Environmental Impact of Business Activities

Crude Oil Extraction INPUT

• Energy Fuel: 28.475TJ

OUTPUT

· Emissions into air: CO2: 1,587,000 t-CO2 sox: 21.887 t Nox: 3.512 t

ENVIRONMENTAL MEASURES

Energy conservation Air pollution control (zero flare project)

R&D Center

ENVIRONMENTAL MEASURES

Energy conservation Resource conservation/recycling Industrial waste management Chemical substance control Water quality control Disaster prevention

Crude Oil Transportation

INPUT

• Energy Fuel: 13.971TJ

OUTPUT

· Emissions into air:

CO2: 955,000 t-CO2 sox: 20.798 t Nox: 25,762 t

ENVIRONMENTAL MEASURES

Oil spills prevention Energy conservation (increasing efficiency by joint distribution, increasing size of tankers)

Office

ENVIRONMENTAL MEASURES

Energy conservation Resource conservation/recycling Green purchasing

Refinina (Refineries)

INPUT

Raw materials

Crude oil: 29,545,000 kl, Other: 1,361,000kl

Power purchased: 2,795 TJ (288,817,000kWh) Own fuel: 70,112 TJ (1,808,000kl-of crude)

Industrial water: 42,941,000 t Seawater: 367,782,000 t

OUTPUT

· Emissions into air:

co2: 4,918,000 t-co2 Own fuel: 4,229,000t-CO2

Purchased electrical power: 109.000t-C02 Hydrogen production process: 380.000t-CO₂ sox: 6,192 t, Nox: 3,103 t

• Waste water*1

Waste water: 377,485,000 t

(incl. 367,782, 000t seawater)

COD: 152 t, Nitrogen: 93 t, Phosphorous: 2 t

Industrial waste

Generated: 50,584 t, Recycled: 18,767 t

ENVIRONMENTAL MEASURES

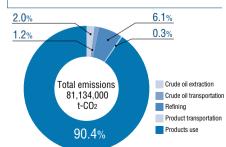
Landfill: 607t

Substance specified by PRTR Law

Releases: 80 t, Transfers: 337 t

Energy conservation Industrial waste management Air pollution control Soil environment measures Disaster prevention Resource conservation/recycling Chemical substance control Water quality control Tree-planting on site

- *1 We emitted clean water excluding this data.
- Proportion of CO₂ in Oil Life Cycle



Product Use

(Factories, Offices, Vehicles, Homes)

Product Transportation and Warehousing **Products** (Oil Depots) INPUT Energy Fuel: 3,548 TJ OUTPUT · Emissions into air CO2: 222,000 t-CO2 S0x: 1,907 t NOx: 3,693 t Production volume: 29,921,000 kl Maritime transportation (ships) Recovered sulfur: ENVIRONMENTAL MEASURES 256,000 t (as by-product) Oil spill prevention Electric power sold: Energy conservation 1.592GWh (increased efficiency through mutual accommodations, (15,653TJ) larger tankers for coastal routes) Land transportation (by road) Energy conservation (larger vehicles, improvement of stowage ratio) Stockpiling (oil depots) Energy conservation Resource conservation Chemical substance control Soil environment measures Oil spill prevention Disaster prevention

Oil Life Cycle Inventory (LCI)

Stage	Crude Oil Extraction	Crude Oil Transportation	Refining	Products Transportation	Products Use	Total
Energy Consumption (TJ)	28,475	13,971	72,908	3,548	1,074,297	1,193,199
CO ₂ Emissions (1,000t-CO ₂)	1,587	955	4,918	222	73,452	81,134
SOx Emissions (t)	21,887	20,798	6,192	1,907	166,435	217,219
NOx Emissions (t)	3,512	25,762	3,103	3,693	_	_

OUTPUT

· Emissions into air

CO2: **73,452,000** t-CO2 S0x: 166,435 t

Service stations

ENVIRONMENTAL MEASURES

Energy conservation Industrial waste management Air pollution control Soil environment measures Resource conservation/recycling Chemical substance control Water quality control Disaster prevention

- Figures are estimated based on the actual production volumes of petroleum products in Fiscal 2004.
- Figures for crude oil production, crude oil transportation, and product transportation are estimated based on LCI for Petroleum Products by Fuel and Environmental Impact Assessment for Petroleum Products, published in March 2000 by the Petroleum Energy Center.
- Figures for refining and product consumption are derived from environmental accounting. See p.75-78 of the Related Data for the methods and basis of calculations.
- In relation to CO2 emissions from refining, we calculate the data by the method recommended by the Ministry of Environment's "Guidelines Concerning Methods of Calculation of Emissions of Greenhouse Gases by Businesses (draft)".
- Refining includes data from the Yokkaichi Kasumi Powei Station and Cosmo Matsuyama Oil Co., Ltd.
- Electric power sold refers to power sold by the Chiba Refinery, the Yokkaichi Kasumi Power Station and Cosmo Matsuvama Oil Co., Ltd. The CO2 emissions from refining is the amount after deduction of CO2 emissions, a result of such power generation. It includes CO2 emissions for the purchased electricity.
- · Figures here do not include CO2 emissions associated with the construction of facilities.
- The figures for SOx emissions at the consumption stage are reported for reference.
- The figure indicates the potential SOx emissions based on sulfur content in products, and does not take into account SOx reductions resulting from desulfurization of emissions that occurs during use by customers. Thus, the actual figure for SOx emissions is expected to be lower than the figure reported here.
- The figures for CO2 and SOx emissions at the use of products stage include potential impacts of naphtha. Naphtha is used as an ingredient in petrochemicals and fertilizers, which by themselves do not emit CO2 or SOx.