

Sakaide Oil Refinery

Address: 1-1 Bannoshu Midori-machi,
Sakaide-shi, Kagawa-ken
Start of operations: October, 1972
Area: 847,943 m²
Employees: 246
Crude oil processing capacity: 140,000
barrels/day* (as of March, 2001)



*120,000 barrels/day
from April 2001

Regulated materials

	Material	Regulation	Regulation contents	Regulation value	Actual results	
					Maximum	Average
Air related	NOx (m ³ /hour)	Pollution prevention memorandum	Total volume regulation	190	62.0	44.0
	SOx (m ³ /hour)	Pollution prevention memorandum	Total volume regulation	164	83.3	59.4
	Dust (boiler) (g/m ³)	Pollution prevention memorandum	Concentration regulation	0.05	0.008	0.006

	Material	Regulation	Regulation contents	Regulation value	Actual results	
					Maximum	Average
Water related	COD (kg/day)	Prefectural regulation	Total volume regulation	120	68.2	40.2
	" (mg/L)	Prefectural regulation	Concentration regulation	15 (10)	6.0	3.6
	SS (mg/L)	Prefectural regulation	Concentration regulation	15 (10)	7.0	3.9
	Oil content (mg/L)	Prefectural regulation	Concentration regulation	2	Below lower measurement limit	
	Nitrogen (mg/L)	Water Pollution Control Law	Concentration regulation	120 (60)	2.0	1.3
	Phosphorus (mg/L)	Water Pollution Control Law	Concentration regulation	16 (8)	0.05	0.03
	Phenol (mg/L)	Prefectural regulation	Concentration regulation	1	Below lower measurement limit	

Figures in parentheses = daily average

Environmental performance

Volume used/volume discharged		Basic unit			
Energy	374,914 (crude oil kL/year)	9.56 (crude oil kL/1,000kL)		Quantity of industrial waste generated	15,120 (tons/year)
CO ₂	1,096,714 (CO ₂ tons/year)	27.97 (CO ₂ kg/kL)		Quantity of industrial waste recycled	1,822 (tons/year)
SOx	1,486 (tons/year)	37.90 (g/kL)		Quantity of industrial waste disposed	190 (tons/year)
NOx	794 (tons/year)	20.25 (g/kL)		PRTR (atmospheric release) benzene	2.5 (tons/year)
COD	15 (tons/year)	0.37 (g/kL)		PRTR (atmospheric release) toluene	6.1 (tons/year)
				PRTR (atmospheric release) xylene	2.7 (tons/year)
				PRTR (atmospheric release) ethyl benzene	0.7 (tons/year)
				PRTR (recycling) volume of industrial waste recycled	68.4 (tons/year)

Environmental accounting

Item	Environmental protection cost			Item	Environmental protection effect	
	Cost	Investment	Fiscal-year-end acquisition costs		Reduction of environmental impact	Decrease of environmental impact
0 Product environmental impact reduction costs	8,375	12	36,302	0 Effectiveness of reduction of product environmental impact		
Heavy fuel oil sulfur reduction	5,162	11	21,289	Product sulfur reduction	(Latent SOx, tons)	(Sulfur content, %)
Diesel fuel sulfur reduction	990		4,475	Gasoline	122	0.0063
Removal of lead from gasoline	1,829	1	9,395	Kerosene	67	0.0048
				Diesel fuel	3,020	0.1608
Benzene reduction in gasoline	394		1,143		(kL)	(%)
1 Business area costs	781		9,200	Benzene reduction in gasoline	58,100	4.3793
				1 Effect within business area	(t)	(g/kL)
Pollution prevention costs	667		9,200	SOx emissions	18	6.46
Global environmental protection costs				NOx emissions	2	3.68
Resource recycling costs	114			Benzene emissions	2.8	0.10
				COD displacement	1.2	0.03
2 Upstream/downstream costs					(1,000 tons CO ₂)	(kg-CO ₂ /kL)
3 Administration activity costs	13			CO ₂ emissions	93.45	2.35
4 Research and development costs					(t)	
5 Social activity costs	165			Industrial waste generated	1,360	
				Reused industrial waste	231	
Total	9,334	12	45,502	Industrial waste disposed	253	

Economic Effect (million yen)

Saving through catalyst recycling (reduction of waste management cost) 37