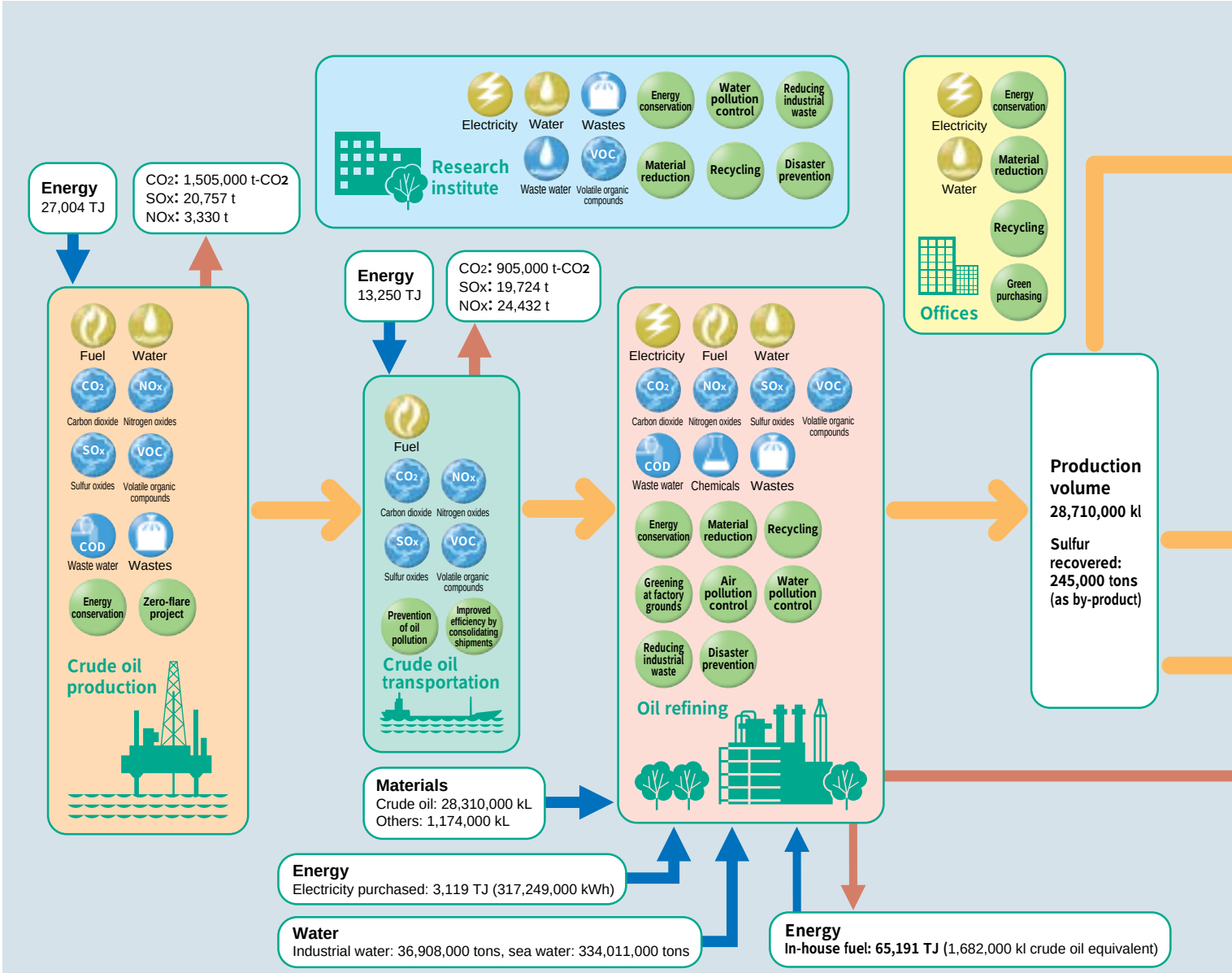
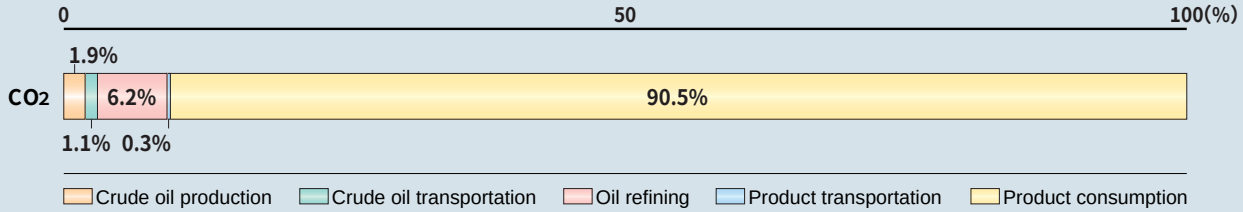
To be effective in our efforts to reduce environmental impacts, Cosmo Oil measures the trends of impacts in each process.

The Cosmo Oil Group's business activities encompass all processes in the life cycle, from exploration and production of crude oil in oil-producing countries, to the shipping and refining of crude oil, to the delivery of petroleum products and sales at service stations. To make continuous improvements and deliver products that have low environmental impacts throughout the life cycle, we recognize the importance of going beyond simply reducing environmental impacts in each of the processes. We must also understand how activities in one process interrelate with other processes, and how each activity affects the environmental impacts of each other process—in both absolute and relative terms.

In fiscal 2002, the amount of SOx (sulfur oxides) emissions from products use decreased by 126 tons from the previous year, despite increased

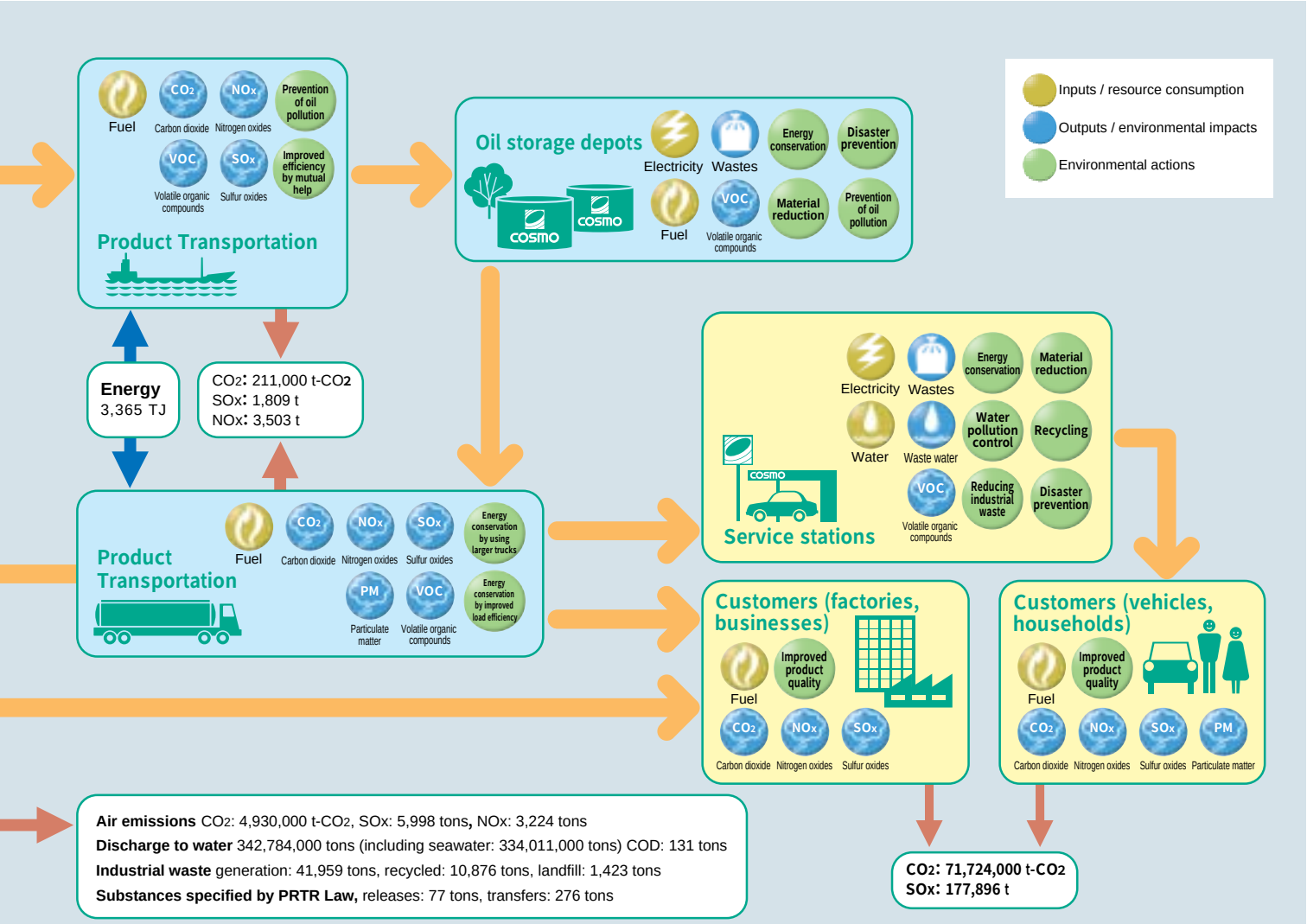


■Breakdown of CO_2 emissions during the life cycle of oil



production volume of petroleum products. This achievement was possible in part because many of the products have been converted to lower sulfur content, including the low-sulfur (50 ppm) diesel oil* that Cosmo Oil began selling on a pilot basis in Tokyo. Meanwhile, the amount of CO_2 emissions arising from use by the customer increased by 2,369,000 tons from the previous year, due to the increased sales volume. Despite the increased production volume and more stringent refining requirements, the amount of CO_2 emissions arising from production increased only a little thanks to our energy conservation efforts. The final outcome for CO_2 emissions during the product life cycle was that the proportion emitted during the refining process decreased by 0.1 point from the previous year to 6.2%, and the proportion emitted at the consumption stage increased by 0.1 point to 90.5% (see graph).

* See page 18 for the integrated assessment of environmental impacts of reduced sulfur content of diesel oil.



■Life cycle inventory of oil

	Crude oil production	Crude oil transportation	Oil refining	Product transportation	Product consumption	Total
Energy consumption (TJ)	27,004	13,250	68,310	3,365	—	—
CO_2 emissions (1,000 t-CO_2)	1,505	905	4,930	211	71,724	79,275
SOx emissions (t)	20,757	19,724	5,998	1,809	177,896	—
NOx emissions (t)	3,330	24,432	3,224	3,503	—	—

Notes to table:
- Figures are estimated based on the actual production volumes of petroleum products in fiscal 2002.
- 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 the environmental accounting section in this report for the methods and basis of calculations.
- NOx gases emitted at the product consumption stage are formed mainly from nitrogen in the air. Because products are used in a variety of forms, it is difficult to arrive at figures for NOx emissions at the product consumption stage. Thus, we do not report the figures this time, leaving this as an issue to be resolved in the future. Also, methods to measure emissions of pollutants at oil storage depots and service stations remain as issues for the future.
- Figures here do not include environmental impacts associated with the construction of facilities.
- It should be noted that environmental impacts of SOx and NOx such as acid rain and photochemical smog are affected by regional characteristics. Thus, they cannot be assessed uniformly on a global scale in a way that can be done for CO_2.
- 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 CO_2 and SOx emissions at the consumption stage include potential impacts of naphtha. Naphtha is used as an ingredient in petrochemicals and fertilizers, which by themselves do not emit CO_2 or SOx.