

Foreword

Improving Our Global Environment



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A handwritten signature in black ink, appearing to read 'Y. Mineno', written in a cursive style.

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Our Earth was created 4.6 billion years ago. The continents and oceans were formed as result of intense tectonic activity and climate changes during that long period of time. Life, which was first nurtured by the oceans and bathed in solar energy from the atmosphere, began in the form of algae. These algae produced oxygen, and over millions of years, created the Earth's atmosphere. As oxygen built up in the atmosphere, it formed a layer of ozone. This ozone layer effectively blocked much of the damaging solar ultraviolet rays from reaching the Earth, which led to life moving from the sea to land, and eventually the advent of human beings.

For thousands of years, we have enjoyed a convenient living environment on our precious blue planet. We have explored our planet in freedom, gained wisdom, created languages and developed technology. However, we must recognize the fact that since the industrial revolution 200 years ago, our technological advances have created a burden on our invaluable environment. The Earth Summit held in Brazil in 1992 was the first international conference to raise environmental issues and numerous resolutions were recorded in Agenda 21.

The most prominent characteristic of the Earth is the existence of water. Human beings cannot survive without fresh water. However, 97.5% of the water on Earth is ocean water, while fresh water only amounts to 2.5%. Of this fresh water, 68.7% is frozen as ice in glaciers or permanent snow, 30% is groundwater, and 0.86% is permafrost. Thus, there is actually very little fresh water that is available for human consumption: only 0.3% or

less of all the fresh water is accessible. After the Earth Summit, World Water Forums were regularly held and quantitative targets were set in the United Nations Millennium Declaration, such as "By the year 2015, the 1.2 billion people who cannot drink safe water will be halved to 600 million, and the 2.4 billion people who cannot use a hygienic toilet will be halved to 1.2 billion."

Another characteristic of the Earth is the existence of its atmosphere. It is the atmosphere that determines the surface temperature of the Earth. The ozone layer has become severely damaged by chlorofluorocarbons (CFCs). The CFCs with the largest ozone depletion potential have been specified, and their use either been banned or the duration of their use limited by the 1987 Montreal Protocol. Despite these precautions, by 2000, the ozone hole above the Antarctic Pole had grown to an area 70 times that of the Japanese mainland. Furthermore, a rapid rise in atmospheric temperature has been reported since the industrial revolution, and the level of carbon dioxide (CO₂), a 'greenhouse' gas, has increased from 280ppm to 370ppm. The Kyoto Protocol that prescribed a reduction of atmospheric greenhouse gas levels was adopted at the COP3 global warming prevention conference in Kyoto in 1997. The protocol was ratified by many countries and became effective on February 16th, 2005.

HORIBA Group, as a key manufacturer of measurement devices for establishing databases to ascertain the precise state of the environment, provides measurement devices for all three phases of matter: solid, liquid, and gas. We are collaborating with UNEP (UN Environmental Program), ILEC (International Lake Environmental Committee Foundation), the Ministry of the Environment and Kyoto University. Especially with ILEC, we have been developing a global standard compact multi-component measurement sensor that monitors water quality in lakes all over the world and then extensively distributes its data. For atmospheric environments, we supply devices for monitoring pollutants such as SO_x, NO_x, CO, HC and PM (Particulate Matter) from mobile emission sources such as automobiles or from fixed emission sources such as chimneys. Especially in the automobile industry, with its strict regulations for exhaust emissions, automobile manufacturers all over the world are using our devices to develop and study engines. We also supply the equipment required by continuous monitoring systems to correctly calculate pollution levels in the atmosphere. HORIBA's instruments play active roles in measuring the Earth's background at Ayasato (Iwate Pref.), Minami-torishima (Tokyo) and Yonaguni Island (Okinawa Pref.) by capturing data about greenhouse gases such as atmospheric CO₂ and CH₄ (methane) through the Meteorological Office supported by the WMO (World Meteorological Organization).

We must act now to restore the global environment and to preserve our blue planet for future generations. To realize this goal, we must correctly gather sufficient amounts of high quality data to form new databases that can accurately portray the state of our environment. HORIBA Group has taken on the responsibility, through the continuous supply of precise measurement devices, to work towards improving the global environment.