



To conserve the local environment, we conduct proper environmental assessments when building electric power facilities; we control air pollutants such as SO_x and NO_x emitted from thermal power stations; and manage radiation levels at nuclear power stations.

Environmental Conservation Measures at Power Stations

When we operate our power stations and other facilities, we comply not only with national laws and regulations but also with the environmental protection agreements that we make with related local government stakeholders.

We perform strict management of exhaust gas, drainage and other emissions that affect the local environment, and this includes reporting our monitoring results to local authorities.

Tackling Air Pollution

We do our best to remove sulfur oxide (SO_x)*¹ and nitrogen oxide (NO_x)*² emissions that inevitably arise with the generation of electricity as much as possible.

In FY2017, our SO_x and NO_x emissions per quantity of thermal power generated were 0.19g and 0.18g per kWh respectively, and both of these figures represent a reduction from FY2016.

■ SO_x and NO_x Emissions by Thermal Power Station*
(FY2017 figures)

Unit: t
t = metric ton (tonne)

Thermal power station (Fuel)	SO _x	NO _x
Shin-Kokura (LNG)	0	249
Karita (Coal/heavy oil/crude oil)	79	426
Buzen (Heavy oil/crude oil)	1,713	945
Matsuura (Coal)	1,397	887
Ainoura (Heavy oil/crude oil)	118	66
Shin-Oita (LNG)	0	2,001
Reihoku (Coal)	3,427	2,900
Sendai (Heavy oil/crude oil)	1,789	503
Total	8,522	7,976

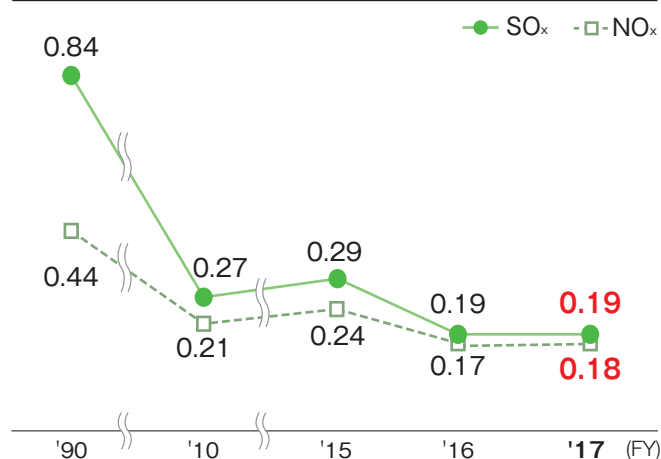
*Excludes internal combustion power stations

*1 SO_x: Generic term for sulfur oxides, including SO₂ (sulfur dioxide) and SO₃ (sulfuric trioxide). Generated when fossil fuels such as coal and petroleum are burned and the sulfur content in the fuel oxidizes, they cause air pollution and acid rain.

*2 NO_x: Generic name for nitrogen oxides, including NO (nitric oxide) and NO₂ (nitrogen dioxide). Generated from the combustion of nitrogen-containing fuel, and also from the oxidation of nitrogen in the air during combustion, they cause air pollution and acid rain.

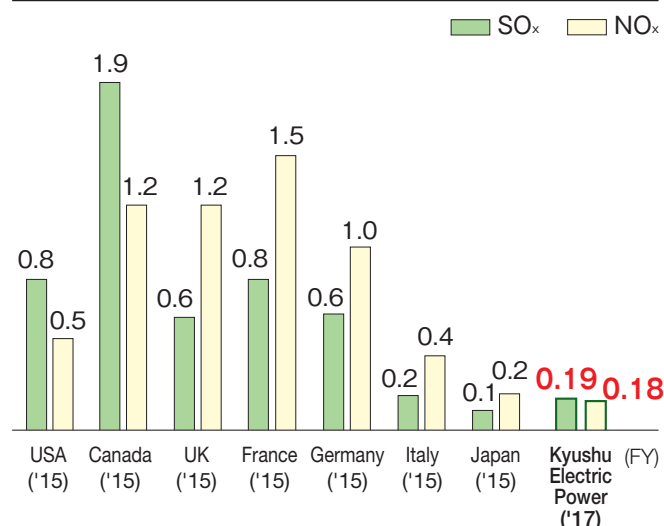
■ SO_x and NO_x Emissions per Quantity of Thermal Power Generated

Unit: g/kWh



■ SO_x and NO_x Emissions per Quantity of Thermal Power Generated, by Country

Unit: g/kWh



Source (Overseas/Japan): Federation of Electric Power Companies' pamphlet "Energy and Environment 2017"

Tackling Water Pollution

We properly treat wastewater generated at thermal or nuclear power stations using wastewater treatment equipment. In addition, our water intake and discharge method for seawater used for cooling water condensers, adapts the discharge according to the characteristics of the surrounding sea area to reduce impact on the sea.

Wastewater is properly treated with wastewater treatment equipment, and the oil content and hydrogen ion concentration (pH) are confirmed to be within standard tolerances.

At the dam reservoir of the hydroelectric power station we regularly conduct water quality surveys, carry out eutrophication countermeasures and red tide treatment, and try to mitigate turbid water early through selective intake. We also strive to preserve water quality by cooperating with maintenance projects for degraded forests in the surrounding area.

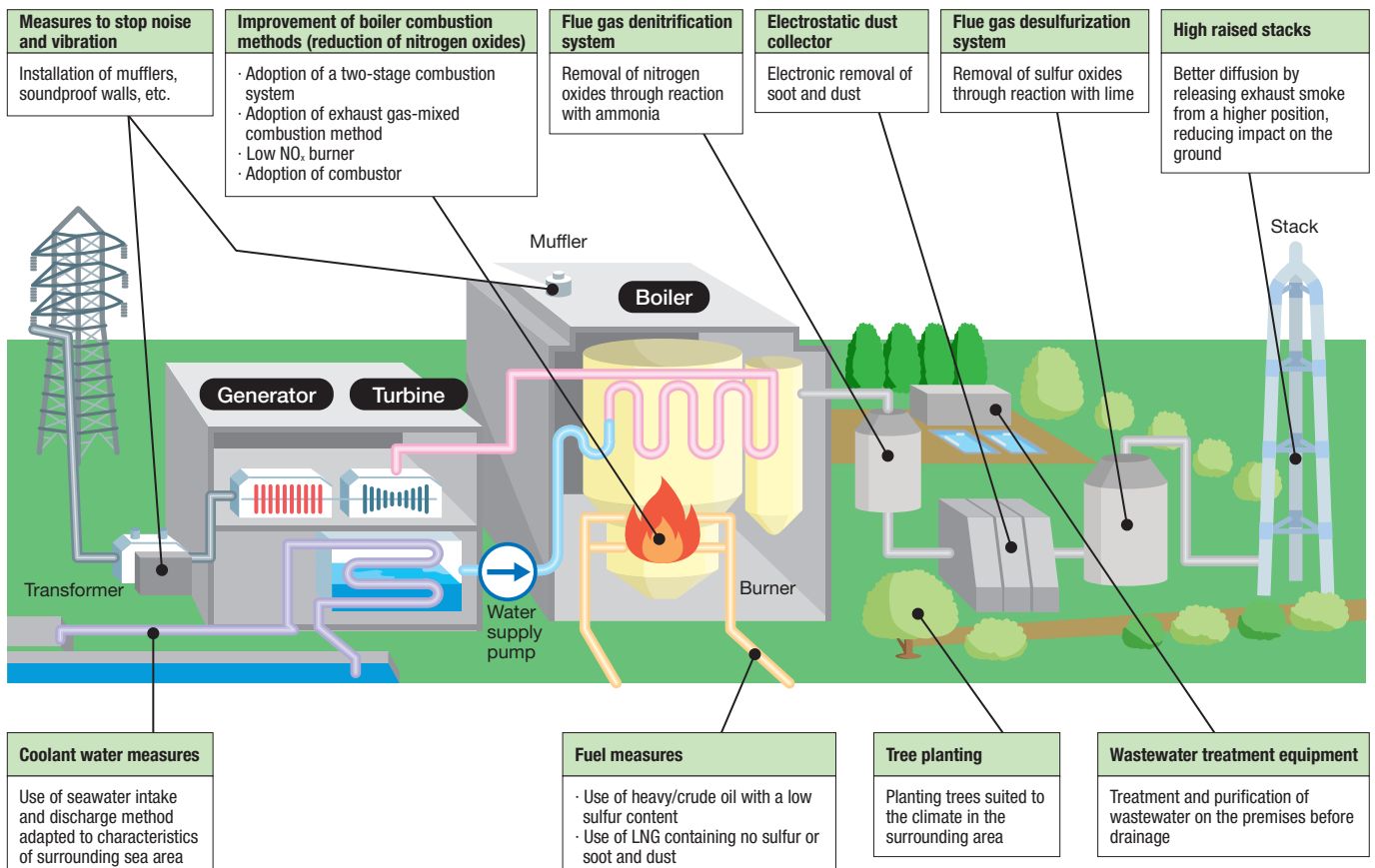
Preventing Noise and Vibration

We utilize low noise/low vibration equipment, install mufflers and soundproof walls, and install equipment indoors as part of our countermeasures. In construction work, we also select low-noise, low-vibration construction machinery.

Preventing Soil Contamination

We try to ensure no releases or leakages of hazardous substances into the soil. In addition, we voluntarily carry out soil contamination surveys when selling company-owned land and when buying land.

Environmental Conservation Measures Taken at Thermal Power Stations



Environmental Considerations When Building Facilities

When we build power generation facilities, we conduct proper environmental assessments according to the characteristics of the facilities and the local environment as part of our commitment to environmentally conscious action and integrating our facilities into the surrounding environment.

Performing Environmental Impact Assessments

When we construct power stations and other facilities, we first conduct environmental impact assessments and other surveys of the natural environment (air, water quality, flora and fauna) in line with the Environmental Impact Assessment Act and other relevant legislation in order to predict what effects the facilities and their operation will have on the surrounding environment. Based on those results we take appropriate steps to protect the environment.

Implementation of Environmental Assessments

Type	Site name	Power generation method	State of implementation
Autonomous* Assessment	Shin-Kikai Power Station Units 7 and 8 Facility Expansion Plan (Kikai, Oshima District, Kagoshima Pref.)	Internal combustion power	Ended March 31, 2018
	Shin-Yoron Power Station Unit. 4 Facility Expansion Plan (Yoron, Oshima District, Kagoshima Pref.)		
	Akusekijima Power Station Unit. 2 Facility Refurbishment Plan (Toshima, Kagoshima District, Kagoshima Pref.)		

*Target scale of the Environmental Impact Assessment Act and the Local Environmental Impact Assessment Ordinance does not apply; assessments are voluntarily implemented for the purpose of environmental conservation

An Example of Environmental Conservation Measures

We performed an environmental impact assessment as part of a plan to refurbish the Otake Power Station (completed in July 2016). The survey revealed the presence of globe thistle* and other rare plants within the power station construction area, so experts were consulted and the plants were relocated. After the relocation, monitoring has been carried out periodically to check if the plants are blooming and bearing seeds.

In addition, we carried out a voluntary environmental assessment (completed in March 2017) accompanying the plan to expand Unit 7 at Shin-China Power Station in Kagoshima Prefecture. A type of hermit crab that had been nationally designated as a natural monument was discovered, so experts were consulted and the hermit crabs were moved to a suitable location off the company premises.

*Scientific name: *Echinops setifer*; a wild plant in the daisy family Asteraceae that grows on grassy meadows of volcanic mountains. Endangered in Japan due to changes to its habitat.



Globe thistle, flowering post-relocation



A hermit crab discovered on site

Management of Water in Power Generation

Water Management

Industrial water used in power generation is drawn from rivers and other sources within usage limitations. We are working to reduce the amount of freshly supplied water we use when power generation facilities are shut down or in normal operation through such measures as water recirculation.

Water Usage for Power Generation and Wastewater Volume at Thermal and Nuclear Power Stations (FY2017)

Unit: 10,000 t

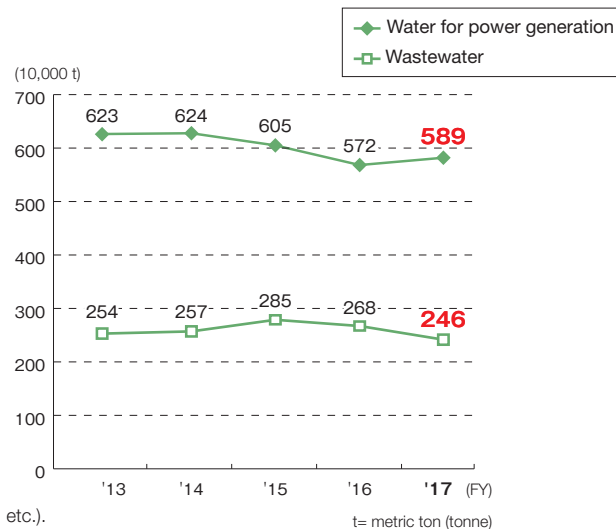
Power station		Water for power generation*1	Wastewater*2
Thermal power	Shin-Kokura	30	14
	Karita	51	8
	Buzen	21	14
	Matsuura	103	38
	Ainoura	10	6
	Shin-Oita	51	37
	Reihoku	205	62
Nuclear power	Sendai	27	8
	Genkai	52	29
Total		589	246

*1 Amount of consumption deducted for daily use from external input (city water, well water, etc.).

Does not include seawater used for cooling water or water circulating in the power station.

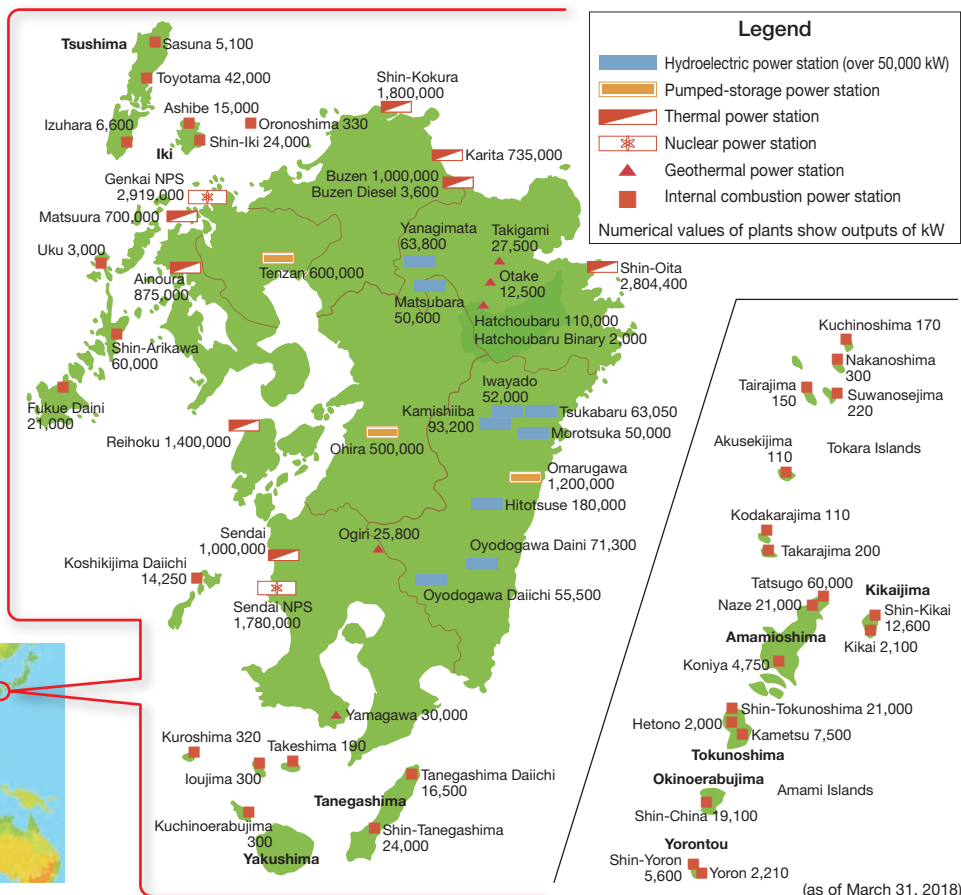
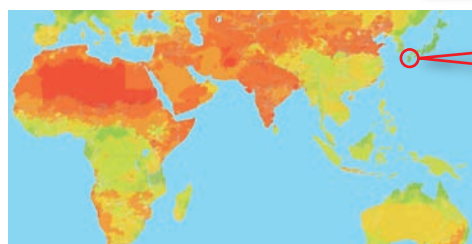
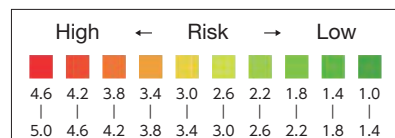
*2 Amount of wastewater properly treated by wastewater treatment equipment at each power station.

Water Usage for Power Generation and Wastewater Volume at Thermal and Nuclear Power Stations



Water Risk Assessment

According to the Water Risk Filter of the World Wide Fund for Nature (WWF), in the Kyushu area where we have installed power stations that use freshwater or seawater, there is no danger of water shortage. We also endeavor to manage water used in power generation and wastewater properly.



Created internally, based on "The Water Risk Filter" from the World Wildlife Fund (WWF) website