

3 Responses to Environmental Pollution

Based on experiences of environmental problems obtained during rapid growth era, the petroleum industry has continually engaged in environmental preventive measures at refineries. Showa Shell Sekiyu, as well, positively invested to make refineries as ecofriendly as possible, constructed such pollution preventive processes as flue gas denitrification and effluent water treatment to eliminate environmental pollutants generated by petroleum refining processes. We intend to make further efforts to improve global pollutants elimination technology including use of clean fuel and improvement of waste treatment facilities.

① Air Pollution Preventive Measures

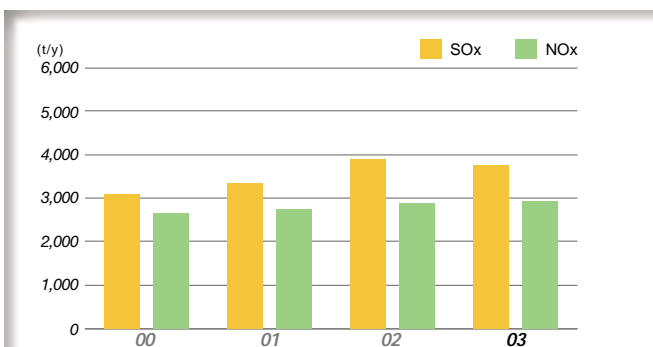
Sulfur oxides (SOx)

Emission of SOx, which is generated by combustion of fuel oil and gas in heaters and boilers is reduced to below a statutory prescribed level by the use of low sulfur fuel oil and/or clean fuel gas, from which sulfur is removed through gas cleansing process.

Nitrogen oxides (NOx)

Emission of NOx, which is generated by combustion through the use of low NOx burners and the introduction of a flue gas denitrification unit. Elimination of other types of dust is also carried out with air pollution preventive measures such as use of an electric dust collector.

■ Emission of air pollutants (sum of all group refineries)

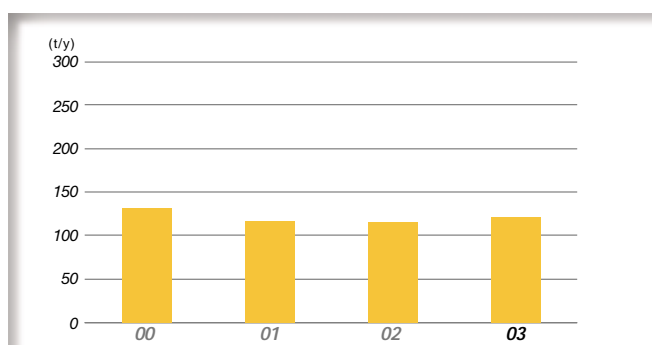


- ① Floating roof tank (a type to reduce vapor loss, which is significant for a fixed roof tank due to evaporation taken place in open space between the roof and the liquid level)
- ② Vapor recovery system at a loading facility (gasoline vapor contained in the displaced gas during loading of petrol to a tank truck or a tank wagon is recovered with an absorbent)
- ③ Vapor return system at a service station (a system to return gasoline vapor contained in the displaced gas to a tank truck during unloading of petrol to an underground storage tank in a service station)

② Water Contamination Preventive Measures

Cooling water and process effluent water are discharged from a refinery. Cooling water is discharged to the outside (the sea). The process effluent, for which treatment is needed, is routed to an oil separator and is subjected to chemical treatment with coagulants, activated sludge treatment and activated carbon treatment to reduce COD and oil content in water to below statutory prescribed level.

■ Total COD loading in effluent water



*COD (Chemical Oxygen Demand)

A yardstick showing contamination of water quality. It is expressed by the quantity of oxygen required for decomposition of organic matters such as sludge.

③ Measures to Reduce VOC Emissions

In May 2004, the Air Pollution Control Law was revised to additionally restrict emissions of VOCs (volatile organic compounds). VOCs are believed to be a causative agent of oxidant and suspended particle matters (SPMs), for which air quality standards are difficult to achieve in air pollution control.

Emissions of VOCs from petroleum-related facilities include those from fixed roof tanks containing volatile oils such as petrol and those discharged to air during the loading to tank trucks. To cope with these VOC emissions, Showa Shell has taken measures such as conversion of fixed roof tanks to floating roof types and installation of vapor recovery equipment on loading facilities. We are studying more stringent measures to better meet the revised law.

