



Suginami Incineration Plant (under construction)



Nerima Incineration Plant

Tokyo Model (by topic)

Consensus Building with Residents

2018



1. History of consensus building with residents



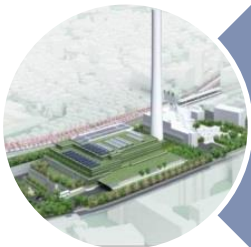
2. How assurance was built

- 2-a. Effort to prevent pollution
- 2-b. Thorough information disclosure



3. How trust was built

- 3-a. Hold briefings
- 3-b. Establish Councils



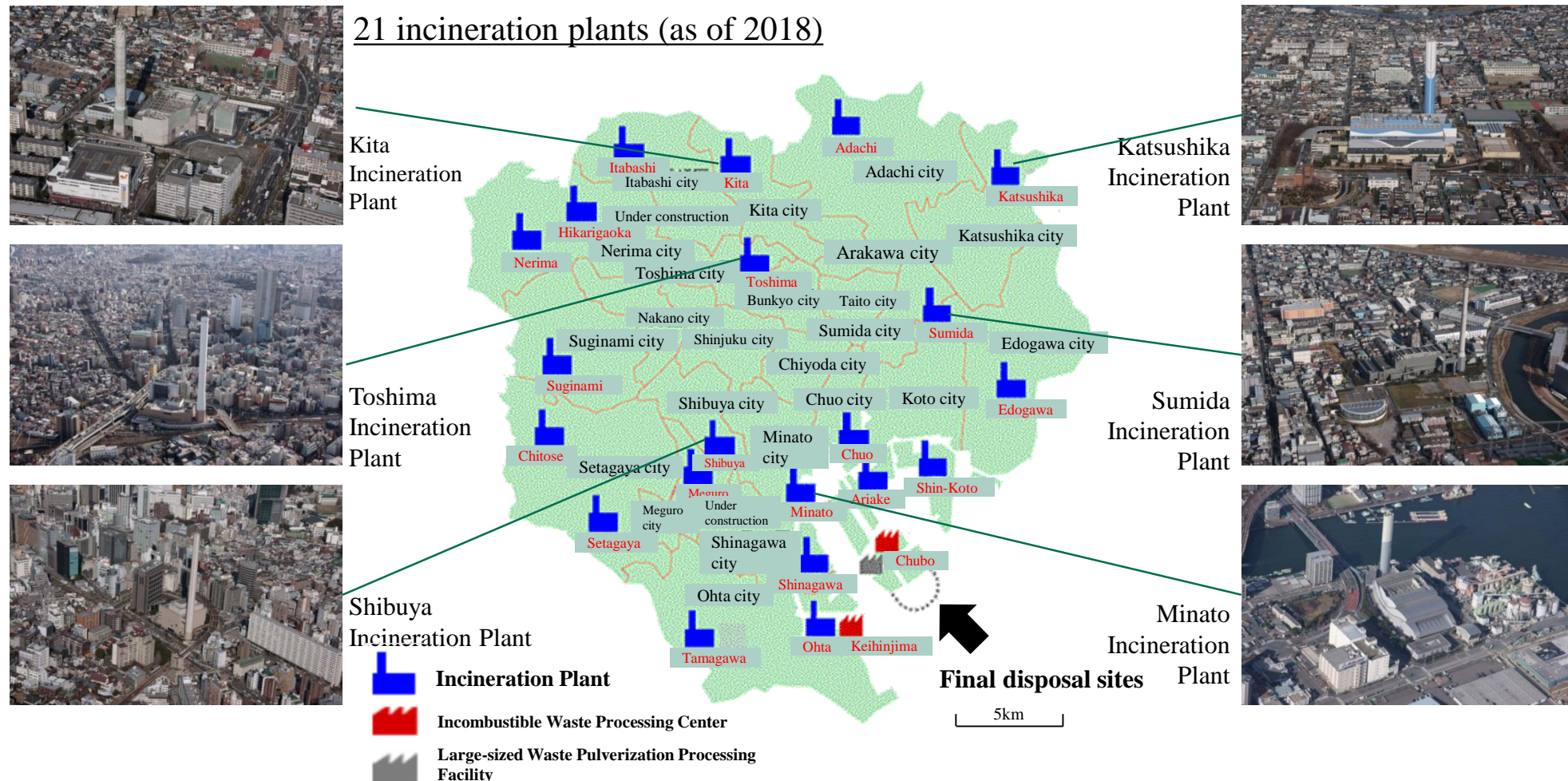
4. How we made considerations for the local communities

- 4-a. Designs in harmony with community
- 4-b. Giving back to local community

1. History of consensus building with the residents

Incineration plants in downtown Tokyo operating safely and stably

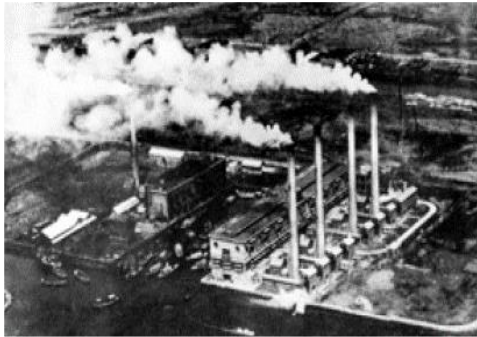
21 incineration plants (as of 2018)



The fact that we can operate an incineration plant close to where waste is generated, is all possible thanks to the continued efforts in pollution prevention and consensus building with residents

1. History of consensus building with the residents

Opposition movements from the residents and our actions taken



Deep-rooted social perception that incineration plants deteriorate the living environment

Soot and smoke problem at Fukagawa Refuse Processing Plant which was a societal concern (ca 1930)

Proactive deployment of innovation

- Compact space-conscious design
- Implementation of overseas technology including electrical dust collector
- Measures against exhaust gas above the regulatory limits



From planning to construction, a long-term planning was required to interface with residents.

Scene (1960) from the protest by local residents opposing against the construction of Tamagawa Incineration Plant

Community-friendly facility

- Facility enabled to give back to the community
- Established councils with participation by residents
- Full prevention of pollution, etc.



Pushback from neighboring residents of landfill disposal sites, delayed the incineration plant construction plan

Koto City blocked the carry-in of waste from Suginami City, that opposed to the construction of an incineration plant

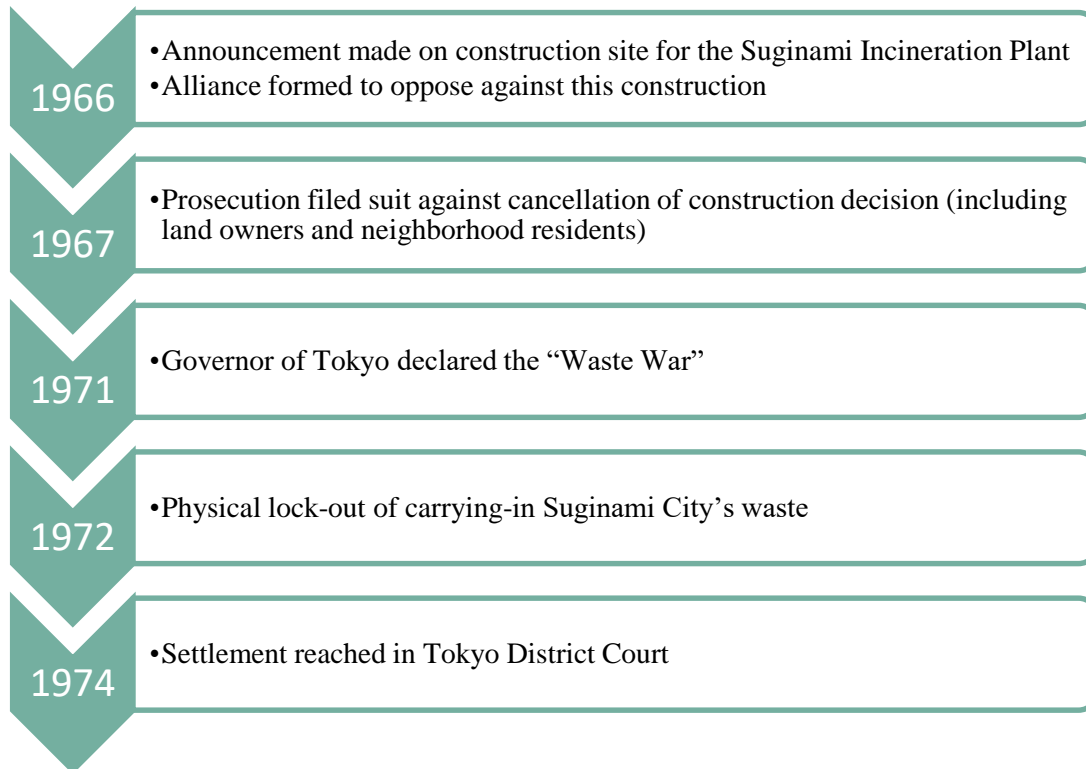
Streamlined the initiatives by government and residents

- Transparency via PR and plant tours, etc.
- Establishing an environment by which government and residents can understand their respective roles
- Further sharing of understanding as critical facility

1. History of consensus building with the residents

Lessons learned from reaching consensus with residents

— History of protest to settlement with the residents for construction of the first generation Sugunami Incineration Plant —





Settlement was reached in 1974, 8 years after construction site was announced in 1966

Key learnings from the residents’ opposition movement and our response to it

- ① Waste disposal business cannot be conducted by government alone. There must be understanding, cooperation, and participation by the residents.
- ② Incineration plants must be in harmony with the community to be a safe and secure community facility producing no pollution.
- ③ To have the residents gain a proper understanding of waste disposal work, site tours, public relations, and briefings are important.

1. History of consensus building with the residents

Concerns, mistrust, and dissatisfaction, and how they were dealt with

Key feedback from the residents		Action taken	Ideal State
Concerns	<ul style="list-style-type: none"> <i>We hear that incineration plants are dangerous. Will everything be okay?</i> <i>Wouldn't there be harmful substances contained in the released smoke that would have a negative impact on our health?</i> <i>Wouldn't the increased vehicles have negative impact on our environment?</i> 	<u>Building assurance</u> <ul style="list-style-type: none"> ▪ Effort to prevent pollution ▪ Thorough information disclosure 	
Mistrust	<ul style="list-style-type: none"> <i>Isn't the incineration plant and/or municipality hiding negative information from us?</i> <i>Government and municipality will make decisions without us, so we cannot trust them.</i> 	<u>Fostering trust</u> <ul style="list-style-type: none"> ▪ Hold briefings ▪ Establish Councils 	
Dissatisfaction	<ul style="list-style-type: none"> <i>Construction of an incineration plant leads to negative image for our neighborhood.</i> <i>We comprehend the need for an incineration plant, but our emotions tell us that having this built in our neighborhood is not acceptable.</i> 	<u>Making considerations for the community</u> <ul style="list-style-type: none"> ▪ Facility design that is in harmony with the community ▪ Giving back to the community with free heat 	Assurance

2. How assurance was built 2-a. Effort to prevent pollution

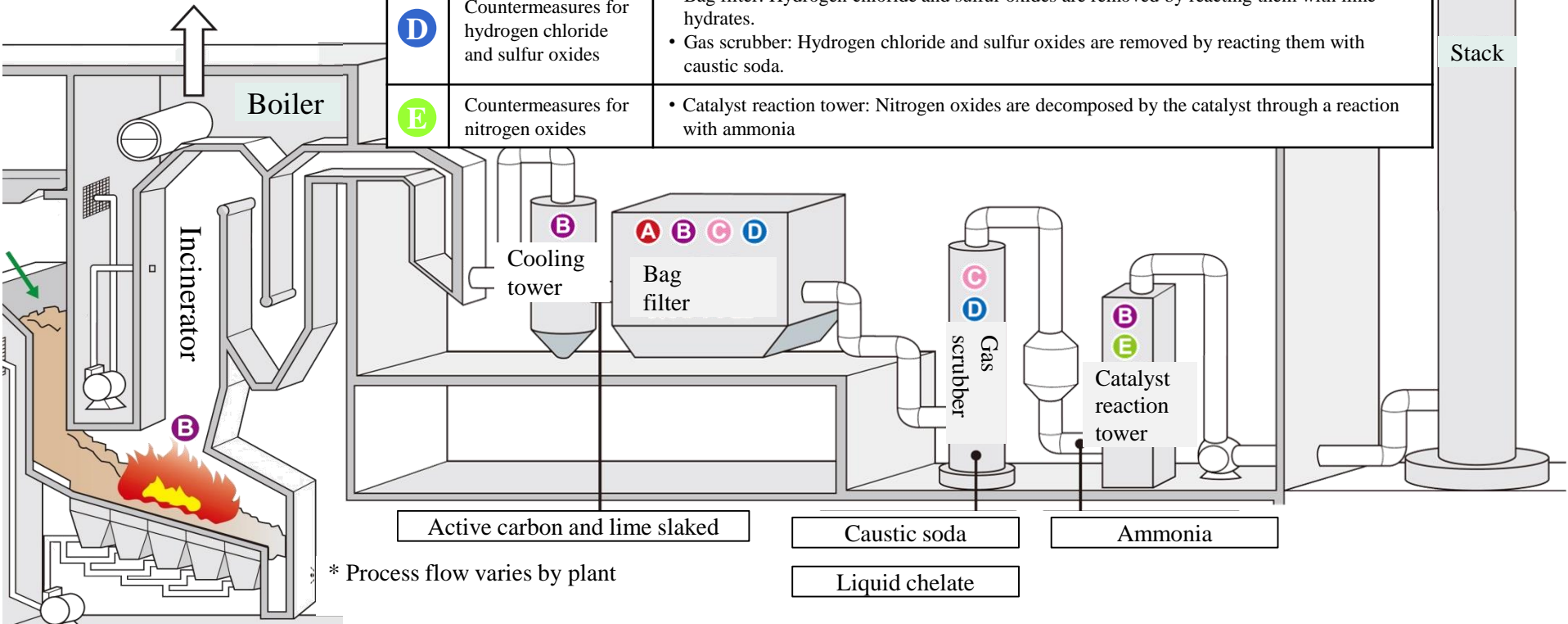
Installed pollution prevention equipment, focusing on the safety of the community

Our self-regulated values are set, which are more stringent than the laws (excluding B and C)



Measures against exhaust gas

A	Countermeasures for soot and dust	• Bag filter: Soot and dust are separated and removed by a filtration cloth
B	Countermeasures for dioxins	• Furnace room: Waste is incinerated at high temperature (800C and higher) to control the generation of dioxins. • Cooling tower: Rapid cooling is performed to prevent re-synthesis of dioxins • Bag filter: Active coal is used to attach to and remove dioxins • Catalyst reaction tower: Dioxins are decomposed by the catalyst
C	Countermeasures for mercury	• Bag filter: Active coal is used to attach to and remove mercury • Gas scrubber: Mercury is removed by liquid chelate solution
D	Countermeasures for hydrogen chloride and sulfur oxides	• Bag filter: Hydrogen chloride and sulfur oxides are removed by reacting them with lime hydrates. • Gas scrubber: Hydrogen chloride and sulfur oxides are removed by reacting them with caustic soda.
E	Countermeasures for nitrogen oxides	• Catalyst reaction tower: Nitrogen oxides are decomposed by the catalyst through a reaction with ammonia

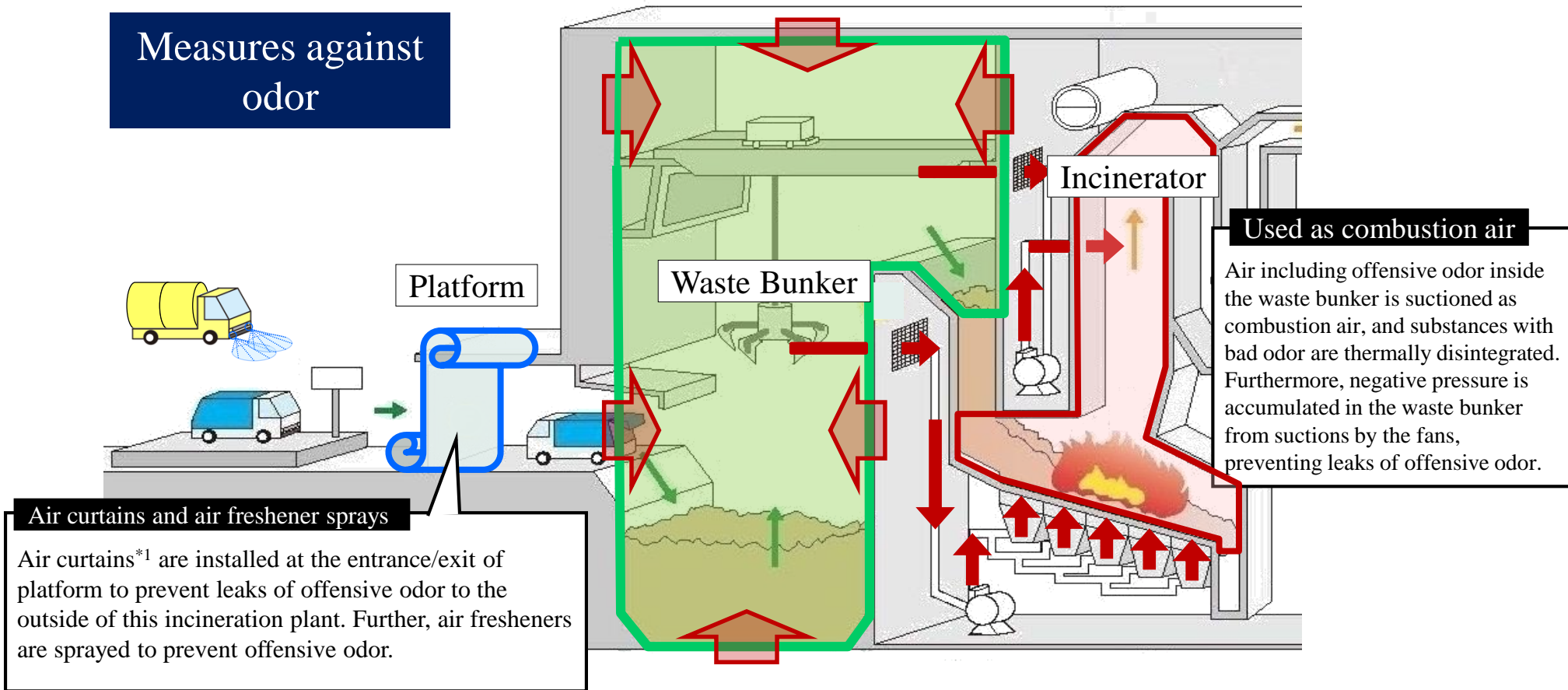


2. How assurance was built 2-a. Effort to prevent pollution



Installed pollution prevention equipment, with the community residents in mind

Measures against odor

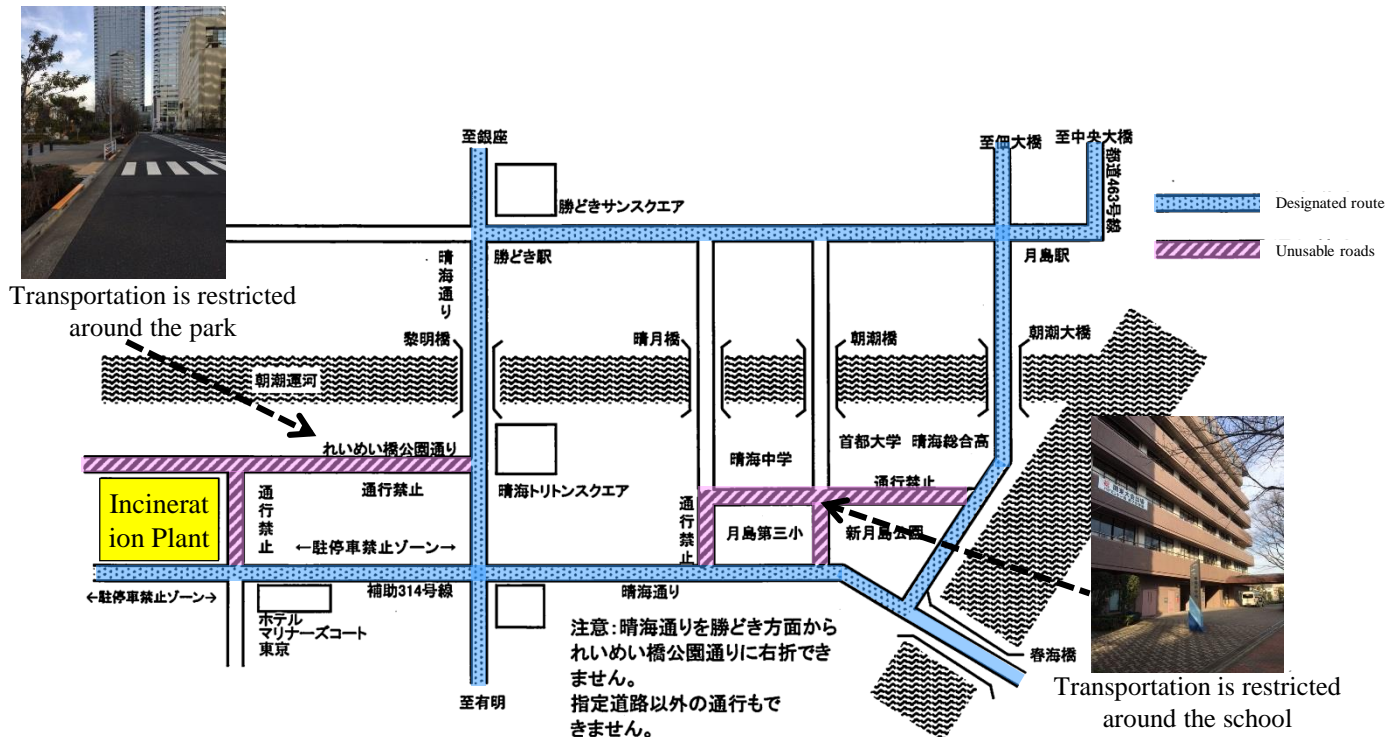


*1: Air curtain is a wall of air that is created to stop outdoor air from coming in.

2. How assurance was built 2-a.Effort to prevent pollution

Minimization of impact on traffic, by full reinforcement of compliance with transportation rules

Transportation route diagram, by Chuo Incineration Plant



Transportation entrance at Suginami Incineration Plant



- Have designated the route for transportation to/from the plant, and ask that transportation is made using the predetermined routes.
- We created an underground route for transportation purpose only.

2. How assurance was built 2-a.Effort to prevent pollution

Building assurance throughout the incineration plant construction process

Temporary wall fencing



Full-coverage temporary tent



* Pioneering efforts by Clean Authority of TOKYO

- We protect the residents' safety with thorough pollution prevention mechanism to eliminate residents' anxiety

2. How assurance was built 2-b. Thorough information disclosure

Distribution of information on incineration plant reconstruction works

Website on information regarding reconstruction works of Hikarigaoka Incineration Plant



- Information on construction progress and environmental protection status throughout this construction are shared with the residents as they become available

- Numerical values of noise and vibration are displayed real time



- Status of reconstruction works can be observed real time through a live camera



Demonstration of safety through disclosure of measured results

Compliance with regulatory standards on hazardous substances contained in exhaust gas

Item	Legal/regulatory value	Self-regulated value
Soot and dust	0.04g/m ³ N	0.01g/m ³ N
Hydrogen chloride	430ppm	10ppm
Sulfur oxides	91ppm	10ppm
Nitrogen oxides	85ppm	50ppm
Mercury	50μg/m ³ N	—
Dioxins	0.1ng-TEQ/m ³ N	—

Our self-regulated values are more stringent than the law

(Nerima incineration plant 2016)

- **Have established our own pollution prevention standard which is more stringent than the guidelines of our government and other municipalities, and will continue to disclose these information on hazardous substances to the residents**

Result of environmental measurements of all incineration plants are published at our website and elsewhere

- Exhaust gas (26 items)
- Wastewater
- Incinerated ash
- Surrounding atmosphere
- Measurement result of dioxins

Above measured data for all incineration plants are shared on our website



Hazardous substances in exhaust gas are measured, and displayed real time on the exhaust gas status display board which is located at the entrance of the incineration plant.

Information sharing and building assurance

Environment Report (Ohta Incineration Plant)



Major contents:

- Environmental policy
- Maintenance status, etc.
(eg, Reduction of air pollutant emission, prevention of water pollution, prevention of offensive odor etc.)

Incineration Plant Newsletter (Nerima Incineration Plant)



Major contents:

- Exhaust gas measurement results of incineration plants
- Call for waste separation cooperation
- Incineration plant tours, and etc.

Safety awareness raising through plant tours for visitors

Scene from an incineration plant tour



- **Majority of plant visitors are school children. Mostly, they come to visit as part of their school curriculum.**

Plant tour facilities at an incineration plant



Display model of an actual size crane

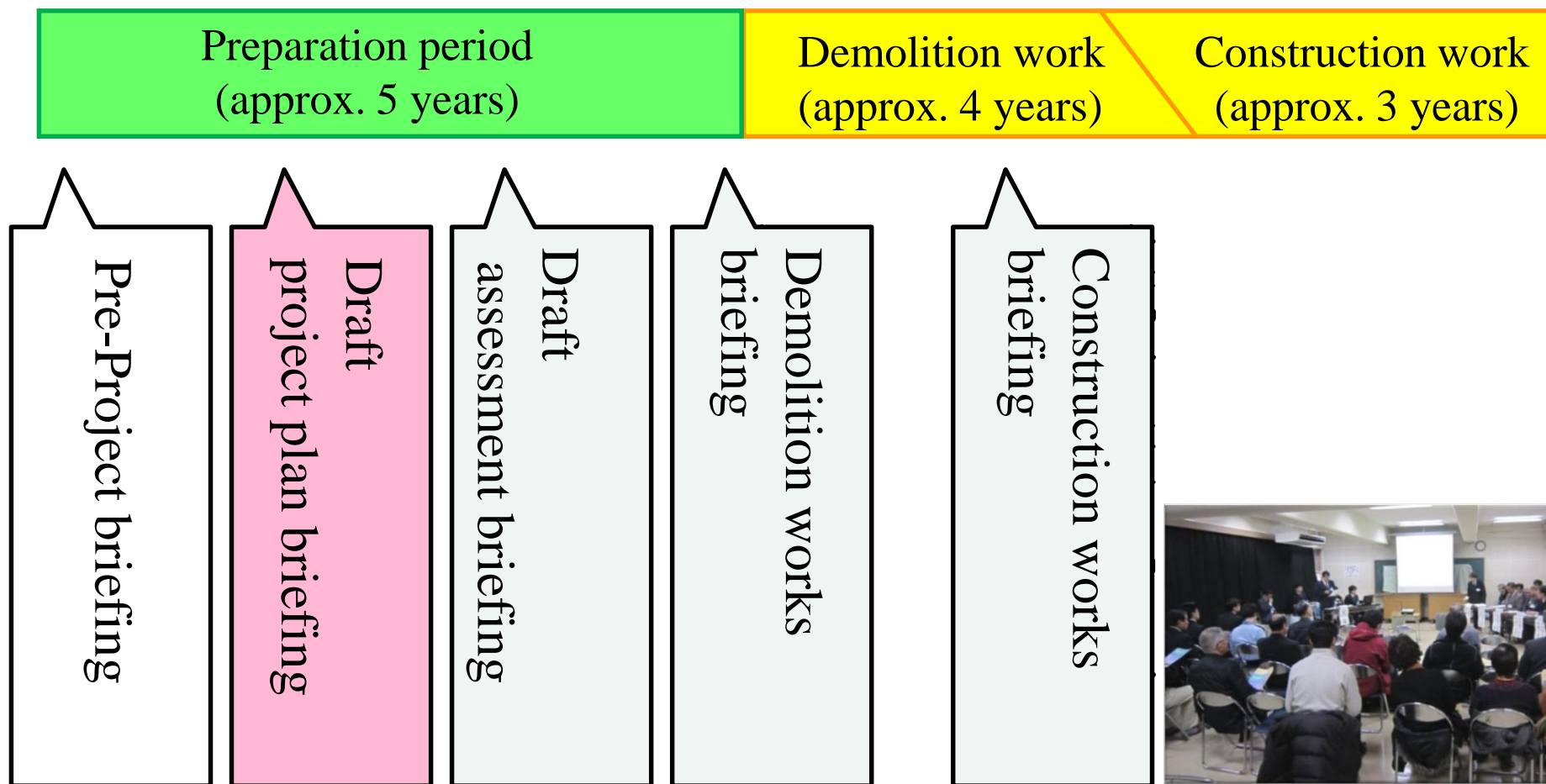


Plant tour to experience the inside of an incinerator

- **Enhance our visitors' understanding towards safety and waste management through a creative plant tour for our visitors**

Promotion of residents' understanding through numerous briefing sessions

[Plant Reconstruction Schedule]



Scene of a briefing session
for the residents

Building a trusted partnership through a Council

Council organized with the residents

Before Incineration plant construction or plant reconstruction

Reconstruction Council

- Organized before the incineration plant is constructed/reconstructed to discuss the construction plan, etc.
- Council is comprised of residents, city officials, and Clean Authority of TOKYO staff
 - Residents are comprised of ① local town councils and residential associations, ② PTA representative of a nearby elementary, middle, and high schools, and ③ representatives from various organizations.



Scene from a plant reconstruction council

During incineration plant operations

Steering Council

- Organized before the start-up of incineration plant operation of the incineration plant, and operation status is reported on regular basis
 - This is held about twice a year, and reports on operation status are made to the residents.
 - Comments and questions from residents are answered in good faith.
 - By holding this council regularly over many years, the relationship is built with the residents.
- Comprised of residents, city officials, and Clean Authority of TOKYO staff



Scene from on steering council. Reports are made to the regional representatives regarding the operation status

Incineration plant design that fit into the community.

Ariake Incineration Plant



- We expected that this plant will become a landmark for the Rinkai sub-metropolitan area, and discussions were held in detail regarding the design of its exterior.
- The concept of this architectural design is a floating incineration plant, and its rectangular shape has a curved surface, giving it a light and powerful image.
- This design won the construction industry association award (BCS award), and today, after 20 years since construction, it is still one of the landmarks of the Rinkai sub-metropolitan area.

Katsushika Incineration Plant



- Selected as the top 10 nation-wide “21st Public Service Colors Award – 10 Colors of the Environment” sponsored by the Association for Color in our Public Space.
- This plant was designed based on three key ideas, which are “incineration plant that is surrounded by water and green”, “incineration plant at the center of a quiet residential town”, and “incineration plant for a friendly town”.
- The blue of this incineration center is the color of the sky and water, and the same blue is used as the blue in communication emblem of Katsushika City where this incineration plant is located.

Harmonization with community through increased greenery

Suginami Incineration Plant



Created areas with greenery

- Increased greenery as much as possible on the rooftops and exteriors of the incineration plant to harmonize with the greenery of the neighborhood.
- Surrounded by trees and water which represent the nature of Musashino area, a walkway was installed where people can enjoy the greenery and flowers of the four seasons

Itabashi Incineration Plant



More greenery on the walls of the incineration plant

- This plant has approx. 2,000m² of greenery on external walls, which is the most greenery per area in all of Japan, and won the Minister of Environment Award at the 3rd Rooftop, Walls, and Special Greenery Technology Competition.
- Efficiency in weight reduction and maintenance of greenery systems

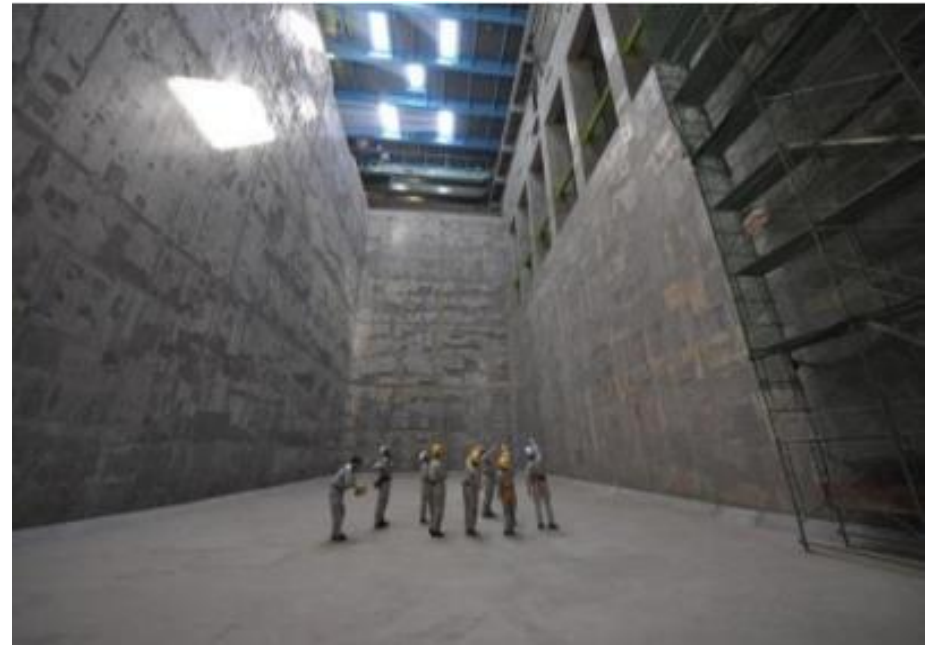
Proactive utilization of natural energy

Solar power generation panels



- **Generated electricity is utilized for operations of the incineration plant**

Skylight installed in the incineration plant



- **Skylights are installed to reduce lighting power**

Giving back to the local communities

Effective utilization of thermal energy



Used on site

Sold to electricity and heat suppliers



Electricity
and heat
providers

Electricity,
heated
water, etc.

Free or for a cost



Itabashi Botanical Gardens



Hot Plaza Harumi (Chuo City)

Green space is open to the public



Chuo Incineration Plant garden area (“Step Garden”) is open to the neighborhood as a recreation spot



Functional hub in case of disaster

Incineration plants have agreement with Tokyo Metropolitan Government to serve as rescue activity base for rescue agencies and private lifeline institutions.

For your inquiries:

Tokyo Model is a systematic summary of the Municipal Solid Waste disposal system in the 23 Cities of Tokyo and its strengths.

Tokyo used to have many problems concerning waste disposal. However, by solving problems one by one, we have come to build today's waste disposal system. This Tokyo Model is our landing point as of today.

All cities alike are facing many problems concerning waste. However, we believe that we can help provide suggestions on how to solve those problems with our solid experiences based on Tokyo's waste disposal system. Please do consult us.

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Details of this program

- ◎ Accepting of observation tours to disposal facilities such as incineration plants and where municipal solid waste is collected, transported, and recycled
- ◎ Advice on how to raise awareness among residents and devise an overall plan on municipal solid waste disposal system for your country (your city); support on considering facility development plans; preparation for issues and analysis of the current state of municipal waste disposal; conduct feasibility study
- ◎ Accepting training participants (training offered)
- ◎ Various consultations