

Hitachi's Automotive Technologies for Environment, Safety, and Comfort



Hideyo Kodama

CTO

Hitachi Automotive Systems, Ltd.

THE environment is one of the key issues that the automotive industry currently faces. As the energy demand increases worldwide, global warming has become a major issue. Global warming is caused by a rise in the concentration of CO₂ in the atmosphere. Meanwhile, the data for CO₂ emissions from Japan in the FY (fiscal year) 2008 were published in November of this year. Although the total was 6.2% lower than 2007 due to the economic downturn in the latter half of the fiscal 2008, this still represents an increase of approximately 1.9% compared to 1990. The Japanese government has announced to the United Nations General Assembly its objective of cutting CO₂ emissions to 25% below the 1990 level by 2020. The EU and other major nations have also announced significant reductions. The transport sector made up approximately 19% of FY 2008 emissions and automobiles accounted for 90% or more of this. Accordingly, improving vehicle fuel consumption and thereby reducing exhaust gas emissions are major issues.

Aiming to solve them, Hitachi Automotive Systems, Ltd. has strengthened the actions described here. In the field of engines, taking account of the trend toward engine downsizing, we are developing technology to improve fuel consumption further employing integrated control of fuel injection systems and valve actuation systems to optimize combustion. For the hybrid vehicles that are anticipated to increase considerably in the future, Hitachi is working on improving the performance and efficiency and reducing the size of the electric motors, power inverters, and rechargeable lithium batteries. These devices together represent the core components of the vehicles. In addition, eyeing on the overall optimization of energy efficiency, development of integrated energy control technology is

intensified utilizing the energy flow analysis techniques that take engine as one of their subjects.

As for the safety, which is another critical issue for the automotive industry, in order to make our roads even safer, Hitachi is enhancing the performance of vehicle motion control technologies for driving, cornering, and stopping. Also, we are proceeding with the development of systems for avoiding danger by using information technologies and outside recognition technologies such as cameras, radar, and navigation systems to support the perception, judgment, and vehicle operation facets of the demands placed on the driver. It is expected that these technologies should contribute to reduce traffic accidents significantly by preventing vehicles from leaving the road, providing advance information about sections of road that are difficult to see, and safely controlling the vehicle speed.

Regarding security and convenience, Hitachi is also working on developments for greater comfort and convenience that take advantage of the rapidly expanding capacity and speed of communications. These include the supply of traffic information to get to the destination quickly and in comfort, the supply of information about the surrounding environment, improvements in the level of comfort inside the passenger compartment, and the use of traffic information to facilitate eco driving.

Hitachi is also developing technologies for materials, analysis, measurements and simulations, and other fields that could help solve the issues the automotive industry is facing.

As described above, Hitachi group companies are cooperating closely with each other to develop integrated control technologies that support both safety and the environment. This issue of Hitachi Review describes the latest of these technologies.