Chiba Oil Refinery

Address: 2 Goi-Kaigan, Ichihara-shi, Chiba-ken

Start of operations: February 1963

Area: 1,209,585 m^2

Employees: 389

Crude oil processing capacity: 240,000 barrels/day

(as of March 2002)

■ Regulated Pollutants

	Pollutant	Regulation	Type of control	Standard	Performance	
					Maximum	Average
Air Pollutants	NOx (m^3_N/hour)	Pollution control agreement	Areawide total pollutant load control	141.1	113.4	86.3
	SOx (m^3_N/hour)	Pollution control agreement	Areawide total pollutant load control	189.7	138.0	104.0
	Particulate (boiler) (g/m^3_N)	Pollution control agreement	Concentration control	0.07	0.047	0.027

	Pollutant	Regulation	Type of control	Standard	Performance	
					Maximum	Average
Water Pollutants	COD (kg/hour)	Pollution control agreement	Areawide total pollutant load control	199	183.2	78.8
	COD (mg/L)	Prefectural ordinance	Concentration control	25	4.4	3.4
	SS (mg/L)	Prefectural ordinance	Concentration control	50	6.4	5.8
	Oil content (mg/L)	Prefectural ordinance	Concentration control	3	1.0	0.9
	Nitrogen (mg/L)	Prefectural directive	Concentration control	(10)	2.1	1.6
	Phosphorus (mg/L)	Prefectural directive	Concentration control	(1)	0.12	0.09
	Phenol (mg/L)	Prefectural ordinance	Concentration control	0.5	Below measurement threshold	

Figures in parentheses = daily average

■ Environmental Performance

	Amount	Amount per unit of production
Energy	649,795 (kL-crude oil/year)	8.99 (kL-crude oil/thousand kL)
CO_2	1,883,303 (t-CO_2/year)	26.05 (kg-CO_2/kL)
SOx	2,601 (t/year)	36.0 (g/kL)
NOx	1,550 (t/year)	21.4 (g/kL)
COD	28.7 (t/year)	0.40 (g/kL)
Industrial wastes generated	24,470 (t/year)	
Industrial wastes recycled	5,346 (t/year)	
Industrial wastes disposed of	505 (t/year)	

PRTR Law designated chemical substance	Release/transfer
Ethyl benzene (atmospheric release)	0.4 (t/year)
Xylene (atmospheric release)	1.3 (t/year)
1,3,5-trimethylbenzene (atmospheric release)	26 (kg/year)
Toluene (atmospheric release)	5.9 (t/year)
Benzene (atmospheric release)	1.0 (t/year)
Cobalt and its compounds (transfer)	0.0 (t/year)
Nickel compounds (transfer)	58.0 (t/year)
Molybdenum and its compounds (transfer)	79.0 (t/year)

■ Environmental Accounting

Item	Environmental cost (million yen)	
	Investment amount	Expenditure amount
1 Business area costs	74	3,812
Pollution prevention costs	57	1,426
Global environmental conservation costs	0	2,151
Resource circulation costs	17	235
2 Upstream/downstream costs	139	14,436
Product environmental impact reduction costs	139	14,436
Product sulfur reduction costs	120	12,417
Gasoline	29	2,991
Naphtha	10	1,041
Jet fuel oil	8	865
Kerosene	20	2,084
Diesel fuel	29	2,965
Heavy fuel oil A	12	1,253
Heavy fuel oil C	7	739
LPG	5	479
Costs of substituting toxic substances in gasoline	19	2,019
Costs of aromatics reduction in petrochemical products	0	0
Green procurement costs	0	0
3 Management activity costs	0	190
4 Research and development costs	0	0
5 Social activity costs	0	167
Total	213	18,605

Item	Benefits of environmental protection	
	Reduction of environmental impacts (2000 value minus 2001 value)	
	Concentrations/unit value	Environmental impacts
1 Business area benefits		
Benefits of reduction in resource input	(kL-crude oil/thousand kL)	(TJ)
Energy input	0.26	266
	(kg/kL)	(thousand t)
Water input	7	282
Benefits of reduction in emissions and waste generation		
Release to atmosphere	(kg-CO_2/kL)	(thousand t-CO_2)
CO_2	1.15	48
	(g/kL)	(t)
SOx	−0.1	−50
NOx	−0.6	−76
Benzene	0	0
Release to water	(g/kL)	(t)
COD	−0.01	−0.7
Wastes	(g/kL)	(t)
Industrial wastes generated	66	4,301
Industrial wastes recycled	−1	−172
Industrial wastes disposed of	2	164
2 Upstream/downstream benefits		
Benefits of product environmental impact reduction		
Product sulfur reduction	(sulfur:weight %)	(potential SOx emissions: t)
Total	0.0371	5,578
Gasoline	0.0005	11
Naphtha	−0.0007	−99
Jet fuel oil	−0.0048	−115
Kerosene	−0.0009	−16
Diesel fuel	0.0014	87
Heavy fuel oil A	0.0591	1,275
Heavy fuel oil C	0.0154	4,435
LPG	0.0000	0
Benefits of substituting toxic substances in gasoline	(volume %)	(t)
	0.0969	1,110
CO_2 emissions from product use	(t-CO_2/kL)	(thousand t-CO_2)
	0.0237	−490

■ Economic Benefit (973 million yen)

Savings through energy reductions (savings through cogeneration): 973

Saving through catalyst recycling (reduction of waste management cost, etc.): 0

Benefits from research and development (income from royalties, etc.): 0