# From the Kyoto Protocol to Carbon Neutrality in 2050

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@2022.3.15 World Bank Technical Deep Dive (TDD)





- Features of Kyoto City
- Progress and Achievements to Date in Climate Change Countermeasures
- Efforts to Achieve Carbon Neutrality by 2050

Examples of Initiatives in Lifestyle, Business, Energy, and Adaptation Measures

- International Collaboration
- <u>Summary</u>

# Features of Kyoto City





Population: 1.47 million

- Area: 827.8 km<sup>2</sup>
  - Almost all urban areas are Densely Inhabited Districts (DIDs)
  - Around 80% of the city is green space! Living in harmony with nature
- Lively city with tourists (50 million per year), students (38 colleges), businesses, etc.

# Kyoto City's Global Warming Countermeasures to Date





- 1997 The 3rd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3) / establishment of the Kyoto Protocol; formulation of the Kyoto City Regional Propulsion Program of Global Warming Countermeasure
- 2004 <u>Enactment of the Kyoto City Code of Global Warming</u> <u>Countermeasure (the first such ordinance in Japan!)</u>
- 2009 Kyoto is chosen as an Eco-Model City by the Government of Japan
- 2010 Complete revision of the Kyoto City Code of Global Warming Countermeasure
- 2011 Formulation of the Kyoto City Program of Global Warming Countermeasure <2011-2020>
- 2015 COP21 / Paris Agreement (replacing the Kyoto Protocol)  $\Rightarrow$  From low carbon to decarbonization
- 2017 20th anniversary of the Kyoto Protocol

"Kyoto Declaration for Cultivating a Culture of Sustainable Cities"; revision of the Kyoto City Program of Global Warming Countermeasure <2011-2020>

### Through the first ordinance in Japan to combat climate change, we implemented 98 concrete measures alongside residents!



#### Promoting innovation by combining the knowledge of businesses, academia, and government

 Successfully mass produced SiC (silicon carbide), an energyefficient semiconductor, and now aiming to put it to practical use



100 nm

 A new material derived from plants, **CNF (cellulose nanofiber)**, is 5 times stronger than steel but is 1/5 in weight

#### Encouraging the community to voluntarily participate in eco-friendly activities



### Fostering the next generation

Raising the standard for environmental education in Kyoto City

Environmental education throughout the elementary and middle school curriculum

Eco-Life Challenge for Children All public elementary school students in Kyoto City participate to save energy with their families. With the support of volunteers, more than 100,000 people have taken the course!



### Partnering with others on various initiatives

From a social experiment at the "Kyoto Agenda 21 Forum" to expansion throughout Japan!



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### The Role of Cities: The Kyoto Declaration for Cultivating a Culture of Sustainable Cities



The world's population is concentrated in cities (half of the population lives in 2% of the land) ⇒ Cities are a major source of greenhouse gas emissions (75% of global carbon emissions)

> **Cities are becoming increasingly important** in combating climate change

The **Kyoto Declaration**, which aims to cultivate a culture of sustainable cities that is in balance with the environment, was adopted at the Kyoto Conference on the Global Environment 2017 (KYOTO+20)



### How the Kyoto Declaration envisions global cities in 2050

- O Coexistence with nature is realized
- Change in people's values and lifestyle is advanced
- Leaders for building a sustainable society are nurtured
- Strategies for adapting to the impacts of climate change and technological innovation are in place
- O Peaceful resolution of social problems such as poverty and disparity is well advanced
- Resource efficient and circular economy is realized
- Energy autonomy of cities is realized
- Urban mobility with low environmental impact is achieved
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[Major Achievement] Reduction in Greenhouse Gas Emissions



- 6.22 million tons in FY2019 (a decrease for the seventh consecutive year)
- This amount shows a decrease of 20.7% compared to FY2013



### [Major Achievement] Energy Consumption Has Decreased by 29% from peak period



- Energy consumption was 73,918TJ in FY2019 (a decrease of 1.7% compared to the previous fiscal year)
- This shows a decrease of 29.1% compared to the peak year (1997)



## [Major Achievement] Solar power generation increased 12-fold





# -Kyoto Appeal to jointly achieve 15 -Kyoto City's Initiatives Towards Carbon Neutrality-

necessary measures and advance concrete actions towards "net zero" of carbon dioxide emissions around 2050 in order to keep the global average temperature rise below 1.5 °C on the basis of the IPCC 1.5 °C Special Report.

> 令和元年5月11日 May 11, 2019

### The First City in Japan to Commit to "Net Zero CO2 Emissions by 2050" (May 11, 2019)



Municipalities that have committed to "Zero Emissions by 2050" (As of Jan. 31, 2022)

534 municipalities (40 prefectures, 319 cities, 15 special districts, 134 towns, 26 villages)

Total population of the above municipalities: Approx. 112.83 million (88.8% of Japan's population) Tokyo (May 21, 2019) Yokohama (Jun. 17, 2019) Osaka (Oct. 7, 2019)



Cities declaring their commitments one after another

Kyoto Prefecture(Feb. 11, 2020) Followed by 163 other municipalities



Then-Prime Minister Suga declaring Japan's commitment to zero emissions (Oct. 26, 2020)

### Formulation of the Kyoto City Program of Global Warming Countermeasure <2021-2030>



#### [Example Initiative] Building Kyoto's Version of a **Decarbonized Lifestyle: Kyoto Creation Meeting** Composed mainly of young people who will lead Kyoto in the future, as well as residents, businesses, academics, etc. Envision a lifestyle that will achieve zero emissions by 2050, and create and promote projects for residents to put this vision into practice. Sustainable Consumption Vision of a Decarbonized Abundance Lifestyle in 2050 Ultra Smart Mutual Team in Living Support charge Perspectives **Goals and** that resolve Share Indices for 2030 bottlenecks and initiate action Action List for 2030 **①Consumption** 2 Housing **3**Community Instead of relying on the good will and behavior Propose, conscience of each person, Projects participate, WG Create mechanisms that implement divided encourage them to take action PJ PJ PJ PJ PJ by theme 13

Lifestyle

### Energy Consumption Reporting System (Requirement for Medium-Sized Businesses)

- Businesses report their annual energy consumption, etc. every fiscal year.
- Based on the report, we provide feedback and information that will lead to better energy efficiency, etc.

### Newly mandated! (In 2021)

### <How the system works>





"EE Electricity", the first system in Japan where citizens can purchase renewable electricity!

### [Example Initiative] Collaboration with Research Institutions: The Establishment of Kyoto Climate Change Adaptation Center

- The Kyoto Climate Change Adaptation Center was established as a regional place to collect and provide information on adaptation
- Its Director is Tetsuzo Yasunari, former Director of the Research Institute for Humanity and Nature (and peer review author of the Working Group I contribution to the IPCC Sixth Assessment Report)

### Jointly Established by Three Organizations (On July 14, 2021)







# Serve as an information base (Main function)

What the Center Does

Collect and analyze information on climate change, etc.

# Research and education

Collaborate with universities and research institutions

# Coordinate with others

Support the creation of adaptation businesses





# **Collecting Information at the** Kyoto Climate Change Adaptation Center



Interview agricultural organizations, cultural figures, etc. about the impact of climate change What is becoming clear (based on the interviews)



### **International Collaboration (Exchanging Information and** Sharing the Results of Initiatives in Japan and Abroad)





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Japan Climate Action Summit

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# **Towards Carbon Neutrality**

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- Everyone needs to take action, voluntarily and proactively
- ⇒ Consider choosing decarbonized products and services in everyday life, and shift assumptions (ownership → sharing, mass production/consumption → circular economy)



### Encourage transformation through a wide range of approaches

- Disseminate and share information that leads to action
- Establish new systems (mandates, certifications, etc.)
- Invite experts to speak, foster leaders, etc.
- Innovation
- Economy (finance, etc.)
- Behavioral economics (nudges, behavioral design, etc.)
  ...and more