

Pollution Prevention

ENVIRONMENT



► Policy and Concept

Steadily implementing local environmental protection measures, including preventing air and water pollution, dealing with asbestos issues and preserving biodiversity, we are also strictly managing chemical substances.

At our power plants, for instance, we undertake measures based on laws, local regulations, environmental protection agreements and other rules to reduce air pollution, water pollution, noise, vibrations, and other problems. In addition, we monitor and measure the air and ocean around our power plants and carefully evaluate the environmental effects of our operations on the regional environment to ensure that no problems occur.

◆ <Kansai Electric Power Group Environmental Policy 4. Protecting local community environments>

4. Protecting local community environments

At the Kansai Electric Power Group, we seek to prevent environmental pollution while working to strictly manage and reduce toxic chemicals in our business activities in order to promote the environmental protection of local communities.

► Goals

● Measures to prevent air pollution

◆ Maintaining current sulfur oxide (SOx) emissions per power output

Emission factor: Maintaining the world's lowest levels, Emissions: Complying with the standards as agreed for each power plant
Results: 0.024 g/kWh (consolidated), 0.045 g/kWh (thermal power generation), with all agreed standards met

◆ Maintaining current nitrogen oxide (NOx) emissions per power output

Emission factor: Maintaining the world's lowest levels, Emissions: Complying with the standards as agreed for each power plant
Results: 0.044 g/kWh (consolidated), 0.082 g/kWh (thermal power generation), with all agreed standards met

● Handling of chemical substances

◆ Proper handling of products containing asbestos

Proper control and processing in compliance with relevant laws and regulations

● Strict control and reduction of hazardous chemical substances

◆ Proper handling of products containing asbestos

Proper control and processing in compliance with relevant laws and regulations

◆ Proper processing of PCB waste

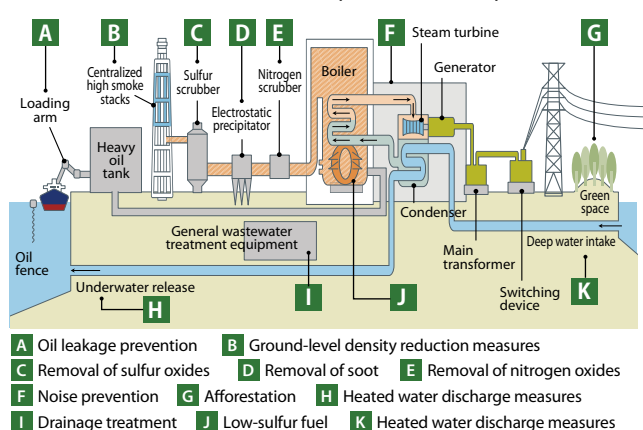
Proceed with certainty to achieve processing before the legal deadline.

► Efforts

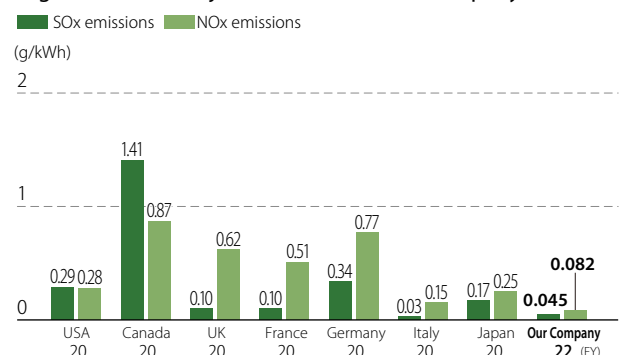
● Air pollution prevention measures (SOx, NOx, soot)

Our Company has implemented measures aimed at reducing the volume of SOx (sulfur oxides) emitted by our thermal power plants by using low-sulfur fuels, installing sulfur scrubbers, and other measures. To address the issue of NOx (nitrogen oxides), we are taking steps to lower emission levels, such as improving combustion methods and installing nitrogen scrubbers. As a result, our SOx and NOx emissions per unit of electric power generated are significantly lower than those of the major countries of Europe and North America, remaining among the lowest in the world. In addition, we have installed high-performance electrostatic precipitators that dramatically cut soot emissions.

◆ Environmental measures adopted at thermal power stations



◆ SOx and NOx emission factors for thermal power generation of major countries and our Company



Sources: OECD.Stat (OECD website) for emissions; World Energy Balances 2022 (IEA) for power generation output



● Handling chemicals

We regularly monitor the status of buildings and equipment that contain asbestos and systematically advance the removal of asbestos and replacement with non-asbestos products. At the same time, employees are trained to better understand the properties of asbestos. In these ways, we are managing asbestos suitably as we strictly abide by related laws, regulations and other rules. Moreover, in addition to abiding by the PRTR (Pollutant Release and Transfer Register) System, we are working actively to manage toxic chemicals strictly and to reduce them.

◆ Use of asbestos in buildings and facilities

Items targeted		Type of use	Present conditions (usage)
Blown-in materials containing asbestos		Acoustic insulation, thermal insulation, and fireproofing materials in company buildings; acoustic insulation for transformers	<ul style="list-style-type: none"> •Company buildings 229 buildings (about 4% of total) •Acoustic insulation for transformers 14 units (about 0.5% of total)
Asbestos-containing products	Building materials	Fireproofing panels, roofing materials, flooring for buildings, etc.	<ul style="list-style-type: none"> •Company buildings May be included in building materials used before August 2006
	Asbestos-cement pipes	Duct wiring for underground wires (transmission, distribution, and communications facilities)	<ul style="list-style-type: none"> •Transmission ducts Approx. 658 km (route length) (about 42% of total length) •Distribution ducts Approx. 581.5 km (route length) (about 12% of total length) •Communications ducts Transmission and distribution: Approx. 5.0 km (route length) (about 26% of total length) Renewable energy: Approx. 0.2 km (route length) (about 5% of total length)
	Thermal insulation	Power generation facilities (thermal power facilities, nuclear power facilities)	<ul style="list-style-type: none"> •Remaining products containing asbestos Thermal power: Approx. 33,632 m³ (about 11% of total) Nuclear power: Approx. 1,910 m³ (about 20% of total)
	Sealing materials, gaskets	Power generation facilities (thermal power facilities, nuclear power facilities)	<ul style="list-style-type: none"> •Sealing materials (remaining products containing asbestos) Thermal power: Approx. 26,000 (about 27% of total) Nuclear power: Approx. 4,800 (about 3% of total) •Gaskets (remaining products containing asbestos) Thermal power: Approx. 3,500 (about 9% of total) Nuclear power: Approx. 9,000 (about 5% of total)
	Buffers	Suspension insulators for transmission facilities, etc.	<ul style="list-style-type: none"> •Transmission facilities Approx. 570,000 (about 12% of total) •Distribution facilities 2,988 (about 4% of total)
	Thickeners	Electric wire for overhead transmission lines; hydroelectric dams	<ul style="list-style-type: none"> •Transmission facilities Approx. 225 km (route length) (about 2% of total length) •Part of asphalt-surface impervious wall for dam structure 1 facility (Tataragi Dam)
	Insulation materials	Main motors and main circuit fuses of electric locomotives; water turbine generators; circuit breakers	<ul style="list-style-type: none"> •Main motors: 4 locomotives (4 units/locomotive) •Main circuit fuses: 4 locomotives (1 unit/locomotive) •Water turbine generators (stators): 53 units •Water turbine generators (rotors): 58 units •Magnetic circuit breakers: 21 units
		Molded case circuit breakers (MCCB) from the uninterruptible power-supply system for telecommunication; transformers; reactors	<ul style="list-style-type: none"> •Transformers (Matsushita Battery Industrial) •Reactors (Matsushita Battery Industrial) •Wiring breakers (Fuji Electric)
	Friction materials	Winding machine brakes, etc.	<ul style="list-style-type: none"> •Water turbine generator brakes: 19 units •Crane brakes: 122 units •Incline brakes: 1 unit •Elevator brakes: 1 unit •Gate winding machine brakes: 99 units •Dust collector brakes: 9 units
	Insulators	Emergency power generators	<ul style="list-style-type: none"> •Emergency power generators: 3 units

Note: The figures in the table reflect the use of asbestos in buildings and facilities as of the end of March 2023.



● Safe, proper disposal of PCB

In line with relevant laws and regulations such as Law Concerning Special Measures Against PCB Waste, we have a program in place to dispose of all equipment containing PCB (transformers, capacitors, fluorescent ballasts, etc.) safely and properly according to their characteristics.

◆ Disposal of high-level PCB

Equipment containing PCB (transformers, capacitors, fluorescent ballasts, etc.) is investigated retrospectively, referring to information on high-level PCB provided by the government and electric manufacturers; high-level PCB, if identified, is disposed of by the Japan Environmental Storage & Safety Corporation (JESCO) in accordance with the national PCB Waste Treatment Basic Plan.

We are currently working to complete proper disposal of all high-level PCB waste located and stored through an on-going search before expiration of the deadline.

◆ Disposal of low-level PCB

We established the Recycling Center for Utility Pole Transformers in 2003 while soliciting consent from local residents and municipalities on disposal of low-level PCB; insulating oil and transformer cases contaminated with PCB were detoxified for recycling purposes, with treatment of these materials in storage completed by July 2015.

Meanwhile, equipment containing insulating oil (transformers in operation at power plants and substations, pole transformers in distribution facilities, etc.) is routinely inspected for maintenance purposes (regardless of the presence or absence of PCB) to ensure proper operation. Additionally, measures are in place in the event of the unplanned release of insulating oil due to natural disasters (typhoons, lightning strikes, etc.), where spillages are prevented and contamination is contained to minimize impacts on the environment.

Moreover, all equipment in operation is inspected for possible PCB contamination and properly treated according to its type, size and PCB levels, leveraging certified detoxifying business contractors authorized by the Minister of the Environment (Kanden Engineering Corporation's Solvent Cleansing Method, etc.), treatment facilities operating under license from prefectural governors, and the energized natural circulation washing technology in compliance with government procedures.

● Performance data

Atmospheric emissions and drainage*1		Unit	FY 2020	FY 2021	FY 2022
SOx emissions*2		t	2,098	2,645	2,111
			(2,099)	(2,646)	(2,111)
SOx emission intensity (at the generation end)*3		g/kWh	0.023	0.027	0.024
SOx emission intensity (per thermal power output) (at the generation end)*4			0.033	0.054	0.045
NOx emissions*5		t	4,551	4,125	3,875
			(4,607)	(4,184)	(3,918)
NOx emission intensity (at the generation end)*6		g/kWh	0.049	0.042	0.044
NOx emission intensity (per thermal power output) (at the generation end)*7			0.072	0.084	0.082
Ozone depletion emissions		t-CO ₂	314	394	361
	HCFC		263	72	234
	Other		577	466	126
COD emissions*8		t	23	23	20
			(23)	(23)	(20)
Amount of PCB waste		1,000 t	10.7	18.9	22.0
			(10.7)	(18.9)	(22.0)

*1 The figures in parentheses include the results of group companies (excluding those of some group companies)

*2 This is calculated from amounts of sulfur in fuel as well as SOx concentrations in gas emissions (measured values) and gas emission volumes. (Some previous fiscal year amounts were calculated from the amount removed by desulfurization equipment.)

*3 SOx emission intensity (at the generation end) = SOx emissions ÷ power output (at the generation end)

*4 SOx emission intensity (per thermal power output (at the generation end)) = SOx emissions ÷ thermal power output (at the generation end)

*5 This is calculated from SOx concentrations in gas emissions (measured values) and gas emission volumes.

*6 NOx emission intensity (at the generation end) = NOx emissions ÷ power output (at the generation end)

*7 NOx emission intensity (per thermal power output (at the generation end)) = NOx emissions ÷ thermal power output (at the generation end)

*8 This is calculated from analyzed wastewater concentration values.

Note: Reporting coverage is shown on page 26.