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# FISCAL YEAR 2025
# REPORT ON THE KYOTO CITY ASSEMBLY OVERSEAS ADMINISTRATIVE STUDY VISIT (RENEWABLE ENERGY)

January 25 (Sun) – January 30 (Fri), 2026

Kyoto City Assembly Overseas Administrative Study Visit Delegation (Renewable Energy)

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*Notice Regarding English Translation:*
*This report has been translated into English using Artificial Intelligence (AI) translation tools. In the event of any discrepancy or inconsistency between the English translation and the original Japanese text, the original Japanese version shall prevail as the official and authoritative document.*

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# Foreword

Takao Yoshida
Leader of Kyoto City Assembly Overseas
Administrative Study Visit Delegation

After a suspension due to the COVID-19 pandemic, the Kyoto City Assembly Overseas Study Visit resumed in Fiscal Year 2025.

Under the core theme, “Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~” a dedicated delegation of 15 members was formed. This included 6 members from the Liberal Democratic Party Kyoto City Assembly Member Group, 3 members from the Ishin/Kyoto/Kokumin Kyoto City Assembly Member Group, and 3 members from the Komeito Kyoto City Assembly Member Group, alongside the Senior Director, Global Environment Policy Office, and two accompanying secretariat staff members. Following comprehensive preparation, the delegation conducted a six-day study visit from January 25 to January 30, 2026, in Austria—a leading environmentally advanced nation that has established a national target of achieving carbon neutrality by 2040.

On January 26, the first day of our onsite investigations, we traveled directly to the central district of Vienna immediately upon arriving at the airport to visit the Spittelau Waste Incineration Plant. This municipal energy facility outstandingly balances functional urban utilities with creative artistic design. We inspected its highly efficient cogeneration system, which processes municipal waste while simultaneously generating electrical power and supplying district heating and cooling to the city.

On January 27, the second day, we spent the morning visiting Aspern Seestadt, a major smart-city development zone. We inspected HoHo Wien, which ranks as one of the world's tallest 24-story mass-timber high-rise buildings. We then toured the broader district to investigate how sustainable urban design integrates directly with public carbon reduction policies.

In the afternoon, we visited GIN Austria, the national incubator network that functions as a global startup platform, where we examined cross-border business acceleration and regional enterprise soft-landing strategies. Following this, we visited the Austrian Biomass Association,

which plays an essential, multifaceted national role ranging from legislative lobbying and technical dissemination to assisting local rural applications. With the President of the World Bioenergy Association also in attendance, we held focused discussions on regional biomass use and market expansion programs.

On the morning of January 28, our third day, we visited the historic Vienna City Hall (*Rathaus*). We engaged in direct discussions with two members of the Vienna City Council regarding the city's overall strategy to attain climate neutrality by 2040, its infrastructure policies to shift heating systems away from fossil gas toward renewable energy, and local district heat delivery networks. Furthermore, Chairman of the Vienna City Council officially welcomed our delegation inside the main legislative assembly hall and personally guided us through the historic building.

In the afternoon, we visited Wiener Stadtwerke (Vienna Municipal Infrastructure Services), the municipal enterprise that manages the critical utilities underpinning public life, including energy grids, public transport, and urban infrastructure. We learned about their broad-based sustainable policies.
Due to the intense, passionate delivery of advanced insights by the leading municipal researchers, our scheduled question-and-answer session was highly interactive and was extended to accommodate deeper inquiries.

On January 29, the final day of our onsite investigations, we visited the Geothermal plant Aspern located in the eastern area of Vienna.
We studied their next-generation district heat delivery systems, which aim to begin commercial operations in 2028 by utilizing thermal energy extracted from hot water reservoirs located 3,000 meters underground.

Although this administrative study visit involved a highly demanding, tight travel schedule, we achieved outstanding results and collected extensive academic data. Conducting these physical onsite investigations allowed us to gain profound, invaluable lessons.

In terms of utilizing these findings to improve our own local governance, our return perfectly aligned with the drafting process of the next Kyoto City Environmental Basic Plan as well as the mid-term review of the Kyoto City Global Warming Countermeasures Plan. Consequently, our delegation immediately compiled our key findings into an "Emergency Policy Recommendation" document, which we delivered directly to Kyoto City Mayor Koji Matsui on March 4, 2026. This resulted in several of our recommendations being directly integrated into the revised municipal

environmental framework.

Subsequently, on May 18, we hosted an official public debriefing session in the Kyoto City Assembly Chamber. This event was highly successful and was attended by city legislators, municipal officers, and local citizens. On May 20, we further refined and expanded our proposals to submit our final, comprehensive "Policy Recommendations Report" to Mayor Matsui.

We are very pleased to share these extensive policy outcomes in this official report. Our delegation remains committed to sharing these technical insights across all assembly parties, deepening our local legislative debates, and working closely with Mayor Matsui, municipal administrators, and the citizens of Kyoto to dedicate our utmost efforts to realizing a sustainable, carbon-neutral society.

# Ⅰ. List of Delegation Members

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Delegation Executive / Members

■ Leader

・Takao Yoshida (Komeito Kyoto City Assembly Member Group)

■ Deputy Leaders

・Kazuhiro Terada (Liberal Democratic Party Kyoto City Assembly Member Group)
・Masaki Kubota (Ishin, Kyoto, Kokumin Kyoto City Assembly Member Group)

■ Members

・Yuko Kawashima (Komeito Kyoto City Assembly Member Group)
・Akihide Tanaka (Liberal Democratic Party Kyoto City Assembly Member Group)
・Yasuhiro Sakurai (Liberal Democratic Party Kyoto City Assembly Member Group)
・Hiroyuki Michihata (Liberal Democratic Party Kyoto City Assembly Member Group)
・Takanori Tanaka (Liberal Democratic Party Kyoto City Assembly Member Group)
・Miyuki Taniguchi (Liberal Democratic Party Kyoto City Assembly Member Group)
・Yoichi Nakano (Ishin, Kyoto, Kokumin Kyoto City Assembly Member Group)
・Risa Hijikata (Ishin, Kyoto, Kokumin Kyoto City Assembly Member Group)
・Nobumasa Nishiyama (Komeito Kyoto City Assembly Member Group)

【Accompanying & Attendant Officials】

■ Accompanying Official

・Ryota Sasaki (Senior Director, Global Environment Policy Office, Kyoto City)

■ Attendants

・Masato Saito (Assistant Director, Coordination Section, Kyoto City Assembly Secretariat)
・Naoko Takada (Assistant Director, Research Section, Kyoto City Assembly Secretariat)

【At Vienna City Hall】
(From left to right):
Mr. Thomas Kreitmayer, Assembly Member Yuko Kawashima, Assembly Member Hiroyuki Michihata, Assembly Member Masaki Kubota, Mr. Thomas Reindl (Chairman of the Vienna City Council), Assembly Member Nobumasa Nishiyama, Assembly Member Takao Yoshida, Assembly Member Akihide Tanaka, Mr. Omar al-Rawi (Committee Chairs of the Vienna City Council), Assembly Member Kazuhiro Terada, Assembly Member Yasuhiro Sakurai, Assembly Member Miyuki Taniguchi, Assembly Member Risa Hijikata, Assembly Member Takanori Tanaka, Assembly Member Yoichi Nakano

# II. Study Visit Itinerary

| Date | Study Visit Destinations & Topics |
|---|---|
| 2026<br>January 25 (Sun.) | (Departure from Kyoto / Travel Day)<br>(Overnight on board) |
| January 26 (Mon.) | <City of Vienna><br>・Spittelau Waste Incineration Plant<br>(Renewable Energy Facility) |
| January 27 (Tue.) | <City of Vienna><br>・HoHo Wien (High-rise Timber Building)<br>・Aspern Seestadt<br>(Sustainable Urban Development Area)<br>・GIN Austria (Global Incubator Network Austria)<br>(International Startup Support Platform)<br>・Austrian Biomass Association<br>(Utilization of Biomass Energy) |
| January 28 (Wed.) | <City of Vienna><br>・Vienna City Council<br>(Initiatives toward Carbon Neutrality by 2040)<br>・Wiener Stadtwerke<br>(Energy, Public Transport, and Startup Support in Vienna) |
| January 29 (Thu.) | <City of Vienna><br>・Geothermal plant Aspern<br>(Renewable Energy Facility) |

# III. List of Members in Charge of Reporting

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## 1. Study Visit Reports

(1) Spittelau Waste Incineration Plant
Assembly Member Miyuki Taniguchi

(2) Geothermal plant Aspern
Assembly Member Risa Hijikata

(3) Austrian Biomass Association
Assembly Member Akihide Tanaka

(4) HoHo Wien / Aspern Seestadt
Assembly Member Takanori Tanaka

(5) Vienna City Council
Assembly Member Nobumasa Nishiyama

(6) Wiener Stadtwerke
Assembly Member Yasuhiro Sakurai
Assembly Member Hiroyuki Michihata

(7) GIN Austria
Assembly Member Yoichi Nakano

## 2. Policy Recommendations for Kyoto City

Delegation Leader Takao Yoshida
Deputy Leader Kazuhiro Terada
Deputy Leader Masaki Kubota
Assembly Member Yuko Kawashima

# IV. Process Leading to the Decision to Conduct the Study Visit

Kyoto City Assembly has established the "Guidelines for the Implementation of Overseas Administrative Study Visits by Kyoto City Assembly" and the "Guidelines for the Organization and Operation of the Kyoto City Assembly Overseas Administrative Study Visit Review Committee" to ensure transparency in the decision-making process for conducting study visits.

Regarding this study visit, the study visit plan was submitted to the Chairperson on July 28, 2025. Subsequently, the Overseas Administrative Study Visit Review Committee was held on July 30 of the same year, where the necessity of the study visit was approved.

Thereafter, the proposal was approved by the Assembly Steering Committee on November 26 of the same year, and the dispatch of the members was officially approved at the Plenary Session on November 27 of the same year.

**<Process Leading to the Decision to Conduct the Study Visit>**

- July 28, 2025
  Submitted the study visit plan to the Chairperson
- July 30, 2025
  The Overseas Administrative Study Visit Review Committee reviewed the study visit and approved its necessity.
- November 26, 2025
  The Assembly Steering Committee approved the implementation of this study visit.
- November 27, 2025
  The Plenary Session approved the dispatch of assembly members for this study visit.

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【Outline of the Review Committee】

○ Date and Time: July 30, 2025 (Wed.), 11:00 AM – 11:50 AM

○ Venue: Kyoto City Assembly Main Conference Room

○ Attendees:

<Review Committee Members>

- Chairperson: Assembly Member Akihide Tanaka
- Vice Chairpersons: Assembly Member Ai Kato, Assembly Member Yoshikazu Hirayama
- Committee Members: Assembly Member Kyoji Shimamoto, Assembly Member Yoichi Nakano, Takaaki Niren (Chairman of the Board of Trustees, Kansai Bunri Sogo Gakuen Educational Corporation)

< Study Visit Plan Proposers >

- Assembly Member Kazuhiro Terada, Assembly Member Masaki Kubota, Assembly Member Yuko Kawashima

○ Key Opinions from Committee Members:

・The City of Vienna is undertaking advanced decarbonization initiatives even within Europe, making the selection of Vienna as the study visit destination highly meaningful.

・Vienna's decarbonization efforts are distinctive in that they aim to improve residents' daily lives and promote economic development concurrently with decarbonization, and that the administration takes the lead in involving citizens and businesses.

・In Vienna, District Heating systems—which are not yet widely adopted in Japan—are well-developed, and we hope this will serve as a useful reference for Kyoto.

・Kyoto also undertakes advanced initiatives. Rather than merely going on a superficial study visit, we hope the delegation will approach this study visit with an attitude of considering the future while communicating with the world.

・In addition to official administrative accounts, please also inquire about the perceptions and responses of local citizens.

※ Based on the above opinions, the following actions were undertaken:

・Visited the Vienna City Council to conduct hearings and exchange information with members of the council, who serve as representatives of the citizens.

・Investigated initiatives regarding District Heating systems at renewable energy facilities and Wiener Stadtwerke.

# V. Delegation Meetings and Study Sessions

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### 1. Initiatives Prior to the Study Visit

After the necessity of the study visit was approved by the Review Committee, meetings and study sessions regarding the study items were held for delegation members to ensure a more effective study visit.

◆ **Delegation Meeting** (September 30, 2025)

- Election of the Delegation Leader and Deputy Leaders
- Confirmation of the itinerary and study items

◆ **Delegation Meeting** (October 31, 2025)

- Study session conducted by the Environmental Bureau and the Industry and Tourism Bureau regarding social trends and municipal measures related to global warming countermeasures and startup support
- Confirmation of the itinerary

◆ **Delegation Meeting** (November 28, 2025)

- Study session conducted by the City Planning Bureau regarding initiatives for decarbonizing municipal buildings, as well as improving convenience and promoting the use of public transport
- Confirmation of the itinerary
- Discussion on study visit reports (allocation of roles for reporting)

◆ **Delegation Meeting** (January 16, 2026)

- Final confirmation of the itinerary
- Confirmation of precautions regarding overseas travel

## 2. Initiatives After the Study Visit

To ensure that the insights gained from the study visit are reflected in Kyoto City's policies, consultation meetings were held as needed among the Leader, Deputy Leaders, and proponents of the study visit plan. In addition, the following initiatives were carried out:

◆ **Delegation Meeting** (February 25, 2026)

- Discussion on study visit reports (urgent recommendations for municipal administration, report document, and reporting session)

◆ **Delegation Meeting** (April 27, 2026)

- Exchange of opinions with relevant municipal bureaus*
  *General Planning Bureau, Industry and Tourism Bureau, Environmental Bureau, City Planning Bureau, and Transportation Bureau
- Discussion on recommendations for municipal administration
- Confirmation regarding the reporting session

◆ **Reporting Session** (May 18, 2026)

◆ **Submission of Recommendations Proposal** (May 20, 2026)

# VI. Study Theme and Rationale for Selecting the Destination City

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## 1. Study Theme and Study Topics

(1) Study Theme

Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~

Note: Although this study visit plan was submitted in FY2019 and approved by the Overseas Administrative Study Visit Review Committee, its execution was inevitably relinquished due to the impact of the COVID-19 pandemic. Considering that Kyoto is the birthplace of the Kyoto Protocol, this theme remains extremely important for the city. Therefore, the contents have been partially updated in line with current conditions to re-implement the study visit.

(2) Reasons for Selecting the Study Theme and Topics

Due to global warming, the frequency and intensity of extreme weather events, such as heavy rainfall and high temperatures, are increasing worldwide. The World Meteorological Organization (WMO) announced that 2024 was the hottest year on record. In Japan, Dazaifu in Fukuoka Prefecture recorded a historic high of 62 extreme heat days (temperatures reaching 35° C or higher) in the same year, and successive torrential rain disasters occurred across various regions, causing severe impacts on health and economic activities.

According to Japan's Plan for Promoting Global Warming Countermeasures*1, which reflects the IPCC Sixth Assessment Report (SYR)*2, urgent action is required to limit global warming to 1.5° C. Furthermore, it states that global warming countermeasures should be promoted to accelerate innovation toward decarbonization, contributing to the simultaneous achievement of emissions reduction and economic growth.

In FY2019, Kyoto City became the first municipality in Japan to declare a goal of "Net Zero $CO_2$ Emissions by 2050," and in FY2022, it was selected as a "Decarbonization Leading Area," actively engaging in global warming countermeasures. The Kyoto City Assembly also submitted a "Written Opinion Requesting the Promotion of Regional Green Transformation (GX)" to the national government in February 2023.

To connect the insights gained from advanced case studies into concrete policy recommendations

tailored to the actual circumstances of Kyoto City, and to contribute to the steady realization of a decarbonized society, the following four study topics have been selected:
*1 Cabinet decision in February 2025　*2 Published in March 2023

### [Topic 1] Advanced Cases of Renewable Energy

The Kyoto City Assembly has previously conducted overseas administrative study visits regarding renewable energy twice, in FY2012 and FY2016, covering Germany, Spain, and Denmark. Based on these study visits, recommendations have been made for municipal administration regarding community-linked initiatives, such as power generation utilizing solar and wind energy.

Building upon past study cases, this study visit will investigate advanced cases of renewable energy, including biomass power and heat generation, as well as the utilization of hydrogen energy.

### [Topic 2] Decarbonization of Buildings

The building sector accounts for a large proportion of energy consumption and $CO_2$ emissions, making it a critical area for urban decarbonization. In particular, the use of renewable materials during construction and measures to improve energy efficiency in post-construction building operations are crucial. This study visit will cover cases of practical application in mid-to-high-rise timber buildings and advanced examples of energy conservation.

### [Topic 3] Enhancing Public Transport Convenience and Utilization

In decarbonization efforts, strengthening measures in the transport sector is essential. Public transport with low $CO_2$ emissions—especially the utilization of trams—is considered key to phasing out fossil fuels.

Therefore, this study will investigate initiatives aimed at enhancing the convenience and promoting the use of public transport, alongside measures to promote bicycle usage.

### [Topic 4] Startup Support

In promoting Green Transformation (GX), startups that generate innovative technologies and new business models to achieve dramatic energy savings and renewable energy generation are expected to play a crucial role.

Accordingly, this study visit will examine support systems for startups that can serve as drivers of new industries, as well as advanced cases of incubation environments.

## 2. Reasons for Selecting the Destination City (Vienna, Austria) and Facilities to be Visited

(1) Reasons for Selecting the Destination City
Austria is strongly driving the energy transition toward decarbonization, setting ambitious goals to: 1) produce 100% of its electricity from renewable energy sources by 2030, and 2) achieve Carbon Neutrality by 2040.

Austria has long promoted power generation utilizing hydroelectricity and wooden biomass. Consequently, the share of renewable energy in its total electricity generation is extremely high, reaching 87% in 2023. Furthermore, the country has launched policies focusing on innovation, leading to the rapid growth of its startup ecosystem in recent years due to substantial support measures.

Its capital, Vienna, promotes green energy, encourages the use of public transport and bicycles, and focuses on raising awareness for the adoption of electric vehicles, striving to be an environmentally friendly city. Moreover, Vienna consistently ranks high in the "Global Liveability Index"*3, achieving a high-level balance between decarbonization initiatives and the enhancement of quality of life.
*3 Released by the Economist Intelligence Unit (EIU), the research division of The Economist magazine.

Vienna is an inland city not facing the sea, possesses rich forests known as the Vienna Woods, and holds numerous World Heritage sites, sharing many commonalities with Kyoto City. Given their similar population sizes, advanced cases of renewable energy introduction and decarbonization-related initiatives in Vienna can be effectively applied to Kyoto City's policies, such as the further promotion of renewable energy.

(2) Facilities to be Visited
・Spittelau Waste Incineration Plant (Renewable Energy Facility)
・Geothermal plant Aspern (Renewable Energy Facility)
・Austrian Biomass Association (Utilization of Biomass Energy)
・Aspern Seestadt (Sustainable Urban Development Area) & HoHo Wien (High-rise Timber Building)
・Vienna City Council (Initiatives toward Carbon Neutrality by 2040)
・Wiener Stadtwerke (Energy, Public Transport, and Startup Support in Vienna)
・GIN Austria (Global Incubator Network Austria) (International Startup Support Platform)

# VII. Study Visit Reports

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# Spittelau Waste Incineration Plant

Miyuki Taniguchi

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## 1. Study Visit Destination and Purpose

・Spittelau Waste Incineration Plant
The City of Vienna is an environmentally advanced city that brought forward the international goal of "Net Zero $CO_2$ Emissions by 2050 (Carbon Neutrality)" by 10 years, aiming to achieve it by 2040. Vienna's efforts to advance the realization of a decarbonized society 10 years ahead of schedule serve as a highly valuable precedent indicating the future direction Kyoto City should take.

The purpose of this Study Visit was to examine Vienna's advanced initiatives in functioning a waste incineration plant not merely as a disposal facility, but as an energy supply foundation for the entire city, and to utilize these findings as a reference for Kyoto City's future waste management administration and decarbonization policies.

## 2. Study Visit Details

【Overview of Visited Facility】
Spittelau Waste Incineration Plant is a waste incineration and energy supply facility operated by Wien Energie, Austria's largest energy supply company. Located in Vienna's 9th District in the central urban area along the Danube Canal, the facility incinerates waste and converts the heat into energy (electricity and District Heating/Cooling) to supply to local residents.

While waste incineration plants are generally built in suburban areas, this facility was intentionally located in the city center, achieving the major advantage of delivering generated heat to surrounding areas with minimal loss. In exchange, considerations regarding landscape and odor were indispensable; this was made possible through an exterior design by a world-renowned artist and advanced odor prevention technology.

Wien Energie, as a company invested in by the City of Vienna, plays a central role in public services. It supplies heat to approximately 470,000 District Heating users, while also operating renewable energy businesses such as wind power generation and solar panels, supplying electricity, gas, heating, and cooling to approximately 2 million people. On the day of the visit, an overview of the facility was presented by Mr. Bernhard Wudy of the company.



○ Why Locate a Waste Incineration Plant in Central Vienna?

District Heating supplies thermal energy by circulating hot water through pipelines; thus, energy is lost the further it is transported over long distances. Therefore, to maximize energy efficiency, it is crucial to position the facility as close as possible to the urban center where heat is consumed. Furthermore, having the facility in the city center shortens the travel distance for garbage collection trucks, reducing fuel consumption and $CO_2$ emissions during transport. Based on these principles, the City of Vienna placed the Spittelau Waste Incineration Plant along the Danube Canal in the center of the urban area, supplying heat to nearby general hospitals and households.

However, placing a waste incineration plant in an urban center requires measures to maximize resident acceptance and minimize environmental impact. The City of Vienna addressed this challenge through both "the power of design" and "the power of technology."

○ Achieving Resident Acceptance Through Design

The original facility was built in 1971, but in 1987, a fire caused by a failure to shut off gas during maintenance completely destroyed it, forcing a rebuild. In rebuilding, addressing resident sentiment—specifically the sentiment that "no citizen wants to live next to a waste incineration plant"—was a major challenge.

As a breakthrough solution, the city aimed to adopt a design that would serve as a tourist resource and increase revenue for the city as a whole, commissioning the renowned artist Friedensreich Hundertwasser to design the facility. Mr. Hundertwasser initially declined from an environmental protection standpoint, stating that "people should live a lifestyle that produces as little waste as possible." However, following enthusiastic persuasion by the city, he accepted on two conditions: installing world-class exhaust gas filters, and incinerating only items that have "absolutely no other use." These conditions marked the beginning of waste separation in Vienna.

As a result, the facility, featuring colorful exterior walls and irregular curves, has maintained a long-standing presence in Vienna. Notably, waste incineration facilities designed by Mr. Hundertwasser also exist in Maishima, Osaka City.

○ Waste Separation and Waste Reduction Initiatives

Under Austrian waste management laws and regulations, waste reduction is prioritized above all else, followed by reuse, recycling, and incineration as a last resort. Furthermore, legal obligations for separation are imposed on each household, and only "residual waste" that cannot be reused or recycled is transported to the facility for incineration.

Additionally, a deposit system for PET bottles was introduced in 2025. A 25-cent surcharge is added at the time of purchase, and 25 cents are refunded when the bottle is returned to a store. This system was introduced as a countermeasure because PET bottles were previously often discarded as "residual waste" without being recycled. Regarding lithium-ion batteries, separate collection is conducted at 17 locations within Vienna; however, two fires caused by improper disposal into "residual waste" have occurred over the past three years.

○ Measures to Suppress Odors and Environmental Impacts

In operating an incineration plant in the city center, odor control is key to resident acceptance. The Spittelau Waste Incineration Plant is equipped with a tall chimney, but odors still occur. Garbage trucks transport waste on weekdays between 6:00 AM and 4:00 PM, during which garbage odors are noticeable. However, after processing ends at 5:00 PM, odors are prevented.

Exhaust gas after incineration is purified through a multi-stage filter system and is treated to a purified state by the time it is emitted from the chimney. The high standard of these filters originates from Mr. Hundertwasser's demand for "world-class exhaust gas filters" as a condition for accepting the design.

According to Mr. Wudy's explanation, constructing a new facility of a similar scale today would cost approximately 300 million euros (approx. 57 billion yen), with two-thirds of that cost dedicated to filter-related expenses. Allocating such substantial investment to exhaust gas purification provides the technological backing that makes operation in the city center viable.

○ "Quadruple-Earning" Energy Supply Mechanism

The most prominent feature of this facility is that it generates four streams of revenue from waste incineration: 1) waste tipping fees, 2) electricity sales from power generation, 3) District Heating, and 4) District Cooling.

The heating system utilizes heat from waste incineration, pressurizing water to raise its temperature to approximately 150° C, which is then delivered to buildings through insulated pipelines. Heat exchangers installed in each building heat the water for domestic heating systems, providing room-by-room heating. Cooling is provided using chilled water as a medium, produced using large electric chillers, waste-heat-driven absorption chillers, and natural cooling from groundwater and river water.

Furthermore, by recovering waste heat from the exhaust gas purification process using a large 16-megawatt heat pump, the facility achieves an energy efficiency of 95%, making it the most efficient waste incineration plant in Central Europe.

Regarding future heat sources, Wien Energie plans not to increase waste incineration, but rather to gradually raise the proportion of heat derived from renewable energy sources such as geothermal power.

○ Public-Private Collaboration: Utilization of Waste Heat from Manner

To diversify the heat sources for its District Heating network, Wien Energie also collaborates with private companies. A notable example is the partnership with Manner, a wafer manufacturer with a factory in Vienna's 17th District. Since October 2016, high-temperature exhaust air from Manner's waffle baking ovens has been converted into hot water via heat exchangers, supplying approximately 5,600 MWh of heat annually to the District Heating network. This benefits approximately 600 nearby households and businesses, reducing $CO_2$ emissions by approximately 1,000 tons annually. Wien Energie measures the volume and temperature of the supplied heat and pays Manner accordingly; this model, in which a private company participates in the public energy network as a heat "producer," is noteworthy as a practical form of a circular economy through public-private cooperation.

## 3. Results and Challenges Identified from the Study Visit

○ Results

It was concretely confirmed that the waste incineration facility is integrated into urban infrastructure as the "heart of energy production," creating four business revenue streams: waste treatment, electricity, heating, and cooling. Its location in the city center is essential for maximizing energy efficiency, and the Hundertwasser design and odor control technologies that enabled this location are highly commendable as pioneering initiatives that achieve both resident acceptance and functionality.

○ Challenges

Vienna's system relies on the precondition that District Heating pipeline infrastructure is already developed; cities lacking such infrastructure require phased implementation. Additionally, the risk of fires caused by the improper inclusion of lithium-ion batteries is a common challenge shared with Japan.

## 4. Observations and Impressions

What made the strongest impression during this Study Visit　was how effectively the City of Vienna utilizes waste treatment. By placing the facility in the urban center to minimize energy consumption and loss, achieving resident acceptance through design and environmental technology, and establishing four revenue streams, Vienna has created a design philosophy that serves as a valuable guideline for Kyoto City when considering future facilities. Meanwhile, the policy of gradually increasing the proportion of clean energy without increasing waste incineration for future heat sources was also impressive.

As implications for Kyoto City, the following points are considered particularly important:

First, collaboration with private facilities. Mechanisms to integrate surplus heat from local factories and business establishments into the energy network, like the Manner case, represent a viable model for Kyoto City. Kyoto City hosts a diverse range of enterprises ranging from traditional industries to advanced manufacturing; examining frameworks to promote local energy production for local consumption through public-private cooperation is recommended.

Second, the effective utilization of thermal energy. Prior to embarking on large-scale infrastructure

investments, it may be beneficial to conduct pilot projects testing heating and cooling supply to hospitals, public facilities, and residential areas near waste processing centers to verify effects and challenges.

Third, the electrification and hydrogen conversion of city buses. Utilizing electricity generated from waste incineration or clean energy to transition public transport fuels would allow a departure from fossil fuel price volatility and geopolitical risks, simultaneously achieving energy security and decarbonization. Bus fuel costs directly impact Kyoto City's finances, making the transition to self-produced energy sources financially effective as well. Regarding solar power generation, issues related to the disposal and recycling of used panels must be addressed concurrently.

Fourth, strengthening reuse and recycling. Just as Vienna upholds the principle of incinerating only items with "absolutely no other use," thoroughly promoting resource recovery prior to the incineration stage will improve the quality of environmental administration as a whole. While Kyoto City's waste volume has decreased to less than half of its peak, enhancing post-sorting resource recovery mechanisms represents the next crucial step.

Fifth, building an industrial ecosystem through the application of new technologies. Recent developments in corrosion-resistant materials have enabled high-temperature, high-pressure boilers, raising steam temperatures above 450° C and achieving power generation efficiencies exceeding 20%. Actively introducing these next-generation technologies into facilities and related infrastructure to serve as demonstration sites will foster specialized human resources and build an industrial foundation supporting a decarbonized society. Furthermore, providing practical fields for technological development by the administration will serve as a catalyst to attract private investment.

By learning from Vienna's example and integrally advancing facility development with energy strategy, industrial policy, and urban planning, Kyoto City can transform its infrastructure into something accessible, meaningful, and beneficial to its citizens.

# Geothermal plant Aspern

Risa Hijikata

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## 1. Study Visit Destination and Purpose

・Geothermal plant Aspern
(Investigation of a district thermal supply project utilizing deep geothermal energy in an urban area)

## 2. Study Visit Details

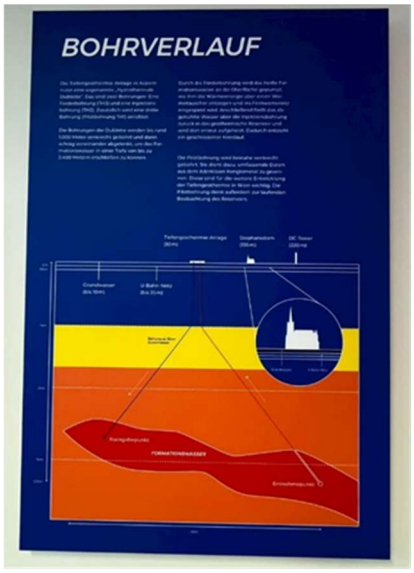
【Overview of Visited Facility】
The project being developed at the Aspern site in eastern Vienna (Vienna's 22nd District) serves as a deep geothermal energy development base. Executed under the business entity "deeep"—a joint venture between Wien Energie (Vienna's municipal energy provider) and OMV (an Austrian oil and gas exploration company)—the project aims to provide climate-neutral district thermal energy utilizing geothermal energy. The initial plant is planned to have a maximum thermal output of 20 MW. In the future, the goal is to construct multiple plants with a total maximum output of 200 MW, capable of meeting the heating demand of approximately 200,000 households. This project is positioned as a key pillar toward achieving Vienna's Carbon Neutrality goal by 2040.

○ Geothermal Plant and Project Overview
During this site visit, the delegation received explanations regarding the deep geothermal utilization project underway in the City of Vienna, investigating renewable energy initiatives that extract thermal water from deep underground for use in District Heating.

This facility is a geothermal development hub established in the Aspern district in eastern Vienna.

The plan involves drilling approximately 3,000 meters underground to extract high-temperature groundwater for use as energy.


On site, an explanation was first provided using materials illustrating the depth of drilling. To clearly convey the underground depth reached, it was compared to the height of St. Stephen's Cathedral in central Vienna, demonstrating that drilling reaches a depth significantly exceeding the height of the cathedral. This explanation conveyed the substantial scale of the underground drilling involved in this project.





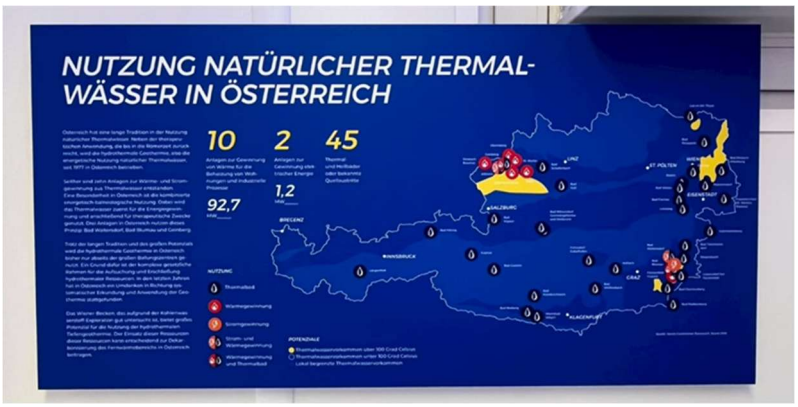
The project is being implemented by "deeep," a joint venture established by Wien Energie, the energy provider for the City of Vienna, and OMV, an Austrian oil and gas company. OMV possesses extensive experience in underground drilling technology and geological surveys gained

through oil and natural gas extraction. Traditionally, discovering oil or gas was considered a success, while encountering groundwater was regarded as a failure. However, in this project, discovering thermal water underground represents success, marking a major turning point.

To achieve a future heat supply independent of fossil fuels, the City of Vienna adopted a system that directly utilizes underground thermal water after a process of trial and error. Underground temperatures increase with depth, reaching approximately 130° C at a depth of around 3,000 meters. This heat, universally present worldwide, is geothermal energy.


Geothermal utilization in this project relies not only on high underground temperatures but also on utilizing existing underground thermal water. For this to occur, geological strata capable of holding and storing thermal water are necessary. The underground area surrounding Vienna features widespread sedimentary layers of gravel and rocks, within whose crevices thermal water has accumulated. These layers were formed millions of years ago by stones transported by rivers; their sufficient thickness enables a stable supply of heat.

An explanation was also provided regarding the history of thermal water utilization. Austria possesses hot springs similar to those in Japan, including one location within the City of Vienna. The first hot spring in Austria was developed in 1777, but it was intended for recreational spa purposes; at a time when petroleum fuels were inexpensive, there was no necessity to deliberately collect or utilize thermal water for heating.




Currently, much of Vienna's heating relies on natural gas, with gas heating also accounting for a large proportion of District Heating. While geothermal utilization did not progress in the past due to cheap fossil fuels, the necessity to reduce $CO_2$ emissions has grown in recent years, making the transition to Renewable Energy an important policy objective. Therefore, the project was initiated with the goal of reducing natural gas usage by utilizing geothermal thermal water and eventually supplying geothermal-derived heat to numerous households.

○ Heat Exchangers

In this project, geothermal energy is not utilized for power generation; rather, the heat from geothermal thermal water is used directly. Because the temperature of Vienna's geothermal water does not reach the levels required for power generation, it was concluded that utilization for District Heating would be the most efficient approach.

The mechanism for utilizing geothermal water involves first drilling down to 3,000 meters to access water at 130° C. After pumping the thermal water from underground, it is routed through heat exchanger pipelines to transfer its heat to water used for District Heating. After its heat is extracted, the cooled water is returned underground in a closed-loop system. The water for District Heating heading toward individual households is heated to approximately 120° C via heat exchangers and adjusted to around 65° C, providing sufficient heat for room heating and cooking.

To prevent underground thermal water from mixing with drinking groundwater, the borehole is equipped with a barrier structure made of steel piping and concrete, ensuring safety. Because underground pressure increases with depth, water rises naturally up to 200 meters below the surface; however, pumps are required to lift the thermal water for the final 200 meters. Operating these pumps requires electricity, but generating 15 kW of heat from 1 kW of electricity is reported to be approximately 15 times more efficient than burning natural gas to produce heat.

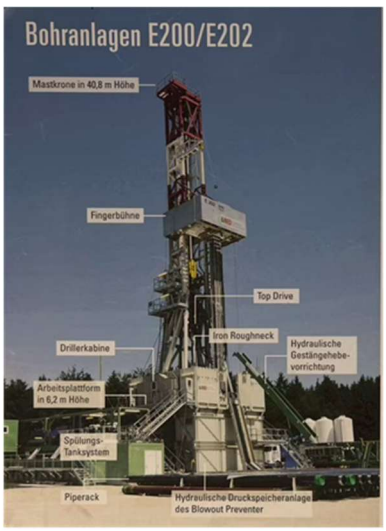
○ Extraction

To extract geothermal thermal water, there are two primary methods: the hydrothermal method, which pumps up naturally existing underground thermal water, and the petrothermal method, which fractures rock layers to artificially circulate and heat water. This facility adopts the hydrothermal method, which carries a lower risk of inducing earthquakes. A key feature of this development is that drilling data from past oil exploration was utilized to pinpoint location sites where thermal water exists.

Geothermal extraction begins with vertical drilling to assess underground conditions. Drinking groundwater exists in shallow layers down to approximately 100 meters below the surface, whereas thermal water for heating is located in much deeper layers. Strict measures are taken to prevent the two from mixing. Specifically, underground concrete structures are installed to physically seal off the shallow groundwater layer, preventing drinking water from entering or mixing during drilling.

Drilling initially proceeds vertically to approximately 800 meters, after which directional drilling technology bends the drill bit laterally to secure a horizontal distance of up to approximately 3 kilometers. Meanwhile, the distance between wellheads on the surface is kept to approximately 12 meters, enabling an efficient surface footprint. Drilling ultimately reaches depths of approximately 3,200 meters while monitoring geological conditions (such as near the 900-meter and 1,600-meter marks).

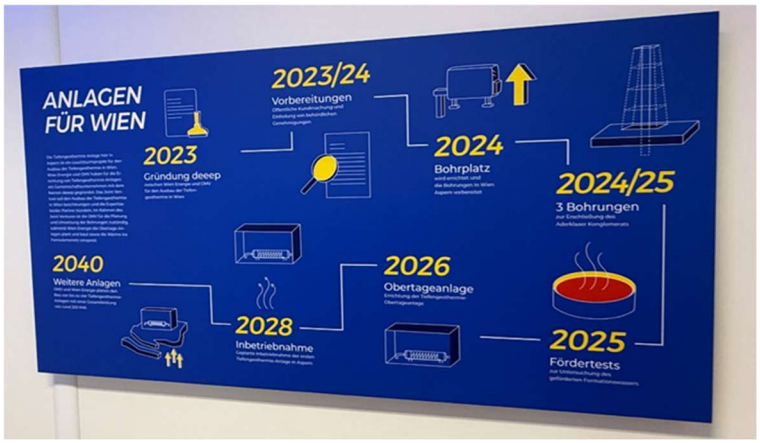
These drilling technologies were originally developed for petroleum exploration and have been adapted to extract geothermal thermal water. Furthermore, to prevent earthquakes caused by drilling, numerous sensors are installed in the surrounding area to continuously monitor micro-vibrations.



○ Project Timeline

In 2023, the operating company "deeep" was established. Realizing the project required various permits. The site was selected in 2024, and drilling began at three locations between 2024 and 2025. While the drilling process itself did not require extensive time, the preparation phase took approximately three years. In the summer of 2025, thermal water was extracted for the first time to verify expected cooling times. Following verification, facility construction will require an additional two years, with actual operation scheduled to begin in 2028. During this period, necessary machinery (such as heat exchangers) is being custom-designed and manufactured.

According to explanations, a single drilling location can supply heat to approximately 20,000 households, with ongoing developments at multiple locations aiming to supply 200,000 households by 2040.




○ Project Costs

The cost of this project is approximately 90 million euros (approx. 16.5 billion yen) per location, with two-thirds allocated to underground drilling and one-third to surface facility construction. Considering that a stable heat supply will eventually be provided to 200,000 households, the investment cost per household is approximately 4,500 euros (approx. 830,000 yen), making it a highly cost-effective investment.


While municipal subsidies from the City of Vienna are utilized, the majority of the cost is borne by the operating company, structured on the premise of cost recovery through user fees.

## 3. Observations and Impressions

Through this Study Visit , the delegation gained a deeper understanding of initiatives aimed at converting existing petroleum resource development technologies into geothermal renewable energy to meet urban heating and thermal supply demands. Geothermal energy, which is unaffected by weather conditions and capable of providing a stable supply, proved to be an effective means for urban decarbonization. Furthermore, it was impressive to observe how citizens and businesses in Vienna are united in understanding the direction toward Carbon Neutrality set by the EU and Austria.

Currently in Japan, geothermal initiatives primarily involve power generation using steam under high-temperature geological conditions in select regions. Geothermal resource extraction faces numerous restrictions and complex geology, making development in Japan relatively difficult compared to other energy sources.

In Vienna, Austria, underground thermal water is supplied directly to households as heating and thermal energy. Similar methods are used in Kyoto City through shallow geothermal heat and groundwater utilization. While expanding knowledge on existing shallow geothermal and thermal utilization is necessary, geothermal thermal water represents a promising future energy supply option.

In utilizing geothermal resources, Kyoto City should consider next-generation geothermal concepts currently under national evaluation. Research and examination should be advanced at an early stage to explore all possibilities for energy supply stability and the realization of Carbon Neutrality.

# Austrian Biomass Association

Akihide Tanaka

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## 1. Study Visit Destination and Purpose

・Austrian Biomass Association
(Investigation into the Utilization of Biomass Energy)

## 2. Study Visit Details

Following visits in FY2012 and FY2016, this Study Visit represents the third study visit regarding renewable energy. On each occasion, initiatives concerning biomass have been investigated. In FY2012, biomass power generation facilities in Germany were inspected; in FY2016, biomass pretreatment facilities and biogas plants in Denmark were examined. For this Study Visit, the delegation learned about the initiatives undertaken by the Austrian Biomass Association.

(1)Austria's Biomass Policy

First, Mr. Christoph Pfemeter, President of the Austrian Biomass Association and Bioenergy Europe, provided an explanation regarding the current state of biomass utilization and biomass strategies in Austria.

○ Biomass Utilization in Austria

In Austria, biomass energy, hydroelectric power generation, and solar power generation have been growing. It is anticipated that fossil fuel consumption will be reduced by more than half by 2030 and reach zero by 2050. Furthermore, according to surveys conducted by the Austrian Biomass Association, regions capable of food self-sufficiency can produce up to 50% of their own energy needs.

Austria is a small country with a population of 9 million and an area of 84,000 km², with approximately 50% covered by forests. Against the backdrop of these abundant forest resources, wood accounts for 80% of domestic biomass, primarily utilized for heat production. In traditional mountain homes in Austria, firewood and wood chip stoves have historically been used, driven by the advantage that wood is cheaper than oil or coal as a fuel. Initially, firewood stoves were mainstream; subsequently, the development of wood chips eliminated the labor of hauling heavy firewood, and the subsequent development of wood pellets allowed even those without access to forests to utilize such stoves. Additionally, as production and distribution systems have matured, the convenience gap compared to oil has disappeared.

The next stage was District Heating, which supplies hot water from a single boiler to surrounding areas. This approach has shown an increasing trend in recent years, with approximately 2,500 facilities operating in Austria. While electricity and Combined Heat and Power (CHP) require

continuous government support through Feed-in Tariff (FIT) schemes, District Heating requires initial capital investment; however, once funded through donations or subsidies, it becomes capable of self-sustaining operation, creating a system that generates local revenue. Furthermore, District Heating offers the benefits of keeping sales revenue within the local economy and creating local employment.

Mr. Pfemeter emphasized that the most crucial factor for developing bioenergy is having experts who do not remain solely in research laboratories, but actively dialogue with farmers and deeply understand field conditions.

○ Biomass Strategy (Key Investigation Results, etc.)

The volume of $CO_2$ circulating in nature is significantly larger than generally assumed, and much biomass currently remains unutilized and abandoned. In Austria, utilizing just 7% of this natural cycle generates 18% of domestic energy demand. Furthermore, without bioenergy, the production of food, animal feed, and textiles would be unsustainable, and energy transition would be impossible; this reaffirmed the high potential and importance of biomass.

In the past, Austria was required to import oil from foreign countries, causing money to flow out of the nation. By transitioning to locally sourced bioenergy, money now remains within the local economy. In addition, approximately 60% of bioenergy prices consist of workers' wages.

Regarding biomass demand by sector, agriculture ranks first, followed by households second, District Heating third, and power generation fourth. Buildings in Austria are predominantly constructed of concrete or brick, with insulation strategies such as expanded polystyrene applied to exterior walls. In addition, due to recent impacts of global warming, winter cold has moderated, leading to a declining trend in heating thermal demand. Meanwhile, because abundant forest resources exist within the country, a sufficient volume of biomass is secured.

○ Regional Networks

Numerous organizations participate in regional networks concerning wood energy. The World Bioenergy Association aims to achieve Carbon Neutrality globally; Bioenergy Europe works primarily on establishing regulatory and legal frameworks for this purpose; and the Austrian Biomass Association focuses mainly on evaluating national subsidy systems.

Below these organizations are local regional entities, whose role is considered extremely vital in achieving Carbon Neutrality. Without the consensus and conviction of local residents, strategies cannot function effectively. In local regions, advancing initiatives under local leadership is indispensable. Key priorities include ensuring energy supply security, exchanging knowledge and technology, and planting tree species adapted to a changing climate.

Regarding network expansion, partners exist beyond Europe in countries such as Canada, and expectations were expressed that partners might also be established in Japan.

Finally, Mr. Pfemeter strongly stated, "We have experienced numerous failures in the past, but there is immense value in learning from failures, and we wish to pass these lessons on to the next generation."

(2) The Bioenergy Economy

Next, Mr. Christian Rakos, President of the World Bioenergy Association, explained how to develop the bioenergy economy and the mindset necessary for making these initiatives successful.

To make bioenergy successful, selecting "simple and user-friendly technology" is vital, as complex systems increase the risk of failure. Having experienced experts handle project planning is extremely important. Furthermore, three essential elements are required for a project to succeed: energy "users," reliable "suppliers," and "public support."

First, regarding technology, Austria has developed bioenergy technology over approximately 40 years. Today, many facilities achieve thermal efficiencies exceeding 90% while emitting almost no exhaust emissions.

Experience in Austria indicates that "failure in planning leads directly to the failure of the entire project." Because biomass possesses characteristics entirely different from petroleum, assigning inexperienced experts increases the likelihood of failure. Therefore, beginning the initial project at an appropriate, profitable scale without overcomplicating the design is the secret to success.

In Austria, 80% of projects involve thermal supply, utilizing primarily wood chips or pellets as fuel. The characteristics of each are as follows:
・Wood Chips: Easy to produce, but quality varies and distribution presents challenges.
・Wood Pellets: Production costs are higher than chips, but quality is stable and distribution is easy.

Mr. Rakos advised that while Japan currently imports large quantities of pellets for power generation, domestic production should be pursued in the future, and considering profitability, project scales of 100 kW or larger should be examined.

Next in importance are energy users, targeting public facilities (city halls, schools, hospitals), apartments equipped with central heating, and businesses requiring large amounts of heat, such as food manufacturing and dry cleaning services. Key advantages motivating these users to choose biomass energy include climate friendliness, "low and stable energy costs," "keeping money in the local economy without relying on imports," and "protecting healthy forest conditions." In promoting bioenergy in Austria, "agents of change" played a crucial role; local representatives, experts, or organizations like the biomass association functioned as bridges with users and providers of technical expertise.

Equally important are motivated enterprises willing to produce and supply energy. In Austria, farmers and forestry operators took the lead, successfully building businesses by utilizing unused timber and wood residues from sawmill processes.

Finally, the importance of public support in initial stages was explained. Concrete examples include supporting activities of "agents of change," local governments acting as direct users in public facilities, providing subsidies, loan guarantees, and facilitating bank financing. Furthermore, organizing events to explain project significance, holding study tours of precedent cases, and political leaders actively communicating the importance of bioenergy were emphasized as highly effective.

(3) Key Questions and Answers

Following the presentation, a question-and-answer session was held. The key exchanges were as follows:

Q1: Is there active debate regarding the potential utilization of nuclear power?
→ Nuclear power is not a topic of discussion in Austria.

Q2: Are there plans to utilize non-forest biomass?
→ While agricultural waste is attracting attention in China and India, Europe prioritizes wood materials from a quality perspective.

Q3: What is the perspective regarding $CO_2$ emissions from burning wood?
→ $CO_2$ originally exists in the atmosphere; plants absorb $CO_2$ during growth and return that $CO_2$ to the atmosphere when burned, representing a natural cycle. Burning coal extracts underground carbon and emits external $CO_2$. In contrast, wood involves only above-ground cycling. Maintaining a balance where consumed resources are regenerated is essential; ideally, planting two trees for every one burned is most desirable.

Q4: What figures or metrics are presented in Austria to gain public understanding regarding $CO_2$ reduction?
→ First, strategies must be formulated after conducting public opinion surveys. Subsequently, dedicated efforts are required to explain the pros and cons of conventional fossil fuel usage versus alternative fuel transitions. Public opinion surveys are conducted every 10 years.

Q5: In Japan, gas pipelines are widespread, and gas is mainstream for thermal energy. Is transitioning from gas to biomass difficult?
→ Biomass can only cover a portion of total demand; therefore, it is necessary to examine which

parts of the overall system yield the highest profitability when converted to biomass. Industrial applications requiring large amounts of heat offer higher profitability than residential applications. Furthermore, under Austrian law, biomass waste cannot be disposed of directly and must be utilized. In developing biomass strategies, Japanese data could be analyzed, and experienced biomass companies could be introduced. Sharing the process of data collection and outcome derivation in Austria can serve as a reference for strategy formulation.

Q6: What measures should be taken to promote biomass in Japan, where electricity and gas infrastructure are already well-established?

→ Achieving success is not simple. Even in Vienna, the biomass ratio stands at only 10%. While biomass is widespread in rural areas, large cities like Vienna must import resources, as local energy self-sufficiency is unattainable. Political strategies must be carefully evaluated.

### 3. Observations and Impressions

In Austria during the 1970s and 1980s, energy policy caused deep national division on two major issues: whether to operate nuclear power plants, and whether to construct large-scale hydroelectric plants in forest areas rich in biodiversity. Following a national referendum in 1978, the decision was made not to operate nuclear power, leading to plant closures; nuclear power remains off the table in national policy today. Similarly, opposition movements led to the cancellation of proposed hydroelectric plant construction.

As felt in the previous two Study Visits, achieving self-sufficiency in food and energy contributes to resolving climate change, economic, and employment challenges, while helping prevent conflict and terrorism. This requires advancing energy conservation, improving energy efficiency, and transitioning from imported fossil energy to domestically available renewable energy. Within this framework, this Study Visit reaffirmed that utilizing biomass is essential for revitalizing agriculture and forestry.

However, even in Austria, biomass accounts for only about 10% in major cities like Vienna, representing a challenge shared by Kyoto City. As recommended during the first Study Visit, initiating efforts in mountainous areas to effectively utilize timber and achieve energy self-reliance holds substantial value. Especially amid concerns over oil shortages influenced by Middle Eastern affairs, transitioning energy sources and promoting agriculture and forestry must be pursued to mitigate climate change and global warming.

# Aspern Seestadt and HoHo Wien

Takanori Tanaka

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## 1. Study Visit Destination and Purpose

・Aspern Seestadt
(Investigation of smart city concepts, environmentally conscious urban development, etc.)

・HoHo Wien
(Investigation of high-rise timber building)

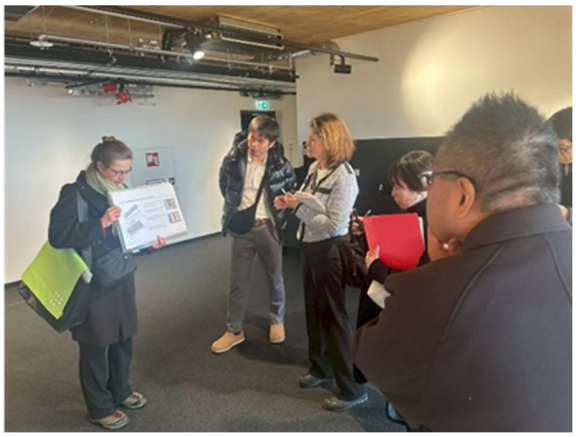
## 2. Study Visit Details

(1) Concept of Aspern Seestadt: Technology as a Support for Daily Life

Under construction on the site of a former airfield in northeastern Vienna, "Aspern Seestadt" is not merely a new residential development. In response to rapid urban growth—with Vienna's population increasing from 1.5 million in 1980 to over 2 million in 2023—the Vienna City Council decided in 2003 to develop this area as a sustainable district providing "a place for new living."

The most defining feature of Aspern Seestadt is that technology is not pushed to the forefront, but naturally blended into the cityscape and daily life. While smart cities often evoke images of sensors and monitors lining every street, this district positions advanced technology as a "behind-the-scenes supporter of daily life." It maintains an approach to urban development where residents can naturally enjoy convenience and comfort without being consciously aware of the underlying technology.

The following sections explore the mechanisms supporting Aspern Seestadt through its "Four Innovative Pillars," examining how these concepts can be integrated with Kyoto's preserved historical wisdom and cityscape to evolve into a next-generation urban model.



(2) The "Four Innovative Pillars" Shaping Aspern Seestadt

① Mechanism for Self-Sufficient and Shared Energy (ASCR)
Buildings in Aspern Seestadt are not merely residential spaces that passively receive and consume electricity and gas from external sources. The buildings themselves function as living infrastructure, utilizing solar power generation and geothermal energy to create, store, and share energy within the community.

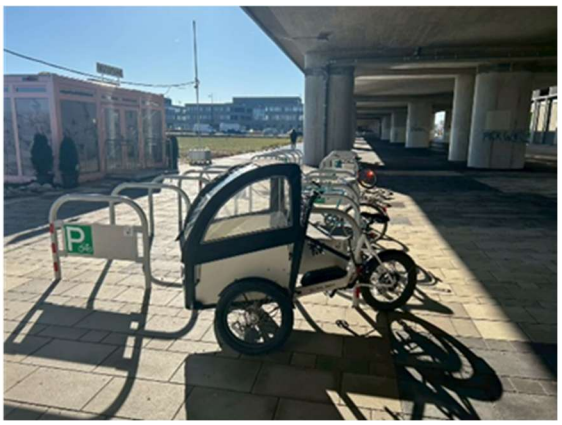
At Aspern Smart City Research (ASCR), a joint public-private research organization, building management systems operate in real-time integration with electricity market prices and weather forecasts. For example, if fair weather and high solar generation are predicted for the following day, battery storage is adjusted during the night to automatically optimize energy operations at the lowest cost.

Furthermore, a geothermal energy facility drawing heat from 3 kilometers underground is planned to heat approximately 5,000 households, advancing community-wide heat sharing mechanisms. By enabling buildings to share surplus electricity, the entire district functions like a giant storage battery, providing resilient disaster prevention capabilities that enhance energy autonomy during emergencies.

② Making "Free Mobility" as Natural as "Vehicle Ownership" (Transportation Network Transformation)
In Aspern Seestadt, cars are not forcibly excluded; rather, an environment is strategically created where residents naturally feel that "living without a car is overwhelmingly more convenient and enriching." This is guided by target modal split figures: 40% public transport, 40% walking/cycling, and 20% private vehicles.

According to explanations by Ms. Konecny, the Study Visit coordinator, the district is designed as a "15-minute city," where daily necessities can be reached within a 15-minute walk. Centered around an underground railway (U-Bahn) station and consolidating large shared parking structures at the entrance of the district, street parking inside residential areas has been eliminated, realizing a safe, quiet space centered on pedestrians and cyclists.

Crucially, emphasis is placed on making the journey from home to the station enjoyable. In addition to smartphone-based reservation and payment systems for all mobility modes, details such as sidewalk widths, bench placements, and street lighting are designed to allow elderly residents and children to enjoy walking itself. Shared mobility hubs, such as bike-sharing stations, are meticulously positioned along resident traffic lines, creating an environment where comfortable mobility is achieved without owning a private car.



③ City-Wide Stormwater Management (Sponge City)
Overturning conventional urban planning that seals ground surfaces with concrete and asphalt, this innovative stormwater management approach treats the entire city as a natural water-retention mechanism.

The most striking feature observed during the visit was the expansive artificial lake in the center of the district. Ms. Konecny noted: "While traditional urban development placed the church at its center, modern diversity calls for a lake where everyone can gather freely regardless of religion." This choice symbolizes contemporary urban coexistence.

In connection with this lake, specialized storage layers installed beneath roads retain rainwater underground rather than immediately routing it to sewers. This moisture nourishes street trees, whose summertime transpiration lowers overall district temperatures by 2–3° C. This provides advanced disaster prevention capabilities, dramatically reducing sudden loads on sewer systems during heavy rainstorms and preventing urban flooding. Furthermore, permeable paving materials facilitate natural water infiltration, preserving urban groundwater levels.

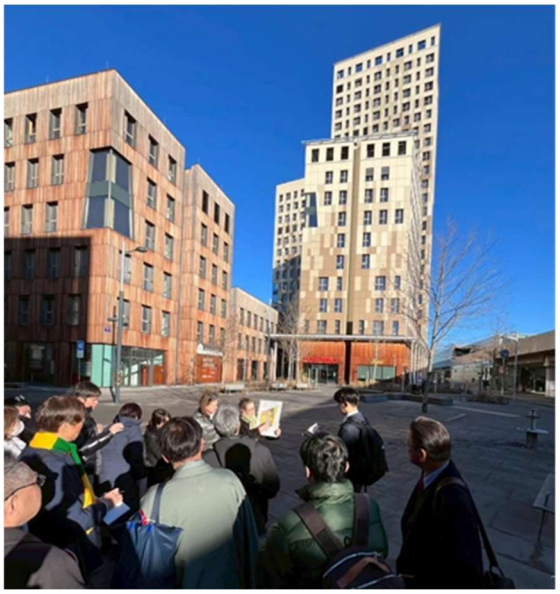
④ Urban Environmental Contributions Through Timber Technology (HoHo Wien)
Serving as a district landmark, the 24-story, 84-meter-tall timber building "HoHo Wien" embodies the vision of Aspern Seestadt using state-of-the-art mass timber technology (Cross-Laminated Timber: CLT). Constructed primarily of timber, the building reduces $CO_2$ emissions by 2,800 tons compared to a conventional reinforced concrete (RC) structure.

Utilizing Austrian spruce (a coniferous softwood), prefabricated components assembled in factories were joined on-site, shortening construction periods while maintaining high quality. Factory fabrication protected site workers from rain and cold, providing better working conditions.

Furthermore, lower humidity levels in factory environments allowed interior work to commence immediately upon structural completion.

Fire safety measures include thorough design features, such as thick structural columns capable of withstanding fire for 90 minutes without collapsing, multi-level smoke sensors, and emergency stairwells housed within a reinforced concrete core.

For Kyoto, where forests cover over 70% of the municipal area and a wood culture has been cherished, this facility offers significant insights for balancing traditional aesthetics with environmental load reduction.



### 3. Observations and Impressions

(1) The Future of Kyoto: Community Coexistence
What resonated most deeply during the Study Visit of Aspern Seestadt was the deliberate consideration for human diversity. Housing options range from low-rent public apartments (around 8 euros per square meter) to high-quality owner-occupied units, intentionally mixed so that students, young families, and elderly residents greet one another on the same street corners.

Kyoto shares similar realities: it is a student city with many universities, holds traditional local communities, and faces rapid population aging. Moving beyond "dormitory towns," Aspern

Seestadt places workplaces, schools, and cultural facilities within walking distance. Similarly, Kyoto must leverage digital technologies across its existing new towns and local districts to re-examine the value of time spent living in these communities.

As Ms. Konecny stated, "Users must also be smart." Mechanisms to help residents utilize modern smart options are essential. Examples include university students supporting elderly residents through technology, community networks supporting students, and efficient delivery services coordinated with local shopping streets. These represent practical steps learned from Aspern Seestadt's social sustainability.

(2) Overall Summary: "Compassionate Technology" Opening Kyoto's Future

The essence of a smart city, as demonstrated by Aspern Seestadt, lies not merely in applying advanced digital technology, but in the fundamental urban development attitude: "How deeply can technology express care for human lives?"

By consistently adopting a "human-centric" philosophy, Kyoto can respect its rich historical heritage while leveraging modern technology to remain close to the daily lives of individual residents, becoming the world's most warm and welcoming advanced city. Implementing insights gained from Aspern Seestadt tailored to Kyoto's local characteristics involves the following key priorities:

① Building High-Efficiency Ground Transportation Networks

Building entirely new transportation infrastructure in Kyoto presents fiscal and environmental challenges. However, drawing inspiration from Aspern Seestadt reveals solutions that maximize existing road networks. Specifically, digital technologies can control existing traffic flows, connecting major stations with surrounding residential areas via high-efficiency transit networks that minimize signal delays. Implementing this step-by-step will allow residents living away from railway stations to travel smoothly and stress-free without relying on private cars, enhancing quality of life across Kyoto.

② Creating New Value Through Harmony Between Landscape and Technology

Kyoto's greatest asset is its preserved historic streetscapes. The methodology of blending technology into the landscape, as practiced in Aspern Seestadt, holds immense value for Kyoto. Examples include introducing highly efficient solar panels designed to blend naturally into traditional townscapes without impairing visual aesthetics, or using digital controls to enhance

indoor comfort based on traditional Machiya wisdom.

③ Transforming "Rain Garden" Culture into Disaster Prevention Infrastructure
Kyoto has long cultivated a "rain garden" culture, capturing rainwater within garden landscapes to enjoy refreshment and cooling. Aspern Seestadt's Sponge City concept reproduces this wisdom of valuing water on a city-wide scale using modern civil engineering. Expanding rainwater management mechanisms in alleys and parks can mitigate basin summer heat and protect citizens from torrential rains, elevating traditional water culture into modern wisdom for environmental management and disaster resilience.

④ Conclusion: A Clear Guidepost for World Leadership
Rather than viewing infrastructure constraints negatively, Kyoto can refine its existing urban strengths using modern technology, enhancing walking enjoyment and residential peace of mind. Adapting lessons learned from Aspern Seestadt to Kyoto's unique character will serve as a clear guidepost for leading future global urban development.

This Study Visit provided firm confidence in Kyoto's potential. Translating this confidence into concrete policies will allow us to shape an attractive Kyoto alongside its citizens, proudly passing it on to future generations.

# Vienna City Council

Nobumasa Nishiyama

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## 1. Study Visit Destination and Purpose

・Vienna City Council
(Investigation of Vienna's climate strategy toward Climate Neutrality by 2040, balancing quality of life with economic development, collaboration with citizens, and mechanisms for behavioral change and dialogue)

## 2. Study Visit Details

○ Overview of the City of Vienna

The City of Vienna is the capital and a federal state of the Republic of Austria. It covers an area of 415 km² with a population of 2 million, achieving a population growth rate of over 10% in the past decade. Green spaces account for more than 50% of its total area.

Vienna is one of the world's leading historical and cultural cities, having flourished as the imperial capital of the Habsburg Dynasty, and is internationally renowned as the "Capital of Music." As a global city, it hosts numerous multinational corporations and regional offices of the United Nations. With 23 universities, it is also a university city home to approximately 200,000 university students. Furthermore, it holds a leading position in numerous global city rankings, including the "World's Most Liveable Cities."

○ Governance of Vienna

While serving as the federal capital, Vienna is unique in being the only city-state among Austria's nine federal states. As a local government entity under Article 108 of the Federal Constitution of the Republic of Austria, the Vienna City Council performs the functions of a state parliament, and the Mayor simultaneously exercises the functions of a state governor.

The Vienna City Council consists of 100 members elected for five-year terms, who concurrently hold seats as state parliament members. The Mayor (State Governor) is elected by the City Council and forms a cabinet, creating a system close to a parliamentary cabinet system between the legislature and executive branch. Although meetings of the City Council and the State Parliament consist of the same members in the same chamber, they are held as separate sessions.

○ Vienna-Specific Circumstances

When considering Vienna's global warming countermeasures, numerous circumstances differ significantly from those in Japan:

- In Austria, Renewable Energy accounts for approximately 90% of electricity supply (dominated by hydroelectric power), with fossil fuels making up the remaining 10%.
- District Heating—utilizing heat from waste incineration and power generation via pipeline networks to supply buildings with heating and hot water—is widely adopted, connecting over 40% of households across a total network length of approximately 1,300 km.
- Approximately 220,000 municipal housing units and 20,000 subsidized housing units exist, housing about 50% of the city's population. New districts are developed around public housing, aligning with environmental policies to promote energy conservation, retrofitting, and connection to District Heating.
- Austria previously imported substantial volumes of gas from Russia; however, following Russia's invasion of Ukraine, gas prices rose up to fivefold. Concerns over potential gas supply

disruptions served as a major catalyst for accelerating energy transition.

・While global warming has moderated winter temperatures, summer days exceeding 30° C have increased. Heating is predominantly gas-based, while air conditioning is not yet widely adopted, leaving many residents without cooling during summer.

○ Vision for Energy Transition

Vienna's vision for energy transition focuses on five key pillars:

・Utilizing 100% environmentally friendly energy for heating and cooling.

・Employing community-wide heat supply systems in densely built urban areas.

・Sourcing central District Heating primarily from Renewable Energy and waste heat from factories.

・Utilizing building-specific Renewable Energy systems in less densely populated areas.

・Utilizing green gas in industrial sectors and power plants.

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○ Greenhouse Gas Emissions and Heating Status

In Vienna, transportation accounts for the largest share of climate-neutral target greenhouse gas emissions at 42%, followed by the building sector at 30%. Within the building sector, decentralized gas heating accounts for 16%, central gas heating 10%, and heating oil 4%—meaning gas heating systems account for approximately 90% of building sector $CO_2$ emissions.

Out of approximately 1.5 million gas-heated households nationwide in Austria, Vienna alone accounts for approximately 600,000 households (40%), making it the nation's largest target area for gas phase-out. Consequently, Vienna's initiatives are vital to achieving national targets.

Currently, approximately 400,000 households in Vienna utilize climate-friendly heating. The remaining 600,000 households consist of approximately 500,000 decentralized gas-heated units,

70,000 central gas-heated units, and 30,000 central oil-heated units. Converting the 500,000 decentralized gas-heated households (individual units with independent heating) to climate-friendly heating represents the greatest challenge.

○ Infrastructure Transformation for Gas Phase-Out

Transitioning away from gas involves large-scale infrastructure changes and substantial physical space requirements. Key infrastructure transformations planned in Vienna include:

・Retrofitting 70,000 buildings within a circular economy framework.
・Converting heating equipment in 600,000 residential units to heat pumps or District Heating.
・Expanding District Heating pipelines by an additional 420 km, alongside deploying deep geothermal energy facilities and large-scale heat pumps.
・Advancing electricity-heat integration by adding 4,000 km of electrical cabling, expanding electric vehicle charging stations, and adding 3,000 substations.
・Targeting 800 MWp of solar power generation by 2030.

○ "Raus aus Gas" (Out of Gas) Program

Strategies have been formulated to achieve climate-neutral heating and cooling in buildings by 2040. Phasing out approximately 600,000 gas boilers presents significant conversion challenges due to the 500,000 decentralized units; nevertheless, transitions toward District Heating, heat pumps, and Renewable Energy are targeted for 2040.

The RAG Program is divided into two phases: RAG1 (2023–2025) focuses on foundational preparation, process adjustments, market promotion, pilot retrofits, and public relations. RAG2 (2026–2040) will focus on large-scale rollout, monitoring markets, research, and innovation, reviewing processes, and making necessary adjustments.

○ Framework Conditions and Legal Foundations Established in RAG1 (2023–2025)

・Legal Framework: Revisions to the Vienna Building Code mandated the use of Renewable Energy in new construction, expansions, alterations, and heating system retrofits.
・Database Construction: Revisions to the Vienna Gas Act and Vienna Fire Police Act enabled the creation of an accurate database identifying building gas installations, facilitating targeted gas phase-out planning.
・Subsidy Systems: An additional budget of 112 million euros was allocated for subsidies focused

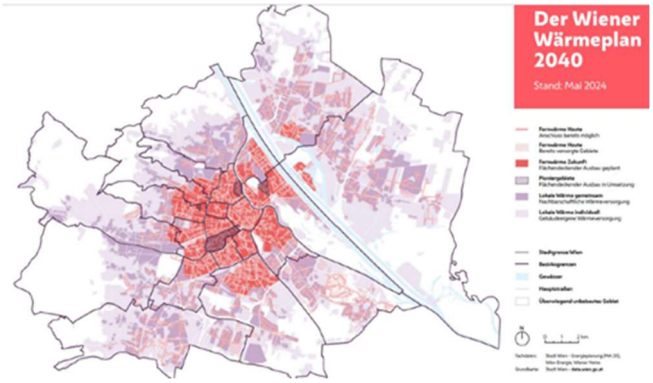
on decarbonization and the circular economy.

・Consultation Services: Consultation desks for housing information and energy consulting were enhanced.

○ Vienna Heating Plan 2040 (Wiener Wärmeplan 2040)

To transition all heating and hot water in Vienna to Renewable Energy by 2040, a plan designating optimal heat supply methods by district for existing buildings was formulated. Covering the replacement of roughly 600,000 gas boilers, this plan serves as a guide indicating to residents which heating method is best suited for their specific building.

Plan maps use color-coding to designate: 1) District Heating in densely populated areas, 2) Shared District Heating (small-scale local grids), and 3) Decentralized Heating in low-density areas. Furthermore, four pioneer areas serving as models for future city-wide rollout are identified.




○ Progress of Energy Transition

・Large-scale introduction of District Heating via geothermal energy (Geothermie): Through "deeep," the joint venture between OMV and Wien Energie, deep geothermal drilling to 3 km underground commenced in winter 2024/25. Geothermal heating will be supplied to 20,000 households starting in 2028, with potential expansion to 200,000 households.

・Operation of heat pumps utilizing sewage treatment wastewater: In 2023, one of Europe's largest heat pumps began operating in the Simmering district. Utilizing wastewater from sewage treatment, it is scheduled to supply District Heating to 112,000 households by 2027.

・New heat pumps utilizing residual exhaust gas heat from waste incineration: While the Spittelau Waste Incineration Plant has traditionally supplied District Heating, new heat pumps constructed in 2025 utilize previously discarded exhaust gas heat to supply District Heating to an additional 16,000 households.

・Gas turbines operating on hydrogen: At the Donaustadt Power Plant, gas turbines successfully operated on hydrogen for the first time.
・Heat Pump Expansion: Adoption of heat pumps utilizing air, geothermal energy, groundwater, and waste heat is expanding. Because heat pumps increase electricity demand, power grid upgrades are being implemented.


○ Advanced Case Studies
・"100 Out of Gas" Projects: Recognizing that energy conservation is as vital as energy generation, building retrofits have progressed, accompanied by a published booklet detailing 100 project examples. This booklet serves as a guide demonstrating optimal decarbonization methods for various building conditions. For example, a retrofitted apartment building constructed in 1904 achieved over 70% reduction in heating demand using insulation, insulated windows, solar panels, and air-source heat pumps while preserving the historic structure.
・Vienna's 22nd District: A 160-unit residential complex in the 22nd District utilizes ceiling heating and cooling powered by heat pumps and geothermal probes. Achieving over 90% Renewable Energy, it realized significantly lower energy costs than conventional systems.
・Aspern North Educational Campus: Completed in 2019 in the Aspern development area, this campus houses facilities from kindergarten to school, serving 1,400 students and 200 staff. Equipped with local renewable heating and cooling, indoor temperatures remain at 23° C even during 35° C summer heat. Solar panels generate power for electricity and internet needs. Achieving 95% energy self-sufficiency without fossil fuels, heating and cooling costs are less

than one-quarter compared to gas.

・Sports Arena: Completed two years ago with a seating capacity of 3,000, this sports arena utilizes 100% local Renewable Energy for heating and cooling. While gas heating would cost approximately 300,000 euros annually, current costs remain around 20,000 euros.



©wienholding/David Bohmann

○ Promoting Public Understanding and Public-Private Collaboration

Efforts to gain public understanding focus on communicating the importance of energy transition and sharing success stories to alleviate public concerns. Environmental education has been conducted in schools for over 30 years, teaching the importance of environmental protection and waste separation. Furthermore, amid worsening summer heat, thermal insulation, greening, and heat pump expansion are advanced in alignment with urban climate adaptation, improving living environments and enhancing public acceptance of energy transition policies.

Additionally, Vienna operates the "Wiener Klimateam" (Vienna Climate Team), a participatory system where citizens propose local climate ideas. Following feasibility evaluations, citizens co-create actionable projects with the administration, and randomly selected citizen juries make selection decisions, with the administration taking responsibility for execution.

In public-private collaboration, waste heat from Manner's wafer baking process supplies heating and hot water to 600 households, achieving a $CO_2$ reduction of 1,000 tons annually (equivalent to emissions from 240 single-family homes). As energy transition progresses, gas companies have adapted without public compensation by shifting business models to manufacture heat pumps and engage in Renewable Energy.

○ Results and Challenges Identified from the Study Visit

The City of Vienna has formulated highly precise and actionable plans, including the "Vienna Heating Plan 2040" designating optimal thermal supply methods by area, and comprehensive gas installation databases. Renewable energy technologies less common in Japan, such as geothermal utilization and District Heating, are widely deployed, while building regulations and expanded subsidy systems steadily advance insulation retrofits. Furthermore, innovative participatory mechanisms like the "Wiener Klimateam" foster collaborative climate action between citizens and administration.

Because energy supply structures, housing conditions, public housing ratios, and municipal roles differ significantly between Vienna and Kyoto, Vienna's methods cannot be directly applied to Kyoto City. However, Vienna's experience demonstrates that achieving Climate Neutrality requires accurately assessing current conditions and building precise, concrete plans tailored to regional characteristics.

Strengthening public-private and national partnerships to present tailored plans for Kyoto is essential. Evaluating regulatory frameworks, expanding subsidy systems, enhancing global warming countermeasures in municipal facilities, and driving policy through citizen participation remain crucial.

Furthermore, just as concerns over energy shortages following Russia's invasion of Ukraine accelerated Austria's energy transition, current geopolitical risks surrounding the Strait of Hormuz underscore the importance of energy self-sufficiency for Japan, highlighting the need for continued study into Renewable Energy adoption.

## 3. Observations and Impressions

Like many cities globally, Kyoto City is advancing initiatives toward Net Zero Greenhouse Gas Emissions by 2050. However, the City of Vienna brought its target forward by 10 years, aiming for Climate Neutrality by 2040. Because the Vienna City Council also serves as a State Parliament, it possesses legislative authority to enact state laws. In March 2025, it passed the Vienna Climate Act, marking Austria's first state-level climate change law.

During deliberations, one council member declared: "We are passing a landmark law for Vienna's climate policy that serves as a model for Europe. This is not merely a declaration; we will take action."

While some council members acknowledged that "achieving the 2040 neutrality target will require immense effort," their strong determination to succeed was evident. Another member shared a vital perspective: "It is crucial to remove asphalt and increase green spaces wherever possible." Across various Study Visit sites, representatives emphasized that achieving targets depends on "political decision-making," reaffirming the responsibility elected officials bear in protecting the environment for the future.

The presentation material provided by the Vienna City Council concluded with a quote from John F. Kennedy: "Action moves us forward while others are only talking." As a member of the Kyoto City Assembly, I remain committed to acting decisively toward Climate Neutrality to protect the future of our planet.

# Wiener Stadtwerke

Yasuhiro Sakurai　　Hiroyuki Michihata

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## 1. Study Visit Destination and Purpose

・Wiener Stadtwerke

(1) Investigation of sustainable public transport

(2) Investigation of decarbonization in the energy and infrastructure sectors

(3) Investigation of support for decarbonization startups at Climate Lab

(4) Investigation of the Vienna Heating Plan

(5) Investigation of district cooling strategies


## 2. Study Visit Details

＜Wiener Stadtwerke＞
Wiener Stadtwerke is Austria's largest infrastructure operator, 100% owned by the City of Vienna, and participates in all major urban planning projects.

As Austria's largest investor, the company plans to invest approximately 10 billion euros over the next five years, with the majority dedicated to achieving Carbon Neutrality. Half of this investment is allocated to public transport, particularly high costs for subway extensions. In the energy sector, the company focuses on wind power generation, while aiming to utilize groundwater and geothermal energy for thermal supply.

In 2024, consolidated revenue reached 4.973 billion euros (approx. 914 billion yen). Annual profit fluctuates between 200 million and 300 million euros. The company employs approximately 18,000 people, with roughly 10,000 working in the public transport division (subway, trams, and buses). In the energy sector, it generates and sells energy (electricity and heat), increasing investments in Renewable Energy in recent years while phasing out gas and fossil fuels. Additionally, it operates grid infrastructure (networks supplying power and heat), parking management, and funeral/cemetery services. Regarding sector profitability, the energy and grid infrastructure divisions generate substantial profits, whereas the public transport division shows low profitability due to subway operating deficits, despite municipal and federal subsidies.

Wiener Stadtwerke is actively working toward Carbon Neutrality by 2040. For example, to encourage shift from private cars to public transport, buses operate across extensive areas at affordable fares. In striving for Carbon Neutrality, the City of Vienna prioritizes "affordable energy," ensuring citizen understanding and cooperation.

(1) Sustainable Public Transport

WIENER LINIEN, the core entity of Wiener Stadtwerke, operates subways, trams, and buses in an integrated manner, serving as the backbone of Vienna's public transport system and carrying over 900 million passengers annually as one of Europe's leading transit operators. Subways and trams run on 100% green electricity (hydroelectric, wind, and solar within Austria), operating with high electrical efficiency by utilizing regenerative braking*1.

WIENER LINIEN currently operates nearly 500 buses, including 60 electric buses and 21 hydrogen buses, with the majority still diesel-powered. Toward 2040, alternative fuel options—electric or hydrogen—are being evaluated based on test run results. While hydrogen buses involve slightly higher energy costs than electric buses, they offer rapid refueling (approx. 12 minutes) similar to gas stations and longer driving ranges. The hydrogen currently used is green hydrogen, despite higher costs.

Multiple bus depots exist across Vienna, deploying suitable vehicle types by location. In southern Vienna, where routes are shorter and flat, electric buses are used; in northern Vienna, where routes are longer, hydrogen buses are deployed. Taking advantage of the high energy efficiency of electric buses while leveraging hydrogen buses on demanding routes (heavy loads, steep inclines, long distances) creates an optimal, zero-environmental-impact mix of bus routes tailored to specific line characteristics.

*1 A mechanism that uses the motor as a generator during deceleration to convert kinetic energy back into electricity.


(2) Decarbonization in Energy and Infrastructure Sectors

According to official explanations, heat production generates significant exhaust emissions. In Vienna, approximately 70% originates from gas power plants (supplying power and heat), 20% from domestic gas use, and 10% from waste incineration.


Due to recent building insulation retrofits and climate warming, future demand for heat production is expected to decrease.

While Vienna's District Heating currently relies heavily on gas for heat generation, future policy aims to replace gas with geothermal energy and large-scale heat pumps. Eliminating exhaust gases from waste processing facilities is difficult; therefore, carbon capture facilities are planned. Additionally, because solar and wind power generation depend on weather conditions, facilities to store surplus energy are being evaluated, with investments of 5.18 billion euros planned by 2030.

Because District Heating requires pipeline connections across multiple buildings to remain economically viable, adoption in public facilities and public awareness initiatives are being pursued. Locations for District Heating deployment are decided in consultation with the City of Vienna, considering resident interest. However, rather than expanding District Heating indefinitely, deployment focuses on high-efficiency areas, avoiding small-scale areas. Rather than mandating District Heating use, increasing efficiency to establish cost advantages and encourage voluntary participation was emphasized as essential.

In Europe, gas was previously purchased relatively cheaply; however, prices skyrocketed following the war in Ukraine. Currently, District Heating and gas prices are roughly equivalent, but gas prices are expected to rise higher in the future. This is because fewer users increase per-capita maintenance and repair costs, and the Austrian government plans to set prices based on $CO_2$

emissions, increasing prices for diesel and gas.

Additionally, small-scale District Heating using heat pumps needs promotion; however, high current costs limit widespread adoption. Nevertheless, costs are expected to decrease in the future.

The greatest challenge toward decarbonization is securing flexibility to supply power and heat even on windless, overcast days. Achieving this requires cultivating specialized experts, investing in large-scale heat pumps and geothermal energy, and securing legislative and political support.

(3) Support for Decarbonization Startups at Climate Lab

Established in 2022, Climate Lab serves as an innovation hub enabling collaboration among universities, startups, and large enterprises toward decarbonization. Climate Lab is not directly managed by Wien Energie, operating independently from a neutral standpoint.


Projects include corporate collaborations and startup partnerships addressing priority themes defined by Climate Lab.

Two concrete project examples were presented:

① Tool development to analyze and project $CO_2$ emissions prior to project implementation, allowing pre-evaluation of environmentally optimal options. This tool has been scaled up for general project use and provided to the "EU Taxonomy."

② At a three-day festival on Danube Island, green hydrogen replaced diesel fuel for stage sound, lighting, and food stall power, successfully achieving substantial reductions in diesel consumption.

(4) Vienna Heating Plan

Vienna's District Heating system is the third largest in Europe, featuring approximately 1,300 km of pipelines connecting major mains to central urban areas and individual households via distributors.

Toward Carbon Neutrality by 2040, expanding the District Heating network is underway. However, many homes in Vienna have small individual gas boilers. While buildings with central basement burners require agreement only from property owners, individual unit boilers require consensus from both owners and residents, necessitating legislative changes by politicians.

The City of Vienna formulated a heating plan designating areas for District Heating connection versus areas for heat pump adoption. Implementing future plans requires constructing an additional 400 km of pipelines; however, urban construction presents challenges due to high pedestrian and tourist traffic.

Furthermore, Vienna operates several sewage treatment facilities. Utilizing surplus heat from the largest facility via large heat pumps is projected to supply heat to approximately 21,000 homes.

In areas unconnected to District Heating, shared heat pumps across roughly 10 households are suitable for new constructions, though retrofitting existing buildings remains difficult.

(5) District Cooling Strategy

District Cooling supplies chilled water at approximately 7° C, primarily to factories, hotels, offices, and museums. Due to high installation costs, it is less suitable for general residential housing.

While cooling involves heat dissipation challenges, supplying chilled water eliminates such issues, requiring only about 20 $m^2$ of underground space. Conversely, providing equivalent cooling via rooftop units requires 300 $m^2$ of roof space and 100 $m^2$ of underground space.

With European summers growing warmer, District Cooling adoption is advancing. Vienna aims to become the "District Cooling Capital of Europe," conducting public awareness campaigns and anticipating completion of its 2030 network targets. Expanding the network improves efficiency and enhances supply stability through backup rerouting if a facility fails.

Vienna is also focusing on deep tech, planning District Cooling to cool local data center infrastructure. Currently, a heat exchange system utilizing Danube River water is under construction, expected to enable efficient cooling for large-scale buildings.

### 3. Observations and Impressions

○ Yasuhiro Sakurai

Wiener Stadtwerke, 100% owned by the City of Vienna, oversees core operating divisions: public transport, energy generation, and energy supply networks, serving as a massive municipal enterprise.

In technical presentations, multiple experts stated that "politicians advance and decide policy." Furthermore, remarks indicated that in pursuing Carbon Neutrality by 2040, "corporate strategy may shift depending on who governs the City of Vienna," demonstrating how political power structures and ideologies directly shape business execution. In other words, this enterprise functions as a powerful administrative tool to execute municipal policy. Discussing Austria's 2040 Climate Neutrality goals requires understanding its political system. Austria relies on federalism, proportional representation, and coalition governments, with Vienna's municipal government long led by the Social Democratic Party (SPÖ). Key social democratic policies emphasize public services and environmental enhancement; the strong determination observed across visit destinations likely stems from this political framework and established citizen consensus. However, ensuring corporate management transparency in the absence of external shareholders remains an ongoing consideration.

Regarding sustainable public transport, a key point is that Vienna's public transport accounts for

merely 1% of the city's total $CO_2$ footprint*2. This remarkably low environmental load reflects subways, trams, and electric buses operating entirely on Renewable Energy. WIENER LINIEN's mission to replace diesel buses to reduce transport environmental impact to 0% represents a noteworthy endeavor.

For Kyoto City, reducing the public transport $CO_2$ footprint toward 2050 Carbon Neutrality is equally vital. Following recent emergency recommendations, introducing electric buses at the Municipal Transportation Bureau and establishing roadmaps to phase out diesel buses—selecting electric or hydrogen buses by route like Vienna—is recommended. Pursuing decarbonization requires decisive investment coordinated with national and prefectural governments. Furthermore, ensuring accountability and visual transparency for citizens will foster public understanding and support.

*2 An indicator showing the total greenhouse gas emissions (primarily $CO_2$) directly and indirectly emitted by an activity, organization, product, or city.

○ Hiroyuki Michihata

Through this Study Visit, it became evident that while Vienna's target of "Carbon Neutrality by 2040" is highly ambitious, it is grounded in extremely realistic strategies.

Particularly in energy and infrastructure decarbonization, the strategy accurately anticipates challenges such as weather dependency in Renewable Energy. Beyond setting ideals, the city steadily accumulates necessary technologies and investments, demonstrating strong commitment to decarbonization.

In startup support, framing decarbonization not as a mere regulatory burden, but as an opportunity for technological innovation and industrial creation, offers a vital perspective shared with Kyoto City's startup support focus.

Furthermore, the Vienna Heating Plan clearly categorizes areas for District Heating expansion versus alternative zones, selecting optimal methods based on regional characteristics and economic viability. This highly rational approach fosters trust and understanding among local residents.

A consistent takeaway from Wiener Stadtwerke's initiatives is that they extend beyond

environmental measures, pursuing a broader vision to transform urban structures into decarbonized models. Interconnecting heat, power, cooling, infrastructure, technological innovation, and industrial development toward 2040 Carbon Neutrality provided profound insights.

When Kyoto City evaluates water, sewage, public facilities, and energy utilization, it must look beyond aging infrastructure replacement and maintenance, adopting a clear perspective of achieving decarbonization and urban enhancement concurrently. Utilizing existing infrastructure, exploring regional heat utilization, and conducting technological demonstrations through university and corporate partnerships tailored to Kyoto's urban resources remain essential priorities.

Leveraging the insights gained from this Study Visit, I will continue striving to contribute to Kyoto City's decarbonization efforts.

# GIN Austria

Yoichi Nakano

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## 1. Study Visit Destination and Purpose

・GIN Austria (Global Incubator Network Austria)
(Startup Support Project)

## 2. Study Visit Details

【Overview of the Visited Organization】
GIN Austria (Global Incubator Network Austria) is an Austrian platform for supporting international startups, serving as a bridge connecting companies, investors, and accelerators between Asia and Europe.

Jointly managed by aws (Austria Wirtschaftsservice) and FFG (Austrian Research Promotion Agency), GIN Austria provides mentoring, networking, and financing support. Through its flagship programs, “GO AUSTRIA” and “GO ASIA,” it facilitates market access and innovation exchange between both regions.

○ Common Features Between Vienna and Kyoto
When considering the business attraction and entrepreneurship outreach in Austria and Vienna, the environment surrounding the city shares three major similarities with Kyoto City.

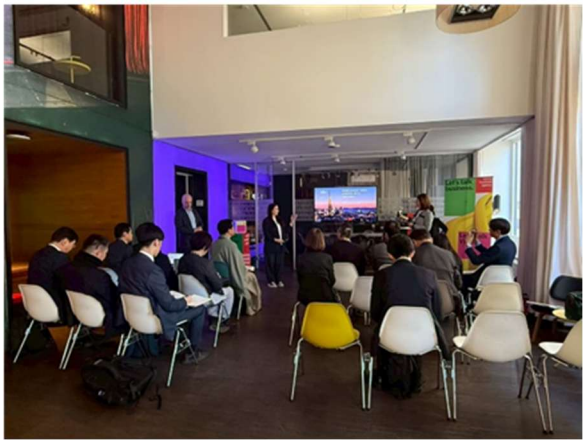

First, when Japanese or international entrepreneurs consider founding a business in

Europe, popular capitals like London, Paris, or Berlin are usually the first locations that come to mind; Vienna is relatively less mainstream. This mirrors Kyoto City's positioning relative to major Japanese centers like Tokyo, Osaka, or Fukuoka.

Second, Vienna possesses a rich historical and cultural heritage, offering abundant "opportunities to enjoy culture," making it a highly liveable and workable city. This aspect is identical to Kyoto City.

Third, located in central Europe, Vienna serves as an optimal midpoint with excellent transport access to neighboring countries and major cities. Kyoto City shares a similar transport advantage, allowing swift access to major metropolitan areas via the Shinkansen or JR lines.

Amid these shared circumstances, Vienna active promotes its unique appeal—framing its non-mainstream status as a distinct advantage—and collaborates across municipal and private sectors to present concrete reasons why entrepreneurs should visit and reside in the city.

○ Two Core Programs: "GO AUSTRIA" and "GO ASIA"

GIN Austria advances corporate attraction and entrepreneurship promotion primarily through two strategic directions:

・"GO AUSTRIA": Inviting global companies, including those from Asia, to Austria.

・"GO ASIA": Connecting Austrian companies with Asia.

＜"GO AUSTRIA"＞
The "GO AUSTRIA" initiative invites companies from around the world to Austria, strongly emphasizing the advantages and unique characteristics of founding a business in Austria and Vienna.

The underlying foundation rests on Austria's strong economic conditions and low unemployment rate.

Building upon this, Vienna provides an attractive business environment for startup support, focusing particularly on four key sectors:
1) Life Sciences (medical and health fields)
2) Digital Technologies (including quantum technology, AI, and cybersecurity)
3) Smart Production & Urban Technologies (including smart city development and circular economy solutions)
4) Creative Industries (cultural fields including music, opera, and fashion)

Support is delivered with long-term sustainability in mind, aiming to help founders maintain lasting operations. As a result, one-quarter of entrepreneurs who established bases in Vienna have successfully maintained ongoing operations.

Specifically, comprehensive support is provided through the "Vienna Startup Package," structured around three core steps:
1) Explore (challenging unknown territories)
2) Follow-up (delivering multi-faceted support)
3) Plus (the Austrian government subsidizes half of the setup costs)

While continuing business operations in Vienna for at least 10 years is a requirement, the support framework is exceptionally robust.

A primary focus sector for GIN Austria is Deep Tech—innovative technologies grounded in scientific discoveries or advanced engineering that aim to address fundamental societal challenges, such as decarbonization, AI, and healthcare. A defining feature of Deep Tech is its versatility across multiple fields. The Austria Research Promotion Agency (FFG) also provides substantial grant funding to support this domain.

For the GO AUSTRIA program scheduled for spring 2026, one Japanese company is slated to

participate, and an entrepreneur from Kobe is currently focusing on Vienna as a prospective hub.

＜Funding and Capital Raising＞
Regarding crucial capital raising, while government-backed support organizations exist in Austria, large Venture Capital (VC) firms are absent. Therefore, support agencies encourage investment by helping investors generate profits through their participation.

Without seed capital, promising ideas remain unrealized. GIN Austria actively facilitates matching between entrepreneurs and investors, creating countless opportunities for interaction to spark entrepreneurial chemistry.

Furthermore, at Climate Lab—a collaborative climate innovation hub working toward Vienna's climate goals—the "Start-up Scale-up Collaboration" program actively supports and assists pioneering environmental enterprises.

A critical need for any entrepreneur is connecting with investors. Without investors, startup growth stalls at the seed stage. Nurturing these seeds is essential.

Because individual entrepreneurs rarely meet investors in daily life, public administration plays a vital role. Leveraging administrative credibility, public agencies create and provide face-to-face meeting opportunities between entrepreneurs and investors.

Rather than holding annual events, these opportunities must be available continuously ("anytime, all the time"). This transforms accidental encounters with investors into inevitable connections.

Public administration possesses the necessary trust and platform-building capacity to facilitate these connections. To ensure successful encounters, providing physical infrastructure, digital tools, translation, and hospitality environments is indispensable.

In startup support, combining existing elements with novel approaches generates innovation. Infusing capital allows businesses to grow beyond administrative hands and develop naturally, fostering a thriving startup ecosystem.

＜GO ASIA＞
GIN Austria actively connects Vienna-based entrepreneurs with Asia.

Under the GO ASIA banner, the annual "GO TOKYO" event is hosted under the "Advantage Austria" brand, connecting Austrian entrepreneurs with Tokyo-based partners to foster new business creation. GIN Austria has previously matched Austrian ventures with a battery manufacturer in Kyoto.

However, at Tokyo events, the high volume of participating companies from Tokyo and surrounding areas can cause Austrian companies to be overlooked.

Conversely, events in the Kansai region feature fewer participating companies, allowing Austrian ventures to stand out effectively. Consequently, GIN Austria plans to place greater strategic emphasis on the Kansai region and Kyoto moving forward.

○ Vienna's Strengths as a Business Hub
A defining advantage of establishing a business in Austria and Vienna is the city's world-class Quality of Life.

For example, Vienna features an extensive, interconnected public transport network that makes travel exceptionally convenient. Affordable transit fares create an environment where seamless mobility is achieved without owning a private vehicle.

Furthermore, as a city rich in history and cultural heritage, Vienna offers abundant opportunities to enjoy culture, making its location value exceptionally high.

As official representatives noted, when attracting startups to Vienna, providing "comprehensive family support" is considered even more important than establishing a business presence. Vienna is presented not merely as a workplace, but as an ideal place to live, framing family support as an indispensable element.

Concrete family support measures include assisting with school searches for children, providing housing information, guiding social and medical insurance procedures, and locating pet-friendly housing. Additionally, referrals to tax accountants and lawyers are provided, covering fine-grained daily living needs.

Combined with relatively affordable rents compared to other European cities and direct public transport links, the nearby Aspern Seestadt development offers a compact "15-minute city" environment where daily necessities are accessible within a 15-minute walk.

International enterprises have taken note of GO AUSTRIA, with particularly high interest from Asia. In a single event cycle, over 150 applications were received from Asia; 15 ventures (including one Japanese entrepreneur) were selected to launch operations and receive support in Vienna.

Fostering a deep understanding of Vienna's unique features and appealing environment directly drives business setups and regional investments.

### 3. Observations and Impressions

For entrepreneurs founding a business in Vienna, the European market represents the primary target. However, unlike in the past, consumers do not need to reside locally. Rapid digital and

internet advancements mean target markets extend far beyond immediate geographic surroundings to global consumers. Consequently, wherever digital infrastructure is established, business founding and product development can occur.

Conversely, one constant remains unchanged: entrepreneurs and employees are human beings. Providing well-equipped workplaces alone is insufficient for human fulfillment, especially for accompanying family members.

Therefore, suitable living environments and Vienna's emphasized identity as a "place to enjoy culture" remain indispensable.

While the necessity of attracting businesses from this perspective has been recognized, its true importance has often been understated. Vienna fully grasps this priority, translating it into reality through developments like Aspern Seestadt. Providing comprehensive living environments alongside workplaces represents an impressive and visionary commitment to attracting global talent.

Furthermore, focusing on Deep Tech allows entrepreneurs to reside in Vienna while serving global markets online. Utilizing Vienna as a business stage while receiving tailored advisory support reflects a highly effective strategic model.

Observing these concrete initiatives highlighted the necessity for Kyoto City to adopt a similar mindset and support structure—providing thorough care for relocated entrepreneurs and their families.

When inquiring why some entrepreneurs with a strong interest in Japan ultimately chose not to establish bases there, responses indicated that while gaining experience and networks in Japan is valuable, adapting to cultural and customary differences proved challenging. Additionally, complex and time-consuming administrative procedures and permitting processes led some to abandon their plans.

As Kyoto City vigorously promotes entrepreneurship attraction, streamlining these procedural hurdles represents a crucial area for improvement.

＜Reference＞
On May 22, 2025, Knowledge Capital (General Incorporated Association) signed a Memorandum of Understanding (MOU) for mutual cooperation with Global Incubator Network Austria (GIN), a startup support project operated under the Austrian Federal Ministry of Labour and Economy.

Knowledge Capital serves as a core facility within Grand Front Osaka, aiming to create new value by fusing creativity and technology. Operated by Knowledge Capital Association and KMO Corporation, it fosters talent aggregation, visitor engagement, and value creation, contributing to Japan's cultural and economic development and global peace. Utilizing its physical space and human support capabilities, Knowledge Capital pursues four core objectives: 1) Industrial Creation, 2) Cultural Promotion, 3) International Exchange, and 4) Human Resource Development.

# VIII. Policy Recommendations for Kyoto City

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Takao Yoshida


Kazuhiro Terada

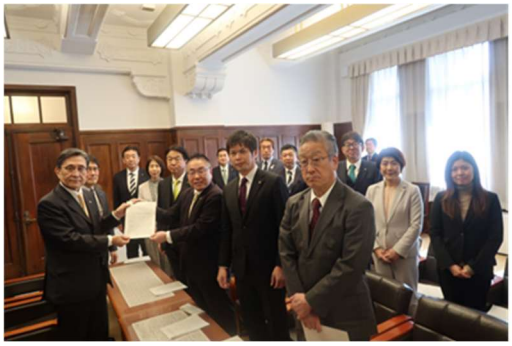

Masaki Kubota


Yuko Kawashima

To leverage the experience and insights gained from this overseas administrative study visit for future Kyoto City policies upon returning to Japan, our delegation—led by four members responsible for policy recommendations—held extensive discussions and submitted recommendations to the Mayor of Kyoto on two separate occasions as detailed below.

**1. Submission of Urgent Recommendations** (March 4, 2026)

Immediately following our return, urgent recommendations were submitted so that the experience and knowledge gained from the study visit could be reflected in the interim review of the Kyoto City Action Plan for Global Warming Countermeasures and related environmental policies for the upcoming fiscal year and beyond.



【Delegation submitting the Urgent Recommendation document to Mayor Koji Matsui】

The contents of the Urgent Recommendations were reflected in the draft revision of the plan:

| Recommendation Item | Content Reflected in Revised Plan |
|---|---|
| 1. Establish policies across relevant bureaus toward achieving Carbon Neutrality by 2050. | In Chapter 3 "Basic Matters of the Plan," the item "Formulation of Concrete Measures and Goal Setting Looking Ahead to 2050" was added, stating that measures will be evaluated moving forward (Plan p. 15). |
| 2. Build policies for biomass, geothermal, and ground-source thermal energy utilization in collaboration with national and prefectural governments. | In Chapter 5 "Greenhouse Gas Emission Reduction & Sink Measures (Mitigation)," Measure 2 under Energy "Promoting Utilization of Regional Resources such as Biomass and Small-Scale Hydroelectric," descriptions regarding "Utilization of Forest Biomass" were enhanced, and a new section on "Utilization of Geothermal and Ground-Source Thermal Energy" was added (Plan p. 43) |
| 3. Proactively seek expert knowledge ahead of national efforts and strengthen future-oriented talent development. | In Chapter 4 "Basic Principles of the Plan," under "Roles of Each Entity" -> "Role of Kyoto City," descriptions regarding deepening collaboration and knowledge-sharing with a broad range of experts were added (Plan p. 23). |

**2. Submission of the Final Recommendation Document** (May 20, 2026)

To further deepen the urgent recommendations, the delegation held iterative discussions, exchanged views with relevant municipal departments, and conducted a report session in the assembly before compiling the final recommendation document.


【 Delegation submitting the Final Recommendation document to Mayor Koji Matsui】

[Urgent Recommendation Document Text - March 4, 2026]

March 4, 2026

To: Mayor of Kyoto, Koji Matsui

Kyoto City Assembly Overseas Administrative Study Visit Delegation
Delegation Leader: Takao Yoshida
Deputy Leaders: Kazuhiro Terada, Masaki Kubota
Delegation Members: Yuko Kawashima, Akihide Tanaka, Yasuhiro Sakurai, Hiroyuki Michihata, Takanori Tanaka, Miyuki Taniguchi, Yoichi Nakano, Risa Hijikata, Nobumasa Nishiyama

**Urgent Recommendations Concerning " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~"**

Representing the Kyoto City Assembly, 12 Assembly members conducted an overseas administrative study visit from January 25 to January 30 under the theme " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~." The delegation visited Vienna, Austria—an environmentally advanced city pursuing the national target of Carbon Neutrality by 2040—examining administrative bodies, energy-related organizations, enterprises, and facilities.

The Kyoto City Assembly has previously conducted two overseas administrative study visits in FY2012 and FY2016, consistently providing policy recommendations based on gained insights. In FY2012, following study visits in Germany and Spain under the theme "Sustainable Local Communities via Renewable Energy," recommendations led to core energy policies in Kyoto City. In FY2016, a study visit in Denmark focused on "Energy Conservation and Renewable Energy Local Communities," resulting in recommendations regarding environmental education expansion, resident-led local revitalization, and institutional frameworks, leading to the installation of the "Science Globe" at the Kyoto Youth Science Center.

Building upon past experiences, this study visit evaluated measures to expand renewable energy and achieve a decarbonized society in Vienna, which targets carbon neutrality 10 years earlier than Kyoto City.

Compared to European cities, Kyoto City's timeline toward a decarbonized society cannot be

considered rapid. Seeing Vienna tackle carbon neutrality 10 years ahead of Kyoto provided significant inspiration and highlighted the urgent need to revise municipal policies.

Regarding energy, transmitting converted energy inevitably incurs energy loss. While Japan faces challenges converting heat energy to electricity before end-use, Europe emphasizes "local energy production for local consumption," utilizing thermal energy directly. While solar panel adoption progresses in Kyoto, traditional energy policy remains reliant on imported fossil fuels.

Importing fossil fuels forces dependence on other nations; to break this dependency, domestic energy generation is essential. In Japan, nuclear power served as a primary pillar; however, following the Chernobyl disaster, European nations accelerated shifts toward decarbonization and renewable energy. Furthermore, global warming countermeasures and decarbonized societies have become global trends, making execution a vital policy priority for Kyoto.

In Vienna, initiatives aim to eliminate fossil fuel use in public transport by 2040, supported by concrete measures. Conversely, Kyoto has not yet planned zero fossil fuel usage in public transport by 2050, requiring urgent evaluation and implementation.

Furthermore, the Spittelau Waste Incineration Plant utilizes incineration heat for power generation, district heating, and district cooling, generating stable revenue while contributing to energy supply.

Additionally, Vienna actively integrates geothermal energy as "reliable earth energy," backed by structured investment plans. Geothermal energy remains unaffected by weather conditions, offering stability and low vulnerability to international conflicts. Recognized by the Ministry of the Environment, ground-source heat pumps are expanding even within national parks.

To leverage these valuable insights for Kyoto municipal administration during the ongoing interim review of the Kyoto City Environment Basic Plan and Global Warming Countermeasures Plan, we submit the following urgent recommendations:

Details:

1. Establish policies across relevant bureaus toward achieving Carbon Neutrality by 2050.

Vienna sets explicit decarbonization goals for energy use toward 2040 Carbon Neutrality, targeting zero diesel buses in public transit by replacing them with electric or hydrogen vehicles. Without cross-bureau discussions, setting 2050 targets risks remaining theoretical; relevant municipal bureaus must establish concrete target values and advance policies promptly.

2. Build policies for biomass, geothermal, and ground-source thermal energy utilization in collaboration with national and prefectural governments.

Biomass, geothermal, and ground-source thermal energy represent core pillars for a decarbonized society. Although initial investment costs remain a hurdle, selecting specific model sites for thermal utilization will enable effective planning toward 2050 Carbon Neutrality. While Vienna's forest coverage stands at 20%, Kyoto's forest coverage exceeds 70% (2/3 of municipal area), making biomass utilization an essential energy policy for Kyoto.

3. Proactively seek expert knowledge ahead of national efforts and strengthen future-oriented talent development.

Public and private officials in Vienna emphasized the importance of expert involvement and future-oriented talent development. To rapidly deploy decarbonization policies toward 2040, Vienna actively engages experts, analyzes technical trends, and conducts pilot implementations. Kyoto must humbly learn from this approach, accelerating close collaboration with experts in "Kyoto, the City of Universities."

[Final Recommendation Document Text - May 20, 2026]

May 20, 2026

To: Mayor of Kyoto, Koji Matsui

Kyoto City Assembly Overseas Administrative Study Visit Delegation
Delegation Leader: Takao Yoshida
Deputy Leaders: Kazuhiro Terada, Masaki Kubota
Delegation Members: Yuko Kawashima, Akihide Tanaka, Yasuhiro Sakurai, Hiroyuki Michihata, Takanori Tanaka, Miyuki Taniguchi, Yoichi Nakano, Risa Hijikata, Nobumasa Nishiyama

## Recommendations Concerning " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~"

Representing the Kyoto City Assembly, 12 Assembly members conducted an overseas administrative study visit from January 25 to January 30 under the theme " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero CO2 Emissions by 2050 ~" in Vienna, Austria, examining administrative bodies, energy enterprises, and facilities.

To apply gained insights to Kyoto municipal policy, urgent recommendations were submitted on March 4. Following discussions with municipal executive departments and assembly reporting sessions on May 18, the final recommendations have been compiled below.

Details:

### 1. Establish policies across relevant bureaus toward achieving Carbon Neutrality by 2050.

Vienna sets explicit decarbonization targets, such as eliminating diesel buses by 2040. Following the urgent recommendations in March, Kyoto City began evaluating target settings in its revised Global Warming Countermeasures Plan. Beyond extending existing efforts, relevant bureaus must rapidly establish specific target metrics and advance effective policies using backcasting approaches.

Action Items:
(1) Promptly set specific target metrics across relevant bureaus and advance effective policies based on backcasting principles.

## 2. Build policies for biomass, geothermal, and ground-source thermal energy utilization in collaboration with national and prefectural governments.

Biomass, geothermal, and ground-source thermal energy are essential pillars for decarbonization. Selecting model cases for thermal utilization will facilitate effective 2050 planning. Considering Kyoto's abundant forest resources compared to Vienna, biomass utilization is an evident priority. Furthermore, geothermal and ground-source thermal energy offer stable, weather-independent renewable power; Kyoto should collaborate with national, prefectural, and expert partners to conduct resource surveys and model projects.
Action Items:
(1) Promote biomass, geothermal, and ground-source thermal energy in collaboration with national, prefectural, and domain experts.
(2) Implement model projects for thermal utilization, formulating institutional designs and support policies based on trial results.
(3) Survey geothermal and ground-source thermal potential within Kyoto City to understand adoption and utilization status.
(4) Evaluate geothermal energy utilization beyond power generation, including hot water supply and district heating.

## 3. Proactively seek expert knowledge ahead of national efforts and strengthen future-oriented talent development.

Vienna rapidly deploys decarbonization policies through expert analysis, trial implementations, and talent development. Kyoto should learn from this administrative posture, accelerating collaboration with experts in "Kyoto, the City of Universities."
Action Items:
(1) Build mechanisms to reflect latest technologies and expert insights into municipal policies in partnership with research institutions.
(2) Establish frameworks to enhance policy quality through iterative verification and testing.
(3) Promote future-oriented talent development initiatives.

## 4. Strengthen startup support for enterprises addressing environmental challenges.

In Vienna, organizations like Climate Lab connect diverse entities to generate innovative decarbonization technology and business models. Kyoto should leverage its strengths to support startups in Deep Tech and environmental fields.
Action Items:
(1) Provide comprehensive support for startup founders and accompanying family members, including living assistance, schooling, and administrative procedures.
(2) Improve workplace environments and public transport connectivity to support daily living lines.

## 5. Establish mechanisms to promote decarbonization through citizen collaboration.

Vienna operates participatory mechanisms like the "Wiener Klimateam," where citizen climate proposals are evaluated by experts and selected by citizen juries for administrative execution. Decarbonization requires public understanding, engagement, and visualization of progress.
Action Items:
(1) Establish participatory frameworks for renewable energy adoption and energy conservation.
(2) Promote "visualization" of environmental policies to foster citizen awareness and behavioral change.

## 6. Enhance initiatives toward Carbon Neutrality drawing from Vienna's advanced cases.

(1) Execute Decarbonization Model Projects in Redevelopment Areas: Integrate district heating and renewable energy into urban redevelopment.
(2) Transition to "A City Where Living Without a Car is Comfortable" Centered on Public Transport: Enhance transit network convenience and optimize mobility alongside walking and cycling.
(3) Expand Energy Efficiency Support for Housing: Enhance subsidies and consultation services for energy-efficient retrofits in new and existing homes.

[Observations and Impressions by Recommendation Drafters]

○ **Delegation Leader: Takao Yoshida**
(Described in " Foreword ")

○ **Deputy Leader: Kazuhiro Terada** (Study Visit Plan Proposer)

"There are still perceptions that overseas study visits are a 'luxury.' However, if advanced international examples exist, thoroughly investigating and applying them to municipal policy is a vital duty entrusted to us by citizens."
This statement introduced my report for the FY2012 overseas Study Visit. Subsequently, in FY2016, we visited Denmark—which targeted 100% fossil-free renewable energy by 2050. This led to recommendations creating the "Forestry Policy Supervisor" post, promoting ZEH housing, and installing the Science Globe at the Youth Science Center.

For this Study Visit, we evaluated Vienna, which targets Carbon Neutrality by 2040—10 years ahead of Kyoto. Observing Vienna's concrete roadmaps, policy shifts, and financial commitments made us realize that without bold action, Kyoto's 2050 target would remain an unachievable dream.

We immediately submitted urgent recommendations, which were reflected in the revised Kyoto City Action Plan for Global Warming Countermeasures. In assembly inquiries, I emphasized that "the 2050 decarbonization scenario announced in 2019 must rely on backcasting—planning backward from a desired future—rather than forecasting from current trends. What we witnessed in Vienna was true backcasting." Kyoto City must now design institutional policies grounded in backcasting toward 2050.

I hope this report conveys the passion of local stakeholders. While information is accessible online, direct dialogues reveal insights unobtainable remotely. I express deep gratitude to the City Assembly Secretariat staff and accompanying coordinators for their dedicated support.

○ **Deputy Leader: Masaki Kubota** (Study Visit Plan Proposer)

From January 25 to 30, a bi-partisan delegation of 12 Kyoto City Assembly members conducted an overseas Study Visit in Vienna under the theme " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero CO2 Emissions by 2050 ~." Studying Vienna's 2040 Carbon Neutrality goal—10 years ahead of Kyoto—was deeply meaningful.

As the birthplace of the Kyoto Protocol, Kyoto led domestic efforts by enacting Japan's first global warming countermeasure ordinance in December 2004. However, achieving 2050 Carbon Neutrality is challenging, and global advanced cities operate with earlier, higher targets. Kyoto must accelerate initiatives by integrating international best practices.

To break dependency on foreign energy, Vienna actively drives renewable energy transitions across administration, citizens, and businesses. Initiatives such as zero-fossil-fuel public transport, electric/hydrogen buses, district heating/cooling expansion, and waste incineration heat utilization served as valuable references.

Achieving a decarbonized society requires innovative ideas and Deep Tech startups. Coupling energy transition with economic growth through vibrant startups holds immense potential, prompting our proposal to study startup support mechanisms.

Kyoto bears a global responsibility as the birthplace of the Kyoto Protocol. Utilizing strengths as a "City of Universities," Kyoto must maintain pride as an environmentally leading city, advancing policies to achieve 2050 Carbon Neutrality and deliver a sustainable society to future generations.

○ **Assembly Member: Yuko Kawashima** (Study Visit Plan Proposer)

~ Learning Sustainable Urban Development Grounded in Decarbonization and Diversity ~
This Study Visit evaluated sustainable decarbonized societies in Vienna. A key insight was that decarbonization is pursued not as isolated measures, but as an integrated component of overall urban policy.

Vienna expands renewable energy alongside district heating and waste incineration heat utilization, maximizing city-wide energy efficiency. Building energy standards and public-transport-centered urban planning effectively curb private vehicle reliance and $CO_2$ emissions. Long-term strategic clarity and policy adaptability to changing social conditions shape Vienna's present success.

What impressed me most was the pride citizens hold in their city. Vienna's population surpassed 2 million in 2023 and continues growing, driven by young immigrants in their 20s and 30s and rising birth rates.

Grounded in historical experience, Vienna actively fosters an inclusive society free from discrimination and exclusion. Respecting individuals across cultural, linguistic, and background differences forms the foundation of a sustainable city.

Kyoto City must advance decarbonization in harmony with regional characteristics and townscapes while respecting diversity and mutual support, applying gained insights to harmonize environmental performance with quality of life.

# IX. Study Visit Debriefing Session

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### 1. Purpose and Objective

Pursuant to the Implementation Guidelines for Overseas Administrative Study Visits of the Kyoto City Assembly, an Overseas Administrative Study Visit Report Session for FY2026 was held in the City Assembly Chamber. The objective was to share Study Visit outcomes among Assembly members and broadly inform citizens regarding the Assembly's research and study activities.

### 2. Date and Time

Monday, May 18, 2026, 1:30 PM – 2:30 PM

[Report session taking place in the Kyoto City Assembly Chamber]

**3. Session Contents** (Verbatim Transcript)

**○ Delegation Leader: Takao Yoshida**

Good afternoon, everyone. I am Takao Yoshida, serving as leader of this overseas administrative Study Visit delegation.

Thank you very much for taking time out of your busy schedules to assemble here today. On behalf of the delegation, I would like to offer a few opening remarks.

Following an interruption due to the COVID-19 pandemic, overseas administrative Study Visits by the Kyoto City Assembly resumed in FY2025. Under the theme " Realization of a Sustainable Decarbonized Society through Renewable Energy and Energy Conservation ~ Towards Net Zero $CO_2$ Emissions by 2050 ~," our 15-member delegation—comprising 6 members from the Liberal Democratic Party, 3 members from Ishin/Kyoto/Kokumin Party for the People, 3 members from Komeito, alongside Senior Director, Global Environment Policy Office, of the Environmental Bureau and 2 accompanying staff—conducted study sessions before embarking on a 6-day itinerary from January 25 to 30 in Austria, an environmentally advanced nation targeting national carbon neutrality by 2040.

The Kyoto City Assembly previously investigated advanced renewable energy cases overseas in FY2012 and FY2016, offering policy recommendations based on gained insights. Building on past experiences, this Study Visit investigated Vienna—which targets carbon neutrality 10 years earlier than Kyoto—to develop policies for expanding renewable energy adoption.

As detailed in the Study Visit outline, we visited eight administrative agencies, energy organizations, enterprises, and facilities over four days. Though an intensive schedule, it was a

deeply fulfilling Study Visit rich in outcomes. Experiencing local environments firsthand and engaging in lively Q&A sessions provided valuable learning opportunities.

Today, we share these results with the Assembly and citizens to build broad understanding and steadily advance initiatives toward a sustainable decarbonized society in Kyoto City. Eight members from our reporting team will present findings, followed by policy proposals from our recommendation team.

We begin with our first presenter, Assembly Member Miyuki Taniguchi.

○ **Assembly Member: Miyuki Taniguchi**

Good afternoon, everyone. I am Miyuki Taniguchi. Today, I present findings from Vienna as policy proposals for Kyoto.

First, Vienna brought its carbon neutrality target forward by 10 years—from the global 2050 standard to 2040. How is this achievable? Part of the answer lies in a specific facility.

Located in central Vienna, the Spittelau Waste Incineration Plant is famous for its asymmetrical, colorful exterior designed by Hundertwasser, a renowned artist passionate about environmental protection.

Supplying district heating to nearby hospitals and homes requires proximity to minimize thermal loss. To overcome local opposition, Vienna adopted a three-pillar strategy: 1) create an artistic design that attracts tourism and generates revenue, 2) install world-class exhaust filters, and 3) establish systems to minimize waste incineration.

This single facility generates four revenue streams: waste intake fees, electricity sales, district heating, and district cooling. Furthermore, five waste categories are legally mandated for sorting, ensuring only non-recyclable residual waste is incinerated.

Importantly, Vienna maintains a policy not to expand waste-to-energy reliance beyond current levels.

Vienna also effectively engages the private sector. In January 2025, a container deposit system was introduced, adding a 25-cent deposit on PET bottles that is refunded upon return.

Additionally, Manner sells surplus heat from its wafer factory to the local grid. Engaging private-sector capability is an initiative Kyoto can readily emulate.

Geopolitical developments in the Middle East underscore the urgent need to diversify energy procurement. According to JETRO reports, Austria views new industries and job creation driven by carbon neutrality as growth opportunities. Designing central waste facilities with business opportunities in mind enables exporting technical expertise internationally.

I propose the "Miyuki Version Kyoto Smart City Concept," highlighting two priority points:
1) Developing areas surrounding the Kyoto Clean Center as pilot urban zones, using Spittelau as a direct benchmark.
2) Utilizing private-sector surplus heat from factories and business facilities within local energy grids.

Additionally, accelerating city bus electrification, enhancing reuse/recycling, and establishing testing fields for next-generation technologies will foster an environmentally friendly, comfortable Kyoto.

Environmental issues know no borders. Kyoto must act now for the children of tomorrow. Thank you for your attention.

○ Assembly Member: Risa Hijikata

Good afternoon. I am reporting on our Study Visit of the Geothermal plant Aspern in Vienna, Austria.

The Geothermal plant Aspern project is operated by "deeep," a joint venture established by Vienna's municipal energy provider Wien Energie and energy company OMV.

To achieve carbon neutrality by 2040 and phase out natural gas dependency for heating, Vienna is deploying geothermal energy. Deep geothermal resources universally reach approximately 130° C at depths of 3,000 meters. Vienna utilizes deep thermal water as a heat source, utilizing OMV's oil exploration data to pinpoint hot water reservoirs.

Unlike Japan, where geothermal energy is primarily associated with power generation, Vienna uses geothermal thermal water directly for district heating and domestic supply.

Initial surveys began in 2015, followed by design work and the creation of "deeep" in 2023. Having successfully extracted thermal water, infrastructure preparation is underway for 2028 supply launch. A single plant site is expected to supply heat to 20,000 homes, targeting eventual expansion to 200,000 homes and achieving an annual $CO_2$ reduction of 54,000 tons.

The extraction utilizes hydrothermal methods pumping naturally occurring thermal water, offering low seismic risk compared to artificial rock fracturing. Pressurized thermal water rises naturally to 200 meters, where pumps complete extraction. Operating pumps requires electricity; however, 1 kW of electrical input yields 15 kW of thermal output, providing high energy efficiency.

Drilling descends vertically to 800 meters before curving horizontally to reach thermal water layers

at 3,000 meters using directional oil-drilling techniques.

Extracted 130° C thermal water passes through heat exchangers, adjusting temperatures to 65–120° C for residential delivery before circulating back underground in a closed, sustainable loop.

Total project costs reach 90 million euros (approx. 16.5 billion yen)—two-thirds allocated to subterranean drilling and one-third to surface facilities, equating to roughly 4,500 euros (830,000 yen) per household. Project costs are borne by operators and recovered through user utility fees.

Kyoto City currently lacks large-scale geothermal power or thermal supply development. However, institutions like AIST possess geothermal potential data. Kyoto City should actively gather information and engage in technical exchanges.

Vienna's progress resulted from long-term research and survey accumulation. Kyoto City should evaluate geothermal resource utilization options as a long-term energy alternative. Thank you.

○ Assembly Member: Akihide Tanaka

Good afternoon. I am Akihide Tanaka, reporting on biomass energy utilization in Austria.

This marks my third renewable energy Study Visit alongside Deputy Leader Terada, having previously visited German biomass power facilities in FY2012 and Danish biogas plants in FY2016. On this occasion, we investigated the Austrian Biomass Association.

Austria is a country of 9.19 million people spanning 84,000 km², with forests covering roughly 50% of its land. Although much biomass remains uncollected, utilizing just 7% of natural cycles generates 18% of domestic energy demand.

In mountainous regions, wood chip and firewood stoves predominate. Established production and distribution networks offer convenience comparable to heating oil.

District heating represents the next developmental tier, with approximately 2,500 facilities operating nationwide. Although initial capital costs are significant, securing grant or donation funding enables self-sustaining operations, retaining sales revenue locally and creating regional employment.

Five key success factors for biomass energy were highlighted:
1) Selecting simple, manageable technologies.
2) Engaging experienced experts for project planning.
3) Securing energy consumers (public facilities or high-heat enterprise users).
4) Securing reliable fuel suppliers.
5) Providing public support, including administrative energy usage and political endorsement.

In the 1970s and 80s, Austrian energy policy experienced intense debate regarding nuclear power commissioning and large-scale hydroelectric development in biodiverse forests. A 1978 national referendum blocked nuclear power plant operations, permanently removing nuclear power from national energy options. Hydroelectric projects were similarly canceled following public opposition.

Self-sufficiency in food and energy strengthens resilience against climate change, economic instability, and security risks. Transitioning from imported fossil fuels to domestic renewable energy through biomass is vital for agricultural and forestry revitalization.

In large cities like Vienna, biomass accounts for roughly 10% of energy supply—a challenge shared with Kyoto City. Utilizing timber in mountainous areas to advance regional energy self-sufficiency represents a highly worthwhile initiative. Thank you.

○ Assembly Member: Takanori Tanaka

I am Takanori Tanaka, reporting on "Human-Centric Urban Development in Aspern Seestadt"—Vienna's next-generation smart city gaining global attention.

Smart cities are often envisioned as digitalized environments driven by AI and data optimization. However, Aspern Seestadt integrates advanced technology subtly into the background to support daily life rather than positioning technology upfront.

Prioritizing resident quality of life, green spaces, and comfortable environments, it demonstrates a human-centric smart city model.

Located 25 minutes by subway from central Vienna, this 240-hectare former airfield represents one of Europe's largest urban development projects targeted for 2030 completion.

Its primary characteristic is phased population growth over 20 years. Gradually expanding residential capacity maintains demographic balance across generations—from children to seniors—without temporary population spikes.

A central artificial lake is surrounded by planned mixed-use developments combining kindergartens, schools, shops, offices, and housing. Designed as a compact "15-minute city," daily living functions are accessible within a 15-minute walk.

Four invisible infrastructure pillars support this living environment:

1) Energy-Generating Buildings: Structures generate power via solar and geothermal systems, sharing energy across districts. AI-driven optimization maintains comfortable indoor temperatures without forcing excessive energy conservation, balancing comfort with utility cost control.

2) Mobility Transformation ("A City More Convenient Without a Car"): Centralized parking structures at district perimeters eliminate street parking in residential areas, creating safe pedestrian spaces and accessible sidewalks.
3) "Sponge City" Design: Urban surfaces store rainwater underground like a natural sponge, nourishing street trees, providing natural cooling during summer heatwaves, and preventing urban flooding during torrential rains.
4) Timber Construction: The district's flagship 24-story timber building, HoHo Wien, utilizes sustainable timber for 75% of its structure, reducing $CO_2$ emissions by 2,800 tons compared to reinforced concrete and acting as a carbon-storing "second forest."

Smart urbanism is defined not by competing over digital specifications, but by using technology to enhance resident quality of life. Kyoto can draw valuable lessons from Aspern Seestadt regarding multi-generational community balance, digital traffic management, modern adaptations of traditional "rain gardens" for flood mitigation, and human-centric urban design. Thank you.

○ Assembly Member: Nobumasa Nishiyama

I am Nobumasa Nishiyama, reporting on our findings from the Vienna City Council.

Vienna is Austria's capital and a federal state with a population of 2 million and green space coverage exceeding 50%.

Uniquely, Vienna functions simultaneously as a municipality and one of Austria's nine federal states. Under the Federal Constitution, the City Council performs state parliament functions, and the Mayor acts as state governor. The 100 council members serve five-year terms, concurrently holding seats in the state parliament. The Mayor is elected by the parliament and forms a cabinet, operating similarly to a parliamentary cabinet system.

Regarding climate conditions, key differences distinguish Vienna from Japan:
1) Renewable energy accounts for ~90% of Austria's electricity supply (dominated by hydro).
2) District heating via pipeline networks serves over 40% of households using waste incineration and power plant heat.
3) ~50% of residents live in municipal or subsidized housing, facilitating public sector-led building decarbonization.
4) Soaring gas prices following Russia's invasion of Ukraine accelerated gas phase-out efforts.
5) Heating relies heavily on gas, while air conditioning remains uncommon despite rising summer temperatures.

In Vienna's emission profile, transport accounts for 42% and buildings 30%. Within buildings, gas heating systems account for ~90% of $CO_2$ emissions. Phasing out gas heating across 600,000 households represents Vienna's primary climate challenge.

The Vienna Heating Plan 2040 designates optimal heating supply methods by district. Under Phase 1 of the RAG Program (RAG1, 2023–2025), legal revisions mandated renewable energy utilization in new construction, expansions, and heating retrofits, supported by comprehensive building gas databases and expanded insulation subsidies.

Vienna promotes public engagement through 30+ years of school environmental education and the "Wiener Klimateam," co-creating climate projects based on citizen proposals.

While Vienna's methods cannot be applied directly due to structural differences, Kyoto City must establish precise baseline databases and tailored local plans. Combining mandatory regulations with subsidies, promoting citizen participation, and enhancing energy self-sufficiency offer critical guidance for Kyoto. Thank you.

○ Assembly Member: Yasuhiro Sakurai

I am Yasuhiro Sakurai, reporting on Wiener Stadtwerke, public transit, and bus operations.

Wiener Stadtwerke is a massive public corporation 100% owned by the City of Vienna, overseeing public transit, energy generation, and utility supply networks.

During technical briefings, officials repeatedly noted that "politicians decide policy, and the enterprise executes it," adding that "2040 climate strategies can shift depending on who governs Vienna." In Vienna's parliamentary cabinet system, the 100-member council elects the Mayor from the governing majority, allowing administration policies to be executed seamlessly.

In public transit, Vienna's 500-bus fleet comprises 60 electric buses, 21 hydrogen buses, and remaining diesel buses. Notably, public transit accounts for merely 1% of Vienna's total city $CO_2$ footprint—an exceptionally low global figure enabled by renewable electricity powering subways, trams, and electric buses with regenerative braking.

To eliminate the remaining 1% footprint toward 2040 Carbon Neutrality, Vienna is evaluating optimal fleet allocations—deploying electric buses on flat urban routes and hydrogen buses on demanding terrain.

Kyoto City must similarly reduce public transit emissions toward 2050 Carbon Neutrality. Current municipal bus $CO_2$ emissions total 38,889 tons annually. Introducing two electric buses recently reduced emissions by 13 tons per year. Kyoto must establish concrete roadmaps, commit bold investments, and maintain public accountability to replace diesel buses effectively. Thank you.

○ Assembly Member: Hiroyuki Michihata

I am Hiroyuki Michihata, reporting on the energy division of Wiener Stadtwerke.

Wien Energie, the energy division of Wiener Stadtwerke, supplies electricity, gas, district heating, and district cooling to 2 million residents, serving as the core entity driving Vienna's 2040 Carbon Neutrality goal.

The Vienna Heating Plan oversees Europe's third-largest district heating network, spanning 1,300 km of pipelines. The plan explicitly maps district heating expansion zones versus heat pump adoption zones. Network expansion requires connecting multiple households to ensure economic viability, pursued through public facility leadership and price competitiveness rather than mandatory usage.

While district heating currently relies on gas, future transitions will utilize geothermal energy and large heat pumps. Facility investments storing surplus renewable energy are planned alongside expert training and legislative support.

District Cooling supplies ~7° C chilled water to factories, hotels, offices, and museums, offering space-saving benefits without heat dissipation issues. Vienna aims to become Europe's "District Cooling Capital" by 2030, leveraging river water heat exchange systems and data center cooling applications.

Climate Lab, established in 2022, acts as a neutral innovation hub connecting universities, startups, and corporations for decarbonization solutions.

Wiener Stadtwerke demonstrates how energy, transport, cooling, infrastructure, and technical innovation can be integrated structurally to achieve carbon neutrality. Kyoto City must adopt a

similar perspective, combining infrastructure updates with regional heat utilization and university-industry technical demonstrations. Thank you.

○ **Assembly Member: Yoichi Nakano**

I report on GIN Austria (Global Incubator Network Austria), which drives startup attraction and corporate recruitment in Vienna.

GIN Austria promotes corporate attraction via "GO AUSTRIA" (inviting global startups) and "GO ASIA" (connecting Austrian ventures with Asia).

Key lessons for startup attraction include:
1) Workplace environments alone are insufficient; comprehensive living, cultural, and family support environments are essential.
2) Vienna succeeds by packaging "City Appeal × Support × Matching." Kyoto shares identical foundational strengths.

Vienna's approach relies on three strategies:
1) Leveraging non-mainstream status as a calm, focused alternative to major hubs like London or Paris.
2) Prioritizing Quality of Life across working and living domains.
3) Delivering extensive family support—including school searches, housing guidance, insurance procedures, and legal/tax referrals.

To build a "Kyoto Version Startup Attraction Model," I propose eight measures:
1) Define clear city positioning (focusing on deep-thought startups).
2) Create structured incentives for business relocation beyond tourism.

3) Establish permanent networking hubs for entrepreneurs and investors.
4) Deliver comprehensive family relocation support.
5) Develop a compact "15-Minute City" model in Kyoto.
6) Streamline administrative permitting procedures rapidly.
7) Focus sharply on specialized domains (fusing tradition with cutting-edge tech).
8) Focus on Kansai-regional advantages rather than competing directly with Tokyo.

Inviting entrepreneurs requires designing for complete lives—combining workplace quality, living enjoyment, and family support. Kyoto possesses every necessary attribute to execute this model effectively. Thank you.

< Policy Recommendations for Kyoto City >

○ Deputy Delegation Leader: Kazuhiro Terada

I am Deputy Leader Kazuhiro Terada, presenting policy recommendations on behalf of our recommendation team (Delegation Leader Yoshida, Deputy Leader Kubota, Assembly Member Kawashima, and myself).

Following our return, we submitted urgent recommendations on March 4 ahead of the Kyoto City Action Plan for Global Warming Countermeasures revision, which were directly reflected in the final plan across pages 15, 23, and 43.

In our final recommendations, Item 1 emphasizes establishing cross-bureau policies toward 2050 Carbon Neutrality using "backcasting." Rather than incremental forecasting from present trends,

backcasting starts by visualizing Kyoto's desired 2050 zero-carbon urban vision and working backward to define required policy steps today.

Item 2 focuses on utilizing local earth energy—biomass, geothermal, and ground-source thermal—in coordination with national and prefectural governments.

Item 3 highlights leveraging Kyoto's vast expert network ("Kyoto, the City of Universities") to accelerate policy development ahead of national efforts.

Item 4 emphasizes comprehensive startup support—covering living, family, and commuting infrastructure alongside business assistance.

Item 5 focuses on citizen collaboration. Achieving net-zero emissions requires public understanding of what a 2050 zero-carbon city looks like—including zero-emission transport and energy transitions in daily life.

Item 6 addresses expanding decarbonization initiatives through designated model zones, public transit enhancements (including LRT evaluations), and housing insulation retrofits led jointly by Environmental and City Planning Bureaus.

While Vienna officials acknowledged that reaching 2040 targets involves immense financial and technical hurdles, they remain committed to executing all technically viable measures. Kyoto City must similarly embrace expert insights, build public consensus, and execute decisive backcasting strategies toward 2050 Carbon Neutrality.

Thank you for your attention.