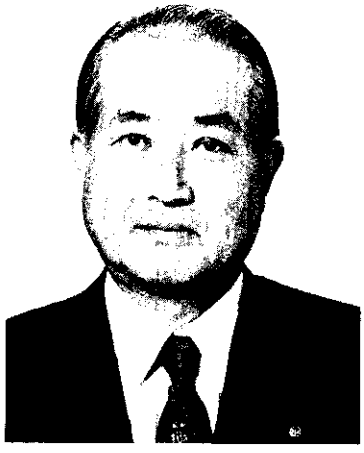
FOREWORD



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Today, as we begin the 21st century, the total world population exceeds 6 billion and is continuing to rise. At the start of the 18th century, the world population was approximately 500 million, but reached 1 billion around the beginning of the 19th century and 1.5 billion at the start of the 20th century. Although local problems were involved, the self-cleaning mechanism which preserves the global environment had functioned effectively until that time.

I first heard the word "kogai (pollution)" used as a legal concept in a university lecture on civil law at the beginning of the 1960s. I recall that this impressed me as a completely new idea. At the time, the world population had already exceeded 3 billion, and environmental problems were becoming manifest on a global scale, including mass consumption of chemical products and fossil fuels in the advanced industrial nations, as well as pollution, food shortages, and urban problems. "Because it has now become difficult to sustain the global environment with only the self-cleaning mechanism, a global response based on international political and economic problems is necessary to solve this problem."— This was the birth of what is now called the "global environmental problem."

In March 1972, the Club of Rome published "The Limits of Growth," which asked the world to recognize that the limits of the planet on which we live. With this report as a starting point, various international bodies, research organizations, and national governments began positive studies of global environmental problems. In 1987, a report called "Our Common Future" was issued by the Brundtland Commission (World Commission on the Environment and Development, sponsored by the United Nations). This was followed by the Rio Summit in 1992, and ultimately led to the Kyoto Protocol for the prevention of global warming in 1997.

At the same time, these international movements also prompted the adoption of stricter regulations in most countries. In Japan, the government included "responding to environmental problems" as one of its Millennium Projects and is promoting technical development aimed at preventing global warming and constructing a recycling society, together with establishing related laws. In the private sector, Japan's respective industries have created voluntary action plans and are strengthening their efforts to solve environmental problems in various ways.

Now, at the start of the 21st century, global environmental problems have reached a stage in which allows no further delay. The time demand that steel, as a basic industry, contribute to solving these problems.

The countermeasures which can be taken by the steel industry itself include further energy savings in the iron and steel manufacturing processes, reduction of the amount of by-products generated and higher recycling rates for by-products, and the use of waste plastic. However, in addition to these measures, the times also require the "development and wider application of high performance steel materials" which can contribute to energy saving and environmental countermeasures by customer industries that use steel.

This special issue introduces new products and technologies developed by Kawasaki Steel from

two environment-related perspectives. The first perspective covers steel materials which respond directly to environmental problems. Eight papers are presented as representative examples, including "Ferritic Stainless Steels and Pipes for Automotive Exhaust Systems to Meet Weight Reduction and Stricter Emission Requirements," "Properties of Chromate-Free Coated Electrogalvanized Steel Sheets for Electrical Appliances," and "Non-Oriented Electrical Steel Having Excellent Punchability for High-Efficiency Motors." The second perspective focuses on technologies which contribute to the construction of a recycling society. The three papers in this field include "Kawasaki Steel Thermoselect Waste Gasification and Melting Process" and "Advanced Heating Technologies Applying Regenerative Heat Exchange Systems for Energy Saving."

We hope that these papers will be useful in the activities of readers in a wide range of fields, beginning with steel customers who are actively working to overcome global environmental problems.