



4 Responses to Disposal of Industrial Wastes and Recycling Measures

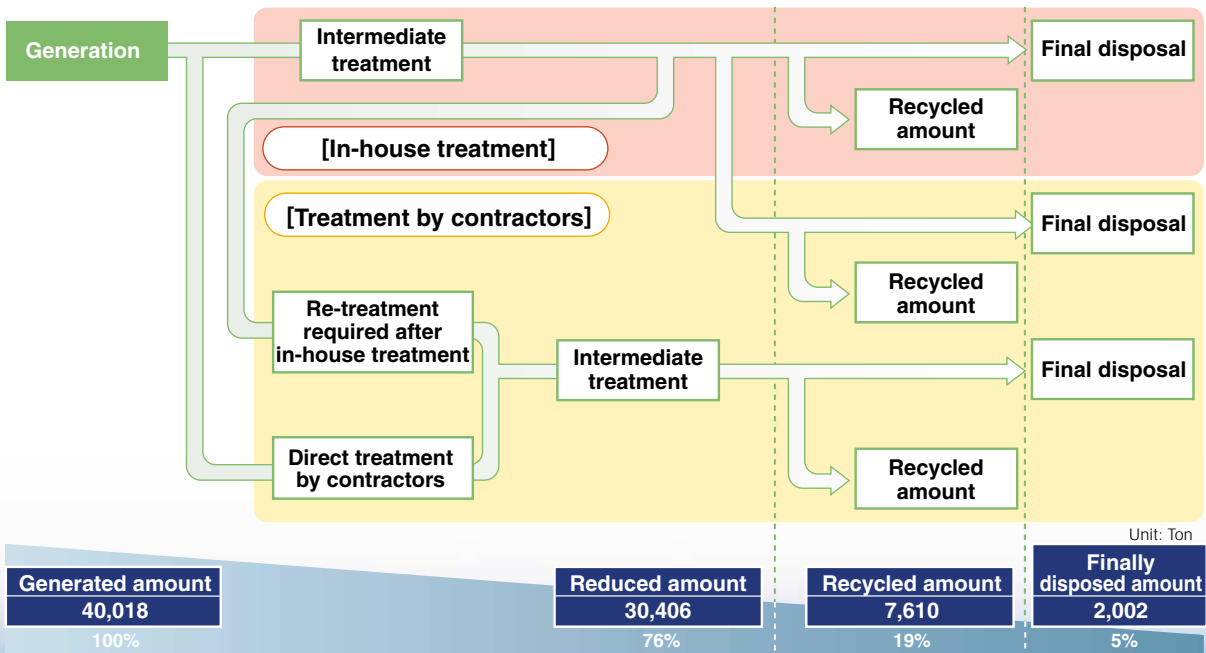
① Flow from Generation of Industrial Wastes to Disposal and Recycling

Industrial wastes are one of nationwide environmental problems as space for waste disposal such as land reclamation sites has become scarce. Refineries produce such industrial wastes as oil sludge generated from oil processing operation, storage tank sludge, spent catalysts and construction wastes generated at plant maintenance work. We are trying to reduce this voluminous amount of wastes within the refinery fence as far as possible, and then the remaining wastes are entrusted to contractors for farther reduction. In addition those wastes which can be reused as,

example, component of cement are recycled to minimize the amount of wastes to be disposed at land reclamation sites, etc.

In 2003 the total quantity of industrial wastes generated at all Showa Shell Group refineries amounted to 40 kt, of which 30.4 kt or approx. 76% was reduced inside or outside of the fence by means of intermediate treatment and 7.6 kt or approx. 19% was recycled, so that only about 2 kt or approx. 5% of the total wastes was finally disposed. The petroleum industry has set a target to reduce the amount of finally disposed wastes by 67% (2/3) by 2010 as compared with 1990. Our group reduced the final disposal amount by approx. 87% in 2003 as compared with 16 kt in 1990, and is continually working to further reduce the amount.

■ Flow of industrial wastes in the group refineries (2003)

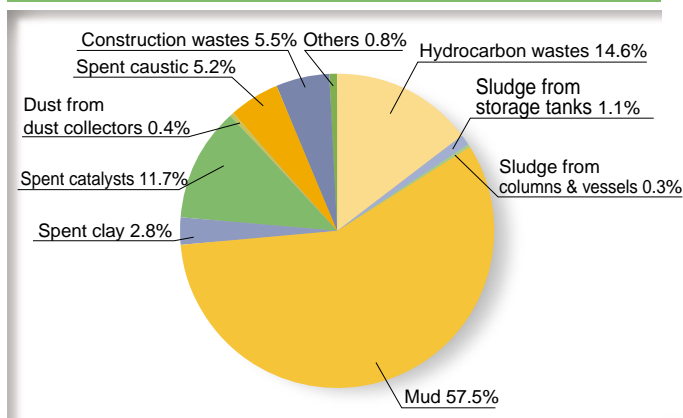


② Efforts to Reduce Industrial Wastes Disposal

In 2000 the "promotion law for efficient use of resources" replaced the "promotion law for utilization of recycled resources". This change was based on the concept that it is necessary not only to reduce final amount of disposal, but also to reduce generation of industrial wastes itself by means of efficient use of resources.

Showa Shell Group is trying hard to minimize the quantity of final wastes for disposal by means of such intermediate treatment of sludge as dehydration, reuse of spent catalysts as cement component, recycling of spent oil and acid, etc. Moreover, in view of illegal disposal of wastes becoming a social issue, Showa Shell Sekiyu is guiding its business sites for tight management of waste disposal and inspection of waste disposal sites.

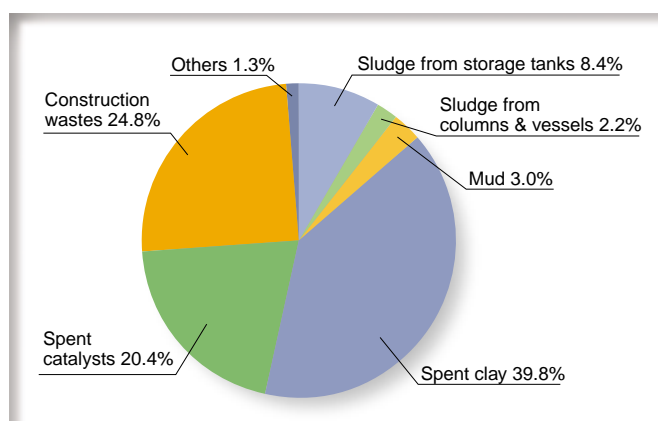
■ Amount of industrial waste (2003 total: 40,018 t)



Amount of industrial waste

Majority of wastes resulting from petroleum refining operation consists of hydrocarbon wastes generated at refining processes and mud and sludge produced in effluent water treatment systems. Hydrocarbon wastes are suitably recycled as feedstock and mud and sludge are compressed by dehydration and drying. Among the wastes which cannot be reduced with intermediate treatment, those which can be converted to useful resources are reused as cement component, etc.

■ Amount of finally disposed industrial wastes (2003 total: 2,002 t)



Amount of finally disposed industrial wastes

The industrial wastes, which can neither be reduced by intermediate treatment nor recycled, are finally disposed at incinerators or land filling sites. The amount and breakdown of those wastes are as shown in this chart. We are making research and investigation to put them to practical use.

③ PCB Wastes

PCB (polychlorinated biphenyl) was used for electric appliances and other articles because of its chemical stability and electric insulation properties. However, the manufacturing, use and import of the substance were banned in 1974 mainly due to its high biotoxicity.

Electric appliances containing PCB that have been installed in business sites and have been disused are now required to strictly be stored as specially controlled industrial wastes. Our Group's facilities including refineries also hold disused equipment using PCB. They are stored and managed in accordance with the "special measures law concerning the promotion of proper handling of PCB wastes," which was issued in 2001, and necessary notifications to relevant authorities have been made. In addition, those pieces of equipment will be disposed of in the future under this law.