Blue
Planet
Prize

FOR IMMEDIATE RELEASE
June 23, 2004

2004 BLUE PLANET PRIZE: ANNOUNCEMENT OF PRIZE WINNERS

Dr. Susan Solomon (U.S.A.)
For pioneering work in identifying the mechanism that produces the Antarctic ozone hole and momentous contributions towards the protection of the ozone layer.

Dr. Gro Harlem Brundtland (Norway)
For putting forward globally the innovative concept of sustainable development, an idea that aims to balance environmental conservation with economic growth.

This year marks the 13th awarding of the Blue Planet Prize, the international environmental award sponsored by the Asahi Glass Foundation, chaired by Hiromichi Seya. Two Blue Planet Prizes are awarded to individuals or organizations each year that make outstanding achievements in scientific research and its application, and in so doing help to solve global environmental problems. The Board of Directors and Councillors selected the following recipients for this year.

1) Dr. Susan Solomon (U.S.A.)
Senior Scientist, Aeronomy Laboratory, National Oceanic and Atmospheric Administration

The stratospheric ozone depletion gained a high degree of international attention beginning in the 1970s, but the discovery of the Antarctic ozone hole in the mid 80s revealed a much larger and more immediate effect, suddenly thrusting ozone depletion into the global spotlight as a major environmental problem. Dr. Solomon was the leading scientist in identifying the mechanism that created the ozone hole. She and her colleagues put forth a new theory involving heterogeneous chemical reactions of chlorine compounds on surfaces, and she also led observations in Antarctica that succeeded in providing the first direct evidence of that chemistry. This research played a leading role in identifying the process by which the extremely low temperatures of Antarctica couple with increased atmospheric chlorine due to human use of chlorofluorocarbons (CFCs) to deplete ozone at unprecedented rates. Dr. Solomon's findings provided one of the scientific cornerstones for the amendments of the Montreal Protocol, leading to a ban on CFCs beginning in 1990, and contributed significantly to the protection of the global ozone layer.

2) Dr. Gro Harlem Brundtland (Norway)
Chairman WCED (World Commission of Environment and Development)
Former Prime Minister of Norway
Director-General Emeritus, WHO

Dr. Brundtland was appointed in 1984 by the United Nations Secretary General to chair the World Commission on Environment and Development, an organization charged with the task of developing a global plan for environmental conservation as the first Prime Minister to have previously fulfilled the post of an Environment Minister. After three years of energetic activities, holding meetings

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throughout the world, the Commission published its report, "Our Common Future," in 1987. Putting forward the concept of sustainable development as its primary theme, the report provided recommendations concerning the elimination of poverty and the realization of global responsibility, which became a driving force behind the Earth Summit in Rio de Janeiro in 1992. Further, as the Director-General of the World Health Organization, Dr. Brundtland has strived towards the implementation of the Framework Convention on Tobacco Control, as well as developing bold plans to respond to global infectious diseases thought to be caused by environmental changes including SARS and HIV.

Both recipients will be awarded a certificate of merit, a commemorative trophy and a supplementary award of 50 million yen.

The awards ceremony will be held on November 10, 2004 (Wednesday), at the Tokyo Kaikan (Chiyoda Ward, Tokyo). The commemorative lectures by the prize recipients will be held at the United Nations University (Shibuya Ward, Tokyo) the next day, on November 11 (Thursday).

* This press release may also be viewed on the Internet from June 30, 2004 at www.af-info.or.jp.

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Attachment

Remarks from the Award Recipients upon Notification of their Selection

Dr. Susan Solomon

"I am honored to receive this wonderful prize, and it is a great challenge to express my gratitude in a few short words.

I feel blessed to have done research that led to an explanation of the reason for the Antarctic ozone hole. That is the kind of thing that might happen once in a scientific lifetime, if you're very, very lucky.

On top of the fascinating and fun science, the physical grandeur of the polar regions and the splendid history of their exploration has also been a great gift in my life. In cold and desolate places, I've also been lucky enough to work with many wonderful colleagues and students. From that I have had the great fortune to learn that science is not a one-man or a one-woman game - it's a team endeavor of sometimes epic meaning, in which I've had the great good luck to work with some of the finest people I will ever know.

To now also receive this Prize for my small part in such work awes and humbles me, and I can only try my best to be worthy of what it represents. Thank you."

Dr. Gro Harlem Brundtland

"I am deeply grateful for the great honor to receive the 2004 Blue Planet Prize, presented by the Asahi Glass Foundation, Japan. Many of the previous winners are friends and colleagues I have worked with in the long process of pursuing a better world, one that is both environmentally and socially sustainable.

As a young doctor I became aware of the public health significance of a safe and secure environment, and how poverty, lack of knowledge and resources were barriers to change and improvement of the human condition. As a young politician my responsibility was the environment. The links between environment and development were evident, and I started out challenging my colleagues in all other ministries of government. New policies had to be put in place. Public debate and education was a crucial part of the process, not just in my own country, but globally.

The call from the Secretary General of the UN to chair an independent commission to address a number of key challenges to the world community, was a daunting task to take on. To recommend ways concern for the environment could be translated into greater cooperation among different groups of countries and lead to the achievement of common and mutually supportive objectives that take account of the interrelationships between people, resources, environment and development.

With the energy, support and enthusiasm of tens of thousands of scientists, NGO's, and politicians world wide, Our Common Future, launched in London in April 1987, became a rallying point of departure for sustainable development.

Ensuring that we can meet the needs of the present without compromising the ability of future generations to meet their own needs, is still a challenge to us all.

Protecting the planet, and promoting human security in the 21st century calls for greater levels of common responsibility and common action, a call that needs to be rooted in all countries and all cultures around the world."

Profiles of the 2004 Blue Planet Prize Recipients

Dr. Susan Solomon

The ozone hole over Antarctica attracted a high degree of interest among the global environmental issues in the late twentieth century due to concerns that stratospheric ozone layer depletion would increase the amount of harmful ultraviolet light on Earth. Prior to the discovery of the Antarctic ozone hole, theories suggested that the ozone layer might be depleted by a few percent in a century, but the issue was transformed by the dramatic discovery of much larger and more immediate depletion in the world's most remote place : Antarctica. Dr. Solomon was the leading scientist in identifying the mechanism that created the Antarctic ozone hole. She and her colleagues put forth a theory involving heterogeneous chemical reactions of chlorine on the surfaces of the particles found in very cold clouds in the Antarctic stratosphere. She then conducted observations in Antarctica over two expeditions in 1986 and 1987, and succeeded in providing key evidence for her theory. This research played a leading role in identifying the process by which the surfaces of clouds produced by the extremely low temperatures of Antarctica couple with increased atmospheric chlorine due to human use of chlorofluorocarbons (CFCs) to deplete ozone at unprecedented rates. Prior to the understanding of the ozone hole, the Montreal Protocol on Substances that Deplete the Ozone Layer required a freeze on production and consumption of ozone-destroying chemicals. Dr. Solomon's findings provided one of the scientific cornerstones for the amendments of the Montreal Protocol leading instead to a ban on CFCs beginning in 1990, and thus contributed significantly to the protection of the ozone layer.

In her senior year studying chemistry at the Illinois Institute of Technology, Dr. Solomon discovered atmospheric chemistry, and became particularly interested in the chemical processes that actually took place on the planet. She continued to study atmospheric chemistry at the University of California, Berkeley, where she received her doctoral degree in 1981. After her graduate work, she joined the National Oceanic and Atmospheric Administration, and she has continued her research on the atmosphere there ever since.

In the mid 1980s, it was revealed that a dramatic depletion of the ozone over Antarctica had been detected in the springtime from September to October beginning in the late 1970s. The ozone depletion was very extensive in both space (covering the entire Antarctic continent) and magnitude (up to about half of the ozone was depleted in comparison to pre-1970 levels). This stood in stark contrast to earlier studies based upon the gas-phase theory proposed by F. Sherwood Rowland and Mario Molina in 1974, which led to predictions that the human use of chlorofluorocarbons would deplete ozone by a few percent in a century, not by 50% in Antarctica and not within just a few decades. Dr. Solomon became deeply interested in these findings, and presented a theory hypothesizing the causes of depletion at a conference about global ozone issues in Boulder, Colorado in March 1986. Her theory attributed the cause of the ozone hole to a different type of chemistry, not gas-phase but surface heterogeneous chemical reactions on polar stratospheric clouds that are created by extremely low temperatures, of minus eighty degrees Celsius. These unusual clouds are unique to polar regions and especially abundant in Antarctica.

The Southern hemisphere has a smaller amount of surface landmass compared to the North, leading to a more isolated stratosphere. The flow of air in the southern hemisphere stratosphere in

winter can be thought of as a polar vortex, a stagnant whirlpool of air in the stratosphere above Antarctica. The polar vortex limits the entry of heat to its interior, allowing the temperature inside the vortex to fall below minus eighty degrees Celsius. These extremely cold temperatures result in the formation of polar stratospheric clouds, which are comprised of substances such as nitric acid and water vapor.

Dr. Solomon theorized that the reaction of hydrochloric acid and chlorine nitrate, which does not occur significantly in the gas phase, might take place extremely rapidly on the icy surfaces of the particles in the polar stratospheric clouds, thereby producing nitric acid and chlorine. She further hypothesized that as the sun first rose with the arrival of spring in Antarctica, the chlorine would dissociate through photolysis, producing reactive chlorine atoms and related molecules such as chlorine monoxide and chlorine dioxide. These reactive forms of chlorine destroy the ozone with dramatic efficiency. Dr. Solomon's theory is considered groundbreaking not only for identifying the mechanisms that produced the chlorine radicals directly related to ozone depletion, but also for explaining the high concentration of reactive chlorine compounds in the atmosphere.

However, skepticism towards whether the ozone hole was a real effect or due to poor measurements was widespread at the time, which made the need to both verify its existence and determine its cause paramount. At the youthful age of thirty, Dr. Solomon was chosen as the leader of the observational expedition and the team set out to Antarctica at the end of August 1986. The team measured the ozone depletion by several methods, and they also measured key chemicals that gave insight into the cause. The measurements of active chlorine revealed that there was approximately a hundred times more of the substance than could be explained through gas-phase chemistry. This finding was a definitive indication of the involvement of heterogeneous chemistry as put forth in Dr. Solomon's theory. The following year, she led a second expedition to Antarctica, a colder year in which the team found that the depletion of the ozone had worsened since the previous year. Through such observations, Dr. Solomon was able to elucidate why ozone depletion specifically occurred over Antarctica, taking the understanding beyond the gas-phase theories put forth by F. Sherwood Rowland and Mario Molina, and illustrating the key role of the very different heterogeneous mechanisms of ozone depletion. Her work has been highly acclaimed, and in honor of her accomplishments in Antarctica, a glacier and a saddle there were named after Dr. Solomon in 1994.

Immediately upon returning from Antarctica, Dr. Solomon led another expedition to the Arctic to study whether a similar but smaller ozone depletion could develop in its skies also caused by heterogeneous chemical reactions. Further, her studies also showed that ozone depletion can be accelerated through the presence of aerosol due to material thrown into the stratosphere by volcanic eruptions even in the mid-latitude regions including Japan, the United States, and Europe. This work played a major role in showing why not only polar but also global ozone depletion is enhanced by reactions on surfaces.

In recent years, Dr. Solomon and her coworker's studies have brought to light the effect that ozone depletion has on the climate of Antarctica. These findings showed that the reduction of ozone has resulted in a cooling of Antarctic surface temperature. Despite the rise in temperatures in other regions of the world brought about by global warming, the opposite effect is taking place in Antarctica, where it is linked to the dramatic cooling effect of the ozone hole.

Dr. Solomon continues her research today at the National Oceanic and Atmospheric Administration, and has authored two books as well as having written or co-written over 150 papers. In her most

recent book, *The Coldest March*, she wrote about the tragic expedition of a team led by British explorer Robert Falcon Scott, who succeeded in reaching the South Pole but perished on their return. Through extensive studies of the records from the expedition and more recent meteorological data, Dr. Solomon investigated the reasons for their demise and illustrated that their downfall was brought on by the rare misfortune of exceptionally frigid climate conditions. Further, she provided throughout the book a wonderful account of the individual explorers of the Scott team as they trekked through Antarctica, bringing to life their personalities, challenges, and legacies.

As a scientist, Dr. Solomon is deeply interested in making a contribution to society, and values the important role that science can play in areas such as environmental issues. Through the application of science, she continues to work towards protecting the society from the dangers that arise from ignorance by shedding light on the nature and reasons for environmental problems.

Biographical Summary

1956	Born January 19, in Chicago, Illinois
1977	Bachelor of Science degree in chemistry at the Illinois Institute of Technology
1981	Doctoral degree in chemistry from the University of California, Berkeley
1981	Research Chemist, the Aeronomy Laboratory of the National Oceanic and Atmospheric Administration (NOAA)
1985	Adjoint Professor, Department of Astrophysical, Planetary and Atmospheric Sciences, University of Colorado
1988	Program Leader, Middle Atmosphere Group of the Aeronomy Laboratory, NOAA
1990 to present	Senior Scientist, Aeronomy Laboratory, NOAA
1992 to present	Member, National Academy of Sciences
1995 to present	Foreign Associate, French Academy of Sciences

Awards

2000	American Meteorological Society Carl-Gustaf Rossby Research Medal
2000	National Medal of Science

Dr. Gro Harlem Brundtland

The concept of sustainable development has become a universally accepted foundation for countries around the world when they contend with environmental problems today. It was put forward with the leadership of Dr. Brundtland by the United Nations World Commission on Environment and Development, and was presented through its report in 1987, *Our Common Future*.

Dr. Brundtland recognized from an early stage the effect of the environment on economic development and public health. She has effectively engaged the general public, businesses, political leaders, and the media to successfully foster a framework through which people around the world strive together towards the achievement of a common objective. It can be said that her such contributions towards environmental preservation are immeasurable.

Dr. Brundtland was born in Oslo, Norway in April 1939, four months before the outbreak of World War II in Europe. Influenced by her father, a doctor who later became the Minister of Social Affairs and Health as well as the Minister of Defense, and her mother, both of whom were prominent members of the Labour Party, Dr. Brundtland became enrolled in the Progress Group, a Labour-inspired organization for children at the age of seven. Through such an upbringing she naturally cultivated a deep-seated sense of social justice, respect for human rights, political activism, and global awareness.

With aspirations to become a medical doctor from childhood, Dr. Brundtland studied medicine at the University of Oslo. In 1960 she married Arne Olav Brundtland, a member of the Conservative Party of Norway. After graduating from the university in 1963, she accompanied her husband to the United States who was accepted to be a visiting scholar at the Harvard Center for International Affairs, and she herself earned a Master's degree in Public Health from Harvard School of Public Health. In addition to concentrating in the study of prophylactic medicine for mothers and children, she became deeply interested in issues of poverty, population growth, food security and public health that were arising throughout the world. It was then that she developed a vision to take public health issues beyond the boundaries of traditional medicine and into the realm of the environment and economic development. Upon returning to Norway in 1965, Dr. Brundtland served at the Department of Hygiene in the National Directorate of Public Health and later at Oslo Municipal Board of Health, where she dedicated herself to protecting the health of children. Meanwhile, she continued her research activities in the field of child growth and development.

An unexpected change of career came in 1974 when Dr. Brundtland, at the age of 35, was offered the position of Minister of the Environment. Recognizing the close relationship between public health and the environment, she accepted the post and began to undertake environmental issues. In 1977, while she was in the midst of seeking to resolve various environmental problems including the development of a strategy to contend with acid rain and creating a national park, an uncontrolled blowout took place at the platform "Bravo" in the Ekofisk oil field. Rushing to the site, Dr. Brundtland personally directed recovery efforts and succeeded in halting the spillage at an early stage, and upon minimizing the environmental damage, actively made information available to domestic and foreign journalists. For both Norwegian citizens and government officials, the oil spillage became a turning point, from which environmental problems became an issue not only for conservationists but an agenda that was central to the formation of national political strategies, and it was recognized that investment towards the environment was a comprehensive investment towards the future of Norway. Dr. Brundtland's accomplishments as the Minister of the Environment were highly recognized, resulting in her becoming the leader of the Labour party and, in 1981 at the age of forty-one, she became the youngest and the first woman to become the Prime Minister of Norway.

In December 1983, the United Nations Secretary General requested Dr. Brundtland to establish and head the World Commission on Environment and Development. When Dr. Brundtland hesitated due to her extremely demanding post as the leader of the Labour Party, Secretary General de Cuellar insisted, telling her that she was the only candidate who had the experience of leading a country as its prime minister after coping with domestic and international environmental issues as minister of environment for years. By accepting the position, she decided to contend with the challenge of protecting the interests of the next generation, facing the future squarely in the eye.

Dr. Brundtland selected to the Commission influential politicians and academics from twenty-one countries around the world, including the former Japanese Foreign Affairs Minister Mr. Okita. More than half of the members for the Commission were chosen from developing countries. There, she demonstrated unparalleled enthusiasm and leadership abilities, a set of values founded in justice and equality, and an unyielding determination for change. For three years beginning in 1984, she held commissions and public hearings in numerous places around the world from Indonesia to Brazil, listening to the opinions of ordinary people. Her efforts culminated in the publication of the well-known report, *Our Common Future*, in 1987. This report presented sustainable development as its main theme, introducing the concept that development should meet the needs of today's generation without compromising those of future generations. The report further analyzed the structures of a wide variety of problems including population and human resources, food security, species and ecosystems, energy, industry, and the international economy, and provided recommendations of measures that countries around the world should immediately implement toward sustainable development. Sustainable development was a truly groundbreaking concept in that it proposed the simultaneous pursuit of environmental conservation and economic development while placing emphasis on social justice and the elimination of poverty that largely existed in the Southern hemisphere. The notion was also revolutionary in that it overcame the North-South opposition and in providing fundamental ideas for the whole society to promote a harmonious development.

The report became the impetus behind organizing the Earth Summit, or the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. At this Summit, Agenda 21, a resolution to implement specific measures to attain sustainable development, was adopted.

Dr. Brundtland's leadership in the areas of public health, environment, and development has been highly acclaimed throughout the world, and in 1998 she was elected to the position of Director-General of the World Health Organization (WHO), becoming the first woman to take the post. Upon assuming the office, she initiated an organizational reform of the WHO. She then continued to develop and implement strategies based on engaging political leaders around the world as well as businesses such as pharmaceutical corporations, successfully applying her approach of working towards a goal with the cooperation of numerous parties.

Her numerous accomplishments at the WHO include establishing a support system to enable citizens of impoverished countries to obtain medicine, advancing the eradication of polio at a global level, leading the efforts to curb tobacco consumption through the adoption of the Framework Convention on Tobacco Control, and creating bold new models to respond to global scale infectious diseases partly triggered by environmental changes such as SARS, malaria and HIV.

Dr. Brundtland, who is a mother of four children, credits her accomplishments to her upbringing and the dedicated support of her husband. Recently, she reflected upon her footsteps through an autobiography titled *Madame Prime Minister.*

Biographical Summary

1939	Born April 20, in Oslo, Norway
1963	Graduated the University of Oslo in Medicine
1964	Obtained a Maters Degree in public health at Harvard University
1965 – 1967	Medical Officer, Department of Hygiene in the National Directorate of Public Health

1968 – 1974	Oslo Municipal Board of Health,
	later becoming the Director of Health Services
1974 – 1979	Minister of Environment, Norway
1981	Prime Minister of Norway
	Leader of the Labour Party of Norway
1983 – 1987	Chairman, United Nations World Commission on Environment and Development
1986 – 1989	Prime Minister of Norway
1990 – 1996	Prime Minister of Norway
1998 – 2003	Director-General, World Health Organization

Awards

1988	Third World Prize
1989	Indira Ghandi Prize
1992	Earth Prize
	The Onassis Prize
1994	Karls Preis
2001	World Ecology Award
	Global Leadership Prize of UN Association of the USA.
2002	Four Freedoms Award

She holds a number of honorary degrees from major universities such as Harvard, Oxford, Louvain, Cape Town and from All India Institute and the Public Health Institute of Mexico

Report on the Selection Process (13th Annual Prize, 2004)

A total of 1,100 nominators from Japan and 1,400 nominators from other countries recommended 162 candidates. The fields represented by the candidates, in order of numbers, were ecosystem (45), environmental economics and policy making (35), climate and earth sciences (24), and restoration of environmental destruction (14).

The candidates were drawn from 38 countries, with those from developing countries numbering 26 persons, or 16% of the total.

These candidates were individually evaluated by each Selection Committee member, then the committee was convened to narrow down the field. These results were examined by the Presentation Committee, which forwarded its recommendations to the Board of Directors and Councillors. The Board formally resolved to award the Prize to **Dr. Susan Solomon**, and to **Dr. Gro Harlem Brundtland**.

The contents of this press release may also be viewed at the Asahi Glass Foundation's Internet web site. Please visit us on-line at:

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Message to the Japanese Public

Dr. Susan Solomon

I strongly believe that science is needed to ensure that humanity makes informed decisions about the environment.

This doesn't mean I am "calling for action." No, I am calling for knowledge to inform society about choices we face.

Environmental science best serves the planet when it is focused on historic standards and values of objectivity and balance, leaving politics and personal opinion to others.

I personally believe that our world today is in an era of terrible blackness in many ways. Good science on the environment is precious because it is one flickering candle that casts light forward in that darkness.

Dr. Gro Harlem Brundtland

Ensuring that we can meet the needs of the present without compromising the ability of future generations to meet their own needs, is a challenge to us all.

Protecting the planet, and promoting human security in the 21st century calls for greater levels of common responsibility and common action, a call that needs to be rooted in all countries and all cultures around the world.

Our future depends on informed and committed citizens, able and willing to support an agenda for positive change.

We live in a globalized world, one that is interdependent. We depend on each other to chart a common future, taking responsibility to overcome poverty and lack of opportunity in a world with great disparities. Japan and the Japanese people will play a crucial role in this transformation to a more peaceful, just and secure world.