

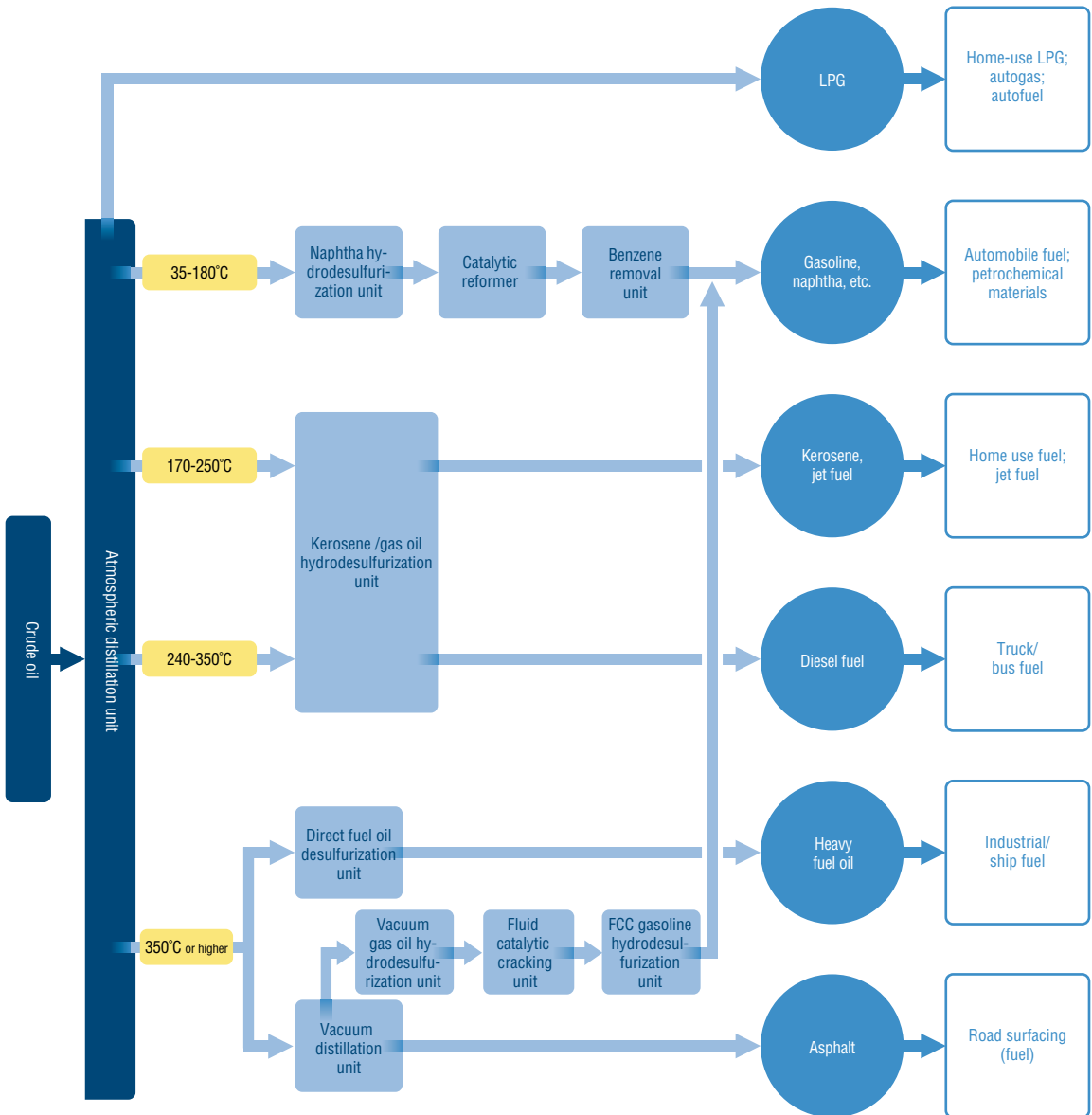
## Production Flow of Petroleum Products

Various petroleum products are produced when crude oil is refined in a refinery. Crude oil is a mixture of hydrocarbons having a wide range of boiling points. Middle East oil, on which Japan is greatly dependent, has a high sulfur content.

In the refinery, crude is distilled in an atmospheric pressure distillation unit and separated into gas, naphtha, kerosene, gas oil and heavy fuel oil fractions. LP gas is produced from the gas fraction. After hydrodesulfurization, the naphtha fraction is processed by a catalytic reformer and converted into gasoline, etc., and the kerosene and gas oil fractions are processed into kerosene and diesel fuel. After hydrodesulfurization

in a direct fuel oil desulfurization unit, the heavy fuel oil fraction is processed into heavy fuel oil, or is separated using a vacuum distillation unit, with the light fraction being converted to gasoline by hydrodesulfurization in a vacuum gas oil hydrodesulfurization unit and processing in a fluid catalytic cracking unit, and the heavy fraction being converted to asphalt.

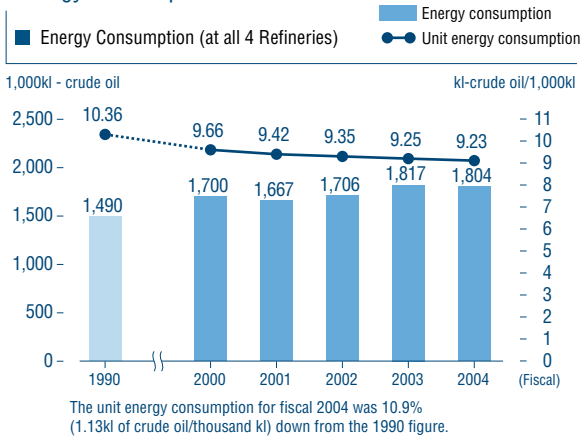
These processes in a refinery impact the environment in the form of atmospheric pollution, water contamination and waste materials, etc., but we take various actions to reduce these impacts.



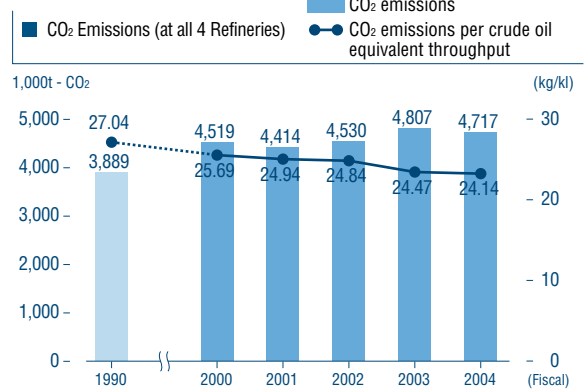
\*Environmental performance data (p. 71-74) relates mainly to Cosmo Oil's 4 refineries.

## Prevention of Climate Change

### Energy Consumption

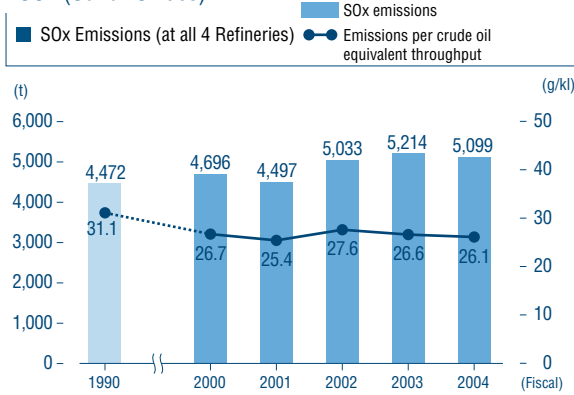


### CO<sub>2</sub> Emissions

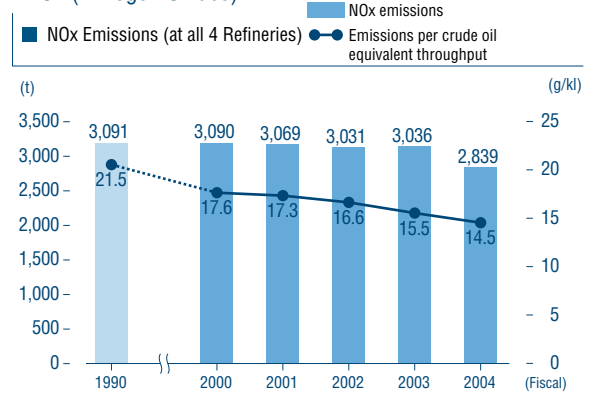


## Prevention of Air Pollution

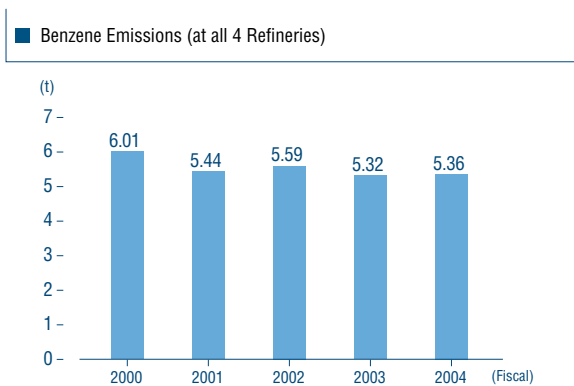
### SO<sub>x</sub> (Sulfur Oxides)



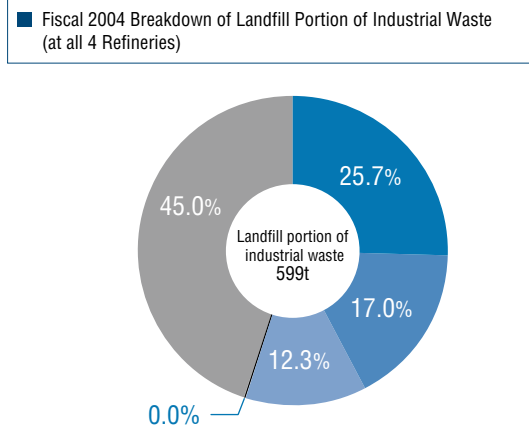
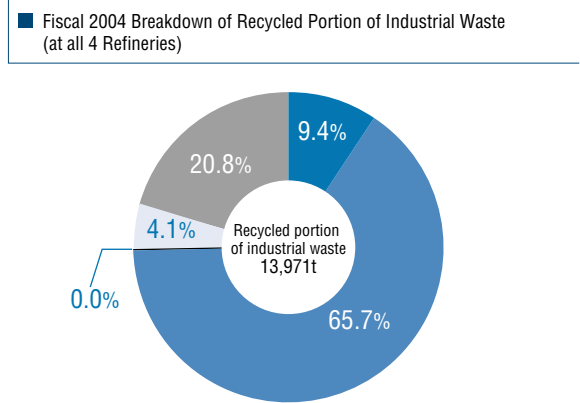
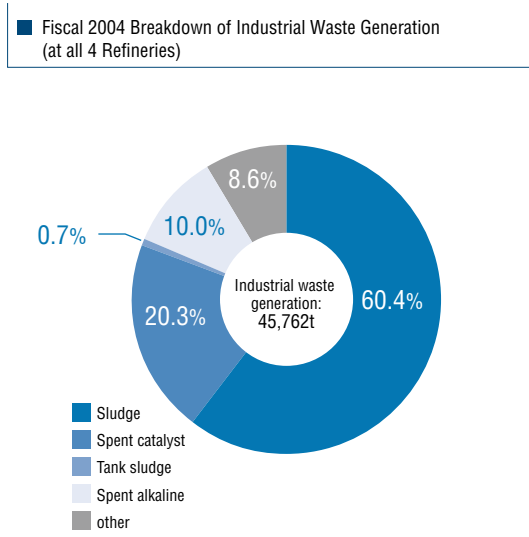
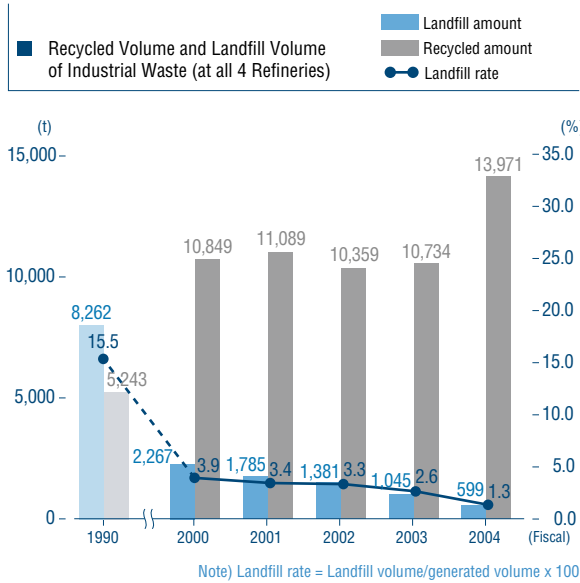
### NO<sub>x</sub> (Nitrogen Oxides)



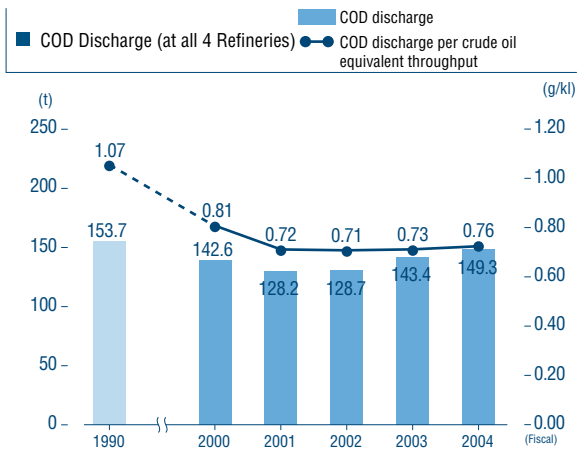
### Benzene Emissions



## Reduction of Industrial Waste



## Prevention of Water Pollution and Effective Use of Water Resources



## Management of Chemical Substances

### Management in Accordance with the PRTR Law

Fiscal 2004 Release and Transfer of Substances Subject to the PRTR Law (at all 4 Refineries)

Substances Subject to the PRTR Law	Amount released				Amount transferred	Total Transfer Amount
	Air	Water	Soil	Total		
Ethyl Benzene (kg/ year)	1,460	0	0	1,460	0	1,460
Xylene (kg/ year)	5,930	0	0	5,930	0	5,930
Cobalt and its Compounds (kg/ year)	0	0	0	0	11,360	11,360
1,3,5-trimethyl Benzene (kg/ year)	2	0	0	2	0	2
Toluene (kg/ year)	21,400	0	0	21,400	0	21,400
Nickel Compounds (kg/ year)	0	0	0	0	128,200	128,200
Benzene (kg/ year)	5,360	0	0	5,360	0	5,360
Molybdenum and its Compounds (kg/ year)	0	0	0	0	197,000	197,000
Zinc Compounds (kg/ year)	0	2,700	0	2,700	0	2,700
Dioxin (mg-TEQ/ year)	1	20	0	21	0	21

Note) 1. In addition to the above, more than 1,000kg/year of 2-aminoethanol, cresol, cyclohexylamine, 1,2-dichloroethane, 1,2-dichloropropane, tetrachloroethylene, nonylphenol, and hydrazine are handled, but all of their release and transfer are 0 kg/year.

2. The above data includes figures for the Yokkaichi Kasumi power station.

