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 processing of PCB waste
Proceed with certainty to achieve processing before the legal deadline

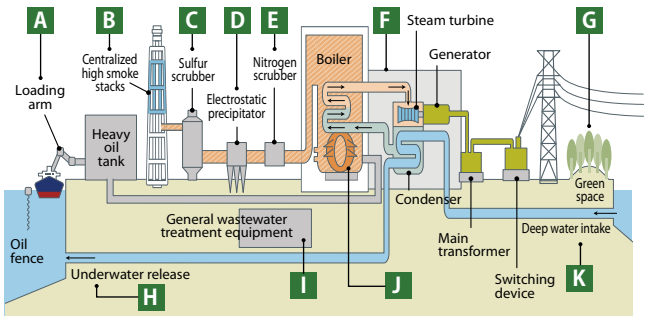
Proper handling of products containing asbestos
Proper control and processing in compliance with relevant laws and regulations

Efforts

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

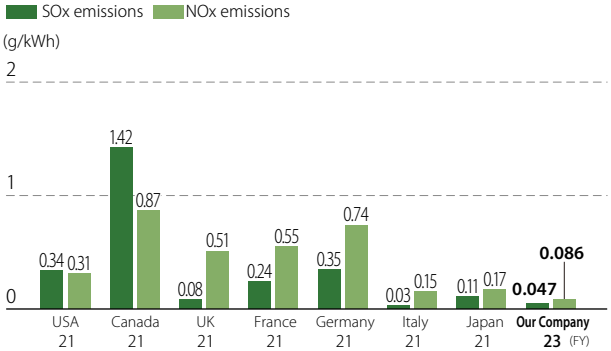
Our Company has implemented measures aimed at reducing the volume of SOx (sulfur oxides) emitted by our thermal power plants by using low-sulfur fuels, installing sulfur scrubbers, and other measures. To address the issue of NOx (nitrogen oxides), we are taking steps to lower emission levels, such as 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



A Oil leakage prevention B Ground-level density reduction measures
C Removal of sulfur oxides D Removal of soot E Removal of nitrogen oxides
F Noise prevention G Afforestation H Heated water discharge measures
I Drainage treatment J Low-sulfur fuel K Heated water discharge measures

◆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 2023 (IEA) for power generation output

Handling of chemical substances

Handling of asbestos

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.

• 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	•Company buildings 213 buildings (about 3% of total) •Acoustic insulation for transformers 9 units (about 0.3% of total)
Asbestos-containing products	Building materials	Fireproofing panels, roofing materials, flooring for buildings, etc.	•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)	•Transmission ducts Approx. 659 km (route length) (about 42% of total length) •Distribution ducts Approx. 584.9 km (route length) (about 12% of total length) •Communications ducts Transmission and distribution: Approx. 2.3 km (route length) (about 12% 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)	•Remaining products containing asbestos Thermal power: Approx. 28,442 m^3 (about 9% of total) Nuclear power: Approx. 1,890 m^3 (about 20% of total)
	Sealing materials, gaskets	Power generation facilities (thermal power facilities, nuclear power facilities)	•Sealing materials (remaining products containing asbestos) Thermal power: Approx. 23,000 (about 24% of total) Nuclear power: Approx. 4,700 (about 3% of total) •Gaskets (remaining products containing asbestos) Thermal power: Approx. 3,700 (about 9% of total) Nuclear power: Approx. 9,000 (about 5% of total)
	Buffers	Suspension insulators for transmission facilities, etc.	•Transmission facilities Approx. 560,000 (about 11% of total) •Distribution facilities 3,395 (about 5% of total)
	Thickeners	Electric wire for overhead transmission lines; hydroelectric dams	•Transmission facilities Approx. 222 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	•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	•Transformers and reactors: 3 units •Wiring breakers: 1 unit
	Friction materials	Winding machine brakes, etc.	•Water turbine generator brakes: 19 units •Crane brakes: 114 units •Incline brakes: 1 unit •Elevator brakes: 1 unit •Gate winding machine brakes: 99 units •Dust collector brakes: 9 units
	Insulators	Emergency power generators	•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 2024.

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.

We are monitoring and regularly inspecting equipment utilizing insulation oil (transformers in operation at power plants and substations, pole transformers in distribution facilities, etc.), regardless of the presence or absence of PCB, to ensure proper operation.

Equipment in operation, moreover, is inspected for possible PCB contamination through analysis, etc.; PCB, if detected, detoxified with energized natural circulation washing according to procedures specified by the government, or treated at designated facilities (detoxification facilities licensed by the Minister of the Environment, treatment facilities licensed by prefectural governors, etc.), following decommissioning of the equipment.

* PCB: Poly chlorinated biphenyl, a compound widely used for transformer insulating oil, etc., because of its excellent electrical insulation properties. Being hazardous to ecological systems, however, PCB production/use is generally banned. High-level PCB is used deliberately while low-level PCB is accidentally mixed in.

Handling of other chemical substances

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.

Performance data

• Atmospheric emissions and drainage*1

	Unit	FY 2021	FY 2022	FY 2023
SOx emissions*2	t	2,645	2,111	1,905
		(2,646)	(2,111)	(1,905)
SOx emission intensity (at the generation end)*3	g/kWh	0.027	0.024	0.019
SOx emission intensity (per thermal power output) (at the generation end)*4		0.054	0.045	0.047
NOx emissions*5	t	4,125	3,875	3,524
		(4,184)	(3,918)	(3,539)
NOx emission intensity (at the generation end)*6	g/kWh	0.042	0.044	0.036
NOx emission intensity (per thermal power output) (at the generation end)*7		0.084	0.082	0.086
Ozone depletion emissions	t-CO_2	466	361	176
HCFC		72	234	17
Other		394	126	159
COD emissions*8	t	23	20	19
		(23)	(20)	(47.1)
Amount of disposed PCB waste	1,000 t	18.9	22.0	16.6
		(18.9)	(22.0)	(16.6)

*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.