

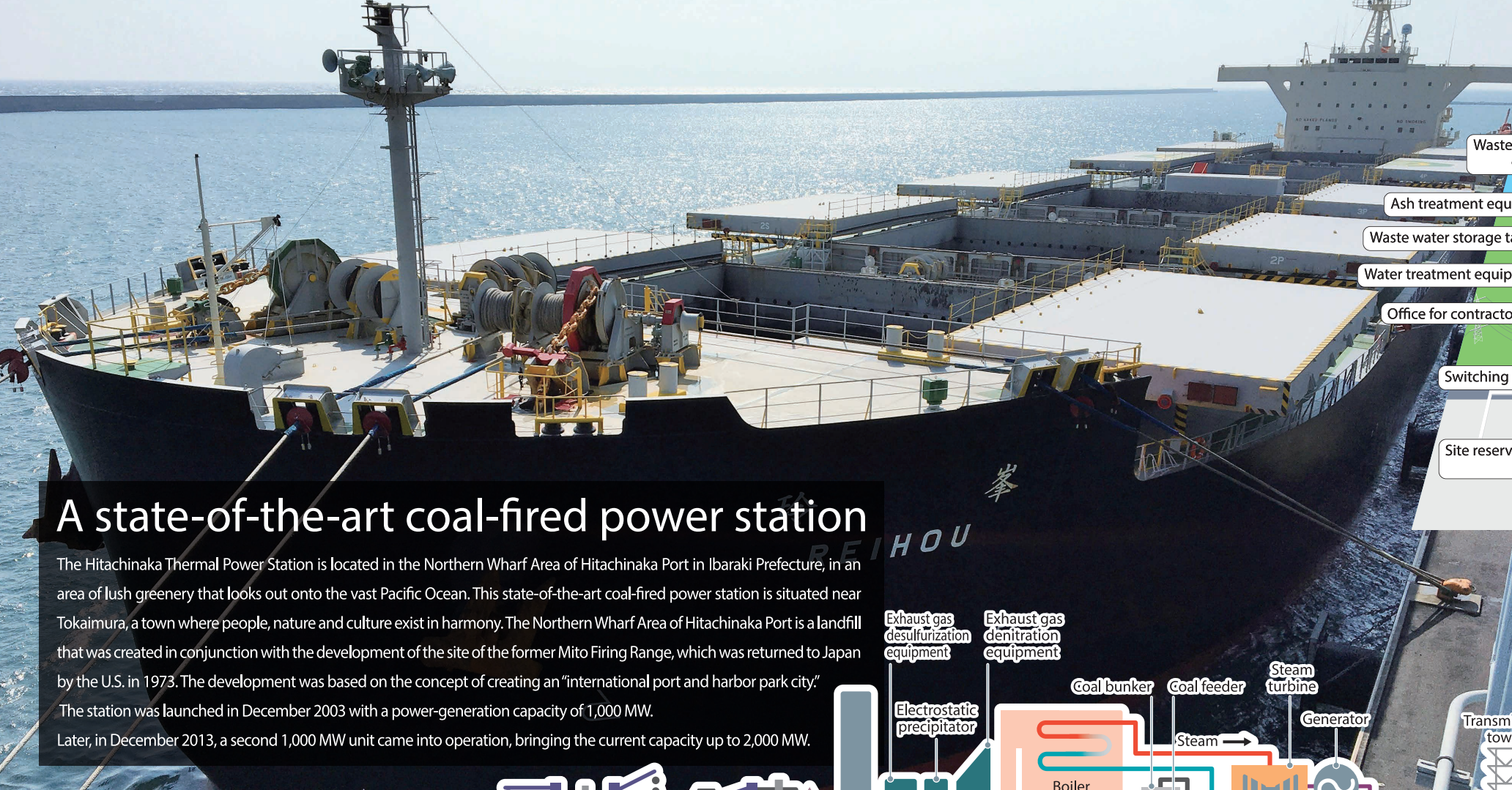
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WELCOME TO HITACHINAKA THERMAL POWER STATION!

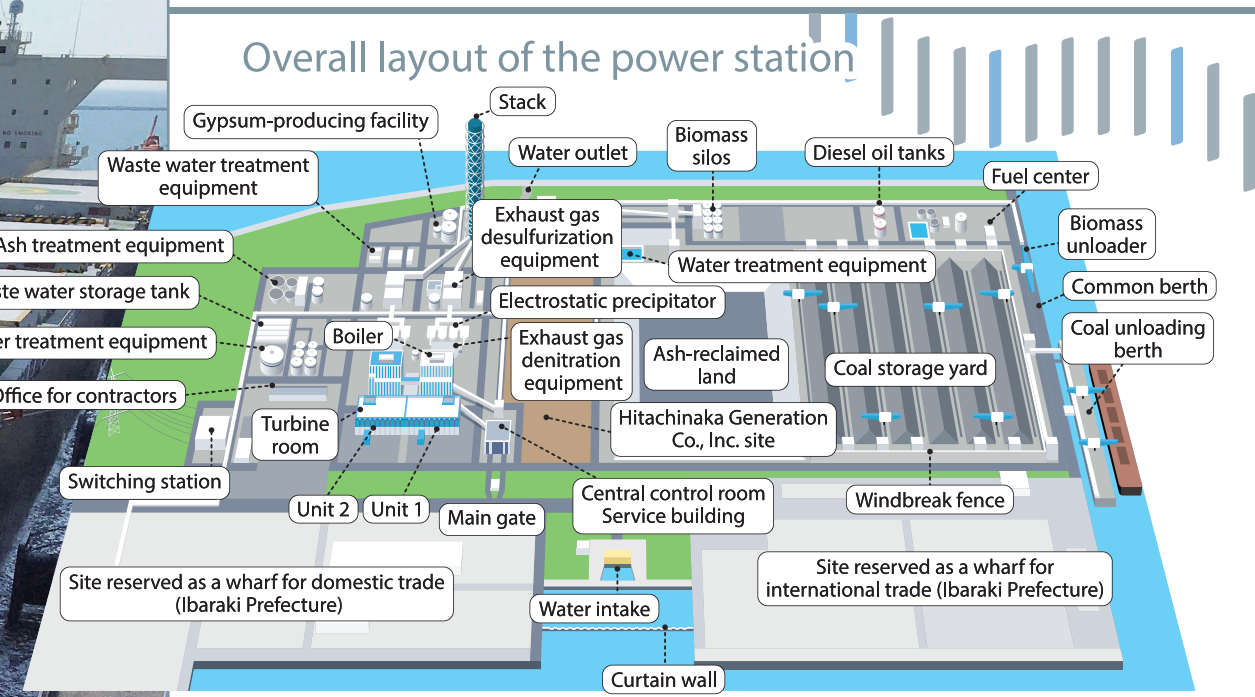
A state-of-the-art coal-fired  
power station





## A state-of-the-art coal-fired power station

The Hitachinaka Thermal Power Station is located in the Northern Wharf Area of Hitachinaka Port in Ibaraki Prefecture, in an area of lush greenery that looks out onto the vast Pacific Ocean. This state-of-the-art coal-fired power station is situated near Tokaimura, a town where people, nature and culture exist in harmony. The Northern Wharf Area of Hitachinaka Port is a landfill that was created in conjunction with the development of the site of the former Mito Firing Range, which was returned to Japan by the U.S. in 1973. The development was based on the concept of creating an "international port and harbor park city." The station was launched in December 2003 with a power-generation capacity of 1,000 MW. Later, in December 2013, a second 1,000 MW unit came into operation, bringing the current capacity up to 2,000 MW.



## Outline of facilities

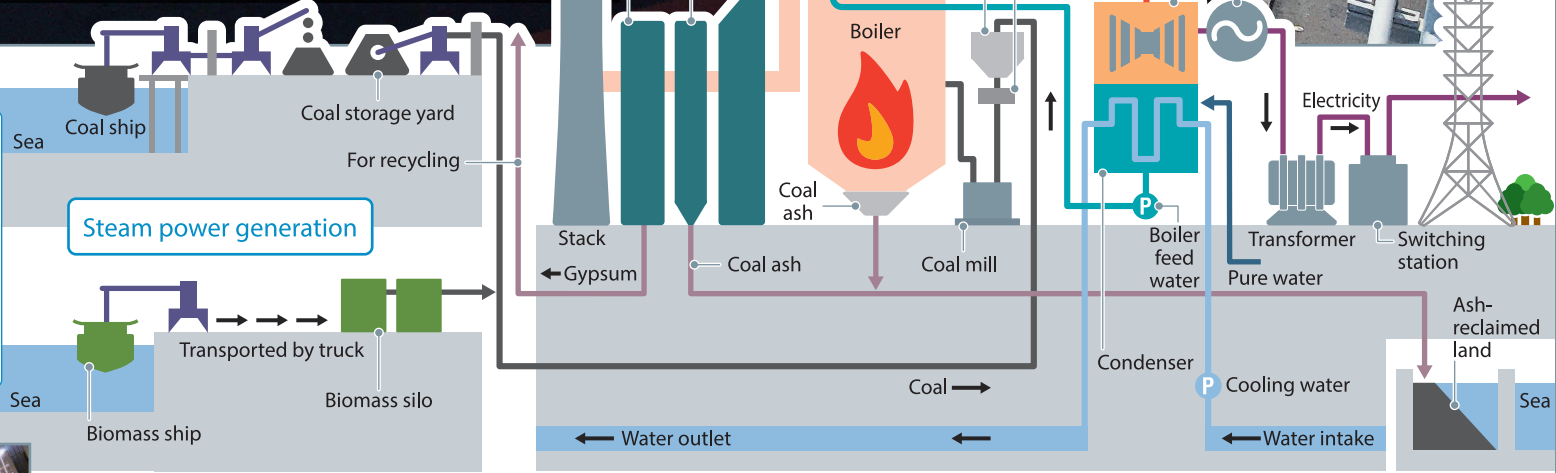
Unit No.	Output (MW)	Fuel	COD	Power generation type
Unit 1	1000	Coal, biomass	December 2003	Steam
Unit 2	1000		December 2013	

Name: Hitachinaka Thermal Power Station Location: Tokai-mura, Naka-gun, Ibaraki Prefecture  
Site area: Approx. 1,410,000m<sup>2</sup>

**CHECK! Features**

### A state-of-the-art coal-fired system

The state-of-the-art USC power station is environmentally friendly because biomass is added to coal as fuel.



## Coal mill

The pulverizer crushes coal to facilitate its combustion. It produces pulverized coal (in powder form), which is supplied through the pipe at the top of the coal mill to the pulverized coal burner while being exposed to an air flow from below for drying.



## Steam turbine

The steam turbine is operated by the high-temperature, high-pressure steam generated by the boiler. Electricity is generated by the generator that is directly connected to the steam turbine.

Steam temperature	600°C	
Steam pressure	24.5 MPa	
Turbine speeds	High pressure and intermediate pressure	3,000 rpm.
	Low pressure	1,500 rpm.



## Boiler

(The photo shows the boiler room)

A boiler is a huge box-shaped structure. The energy produced by the combustion of fuel is used to heat water to generate the required steam. The internal walls consist of water tubes. Boiler combustion turns the water in the water tubes into high-temperature, high-pressure steam, which is sent to the turbine generator.

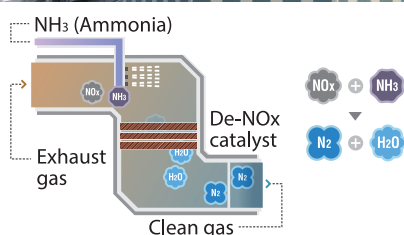


# Environmental Initiatives

## Preventing air pollution

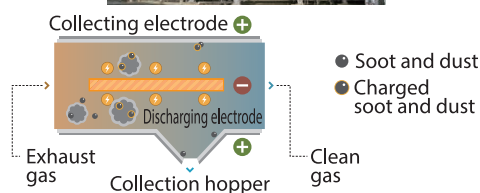
A range of measures have been taken to ensure that the environment in the area surrounding the power station is pleasant. Air pollutants such as NO<sub>x</sub>, soot, and SO<sub>x</sub>, which are produced during the combustion of coal, are removed using exhaust gas denitration equipment, electrostatic precipitators, and exhaust gas desulfurization equipment, and the treated exhaust gas is then released into the air from a stack.

Exhaust gas denitration equipment (removal of NO<sub>x</sub>)



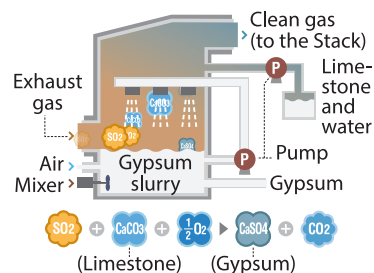
Ammonia is injected into the exhaust gas. The de-NO<sub>x</sub> catalyst stimulates a chemical reaction that turns the nitrogen oxides into harmless nitrogen and water.

Electrostatic precipitator (removal of soot and dust)



The high voltage power between the discharge electrodes and dust-collecting electrodes electrifies the soot and dust. The dust-collecting electrodes then capture the particulates to reduce their concentration in the exhaust gas.

Exhaust gas desulfurization equipment (removal of SO<sub>x</sub>)



SO<sub>x</sub> in the exhaust gas react with limestone slurry and are removed in the form of gypsum.

## Keeping the oceans clean

The equipment cleaning water and general waste water generated at the power station undergoes pre-processing such as oil separation and neutralization. It is then purified by means of condensation, sedimentation, filtration and neutralization, and the water quality is checked before it is discharged.

## Protecting the global environment

Since power stations make use of the earth's enriched resources, it is important to achieve high level of thermal efficiency when generating electricity due to preservation of the global environment. In addition, greater generating efficiency means that less carbon dioxide, which causes global warming, is produced.

We are committed to conserve the earth's finite resources and curb global warming by leveraging the technical capabilities we have accumulated over the years and by introducing highly efficient power generating equipment.

## Keeping the surrounding environment clean—preventing the dispersal of coal dust

The coal storage yard is surrounded by an 18 meter-high fence that protects it from the wind, while the conveyor belts that carry the coal are sealed. Measures like these help to prevent the dispersal of coal dust.



Windbreak fence



Coal yard sprinkler system



Conveyor belt

## Installation of biomass equipment

In June 2017, the power station began using woody biomass fuel, which is a form of renewable energy, to generate electricity. The main fuel is still coal, but woody biomass fuel made of compacted wood chips is added to the coal. In Unit 1, 3% of the fuel is this biomass fuel, while in Unit 2 biomass makes up 4.5% of the fuel combusted. This means that the amount of coal burned and the amount of CO<sub>2</sub> emitted each year can be reduced by approximately 80,000 tons and 220,000 tons, respectively.



Wood pellets



Biomass unloader



Biomass silo