

Sakaide Refinery (as of March 31, 2005)

Address	1-1 Bannosumidori-cho, Sakaide, Kagawa
Start-up	October 1972
Total area	847,943 m ²
Company Staffs	209
Capacity	120,000 barrels / day
ISO 9001	May 10, 1996
ISO 14001	June 18, 1997

About the Sakaide Refinery

The Sakaide Refinery, located in Kagawa Prefecture in the Shikoku Region, is positioned in the Sakaide Ichiban Industrial Belt and facing the Seto Inland Sea. It produces products such as LPG, gasoline, kerosene, diesel fuel, A/C heavy fuel oil, and asphalt for road use, as well as liquid sulfur and liquid carbon gas, and provides these products to various locations in Eastern Japan. The Sakaide Refinery also plays a role as an export hub of these products overseas.

- **Environmental activities:** Beginning with supplying sulfur free products, the Sakaide Refinery promotes energy conservation and the reduction of environmental impact, and actively participates in external announcements regarding energy conservation examples, etc. Since it is located next to the Seto Inland Sea National Park, it also aims to be an environmentally conscious refinery facility as a whole.
- **Safety activities:** Safety is the foundation of this refinery's operations, and safety maintenance and improvement measures beginning with safety management and educational programs for the operations departments are actively pursued. Furthermore, in order to handle major disasters such as the Tounan Sea Earthquake, the Sakaide Refinery also reinforces its crisis management system by engaging, for example, in joint training programs with other companies in the area.
- **Activities for the regional community:** Striving for symbiosis with the regional community, the Sakaide Refinery, together with other companies in the Bannosu Industrial Belt, participates in exchanges with the local community (such as the softball tournament, field day events, etc.) and in the "Sakaide Ohashi Festival", placing importance on direct communication.



Hidetomo Matsumura
General Manager
Sakaide Refinery

Environmental Activities

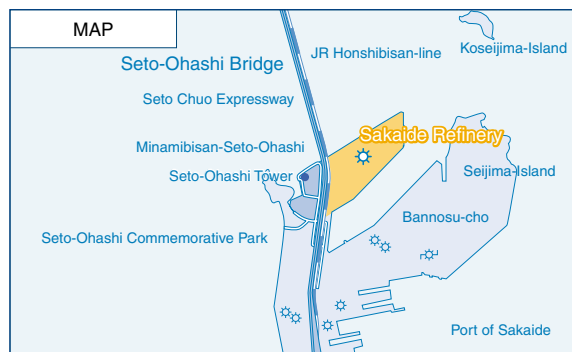
- **Energy conservation and awards**
Received the Energy Conservation Center Chairman's Award at the Energy Conservation Excellent Case Example Competition (Sponsor: Energy Conservation Center)
(Content: Reduction of fuel consumption by changing in accordance with the production plan the heating furnace temperature of the atmospheric distillation units.)

Health and Safety Activities

- **Preventative measures**
Developed various safety Activities in conjunction with cooperating companies such as educational seminars on disasters and explosions
- **Awards**
Received the "Fiscal 2004 Excellence in handling of hazardous substances by a production site" Fire Chief's Award at the Fiscal 2004 Hazardous Substances Safety Competition (Sponsor: National Hazardous Substances Safety Association), etc.

Regional Communication Activities

- Engages in information exchange with the 6 companies located in the Bannosu District, by implementing the General affairs meeting (once monthly), and Safety & environment meeting (6 times annually)
- Participation in events such as the "Sakaide Ohashi Festival" and the festival sponsored by the town council (approximately 6 events annually)
- Participation in the regional field day event and the softball tournament
- Cleaning of local roads (4 times annually), etc.



Number of Staff holding Environmental Qualifications

Air pollution control manager	10
Water pollution control manager	11
Noise pollution control manager	1
Hazardous materials officer (Class A & B)	217
High-pressure gas production safety manager (Class A & B)	174
Qualified person for heat management	10
Qualified person for electricity management	5
Specially controlled industrial waste manager	2
Engineering manager for disposal facilities of industrial waste	2
Boiler operator (Special grade)	2
Boiler operator (1st & 2nd grade)	211

Number of visitors to the Refinery in Fiscal 2004	17 visits 337 people
No accident record (as of December 2004)	299,000 hours
PCB custody status	None

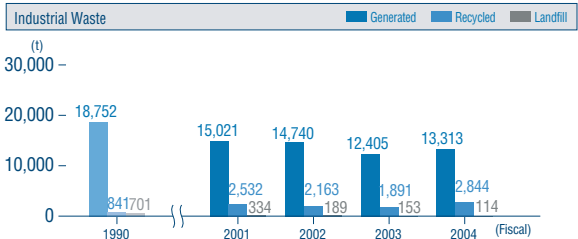
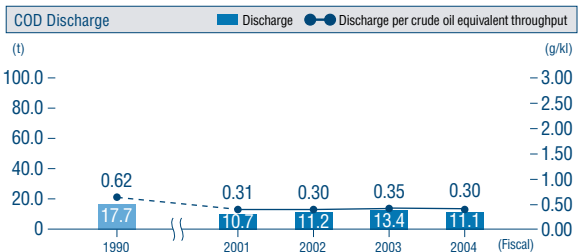
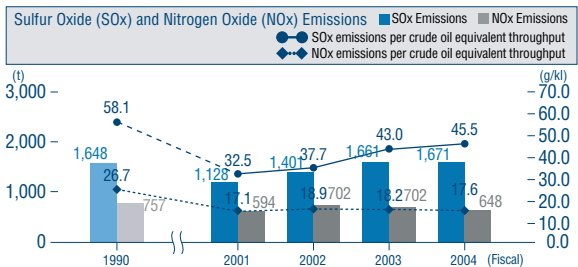
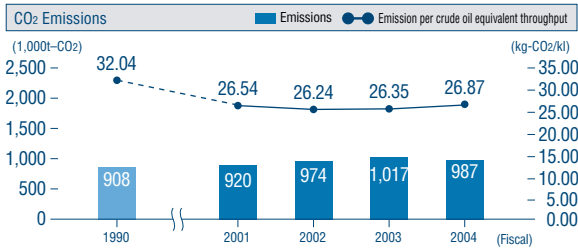
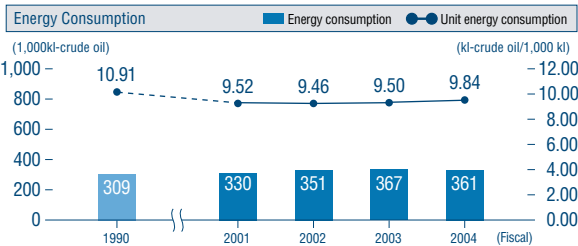
Regulated Pollutants

Air pollutants	Pollutant	Standard	Actual Performance in Fiscal 2004	
			Maximum	Average
	NOx (m ³ N/hour; total pollutant load control)	190.0	48	36
	SOx (m ³ N/hour; total pollutant load control)	164.0	75.5	66.8
	Particulate (boiler; g/m ³ N)	0.05	0.005	0.005

Water pollutants	Pollutant	Standard	Actual Performance in Fiscal 2004	
			Maximum	Average
	COD (kg/day; total pollutant load control)	120.0	47.1	30.3
	COD (mg/L)	15 (10)	6.0	4.2
	SS (mg/L)	15 (10)	8.0	4.5
	Oil Content (mg/L)	2	Below measurement threshold	
	Nitrogen (kg/day; total pollutant load control)	180	54.1	31.2
	Nitrogen (mg/L)	120 (60)	2.3	1.5
	Phosphorus (kg/day; total pollutant load control)	18	1.03	0.14
	Phosphorus (mg/L)	16 (8)	0.06	0.04
	Phenols (mg/L)	1	0.010	0.010

Values in () are daily average.

Environmental Performance (energy, etc.)



Environmental Performance (PRTR)

PRTR listed substances	Releases	Releases				Transfers
		Air	Water	Soil	Total	
Ethyl benzene	kg/year	690	0	0	690	0
Xylene	kg/year	2,800	0	0	2,800	0
Cobalt and its compounds	kg/year	0	0	0	0	1,700
Toluene	kg/year	10,000	0	0	10,000	0
Nickel compounds	kg/year	0	0	0	0	35,000
Benzene	kg/year	2,500	0	0	2,500	0
Molybdenum and its compounds	kg/year	0	0	0	0	55,000
Zinc compounds (water soluble)	kg/year	0	1,500	0	1,500	0

* In addition to above, we treat 2-aminoethanol, 1,3,5-trimethylbenzene and cyclohexylamine over 1 thousand kg per year, the release and transfer volume are 0 kg per year for all substances.

Environmental Accounting

Environmental conservation costs (million yen)		
Category and Key Activity	Fiscal 2004	
	Investment	Cost
1. Business area: Pollution prevention	51	742
Global environmental conservation	0	0
Resource circulation	0	52
2. Upstream/downstream: Green purchasing	0	0
Reduction of environmental impact of products	220	8,373
Sulfur reduction of products	(209)	(5,870)
Substitution of toxic substances in gasoline	(11)	(2,503)
3. Administration	0	35
4. Research and development	0	0
5. Social activity	0	0
Total	271	9,202

Purchasing recycled paper: 1 million yen

Economic benefit (million yen)

Details of Benefit		Fiscal 2004
Energy conservation (cogeneration)		152
Total		152

Environmental conservation benefits

Item	Fiscal 2004	
	Reduction (year-on-year)	
	Concentrations/unit value	Impact
1. Benefits corresponding to worksite costs		
Resources input into business activities		
Energy input	- 0.34 (kl-crude/1,000kl)	211 (TJ)
Water input	- 6 (kg/kl)	- 56 (1000t)
Related to environmental impacts and wastes		
Emissions to air:		
CO2	- 0.52 (kg-CO2/kl)	30 (1000t-CO2)
SOx	- 2.5 (g/kl)	- 10 (t)
NOx	0.6 (g/kl)	54 (t)
Benzene	- 0.01 (g/kl)	0.00 (t)
Emissions to water:		
COD	0.05 (g/kl)	2.3 (t)
Industrial waste :		
Generated	- 42 (g/kl)	- 908 (t)
Recycled	- 28 (g/kl)	- 953 (t)
Landfill	1 (g/kl)	39 (t)
2. Benefits related to upstream and downstream costs		
Related to goods and services		
Reducing sulfur content of products	(sulfur content: mass %)	(potential SOx: t)
High octane gasoline	0.0002	1
Regular gasoline	0.0016	23
Naphtha	- 0.0219	- 5
Jet fuel oil	0.0002	2
Kerosene	0.0011	10
Diesel fuel	0.0010	18
Heavy fuel oil A	- 0.0095	- 88
Heavy fuel oil C	- 0.0641	- 541
LPG	- 0.0001	0
Total	- 0.0025	- 581
Reducing benzene in gasoline	- 0.0393 (volume %)	- 1,206 (t)
CO2 emissions from product use	0.0075 (t-CO2/kl)	305 (1,000t-CO2)