

As one of the world's leading suppliers of automobile systems and components, DENSO is striving to reduce the impact of the car on the environment. With this in mind, we are implementing numerous initiatives that influence all stages of the life of the car, from manufacturing processes where DENSO is directly involved, through car use and end-of-life stages. In June 2000, we formulated DENSO EcoVision 2005. This Vision provides the foundation for environmental action plans initiated by DENSO and its consolidated subsidiaries and affiliates, and details concrete measures and targets related to environmental issues. The result—a comprehensive approach to environmental activities utilizing the resources of the entire DENSO Group. The following are just some of the steps we are taking in this area.

## ... CORPORATE INITIATIVE —TO BE A GOOD CITIZEN



» DENSO volunteers have started planting *kenaf*, a plant that can absorb more CO<sub>2</sub> than many other species.

## IMPROVING COMPONENT RECYCLABILITY

Based on DENSO's own product recyclability appraisal method, we are working to ensure that a higher proportion of the car can be recycled. We set ourselves a clear target: 95% of DENSO automobile components to be recyclable by fiscal 2005. These efforts are aimed at European Union regulations that stipulate an actual recycle rate for end-of-life cars of 95% by 2015. In fact we have already cleared the first hurdle, achieving a 96.9% recyclability rate for automobile components in the year under review. We are now focusing on maintaining this high recyclability rate and achieving more gains. Despite available technology that enables the recycling of some components, the high cost of this technology, the need to build infrastructure, and the degraded quality of recycled material, all mean that actual recycle rates have still not matched the recyclability of components. So at DENSO, we are now developing new recycling technologies and pushing ahead with reuse and remanufacturing businesses to improve the actual component recycle rate.

### DENSO AND DUPONT: DEVELOPING COMPOSITE RECYCLE TECHNOLOGY FOR RADIATOR END TANKS

Nylon-based radiator end tanks currently used in cars are recycled using a crushing process. Unfortunately, the process cannot recover material properties that have severely degraded during the life of the tanks. This limits the reuse of the crushed material. The inherent inefficiency in the process means the great majority of radiator end tank material is sent to landfills. In an attempt to rectify this, DENSO has joined hands with DuPont Engineering Polymers to enable the recycling

of nylon-based radiator end tanks using new technology. The new technology can recover degraded nylon material with minimal losses. DENSO has already succeeded in producing a radiator end tank made from reclaimed material, and it is currently undergoing evaluation in a test vehicle.

### DENSO'S CHEMICAL SUBSTANCE DATABASE

In order to control and reduce the use of environmentally harmful chemicals in its operations, DENSO has compiled a chemical substance database—the Material Chemical Assessment System (MACAS). The database, which became fully operational in April 2001, lists over 1,400 primary chemicals used to produce DENSO products and secondary chemicals such as cleaning agents employed in manufacturing processes. The MACAS database allows DENSO to keep a close watch on chemical usage and releases. The database is a vital tool in reducing the volume of environmentally harmful chemicals used in DENSO's operations.

### ECO-MANAGE—AN INDUSTRIAL WASTE AND RESOURCE MANAGEMENT SYSTEM

DENSO has developed and introduced a system to manage the volume of resources it uses and to verify the amount of waste reused in its operations. Using proprietary bar code scanning systems, DENSO can accurately measure and monitor the volume of waste and scrap materials generated at its facilities. This data helps DENSO to reduce waste volumes, cut back on waste management costs, and utilize resources more effectively. This system can be integrated with another DENSO-developed product—the advanced vehicle operation system (AVOS). AVOS uses GPS and a network of

communication satellites to track the location of vehicles. Fitted to waste disposal vehicles, AVOS allows DENSO to verify that all waste is disposed of appropriately and in accordance with relevant regulations by monitoring waste transportation routes and records. DENSO began sales of this system, sold as “Eco-Manage,” in December 2001.

### PROGRESS ON FLUOROCARBON RECOVERY AND DESTRUCTION

In anticipation of Japan's Fluorocarbon Recovery and Destruction Law that came into effect in April 2002, DENSO joined hands with Japan Automobile Manufacturers Association Inc. and the Japan Auto Parts Industries Association, to help build a recovery and destruction system for chlorofluorocarbon (CFC-12) substitute HFC-134a. The project includes putting in place necessary infrastructure. As part of the system, in May 2001, DENSO started transferring HFC-134a it recovers in one-liter canisters to larger containers. This increases efficiency at destruction facilities. DENSO has carried out similar operations for CFC-12 since 1998. In the year under review, around 31,000 canisters of CFC-12 and 4,000 canisters of HFC-134a were transferred at three facilities in Japan. Moreover, DENSO has put in place its own recovery and destruction system to ensure the safe disposal of refrigeration vehicle fluorocarbons, which are different to those used in car air-conditioning systems.