

Logistics

Teaming up with suppliers to reduce environmental impact

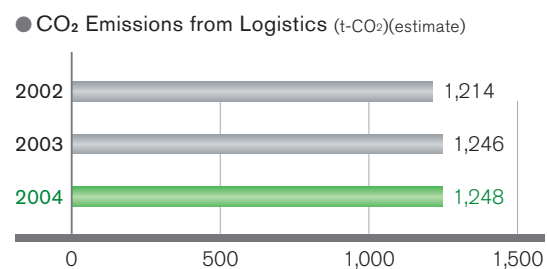
With markets and production bases around the world, reducing environmental impact in logistics is a serious matter for Nissan. We remain committed to localizing our global production and joining forces with local suppliers to reform our logistics management.

Reducing CO₂ Emissions

In fiscal year 2004, total CO₂ emissions generated by Nissan logistics came to approximately 1.25 million tons, roughly equal to the level of the previous year. This includes CO₂ emissions from transporting finished cars and parts in Japan, as well as shipments between domestic and foreign ports. Nissan, the most successful among Japanese automakers at managing logistics-related CO₂ emissions for domestic shipments, is increasingly adopting eco-friendly methods to be applied at our overseas facilities as well.

However, with the current unit of measuring CO₂ emissions [t-CO₂ / t-km *], it is impossible to monitor such reductions as those achieved by improving loading efficiency. Nissan is conducting research on this point to develop a unit of measurement that will facilitate more accurate monitoring in the near future.

* From "Source Measures for Carbon Dioxide Emissions in Cargo Transport", Japan Ministry of the Environment, Central Environment Council.



Improving Efficiency in Logistics

The cooperation of parts suppliers and logistics companies is critical in streamlining the overall logistics flow and reducing CO₂ emissions throughout the process. At Nissan, to promote greater efficiency in our

logistics operations, we have established a feedback mechanism for obtaining constructive input from our parts makers and cooperating logistics firms. There are two main approaches to improving efficiency. The first involves realizing higher loading ratios by increasing the volume of each load, thereby reducing the number of trips needed. The second is the promotion of transportation modes with lower CO₂ emissions than conventional truck transport.

► Improving the loading ratio

In fiscal year 2000, Nissan became the first Japanese automaker to employ a "roundup" system of collecting required parts. This means that, in addition to the traditional dispatch system in which different suppliers deliver various individual parts required, we use chartered trucks to pick these parts up directly from the suppliers ourselves, allowing us to sometimes consolidate parts from several different suppliers into larger single loads.

This has resulted in noticeable improvements over systems that only dispatch. The over 2,500 deliveries per day, traditionally made by 10-ton trucks, have now come down to 2,200. This system has already been adopted in China as well and we plan to expand it to Thailand and other countries in the near future.

Nissan is also improving the design of its transport containers. By using for example, collapsible containers for empty return trips to minimize excess volume. We have also developed 55 different container types for more efficient loading, thereby raising the loading ratio by some 10 percent.

The use of Computer Aided Design (CAD) helps us to simulate packing types, enabling maximum loading ratios during the design stage, and eliminating the need



Modal shift to rail



Modal shift to ferry transport

for prototype parts in our studies. In April 2005, the Logistics Engineering Group was established to refine this work, and to streamline Nissan's logistics even more systematically.

We also use joint transport arrangements with other companies to achieve greater logistics efficiency. In Europe, for example, Nissan cooperates with Renault in transporting cars and parts. We worked with Renault for some time in ferry transport between the UK and the European mainland for finished cars. In January 2004, we began collaborating with other manufacturers on the same route. When manufacturers send finished cars from Europe to the UK, the ships return empty. However, Nissan, which has plants in the UK, needs to ship in the opposite direction. By aligning our common interests to avoid empty return trips, coordinating trips both to and from continental Europe, and have eliminated the unnecessary waste of transporting empty containers.

► Modal shift

In Japan, Nissan has begun transporting finished cars and parts over longer distances, such as between the Kanto and the Kansai or Kyushu areas, by sea rather than by road. Currently, 51% of these shipments are made by sea. In addition, an increasing number of parts from inland suppliers are forwarded to ports by train, a mode of transportation with CO₂ emissions less than half that of ferries.

Rail containers were first used in place of trucks to ship parts from the Kanto region of Greater Tokyo to the plant in Kyushu, accounting for 3% of the value of total parts shipped domestically and 0.5% of total volume. This system was completed in fiscal year 2004, and is projected to cut CO₂ emissions by about 70% compared to transporting the same volume by truck. Our studies continue on how to best employ rail

containers between Kanto and the Kansai region of western Japan.

Vehicle orders usually increase in February and March. In 2005, we introduced the "Nissan Car Pack" for the two-month period to help deal with the higher volume. This method uses a double-stack container that carries two vehicles, one above and one below. We used the Nissan Car Pack to ship 1,000 export-bound sports cars from the Tochigi Plant to the Yokohama Honmoku Pier. In addition to steadily expanding this method, Nissan's modal shift to rail transport is also being extended to our affiliated subsidiaries. The parts supplier Calsonic Kansei Corp. has completed its transition from marine transport to rail between Atsugi and Hiroshima and has reduced its CO₂ emissions in fiscal year 2004 by about 16 tons per month compared to fiscal year 2003.

Reducing Waste

Another issue in the field of logistics is waste reduction. We transport parts by placing them in containers and stacking them on pallets. However, most pallets are made out of wood, and eventually are left over as waste at our plants. Early on, for the purpose of forest preservation, we began a switch to a returnable pallets system. Since 2001, we have promoted the establishment of systems that minimize the number of pallets and improve efficiency by sharing them with Renault. This practice is now being adopted in China and other parts of Asia, and the global shift to this pallet mode is soon to be completed and applied to Nissan's international suppliers. In co-ordination with our suppliers, studies on replacing paper, vinyl and other such packing materials for several products are also currently underway.