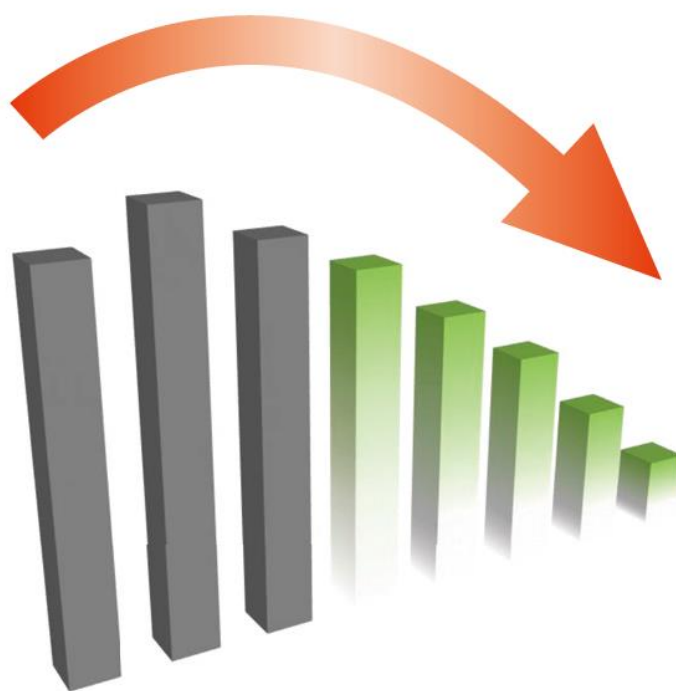


Kyoto City Program of Global Warming Countermeasures <2011-2020>

Further efforts to battle climate change
~Road to “Zero” Project : A path to a low-carbon society~



CITY OF
KYOTO

Developed in March 2011

Revised in March 2014

Revised in March 2017

Remarks upon revising “Kyoto City Program of Global Warming Countermeasures”

From the “Kyoto Protocol” to the “Paris Agreement”

Rashes of record-breaking torrential rains and droughts are happening all over the world... The global average temperature continues to rise. There are concerns of food shortages and extinctions of large numbers of species in the near future. Climate change is becoming a grave threat not only for humans, but for all living things.



Here in Kyoto 20 years ago in 1997 we saw the adoption of the Kyoto Protocol, the first international convention in human history as a countermeasure to global warming. These principles were then inherited in the Paris Agreement which went into effect last year, signifying as a framework for the participation of people all over the world a great move forward.

The Paris Agreement set the targets of “holding the increase in the global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.” In order to achieve this, greenhouse gas (GHG) emissions must be reduced to effectively zero in the latter half of the century. This is quite a demanding goal, but it expresses the realization for all humanity that “If we do not achieve this, there is no future.”

As an Environmentally Advanced City, Kyoto has set the high targets of reducing GHG emissions to 25% below FY1990 levels by FY2020, and 40% below those levels by FY2030. Citizens and businesses have come together to work toward the conservation and creation of energy. These efforts have steadily been producing observable effects, including a 26% decrease in energy consumption from peak levels in FY1997. Energy consumption is closely related to GHG emissions. However, the sudden jump in emissions from the steps taken to generate electricity after the Great East Japan Earthquake caused GHG emissions to rise, and they are now hovering at levels similar to those in FY1990.

In this mid-term review of the Program of Global Warming Countermeasures we are adding the new “Adaptation to the Impacts of Climate Change”, while also taking action to initiate fundamental shifts in society by implementing the Road to “Zero” Project strategy, which sets ambitious common goals for all of humanity. At the same time, we maintain high reduction targets and enhance our initiatives to achieve them.

As we set our sights on a societal shift away from fossil fuels, each and every one of us needs to think about the way we exist, such as how we live and how we work. Then we need to take action. Kyoto has a mindset, culture, and knowledge built up over its long history which are symbolized by expressions such as “mottainai” (no garbage) and “shimatsu suru” (using something from start to finish). It is now more than ever that we need to utilize these to create sustainable lifestyles and communities. I am confident that since we are Kyoto, we can do it!

Now then, I hope you are all prepared. In order to build a better future, let us work together to create a model for a sustainable society, and share it with the world!

March 2017

Mayor of
Kyoto City

門川 大作
Daisaku Kadokawa

Approaches towards Program Revisions

1 Necessity of revisions to the plan

- (1) In order to play a leading role as an environmentally advanced city, Kyoto enacted the Code of Global Warming Countermeasures in FY2004. It was the first specialized set of global warming countermeasures to be enacted anywhere in Japan. In conjunction with a revision to the code in FY2010, the Program of Global Warming Countermeasures was also drafted, with the aim of steadily reaching newly decided GHG reduction targets (the target at the time was to achieve a 25% reduction from FY1990 levels by FY2020).

With these as a focal point, citizens, businesses, and all types of entities came together for the Global Warming Countermeasures, making efforts to conserve and create energy among other things. The results of these efforts have steadily come into view. **In FY2014 energy consumption had reached a low point (see figure 1) of 20% less than the base year (FY1990) and 26% less than the peak consumption year (FY1997).**

Since GHG emissions are mostly dependent on energy consumption, the expectation was that they would naturally be a significant dip along with a concurrent fall in energy consumption.

- (2) However, after the Great East Japan Earthquake all nuclear power generation in the country was suspended. Japan underwent a major change to a power source structure that relied heavily on thermal power generation, which emits high levels of CO₂ (see figure 2). This caused a sharp increase in the CO₂ emissions released in the process of generating the electricity† used in the Kyoto area. As a result, despite all of the aforementioned efforts by citizens, business, and others which brought energy consumption to its lowest point, GHG emissions (see figure 3) stagnated at 7.82 million tons which is roughly the same level as the base year (7.83 million tons).

- (3) This meant that **the conditions had drastically changed from what was assumed at the time the plan was formulated**, and there were other contributing factors to higher GHG emissions, which include increases in the numbers of households, tourists, and lodging facilities.

- (4) Looking at the state of the world, the Paris Agreement in November 2016 marked a tremendous advancement from the first legally binding international framework for global warming countermeasures in human history, the Kyoto Protocol. It set a common long-term worldwide target of “holding the increase in global average temperatures to lower than 2°C above pre-industrial temperatures”, and **aims for a societal shift away from the use of fossil fuels in order to reduce GHG emissions to effectively zero in the latter half of this century.**

Figure 1 Energy consumption of Kyoto City

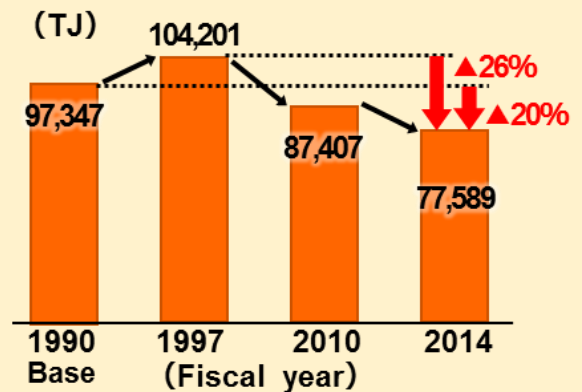


Figure 2 Change in the power supply construction of the Kansai Electric Power Co., Inc.

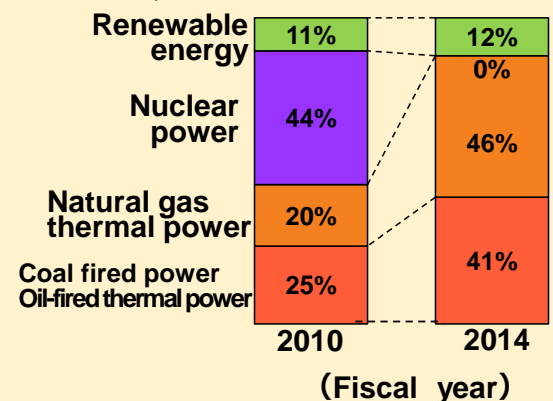
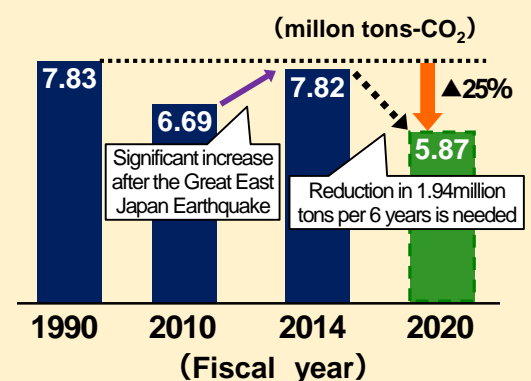


Figure 3 GHG emissions of Kyoto City



† Calculations for amounts of GHG emissions in the Kyoto area were made using the CO₂ emitted when generating the electricity used in the Kyoto area as being emitted in the place the energy was used (the Kyoto area) and not the place in which it was generated.

- (5) Taking these circumstances into account, Kyoto City considered maintaining the aforementioned reduction targets rather than lower them. Opinions on the matter were gathered from citizens of Kyoto and results showed that many approved. Reaching these targets will undoubtedly require power business operators to take steps such as implementing renewable energy or improving the efficiency of thermal power generation to reduce CO₂ emitted when producing power. With that in mind, **citizens, businesses, and government agencies need to work together and put more effort than ever into global warming countermeasures.** Of course, these efforts cannot come at the cost of the steady, secure, and healthy economic activities of citizens and businesses.
- (6) On the other hand, extreme weather phenomena thought to be caused by global warming, such as strong typhoons, torrential rains, heat waves, and tornadoes, are occurring around the world nearly every year, causing major losses in terms of lives, agricultural production, and other costs. **The impacts of climate change are being felt in Kyoto as well, in forms that include large-scale flood damage from heavy rains, earlier blooming of the cherry blossoms, and delayed autumn foliage for maple trees.** Since higher temperatures and climate change are currently unavoidable for the world as a whole, countermeasures have become necessary in order to prevent and mitigate damage brought about by various potential conditions discussed above. In other words, it is necessary to adapt current measures.

2 Aims of Revisions to the Program

Based on the above approaches to mid-term revisions of the program, the following approaches were incorporated further intensifying efforts while also maintaining GHG reduction targets, as well as the “Six visions of a low-carbon society” that Kyoto City hopes to achieve by the year 2030.

Enhanced countermeasures for increased energy consumption for residential and commercial areas

While energy consumption in residential and commercial areas has been decreasing since 2010, the amount is still 10% higher than it was in FY1990. Considering this, countermeasures aimed at the spread of energy-saving products and buildings have been strengthened, as well as promoting a shift towards more environmentally friendly lifestyles.

Using a backcasting approach to strengthen progress management towards the achievement of reduction targets

Kyoto City using a backcasting approach implements precise and tangible actions towards achieving GHG emissions reduction targets, including strengthening policies. For this purpose, the city analyzes each of the causes of fluctuations in GHG emissions, and quantitatively visualizes the effectiveness of global warming countermeasures, including influences from external factors. Conducting analysis that is unprecedented.

Developing initiatives that achieve reduction targets for FY2020 as well as focus on FY2030 and beyond

In addition to achieving the immediate target of a 25% reduction by FY2020, the city is actively discussing and proposing plans to start implementing measures to bring about a low-carbon society that achieves medium to long term reduction targets greater than those of Japan as a whole, such as 40% by FY2030 and more than an 80% reduction thereafter.

Kyoto City also aims to build a low-carbon society with effectively zero GHG emissions (zero balance between emissions and absorptions) in the latter half of this century as stated in the Paris Agreement.

Shaping the direction of adaptations of current measures towards the impacts of climate change accompanied global warming

The City of Kyoto is also now experiencing the impact of extreme weather phenomena, such as torrential rains, that are considered to be the manifestation of the effects due to global warming. It is necessary not just to conduct “alleviating measures” to curtail GHG emissions as have been done up until now, but to plan adaptations to current measures as the impacts of climate change have already arrived influencing the inevitable mid-term to long term rise in global temperatures. For this reason, Kyoto is advancing the shaping of the program in the direction of adaptations to current measures.

1 Outline of the Kyoto City Program of Global Warming Countermeasures

The Kyoto City Program of Global Warming Countermeasures is an action plan to comprehensively and systematically pursue global warming countermeasures that ensure the achievement of GHG emissions reduction targets set forth in the Kyoto City Code of Global Warming Countermeasures.

Basic policy

The plan aims to create a low-carbon society that ensures healthy and culture-filled lives for citizens of the present and future and contributes to the welfare of humankind by indicating specific global warming countermeasure policies that can achieve these aims through comprehensive and systematic implementation.

Present an image of a society that must be achieved, and aim to have all entities, including citizens and businesses, work together on global warming countermeasures to make steady progress toward achieving the GHG emissions reduction targets set forth in the code.

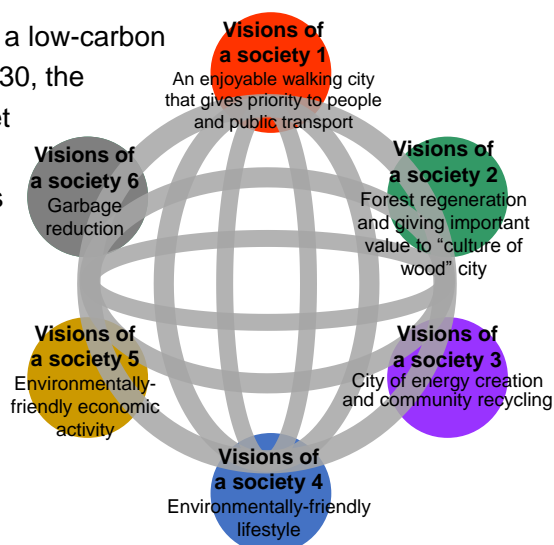
Connecting that the comprehensive advancement of global warming countermeasures is the basis for improvements in citizens' quality of life and status of the city.

As the city where the Kyoto Protocol was born, to create pioneering measures that cater to the special characteristics of Kyoto, share them with the world, and be a leader in global warming countermeasure efforts worldwide.

Aim to create a sustainable energy society, and build a low-carbon society.

The six visions of a low-carbon society

This plan presents a low-carbon society for fiscal 2030, the end reduction target of the regulations, from six perspectives taking into account the character of Kyoto.



Plan period

A ten-year period from FY2011 to FY2020.

Greenhouse gases (GHGs) targeted for reduction

- ① Carbon dioxide (CO_2)
- ② Methane (CH_4)
- ③ Nitrous oxide (N_2O)
- ④ Hydrofluorocarbons (HFCs)
- ⑤ Perfluorocarbons (PFCs)
- ⑥ Sulfur hexafluoride (SF_6)
- ⑦ Nitrogen trifluoride (NF_3)

For more information, see pages 12-17.

Reduction targets of GHG emissions

Reduce GHG emissions from the Kyoto municipal area by 25% compared to 1990 levels by fiscal 2020.

Aim to build a low-carbon society with effectively zero GHG emissions (zero balance between emissions and absorptions) in the latter half of this century as stated in the Paris Agreement.

The Kyoto Code of Global Warming Countermeasure stipulates the following reduction targets.

25% reduction by FY2020
40% reduction by FY2030
80% reduction long term
As compared to FY1990

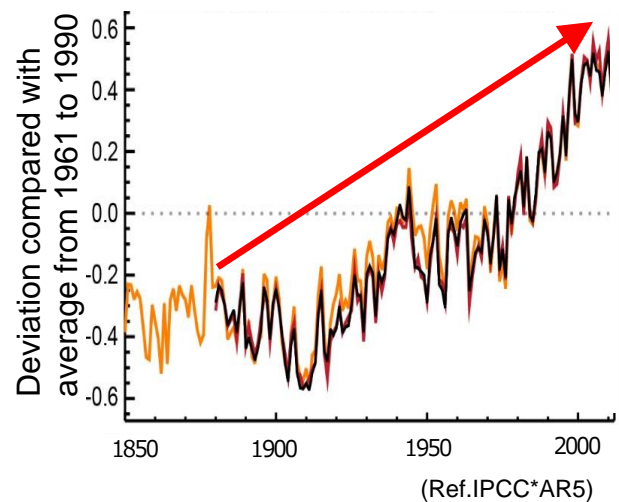
2 Circumstances and Developments in Global Warming

What is global warming?

We utilize fossil fuels such as coal and oil in how we live and in economic activities, and as we do so we emit GHGs. Some of these gases are absorbed by the forests and oceans but the remainder stays in the atmosphere. The amount of GHG emitted currently exceeds the amount absorbed, so it continues to build up in the atmosphere and the density of the GHGs is increasing. This is disrupting the balance of heat release and absorption in the atmosphere, and **temperatures throughout the world are beginning to rise.**

The global average temperature has increased **0.85°C between 1880 and 2012 (an increase of 0.64°C per 100 years)** as global warming continues to advance.

Figure 4 Global average temperature by year

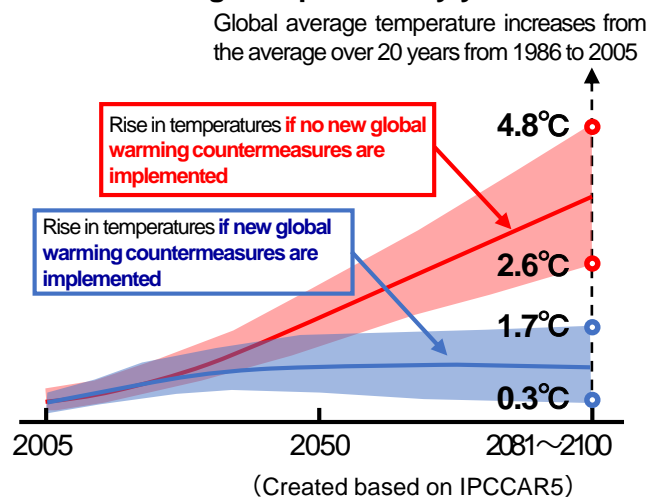


Future Forecast for Global Warming

According to the IPCC Fifth Assessment Report, if no new global warming countermeasures are implemented then the global average temperature between the years 2081 and 2100 will increase to anywhere between 2.6 and 4.8°C higher than it was during the 20 years between 1986 and 2005.

However, it is not impossible to hold the increase to less than 2°C. The report also presents the scenario of being able to hold the rise in temperatures to less than 1.7°C by reducing GHG emissions to effectively zero or even negative numbers by 2100.

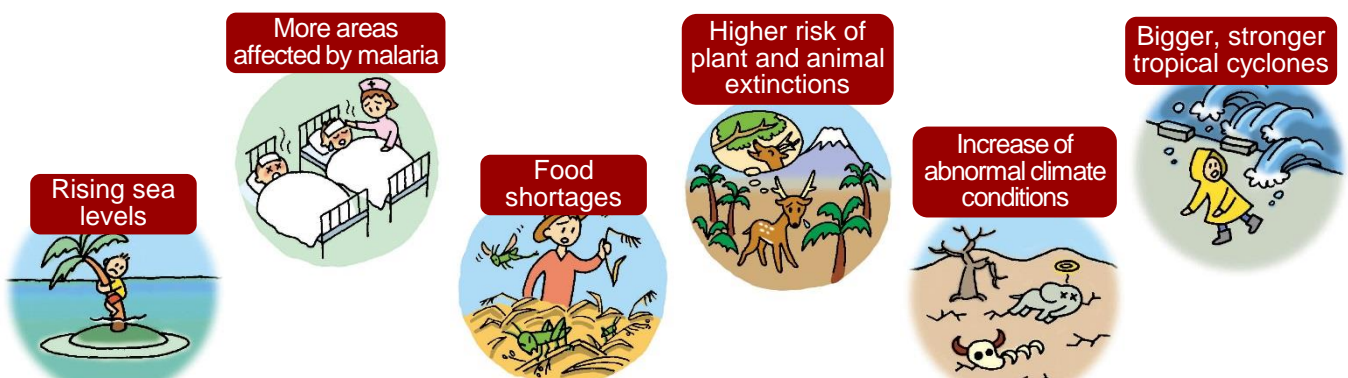
Figure 5 Future forecast of global average temperature by year



Impacts of Global Warming

According to the IPCC AR5, if warming continues in its present state, **the climate change that it causes is highly likely to have wide-ranging grave and irreversible impacts on humans and ecosystems.**

In recent years places all over the world have suffered damage nearly every year from extreme weather phenomena such as strong typhoons, torrential rains, heat waves, and tornadoes brought about by climate change. This is causing major losses in terms of lives, agricultural production, and other things.



International trends related to global warming countermeasures

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992. The subsequent adoption of the “Kyoto Protocol” at the UNFCCC COP*3 held in Kyoto in 1997 served as a major step for global warming countermeasures around the world.

Then, based on the scientific research findings and other material in publications such as the IPCC*, all parties in attendance at the COP21 held in Paris in December 2015 unanimously adopted the “Paris Agreement” as the framework for global warming countermeasures from 2020 onward. It went into effect the following year, in November 2016. The Paris Agreement did not apply only to advanced countries as was the case for the Kyoto Protocol. All 197 countries and regions signatory to the UNFCCC would reduce GHGs, **marking a major turning point towards the goal of a society that does not rely on fossil fuels such as coal and oil.**

[Key Points of the Paris Agreement]

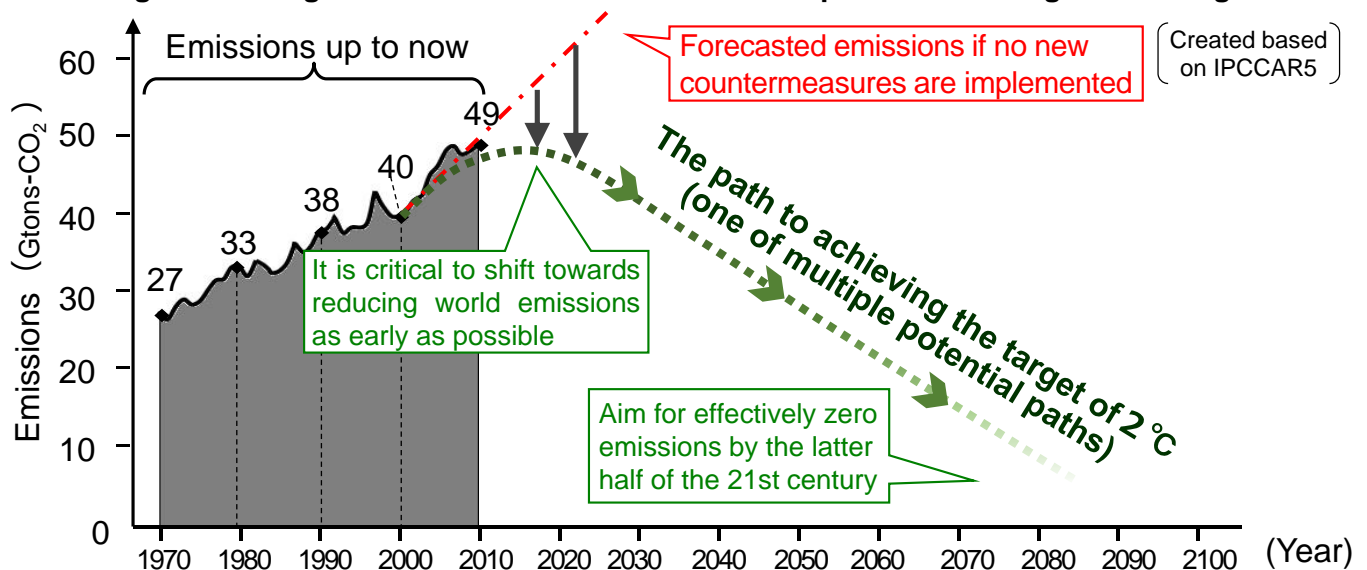
Targets

Hold the increase in the global average temperature to well below 2°C above pre-industrial levels, and pursue efforts to limit the increase to 1.5°C above those levels. Aim to balance the emission and absorption of human-produced gases in the latter half of this century.

Countermeasures

- Offer GHG reduction targets to each country and obligation towards implementing domestic measures aimed at achieving those targets (although achieving targets is not mandatory).
- Revise the reduction targets every five years, seeking to set tougher targets if possible.
- Perform the first assessment in 2023, and get an understanding of worldwide emissions reductions every five years thereafter.

Figure 6 Changes in world GHG emissions and the path to achieving the 2°C target



Japanese domestic trends related to global warming countermeasures

After the adoption of the “Kyoto Protocol”, in 1998 Japan set out its “General Policy for Promoting Measures Against Global Warming”, while also enacting the Act on “Promotion of Global Warming Countermeasures”.

After the Kyoto Protocol took effect in 2005, Japan formulated the “Kyoto Protocol Target Achievement Plan” in April 2005 with the aim of steadily reaching its targets set forth in the Kyoto Protocol (Average emissions levels 6% lower than FY1990 from FY2008 to FY2012).

Adding in the effects of absorption sources such as forests and Kyoto Mechanism Credits*, the result was an 8.7% reduction from FY1990 levels during the five years from FY2008 to FY2012. **Japan had achieved its Kyoto Protocol Reduction Targets.**

For an INDC, Japan submitted a target of a “26% reduction in FY2030 from GHG emission levels in FY2013” to UNFCCC in 2015. In order to achieve it, Japan formulated a new Plan for Global Warming Countermeasures in 2016.

In November 2015 Japan also formulated the “National Plan for Adaptation to the Impacts of Climate Change,” in order to promote comprehensive and more over systematic efforts coordinated nationwide to deal with the various impacts brought about by climate change.

3 Past Kyoto City Global Warming Countermeasures

A background on Kyoto City global warming countermeasures

Efforts in the area of global warming countermeasures in the city of Kyoto began on the occasion of hosting the COP3 in 1997 at which the Kyoto Protocol was adopted. Table 1 shows the timeline of countermeasures from then on.

Table 1 Kyoto City developments related to global warming countermeasures

Year	Occurrence
1997	"Regional Propulsion Program of Global Warming Countermeasures" formulated
2004	"Code of Global Warming Countermeasures" enacted
2006	"Program of Global Warming Countermeasures" formulated
2010	New decision to aim for the creation of a low-carbon society that reduces GHG emissions by at least 80%, and comprehensive revision of the "Code of Global Warming Countermeasures".
2011	Formulated the "Program of Global Warming Countermeasures (2011-2020)" as an action plan for achieving the reduction targets set forth in the comprehensively revised code
2014	Revised the plan to immediately reflect the aims, leading projects, and other elements involved in promoting the measures indicated in the Strategy for the "Promotion of Energy Policy"

Main rules and responsibilities for the Kyoto City Code of Global Warming Countermeasures

Large emitters*

- Submission of a plan to reduce CO₂ emissions by businesses, etc.
- Implementation of environmental management system
- Selection of eco-friendly cars when purchasing or leasing

Those adding new expansions to large-emission buildings*

- Submission of building emissions reduction plans, etc.
- Implementation of renewable energy
- Use of locally-sourced lumber
- Assessments based on CASBEE Kyoto, with reports and displays of the results

Those adding new expansions to large greenery buildings*

- Greening of buildings and sites

Car sales businesses

- Explanation of car environment information to new car buyers
- Performance reports for eco-friendly car sales

Distributors of large emission equipment*

- Energy efficiency displays for specified emissions devices
- Explanations to citizens about energy efficiency for specified emissions devices





Progress of past global warming countermeasures

(1) Progress and achievements of measures outlined in the program

Nearly all of the 128 specific measures outlined in the previous program were proceeding smoothly as of the end of the first five-year half of the program, at the end of 2015. 95% of the measures were either completed or fully in-place.

The table below shows what was accomplished by people and businesses working together on measures including thorough promotion of energy conservation, dramatic expansion and spread of renewable energy, measures to prioritize public transportation for people, and garbage reduction. In FY2014 annual energy consumption in the area had reached its lowest level since FY1990, 20% lower than in FY1990, and 26% lower than the peak year of usage in FY1997 (See Figure 1 on page 2).

Table 2 Main achievements of global warming countermeasures

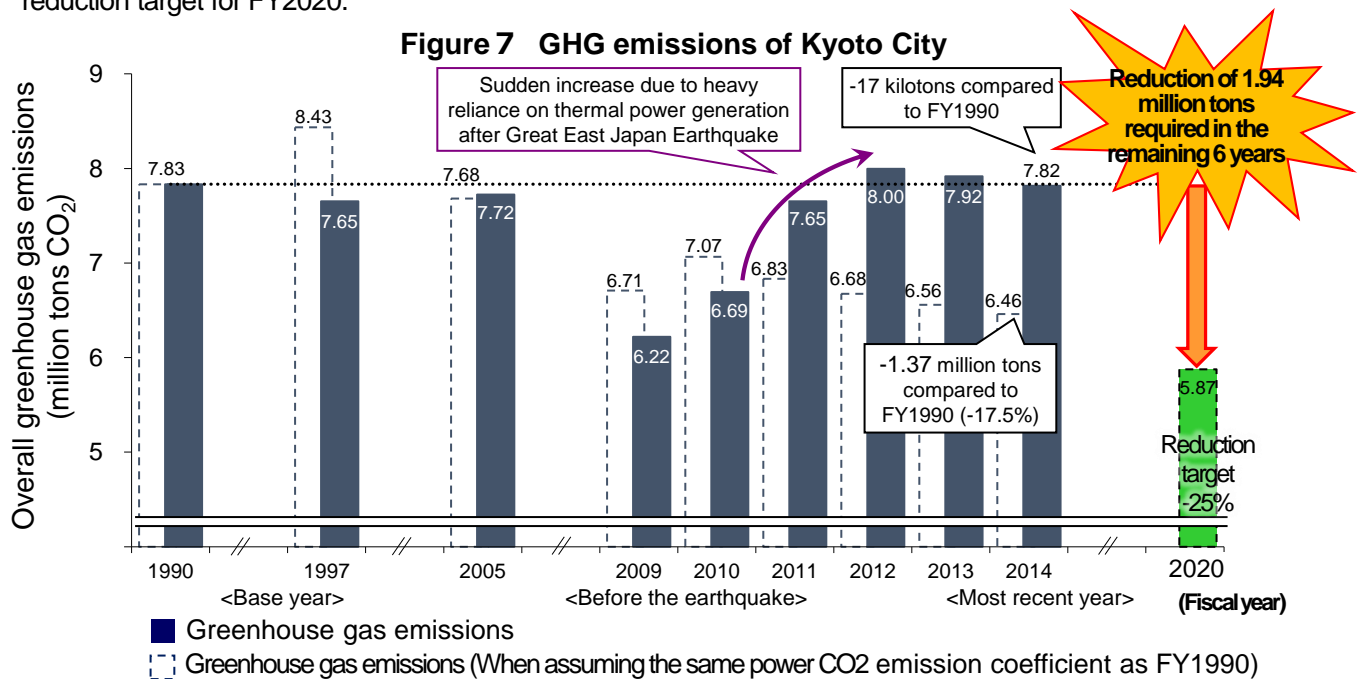
Amount of energy consumed at home annually per household	FY1996 (peak) 38.8GJ	21% reduction 	FY2014 30.6GJ
Cumulative number of solar power generation system subsidies	FY2005 500	19-fold increase 	FY2015 9,512
Vehicle share ratio*	FY2000 28.3%	6.2 point reduction 	FY2015 22.1%
Amount of garbage collected by the city	FY2000 (peak) 815 kilotons	46% reduction 	FY2015 440 kilotons

(2) GHG emissions

Based on assumptions made that FY2014 GHG emissions would be produced using the same power source structure as the base year FY1990, emissions for FY2014 year were set to be 6.46 million tons, a 17.5% reduction as compared to the 7.83 million tons emitted in FY1990. Conditions were also set to see 7.5 % in further reductions over the remaining 6 years which would have achieved the FY2020 reduction target of 5.87 million tons (see Figure 7).

However, since the Great East Japan Earthquake large increases in thermal power generation have been used to make up for the energy shortages due to the suspension of nuclear power plant operations. Thermal power generation emits large amounts of CO₂ during the generation process, so this represented a shift to a power supply configuration of heavy reliance on thermal power (see figure 2 on page 2). As a result, accounting for the effects of the shift in power supply configuration, the actual emissions were 7.82 million tons, a decrease of 17,000 tons or 0.2% from FY1990.

A reduction of 1.94 million tons over six years from the emissions in FY2014 will be needed to reach the reduction target for FY2020.



(3) Main factors behind fluctuations in GHG emissions following the Great East Japan Earthquake

The results of analyzing factors behind fluctuations in GHG emissions over the four years between FY2010 and FY2014, from 6.69 million tons to 7.82 million tons respectively, are as follows.

Decrease factor Total reduction of 891 kilotons accompanying reductions in energy consumption

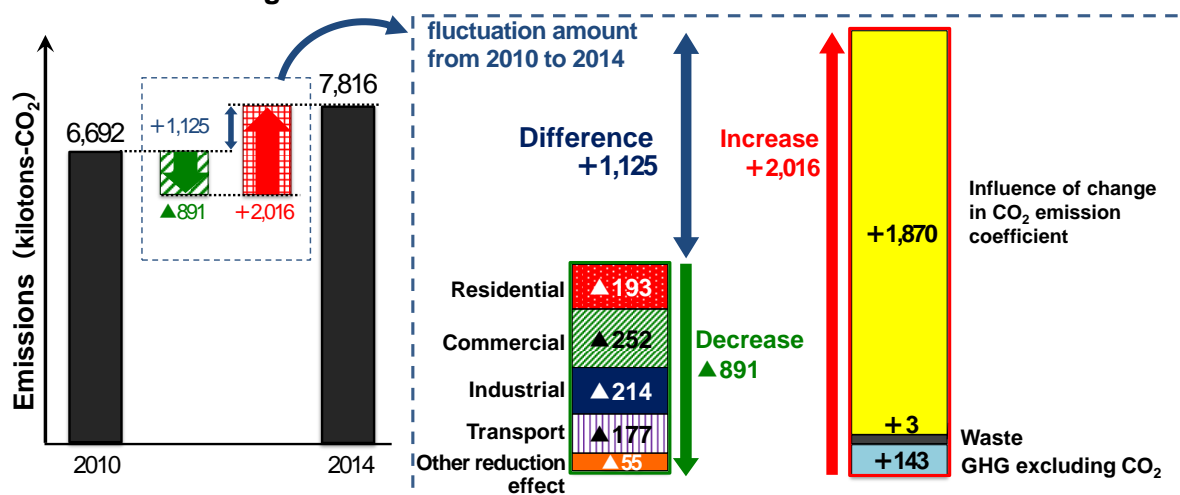
Increase factor

- 1,870 kilotons increase in GHG emissions during the power generation process caused by sudden change in power source structure
- 146 kilotons increase in GHG emissions excluding CO₂

Total +2,016 kilotons

Difference 1,125 kilotons increase compared to FY2010

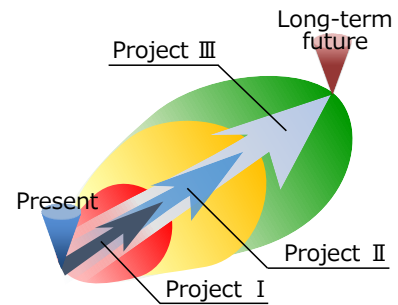
Figure 8 Fluctuation in GHG emissions from FY2010 to FY2014



4 A Path to Realizing a Low-carbon Society

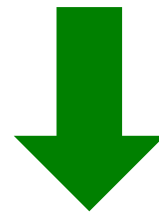
Road to "Zero" Project

The City of Kyoto has adopted the Road to "Zero" Project, as a strategy in order to **take aim for effectively zero GHG emissions in the latter half of this century** as stated in the Paris Agreement. The strategy sets its sights on the immediate future leading up to the final year of the plan in FY2020, the mid-term future to follow (2030-2040), and the long term future after that (2050 and onward) and is advanced by the following three projects.



Project I (Measures for steady implementation in order to achieve FY2020 reduction targets)	Project II (Measures to pursue in the present with sights set on the mid-term future)	Project III (Measures aimed at a societal shift away from the use of fossil fuels with sights set on the long term future)
<ul style="list-style-type: none"> Steadily implement measures including strengthening measures for residential and commercial areas 	<ul style="list-style-type: none"> Create and promote environmental energy related industry Environmental education and public awareness etc. 	

See pages 12 through 17



To achieve the six visions of a low-carbon society that have been set as a goal for FY2030, and for the long-term future afterward, Kyoto aims to create a sustainable low-carbon society that does not rely on fossil fuels. For that reason, in addition to the policies of Projects I and II, Kyoto is taking the initiative to immediately begin pursuing possible policies to that end that can be considered, researched, and verified. To explore these possibilities Kyoto will gather knowledge from the rest of the world, collaborate not only with the prefectural and national governments but with every other city, while working in partnership with citizens, Kyoto Prefecture and the business community to try to turn the possibilities into realities.

Structure of Support System and Mechanisms

To change the way city planning is done there is a need to create a forum for all related entities to hold discussions, and also build support systems and mechanisms, so that citizens and businesses can change the way they live and work independently.

Examples of measures to be considered

- Create mechanisms to promote energy-saving renovations of residences in partnership with private businesses
- Create energy consumption standards for each industry (benchmarks) according to the characteristics of Kyoto City

Changing the way people live and work

Each and every person needs to change the way they live and work, such as changing from gas powered cars to next-generation cars powered by electricity or fuel cells, and by sharing items and services

Examples of measures to be considered

- Measures to promote "adjacent housing" that generate secondary effects for mitigating population decreases and welfare for the elderly
- 100% adoption of next-generation cars, and restrict access of other types of cars from being used in the city.
- Promote cooperative delivery systems to keep freight vehicles from being used on smaller streets, etc.

Changing city planning

Fundamental changes in city planning are required, with citizens, businesses, and all entities involved having a shared vision of how city planning should be, including urban infrastructure and for how energy should be supplied

Examples of measures to be considered

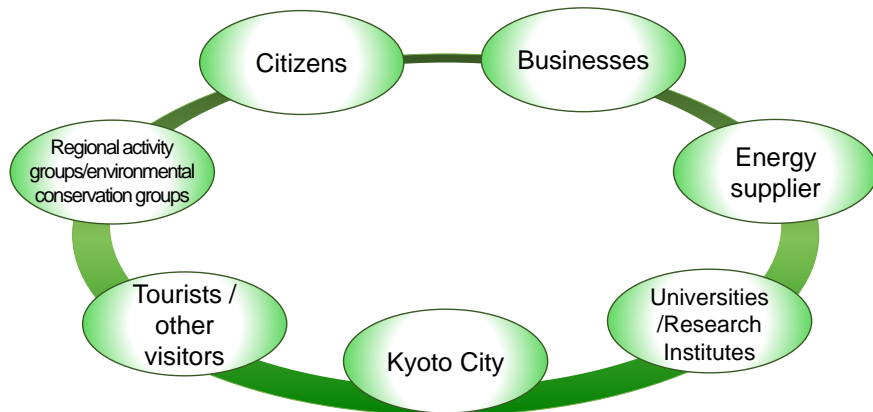
- Build a "green infrastructure" aimed at a shift to city planning that utilizes the functions of nature
- Implementing new ways to use renewable energy, such as "solar roads", streets that generate solar power
- Full use of thermal energy on a regional level
- Measures to promote the spread of Net Zero Energy Buildings (ZEB)*
- Promote services that utilize the transport capabilities of transportation businesses in locations with poor transport connections, such as combined passenger-freight transport

Promoting technological development

Requiring the spread and innovation of energy conservation and creation technologies which are essential to transforming city planning and the way people live

Roles for each member

Citizens, businesses, the City of Kyoto, and various other entities play their own roles in advancing global warming countermeasures, while collaborating on specific activities to realize a low-carbon society.



Forecasted reduction in GHG emissions by FY2020

Achieving the GHG reduction target of 5.875 million tons by FY2020 will require a reduction of 1.941 million tons over 6 years based on the most recent figure of 7.816 million tons in FY2014. Of the 1.941 million tons required to reach the target, measures stated in the plan are forecasted to yield a reduction of 1.335 million tons. The roughly 0.6 million tons that remain will be reduced through improvements in external factors, such as better energy generation efficiency, changes to the power source structure, and technological innovation in the conservation and generation of energy.

Figure 9 Forecasted reduction in GHG emissions by FY2020

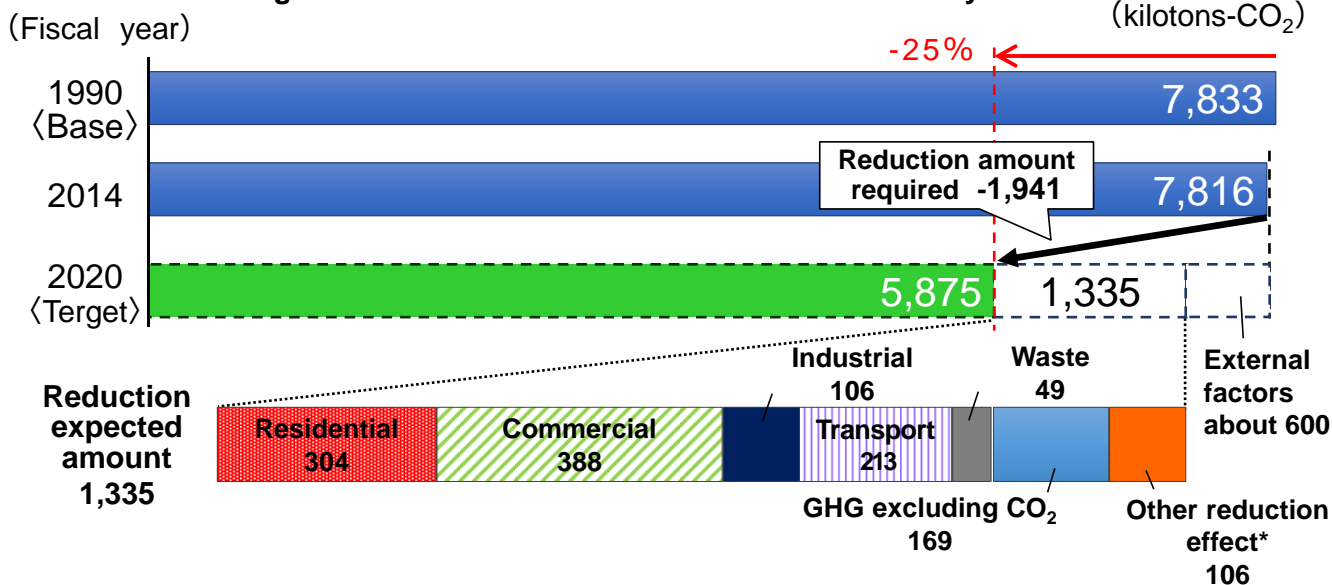


Table 3 Breakdown of forecasted reduction

	Fiscal 2014 Results (kilotons-CO ₂)	Fiscal 2020 Target		
		Emissions (kilotons-CO ₂)	Reductions (kilotons-CO ₂)	Reduction Rate
Residential	2,049	1,745	-304	-15%
Commercial	2,570	2,182	-388	-15%
Industrial	1,048	942	-106	-10%
Transport	1,509	1,297	-213	-14%
Waste	218	169	-49	-22%
GHG excluding CO ₂	582	413	-169	-29%
Other reduction effects*	-160	-267	-106	—
Total	7,816	6,481	-1,335	-17%

Strategies for reducing GHG emissions

The 1.335 million tons that are forecasted to be reduced by the aforementioned measures will be achieved through the following 13 GHG reduction strategies.

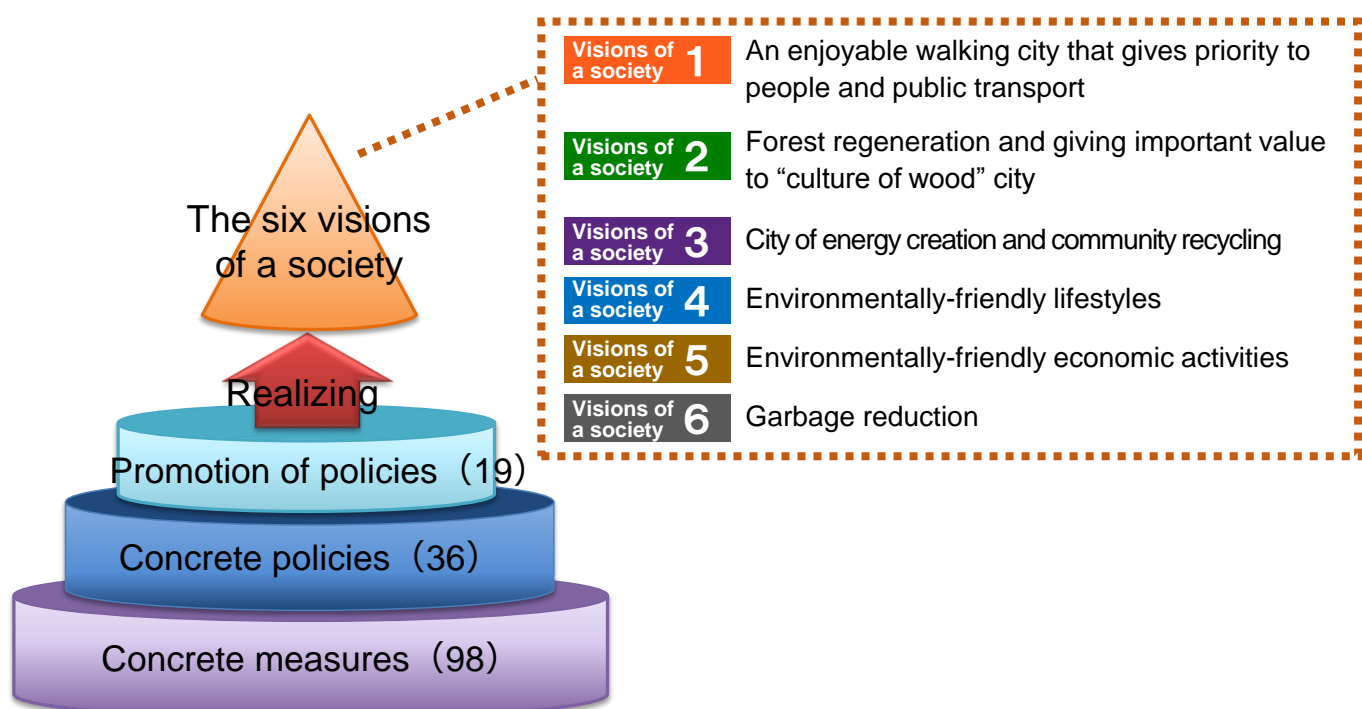
Forecasted FY2020 reductions		
Residential		
1 Promoting the adoption of highly efficient energy-saving appliances	210 kilotons	
2 Promoting energy-saving housing	8 kilotons	
3 Promoting energy-saving behavior	86 kilotons	
Commercial		
4 Promoting lower carbon use in business activities	331 kilotons	
5 Promoting energy-saving buildings	57 kilotons	
Industrial		
6 Promoting lower carbon use in business activities	106 kilotons	
Transport		
7 Promoting transport on foot, by bicycle, and by public transportation	39 kilotons	
8 Promoting switches to eco-vehicles* and the spread of eco-drive	166 kilotons	
9 Promoting lower-carbon operations for transport businesses	8 kilotons	
Waste		
10 Promoting less garbage generation, and more separation and recycling	49 kilotons	
GHG excluding CO₂		
11 Reduction to GHG excluding CO ₂	169 kilotons	
Other reduction effects*		
12 Spreading the adoption of renewable energy	104 kilotons	
13 Cultivating and maintaining forests	2 kilotons	

5 Policies to mitigate GHG emissions

Policies indicated by each of the six visions of a low-carbon society

For each of the six visions of a low-carbon society we will indicate the policies (Project I and Project II) to achieve the 1.335 million ton emissions reduction that the 13 strategies aim for.

Below is an illustration of the overall 19 promotion of policies, 36 concrete policies, and 98 concrete measures.



A vision of society to aim for

- User-friendly public transport and walks bursting with the charm, realizing a “pedestrian friendly Kyoto” which values a way of life where people walk and give priority to people and public transport.
- Through various control measures, including a limit on car use, reduce the total volume of traffic, replace the cars on the road with eco-vehicles,* such as electric cars.

Effects of measures	Fiscal 2010 results	Fiscal 2014 results	Fiscal 2020 target
Lower vehicle share ratio* due to prioritizing public transportation	24.3%	21.3%	Less than 20%
Spread of eco-vehicles	13,000cars	51,000cars	120,000cars
Improved fuel efficiency for vehicles	17.1km/L	22.4km/L	29.5km/L

Promotion of policies 1 Improving the convenience of existing public transport

Concrete policies Policies to improve the convenience of public transport

- measures
- 1 Making railways and buses more convenient
 - 2 Review of countermeasures for public transport in inconvenient areas

Promotion of policies 2 Urban development giving priority to pedestrians

Concrete policies(1) Supporting “Pedestrian Friendly City Kyoto” by enriching walking spaces

- measures
- 3 Promote the creation of safe, secure pedestrian spaces
 - 4 Promote the move to barrier-free stations and other facilities, implemented already at Nishioji Station

Concrete policies(2) Suppressing the proliferation of cars and working to improve future public transportation facilities

- measures
- 5 Promote policies for suppressing the proliferation of cars, including improvements to park and ride programs
 - 6 Measures for new public transportation such as LRT and BRT
 - 7 Utilize ICT in the operation of Kyoto Future Transportation Research Institute which researches traffic in Kyoto

Promotion of policies 3 Switching to a lifestyle that values an enjoyable life on foot

Concrete policies(1) Spread of and education on “Pedestrian Friendly City Kyoto” Charter

- measures
- 8 Popularize and provide education on “Kyoto, enjoyed by walking” charter in educational institutions, events and commercial institutions

Concrete policies(2) Project “Slow life Kyoto” strategy

- measures
- 9 Partner with communities and other entities to encourage the use of public transportation, and promote mobility management* to facilitate lifestyle changes

Promotion of policies 4 City planning for the coexistence of pedestrians and bicycles

Concrete policies(1) Improve the environment for bicycle usage

- measures
- 10 Improve the environment for bicycle usage taking the characteristics of Kyoto into account
 - 11 Create a safe, enjoyable bicycle rental system unique to Kyoto

Concrete policies(2) Awareness of rules and good manners for bicycle riders

- measures
- 12 Make bicycle insurance mandatory and establish the Kyoto Cycle Path System for the observance of rules and good manners
 - 13 Establish a permanent cycle center (learning facility) where anyone can get experience with bicycles and learn safe ways to ride them

Promotion of policies 5 Shift to eco-vehicles

Concrete policies Promote the introduction of eco-vehicles

- measures
- 14 Facilitate the introduction of electric cars
 - 15 Facilitate the introduction of fuel cell cars
 - 16 Promote the switch to eco-vehicles by requiring them to comprise at least a certain of the percentage of vehicles that large emitters* use
 - 17 Promote the sales of eco-vehicles by requiring car sellers to report their eco-vehicle sales performance

A vision of society to aim for

- Becoming familiar with the forest and returning the riches of the forest to the city, thus proactively tackling the fostering of culture and stimulation of industry by regenerating forests which make up three-quarters of the municipal area.
- While widely using timber produced from within the Kyoto area, facilitating the construction of new housing by utilizing the wisdom of Kyo-Machiya type housing and, together with building a cycle of sustainable timber use, promoting the formation of Kyoto-style scenery.
- Realizing a city where, surrounded by lush green, people can feel the warmth of the trees near them in their daily lives.

Effects of the measures	Fiscal 2010 results	Fiscal 2014 results	Fiscal 2020 target
Spreading the use of locally-produced wood pellets*	80 tons	781 tons	3,500 tons
Increase the area of forested land	29,200 ha	29,600 ha	30,100 ha

Promotion of policies 1 Use of timber produced from within the Kyoto area

Concrete policies(1) Use of timber produced from within the Kyoto area in buildings

- measures
- 18 Facilitate the use of timber produced within the Kyoto area by requiring it for large-emission buildings*
 - 19 Set an example by using timber produced from within the Kyoto area for public facilities
 - 20 Facilitate the spread of buildings with high environmental performance assessment by "CASBEE Kyoto"
 - 21 Preserve and create historical urban scenic areas focused on wooden buildings
 - 22 Comprehensively grow the demand for timber produced within the city of Kyoto building materials, unused thinned wood, etc.

Concrete policies(2) Use of timber from forest-thinning and wood pellets

- measures
- 23 Promote the use of biomass*
 - 24 Facilitate the spread of wood pellet heaters
 - 19 Prioritize the use of timber produced within the city of Kyoto for public facilities (reprinted)
 - 25 Assist in the transport of thinned wood

Concrete policies(3) Provision of information to timber users

- measures
- 26 Deploy information systems for managing stock of timber produced within the city of Kyoto

Promotion of policies 2 Appropriate preservation of forests

Concrete policies(1) Forest maintenance

- measures
- 27 Cultivate healthy and diversified forests
 - 28 Foster and secure personnel to be responsible for the maintenance of the forests

Concrete policies(2) Forestry promotion

- measures
- 29 Promote efficient forestry management and cost reduction

Concrete policies(3) Participation of citizens in reforestation

- measures
- 30 Create Sanzan city scenery through collaboration with citizens, businesses, etc.
 - 31 Develop of environmental learning activities using forests, including satoyama areas

Promotion of policies 3 Urban development that uses water, flora and wind

Concrete policies(1) Greening of urban areas

- measures
- 32 Creation of forested and flower-lined roads by promoting the planting of roadside trees, etc.
 - 33 Roadside trees supporter system
 - 34 Promote greening public facilities
 - 35 Promote greening by making large greenery buildings* and similar structures mandatory
 - 36 Enhance grants provided for afforestation of privately-owned land
 - 37 Promote greening of private land through green space agreements, etc.
 - 38 Effective utilize agricultural land by improving private farmland, etc.

Concrete policies(2) Healthy recovery of water cycles

- measures
- 39 Restore and maintain Kyoto rivers
 - 40 Promote the improve porous pavement
 - 41 Promote of water-use measures

A vision of society to aim for

- The creation of clean energy using sunlight and solar heat to flourish in all parts of the city, and for biomass, including rubbish, and rivers to fulfill the role of regionalized energy sources.

Effects of the measures	Fiscal 2010 results	Fiscal 2014 results	Fiscal 2020 target
Prevalence of solar power generation equipment (Number of home and residential solar power generating installations)	13,600 kW (approx 2,300)	77,000 kW (approx 8,500)	224,000 kW (approx 25,000)
Introduction of other renewable energies	480 TJ (approx 36,000)†	492 TJ (approx 37,000)†	888 TJ (approx 66,700)†

† When converted to yearly energy consumption in households within the city

Promotion of policies 1 Expansion of the introduction of renewable energy

Concrete policies(1) Uses in business activities

- measures
- 42 Promote the use of renewable energy by making it mandatory to install equipment that uses renewable energy in large emission buildings*
 - 43 Promote institutions to plan reduction of CO₂ emissions from employers
 - 20 Promote the spread of buildings with high environmental performance assessment by “CASBEE Kyoto” (reprinted)
 - 44 Promote the Institution to Generate Electric Power by Civic Collaboration
 - 23 Promote the use of biomass (reprinted)
 - 24 Facilitate of the spread of wood pellet heaters (reprinted)
 - 45 Promote the development of new technologies related to hydrogen and unused energy
 - 46 Develop comprehensive advertising about the effects of global warming countermeasures

Concrete policies(2) Uses in citizens' lives

- measures
- 47 Continue to provide grants and other support for the installation of solar power systems, solar thermal systems, and other such equipment
 - 48 Consider measures to promote the introduction of renewable energy in apartment buildings
 - 49 Promote the spread of Net Zero Energy Houses (ZEH)*
 - 50 Strengthen ties with related businesses to boost the implementation of renewable energy
 - 44 Promote the Institution to Generate Electric Power by Civic Collaboration (reprinted)
 - 24 Facilitate of the spread of wood pellet heaters (reprinted)
 - 51 Promote the introduction of small hydroelectric and wind power generation and the use of geothermal heat, etc.
 - 46 Develop comprehensive advertising about the effects of global warming countermeasures (reprinted)

Concrete policies(3) Uses in the public sector

- measures
- 52 Actively introduce the use of renewable energy at public facilities
 - 23 Promote the use of biomass (reprinted)
 - 53 Remodel the South Clean Center Number 2 to be a part of citizens' lives by equipping it with high energy-generating functionality, and conjoining it with environmental learning facilities

Promotion of policies 2 Appealing low-carbon city planning

Concrete policies Optimizing supply and demand of energy to lower carbon city-wide

- measures
- 54 Consider city planning for the appeal of Kyoto in the future
 - 55 Compose new projects by the “Smart City Kyoto Research Group” and others
 - 56 Promote revitalization of the Okazaki area centered on measures for “visualization” and “optimization” through renewable energy and energy management systems
 - 57 Layout and implement city functions to maintain and enhance the vitality of the city

A vision of society to aim for

- Everybody undertaking environmentally-friendly measures as a matter of course, thus establishing a “Kyoto Model lifestyle”, which values a food culture of consuming local produce that coexists with nature and has a sense of the season.
- In addition, making use of local original ideas, “eco” is transmitted from the community close to each citizen.

Effects of the measures		Fiscal 2010 results	Fiscal 2014 results	Fiscal 2020 target
Switch to high energy-saving appliances	Refrigerator	300,000 units ^{†1}	→ 400,000 units ^{†2}	
	Air conditioning	770,000 units ^{†1}	→ 830,000 units ^{†2}	
	Television	630,000 units ^{†1}	→ 1320,000 units ^{†2}	
	LED Lighting (diffusion rate)	—	28.5%	78%
Spread of high-efficiency water heaters		—	116,000 units	395,000 units
Spread of fuel cells for household use		—	2,316 units	24,640 units
Improving heat insulation of buildings (residential) within the city (Achievement rate of 1999 or 2013 energy-saving standards)		5.9%	—	15.0%
Energy-saving behavior in households (Effects from factors other than the four above)		-66 kt. of CO ₂ effect over 4 years from FY2011 to FY2014 → -86 kt. of CO ₂ effect over 6 years from FY2015 to FY2020		
More pledges to become eco-drivers*		71,000 people	137,000 people	256,000 people

^{†1} Units switched over 4 years from FY2011 to FY2014 ^{†2} Units switched over 6 years from FY2015 to FY2020

Promotion of policies 1 Facilitation of the spread of eco-life

Concrete policies(1) Fun, stylish eco

- measures
- 58 Eco-friendly lifestyles through “Do You Kyoto?” promotions
 - 59 Promote “Kyoto- a university city, a student city” eco-activities that harness the energy of students
 - 60 Promote of eco-driving
 - 61 Reduce redeliveries with “one-time receiving” for home deliveries
 - 41 Promote water-use measures (reprinted)

Concrete policies(2) Eco for health and long life

- measures
- 62 Popularize environmentally-friendly diets through dietary education
 - 63 Popularize environmentally-friendly, Kyoto-style, healthy life habits
 - 8 Spread awareness in school education, events, and commercial establishments for “Kyoto, enjoyed by walking” (reprinted)
 - 9 Partner with communities to encourage the use of public transportation facilities, and promote “mobility management”* to facilitate lifestyle changes (reprinted)
 - 58 Switch to eco-friendly lifestyles through “Do You Kyoto?” promotions (reprinted)

Concrete policies(3) Learn about eco

- measures
- 64 Formulate and promote new guidelines for systematic, cohesive environmental education and learning
 - 65 Promote environmental education that encourages children to think about the future of the Earth's environment on their own
 - 66 Improve the functions of the Miyako Ecology Center as a base for environmental activities
 - 67 Improve the functions of the Kyoto Municipal Science Center for Youth
 - 53 Remodel the South Clean Center Number 2 to be a part of citizens' lives by equipping it with high energy-generating functionality, and conjoining it with environmental learning facilities (reprinted)
 - 46 Develop comprehensive advertising about the effects of global warming countermeasures (reprinted)

Promotion of policies 2 Facilitation of eco activities in the community

Concrete policies Facilitation of eco activities throughout the community

- measures
- 68 Offer more activities in eco-communities in elementary school districts that proactively promote environmentally-friendly measures
 - 69 Promote “DO YOU KYOTO? credit” institution

Promotion of policies 3 Facilitation of the spread of environmentally-friendly housing

Concrete policies(1) Facilitation of low-carbon housing

- measures
- 70 Promote the construction of new energy-saving housing unique to Kyoto
 - 49 Promote the spread of Net Zero Energy Houses (ZEH)* (reprinted)
 - 20 Promote the spread of buildings with high environmental performance assessment by “CASBEE Kyoto” (reprinted)
 - 71 Provide grants and other support to make existing houses more energy efficient
 - 72 Work on energy-saving renovations to apartment buildings
 - 47 Continue to provide grants and other support for the installation of solar power systems, solar thermal systems, and other such equipment (reprinted)
 - 73 Promote effective use of energy through wider spread of fuel cells for household use, etc.
 - 74 Spread awareness of the multifaceted effectiveness of energy-saving functions for households
 - 75 Consider measures to enhance expertise on energy functionality through collaboration with organizations related to real estate and construction

Concrete policies(2) Promoting “visualization” of energy usage

- measures
- 76 Expand of energy-saving testing in homes
 - 77 Promote energy-saving countermeasures by citizens that utilize HEMS*
 - 78 “Visualize” the energy consumption status of each household

A vision of society to aim for

- Boasting the latest technology, Kyoto's environmental industries play a leading role in the spread of resource- and energy saving, long-life, recyclable goods and services, thus contributing greatly to vibrant community development and a reduction in carbon worldwide through a virtuous cycle between the environment and the economy.
- Expanding the adoption of highly energy-efficient equipment, together with actively contributing to social actions environmentally, businesses to continue to become a major force in leading to a low-carbon city.

Effects of the measures		Result of 4 years from FY2011 to FY2014	Forecast of 6 years from FY2015 to FY2020
Energy-saving activities of large emitters*	Industrial	3.2% annual energy savings	0.6% annual energy savings
	Transport	2.2% annual energy savings	1.9% annual energy savings
	Commercial	3.9% annual energy savings	1.5% annual energy savings
Energy-saving activities excluding large emitters	Industrial	6.3% annual energy savings	1.9% annual energy savings
	Commercial	3.9% annual energy savings	1.3% annual energy savings
Switch to low-carbon fuel by businesses		+2 ktons CO ₂	-137 ktons CO ₂
Improving heat insulation of buildings (non-residential) within the city (Achievement rate of 1999 or 2013 energy-saving standards)		20% (Fiscal 2010 results)	49% (Fiscal 2020 target)
Reductions to GHGs excluding CO ₂		Refrigerant leakage management and other measures pertaining to commercial refrigeration and air conditioning equipment -169 ktons CO ₂	

Promotion of policies 1 Promotion and development of environmental industries

Concrete policies(1) Development of environmental technology through collaboration between development of industry , academia and the public

- measures
- 79 Promote Kyoto City's Vision for the Promotion of its Green Industry
 - 80 Create and promote green innovation in partnership with Kyoto Prefecture and the business community
 - 81 Promote new innovative projects leveraging competitive funds from the national government
 - 45 Promote the development of new technologies related to hydrogen and unused energy (reprinted)

Concrete policies(2) Support of business expansion

- measures
- 79 Promote Kyoto City's Vision for the Promotion of its Green Industry (reprinted)
 - 82 Facilitate green purchases
 - 80 Create and promote a Kyoto-wide green innovation in partnership (reprinted)

Promotion of policies 2 Facilitation of carbon reduction in businesses

Concrete policies(1) Facilitation of carbon reduction in small and medium-sized businesses

- measures
- 83 Assist in introducing high-efficiency equipment
 - 84 Improve the system to foster, advise and test personnel who promote low-carbon economic activities
 - 85 Promote energy-saving countermeasures by businesses that utilize energy management for buildings, plants, etc.

Concrete policies(2) Facilitation of carbon reduction in big businesses

- measures
- 43 Promote the institution to plan reduction of CO₂ emissions from employers (reprinted)
 - 86 Promote conservation and creation of energy at universities
 - 87 Promote the implementation of environmental management systems
 - 88 Make public facilities low-carbon based on the "Low-Carbon Specifications for Public Buildings in Kyoto City"
 - 89 Promote public facility management

Promotion of policies 3 Creation and cycle of environmental value

Concrete policies(1) Develop of a system for creating environmental value

- measures
- 69 Promote "DO YOU KYOTO? credit" institution (reprinted)

Concrete policies(2) Environmental value cycles

- measures
- 90 Promote carbon offsetting

A vision of society to aim for

- The spread of products in line with the creation of reduced-garbage lifestyles and business activities as a social system.
- The use of people's own shopping bags to become commonplace, thus minimizing the need for containers and packing material together with a sharp decrease in plastic goods.

Effects of the measures	Fiscal 2000 results	Fiscal 2014 results	Fiscal 2020 target
Reduction in amount of garbage received at the municipal disposal facilities	820 kilotons	461 kilotons	390 kilotons
(Amount of garbage incinerated and disposed at the municipal disposal facilities)	760 kilotons	410 kilotons [†]	350 kilotons
(Food loss garbage)	96 kilotons	65 kilotons [†]	50 kilotons
(Plastic grocery bag garbage)	5.2 kilotons (500 million sheets)	2.8 kilotons [†] (330 million sheets)	1.8 kilotons (200 million sheets)
(Execution rate for separation of plastic containers and packaging)	—	40% [†]	60%

[†] Fiscal 2015 results

Promotion of policies 1 Reducing potential garbage

Concrete policies Facilitation of the 2Rs

- | | | |
|----------|----|---|
| measures | 91 | Promote the 2Rs through a collaboration between citizens, businesses, and the city of Kyoto |
| | 92 | Promote measures aimed at reducing food loss by half from its peak |
| | 93 | Enhance measures to reduce plastic grocery bags, such as adding a fee |
| | 94 | Transform events into eco-friendly events |

Promotion of policies 2 Facilitation separation and recycling of garbage for resources and energy

Concrete policies Facilitation of recycling and separating garbage

- | | | |
|----------|----|--|
| measures | 95 | Expand and enhance measures to promote voluntary separation and recycling by citizens |
| | 96 | Promote recycling through thorough separation of garbage from households and companies |
| | 23 | Promote the use of biomass (reprinted) |

Promotion of policies 3 Safe disposal and making the most of garbage

Concrete policies(1) Maximizing the harnessing of energy from garbage

- | | | |
|----------|----|---|
| measures | 23 | Promote the use of biomass (reprinted) |
| | 53 | Remodel the South Clean Center Number 2 to be a part of citizens' lives by equipping it with high energy-generating functionality, and conjoining it with environmental learning facilities (reprinted) |

Concrete policies(2) Appropriate disposal of garbage to reduce the environmental load

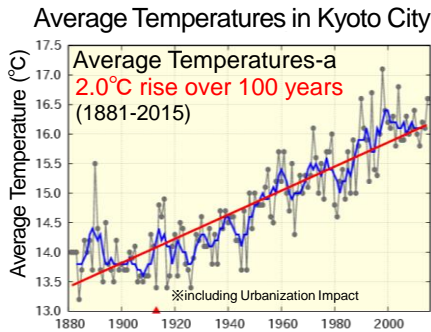
- | | | |
|----------|----|---|
| measures | 97 | Utilize biomass polyethylene in fee-based designated bags for household garbage |
| | 98 | Maintain and operate facilities that utilize the long-life plan of the Clean Center and other such initiatives to reduce costs and environmental burden |

6 Adaptation to the Impacts of Climate Change

As indicated below, the impacts of climate change are being felt in Kyoto in forms that include rising temperatures, increasing bouts of torrential rain, flood damage, increased numbers of heatstroke patients, and delayed autumn foliage for maple trees. "Adaptation" has become necessary.

Climate Change in Kyoto City

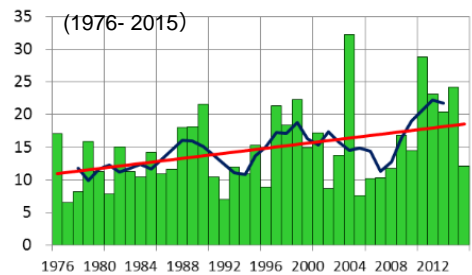
Average temperatures are rising, and the number of hot days is increasing



Between 1931 and 2015 the number of **sultry nights** per year on a 50-year basis has **increased by 18**,
The number of **frost days** has **decreased by 38**,
And the number of **heat days** has **increased by 5.5**.

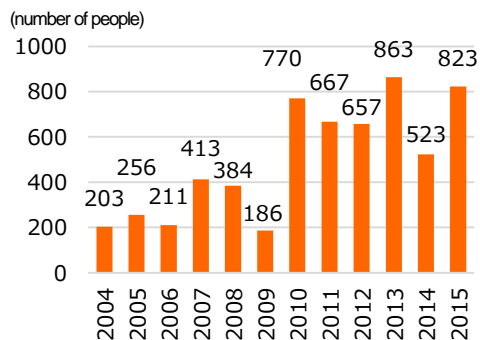
The occurrence rate of torrential rains is nearly twice what it was 40 years ago

Number of times per year rainfall in excess of 30 mm per hour has been observed based on 10 locations (in the Kinki area)



Increase in heatstroke patients taken by emergency transport.

Total number of heatstroke patients taken to the hospital by emergency transport.



Impacts to the natural environment have appeared.

The flowering date for **cherry blossoms** has moved up at the rate of approx. **one week** over 50 years.

The day **maples** begin to turn color has become later at the rate of approx. two weeks over 50 years.

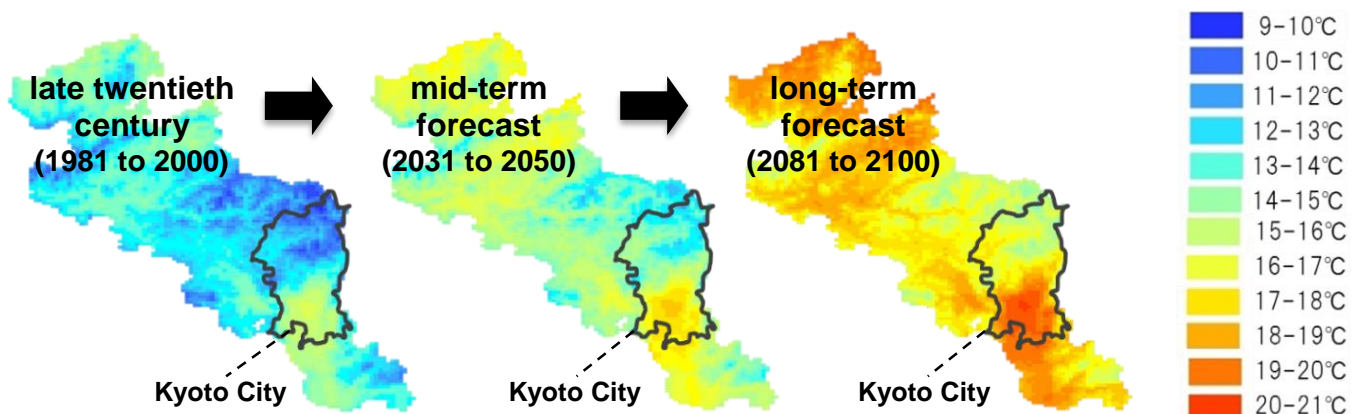
Heavy rains have caused record high rainfall all over the Kinki area.



Flooding of the Kamogawa River caused by Typhoon #18 in 2013

Forecast of future average temperatures in Kyoto

Measurement tools, which can forecast future climate change by area, have been used to forecast future average temperatures for Kyoto. As indicated in the figure below, if no countermeasures are taken against global warming† the forecast calls for a **4°C rise in the average temperature over a 100 year period** from the end of the 20th century until the end of the current one.



† Calculation Condition: RCP8.5,MIROC
(Reference: National Institute for Environmental Studies)

Fundamental approach to adaptations

By implementing adaptations to the impacts of climate change accompanying global warming, Kyoto City aims to create a safe, secure, sustainable society which can protect the lives and health of its citizens, along with its resources; minimizing or otherwise avoiding damage to the city's economy, natural environment, and other attributes, while quickly recovering from any such damage.

- (1) Gather scientific knowledge related to climate change and its impacts.
- (2) Work in collaboration with national and prefectural governments to pursue effective countermeasures, with an awareness that the impact severity of climate change and the urgency of the countermeasures will depend on the sector.
- (3) Share information with citizens, businesses, and each sector of government and build collaborative systems based on understanding and cooperation.

Sectors for specific countermeasures

Kyoto City will steadily push forward with specific countermeasures in sectors where the impacts of climate change are already apparent, and in sectors where the concerned impacts have a high degree of certainty or severity, and where infrastructure preparations for countermeasures will take time.

Natural disasters

There are concerns about river flooding or landslide damage caused by heavy rains, or city flooding caused by sudden downpours.

Aims of countermeasures

- To be more prepared for flooding by making improvements to rivers, maintenance to main rainwater pipelines, etc.
- Retaining more rainwater and preparedness against inundation by improving facilities to contain rainwater outflow and by maintenance on inundated areas
- Preparedness for inland water with drainage pump stations, rainwater pump stations, and other such facilities.
- Gathering and communicating disaster information and preparing evacuation guidance systems, etc.
- Improving first response and preventative systems for floods
- Implementing specific instructions for landslide warning areas, landslide hazard mapping, and training based on the instructions

Health and city life

There are concerns that the number of people who will suffer heatstroke or contract an infectious disease will increase with the rise in temperatures. There are also concerns that temperature increases from climate change in urban areas will amplify the urban heat island phenomenon causing dramatic temperature increases..

Aims of countermeasures

- Spreading awareness about heatstroke prevention and infectious disease prevention
- Guidance towards "cool spots"
- Promoting city greening
- "Water sprinkling" on a wider scale
- Facilitate the spread of mist devices

Aquatic environment and resources

There are concerns that the quality of the water will decline in the Kyoto water resource of Lake Biwa.

There are concerns of impacts to water resources from the drying out of tap water reserves in mountainous areas. This includes greater risk of the water level in Lake Biwa falling to drought levels, decreases in underground water flows, and declining water levels in wells.

Aims of countermeasures

- Regularly validating and revising the "Kyoto City Tap Water Business Safety Plan"
- Systematically preparing operating procedures and instruction manuals for water quality management
- Improved monitoring of water quality for city water supplies
- Considerations for larger-scale water operations by preparing connecting pipes, etc.
- Promoting sophisticated sewage treatment and making improvements to combined sewer systems

Aside from these, in **sectors where the impacts of climate change are not yet evident** (agriculture and forestry, natural ecosystems, traditional culture, tourism industry, local industry, etc.) Kyoto City will work to get an understanding of the impacts climate change may have, and will consider the countermeasures that are needed.

7 Management of the progress of program

Mitigation implementation systems

Concerning mitigation strategies for measures to check GHG emissions, Kyoto City will manage progress emissions using the following system and evaluation methods.

- (1) Horizontally collaborate across all agencies and utilize funding received through the Kyoto Citizen Environmental Fund and Forest Environment Tax to secure strong funding to work on promoting global warming countermeasures.
- (2) Check and evaluate countermeasures for global warming through the Committee for Global Warming Countermeasures Promotion, which is comprised of knowledgeable individuals.
- (3) Proactively utilize organizations such as the Miyako Agenda 21 Forum, a participative organization for citizens, businesses, and government agencies, to comprehensively promote a variety of measures based on partnerships with citizens, businesses, and private organizations.
- (4) Aggressively make policy proposals to the national government, and work to cooperate and collaborate with neighboring local government entities such as Kyoto Prefecture and the Union of Kansai Governments, as well as other cities including Environmental Model Cities.
- (5) As the birthplace of the Kyoto Protocol, continue to facilitate interaction, exchange information, and share trail-blazing measures taking place in Kyoto, utilizing our global network which includes the ICLEI (local governments for sustainability), the League of Historical Cities, and other such organizations. Kyoto will make particular efforts to develop our international partnerships even further. This includes building a closer relationship with our sister city Paris, the birthplace of the Paris Agreement. Kyoto will utilize the diverse knowledge gained as a result of implementing trail-blazing measures, and share the results of with the world.

Managing the progress of mitigation

Kyoto is taking precise and tangible actions, such as strengthening policies to achieve GHG emissions reduction targets, using a backcasting approach to manage the progress of mitigation.

- (1) Not only evaluating the progress of the measures, but also evaluating the effects of those measures, analyzing the causes of increases and decreases in GHG emissions, and visualizing the achievements of global warming countermeasures and impacts of external factors for each civic sector.
- (2) Since it is essential to quickly address affairs related to global warming countermeasures taking place in Japan and other parts of the world, Kyoto will continue to evolve our plan, consistently working to add to our policies and strengthen them.

Managing the progress of adaptation

- (1) Kyoto will gather scientific knowledge related to climate change and its impacts, while also using indexes and monitoring to understand of the impacts on communities of climate change in various sectors.
- (2) Various sectors impacted by the climate cooperate, sharing information about climate change and its impacts, and horizontally collaborating across all agencies. We will also cooperate closely with citizens, businesses, and the national and prefectural governments to promote countermeasures that are effective.
- (3) Since there are a wide variety of sectors impacted by the climate, Kyoto will manage the progress of adaptation policies on a per-sector basis. Kyoto will enact policies flexibly with a medium to long term perspective, taking the risks of climate change into consideration.

Producing and disclosing annual reports

Based on the rules in the code, Kyoto will produce and **widely disclose annual reports** that summarize and evaluate GHG emissions in the Kyoto area and the implementation status of the program of global warming countermeasures.

Glossary

Backcasting

Deciding the “vision of an ideal future” at the outset from among multiple future possibilities, then thinking and analyzing what needs to be done at the present to turn it into a reality, and taking tangible action.

Biomass

Organic resources, such as raw garbage and wood debris, derived from biological organisms, excluding fossil fuels such as petroleum. Burning biomass does emit CO₂, but this is what was absorbed and consolidated from the atmosphere through photosynthesis during the growth of the trees whose wood is being burned, so the net overall emissions can be considered to be zero (carbon neutral).

CASBEE Kyoto

The Kyoto standards for rating the environmental performance of buildings. Based on the national version of CASBEE, it was built as an original system for Kyoto to prioritize and revise certain points related to the buildings.

Credit, Credit system

An economic mechanism that encourages reductions in greenhouse gas emissions on a society-wide level. Allows the sale and purchase of “credits” representing absorption or emissions reductions of greenhouse gases such as CO₂ achieved through measures such as introducing energy-saving products or forestry management.

Eco-drivers

People who practice “eco-driving”, earth-friendly fuel-saving driving, and publicize it by word of mouth.

Eco-vehicle

The types of eco-vehicle referred to in this plan include electric cars, plug-in hybrid cars, hybrid cars, natural gas cars, fuel cell cars and clean diesel vehicle.

Framework Convention on Climate Change, COP

Normally referred to as the United Nations Framework Convention on Climate Change (UNFCCC). It is a convention with the purpose of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, geared towards international cooperative efforts related to global warming countermeasures. The supreme decision-making body for signatory countries to make decisions on matters in many conventions is the Conference of the Parties (COP).

HEMS

Acronym for Home Energy Management System. Systems that utilize information communication technology (ICT) to visualize and automatically control energy consumption and optimize the supply and demand of power within houses.

INDC

An Intended Nationally Determined Contribution that a country decides for itself geared toward constructing an international framework for 2020 onwards. Japan submitted an INDC to the Secretariat of the United Nations Framework Convention on Climate Change in July, 2015.

IPCC

The Intergovernmental Panel on Climate Change is an organization established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). Its purpose is to comprehensively evaluate climate change caused by human activities, its impacts, and adaptation and mitigation policies from scientific, technological, and socioeconomic points of view, and then to produce reports. Their most recent report was their Fifth Assessment Report (AR5), published between the years 2013 and 2014.

Glossary

Kyoto Mechanisms

Measures that allow greenhouse gas emissions reductions produced in other countries to be converted to count towards the achievement of emissions reduction pledges in home countries.

Large emission buildings

New or add-on buildings with total floor area of 2,000m² or more.
(stipulated in the Kyoto Code of Global Warming Countermeasures)

Large emission equipment

Lighting fixtures, air conditioners, TV, refrigerators, electric toilet seats.
(stipulated in the Kyoto Code of Global Warming Countermeasures)

Large emitters

Businesses with large greenhouse gas emissions, including those who use an annual crude oil equivalent of 1,500 kL or more for their business activities.
(stipulated in the Kyoto City Code of Global Warming Countermeasures)

Large greenery buildings

New or renovated buildings on lot sizes of 1,000 m² or more within greening priority zones.
(urbanization areas) (stipulated in the Kyoto Code of Global Warming Countermeasures)

Mobility management

Providing information intended to motivate people to enjoy walking as a lifestyle, and necessary information for using public transportation, with the perspective of the users in mind. At the same time, using communication policies that encourage each individual person to change their lifestyle by having them reflect on their own activity and think about what they can change.

Net Zero Energy Building (ZEB)

Buildings with zero or generally zero net energy consumption each year as a result of installing high thermal insulation functionality and high-efficiency equipment that produce energy savings and renewable energy.

Net Zero Energy House (ZEH)

Houses with zero or generally zero net energy consumption each year as a result of installing high thermal insulation functionality and high-efficiency equipment that produce energy savings and renewable energy

Other reduction effects

Forest absorption, Amount of other renewable energy imported. (Solar heat, Small-scale hydropower, wind, waste power generation, BDF, wood pellets, etc.)

Residential fuel cells

Household devices that generate electricity through a chemical reaction between oxygen in the air and hydrogen produced from city gas.

Vehicle share ratio

The ratio of cars used among means of transportation. The Kyoto-Osaka-Kobe Metropolitan Area Transportation Planning Council obtains this information every 10 years through a person-trip survey that asks what means of transportation people used.

Wood pellets

Fine solid fuel created by compressing timber by-products such as timber from forest-thinning and sawdust.



This pamphlet is a summary of the Kyoto City program of global warming countermeasures.