chapter 5に We aim to achieve the reduction targets by promoting the initiatives listed in Chapter 5に.

Table 5. Reduction Efforts by Sector

① Household sector — Reduction of 520,000 t-CO2

(10,000 t-CO2)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030
energy conservation 330,000 tons	Diffusion of high-efficiency appliances and equipment	24	Diffusion of LED lighting: 100% (current 40% approx.) ・Diffusion of high-efficiency water heaters: 75% (current 20～30%) Diffusion of high-efficiency home appliances: Refrigerator, air conditioner efficiency improved by approx. , etc.
	Improvement of energy-saving performance of housing	4	ZEH is standard in new constructionに (Currently about 10%) Achievement rate of energy conservation standards for residences: 27% (current rate is about 10%)
	Other household energy conservation efforts	5	Energy-saving actions other than the aboveに
Renewable energy 190,000 t	Widespread use of solar power generation equipment	1	Solar power generation equipment installations: residential up approx. 15,000
	Renewable Energy Electricity selection promotion	7	Percentage of contracts for electricity from 100% renewable energy sources: approx. 10%. (Currently almost 0%)
	Promotion of renewable energy supply by electric utilitiesに	11	Percentage of electricity supplied by electric power companies from renewable energy sources 25% (Currently about 15%)

② Industrial Sector — Reduction of 170,000 t-CO2

counter-measure		curtailment estimated amount	Level of efforts, ideas, etc. for FY2030
energy conservation 100,000 tons	Large-scale emitters (specified business operators) Energy conservation efforts in	5	Emission reductions of at least 1.0% per year
	Energy conservation efforts by non-specified enterprises	5	Effects of energy conservation efforts other than the above
Renewable energy	Widespread use of photovoltaic power generation equipment, renewable energy	4	Solar power generation capacity: Approx. 30 MW increase Percentage of contracts for electricity from 100% renewable energy sources Approx. 10% (currently almost 0%)

(iii) Business Sector

Reduction of 490,000 t-CO2

(**10,000 t-CO2**) (Reduction (10,000 t-CO2)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030
energy conservation 260,000 tons	Large-scale emitters (specified business operators) Energy conservation efforts in	12	Emission reductions of at least 1.5% per year
	Energy conservation efforts by non-specified enterprises	12	Effects of energy conservation efforts other than the above
	Improvement of energy-saving performance of offices, etc.	2	Percentage of offices and other buildings achieving energy conservation standards 59% (Currently approx. 30%)
Renewable energy 230,000 t	Widespread use of photovoltaic power generation equipment, renewable energy electricity Promotion of chi selection	8	Solar power generation capacity: Approx. 30 MW increase Percentage of contracts for electricity from 100% renewable energy sources Approx. 10% (currently almost 0%)
	Promotion of renewable energy supply by electric utilities	15	Percentage of electricity supplied by electric power companies from renewable energy sources 25% (Currently about 15%)

Ⓐ Transportation

350,000 t-CO2 Reduction

(Reduction (10,000 t-CO2)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030
energy conservation 310,000 tons	Promote the use of public transportation	10	Non-automotive share increase
	Fueled by cost improvement	18	Next-generation vehicle penetration rate (stock basis) 50% (Currently 19%)
	Transportation and shipping companies Energy-saving initiatives in transportation and shipping companies	3	Emission reductions of at least 0.5% per year
Renewable energy 40,000 t	Widespread use of photovoltaic power generation equipment, renewable energy electricity Promotion of chi selection	1	Percentage of contracts for electricity from 100% renewable energy sources Approx. 10% (currently almost 0%)
	Promotion of renewable energy supply by electric utilities	3	Percentage of electricity supplied by electric power companies from renewable energy sources 25% (Currently about 15%)

ⓒ **Other** **160,000 $_{t\text{-}CO_2}$ Reduction** (1 0 , 0 0 0 $_{t\text{-}CO_2}$)

department	counter-measure	Estimated reduction	bout (in sports, etc.)
waste	Reduction of waste incineration	4	Reduction of waste (mainly 亡 plastic) incineration
Other	Reduction of CFC substitutes, etc.	10	Ensure proper management of equipment based on the Fluorocarbons Emission Control Law, etc. 亡
Absorption	Increase in absorption by forests, etc. 亡	2	Forest maintenance, green space maintenance (street trees, urban parks, etc.) Promote environmentally friendly agriculture

Chapter 5. Greenhouse Gas Emission Control and Sink Source

This chapter presents the measures (mitigation measures) to achieve the reduction of more than 1.61 million tons of greenhouse gas emissions described in Chapter 4に by sectorに.

1 How to proceed with mitigation measures

We aim to shift to non-emitting CO2 in four areas: lifestyle, business, energy, and mobility, which form the basis of these activities.に We also aim to maintain and improve the absorption of CO2 in forests and otherに areas.に にFor this purpose, we will set up a promotion policy and measures based on the policyに, each field and sink measuresに.

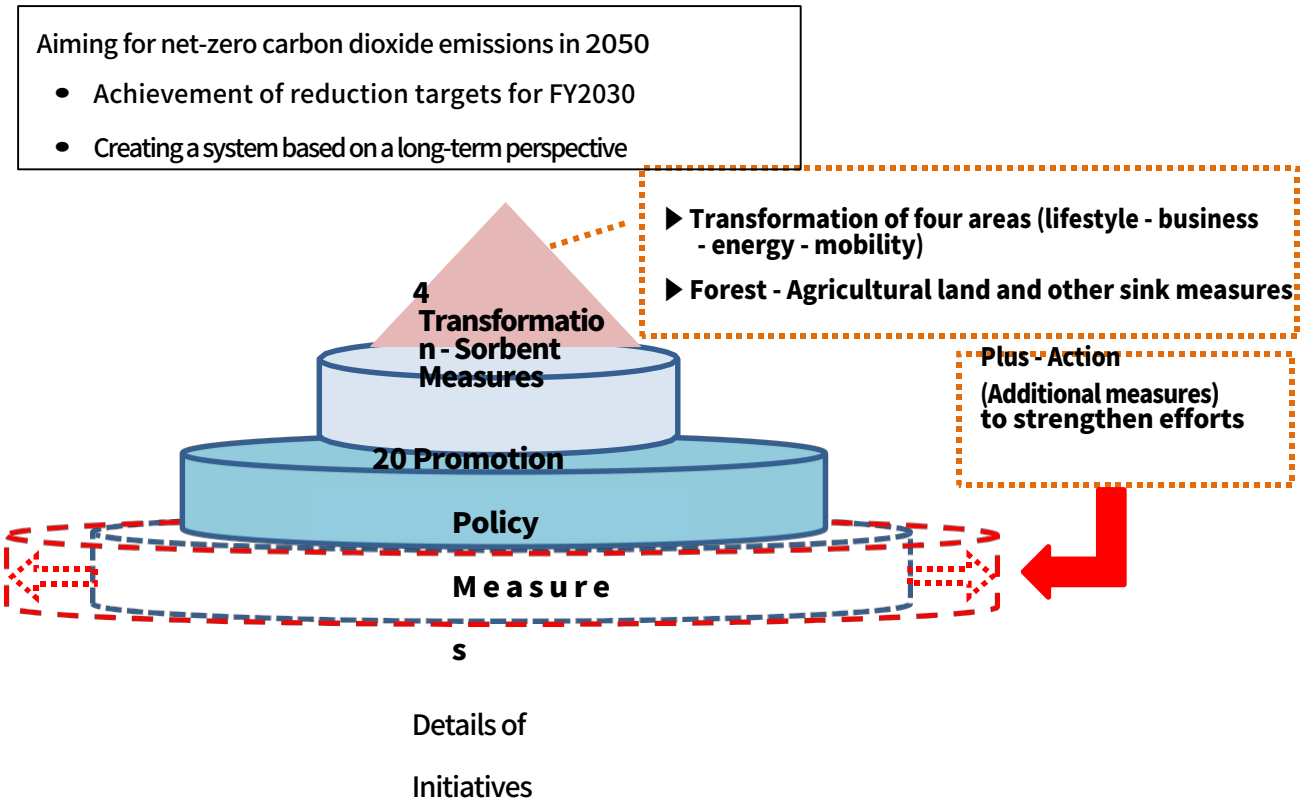


Figure 15: Greenhouse gas emission control and sink measures (mitigation measures)

SDGs (Sustainable Development Goals : Sustainable Development Goals)

TheSDGs are17 universal goals that aim to realize a sustainable society through human rights, disparity reduction, education, environment, peace, etc. for the entire international community.

（In addition to governments, local governments, businesses, and other individuals are required to take the initiative to achieve the 169 targets (achievement criteria)

Since global warming countermeasures aimed at realizing a "prosperous Kyoto" are consistent with the principles of the SDGs, relevant targets are listed for each mitigation policy and each area of adaptation measures.

2 Conversion of four sectors and forestry - Agricultural land and other sink

measure

Lifestyle Transformation

Vision of Society in 2050 - Living Conditions

residence Comfortable and healthy living is standardized by selecting homes with high environmental performance that generate more energy than they use.

consumption behavior A change in consciousness from "owning" to "sharing" and a style that takes into consideration the global environment and have taken root, utilizing local resources such as foodstuffs and establishing a lifestyle based on Kyoto's culinary culture.

connection Effective use of energy and resources, such as flexible use and local production for local consumption, is spreading among various communities, including local communities.

Direction for Conversion

Achieving a decarbonized society requires a shift in the way we live to one that does not emit carbon dioxide. To this end, we will build on the tradition of valuing the culture of coexistence with nature and the spirit of pine trees that has been nurtured in Kyoto and actively adopt new technologies and services such as environmentally friendly housing, home appliances, and electricity derived from renewable energy, as well as, further improve our daily lives by saving energy, reducing waste, and so on. We need to evolve sustainable lifestyles that simultaneously protect the environment and improve the quality of life by changing our daily lives to be more environmentally friendly, such as by saving energy and reducing waste further.

The "Kyoto version of the decarbonization model" was developed based on a shared sense of urgency in the climate emergency among a wide range of actors. We will build a "lifestyle" and create a system that leads to concrete changes in behavior through various awareness-raising activities, environmental education, and training of bearers.

Promotion Policy

1 **Dissemination and establishment of a "Kyoto version of a decarbonized lifestyle" that leads to solutions to local problems, improvement of quality of life, and change in awareness**

2 **Promotion of ethical consumption to change society by selecting products and services with consideration for environmental and social issues**

3 **Improving the quality of life through energy conservation in housing and home appliances and introduction of renewable energy**

4 **Developing Leaders to Support the Transition to a Decarbonized Lifestyle**

5 **Innovations for 2050 - Lifestyle Edition**

Reduction target by initiatives

Household Energy Consumption

21,727 TJ (2018)→ 16,830 TJ (2030) ▲ 23% reduction

Waste Division

Reduction in Waste Incineration ▲30%, etc.

Household Emissions

▲330,000 t-CO2

Waste Sector Emissions

▲40,000 t-CO2

Estimated reduction per measure

(million t-CO2)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030	Related Promotion Policies
household sector	Diffusion of high-efficiency homes and equipment	24	Diffusion of LED lighting: 100% (current 40% approx.) ・Diffusion of high-efficiency water heaters: 75% (current 20～30%) Diffusion of high-efficiency appliances Refrigerator, air conditioner efficiency improved by approx. , etc.	1.3
	Improvement of energy-saving performance of housing	4	ZEH to become the standard for new construction (currently approx. 10%) Energy conservation standard compliance rate for housing: 27% (current rate is about 10%)	1.3
	Other household energy-saving measures composition	5	Effects of energy-saving actions other than the above	1, 2, 4
waste department	Reduction of waste incineration	4	Effects of reducing the amount of waste (mainly plastic) incinerated	1, 2, 4

Promotion Policies 1

地域の課題解決や生活の質の向上・意識改革につながる

Dissemination and establishment of the "Kyoto version of decarbonized lifestyles

Measure 1 Establishment of as a mechanism for building and sharing a "Kyoto version of a decarbonized lifestyle" image.

Citizen participation in discussions on the vision of a lifestyle with net-zero carbon dioxide emissions 2050.

We discuss, build and share.

Main Initiatives

■ **Creation of a space for the construction and sharing of a "Kyoto version of decarbonized lifestyles**

Create a space for building and sharing a vision of a decarbonized lifestyle in Kyoto with youth and other diverse actors. We will create a forum for the creation and sharing of a vision for decarbonized lifestyles in Kyoto, involving young people and other diverse actors.

Measure 2 Implement environmentally friendly lifestyles in collaboration with local communities

Promote the practice of decarbonized lifestyles, including the spread of energy conservation and renewable energy initiatives at the community level, such as in eco-school districts.

Main Initiatives

■ **Support for various community-based initiatives, including eco-school districts**

Support the creation of pioneering initiatives that can be horizontally deployed in eco-school districts, etc., and create a mechanism to promote initiatives in diverse communities. In addition, we will create a mechanism to promote initiatives in various community units.

■ **Local に Adding an Environmental Perspective to Various Efforts in the Region**

Environmental Perspective as a Trigger The environmental perspective will be the catalyst for the expansion of the circle of practice of lifestyles in harmony with the environment, through cooperation and collaboration with local efforts for disaster prevention and welfare, etc., transcending the boundaries between different fields.

Measure 3: Promotion of all people-oriented actions

The "Environment に Are you doing something good? に We will also implement educational activities from the viewpoint of simultaneous resolution of social issues に , and に , establish a system to promote environmentally に -conscious behavior and improve the quality of life , in order to promote the spread of environmentally に -conscious behavior through the slogan "DO YOU KYOTO? We will also implement measures that will lead to に improvement of the quality of life. In addition, in order to promote global warming countermeasures on a global scale, we will disseminate our city's efforts to the world に through cooperation with international networks and participation in international conferences.

Main Initiatives

■ **Enlightenment through behavioral design and nudges**

We will promote initiatives that lead to behavioral change に in as many people as possible by incorporating behavioral design and nudges[7] に so that everyone can act in a natural and environmentally に friendly manner.

■ **Establish mechanisms to promote environmentally conscious behavior**

Environment に We will create a system that makes it easier for more people to proactively に environment に friendly behavior に by visualizing the effects of considerate behavior and carbon dioxide emission reductions and providing incentives (benefits).

■ **Integrated promotion of health promotion, etc. and global warming countermeasures**

We will simultaneously improve the quality of life に by incorporating perspectives such as global warming countermeasures に health promotion, housing, promotion of dietary habits and food culture.

■ **Disseminate initiatives through collaboration with international networks and participation in international conferences**

The city will disseminate its initiatives around the world through collaboration with international networks such as IKREI (Council of Local Authorities for Sustainable Cities and Regions)[8] and participation in international conferences such as the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC).

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Promotion Policy 環境や社会問題に配慮して商品・サービスを選ぶことで社会を変えるエシカル消費の推進

Measure 1: Promotion of a recycling-oriented society through a change in consumption behavior

Aiming for a recycling-oriented society where consumption of natural resources is reduced and the burden on the environment, including greenhouse gases, is reduced, we will promote initiatives that add the 2Rs (Reduce (control of generation) and Reuse (reuse)) and the concept of sorting and recycling に Renewable[9] that have been promoted up to now to に and change citizens' consumption behavior. We will promote initiatives to change the consumption behavior of citizens.

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7 Methods that gently encourage people to behave in ways that are desirable for them and for society by creating an environment that does not deprive people of choices.

8 A global network of more than 1,750 cities, towns, and regions committed to sustainability

9 The concept of curbing resource depletion and greenhouse gas emissions by using resources that can be regenerated in a shorter time than fossil resources such as oil (renewable resources: natural resources such as plants) as raw materials.

Main Initiatives

■ **Promotion of 2R and sorting/recycling through collaboration among citizens, businesses, and government**

We will promote 2R and sorting/recycling initiatives to the public through community study groups, environmental study facilities, and cooperation with business operators. We will also periodically review waste sorting and collection methods and support voluntary sorting and recycling initiatives such as community collections and business collections.

■ **Resource recycling of plastics**

We will thoroughly reduce the use of single-use plastics such as plastic bags and plastic bottles, as well as examine ways to collect plastics other than plastic containers and packaging and to collect them together with plastic containers and packaging in a way that is familiar and easy to understand for citizens.

In addition, we will raise awareness among citizens and support the efforts of business operators regarding renewable initiatives that give priority to the use of renewable resources such as biomass plastics and paper materials.

■ **Realization of a "Food Loss Reduction City" that leads the nation**

We will promote support for business operators to introduce and also conduct educational activities to deepen citizens' understanding in cooperation with business operators.

Measure 2 – Promotion of local production for local consumption and Kyoto's food culture

Health promotion, preservation of farmland and forests, etc. Promote connected Kyoto food culture and local production for local consumption.

Main Initiatives

■ **Strengthen efforts to consume and support local agriculture, forestry, and fisheries products**

Promote local production and local consumption of city agricultural, forestry, and fishery products, disseminating information that stimulates consumption, promoting sales at direct sales outlets in the city, and subsidizing the use of city-grown lumber.

Promote nutrition education through school lunches at day-care centers and elementary schools that incorporate local ingredients and traditional foods, and food-mileage reduction.

■ **Disseminate information on the appeal of Kyoto's food culture and local production for local consumption**

We will use our website "Kyo-Shoku Net" and the Kyoto Food Culture Museum Ajiawaikan to promote the appeal and wisdom of the food culture that has been nurtured in the history and seasonal nature of Kyoto. In addition, we will actively utilize agricultural and marine products and lumber produced in the city, and stimulate demand through information dissemination, etc., and strengthen production, distribution, and sales systems to make it easier to choose products produced in the city.

■ **Promote the use of local timber, including timber produced in the city, in buildings**

Increase the use of wood in homes and businesses, promote the recycling of forest resources, and enhance their function as sinks for carbon dioxide fixation and sinks.

[10] Efforts to reduce food loss by extending sales deadlines for food products that retailers stop selling and discard before the expiration date.

[11] Efforts to reduce food loss by matching food products just before disposal from restaurants and other sources to consumers.

Measure 3　Diffusion of new consumption styles that will change society

A society with net-zero carbon dioxide emissions in 2050に will promote new consumption styles that will change

Main Initiatives

■ **Promoting Ethical Consumption**

In order to promote the practice of ethical consumption, which is consumption behavior that is considerate of people, society, and the environmentに, we will work with various actors, including businesses and producers, to widely spread awareness in various settings, thereby enhancing opportunities to learn that each individual's consumption behavior can play a major role in realizing a decarbonized societyに.

■ **Simultaneous resolution of social issues such as sharingに Diffusion of connected consumption styles**

Promote the spread of consumption styles that will lead to the effective use of energy and resources as well as simultaneous resolution of social issues by the spread of sharing, etc.にに

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Column The Relationship Between Diet and Climate Change

○ The IPCC report analyzes that the amount of greenhouse gases emitted from food production, processing, distribution, cooking, consumption, etc. accounts for up to nearly 40% of global anthropogenic emissions, and is largely related to current dietary patterns (wide distribution, increased meat consumption, etc.).

○ In order to reduce the amount of food loss and CO_2 emissions and mitigate the burden on the global environment, it is important to be aware of food mileage (transportation distance of food) and practice ethical consumption such as local production for local consumption and traditional food culture focusing on seasonal foods with low environmental impact in their production.

Promotion Policy 3　Energy saving and renewable energy for housing and home appliances

エネルギー導入で進める暮らしの質の向上

にSince houses with **high environmental performance such as Net Zero Energy House (ZEH)**[12] will last for a long period of time once built, we will promote the spread of new **houses** with high environmental performance such as ZEH and other houses with Kyoto-like features by effectively raising awareness through cooperation with housing developersに and by promoting the appeal of using local timber including those produced in the cityに. We will promote the spread of new houses with high environmental performance, including ZEH, and that are unique to Kyoto.

Main Initiatives

■ **Promotion of ZEH**

Accelerate efforts to promote the spread of ZEH by utilizing private-sector vitality to improve the quality of the housing stock.

■ **Effective public awareness raising in cooperation with architects, brokerage firms, etc.**

We will work with architects, brokers, and other businesses involved in the distribution of buildings to raise awareness of the benefits of energy-efficient housing, not only in terms of the environment, but also in terms of health and cost, so that people can choose the type of housing in which to live.

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[12] A house with net annual energy consumption of zero or approximately zero through energy saving by high thermal insulation performance and high-efficiency equipment and the introduction of renewable energy.

■ **Dissemination of Kyoto-style energy-efficient housing**

Introduce energy-saving technologies, and promote new housing that incorporates Kyoto's unique living style.

■ **Popularization of wooden buildings**

Promote the spread of wooden houses that support Kyoto's "wood culture" and wooden buildings (houses, stores, buildings, etc.) that utilize local timber, including timber produced in the city.

Measure 2 Promote energy conservation in existing homes

Energy-saving renovation: In addition to providing subsidies for energy-saving renovation, we will promote emission reductions from existing homes from various perspectives, such as disseminating information on energy-saving living styles so that homes with high energy-saving performance will be appreciated.

Main Initiatives

■ **Promote energy-saving retrofits**

Promote energy-saving renovation of existing houses by raising awareness of the benefits of energy-saving renovation and subsidizing the necessary costs.

■ **Spreading awareness of the need to revitalize the distribution of existing homes with high environmental performance**

We will disseminate information on existing housing that promotes energy-saving renovation along with seismic retrofitting, etc., which will lead to improved housing performance. We will also raise awareness of initiatives to ensure that quality existing housing is properly evaluated, such as inspection.

■ **Kyoto's lifestyle and culture: Promote energy-efficient living rooted in**

Machiya, and other energy-saving lifestyles unique to Kyoto, such as utilizing the wisdom of Kyoto's unique way of life in machiya houses.

We will promote the use of this product.

Measure 3 Promote energy conservation in condominiums, etc.

Promote the spread of condominiums with high environmental performance and energy-saving renovation of existing condominiums through publicizing energy-saving performance in the distribution stage.

Main Initiatives

■ **Examination of energy conservation performance labeling methods**

We will encourage the disclosure of information on energy efficiency and conservation performance so that residents can collect basic information on energy efficiency and conservation performance at the time of purchasing or renting a house. In addition, we will consider a system to visualize energy efficiency and conservation performance by displaying utility bills, etc.

■ **Effective public awareness raising in cooperation with architects, brokerage firms, etc. (reiterated)**

In cooperation with architects, brokers, and other businesses involved in the distribution of buildings, we will promote awareness of the benefits of energy-efficient housing not only in terms of the environment, but also in terms of health and cost, so that people can choose the type of housing in which they live with a better understanding of these benefits.

■ **Promote energy conservation in condominiums**

Promote awareness and education on appropriate performance improvement of condominiums by disseminating advanced examples of LED and insulation retrofitting, etc. through □.

Measure 4　Promote energy conservation in home appliances and housing equipment

We will promote the spread of energy-efficient home appliances and hot water heaters, etc., by enhancing awareness-raising through cooperation with businesses.

Main Initiatives

■ **Promote replacement of energy-efficient appliances, water heaters, etc.**

In order to promote energy conservation in daily life, we will promote the replacement of products with high energy-saving performance, such as energy-saving home appliances, high-efficiency water heaters, and household fuel cells with those that use a large amount of energy in the home.

■ **Initialization of energy saving mode of home appliances, familiarization of energy saving functions**

Promote energy conservation in household electricity use by, for example, promoting the default setting of home appliances to eco-mode in cooperation with the industry and other home appliance manufacturers.

Promotion Policy　脱炭素型ライフスタイルへの転換を支える担い手の育成

Measure 1　Enhancement of environmental learning, etc. according to life stages

In addition to the enhancement of activities in elementary schools and environmental learning facilities, we will expand opportunities through the use of ICT and enhance activities according to life stages.

Main Initiatives

■ **Enhancement of the Children's Ecolife Challenge Program for elementary school students**

We will enhance the "Children's Ecolife Challenge Program" in which children, who will lead the next generation, will think about and practice an eco-life that will lead to the prevention of global warming together with their families and expand their understanding of and actions against global warming.

■ **Linkage and enhancement of learning opportunities for environmental issues for young children before entering elementary school, junior high school, high school, and university students, as well as the elderly.**

We will further enhance the program by trying to link and enhance learning opportunities for each generation to learn about environmental issues, such as for pre-elementary school children and junior high school students, for high school students to learn about climate change issues, for university clubs, and lifelong learning.

■ **Expand environmental learning opportunities through the use of ICT**

Through the use of ICT, we will also provide learning opportunities that do not necessarily require gathering together. We will also reach out to those who have had difficulty participating in face-to-face sessions in the past.

■ **Use of Environmental Learning Facilities**

Enhance opportunities to learn about environmental issues in a fun way at environmental learning facilities such as Kyoto Ecology Center, Sastena Kyoto, Youth Science Center, etc.

Measure 2　Develop human resources to engage in environmental activities in the community

We will further promote the development of human resources to engage in environmental activities in the community に at environmental learning facilities に.

Main Initiatives

■ **Training of volunteers at Kyoto Ecology Center, etc.**

The Kyoto Ecology Center is a base for expanding environmental learning and environmental preservation activities に We will develop human resources for environmental preservation activities in the region.

■ **Fostering active players in the community through eco-school district projects, etc.** に

Developing eco-school district projects to support school districts that engage in community-based eco-activities に Developing eco-school district projects to support school districts that engage in community-based eco-activities に

■ **Cooperation with students and other environmental groups**

Environmental Activities に We will work with students and others involved in environmental activities to strengthen ties with various local entities and expand the scope of our efforts.

Promotion Policy　２０５０年に向けたイノベーション～ライフスタイル編～

Measure 1　Research on new mechanisms and initiatives to change attitudes and behavior

に We will conduct research and demonstration experiments to establish new mechanisms and implement initiatives through cooperation with citizens, businesses, universities, and research institutions に.

Main Initiatives

■ **Research, study, and practice in collaboration with research institutions**

Conduct surveys and research in cooperation with the Institute for Global Environmental Studies and other research institutions to change behavior and create mechanisms for lifestyle change に, and create new initiatives に.

■ **Conduct social experiments in cooperation with environmental conservation groups and businesses, etc.**

Environmental conservation に We will promote research and investigation of new systems and mechanisms that will lead to に social experiments, etc. に for social implementation.

Business Transformation

Vision of Society in 2050: The State of Work

Office	Offices and buildings with high environmental performance, health, comfort, and energy self-sufficiency become the norm.
business style	Move away from the "mass production/consumption" business model to a business based on sustainable use of resources and energy.
Work	Through the digitalization of the work environment and changes in the concepts of commuting and the office, a time- and location-independent work style has taken root.
innovation	New industries and businesses will be created by universities and businesses utilizing the "wisdom" of Kyoto, contributing to the decarbonization of the world.

Direction for Conversion

Achieving a decarbonized society and economy requires a transition to business based on sustainable resource and energy use. It requires voluntary carbon emission reductions in all business activities, from large to small businesses.

Therefore, businesses should aim to create a virtuous circle between the environment and the economy by implementing energy-saving measures to simultaneously reduce environmental impact and cut costs (improve management) and by creating a mechanism to reduce carbon dioxide emissions that will also increase corporate value.

At the same time, we will promote initiatives to support the transition to a decarbonized society, such as creating new businesses that do not depend on energy and promoting technological innovation that contributes to decarbonization by leveraging the strengths of Kyoto's industry-academia-government partnerships.

Promotion Policy

6 Promotion of further measures in business activities

7 Creating a mechanism to create a virtuous circle between the environment and the economy

8 Innovation for 2050 - Business～

Reduction target by initiatives

Industrial Sector Energy Consumption

10,167 TJ (2018) -> 9,137 TJ (2030) ▲ 10.1% reduction

Business Sector Energy Consumption

21,388 TJ (2018)→ 18,943 TJ (2030) ▲ 11.4% reduction

Industrial Emissions

▲100,000 t-CO2

Business Sector Emissions

▲260,000 t-CO2

(million t-CO2)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030	Related Promotion Policies
Estimated reduction per measure				
Industrial Sector	operators) Energy conservation efforts in	5	Emission reductions of at least 1.0% per year	6.7
	Other businesses energy-saving initiatives	5	Effects of energy conservation efforts other than the above	6.7
business department	Large-scale emitters (specified business operators) Energy conservation efforts in	12	Emission reductions of at least 1.5% per year	6.7
	Other businesses energy-saving initiatives	12	Effects of energy conservation efforts other than the above	6.7
	Improvement of energy-saving performance of offices, etc.	2	Percentage of offices and other buildings achieving energy conservation standards : 59% (Currently about 30%)	6.7
Other	Alternative CFCs, etc. curtailment	10	Ensure proper management of equipment based on the Fluorocarbons Emission Control Law. base (logarithmic, exponential, number system)	6

Promotion Policy 6 Promotion of further measures in business activities

Measure 1 Further promotion of initiatives by large emitters (specified business operators)

Large emitters に, which account for about a quarter of city's に GHG emissions, will strengthen their efforts to promote further emission reductions in their business activities に.

Main Initiatives

■ **Emission Reduction Plan for Businesses に Raise the target reduction rate and improve the evaluation contents** by sector Raise the target reduction rate に and improve the content of evaluation. The system will be designed to draw out various initiatives of business operators, such as a new evaluation of the use of electricity derived from renewable energy sources に. The system will be designed to encourage a variety of initiatives by business operators, including a new evaluation system for the use of electricity derived from renewable energy sources に.

■ **Industry-academia-government collaboration に Implementation of model initiatives for energy conservation measures through** Industry-academia-government collaboration に

The university campus is considered to be a city, and a model for reducing urban energy consumption is studied and built. We will study and build a model to reduce energy consumption in the city.

Measure 2　Promotion of voluntary reduction efforts by small and medium-sized businesses and enhancement of support

We will build a mechanism to promote voluntary reductions by small and medium-sized businesses and enhance support for the decarbonization of business activities centered on the "Kyoto Forest of Knowledge Industry Creation".

Main Initiatives

■ **Establishment of Energy Consumption Reporting System**

Medium-sized businesses (semi-specified businesses) are requested to report their energy consumption every fiscal year, and the city will establish a system to provide feedback of information that will lead to energy conservation measures, etc.

■ **Provide support for energy-saving initiatives and the introduction of high-efficiency equipment**

Targeting small and medium-sized businesses, we dispatch energy management experts to provide energy conservation advice and support the introduction of high-efficiency equipment.

■ **Environmental Management System (EMS) to promote decarbonization of business**

The KES[13] Environmental Management System Standard, ISO 14001, and other environmental management system certifications and awareness-raising activities promote voluntary environmental conservation activities by small and medium-sized enterprises (SMEs), such as decarbonization.

Measure 3　Promotion of CFC emission control

In recent years, emissions of CFC substitutes, which have a high greenhouse effect, have been increasing, and we will educate the public on the proper management of equipment that uses CFC substitutes.

Main Initiatives

■ **Ensure appropriate management of CFC substitutes　Raise awareness of the importance of proper management of CFC substitutes**

The Law Concerning the Rational Use and Proper Management of Fluorocarbons (Law for the Rational Use and Proper Management of Fluorocarbons)　Law Concerning the Rational Use and Proper Management of

Promotion Policy 7　環境と経済の好循環を生み出す仕組みづくり

Measure 1: Promote a shift to environmentally friendly business and work styles

We will build and support a system that encourages business operators to work on social reform, such as shifting from the conventional business style based on the one-way flow of goods (production, consumption, and disposal) to a business style based on the recycling of resources and the promotion of diverse work styles.

[13] The "Environmental Management System" standard from Kyoto, the birthplace of the Kyoto Protocol.

Main Initiatives

■ **Promoting environmentally friendly product design from manufacturing to disposal　Promote product design that is environmentally friendly from manufacturing to disposal**

Manufacturing　The program encourages the spread of these products by presenting awards for product designs that have a low environmental impact related to their manufacture and that do not generate waste after use.　We will encourage the spread of these products ~~by presenting awards for product~~ designs that have low environmental impact in terms of manufacturing and do not generate waste after use.

■ **Promoting diverse and flexible work styles**

We will promote diverse and flexible work styles that lead to improved worker productivity and reduced environmental impact through the promotion of telework and other digitalization.

■ **Promote "visualization" of building quality and performance**

Utilizing tools such as CASBEE Kyoto, we will disseminate information on high quality buildings with high energy-saving performance, etc.

■ **Promotion of wooden buildings**

We will encourage the spread of wooden buildings, which will also lead to forest sink measures and the creation of a Kyoto-like landscape.

Measure 2 Promotion of Green Finance

In finance, which is the foundation of any business, we will promote green finance, including the expanded use of ESG finance [14] and green bonds [15].

Main Initiatives

■ **Promoting and educating the public about green finance**

In cooperation with financial institutions, we will promote the understanding and spread of green finance, such as ESG finance.

■ **Disseminate information on business decarbonization management cases**

Disseminate information on management cases that utilize corporate financial information, such as TCFD[16] (Task Force on Climate-related Financial Disclosure) and SBT[17] (Science-based Target Setting), to expand initiatives to incorporate climate-related risks into management strategies and to promote the use of climate-related risks among small and medium-sized enterprises (SMEs).

Measure 3 Promote sustainable tourism

We will promote tourism to learn about the environment and to enjoy nature, making the most of our efforts as an environmentally advanced city and the characteristics of a city with beautiful nature in the mountains and in the sea.

Main Initiatives

■ **Promotion** of environment-**and nature-themed tourism (eco-tourism and green** tourism**)**

The project will promote green tourism, development of content for the Kyoto Round-the-Kyoto Trail, and other activities.

[14] Initiatives that emphasize a long-term perspective in analyzing and evaluating companies, and require that environmental, social, and governance information be taken into account in investment and financing actions.

[15] Bonds issued by companies, local governments, etc. to raise funds for projects that contribute to solving environmental problems.

[16] Abbreviation for Task force on Climate-related Financial Disclosures. A framework for companies to disclose financial information on their climate change initiatives and impacts.

[17] Abbreviation for Science Based Targets. Greenhouse gas emission reduction targets for companies that are consistent with the levels set in the Paris Agreement.

■ **Reduction of greenhouse gas emissions and waste generation by tourism businesses and tourists**

Support the development of environmentally friendly tourism content by tourism operatorsに and に, and promote the reduction of greenhouse gas emissions and waste, including plastic waste, by tourism operators.

In addition, we will work with local communities and tourism businesses to encourage tourists to use their own bags and bottles, reduce leftover food, and other environmentalに friendly tourism styles, and furtherに encourage a shift to environmentallyに friendly lifestyles by practicingに what they have experienced in Kyoto.

Promotion Policy 8　２０５０年に向けたイノベーション～ビジネス編～

Measure 1: Creation of innovation and new business through industry-academia-government collaboration

By leveraging the strengths of Kyoto, where universities and research institutions conducting cutting-edge research and companies in a wide range of industries from traditional to advanced technology, we will promote innovation and the creation of new businesses that do not depend on energyに through collaboration between industry, academia and publicに.

Main Initiatives

■ **Promote innovation in the environment and energy sectorに**

Through industry-academia-government collaborationに, we promote research and development of new technologies and products in the environmental and energy fieldsに.

■ **Support for start-up companies**

New technologies and novel ideasに to solve social issuesに and support start-up companies that take on the challenge of overcoming social issues and improving the lives of citizens.

Energy Conversion

Vision of Society in 2050 - The Town

The supply of renewable energy is being promoted in various ways, such as through systems to utilize surplus electricity from renewable energy on a regional and community basis and through cooperation with neighboring municipalities that produce large amounts of renewable energy, etc. Energy used is 100% renewable energy, and hydrogen and other energy sources that do not emit CO_2 are becoming widespread. Energy supply in times of disaster is also secured. Energy supply during disasters is also secured, and urban resilience is improved.

Direction for Conversion

In order to realize a decarbonized society □, in addition to maximum energy conservation, society as a whole must share the importance of renewable energy and shift all energy use to renewable energy instead of relying on nuclear power and fossil fuels.

Therefore, we will maximize the creation of renewable energy including solar power generation in the city area, promote the selection of electricity from renewable energy sources by citizens and businesses, encourage power companies to expand the supply of renewable energy, and supply renewable energy electricity to our city in cooperation with other regions. By promoting efforts on the "demand side" and "supply side" in parallel, we will create a virtuous circle and steadily expand the use of renewable energy in our city.

In addition, we will promote the construction of a distributed energy system by conducting surveys and research on improving the stability of the supply-demand balance of electric power and strengthening resilience through the use of in times of disaster.

Promotion Policy

9	**Maximize the use of renewable energy in the city**
10	**Promoting the use of renewable energy electricity**
11	**Promotion of renewable energy supply by electric utilities**
12	**Innovations for 2050 - Energy～**

Reduction target by initiatives

Ratio of renewable energy to electricity consumption

About 15% (2018)→ 35% or more (2030)

amount of discharge	household sector	Industrial Sector	business department	Transportation
▲530,000 t-CO2	▲190,000 t-CO2	▲70,000 t-CO2	▲230,000 t-CO2	▲40,000 t-CO2

Estimated reduction per measure

(million t-CO2)

counter-measure	Estimated reduction	Level of efforts, ideas, etc. for FY2030	Related Promotion Policies
Widespread use of solar power generation equipment	2	Solar power generation equipment installed 250MW (Currently 136MW) (solar: up approx. 15,000 Non-residential: up approx. 60 MW)	3-9. 13&14
Promoting the Selection of Renewable Energy Electricity	20	Percentage of contracts for electricity from 100% renewable energy sources Approx. 10% (currently almost 0%)	10
Promotion of renewable energy supply by electric power companies	31	Ratio of renewable energy to electric power supplied by electric power companies: 25% (currently approx. 15%)	11

Promotion Policy 9 Maximize the use of renewable energy in the city

Measure 1: Enhance mechanisms to promote the introduction of photovoltaic power generation equipment, etc.

In order to promote the introduction of solar power generation equipment, etc., we will review subsidy programs, group purchasing to lower prices through economies of scale, and "zero yen solar" to reduce the cost burden. We will also enhance and strengthen mechanisms that lead to

Main Initiatives

■ **Subsidies for the introduction of solar power generation equipment, etc.**

The subsidy system for photovoltaic power generation equipment and storage batteries will be reviewed to make it easier to use and more effective in introducing renewable energy, taking into account past issues and recent trends in renewable energy.

■ **Implementation of group purchasing projects for solar power generation equipment**

We will continue to implement the group purchase project, which aims to lower the price of photovoltaic power generation equipment by soliciting potential purchasers of photovoltaic power generation equipment from all over the city and placing orders collectively, in cooperation with businesses that have concluded business agreements with the city, and will also collaborate with businesses in other regions to promote the spread of photovoltaic power generation equipment over a wider area.

■ **Promoting the introduction of "zero yen solar**

In order to increase awareness and promote the use of "0 yen solar," a solar power generation system with zero initial cost, we support matching service providers with facility owners in the city.

■ **In the event of a disaster, Consideration of mechanisms to utilize renewable energy electricity, etc.**

In the event of power outages accompanying disasters, etc.,

Measure 2 Promote utilization of local resources such as biomass and small-scale hydropower

Further promote the use of various types of biomass, from waste to wood, for energy. We will also strengthen support for the commercialization of small-scale hydroelectric power generation.

Main Initiatives

■ **Waste management, Promoting effective use of energy related to**

We will promote efficient operation of waste treatment facilities, including promotion of energy creation through high-efficiency waste power generation, biogas power generation, etc., and promote recycling of resources, such as conversion of waste to solid fuel, instead of simple incineration or landfill, for private enterprises.

■ **Utilization of forest biomass**

By establishing a supply chain in cooperation with energy companies, forestry management entities, etc., unused wood from forest thinning, etc., will be supplied as fuel material for woody biomass power plants, etc., to further promote the use of forest biomass.

■ **Utilization of Sewage Biomass**

We promote the conversion of sewage sludge (sludge generated in the process of treating sewage) into fuel for effective use in sewage facilities.

■ **Utilization of Waste Cooking Oil**

We promote the collection of waste cooking oil from households for use as biodiesel fuel, etc.

■ **Promotion of small hydropower through collaboration with local communities**

We will provide support for consensus building among the parties concerned and licensing procedures so that the community can take the initiative in implementing small-scale hydropower, which can also enhance the disaster prevention function of the community.

Measure 3: Promote the introduction of renewable energy facilities based on ordinances

The introduction of more renewable energy will be promoted through the obligation to install renewable energy equipment in buildings above a certain size under the ordinance, and the obligation of architects to explain renewable energy equipment to clients.

Main Initiatives

■ **Expand and strengthen the obligation to install renewable energy equipment in buildings**

The obligation to install renewable energy equipment, which was previously imposed on new construction or expansion of large buildings (specified buildings) with a total floor area of 2,000 m² or more, will be extended to medium-sized buildings (semi-specified buildings) with a total floor area of 300～2,000 m(2).

In addition, for large buildings (specified buildings), measures will be strengthened so that the obligatory amount to be installed is in proportion to the total floor area.

■ **Architect's duty to explain**

When building a new or additional building, the architect who is involved in the design of the new or additional building has a major role to play in the client's consideration of the introduction of renewable energy equipment. The architect's explanation is obligatory so that the client can easily understand the environmental, economic and disaster prevention benefits brought by the introduction of renewable energy equipment.

Promotion Policies 10 Promote the use of renewable energy electricity

Measure 1: Create a mechanism to promote demand-side choice

Raise awareness about the importance of "using" renewable energy, such as the fact that energy choices lead to [illegible]. In addition, we will promote the use of renewable electricity not only through measures against global warming, but also by presenting a variety of options according to one's sense of values and creating a system that encourages choice, including the presentation of a menu with favorable prices and social contributions through payment of electricity bills.

Main Initiatives

■ **Improved dissemination of information on renewable electricity**

We will provide a variety of options by providing information on power companies that supply renewable energy electricity and their menus, etc., in an easy-to-understand manner via the Internet, etc. We will also create opportunities for residents to learn about their options at every opportunity, such as by showing examples of electricity contracts from brokers, etc., when they move in.

■ **Implementation of group purchasing of renewable energy electricity**

We will present a method of selecting renewable energy electricity by continuously implementing a group purchasing project in cooperation with businesses that have signed an agreement with the city to lower prices by soliciting a wide range of people in the city who wish to switch to renewable energy electricity and placing orders together. In addition, we will expand the effect of the project by making it a more wide-area project, such as joint implementation with neighboring areas.

■ **Promote the Renewable Energy 100 Declaration RE Action** [18]

As ambassadors of the Renewable Energy 100 Declaration RE Action, we will encourage participation and publicize the declaration to all organizations in the city, including businesses and educational institutions. We will promote information dissemination and collaboration to enhance the value of the declared organizations. In addition, we will work with the RE Action Council to provide best practices and know-how so that declared organizations can convert to 100% renewable energy by 2050.

■ **Promoting Choice in Business**

(In collaboration with the KES Environmental Organization and other existing corporate networks, we will strengthen our efforts to promote the fact that the choice of renewable energy electricity can contribute to the decarbonization of management and SDGs. We will provide integrated energy management support to companies that are already interested in saving energy and installing renewable energy equipment, by presenting the option of switching to renewable electricity as an additional option.

[18] A framework that allows participation in the "RE100" initiative, which aims to procure 100% of the energy needed for corporate activities from renewable energy sources, regardless of the size or type of organization.

■ **Large emitters (specific businesses)に Promoting choice in**

In the business emission reduction plan system for specific businessesに, the use of electricity derived from renewable energy sources is newly included in the evaluation itemsに to promote switching to electricity from renewable energy sources.

Measure 2　Establishment of a renewable energy electricity supply system in collaboration with other regions

We will promote the efficient expansion of the supply of renewable electricity used in the city through partnershipsに with communities that have abundantに renewable energy sources.

Main Initiatives

■ **Promotion of cooperation with regions outside Kyoto City for renewable energy** electricity **supply and use**に Since Kyoto is a city and a major energy consumer, we will establish a **cooperative system** to **supply** renewable energy electricity to our city in cooperation with regions that have abundant renewable energy sourcesに in order to steadily supply energy consumed within the cityに with renewable energyに. We will establish a cooperative system to supply renewable energy electricity to our city in cooperation with regions that have abundant renewable energy sources .

Promotion Policy 11　エネルギー供給事業者による再生可能エネルギー供給の促進

Measure 1: Make requests and proposals to electric power companies and the national government

にWe will firmly promote initiatives that we can take as a municipality, such as strengthening our efforts to lobby electric power companies and making policy proposals and requests to the national government, in order to make renewable energy a main source of power, to break away from coal-fired power generation that has not been addressed, and to build an energy system that does not depend on nuclear powerに.

Main Initiatives

■ **Shareholder Proposals and Opinions at the Ordinary General Meeting of Shareholders of Kansai Electric Power Co.**　に

にWe will continue to demand that Kansai Electric Power Co., Inc. introduce renewable energy to the maximum extent possible and establish a sustainable, safe and secure power supply system that is not dependent on nuclear power generation.　に

■ **Designated City Renewable Energy Councils, etc.**　**Lobbying the government at**

Designated cities, which are major energy consumption areas, should take the initiative and cooperate with each other to promote the development of locally distributed renewable energy sources.

Measure 2: Support for renewable energy supply projects

To promote and expand the use of energy　　y energy to the national government.　We will propose to the government the necessary policies to promote and expand the use of energy.

We will promote the creation of an environment that supports decarbonization businesses through the dissemination of information on businesses that supply renewable energy in the city. Through thisに, we will support businesses that supply renewable energy electricity in the city and encourage the further supply of renewable energy.

にWe will also consider initiatives for the future diffusionに of new energy sources such as hydrogen, which does not emit carbon dioxide, in cooperation with business enterprises.

Main Initiatives

■ **Improved dissemination of information on renewable electricity (reiterated)**

Promotion Policies 12 ２０５０年に向けたイノベーション～エネルギー編～

Measure 1: Research and studies for the establishment of decentralized energy systems

With a view to making renewable electricity the main source of power, we will conduct surveys and research to build a decentralized energy systemに that ensures a stable supply-demand balance and improves resilience in the event of disasters, taking into account the variability of renewable electricity.

Main Initiatives

■ **Research and studies for the construction of distributed energy systems at the regional/community level**

First, we will conduct surveys and research on a regional basis in order to solve issues for building a decentralized energy system, such as understanding the amount of renewable energy that can be utilized, from solar power generation equipment in each home to waste heat from commercial facilities, efficient use of EVs and storage batteries, and demand response [19]. (2) The first step is to conduct research and studies on a regional basis.

に

[19] Changing electricity consumption patterns so that consumers curtail their electricity use in response to electricity pricing or incentive payments during times of high wholesale market prices or low grid reliability.

Mobility Transformation

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The construction of an advanced transportation system utilizing new technologies such as automated driving and AI has made travel more efficient and comfortable, and the "Walking City Kyoto" initiative, which prioritizes people and public transportation, is progressing, creating an attractive and vibrant city that makes people want to go out.

Directions for Conversion

To achieve a decarbonized society, we must shift our lifestyles and social and economic activities away from dependence on fossil fuels and automobiles.

To this end, we will further promote the "Walking City Kyoto" initiative, which has achieved great results to date, by prioritizing people and public transportation.

In addition, we will change the mindset toward automobiles and strongly promote the spread of next-generation vehicles [20], including EVs. In addition, we will reduce the number of automobiles owned through the promotion of car sharing. In order to achieve the effects of these efforts, we will enhance the convenience of public transportation and promote the creation of a new system for the movement of people and goods with less environmental impact by conducting surveys and research on various mobility services based on new technologies and concepts.

Promotion Policy

13 **Promote community development that prioritizes public transportation**

14 **Diffusion of EVs and other next-generation vehicles**

15 **Shift in Attitudes toward Car Use**

16 **Innovation Toward 2050 - Mobility Edition**

[20] Electric vehicles (EV), fuel cell vehicles (FCV), plug-in hybrid vehicles (PHV), hybrid vehicles, natural gas vehicles, clean diesel vehicles

Reduction target by

Transportation Energy Consumption

21,493 TJ (2018)→ 16,696 TJ (2030) ▲ 22% reduction

Transportation sector emissions

▲310,000 t-CO2

Estimated reduction per measure

(million $t\text{-}CO_2$)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030	Related Promotion Policies
Transportation	Promote the use of public transportation	10	Increase in non-automotive share	13
	Diffusion of next-generation vehicles, etc.	18	Next-generation vehicle penetration rate (stock basis) 50% (Currently 19%)	14/15
	Energy conservation efforts by transportation and shipping companies	3	Emission reductions of at least 0.5% per year	6-14

Promotion Policies 13 Promote community development that prioritizes public transportation

Measure 1: Improve convenience of public transportation and promote its use

We will further promote the use of public transportation by improving the convenience of public transportation such as buses and subways, and by ensuring public transportation that supports the daily lives of citizens according to regional characteristics.

Main Initiatives

■ **Strengthen collaboration among transportation operators**

Further improve the convenience and comfort of public transportation and promote its use. Further strengthen cooperation among transportation operators to further improve convenience and comfort and the use of public transportation.

■ **Further improve convenience of city buses and subways**

Promote the use of city buses and subways. We will further improve the convenience of transfers and other services to promote the use of city buses and subways.

Measure 2: Creating a town that is pleasant to walk in and promoting lifestyles

We will promote the creation of a town where everyone "wants to go out" and promote a lifestyle that values a pleasant life on foot through initiatives such as mobility management [21].

Main Initiatives

■ **Promoting the development of a town where everyone "wants to go out**

We will continue our efforts to create an attractive and bustling pedestrian space and to curb the influx of cars by promoting the use of "park-and-ride" systems. We will continue our efforts.

[21] The project will provide information to motivate people to cherish a pleasant life on foot and information necessary when using public transportation, from the user's point of view, in an appropriate manner. Communication measures

■ **Further promotion of smart lifestyles that value a life that is fun to walk**

We will promote the use of public transportation based on the community through the establishment of a lifestyle of convenient and comfortable use of public transportation and mobility management initiatives.

Measure 3: Enhancement of a safe and secure environment for bicycles and their use in a variety of situations

We will promote efforts to improve the environment for safe and secure bicycle use to reduce the number of bicycle-related accidents, to practice a new lifestyle in a with-corona and post-corona society, and to further promote the use of bicycles from the perspective of health promotion, etc.

Main Initiatives

■ **Establishment of a safe and secure environment for bicycle use**

Through the use of cycle centers, etc., we will work to ensure the rules and manners of bicycle use, safety and security, further improve the environment for bicycle riding, develop bicycle parking facilities that meet the demand for bicycle parking, and promote more effective and efficient measures to prevent abandoned bicycles.

■ **Consideration of measures to utilize bicycles by taking advantage of their characteristics**

With Corona and Post-Corona Society We will develop measures that take advantage of the characteristics of bicycles to implement new lifestyles and promote health and wellness in the Corona and Post-Corona society.

Promotion Policies 14 Diffusion of EVs and other next-generation vehicles

Measure 1 Further promotion of next-generation vehicles

We will work to promote the spread of next-generation vehicles from both the supply and demand sides, including strengthening mechanisms to promote the further spread of next-generation vehicles.

Main Initiatives

■ Ordinance to **Strengthen Obligation of Large-Scale Emitters (Specified Business Operators) to Introduce Next-Generation** Vehicles **at the Time of Purchase of New Vehicles**

■ **Promotion of Next-Generation Vehicles by Automobile Dealers**

We will work to further promote the spread of next-generation vehicles through explanations of fuel efficiency by automobile dealers and reports on sales results of next-generation vehicles.

Measure 2: Promoting the spread of next-generation vehicles by communicating their multifaceted functions

We will promote the spread of next-generation vehicles such as EVs not only as a means of transportation, but also as a means of storing solar power generation at home and as a power source in times of disaster, etc., and will communicate and promote a decarbonized lifestyle utilizing the multifaceted functions of these vehicles.

Main Initiatives

■ **Enhancement of public awareness and information dissemination**

The city will also utilize its own EVs and FCVs for visitors to see and experience them, as well as to raise awareness and disseminate information on next-generation vehicles.

■ **Promoting the use of energy storage functions**

Significantly reduce household carbon dioxide emissions and improve resilience in times of disaster. Connecting, V2H[22] that charges EV/PHV with surplus electricity from solar power generation, and other examples of utilizing multifaceted functions other than mobility, will be presented.

Measure 3 Improvement of the environment for the use of next-generation vehicles

Promote the development of next-generation vehicle use environments, including infrastructure such as EV recharging facilities and hydrogen stations for FCVs.

Main Initiatives

■ **Promote installation of EV charging facilities**

We will promote environmental improvements, such as encouraging the installation of charging facilities at new condominiums and parking lots, with a view to the future spread of electric vehicles.

■ **Lobbying for the installation of hydrogen stations**

We will encourage business operators, etc. to promote the spread of FCVs and to enhance hydrogen supply bases, which will be important.

Measure 4: Research on the shift away from fossil fuels in urban transportation

Toward 2050, urban transportation infrastructure such as buses will be required to shift away from fossil fuels. Therefore, a major system shift will be required, and research will be conducted on issues and measures in anticipation of this shift.

Main Initiatives

■ **Research for Fossil Fuel Free Urban Transportation** **Research for**

We will conduct research on issues and measures to move away from fossil fuels in urban transportation infrastructure. We will conduct research on the issues and measures for the transition of urban transportation infrastructure from fossil fuels to

Promotion Policies 15 **Changing attitudes toward automobile use**

Measure 1: Promotion and practice of eco-driving

The practice of eco-driving can improve fuel efficiency by up to compared to driving without awareness, and has the effect of greatly reducing the environmental burden. We will promote further efforts to spread and practice eco-driving as an effective measure that anyone can take.

[22] Abbreviation for Vehicle to Home, a system in which electricity stored in the storage batteries of EVs and PHVs is used in the home and on the road.

Main Initiatives

■ **Expanding the number of offices implementing eco-driving**

To promote the spread of eco-driving, we will utilize registration and certification systems.

■ **Practice に Enhance training and information dissemination for**

We will provide citizens and businesses with more information and hands-on training on the benefits of eco-driving.

Measure 2: Promotion of Sharing

Reduce the number of cars owned に Connectivity, curb excessive car use に Promote the spread of connected sharing, etc., so that it becomes common に as a new lifestyle and style of business activity.

Main Initiatives

■ **Further promotion of car sharing (shared use of automobiles)**

Provide information on car sharing services に and promote shared use in condominiums and other shared housing and community に efforts.

■ **Establishment of EV bike utilization model in cooperation with business operators**

Promote the electrification of motorcycles by promoting a project to build a model for the use of EV motorcycles through inter-company battery sharing に.

Measure 3 Promotion of logistics efficiency

EC market[23] Expansion に to improve the efficiency of logistics, including measures to deal with re-delivery.

Main Initiatives

■ **Promote reduction of redelivery of parcels**

Raise awareness, etc. to reduce redelivery of parcels に We will work on this in cooperation with businesses and other organizations. に

■ **Logistics Vehicles Promoting the introduction of next-generation vehicles in**

Promote the introduction of next-generation vehicles in trucks and other logistics vehicles.

[23] EC stands for Electronic Commerce and refers to the buying and selling of goods and services over the Internet.

Measure 1 Promote research for the realization of mobility services based on new technologies and concepts. Toward the formation of a public transportation network that realizes sustainable urban development, promote research on new technologies such as IoT, AI, and automated driving, as well as new mobility services that utilize these technologies.

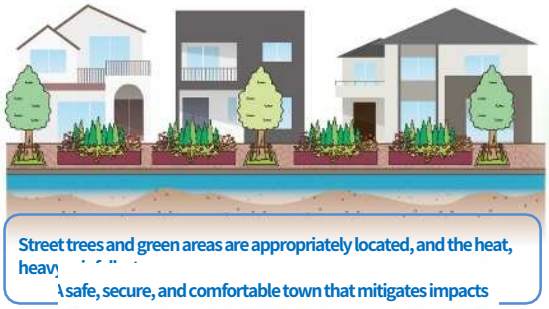
Main Initiatives

■ **Research on MaaS[24] and new transportation systems**

Collaborating with the national government and private operators, we will promote research on a centralized service, not just a means of transportation, that will be called "MaaS." MaaS is expected to provide integrated services, not just a means of transportation. In addition, we will promote research on new transportation systems that utilize automated driving technology, etc.

[24] Abbreviation for Mobility as a Service, a new concept of "mobility" that seamlessly links all modes of transportation other than private cars as a single service, regardless of whether they are public transportation or not, and regardless of their operating entities, by utilizing ICT to cloud transportation.

Forest and agricultural land sink measures



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forest
forest

In addition to the production of forests as active use as places for environmental education and recreation, and fully demonstrate their functions such as carbon dioxide absorption and flood control.

agriculture

land

Through the promotion of local production for local consumption and support for environmentally friendly agriculture, farmland is properly maintained and managed, contributing to the absorption of carbon dioxide and the conservation of biodiversity.

Directions for Conversion

Achieving net zero carbon dioxide emissions by 2050 requires drastic reductions in carbon dioxide emissions, while at the same time preserving and strengthening the carbon dioxide absorption and fixation functions of forests and agricultural land.

Therefore, by 2050, forests, agricultural lands, etc. are properly managed by 2050, and by 2050, by developing urban green spaces, biodiversity by 2050, including adaptation to climate change, such as disaster prevention and disaster mitigation, is also taken into consideration, and the functions of forests, etc. are improved.

By 2050At the same time, we will promote lifestyle businesses that take advantage of nature's bounty, which will lead to the use of city-grown timber and increased consumption of agricultural products by 2050, with the aim of developing sustainable business activities based on forests and agricultural lands.

Promotion Policy

17 Promotion of forest maintenance

18 Maintenance and development of agriculture and rural areas

19 Preservation of green spaces

20 Promotion of local production for local consumption

Reduction target by initiatives

Absorption in forests, urban green spaces, and agricultural lands

8.7% increase (compared to FY 2018)

Absorption

20,000 t-CO2

Estimated reduction per measure

(million $t\text{-}CO_2$)

counter-measure		Estimated reduction	Level of efforts, ideas, etc. for FY2030	Related Promotion Policies
Absorption	Increase in absorption by forests, etc.	2	Forest maintenance Green space development (street trees, urban parks, etc.) Promote environmentally friendly agriculture	17 and 18. 19 & 20

Measure 1 Appropriate conservation of forests as carbon dioxide sinks and development of their leaders

We will promote appropriate conservation and maintenance of forests and develop human resources who will be responsible for forestry.

Main Initiatives

■ Promote efforts to maintain healthy forests

We promote efficient and sustainable forestry based on the Forest Management Plan and promote effective use of forest resources and forest conservation activities with the participation of citizens and companies to create bountiful forests.

■ Promote the use of local timber, including timber from within the city

We support producers who consolidate forest management, promote efficient forestry operations based on forest management plans, and acquire FSC certification [25]. In addition, we promote the use of timber by supporting the introduction of high-performance forestry machinery to management entities aiming for sustainable growth, and by improving the efficiency of forestry management.

■ Fostering new bearers who practice productive and profitable forestry

We will also support the development of bearers with advanced technology and management skills, such as through the promotion of AI/ICT-based management and mechanization.

The following is a summary of the results of the study.

Measure 2 Establish a mechanism for forest utilization through collaboration with various industries, etc.

Create new forest utilization businesses through collaboration with other industries and fields, etc.

Main Initiatives

■ Forestry Securing new bearers in the forestry industry Promoting efforts toward

Promote the cultivation of new forestry leaders by promoting diverse ways of interacting with forests, including the creation of new forest utilization businesses through collaboration with other fields such as education, tourism, and welfare.

■ Promotion of ecotourism

Creation of opportunities for citizens and others to experience forests and local agriculture and forestry, such as tourism to experience the rich forests and the culture and lifestyle of mountainous regions.

[25] A system in which the Forest Stewardship Council (FSC) certifies that the wood is environmentally friendly.

Measure 1 Maintain the multifunctionality of agricultural land through initiatives that take advantage of Kyoto's characteristics

Taking advantage of Kyoto's unique characteristics, such as the proximity of production and consumption areas, we support efforts to conserve farmland with multifaceted functions.

Main Initiatives

■ **Demonstration of the multifunctional role of agricultural land**

We will support initiatives that take the local ecosystem into account, such as reducing the environmental impact of agricultural processes, promoting the implementation of GAP[26], and developing agricultural facilities[27] that take the habitat and growth of living creatures into account.

Measure 2 Promote environmentally friendly agriculture, including the use of biomass

We promote environmentally friendly agriculture that sequesters more carbon and fixes and absorbs carbon dioxide than conventional farming methods.

Main Initiatives

■ **Utilization of biomass (plowing, composting), etc.** **Promotion of environmentally friendly agriculture, such as the use of biomass (plowing, composting)**

We will support agricultural methods that utilize biomass, such as sukikomi and composting, to expand the area of environmentally friendly agriculture. We will expand the

Measure 3 Establish a mechanism for farmland preservation through collaboration with diverse industries, etc.

and composting.

Create a system for farmland preservation through collaboration with other industries and sectors.

Main Initiatives

■ **Strengthening of matching with farmers, such as by understanding the status of farmland**

We will grasp the situation of farmland and bearers, and promote matching so that motivated farmers can secure farmland in the city.

■ **Securing new bearers in agriculture Promoting efforts toward**

In order to promote the concentration of farmland to bearers of agriculture, we will promote the efficiency of agricultural management, and will secure new bearers of agriculture by promoting various ways to engage in agriculture with other industries, such as Half Farmer, Half X[28] and Agriculture-Food Cooperation[29].

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[26] Good Agricultural Practice. Efforts in production process management to ensure sustainability in agriculture, including food safety, environmental conservation, and labor safety.

[27] Agricultural canals and reservoirs

[28] A way of life that combines agriculture and forestry with other work that one wants to do.

[29] Initiatives that are expected to help people with disabilities participate in society with confidence and a sense of fulfillment through their activities in the agriculture and forestry industry, and to help secure new workers in the agriculture and forestry industry, where there is a shortage of skilled workers and an aging population.

Promotion Policy 19 Preservation of green space

Measure 1 Preservation of green spaces that form a green network such as roads, parks, farmlands, and rivers, including roadside trees

We will develop high quality green spaces, including roads and parks where you can experience the four seasons, as well as In addition, we will conserve green spaces that form a green network with the axis of the river that runs through the city as its backbone, along with the conservation of agricultural lands, etc.

Main Initiatives

■ **Conservation and utilization of greenery, creation of new greenery**

We will conserve greenery such as parks, green spaces and agricultural canals and create new greenery through partnerships with citizens and businesses.

■ **Preservation of reservoirs, rivers, and other water bodies**

Preserve waterfront areas such as reservoirs and rivers, and promote the creation of water and greenery networks.

Promotion Policy 20 Promotion of local production for local consumption

Measure 1: Promote local production for local consumption by increasing demand for local agricultural products and lumber

It is an initiative that has synergistic effects in various aspects, such as regional revitalization through resource and economic circulation in the region, inheritance of culture, and reduction of energy consumption for transportation. It promotes local production for local consumption as an action that supports the maintenance and use of forests and agricultural land, which are sinks.

Main Initiatives

■ **Strengthen efforts to consume and support the city's agricultural, forestry, and fishery products (reiterated).**

We will promote local production and local consumption of city agricultural, forestry, and fishery products by establishing sales methods that make it easy to purchase city agricultural, forestry, and fishery products, disseminating information that stimulates consumption, promoting sales at direct sales outlets in the city, and subsidizing the use of city-grown lumber.

Promote nutrition education through school lunches at day-care centers and elementary schools that incorporate local ingredients and traditional foods, and food mileage reduction.

■ **Disseminate information on the appeal of Kyoto's food culture and local production for local consumption (reiterated)**

The city will use its website "Kyo-Shoku Net" and the Kyoto Food Culture Museum Ajiawaikan to communicate the charm and wisdom of the food culture that has been nurtured in the history and seasonal nature of Kyoto. In addition, we will actively utilize agricultural and marine products and lumber produced in the city, and stimulate demand through information dissemination, etc., strengthen the production, distribution, and sales systems to make it easier to select products produced in the city.

■ **Establishment of the Kyoto Brand" the city's agricultural, forestry, and fishery products Establishment of a new food distribution system** by promoting the story of the " " Kyoto Brand" that is linked to the region, differentiating it from other regions, and expanding sales channels for high value-added agricultural, **forestry, and fishery products and lumber**. We will promote the expansion of sales channels for high value-added agricultural, marine, and timber products.

Chapter 6. Coping with the Impacts of Climate Change (Adaptation Measures)

Achieve net zero carbon dioxide emissions and reduce global average temperature increase compared to pre-industrial に 1.5℃ or less に Even if the maximum extent is limited, various climate changes, including changes in precipitation, are expected to occur, affecting a wide range of areas.

Therefore, it is necessary to steadily に advance "mitigation measures" to reduce emissions of greenhouse gases that cause global warming に and to systematically に advance "adaptation measures" to cope with the impacts that have already に appeared and that are unavoidable in the medium- to long-term に future.

By promoting adaptation measures に, we aim to build a safe, secure, and sustainable society that can protect the lives, health, and property of citizens, avoid or minimize damage to the economy and natural environment, and recover quickly に.

1 適応策の進め方 How to proceed with adaptation measures

(1) Policy

We will promote the penetration of adaptation efforts into the daily lives and business activities of citizens, enhance measures in each field from a long-term perspective, and promote urban development that adapts to climate change.

With the implementation of adaptation measures

- Maintain and improve the quality of life and business activities of citizens.
- Sustain and develop "Kyoto-ness" including tradition and culture.
- Kyoto's accumulated wisdom will be disseminated.

＜Five Perspectives on Adaptation Initiatives

Since the effects of climate change are multidisciplinary and wide-ranging に and are expected to become more serious in the future, we will consider and promote actions based on the following perspectives に.

Long-term perspective
Since the costs involved in responding to an impact after it becomes apparent can be enormous, countermeasures should be implemented taking into account the extent of the impact and the temporal and spatial spread of the target.

Wide range of targets
Since the targets and degree of impact are diverse, we will take a broad view of the scope and implement flexible measures according to the situation of each entity, including the elderly and other vulnerable groups.

Measures unique to Kyoto
Kyoto should take the lead in areas utilizing its history, wisdom of its predecessors, and lifestyle and culture.

simultaneous resolution
In addition, by incorporating the viewpoint of adaptation into each policy, we will create a synergy effect by integrating policies to solve problems simultaneously.

Connecting to Business
Since there is a wide range of fields involved, we promote not only government-led measures but also business-based measures that lead to self-reliant measures.

Figure 16: Five perspectives on adaptation efforts

(see Figure 1) Flow of adaptation measures implementation

After establishing the functions of the "Regional Climate Change Adaptation Center" that collects and analyzes information and findings on climate change impacts and adaptation, we will promote the understanding of adaptation measures among citizens and businesses by collecting and analyzing climate change and its impacts, collecting and disseminating findings and information while utilizing the Center ("Know and Communicate)"

Then, based on the knowledge collected, the administration promotes measures that contribute to adaptation in each area of the city government, as well as, the administration, citizens, and businesses work together to ensure that adaptation efforts permeate in citizens' daily lives and business activities ("responding")

In addition, we will "create" new adaptation measures, including business-based initiatives, and develop them step by step so that they can be promoted independently

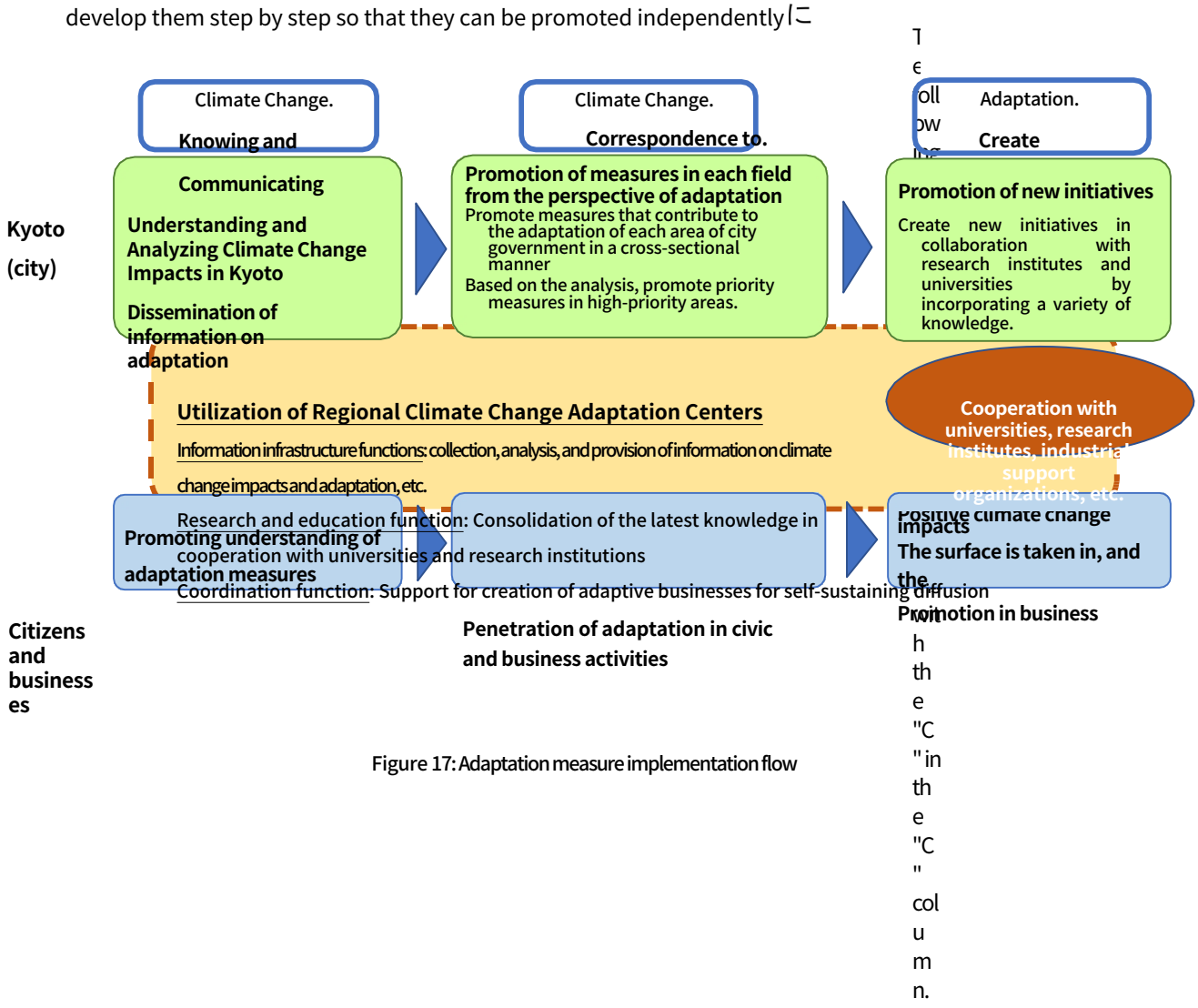


Figure 17: Adaptation measure implementation flow

(3) (a) (3) Collection and analysis of information by regional climate change adaptation centers, etc.

The penetration of adaptation initiatives in the daily lives of citizens and business activities requires interactive information sharing and dissemination that meets the needs of each entity, such as information dissemination and horizontal deployment of examples of adaptation according to Kyoto's social characteristics and natural conditions.

As a center that plays this central role, the Climate Change Adaptation Law obliges local governments to make efforts to ensure a system, and we will develop the functions of the "Regional Climate Change Adaptation Center" in Kyoto in cooperation with Kyoto Prefecture to promote adaptation measures.

<Images of the functions of the Regional Climate Change Adaptation Center>.

The basic function is to collect, organize, analyze, and provide information on climate change impacts and adaptation, and to consolidate the latest knowledge in collaboration with various related organizations in Kyoto. The center will have a "research and education function" and "coordination function" to support adaptive business.

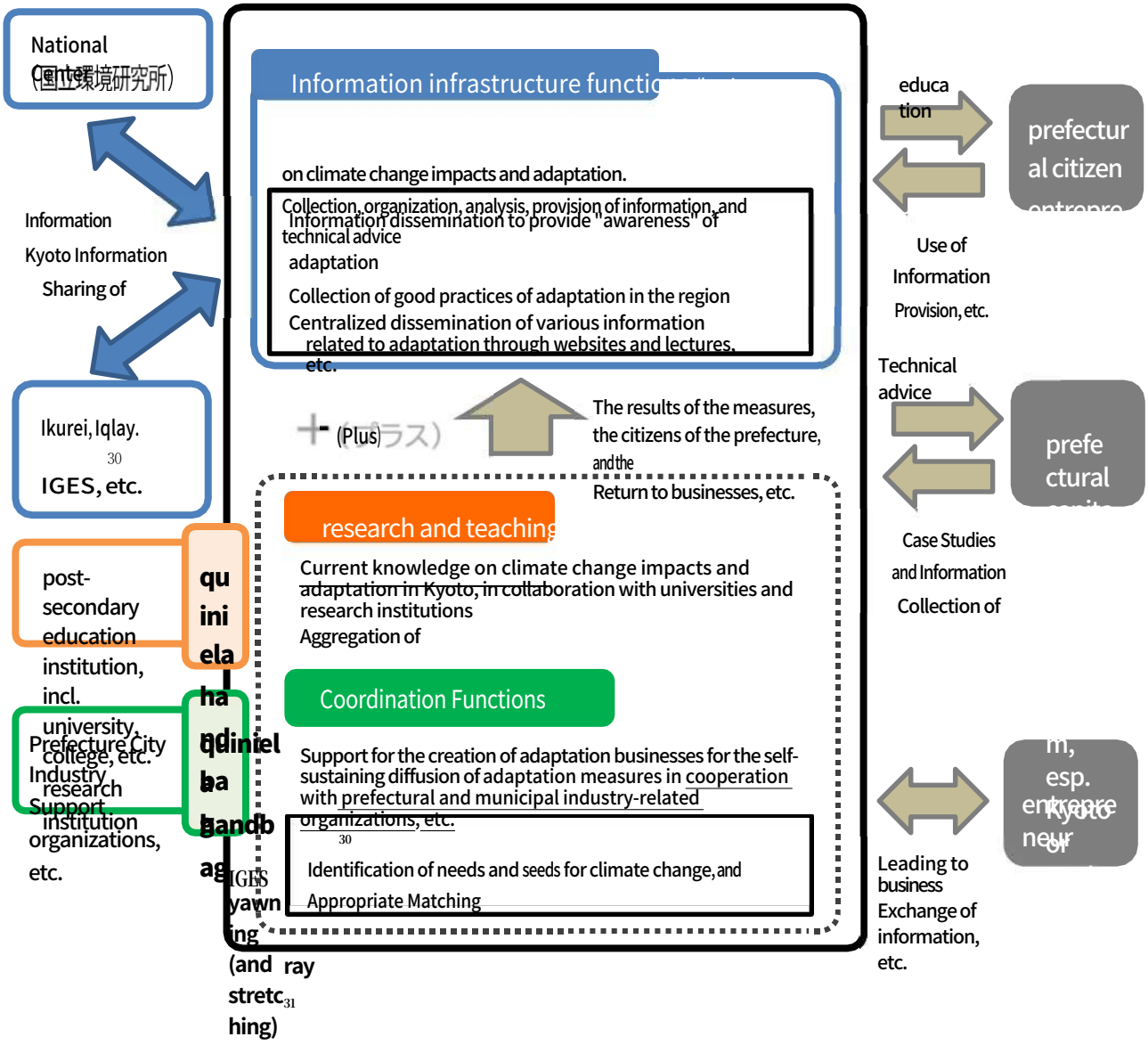


Figure 18: Functional Image of the Adaptation Center

[30] (Public Foundation) Institute for Strategic Studies of the Global Environment. An international research institute that conducts strategic policy research from an Asia-Pacific perspective, focusing on the escalating global environmental problems in order to promote the transition to a low-carbon and sustainable society.

(4) Promotion of sector-specific measures

We will enhance measures from a long-term perspective in the six areas adaptation to climate change needs to be promoted: "natural disasters," "health and urban life," "water environment and water resources," "agriculture and forestry," "natural ecosystems," and "culture, tourism, and local industry."

In promoting measures in the six areas, we will promote the collection and analysis of information on climate change impacts and adaptation after establishing a "Regional Climate Change Adaptation Center" that will collect and analyze information and knowledge on climate change impacts and adaptation.

Measures include re-evaluating the multifaceted functions of gray infrastructure, forests, farmland, and urban green space, and further promoting infrastructure development that makes good use of the ecosystem services provided by nature and that takes into account the concept of green infrastructure according to the characteristics of Kyoto's land.

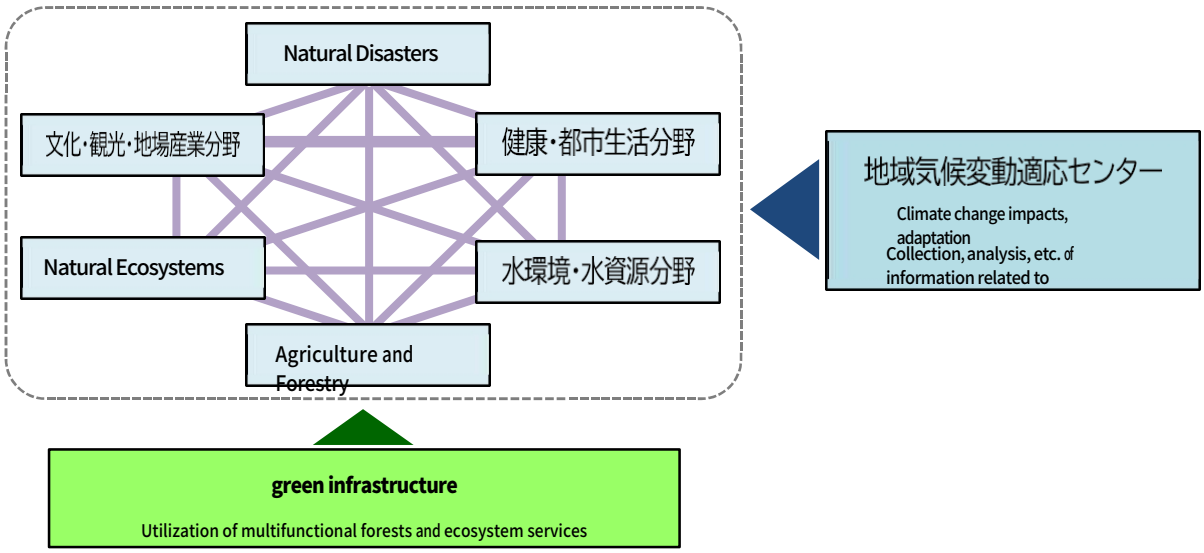


Figure 19: Image of adaptation measures promotion

Column Green Infrastructure

Green infrastructure refers to the development of infrastructure and land use that takes advantage of the diverse functions of the natural environment, including green spaces, forests, waterfront areas, and agricultural land.

Green infrastructure is characterized by the fact that its effects extend to various fields, contributing not only to adaptation measures in many fields, such as "disaster prevention and mitigation through rainwater storage and infiltration," "mitigation of the heat island effect," "water source recharge," and "provision of habitats and growth areas for living organisms," but also to "good landscape formation."
and "creating a place for recreation and community relaxation."

In the future land use planning of our city, we will incorporate the perspective of green infrastructure and combine it with conventional man-made structures known as gray infrastructure to create a climate change-adaptive, sustainable, and environmentally friendly infrastructure.

We will continue to promote the development of sustainable and attractive communities.

Examples of Green Infrastructure
Shijo Nonkawa Garden

field 1

natural disaster

Current Status etc.

In the city In the city, the flooding of the Katsura River caused by Typhoon No. 18 in 2013, the torrential rainfall in July 2018, Typhoon No. 21 Flooding and fallen trees caused by Typhoon No. 21 and the July 2018 torrential rains, as well as the overflowing of the Katsura River caused by Typhoon No. 18 in 2013 The flooding and fallen trees caused by Heavy rains and large typhoons have caused flooding and landslides in the city. The flooding and landslides caused by heavy rains and large typhoons have already occurred. If global warming continues, the frequency of torrential rains is expected to increase in the future.

There is concern that even more extensive damage may occur in the future.

Figure 20.Trees felled by Typhoon No. 21 in 2018 (North District)

Prevention

Prevention of damage due to climate change and promotion of disaster prevention and mitigation measures, including flood control measures, to improve urban resilience

In addition to the implementation of soft measures to minimize damage, such as the thorough dissemination of hazard maps, the steady improvement of sewage systems, including river improvement and rainwater trunk lines, the reduction of inundation and the control of the expansion of flooding in cooperation with urban development, the mitigation of mountain disasters through forest improvement, and the development of disaster response systems in cooperation with various entities, etc., will be promoted to steadily implement disaster prevention and mitigation measures. Steadily promote disaster prevention and mitigation measures to improve urban resilience.

Knowing and Communicating

Disaster prevention and disaster-related information

(rivers, rainfall, water levels, damage, methods for sorting and discharging disaster waste, etc.)

Provide information on flood and landslide disaster risks through disaster prevention maps, etc., and raise awareness.

Correspondence to.

■ **Comprehensive flood control measures and rainfall resilient city planning in cooperation with the national and prefectural governments**
Initiatives for building a rain-resistant city in cooperation with the national and prefectural governments, etc.

Promotion of urban infrastructure river improvement, improvement of ordinary rivers, etc.

Promote urban infrastructure river rehabilitation and improvement of ordinary rivers, etc.

Sewerage improvement, etc. Sewerage projects, such as rainwater trunk line

Flooding countermeasures by Private facilities, public facilities Installation of stormwater runoff control facilities in private and public facilities

■ **Disaster prevention measures to mitigate flood damage, etc.**

... Farmland Preservation

... Enhancing Resilience Strengthen disaster prevention and mitigation measures aimed

at

(awareness-raising on reservoir

hazard maps, forest maintenance)

Create a mechanism to utilize independent and distributed power sources (renewable energy, storage batteries, household fuel cells, etc.) that can contribute to disaster management, such as responding to power outages due to typhoons, etc.

Prepare for the generation of disaster waste (e.g., secure personnel and equipment that can respond to the disaster, secure temporary storage and landfill sites, etc.).

field 2

Health - Urban Living

Current Status etc.

In recent years, Kyoto has recorded temperatures approaching 40℃ in the summer, and the number of people suffering from heat stroke has been on the , making the heat in urban areas more serious.

According to a report by a national research institute, the heat wave of 2018 (Kyoto recorded 14 consecutive hot days) would not have occurred without the effects of global warming.

In addition, if the global average temperature increases by 2 ℃

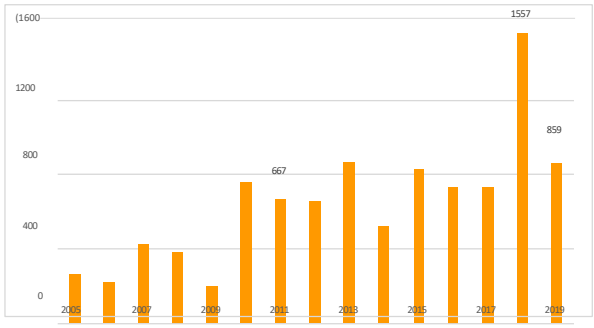


Figure 21: Number of People Transported for Heat Stroke in Kyoto City

In the future, it is estimated that the number of heat The number of extremely hot days in Japan is estimated to be 1.8 times higher than the current level.

There are concerns about further impacts on health and urban life in the future, including the island phenomenon and an increase in infectious diseases. There is concern that this will have a further impact on health and urban life.

Promotion Policy

Enhance prevention and countermeasures for heat stroke, etc., and promote measures to deal with the heat island phenomenon and its impact on urban infrastructure

Provide weather information and alerts to raise awareness of how to prevent and deal with heat stroke, collect knowledge on rising temperatures and the risk of infectious diseases, mitigate the heat island effect, and promote measures to deal with natural disasters and their impact on urban infrastructure.

Main measures

Knowing and Communicating

Disseminate weather information for prevention of heat stroke and raise awareness of prevention.

Information gathering on infectious diseases

Promotion of greening

Correspondence to.

■ **countermeasures against heat stroke**

... Installation of misting equipment

Cool Spot Expansion Expansion of cool spots

Expansion of water supply spots Expansion of water supply spots

Promotion of water sprinkling Promotion of sprinkling water

■ **Mitigation of heat island effect**

・・・ Maintenance of street trees and green areas (rain gardens, private land, public facilities, medium- and high-rise buildings, etc.) (promotion of greening in rain gardens, privately owned land, public facilities, medium- and high-rise buildings, etc.)

Promotion of permeable pavements, etc. Promote permeable pavement, etc.

■ **Urban Infrastructure Measures**

... Underground Space Flooding Countermeasures in Underground Spaces

field 3

Water Environment - Water Resources

Current Status etc.

The water quality of the city's rivers is also generally good.

The water quality of Lake Biwa, the raw water for the city's water supply, has not shown any signs of deterioration.

However, in the future, changes in water temperature, water quality, groundwater level, and precipitation patterns due to global warming will cause water shortages and other problems.

Impacts are expected to occur.

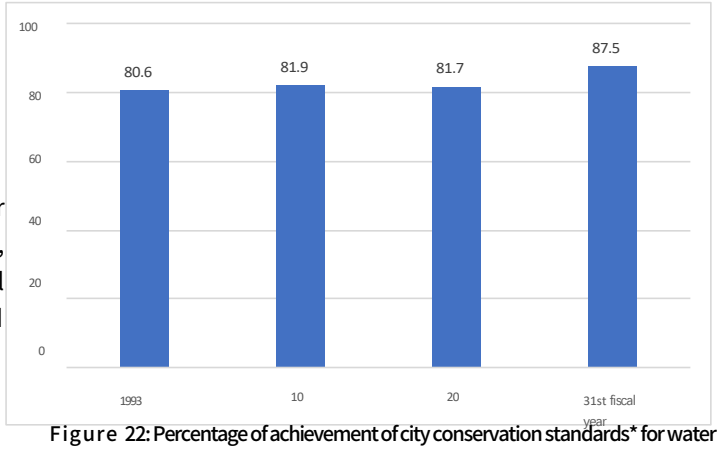


Figure 22: Percentage of achievement of city conservation standards* for water pollution

The city's conservation standards for water pollution] Standards that should be maintained to protect the health of citizens and to preserve a comfortable living environment and a good natural environment.

Promotion Policy

Assessment of water quality and drought risk, and good water resources through rainwater and recycled water use, etc.

Promoting Source Control

By sharing the results of water quality and drought risk assessments with other entities and promoting the use of rainwater and recycled water, we will promote initiatives to enhance a good water environment and maintain and preserve a healthy water cycle system.

Main

Knowing and Communicating

The following is a summary of the results of the study. Investigation of river water quality

The following is a summary of the results of the Investigation of groundwater quality

Understanding Drought Risk

Citizens Citizens New easy-to-understand indicators Water Circle by Evaluation of Boundaries

Correspondence to.

■ **Enhancement of a good water environment**

City Urban areas Promotion of rainwater infiltration in New buildings, public facilities, etc. New buildings, public facilities, etc.

Promotion of rainwater utilization in new buildings, public facilities, etc.

■ **Maintenance and preservation of a healthy water circulation system**

・・ Promote efforts to maintain healthy forests (nursery and thinning)

・・ Appropriate conservation of farmland and reservoirs

The following is a list of the most important issues that need to be addressed in the creation of waterfront areas Preservation and creation of friendly waterfront areas, etc.

field 4

Agriculture - Forestry

Current Status etc.

Nationwide, rising temperatures and changes in precipitation patterns have led to a decline in the ratio of first-grade rice, which is of good shape and color, and poor growth of vegetables. In addition, the expansion of the distribution area and increase in the amount of pests and diseases have caused damage to crops.

As temperatures rise, these damages are expected to become more serious.

Figure 23. Tsubo blight of rice caused by insect pests (Fushimi Ward)

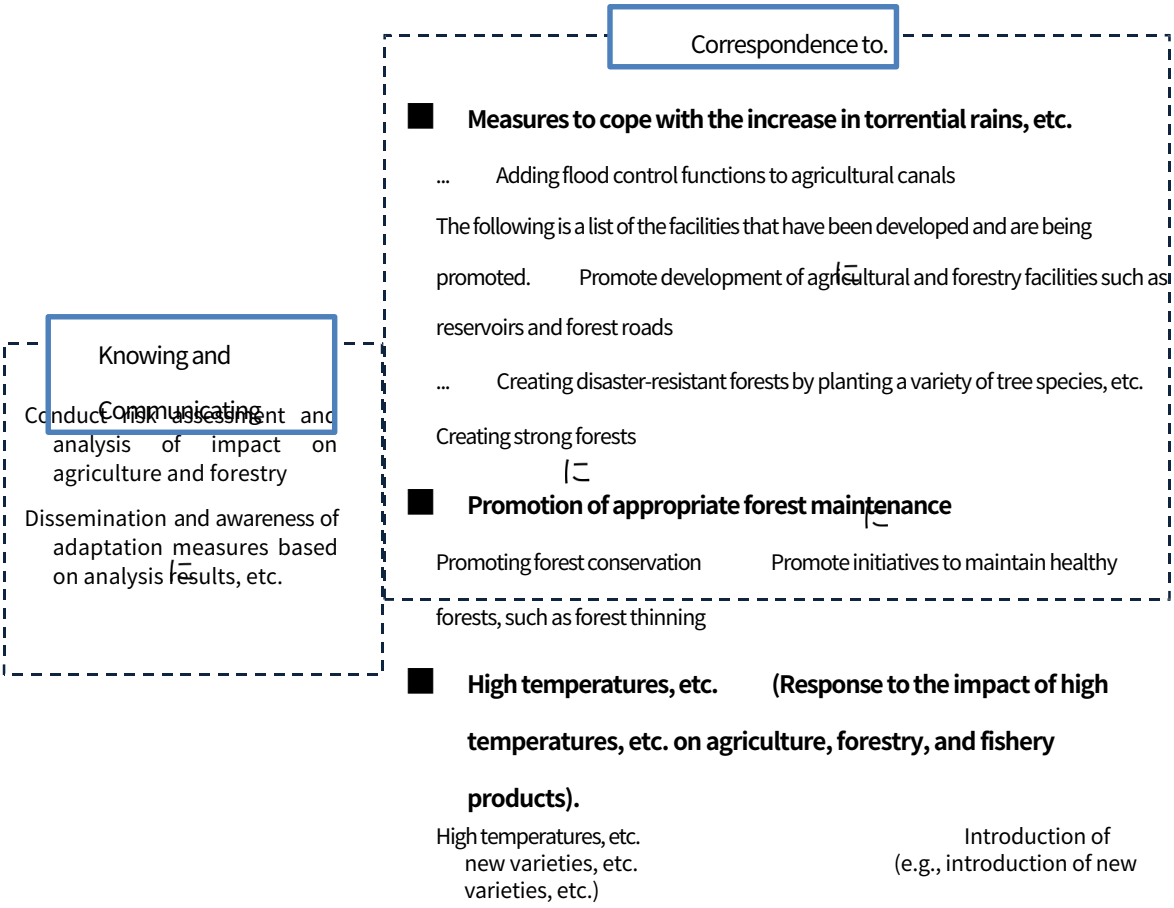
In addition, wind and flood damage in agricultural and mountainous areas is also expected to become more severe in relation to natural disasters (Area 1). In addition, wind and flood damage in agricultural and mountainous areas is also expected to become more severe.

Promotion Policy

Assessing the impact of climate change on agriculture and forestry and strengthening measures

We will strengthen our response to the effects of natural disasters and promote the understanding and analysis of the effects of climate change on agriculture and forestry, and raise awareness among producers about the need for adaptation measures. In addition, we will improve the resilience of agricultural lands and forests by promoting measures to prepare for the expected impacts of high temperatures and dry weather.

Main measures


Correspondence to.
■ Measures to cope with the increase in torrential rains, etc.
... Adding flood control functions to agricultural canals
The following is a list of the facilities that have been developed and are being promoted. Promote development of agricultural and forestry facilities such as reservoirs and forest roads
... Creating disaster-resistant forests by planting a variety of tree species, etc.
Creating strong forests
■ Promotion of appropriate forest maintenance
Promoting forest conservation Promote initiatives to maintain healthy forests, such as forest thinning
■ High temperatures, etc. (Response to the impact of high temperatures, etc. on agriculture, forestry, and fishery products).
High temperatures, etc.
new varieties, etc.
varieties, etc.)
Introduction of
(e.g., introduction of new
Knowing and
Communicating
Conduct risk assessment and analysis of impact on agriculture and forestry
Dissemination and awareness of adaptation measures based on analysis results, etc.

field 5

natural ecosystem

Current Status etc.

With the increase in the number of Japanese deer, which is said to be partly caused by global warming, damage to forest floor plants is becoming more serious. In Kyoto, plants on the forest floor, such as Japanese knotweed, have also been damaged due to feeding damage by the Japanese deer. In addition, cherry blossoms are blooming earlier and autumn leaves are turning late.

In the future, changes in vegetation and habitat will lead to a greater number of organisms. In the future, changes in vegetation and habitat increase the

The effects of forest degradation, such as the deterioration of forest diversity and the degradation of multifunctional forests, are also expected to occur.

Figure 24.

(Sakyo-ku, Takaraga-ike Park)

Promotion Policy

Promote assessment of the impact of climate change on biodiversity and information sharing, etc.

Assess the impact of climate change on biodiversity, including the status of biodiversity in priority conservation areas such as Fukamori-ike, Hacchodaira, and Oharano Forest Park, etc., and share information and take measures in cooperation with other entities.

In addition, we aim to reduce stresses caused by factors other than climate change, taking into account the effects of climate change and other factors, as well as, and to build an ecosystem network to enhance adaptability to climate change, and to conserve and restore healthy ecosystems.

Main measures

Knowing and Communicating

Collect monitoring results, etc. to understand the impact on biodiversity

Biodiversity learning hubs, and opportunities to interact with and learn about nature.

Correspondence to.

■ **Biodiversity Reduction of negative impacts on**

and Strengthen conservation of satochi, satoyama, rare species, and priority conservation areas

... Green and waterfront development that takes advantage of the functions of nature

Sustainable Tourism Promotion of sustainable tourism

■ **Biodiversity Promote economic activities and conservation activities that take biodiversity into consideration**

Biodiversity Biodiversity Biodiversity Conscious Corporate Activities

... Formation of biodiversity conservation networks

Public Facilities and Businesses Public Facilities and Businesses Consideration for Biodiversity in Public Facilities and Businesses

field 6

Culture - Tourism - Local Industry

Current Status etc.

In Sakyo-ku, the Gions Festival and the Japanese confectionery industry have been affected by the feeding damage of the Japanese deer, as described in the section on natural ecosystems (Area 5).

In 2018, one of the main events of the Gionshon festival, the Hanagasa parade, was cancelled due to the extremely hot weather as described in Area 2.

Figure 25. mountainous area (Sakyo Ward) where Chimakizasa has been drastically reduced.

In the future, the impact of the project on the field 1～5 will include the impact on cultural and tourism resources (e.g., landscapes around historical properties and forests comprising traditional borrowed landscapes, dyes for Nishijin textiles and Kyoto Yuzen, ingredients for Kyoto cuisine and vegetables, and sake brewing) and economic loss (decrease in tourism value) in tourism and traditional industries, etc. ☒ The economic loss (decrease in tourism value) in the tourism industry and traditional industries, etc. is assumed to occur.

Promotion Policy

Assessment of the impact of climate change on culture, tourism, and local industries, and information sharing, etc.

We will collect, analyze, and evaluate information on the effects of climate change on Kyoto's culture, tourism, traditional events, and local industry. We will also provide information to the local community and share it with other interested parties and link it to specific measures.

Main measures

Knowing and Communicating

Gathering and analysis of information on the impact on culture, tourism, and local industry

Disseminate information on the natural ecosystems that support Kyoto's traditional culture.

Correspondence to.

■ **Protection and succession of landscapes and tourist resources, etc.**

Protection of the landscape around historic properties from impacts on natural ecosystems, etc. Protection of landscapes around historic properties from impacts on natural ecosystems, etc.

■ **Impacts of Climate Change Promoting Disaster Prevention Measures for Cultural Properties Prepared for**

The following is a brief overview of the disaster response plan for cultural properties in Japan.

Consideration of where to store cultural properties in the event of a disaster and development of an emergency response system

■ **Promote tourism in light of climate change impacts**

Strengthening risk response to heat stroke, flooding, etc., among tourists

Reinforcement of risk responses to heat stroke and flooding among tourists

Sustainable Tourism Promotion of sustainable tourism

Chapter 7. Planning Progress

1 推進体制 Promotion Structure

(1) (1) Citizens - businesses - universities - research institutions - community groups - environmental conservation groups, etc.

In order to achieve a decarbonized society, it is necessary for all actors to promote voluntary and proactive initiatives as their own business, so we will create opportunities for dialogue with various stakeholders, including young people who will lead the next generation, and create a mechanism to build and share a decarbonized lifestyle. We will promote voluntary efforts by each entity by fostering momentum for global warming countermeasures in the city.

In addition, to realize a decarbonized society and create essential innovation, we will promote the development of cutting-edge technologies and the creation of new businesses that simultaneously solve social, economic, and environmental problems by taking advantage of Kyoto's characteristics as a "university town" and its wide range of industries, from traditional to cutting-edge .

(2) Cooperation with Kyoto Prefecture, the national government, and other cities Cooperation with Kyoto Prefecture, the national government, and other cities

We will promote efforts while enhancing synergies by collaborating with Kyoto Prefecture on the operation of mandatory provisions based on the joint prefectural and municipal ordinance "Global Warming Countermeasures Ordinance" and on the jointly established Regional Climate Change Adaptation Center.

We will actively make policy proposals to the government and , and consider projects that utilize the budgets of the Ministry of the Environment and other ministries every fiscal year.

In addition, we will promote the change of national systems and policies by strengthening cooperation with the "Kansai Association of Governments," the "Designated Cities Renewable Energy Council," and the "Zero Carbon Municipal Council," and also promote cooperation at the specific action level to promote effective global warming countermeasures, such as the supply of renewable energy. We will also promote cooperation at the level of specific initiatives to promote effective global warming countermeasures, such as the supply of renewable energy.

(3) (3) (4) (4) (5) (5) (6) (3) Promotion of efforts through international cooperation

In order to promote global warming countermeasures on a global scale, we have been implementing various international initiatives such as cooperation through international networks such as IKREI, holding international conferences hosted by the city and participating in international conferences such as COP, disseminating our city's initiatives, and cooperating with efforts to prevent global warming in Asia . We have been implementing various international initiatives.

As the birthplace of the "IPCC Kyoto Guidelines" that support the Kyoto Protocol and the Paris Agreement, we will continue to work with these international networks to implement pioneering initiatives using the diverse knowledge we have gained and promote the results through international conferences hosted by our city and participation in international conferences such as COP. We will also disseminate the results to the world through international conferences hosted by the city and participation in international conferences such as COP, etc., and promote our efforts worldwide.

(4) Promotion of global warming countermeasures through an all-agency cross-functional system

The "Kyoto City Headquarters for 1.5°C Global Warming Countermeasures" headed by the mayor will take the lead and establish subcommittees for each theme such as initiative implementation and adaptation measures within the city government, and promote effective measures by integrating specific measures across the entire city government.

2 計画の進行管理 Plan Progress Management

To achieve the goals of the plan に, we will inspect, evaluate, and publicize the status of progress toward the goals に and the status of measures being taken に.

The Global Warming Prevention Committee (hereinafter referred to as the "Committee"), which consists of experts and others, inspects and evaluates global warming countermeasures from an expert's perspective に The committee will inspect and evaluate global warming countermeasures from a professional perspective.

The results に will be reflected in the initiatives に in the following fiscal year and beyond, and we will improve our initiatives based on the PDCA cycle に as well as take additional measures based on に and the concept of positive action に.

(1) mitigation measures

Mitigation measures に are managed based on two perspectives に "reduction progress" to see the progress of expected reductions by sector and by measure, and "progress" to see the progress of each initiative に, the main contents of initiatives に, the implementation status of related projects each fiscal year, and the progress of projects に for which indicators have been set.

We will compare the progress of actual reductions with the progress of initiatives, inspect and evaluate the effectiveness of initiatives as a whole, and review items that need improvement and enhancement に to achieve our goals.

(2) adaptation measures

Adaptation measures に include the status and results of information collection and monitoring on climate change and its impacts に in each fiscal year, as well as the status of efforts in each of the six areas に measures are taken, and across bureaus.

に Based on the status of the monitoring and the efforts in each field, we will discuss issues and necessary measures for the following fiscal year and beyond に and enhance the measures in cooperation with universities, research institutes, and related organizations, with the Regional Climate Change Adaptation Center as the core に.

(3) (3) Plus - Action.

Achieving net zero carbon dioxide emissions in 2050 に requires positive actions to advance the measures.

To this end, we will steadily に grasp the domestic and international situation surrounding global warming countermeasures and the latest knowledge に and, apart from the progress に based on the plan に, we will consider and implement new initiatives beyond the promotion policy and initiatives に described in the plan に while receiving opinions from the Promotion Committee.

3 作成報告書の作成公表 Prepare and publish annual report

In accordance with the provisions of the ordinance に, we will compile and widely publish an "Annual Report" on greenhouse gas emissions from the city area and the implementation status of mitigation and adaptation measures and their evaluation に under the Global Warming Prevention Plan に.

endnotes

Outline of the Kyoto City Ordinance on Global Warming Countermeasures

Ordinance No. 26 of December 24, 2004 (enacted)
Ordinance No. 24 of December 18 2020

Preamble (Summary)

In order to create a prosperous Kyoto, where future generations can dream of a prosperous future, we have decided to share a sense of urgency about climate change and to confront global warming and the climate crisis with determination, aiming to realize a decarbonized society that simultaneously achieves net zero CO2 emissions, improved quality of life, and sustainable economic development by 2050. We enact this ordinance with a shared sense of urgency about climate change and a determination to confront global warming and the climate crisis with resolve.

Definition of Global Warming Prevention (Article 2)

Measures to reduce greenhouse gas emissions and to conserve and enhance the absorption of greenhouse gases [Mitigation Measures].

Measures to prevent and mitigate damage from climate change impacts [Adaptation measures

Basic Philosophy (Article 3)

(1) Transform the socio-economic system so that net zero carbon dioxide emissions are achieved in business activities and daily life.
(2) The city, businesses, citizens, environmental conservation groups, tourists and other visitors to the city recognize the importance of realizing a decarbonized society and work voluntarily and proactively based on their respective responsibilities.
(iii) To contribute to the resolution of social and economic issues through global warming countermeasures, as well as to reduce greenhouse gas emissions.

The City's greenhouse gas emissions reduction targets (Article 4)

By FY2030 (FY2030)

Compared to FY2013 (FY 2013)

Reduction of **40%** or more

Common goals for all cities

Responsibilities of each entity (Articles 5-8)

Kyoto (city)

(1) Formulate and implement comprehensive global warming countermeasures
(2) Promotion of participation of all entities, reflection of their opinions, and cooperation with educational and research institutions, the national government, and local governments in Japan and abroad.
(iii) Foster momentum and implement necessary measures to promote voluntary and proactive efforts by all entities.
(4) Promotion of global warming countermeasures in the city's administrative operations

Businesses and Citizens

Voluntary and proactive implementation of global warming countermeasures
Contribute to the promotion of global warming countermeasures by others

Energy Suppliers

Providing information to the City
Implementation of initiatives that contribute to the expansion of the use of renewable energy

Tourists and other visitors

Implementation of global warming countermeasures
Cooperation of the city, businesses, citizens, etc.

priority measures

(i) Promotion of installation of facilities using renewable energy, promotion of purchase of electricity from renewable energy, and investigation of stable supply of electricity from renewable energy, etc.
(2) Promote energy conservation 3Promote energy conservation in buildings
(4) Dissemination of environmental management systems (5) Provision of information on environmental goods, etc., and promotion of preferential purchasing
(6) Reduction of emissions from automobile use (promotion of public transportation, promotion of MaaS, etc.)
(7) Forest development, promotion of forest resource use including local timber
8) Raise awareness of dietary habits in harmony with the environment through local production for local consumption and Kyoto's food culture
(ix) Promotion of appropriate preservation of greening of urban areas and agricultural land (10) Thorough reduction of garbage
(11) Maximize energy recovery from refuse (12) Promote trading of reductions
⑬ Promote research and development of technologies that contribute to the prevention of global warming
⑭ Fostering and promotion of environmental industries
(15) Spreading efficient business activities and labor ⑯ Environmental education
(3) Provide information to citizens and business operators, human resource development, etc.
(iv) Promotion of community-based initiatives (19) Promotion of efforts by tourists and other visitors
⑳ Cooperation with the national government, domestic and foreign local governments, environmental conservation groups, etc.
㉒ Investigation and research on economic measures ㉒ Promotion of appropriate management of CFC substitutes
㉓ Prevention of natural disasters based on climate change impacts ㉔ Prevention of heat stroke based on climate change impacts
㉕ Research on climate change adaptation, etc.
㉖ Ensure a system for collecting information on climate change adaptation, etc.

(Next 11)

Global Warming Prevention Plan

(Article 10)

annual report

(Article 9)

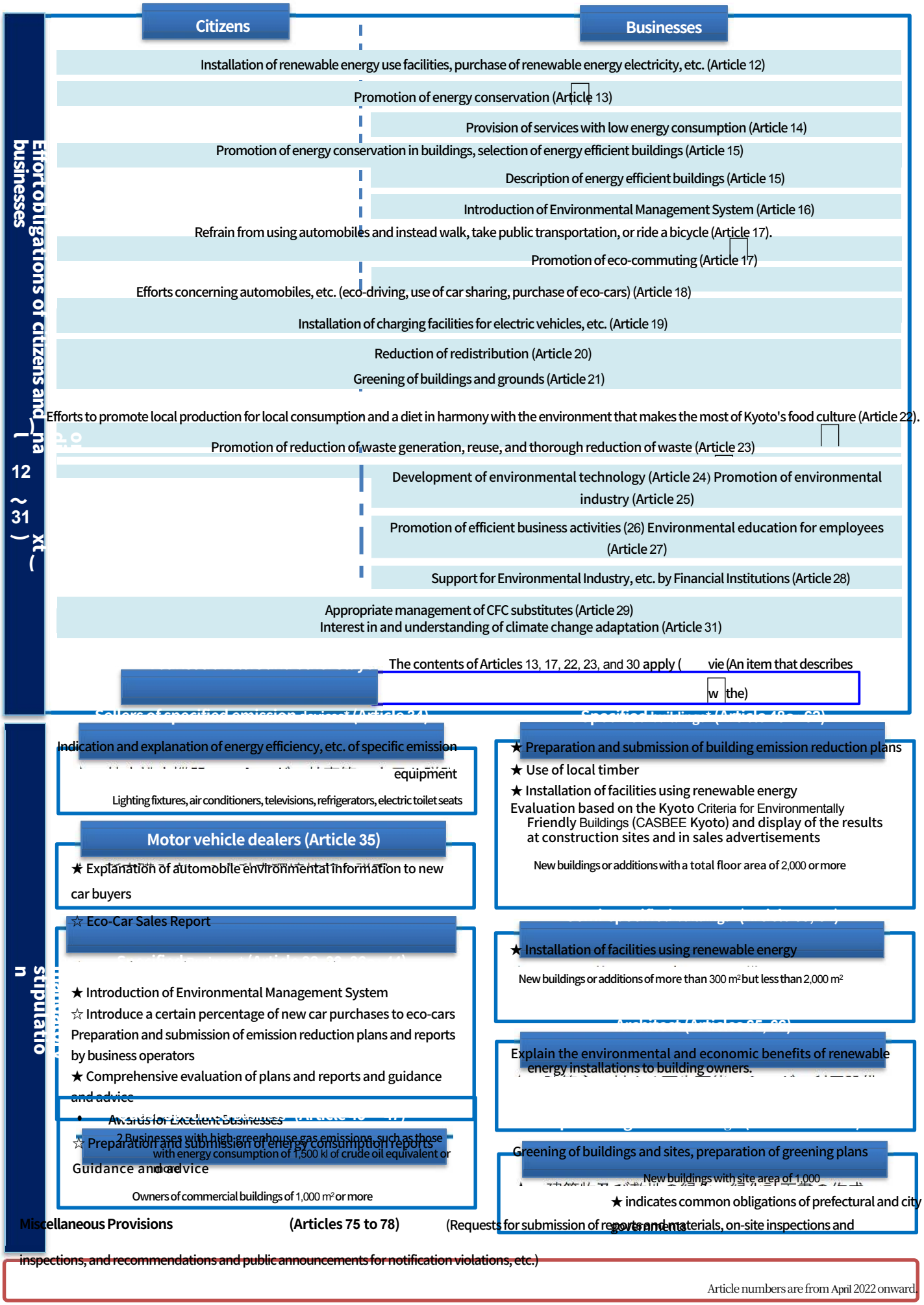
Percentage of Kyoto ① Promote action plan of city hall ② Purchase renewable energy electricity etc. from TMG ③ Establish and promote environmental management system ④ Actual procurement of environmental goods TMG ⑤ Global warming countermeasures for public works projects

of

Evaluation of measures Review

(Article 73)

6) Use of renewable energy in public facilities, use of local timber, promotion of greening


Effort obligations of citizens and businesses
Citizens
Businesses
Installation of renewable energy use facilities, purchase of renewable energy electricity, etc. (Article 12)
Promotion of energy conservation (Article 13)
Provision of services with low energy consumption (Article 14)
Promotion of energy conservation in buildings, selection of energy efficient buildings (Article 15)
Description of energy efficient buildings (Article 15)
Introduction of Environmental Management System (Article 16)
Refrain from using automobiles and instead walk, take public transportation, or ride a bicycle (Article 17).
Promotion of eco-commuting (Article 17)
Efforts concerning automobiles, etc. (eco-driving, use of car sharing, purchase of eco-cars) (Article 18)
Installation of charging facilities for electric vehicles, etc. (Article 19)
Reduction of redistribution (Article 20)
Greening of buildings and grounds (Article 21)
Efforts to promote local production for local consumption and a diet in harmony with the environment that makes the most of Kyoto's food culture (Article 22).
Promotion of reduction of waste generation, reuse, and thorough reduction of waste (Article 23)
Development of environmental technology (Article 24) Promotion of environmental industry (Article 25)
Promotion of efficient business activities (26) Environmental education for employees (Article 27)
Support for Environmental Industry, etc. by Financial Institutions (Article 28)
Appropriate management of CFC substitutes (Article 29)
Interest in and understanding of climate change adaptation (Article 31)
The contents of Articles 13, 17, 22, 23, and 30 apply (
vie (An item that describes
w the)
Indication and explanation of energy efficiency, etc. of specific emission
equipment
Lighting fixtures, air conditioners, televisions, refrigerators, electric toilet seats
★ Preparation and submission of building emission reduction plans
★ Use of local timber
★ Installation of facilities using renewable energy
Evaluation based on the Kyoto Criteria for Environmentally Friendly Buildings (CASBEE Kyoto) and display of the results at construction sites and in sales advertisements
New buildings or additions with a total floor area of 2,000 or more
Motor vehicle dealers (Article 35)
★ Explanation of automobile environmental information to new car buyers
☆ Eco-Car Sales Report
★ Installation of facilities using renewable energy
New buildings or additions of more than 300 m² but less than 2,000 m²
★ Introduction of Environmental Management System
☆ Introduce a certain percentage of new car purchases to eco-cars
Preparation and submission of emission reduction plans and reports by business operators
★ Comprehensive evaluation of plans and reports and guidance and advice
Explain the environmental and economic benefits of renewable energy installations to building owners.
Awards for Excellent Businesses
2 Businesses with high greenhouse gas emissions, such as those with energy consumption of 1,500 kl of crude oil equivalent or more
☆ Preparation and submission of energy consumption reports
Guidance and advice
Owners of commercial buildings of 1,000 m² or more
Greening of buildings and sites, preparation of greening plans
New buildings with site area of 1,000
★ indicates common obligations of prefectural and city governments
Miscellaneous Provisions (Articles 75 to 78) (Requests for submission of reports and materials, on-site inspections and inspections, and recommendations and public announcements for notification violations, etc.)
Article numbers are from April 2022 onward.

List of World, National, and Kyoto City Movements

counter for years (following a number in the hito-futa-mi counting system)	world	home (i.e. hometown, home country)	Kyoto (city)
1992	Climate Change Framework Adoption of the Convention		
1997	of the Kyoto Protocol. Adopted (COP3)		Formulation of regional promotion plan for global warming countermeasures
1998		Formulation of "Outline for the Promotion of Global Warming Countermeasures Enactment of the Law Concerning the Promotion of Measures to Cope with Global Warming	Establishment of the Kyoto Agenda 21 Forum
2002			Kyoto City Environmental Conservation Activity Center (KYOE) (Colology Center) opened.
2004			Enactment of Global Warming Prevention Ordinance By FY2010, 10% below the FY1990 level
2005	Kyoto Protocol enters into force	Establishment of Kyoto Protocol Target Achievement Plan	
2006			Formulation of Global Warming Prevention Plan
2009		Announcement of 2020 target* (COP15) FY1990: -25% FY1990: -25	Selection as an Environmental Model City
Year 2010			Revision of Global Warming Prevention Ordinance By FY2020, 25% reduction from FY1990 level By FY2030, the ratio will be 40% below the FY1990 level. Long-term: Reduction of 80% or more from FY1990 levels
2011			Establishment of the Global Warming Prevention Plan (2011-2020)
2013		Announced reduction targets for FY2020 to implement the Cancun Agreements*. (3.8% down from FY2005)	Formulate strategies to promote energy policy *Energy savings: 15% or more in FY2020 compared to FY10 Renewable energy: More than 3 times the FY2010 level in FY2020
2014			Revision of the Global Warming Prevention Plan (2011-2020) *Reflects strategy to promote energy policy
2015	Adoption of the Paris Agreement (COP21)	Announcement of 2030 reduction target*. (-26% compared to FY2013) Adaptation planning to climate change impacts	
2016	Paris Agreement enters into force	Formulation of Global Warming Prevention Plan Until FY2020 -3.8% from FY05 By FY2030, 26% of level (-26%) 80% by 2050	
2017			Revision of the Global Warming Prevention Plan (2011-2020) Toward building a sustainable urban civilization Kyoto Declaration

Kyoto City Environmental Council List of Committee Members

As of March 31, 2021

name name	service Position Name etc.
pattern of diagonal stripes field Miho Haru pond this Yu fragrance stone river Ichiro Ichiro Ishikawa -Hara original Masashi child upper reaches of a river rice field Kay pronoun or suffix used in reference to an older brother or older woman Okubo Japanese Judas tree (Cercidiphyllum japonicum) child large island Island Shoko Shoko Oshima tail Rumiko Ozaki lumineering Oda Oda Hideo Oda Hideo Oda Oban Obata Nori male ○ marbled rockfish (Sebastiscus marmoratus) field Mikio Hung Kamigami Tatsu Tatsuya Japanese cedar (Cryptomeria japonica) Japanese cedar (Cryptomeria japonica D. D.) Takashi Shin Saka-no-kami na cherry tree well Ryo Shiyo Road Masashi Hiroshi rice field (usu. small) rice	Member of the Kyoto Municipal Suzaku Daishi Elementary School Principal Citizens' Recruitment Committee Chairman of the Editorial Board and member of the Citizens' Public Commission, Kyoto Shimbun, Inc. Associate Professor, Department of Environmental Health Science, Graduate School of Global Environmental Studies, Kyoto University Professor, Graduate School of Law, Osaka University Representative of Souk Sousei Office Standing Committee Member, Kyoto City Regional Women's Federation Vice President, Kyoto City Health Council Federation Professor Emeritus, Kyoto University, Professor by Special Appointment, School of Policy Science, Ritsumeikan University Executive Committee Member, Japan Trade Union Confederation, Kyoto Prefectural Federation of Trade Unions Professor, Faculty of Policy Science, Ritsumeikan University Assistant Professor, Field Science Education and Research Center, Kyoto UniversityAssociate Professor, Faculty of Policy Science, Ritsumeikan University Professor Emeritus, Kyoto University Executive Director, Climate Network, a non-profit organization Associate Professor, Graduate School of Human and Social System Sciences, Osaka Prefecture University Director, Kyoto Prefectural Government Director, Kyoto District Meteorological Observatory Director, Industrial Promotion Department, Kyoto Chamber of Commerce and Industry Professor Emeritus, University of Shiga Prefecture Chairman, Environment Committee, Kyoto Industrial Association, Kyoto, Japan Representative, Field Society lawyer Director, Kyoto Medical Association Emeritus Professor, Kyoto University Professor, Graduate School of Global Environmental Studies, Kyoto University Professor Emeritus, Kyoto Seika University Associate Professor, Department of International Tourism, Heian Jogakuin College Professor, Primate Research Institute, Kyoto

(○=Chairman, in alphabetical order, titles omitted)

Global Warming Prevention Committee List of Committee Members

As of March 31, 2021

he name	service Position Name etc.
pond this superior leaf thousand leaves (indicating an Chiku fragrance Se item near the Tsukuda Ken Kenji Uchida speaker, the Fuji Hiroshi action of the Uchifuji Person speaker, or the West Okay Makoto current topic) Tentocaoi Nishioka -Hara original benevolence (esp. as a virtue elegance of Confucianism) (in (taxonomical) tribe gagaku or filial piety Shou noh) middle bridge this section of a Yuji Yuji song Hashimoto Italy garden Chiemi (in the ancient Chinese army) (esp. man- one day's march (approx. 12.2 made) km) Mountain Kikuo Okaya village full (years, etc.) face down looking Kou Kouji Fushimi Thailand persimmon forest mouth sharpness Jiro (esp. Japanese Moriguchi man persimmon, forest main body (of a Diospyros kaki) plant) Sachi Yutaka Yukihiro Morimoto (in Toru	public member of a publicly subscribed committee Vice President, Kyoto Federation of Small Business Association, Kyoto Prefecture Vice President, Kyoto Federation of Small Business Women's Association public member of a publicly subscribed committee Associate Professor, Graduate School of Engineering, Kyoto University Executive Director, Kyoto Association of Corporate Executives Chairman, Special Committee on Environment and Energy, Kyoto Chamber of Commerce and Industry

(○=Chairpersons of the subcommittees, in alphabetical order, titles omitted)

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SUSTAINABLE DEVELOPMENT GOALS

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