

# We calculate and are working to reduce CO<sub>2</sub> emissions for each product at each stage of the life cycle.

## Our Approach

Preventing global warming is an important challenge for the manufacturing industry today. Konica Minolta feels it must take responsibility not only for the energy it consumes in plants, but also for the energy needed to manufacture the raw materials and in the transport, use, disposal and recycling of the goods produced, and is taking measures accordingly.

## Results and Future Goals

After re-organizing our business structure, we undertook a company-wide study to standardize CO<sub>2</sub> emission indices and premises, and confirmed the data totals for each site up to fiscal 2003. We then re-calculated CO<sub>2</sub> emission volumes for each of our business companies, covering the entire life cycles of their products. We hope to use this data to promote further activities on the dual basis of "site targets" and "Group LCA targets".

**Konica Minolta's approach** Determine each product's CO<sub>2</sub> emission load, and devise appropriate measures to address them.

**1** We calculate CO<sub>2</sub> emitted during each stage, from raw material, through to manufacture, use and disposal. Examining the whole life cycle of each product leads to effective reduction measures.

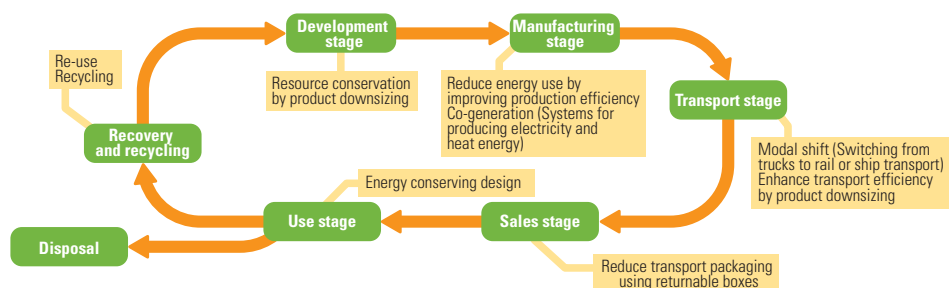
Konica Minolta manufactures a wide diversity of products, so blanket measures to reduce CO<sub>2</sub> emissions have a limited role. Instead, by using the LCA (life cycle assessment) method, we can grasp how much CO<sub>2</sub> is being emitted at each stage of a product's life cycle, and then target the stages at which large amounts of CO<sub>2</sub> are being emitted. By devising CO<sub>2</sub> reduction measures tailored to each product, reductions can be efficiently achieved.

For example, copiers emit the most CO<sub>2</sub> during use by the customer, so energy conservation dur-

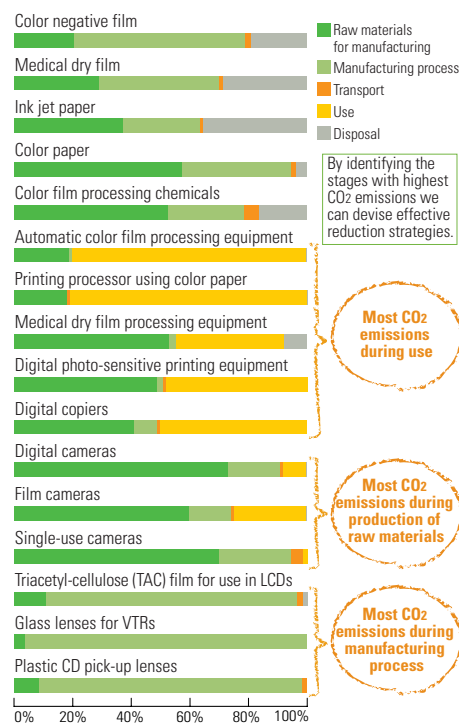
ing use is the main issue for copiers, and we are working to create energy efficient designs. In the case of triacetyl-cellulose (TAC) film for use in LCDs, panels and CD pick-up plastic lenses, most of the CO<sub>2</sub> emissions occur during the manufacturing process, so energy conservation in the plant is the main issue for these products.

By taking appropriate measures for each product in this way, we are fulfilling our responsibility to help prevent global warming.

### Example of Product Life Cycle and CO<sub>2</sub> Reduction



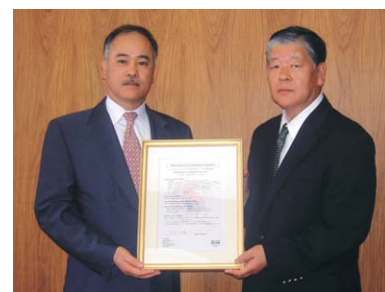
### Ratios of CO<sub>2</sub> Emissions during Each Life Cycle Stage of Major Products



### Participation in the "Prototype Project of Voluntary Domestic Emissions Trading Scheme"

An independent body has verified our greenhouse gas emission volumes.

We participated in the Japanese Ministry of the Environment's "Prototype Project of Voluntary Domestic Emissions Trading Scheme for Fiscal Year 2003". In line with this project, total 25 sites of our Group companies and affiliates in Japan calculated greenhouse gas emission volumes for fiscal 2003, and underwent a third-party verification process. At the same time, the second co-generation system installed at our Tokyo site has been recognized as a greenhouse gas reduction project under the government scheme.



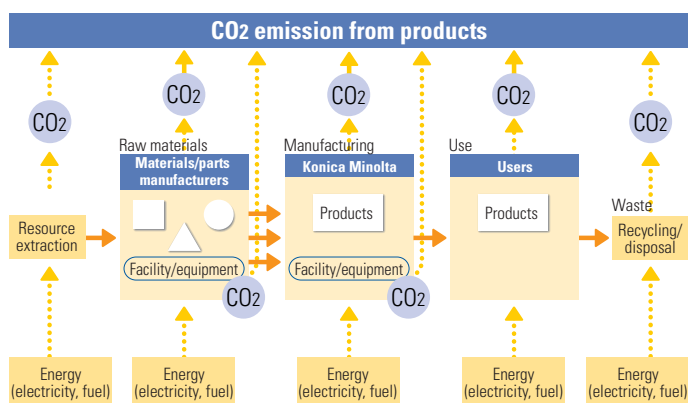
Presentation of Verification Opinion from BSI Japan, an independent verification body.

Report of Group CO2 Emissions

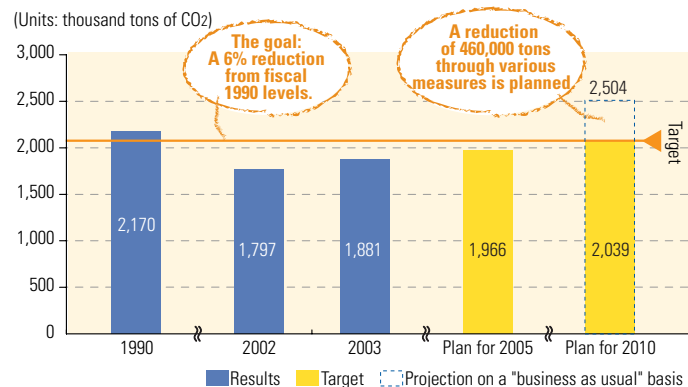
Targets have been set for business companies to reduce total CO2 emissions by 6% compared to fiscal 1990 levels.

We are working hard to achieve targets for the year 2010 for the entire Group, from the perspective of both a "Group LCA target" and "Site targets," and under the guidance of the Global Warming Prevention Committee, part of our ISO 14001 based system. Our group LCA target is to achieve a 6% reduction (compared to fiscal 1990) in total emissions (CO2 equivalent) collectively by the entire Group by 2010. Our initiatives have three features: consideration of products in each and every product category over the course of their entire life cycle, targeting not only domestic but also overseas operations, and targeting all greenhouse gases. We have adopted and aim to achieve this target collectively.

■ The Konica Minolta CO2 emission calculation method based on the concept of product LCA



■ Trends in CO2 emission volumes for the entire Group calculated from entire product life cycles

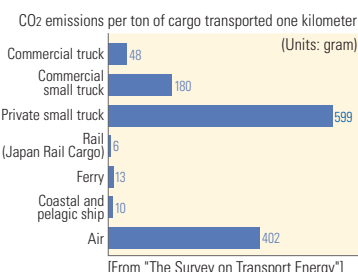


**CO2 emissions by the entire Group (fiscal 2003)**  
**30,000 tons reduced**  
 (compared to "business as usual")

Other measures

Initiatives to Achieve CO2 Emission Reductions in Transport

By minimizing the distances traveled by trucks, we are endeavoring to reduce emissions of both greenhouse gases such as CO2 and air pollutants that cause acid rain. To achieve this we are promoting a modal shift away from long-distance truck transport to transport by rail and sea. At present, 80% of transport between the Kanto district (around Tokyo) and Sapporo



Initiatives to Reduce CO2 Emissions from Manufacturing

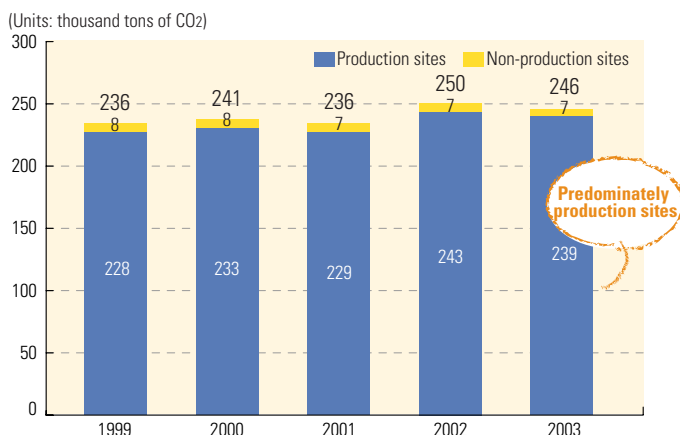
Energy conservation is the main issue at production sites.

"Site targets" have been set with a view to encouraging domestic implementation of the Kyoto Protocol. Site targets for 2010 have been set for six gases (CO2, CH4, N2O, PFCs, HFCs, SF6) for our Japanese sites, including plants, research institutes, and offices. Energy use at production sites in particular is far greater compared to office sites, and energy conservation measures are being introduced, including installment of co-generation systems and cell production systems, as well as increasing production efficiency.



Cell production system contributes to energy conservation at Sankei Precision Products Co., Ltd.

■ Trends in direct emissions of greenhouse gases by domestic sites



Initiatives for CO2 Emissions Trading within the Group

We are considering intra-Group trading to accelerate CO2 emission reductions.

Konica Minolta is now planning to start intra-Group CO2 emissions trading. In fiscal 2003, we prepared for emissions trading using a "register" for accommodating non-monetary transfers. At present, costs for reducing one ton of CO2 emissions differ by a factor of five or more among the Group. By utilizing the trading system, we hope to achieve an accelerated rate of CO2 reduction by the Group as a whole in an economical way.

(in Hokkaido) is by rail and sea, while mid-distance transport, such as between Kanto and Sendai, Kanto and Nagoya and Kanto to Hiroshima, is mainly by rail. With a view to reducing transport costs as well as the distances traveled by truck, we are consolidating distribution centers, pooling shipments between distribution centers, and using the return trip from deliveries to recover end-of-life copiers and other products.

**Switching Boilers from Heavy Oil to Natural Gas**  
 The trial calculations of expected results in terms of costs and the environment were not easy, and neither were the price negotiations. However, after we made the shift, we succeeded in reducing CO2 emissions by 816 tons. We also reduced NOx emissions by 45% and SOx emissions by over 90%, and saved 75 hours of work that were formerly spent ordering and receiving heavy oil. In future I hope to work more actively in reducing environmental burdens, while taking measures to prevent losses from waste heat.  
 (Masami Nakamura, Quality and Environment Department, Konica Minolta Supplies Manufacturing Co., Ltd.)