Preventing air pollution

Clean power generation at thermal power stations

Terminology

Sulfur oxides (SOx)
The generic term for sulfur dioxide (SO_2), sulfur trioxide (SO_3), and other sulfur oxidation compounds. Sulfur oxides are formed by combustion of oil, coal, and other fossil fuels containing sulfur. These chemicals can affect our respiratory organs and also cause acid rain.

Nitrogen oxides (NOx)
The generic term for nitrogen monoxide (NO), nitrogen dioxide (NO_2), and other nitrogen oxidation compounds. Nitrogen oxides are formed by oxidation of nitrogen in fuel and the air due to combustion. These chemicals cause photochemical smog and acid rain.

Particulate matter (PM)
Particulate matter consists of soot and dust from plants, powder caused by pulverization, and solid and liquid particles contained in substances such as exhaust gas from diesel engines. These matters can affect our respiratory organs. Particulate matter with a diameter of no more than 10 microns is called “suspended particulate matter” (SPM).

Soot and dust
Soot, ash, and other substances as a result of combustion.

Air pollution problems

Why does air pollution occur?

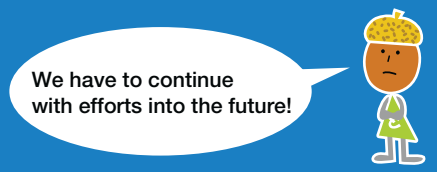
Combustion of fossil fuels (e.g., oil and coal) to provide power for plants, automobiles, etc. also produces air pollutants such as sulfur oxides (SOx)*, nitrogen oxides (NOx)*, and particulate matter (PM)*.

Influence of air pollutants

Air pollutants can affect our respiratory organs and also cause factors behind photochemical smog and acid rain.

The future of air preservation in Japan

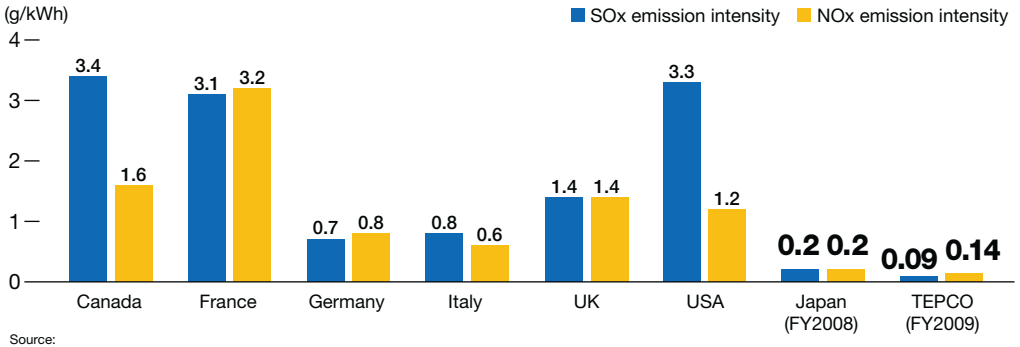
Japan was affected by serious air pollution in the phase of booming economic growth, but the situation subsequently improved along with various measures by the government, private companies, and other parties. However, while automobile ownership is on the rise, we have been slow in improving NOx and PM levels. Thus, the issue of air preservation remains an important issue for the society as a whole.



The world’s cleanest production of electrical power

TEPCO’s measures to prevent air pollution are the world-class.
We use clean fuel, rigorously treat exhaust gas, and take other steps to keep our SOx and NOx emission intensity accompanying thermal power generation on levels that are much lower than those in other countries. Our nuclear power and hydropower stations, which emit no SOx or NOx when generating, are also contributing to preservation of the atmosphere.

International comparison of SOx and NOx emission intensity (average for thermal power stations)



Source:
Calculations based on “OECD Environmental Data Compendium 2006/2007” and “Energy Balances of OECD Countries 2010 Edition”
* Figures for TEPCO are based on FY2009 data, figures for Japan are based on FY2008 data from the Federation of Electric Power Companies of Japan, and figures for the other six countries are based on 2005 data.

At thermal power stations, TEPCO is taking various steps to reduce air pollutants.

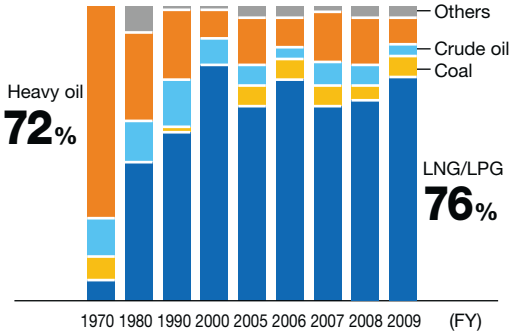
Three approaches to preventing air pollution at thermal power stations

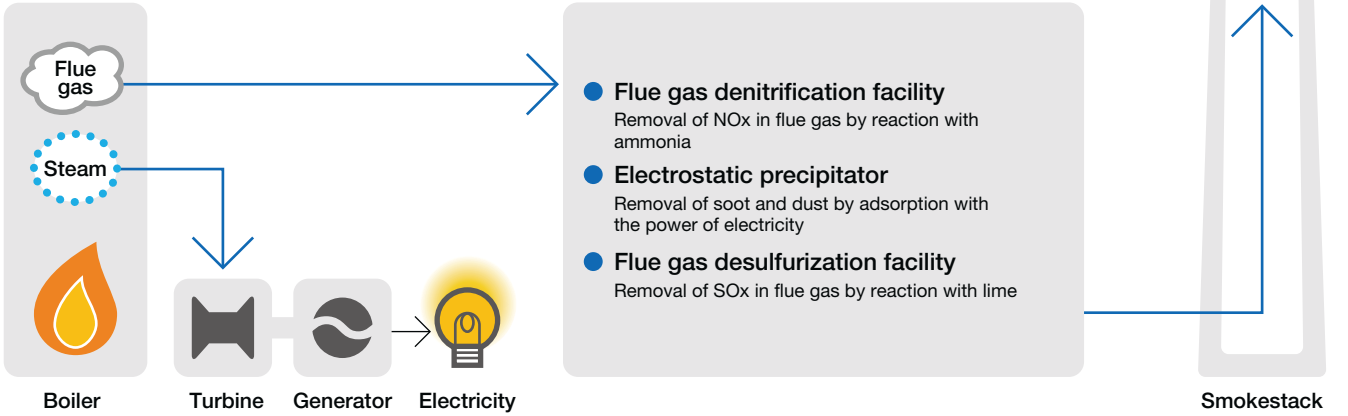
1 Use of clean fuel ▶ 2 Improvement of the combustion method ▶ 3 Equipment for removal of air pollutants

We use environment-friendly fuel, mainly LNG (liquefied natural gas)

When combusted, LNG (liquefied natural gas) has zero emissions of SOx and soot and dust*, and only very low emissions of NOx. In 1970, TEPCO became the first electric power company in the world to begin burning LNG at its thermal power stations. Today, these stations are fired mainly by LNG. It is also making active use of crude oil and heavy oil, which contain little sulfur that causes SOx emissions.

Trends in ratios of fuels used for thermal power generation at TEPCO





We are improving combustion methods to reduce NOx

Because NOx is easily formed at high temperatures, we rigorously control NOx emissions by adopting a combustion method that does not create high-temperature spots inside boilers and gas turbines.

We have installed facilities for removing air pollutants

Flue gas from boilers is released into the atmosphere only after removal of its atmospheric pollutants by means of flue gas denitrification facilities, electrostatic precipitators, and fuel gas desulfurization facilities.