



2021 Environmental Report

(FY2020 Results)



Clean Authority of TOKYO

Suginami Incineration Plant

Our Initiatives

Work started in September 2012 and in September 2017 the 2nd Sugunami Incineration Plant was completed, and with the region's understanding and cooperation, this financial year it has reached its 5th year of operation.

The plant has energy conservation measures, including using geothermal energy and solar electricity generation, and is introducing new pollution prevention equipment. In December 2020 this environmentally friendly plant obtained the international environment management system qualification ISO 14001. The unique traits of this plant include our open to the public *Tokyo Waste War History and Future Building*, our environmental education facility *Takaido Village Foot Spa*, our *Walking Road* where you can enjoy flowers all year round and where we work with regional volunteers and take care of our *Anne's Roses*. Visitors to the plant were originally a large number of city residents, but have expanded to include many people from overseas too.

In the operation of our plant, we aim for a "reliable incineration plant that blends into the area". We are endeavoring to make a recycling oriented society by adhering to environmental laws and ordinances and our operational agreement, effectively using the heat generated by waste incineration for power generation and our heat supply together with hygienically incinerating waste.

This environmental report is the conclusion of FY2020's achievements. We are grateful for your reading it and gaining a deeper understanding of our plant.

December 2021

Susumu Kitakaze, Sugunami Incineration Plant Manager

Equipment Outline

Incinerator	Fully Continuous Combustion Fire Grate Incinerator Processing Capacity 600t/day (300t/day x2 Incinerators)
Boiler	Natural Circulation Water Pipe Boiler w/ Superheater Maximum Usable Pressure/Temperature 5.35 MPa/420 °C Maximum Evaporation Volume 63.21 t/h
Generator	Steam Turbine Generator Rated Output 24,200 kW
Exhaust Processor	Bag Filter, Gas Scrubber, Catalytic Reaction Tower
Stack	Approximately 160 m

Tokyo Waste War History and Future Building Takaido Village Foot Spa Anne's Roses



●Tokyo Waste War History and Future Building

In addition to explaining the background, we also introduce the process leading up to the residents' opposition movement and reconciliation against the planned construction of Sugunami Incineration Plant, and the lessons that were utilized in the subsequent incineration enterprise.



●Takaido Village Foot Spa

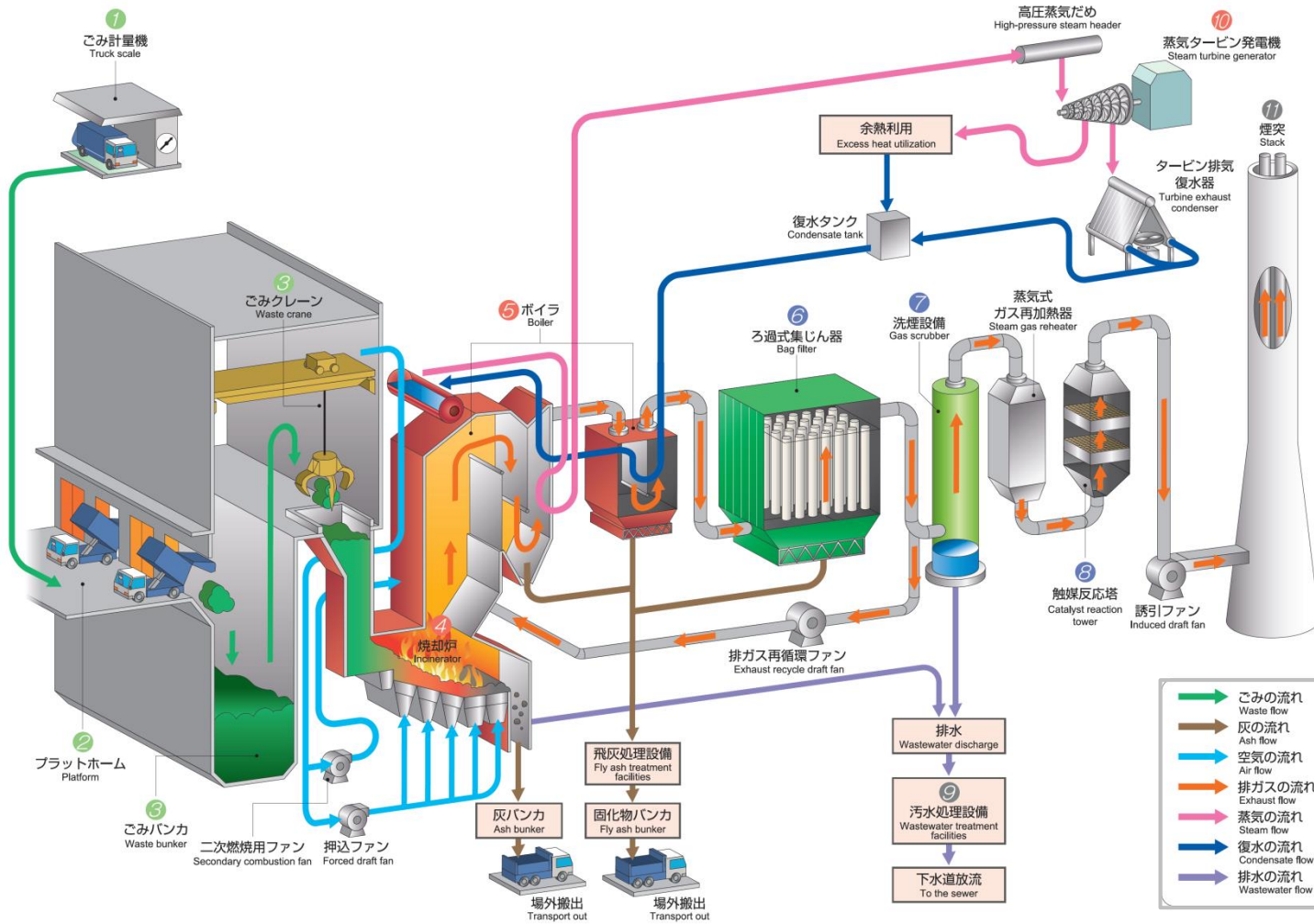
An environmental learning facility where you can feel the heat produced from waste incineration, which is used to heat the water.



●Anne's Roses

While enjoying the year round blossoms of the Walking Road, you can walk in the plant's surrounding green space. The flower beds are Anne's Roses root shared by Takaido Junior High School.

Structure of Suginami Incineration Plant



→Steam flow

The (5) boiler's vapor is sent to (10) the steam turbine generator. The steam turns the turbine which generates electricity by rotating. Using the residual heat from the vapor, other than making the spa in our *Takaido Village Foot Spa* education center, it also supplies the hot water for the adjoining Takaido Residents Center.

→Condensate flow

The steam used in the (10) steam turbine generator returns to water through the turbine exhaust condenser and using residual heat.

→Waste flow

Brought in waste is (1) weighed at the truck scale then goes from (2) the platform and enters (3) the waste bunker. Afterwards, (3) the waste crane puts the waste in (4) the incinerator where it's continuously incinerated over 24 hours at high temperatures of more than 800°C.

→Ash flow

Ash leaves (4) the incinerator and is held in the ash bunker. Later it is transported to the landfill or public resourcing facility. Fly ash gathered by (6) the bag filter is treated with chemicals in the fly ash treatment facility to remove toxins and transported to the landfill.

→Air flow

The air needed for waste combustion is drawn by a fan from (3) the waste bunker and by sending it to (4) the incinerator, at the same time as the incinerator is stabilized the odor in the waste bunker doesn't leak outside.

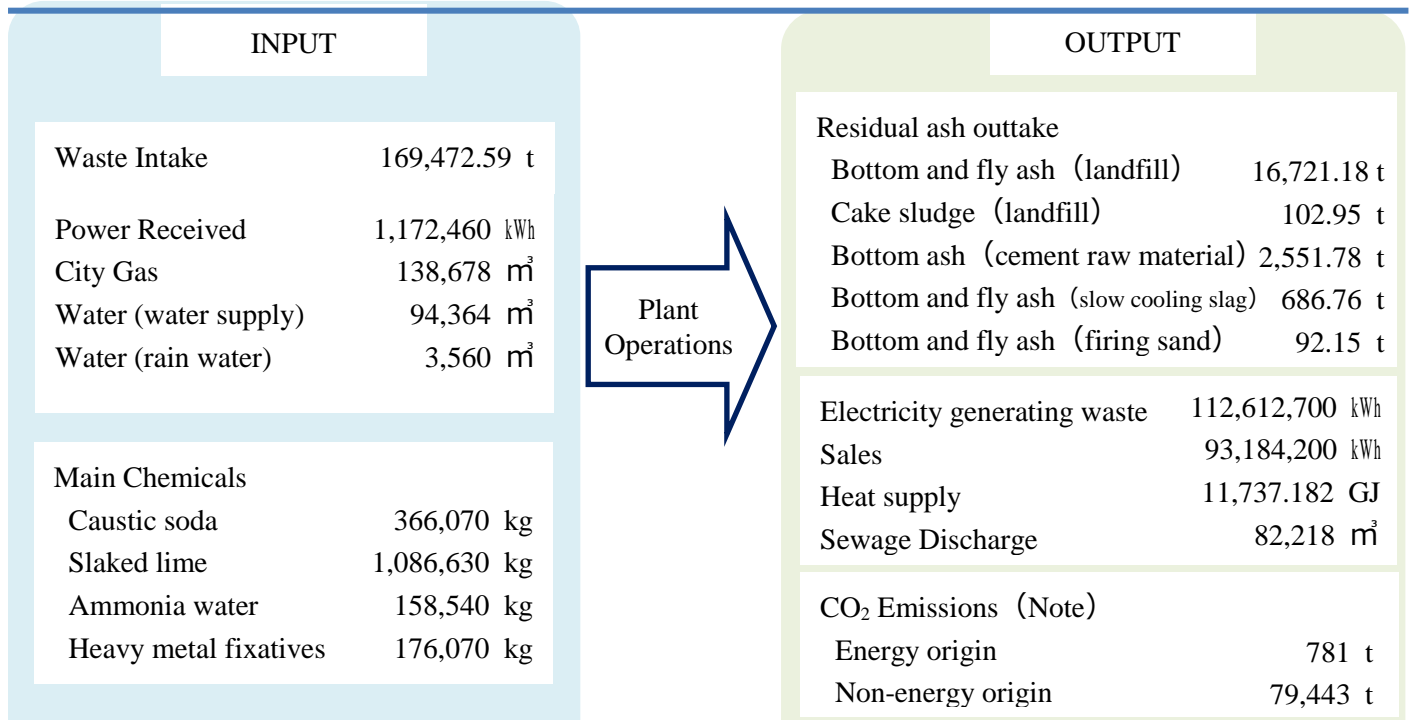
→Exhaust flow

Exhaust generated by waste incineration, after heat recovery by (5) the boiler, has toxins removed by (6) the bag filter, (7) the gas scrubber and (8) the catalyst reaction tower and then is released from (11) the stack. Furthermore, by recycling a part of the exhaust, it suppresses the production of nitrogen oxide.

→Wastewater flow

The ash refrigeration water and exhaust washing water has its toxins removed in (9) the wastewater treatment facility and discharged into sewage pipes.

Mass Balancing

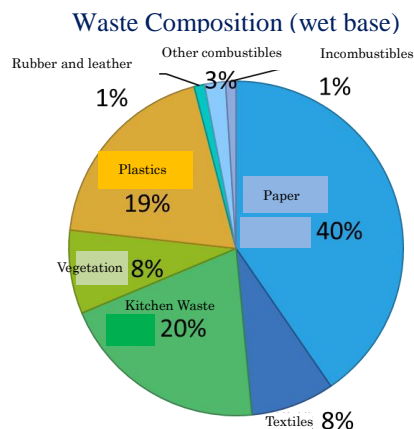


Note: Energy originating and non-energy originating CO₂ emission amounts are calculated based on stipulations in Article 26 of the **Act on Promotion of Global Warming Countermeasures** (Act No. 117 of 1998), and are values discharged etc. by a general waste incinerator.

About INPUT

●Waste Intake

Receives combustible waste taken from Sugunami City and surrounding cities (Setagaya, Nerima, Nakano, Shinjuku)



Reference Material: FY2020 Incineration Plant Waste Characteristics Survey Report

●Power Received

The electricity needed in the plant uses waste generators. In the event of insufficient power, including incinerator repairs, power is bought (received).

●City Gas

In addition to when they're turned, started up and shut down, city gas is used to reliably burn waste.

●Water

The boiler water supply, exhaust washing, machinery cooling, watering of plants and trees etc., use the water supply. By using rainwater from the grounds to wash the grounds and road, we endeavor to reduce the amount of water supply used.

●Main Chemicals

Caustic soda: used to remove acidic substances from the exhaust, adjust wastewater pH and recycling ion exchange resins for making pure water.

Slaked lime: used for removing acidic substances from the exhaust.

Ammonia water: used for breaking down nitrogen oxides in the exhaust into water and nitrogen.

Heavy metal fixatives: contains heavy metals in the fly ash and prevents liquidation at the landfill.

About OUTPUT (results of environmental measurements)

●Exhaust Measurement Results

Soot and dust, sulfur oxide, nitrogen oxide, hydrogen chloride, mercury, dioxins and other toxins that cause environmental pollution are released when waste is incinerated. At the Sugunami Incineration Plant the exhaust containing toxins is cleaned by the bag filter, gas scrubber and catalyst reaction tower. In addition to abiding by the related laws and ordinances which include the Air Pollution Control Act and the Law Concerning Special Measures Against Dioxins, by setting even more stringent values for self-regulation in the operations agreement (note), our measures to prevent environmental contamination are very thorough.

Note: With the preventing of preventing the occurrence of pollution and preserving the local environment through safe and stable plant operations, we have signed an agreement with the Clean Authority of Tokyo, Sugunami City, and representatives for the surrounding residents.

Investigative Body: Environmental Technical Laboratory Ltd.

Tokyo Technical Services Ltd. (Dioxins)

Item	Standard Value		Incinerator	Survey Date						Unit
	Law	Agreement		No.1	04/27/2020	06/26/2020	08/19/2020	10/20/2020	12/09/2020	
Dust and Soot	0.04	0.01	No.1	04/28/2020	06/19/2020	08/20/2020	10/08/2020	12/08/2020	01/12/2021	g/m ³ N
			No.2	Undetected	Undetected	Undetected	Undetected	Undetected	Undetected	
Sulfur Oxide	123	10	No.1	1	Undetected	Undetected	Undetected	Undetected	2	ppm
			No.2	Undetected	Undetected	Undetected	Undetected	Undetected	Undetected	
Nitrogen Oxide	84	50	No.1	33	42	34	27	32	35	ppm
			No.2	37	40	42	37	38	35	
Hydrogen Chloride	430	10	No.1	Undetected	Undetected	Undetected	Undetected	Undetected	Undetected	ppm
			No.2	Undetected	Undetected	Undetected	Undetected	Undetected	Undetected	
Mercury	50	-	No.1	0.40	0.62	0.63	1.3	0.34	0.82	μg/m ³ N
			No.2	0.55	0.78	0.39	0.48	0.36	1.4	
Dioxins	0.1	-	No.1	0.000010	0.000027	0.000017	0.000017	-	-	ng-TEQ/m ³ N
			No.2	0.000019	-	0.0000064	--	0.0000011	0.0000042	

Note 1: **Undetected** represents a measurement didn't reach the lower limit value.

Note 2: Each item's value has a conversion value of 12% oxygen concentration.

Note 3: m³N (normal cubed meters) represents the volume of gas in the standard state of 0°C and 1 atmosphere.

Note 4: ppm represents a ratio of 1 to 1,000,000.

Note 5: Dioxins is a general name for polychlorinated dibenzodioxins, dibenzofuran and polychlorinated biphenyl.

Note 6: TEQ (Toxic Equivalent) is an amount of dioxins the converted to the toxicity of the most toxic, 2,3,7,8 tetrachlorodibenzodioxin.

Note 7: ng (nanogram) represents 1 billionth of a gram's mass.

μg (microgram) represents 1 millionth of a gram's mass.

●Table is the measurement results of a third party's regular measurement of things including the exhaust. Other environment measurement results are listed on the Clean Authority of TOKYO homepage.

<https://www.union.tokyo23-seisou.lg.jp/gijutsu/kankyo/toke/chosa/index.html>

Environmental System Management Initiatives

About ISO14001

ISO14001 is an international standard that requires the formulation of a system of sustainable improvement for an organization's environmental impact, through a cycle of Plan, Do, Check and Act. The Clean Authority of TOKYO has jurisdiction over intermediate processing facilities and is working hard on formulating an environment management system that meets the ISO 14001 standard, reducing environmental waste pollutants, and conserving resources and energy. This plant obtained its certification in December 2020.

Certification
Examination



ISO14001
Registration
Certificate



Suginami Incineration Plant's Environmental Policies and Goals

Based on the environmental policies stipulated by the plant manager, each related goal is set out on the following page. Each section manager is responsible for their implementation and works as the environmental promoter for their section, tackling the daily environmental management activities to achieve the environmental goals.

Environmental Policies

At present and in the future, we humans must endeavor properly to preserve the environment, conserve resources and conserve energy to healthily enjoy the benefits of a sound and bountiful environment.

Among those endeavors, at Suginami Incineration Plant we have a responsibility to take the necessary measures to hygienically incinerate waste, be diligent in rationalizing our energy use and appropriately preserve the natural environment while we reliably prevent atmospheric pollutants, water contamination and other kinds of pollution.

In order to continue being a "reliable incineration plant that blends into the area", Suginami Incineration Plant is working hard on every staff member and working together on environmental management activities.


- 1 Abide by environmental laws and ordinances and the Agreement Related to Suginami Incineration Plant Operations, and endeavor to preserve the local living environment.
- 2 Hygienically incinerate brought in waste and endeavor to prolong the life of final disposal sites by reducing the amount of waste and recycling of ash.
- 3 Along with endeavoring to conserve resources and energy, work hard on creating a recycling-oriented society and global warming measures through the effective use generating electricity and supplying heat with the heat energy produced via waste incineration.
- 4 Consider harmony with the local area and the proper maintenance and management of plants and trees.
- 5 Hold study tours and environmental events, provide information closely related to operational conditions, including through the management council and plant newsletters.



These environmental policies are generally open to the public, as well as spreading the information to persons working at the plant starting with all of the staff of Suginami Incineration Plant.

In addition to this we are endeavoring to continuously improve our environment management system and further reduce the environmental burden, by setting environmental goals based on our environmental policies and regularly reviewing them, as well as working hard to achieve them.

Environmental Goals

FY2020 Achievements and Circumstances (upper columns: goals, lower columns: achievements and circumstances)

Administration Section	Maintenance Section
<p>Plan to publish the plant news more than once per year, and promote understanding for Sugunami Incineration Plant's regional residents.</p> <p>Plan to hold an environment fair once per year, and promote understanding for Sugunami Incineration Plant's regional residents. (As a replacement in line with the fair's suspension, plan further active use of the walking road and improvement of the plants and trees environment).</p>	<p>Make things to give out at the environmental fair.</p>
<p>Published News from the Plant. Please read it on our homepage.</p> <p>https://www.union.tokyo23-seisou.lg.jp/kojo/suginami/index.html</p> <p>Issue 42 (New Plant No. 6) (09/29/2020) Issue 43 (New Plant No. 7) (03/02/2021)</p> <p>Walking Road PT started up by plant staff, planted trees and plants. Please read the next page.</p>	<p>Created miniature cranes and bolt dolls.</p>  <p>Miniature crane and bolt dolls</p>

Engineering Section	Operations Section
<ol style="list-style-type: none"> Established a Visitors Manual. Added 1 point to the exhibitions. 	<p>In order to use heat energy most effectively, abided by the incinerator volume in the incinerator operations plan that was stipulated based on the carrying in plan. FY2020, guaranteed 96% or more incinerator volume for each month's plan (excluding unplanned stoppages).</p>
<ol style="list-style-type: none"> Revised the Visitors Manual. Made an exhibit about recycling main ash and fly ash.  <p>Ash Recycling Exhibit</p>	<p>In the year, achieved 99.87% of the planned ratio.</p>  <p>Inside the Central Control Room</p>

Communication

●Holding Plant Study Tours

The special characteristic of each of Sugunami Incineration Plant's visitor spaces is that they've been devised to have ease of viewing and understanding, to grasp the curiosity and interest of visitors of all ages from children to the elderly. Plant study tours show you the waste actually burning in the incinerator, and you can experience the **Waste Separation Game**. For FY2020, study tours have been suspended due Covid-19 infection prevention measures.



Visitors Route



Incinerator Observation Window



Waste Separation Game

●Walking Road PT Activities

The **Suginami Incineration Plant Environment Fair** was held until FY2019 but was suspended like the study tours. The Project Team (PT) at Suginami Incineration Plant was started to increase the attachments of the city residents and users, and deepen their understanding of the plant. So, the further active use of the Walking Road and improvement of the plant and tree environment was planned. Since FY2020 approximately 600 seedlings have been planted by staff in the plant's south side promenade (rhododendrons, azaleas, etc.).



Blooming rhododendrons



Planted rhododendrons



Planted azaleas

◆Regarding applications for study tours

Study tours are presently suspended due to Covid-19 measures to prevent infection, but Suginami Incineration Plant will reopen from December 1st 2021. However, in consideration of the state of Covid-19 infections of late, the tour times will be different to usual. Moreover, keeping the state of infections in mind, please understand that there are times a study tour will be suspended without notice.

Thank you for your cooperation and understanding.

●Management Council

The **Suginami Incineration Plant Management Council** formed by the Suginami City committee members, regional residents' representative, and the Clean Authority of Tokyo is held twice a year and it reports on the state of operations at Suginami Incineration Plant, environmental survey results, etc. With the goal of being a "reliable incineration plant that blends into the region", we are using opinions received at meetings in our operations. (FY2021 was held in writing.)



Management Council

Map



- 〒168-0072 3-7-6 Takaido Higashi Suginami City
- 5 min. walk from Takaido Stn., Keio Inokashira Line

◆To contact us regarding this booklet
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