

## Chiba Oil Refinery

Address: 2 Goi-Kaigan, Ichihara-shi,  
Chiba-ken  
Start of operations: February, 1963  
Area: 1,217,835m<sup>2</sup>  
Employees: 412  
Crude oil processing capacity: 240,000  
barrels/day (as of March, 2001)



### Regulated materials

	Material	Regulation	Regulation contents	Regulation value	Actual results	
					Maximum	Average
Air related	NOx (m <sup>3</sup> /hour)	Pollution Prevention Agreement	Total volume regulation	141.1	113.6	82.0
	SOx (m <sup>3</sup> /hour)	Pollution Prevention Agreement	Total volume regulation	189.7	137.1	102.1
	Dust (boiler) (g/m <sup>3</sup> )	Pollution Prevention Agreement	Concentration regulation	0.07	0.036	0.027

	Material	Regulation	Regulation contents	Regulation value	Actual results	
					Maximum	Average
Water related	COD (kg/day)	Pollution Prevention Agreement	Total volume regulation	199	154	76.6
	" (mg/L)	Prefectural regulation	Concentration regulation	25	4.4	3.7
	SS (mg/L)	Prefectural regulation	Concentration regulation	50	8.6	5.1
	Oil content (mg/L)	Prefectural regulation	Concentration regulation	3	0.7	0.6
	Nitrogen (mg/L)	Prefectural directive	Concentration regulation	(10)	1.6	1.0
	Phosphorus (mg/L)	Prefectural directive	Concentration regulation	(1)	0.13	0.09
	Phenol (mg/L)	Prefectural regulation	Concentration regulation	0.5	Below lower measurement limit	

Figures in parentheses = daily average

### Environmental performance

	Volume used/volume discharged	Basic unit		
Energy	656,655( crude oil kL/year )	9.25( crude oil kL/1,000kL )	Quantity of industrial waste generated	28,771 (tons/year)
CO <sub>2</sub>	1,930,591( CO <sub>2</sub> tons/year )	27.2( CO <sub>2</sub> kg/kL )	Quantity of industrial waste recycled	5,174 (tons/year)
SOx	2,551( tons/year )	35.95( g/kL )	Quantity of industrial waste disposed	669 (tons/year)
NOx	1,474( tons/year )	20.77( g/kL )	PRTR (atmospheric release) benzene	1.1(tons/year)
COD	28( tons/year )	0.39( g/kL )	PRTR (atmospheric release) toluene	3.9(tons/year)
			PRTR (atmospheric release) xylene	1.6(tons/year)
			PRTR (atmospheric release) ethyl benzene	0.4(tons/year)
			PRTR (recycling) volume of industrial waste recycled	238.7(tons/year)

### Environmental accounting

Item	Environmental protection cost			Item	Environmental protection effect	
	Cost	Investment	Fiscal-year-end acquisition costs		Reduction of environmental impact	Concentration/basic unit
0 Product environmental impact reduction costs	14,538	662	27,456	0 Effectiveness of reduction of product environmental impact		
Heavy fuel oil sulfur reduction	10,024	513	15,347	Product sulfur reduction	(Latent SOx, tons)	(Sulfur content, %)
Diesel fuel sulfur reduction	2,149	68	7,219	Gasoline	249	0.0076
Removal of lead from gasoline	1,602	81	2,872	Kerosene	113	0.0043
				Diesel fuel	5,830	0.1592
					(kL)	(%)
Benzene reduction in gasoline	763		2,018	Benzene reduction in gasoline	97,215	4.3307
1 Business area costs	3,602	241	9,526	1 Effect within business area	(t)	(g/kL)
				SOx emissions	99	1.92
				NOx emissions	166	1.99
				Benzene emissions	0.7	0.01
				COD displacement	3.7	0.05
					(1,000 tons CO <sub>2</sub> )	(kg-CO <sub>2</sub> /kL)
				CO <sub>2</sub> emissions	69.90	0.56
					(t)	
				Industrial waste generated	6,817	
				Reused industrial waste	569	
				Industrial waste disposed	116	
2 Upstream/downstream costs						
3 Administration activity costs	29					
4 Research and development costs						
5 Social activity costs	241					
Total	18,410	903	36,982			

(unit: million yen)

### Economic Effect (million yen)

Savings through energy reductions (savings through cogeneration) 1,510  
Savings through catalyst recycling (reduction of waste management cost) 44