Initiatives to Reduce Industrial Waste Disposal

Concept of Waste Reduction

The Idemitsu Group works to curb environmental impact by reducing the volume of industrial waste generation and by promoting the reuse of raw materials and the utilization of recycled raw materials from the perspective of the effective use of resources.

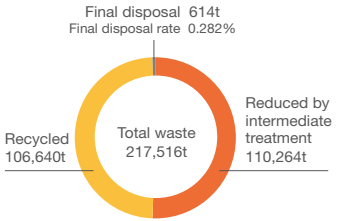
Among the major types of waste generated by our businesses are waste catalysts from refinery processes, sludge from tank cleaning, and sludge from wastewater treatment facilities. We constantly strive to reduce the volume of waste and render it harmless through such intermediate treatments as incineration, dehydration, and dissolution, and we promote the reuse of treated waste such as using it as raw material for cement. By doing so, we are maintaining our "zero emissions" status, that is, keeping the ratio of waste we dispose of by landfill at 1% or less.

Reduction Targets

Currently, Japan's petroleum and chemical industries are pursuing their respective voluntary reduction targets* for the final disposal volume of industrial waste in line with Nippon Keidanren's Voluntary Action Plan for Establishing a Sound Material-Cycle Society. Based on these targets, our company has defined its own target for waste, namely, keeping the ratio disposed of by landfill at 1% or less of the overall volume of waste emitted from our refineries and petrochemical plants.

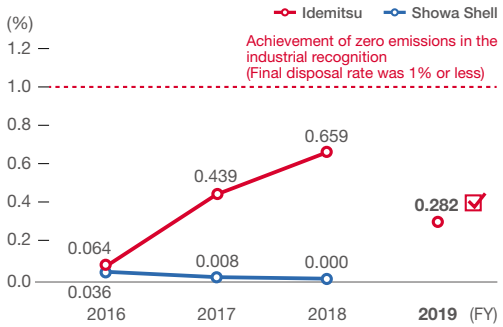
* Voluntary reduction targets for the final disposal volume of industrial waste
  The petroleum industry (Petroleum Association of Japan): Maintain "zero emission" status by keeping the ratio of waste disposed of by landfill at 1% or less in FY2020 (the ratio was 5.8% in FY2000)
  The chemical industry (Japan Chemical Industry Association): Reduce the volume of waste disposed of by landfill approximately 70% in FY2020 from the FY2000 level

■ Breakdown of industrial waste disposal ☑



Scope of calculation: Hokkaido Refinery, Chiba Complex, Aichi Refinery, Tokuyama Complex, TOA Oil Co., Ltd. and Showa Yokkaichi Sekiyu Co., Ltd.

■ Final disposal rate at group refineries



Scope of FY2019 calculation: Hokkaido Refinery, Chiba Complex, Aichi Refinery, Tokuyama Complex, TOA Oil Co., Ltd. and Showa Yokkaichi Sekiyu Co., Ltd.

Water Management

Concept of Utilization of Water Resources

Today, the problems arising from the lack of water resources have become serious and are affecting large parts of the globe. It is said that more than two billion people are unable to obtain safe drinking water. Japan has abundant water resources, and so it is rare to face a severe water shortage problem. However, there are many countries and regions overseas where water resources are depleted. The Idemitsu Group is committed to the efficient use of water resources, as we operate business in areas with high water stress.

In addition to conventional water risk assessments, we have begun to identify and review risks of droughts and flood at some of our complexes, with reference to AQUEDUCT issued by the World Resources Institute (WRI) and information provided by the Ministry of Land, Infrastructure and Transport. In Japan, the risk of flooding is high, and damage is expected to increase due to climate change in the future. Therefore, we are working to strengthen related infrastructure facilities. (See also "Concept of Climate Change Adaptation" on page 24.)

Examples of Initiatives

Strengthening of Water Recycling at Refineries and Complexes

Our refineries and complexes, which use a large amount of water, are working on reducing their water consumption.

A certain amount of water (seawater and fresh water) is required to cool the process fluid during the oil refining process at refineries. Fresh water becomes hot after used for cooling is circulated in an air-cooled condenser to lower its temperature, and is used again as cooling water for the process fluid to reduce the impact on the natural environment. As a water user, we will make further efforts to recycle water resources.

Recycling of industrial water ☑

	Unit	FY2019
Industrial water intake	thousand t	81,740
Water recycling rate	%	94

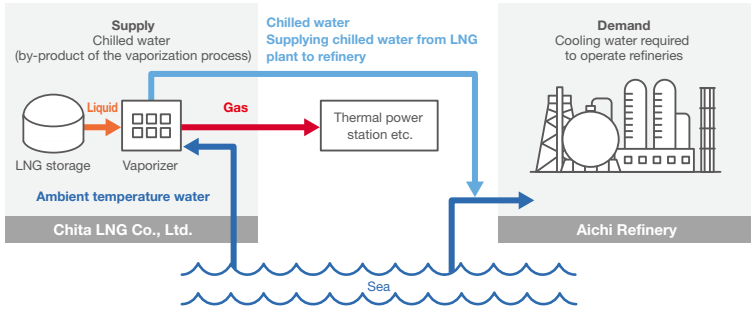
Scope of calculation: Idemitsu Kosan and consolidated subsidiaries

Water Management

Reduction of Water Consumption through Collaboration with Other Companies

At Aichi Refinery, we are working to reduce water consumption by sharing cold water with other companies through cooperation within the industrial complex. This is an initiative supported by the Research Association of Refinery Integration for Group-Operation (RING). By effectively using the chilled water discharged from the LNG vaporizer of Chita LNG Co., Ltd., which is adjacent to the complex, as process cooling water, we are contributing to the overall reduction of water intake in the Chita area.

■ Chilled water supply through cooperation within the industrial complex



Conservation of Biodiversity

Concept of Conservation of Biodiversity

A tremendous variety of organisms live on Earth. They intertwine in highly complex ways to form ecosystems that are often resilient enough to absorb the impact of various external changes and thus returning to their original state. We are aware of our important mission to pass down sound ecosystems to future generations and thus maintain an environment in which diverse living organisms can thrive in the course of our corporate activities.

The History of Our Biodiversity Initiatives

Even before the recent rise in public interest elevated the conservation of biodiversity, we have long taken it to heart, adopting a management approach that aims to harmonize concerns about the natural environment and business operations.

In the course of constructing refineries and complexes, for example, we have ensured that the green areas within their premises exceed legal requirements. We began building and operating these refineries and complexes, which represent our main business sites, across Japan in the 1950s when the government introduced regulations mandating that businesses secure greenery within newly constructed manufacturing facilities. In response, we have consistently sought to do more than simply meet our legal obligations for square meters of greenery. We have also striven to harmonize our new facilities with their surrounding natural environments. Our approach has resulted in green areas far more extensive than the legal requirement. Initiatives like these are highly evaluated by external organizations. Hokkaido Refinery and Aichi Refinery have received the highest grade of 5 (Superlative Stage) in the "Social and Environmental Green Evaluation System (SEGES)" organized by the Organization for Landscape and Urban Green Infrastructure.

Source: SEGES website (Japanese only) **https://seges.jp/**

■ Hokkaido Refinery's green belt

■ Aichi Refinery's green belt