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: 0.027 g/kWh (consolidated), 0.054 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: 0.042 g/kWh (consolidated), 0.084 g/kWh (thermal power generation), with all agreed standards met

Measures to process PCB waste

Proper processing of PCB waste

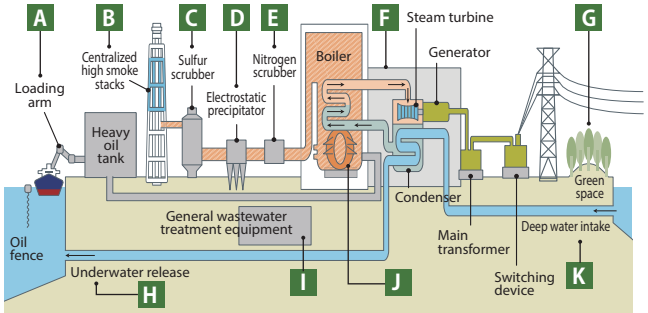
Proceed with certainty to achieve processing before the legal deadline.

Efforts

Air pollution prevention measures (SOx, NOx, soot)

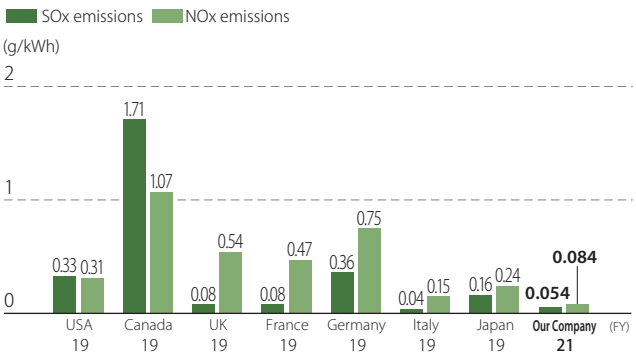
Our Company has implemented measures aimed at reducing the volume of SOx (sulfur oxides) emitted by our thermal power plants by using low-sulfur fuels, installing sulfur scrubbers, and other measures. To address the issue of NOx (nitrogen oxides), we are taking steps to lower emission levels, such as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



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 StatExtracts for emissions; IEA Energy Balances 2021 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. 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	• Company buildings 262 buildings (about 4% of total) • Acoustic insulation for transformers 20 units (about 1% of total)
Asbestos-containing products	Building materials	Fireproofing panels, roofing materials, flooring for buildings, etc.	• Company buildings May include 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. 575.9 km (route length) (about 11.7% of total length) • Communications ducts Transmission and distribution: Approx. 5.2 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 facility, nuclear power facility)	• Remaining products containing asbestos Thermal power: Approx. 58,543 m³ (about 18% of total) Nuclear power: Approx. 1,910 m³ (about 20% of total)
	Sealing materials, gaskets	Power generation facilities (thermal power facility, nuclear power facility)	• Sealing materials (remaining products containing asbestos) Thermal power: Approx. 28,000 (about 29% of total) Nuclear power: Approx. 5,000 (about 3% of total) • Gaskets (remaining products containing asbestos) Thermal power: Approx. 3,800 (about 10% of total) Nuclear power: Approx. 10,000 (about 5% of total)
	Buffers	Suspension insulators for transmission facilities, etc.	• Transmission facilities Approx. 570,000 (about 12% of total) • Distribution facilities 2,064 (about 3% of total)
	Thickeners	Electric wire for overhead transmission lines, hydroelectric dams	• Transmission facilities Approx. 229 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	• Main motor: 4 locomotives (4 units/locomotive) • Main circuit fuse: 4 locomotives (1 unit/locomotive)

Note: The figures in the table reflect the use of asbestos in buildings and facilities as of the end of March 2022.

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.
As the deadline is approaching for the disposal of high-level PCB at the Group's business locations, 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.

* Poly Chlorinated Biphenyl. PCB was widely used for transformer insulating oil, etc. because of its excellent properties as an electrical insulator. However, due to PCB being a hazard to ecosystems, production and use have since been largely banned. More often than not, high-level PCB was intentionally used while low-level PCB was accidentally mixed in.

Performance data

Atmospheric emissions and drainage*1	Unit	FY 2019	FY 2020	FY 2021
SOx emissions*2	t	2,138	2,098	2,645
		(2,138)	(2,099)	(2,646)
SOx emission intensity (at the generation end)*3	g/kWh	0.021	0.023	0.027
SOx emission intensity (per thermal power output) (at the generation end)*4		0.036	0.033	0.054
NOx emissions*5	t	4,414	4,551	4,125
		(4,474)	(4,607)	(4,184)
NOx emission intensity (at the generation end)*6	g/kWh	0.043	0.049	0.042
NOx emission intensity (per thermal power output) (at the generation end)*7		0.074	0.072	0.084
Ozone depletion emissions	t-CO_2	1,153	314	394
HCFC		690	263	72
Other		463	577	466
COD emissions*8	t	22	23	23
		(23)	(23)	(23)
Amount of PCB waste	1,000 t	6.6	10.7	18.9
		(6.7)	(10.7)	(18.9)

*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.