



## Environmental Report - Reduction of environmental impact

### ■ Management Approach

The TEPCO Group conserves the local environment by conducting management based on the following four approaches : (1) recognition and evaluation of environmental impact (environmental assessments), (2) management of polluting substances, (3) reduction of polluting substance emissions volume, and (4) risk management. A summary of detailed initiatives is as follows.

#### **Environmental assessment**

When conducting development projects, from the planning phase, we conduct environmental impact assessments as mandated by law to reduce environmental impact as much as possible.

#### **Air pollution and water contamination prevention**

We take continuous measurements and conduct sampling to monitor emissions released into the air and public water area from TEPCO power plant facilities and confirm that emissions are compliant with mandated environmental standards. To reduce emissions of polluting substances, we implement countermeasures concerning fuel, facilities, and operations management.

#### **Waste management**

The TEPCO group promotes waste management, including management of PCB waste products, to reduce the environmental impact accompany with by our business activities. The Federation of Electric Power Companies has established the goal of striving for an approximately 95% recycling rate for waste by FY2020. The TEPCO Group is contributing to this initiative by promoting the recycling of industrial waste products. For PCB waste, we conduct appropriate storage and management in accordance with relevant laws. We transferred control of operations related to the cleaning, treatment, and recycling of low-level contaminated PCB equipment to our wholly-owned subsidiary Tokyo Power Technology Inc. to promote planned detoxification and treatment.

#### **Chemical substance management**

Through our environmental management system, we ascertain emissions volumes, consumption volumes, and retention volumes for PCB (polychlorinated biphenyl) waste, toxic substances subject to the PRTR Act, ozone depleting substances, and asbestos. Substances subject to management are managed appropriately in accordance with applicable laws and we work towards emissions reduction by promoting switching to products not containing applicable substances.

#### **Risk management**

We conduct risk management for soil and water pollution due to toxic substance leaks by regularly inspecting storage tanks, installing breakwaters and leak-off barriers, and preparing neutralizing agents, to prevent pollution damage. We also maintain records of products in use that contain polluting substances to ensure appropriate treatment during disposal and replacement. To address radioactive pollution incidental to the Fukushima Daiichi Nuclear Power Plant, in addition to cooperating with the government to conduct cleansing and prevent contamination to groundwater that flows below the grounds of the power plant, we also are implementing various measures to prevent polluted water from flowing into the ocean.

■ Water

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Water withdrawals / discharges by sources

Total water volume used for power plants (industrial water and river water) and tap water volume use are as follows.

\*River water used for hydroelectric power stations excludes water used for pumped-storage hydroelectric power stations.

	2016	Remarks
● Water withdrawals (m3)		
• Industrial water, etc.	9.93 million	
Tap water used of the above industrial water	1 million	Actual amount in 2015: 1.06 million m3
• River water (hydroelectric power stations)	51 billion※	
● Water drainage volume (m3)		
• Drainage volume	4.97 million	
• River water (hydroelectric power stations)	51 billion	

Water sources significantly affected by withdrawal of water

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Hydroelectric power stations use 51 billion m3 of river water (excludes pumped-storage hydroelectric power) from rivers for power generation, including Katashina river whose water source is the Oze Wetlands (1.81km2), a part of the wetlands registered under the Ramsar Convention. However, there are no facilities that draw water directly from the lake or marshes, and the power generation process does not accompany water consumption. Thermal power plants and other facilities use 9.93 million m3 of industrial water, etc. However, Japan's water withdrawals for municipal water supply from lakes and marshes is only 1.4%, with 3/4 of total water used being taken from dams and rivers. As such, no water sources are thought to be significantly affected by use of industrial water, etc.

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Water bodies and ecosystems affected by water discharges and/or runoff

Wastewater from power plants, etc. is treated appropriately at TEPCO treatment plants in accordance with relevant laws. We also confirm that the water has no environmental impact prior to draining. Contaminated water produced at the Fukushima No. 1 Nuclear Power Plant is being treated appropriately and stored in tanks in the facility area. As there is no flow or drainage to external sources, there are no water basins or related ecosystems impacted by wastewater from power plants, etc.

Furthermore, at certain hydropower plants, water used is flowed into a separate water system but hydropower plant operations are managed in accordance with the Guidelines for River Water Level Maintenance, and the impact of water use by power plants on river basins is limited.

■ Emissions of ozone depleting substance (ODS)

Ozone depleting substance (ODS) production, imports, and exports volumes



The TEPCO Group does not produce, import, or export ozone depleting substances (ODS).

	FY2015	FY2016
Production / import / export volume (t)	0	0

\* Emission intensity used for calculations: N/A

\* Standards, methods, prerequisites, calculation tools used: N/A

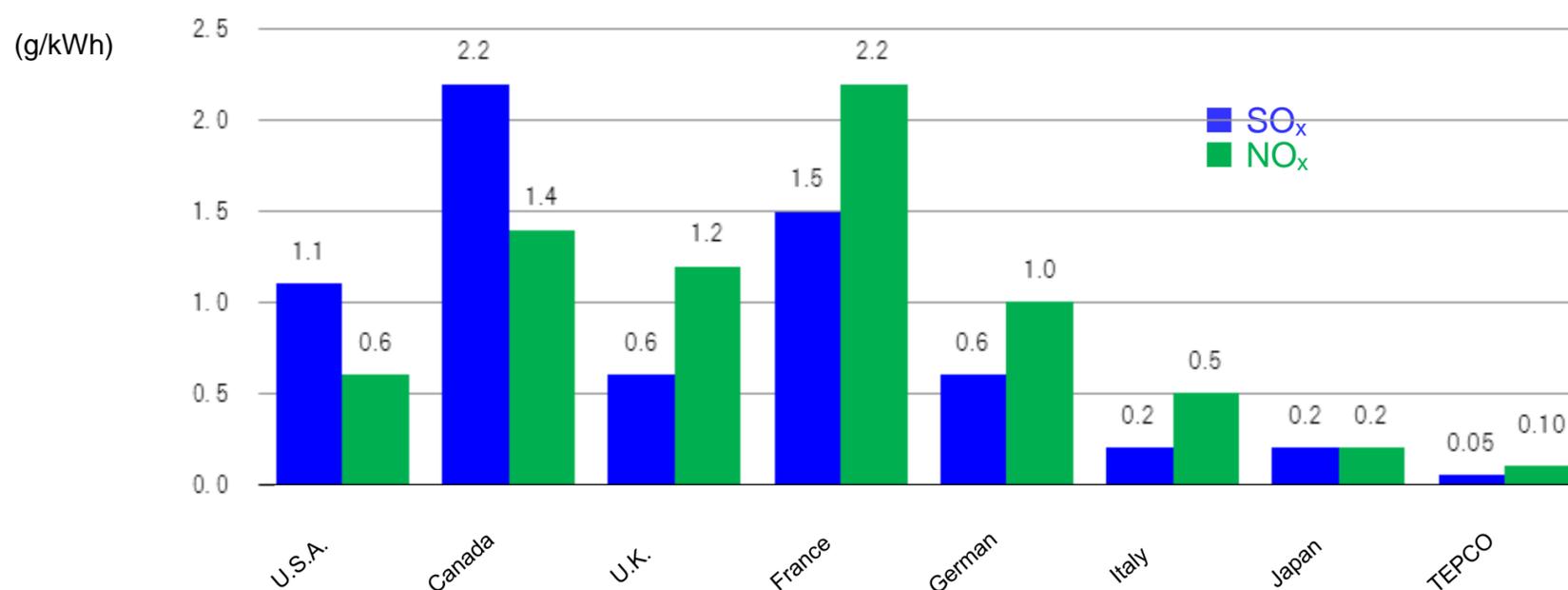
Other atmospheric emissions (SO<sub>x</sub>/NO<sub>x</sub>)



To reduce sulfur oxides (SO<sub>x</sub>) and nitrogen oxides (NO<sub>x</sub>) emitted from TEPCO Fuel & Power thermal power plants, we have implement several countermeasures and thus achieved a very low emissions levels globally.

	FY2015	FY2016	YoY
SO <sub>x</sub> (g/kW h)	0.05	0.05	-
NO <sub>x</sub> (g/kW h)	0.11	0.10	△9%

SO<sub>x</sub> · Nox Emissions Intensity per kWh (Average of thermal power plants)



(Source)

Emissions are based on "OECD.StatExtracts" (Complete databases available via OECD fs library)  
 Electricity generations are based on "IEA ENERGY BALANCES OF OECD COUNTRIES 2016 EDITION."  
 Figures for Japan are based on a survey of the Federation of Electric Power Companies.

## ■ Materials used by volume

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The TEPCO Group's main product is electricity, and fuel for power generation is a raw material. Respective consumption volumes are as follows.

### FY2016 fuel consumption volumes

Fuel type	Consumption volume
Coal (1,000t)	8,137
Heavy & crude oil (1,000 kL)	2,134
Gas (LNG, city gas, etc.) (1,000t)	23,565
Fuel for nuclear power generation (t)	No operation

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## ■ Waste by type and disposal method

We promote industrial waste recycling to reduce environment impact accompanying with our business activities as much as possible.

### Industrial waste recycling and landfill treatment volumes

	FY2015	FY2016	
			YoY
Recycling rate (%)	99.4	99.5	0.1 (%)
Amount of Landfill disposal (1,000t)	7.8	5.2	-33 (%)

### Breakdown of main industrial waste recycling

Waste product name	Volume (1,000t/year*1)	Main recycling applications
Coal ash	785.7	Cement raw materials, materials for landfill
Desulfurized gypsum	180.9	Construction materials, cement raw materials
Decommissioned concrete pillars	77.6	Road materials
Metal dust	52.5	Metallic materials, recycled power cables
PCB, etc.	19.2	Insulation oil: Heat recovery after detoxification Transformer unit: Recycled for steel and copper materials after washing
Wastewater treatment sludge*2	8.7	Road materials, raw materials for cement
Heavy, crude oil ash	0.7	Metal recovery, raw materials for cement
Shells	3.3	Materials for road construction
Other	12.3	—
Total	1,140.8*3	

\*1: Volume = Volumes for materials with value + materials reused internally + industrial waste (handling for radioactive waste is defined under nuclear power laws and thus is not included in the waste volumes for industrial waste).

\*2: Mass after dehydration.

\*3: Total figure and breakdown sum do not match due to rounding of figures.



## ■ Significant spills

	FY2015	FY2016
No. of spills	0	0

The number of significant spills is zero. In the event of a significant spill accident, we respond promptly and appropriately in accordance with relevant laws and regulations.



## ■ Transport of hazardous waste

- Japan is a signatory of the Stockholm Convention and the Minamata Convention. We manage PCBs and mercury-contaminated waste appropriately and in accordance with relevant laws based on these conventions. We also work to ascertain the status of use of asbestos and conduct management in accordance with relevant laws and regulations.
- There was no importing or exporting of hazardous waste.
- PCBs and asbestos are transported for processing.

## Treatment of hazardous waste

### Volume of PCB waste treated (FY2016)

Treatment Products	No. Treated
No. of pole transformers (Unit: 10000)	7.0
Insulating oil inadvertently containing PCB (Unit: 1000 kL)	4.2
No. of high-voltage transformers and condensers (high contamination) (Unit: 1)	797.0