

**2008 BLUE PLANET PRIZE:
ANNOUNCEMENT OF PRIZE WINNERS**

Dr. Claude Lorius (French Republic)

For his contribution in disclosing past climate change based on polar ice sheet core analysis and in discovering the relation between climate change during glacial and interglacial periods and atmospheric concentrations of carbon dioxide, indicating its current unprecedentedly high level and warning a consequent global warming

Professor José Goldemberg (Federative Republic of Brazil)

For making major contributions in formulating and implementing many policies associated with improvements on energy use and conservation, in devising a pioneering concept of “technological leapfrogging” for the developing countries for their sustainable development and in exhibiting strong leadership in preparation for the 1992 Rio Earth Summit.

This year marks the 17th 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. Claude Lorius (French Republic)
Director Emeritus of Research, CNRS
Member of the French Academy of Sciences

Dr. Lorius began his research on Antarctic glaciers and ice sheet from the mid-1950s and made a total of 22 polar expeditions mostly to Antarctica. Through those expeditions together with various teams of international experts, he drilled ice cores, analyzed them and disclosed the global climate change which took place in the last 400,000 years. Comprehensive studies on the ice cores allowed to obtain both past temperatures and composition of the atmosphere. Among those achievements, the relation he discovered between climate change during glacial and interglacial periods and atmospheric concentrations of carbon dioxide and methane through ice sheet cores drilled at Vostok station, the coldest place on earth, was exceptional. Based on these results, Dr. Lorius has indicated that current atmospheric concentration of carbon dioxide is unprecedentedly high and that this high level may possibly be due to human activity and warned of a consequent global warming of the planet.

2. Professor José Goldemberg (Federative Republic of Brazil)
Professor, Institute of Electrotechnics and Energy, University of São Paulo
Former Rector, University of São Paulo

Professor Goldemberg began making a thorough study on energy problems from the late 1960's, and in 1973 after the oil crisis he served a major role in the adoption of bio-ethanol program, thus had made major contributions in formulating and promoting energy policies in Brazil. In the 1980's he designed an energy strategy which contributed to global sustainable development in which he devised a pioneering concept of “technological leapfrogging” for the developing countries where they could develop through strategies by introducing innovative technologies and with this concept he made a significant contribution in promoting renewable energy for a sustainable development. In 1992 as the Environment Minister of Brazil, he was active in preparing for the Rio Earth Summit and afterwards he exhibited strong leadership on environmental issues including energy, global warming, ethics, policies and deforestation, not only in Brazil domestically but also internationally including United Nations and other organizations, and in particular, he contributed in the implementation of many policies associated with improvements on energy use and conservation.

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 12, 2008 (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 13 (Thursday).

*This press release may also be viewed on the Internet from June 19, 2008 at www.af-info.or.jp.

Report on the Selection Process (17th Annual Prize, 2008)

A total of 850 nominators from Japan and 1,200 nominators from other countries recommended 104 candidates. The fields represented by the candidates, in order of number, were ecology (32), environmental economics and policy making (22), Compound area (22) and atmospheric and earth sciences (20).

The candidates represented 26 countries; 14 persons, 13 percent of the total, were from developing countries.

After individual evaluation of the 104 candidates by each Selection Committee member, the committee was convened to narrow down the field. The results of their deliberation 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. Claude Lorius** and **Professor José Goldemberg**.

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Profile of the 2008 Blue Planet Prize Recipient

Dr. Claude Lorius (France)

Dr. Lorius began his research on Antarctic glaciers and ice sheets from the mid-1950s and made a total of 22 polar expeditions mostly to Antarctica. Through those expeditions he led teams to drill ice cores and analyze them, and disclosed the global climate change which took place in the last 420,000 years from ice cores drilled at the Russian Vostok station. Comprehensive analyses on the ice cores allowed reconstructing temperature of the air when the ice was formed through measurement of the oxygen and hydrogen isotopes. Furthermore, for the first time, the composition of past atmosphere was obtained by analyzing the bubbles of air trapped inside the ice. From measurements of the amount of trapped air, it was also possible to determine elevation changes of the ice sheet surface. Among those achievements, the relation discovered between climate change during glacial and interglacial periods and atmospheric concentrations of carbon dioxide and methane was exceptional. Based on such analyses, Dr. Lorius and colleagues have indicated that current atmospheric concentration of carbon dioxide is unprecedentedly high and that this high level is likely to be due to human activity and warned of a consequent global warming.

Dr. Lorius was born in Besancon, France on February 27, 1932. He received his bachelor's degree in physics in 1953 and earned his doctorate degree from the Sorbonne University in 1962.

Began Research on Antarctic ice from mid-1950s

Dr. Lorius began his research career where he later accomplished many outstanding achievements by applying to an ad posted on the walls of the University of Besancon in 1955 which read "Needed: young researchers to join scientific expeditions organized in conjunction with the International Geophysical Year." Two years later in 1957, as a fresh initiate in the emerging science of glaciology, he spent the winter at Charcot Station, a small base camp perched in Antarctica at 2,400 meters elevation. He was responsible for the program on heat balance of ice sheet and measured the accumulation, temperature, altitude and thickness of the ice, which are essential data for modeling the flow of ice sheet. He returned to Antarctica in 1959, joining the U.S. Victoria Land Traverse exploration and came up with an idea of obtaining the temperature of the air from the measurement of the oxygen and hydrogen isotopes of 'solid water' ice. Furthering the idea provided means of characterizing the successive seasonal layers of ice and an ice flow tracer, which enabled him to reconstitute past climate change and dating.

Idea of analyzing the air bubbles trapped inside the ice sheet core came up during the 1965 expedition

Afterwards, while leading the 1965 wintering over team to the coastal base at Adelie Land, drilling ice sheet core, making casual observation of ice cubes melt in a glass of whisky and seeing the air bubbles trapped in the ice burst, Dr. Lorius came up with an idea of analyzing them. He thought that they would hold vital information of the composition of the air. It was proved over the years that those air bubbles were reliable and unique indicators of past atmosphere composition.

After 1968, the information obtained from analyzing the ice sheets disclosed not only the climate but also information on the atmospheric environment. The small research team Dr. Lorius organized joined CNRS's Laboratory of Glaciology at Grenoble in 1971 to become Laboratory of Glaciology and Geophysics of the Environment (LGGE).

Dr. Lorius proposed original ideas such as that to use crystal size in the field as an indicator of past climate change and to estimate the altitude the ice was formed by measuring the volume of trapped gas. Level of expertise were further raised in his team with the identification of impurities in the ice such as lead and radioactivity which were indicators of a global atmospheric pollution.

Excavated ice sheet core from a depth of 900 meters at Dome C (Concorde)

—Broadened understanding of the end of the last ice age—

Although the techniques for dating and interpreting the ice sheet archives were finalized and ice core drilling equipment capable of drilling to a depth of 1,000 meters was ready, there remained the issue of available field support. This was made possible within the International Antarctic Glaciological Programme which included, researchers and logistics specialists from the U.S., Great Britain, Australia, France and the former U.S.S.R. Since 1974 with the US air support, began the hard work lasting several years at the Dome Concorde, a high plateau located in central Antarctica, and in 1978 succeeded in drilling to a depth of 900 meters. By analyzing the ice sheet core, it was revealed that the bottom ice was to be about 35,000 years old, that the end of the last ice age was about 20,000 years ago and that the subsequent warm period has now lasted for 10,000 years. An astonishing result was that the levels of greenhouse gases (carbon dioxide and methane) 20,000 years ago were markedly lower than those recorded during the warm period. In order to make this finding firm, it was necessary to go further back in time, and get core samples from the previous warm interglacial period that took place some 100,000 years ago.

Joint research on the Vostok core revealed the climate for the past 150,000 years

In order to further conduct an analysis, there was a need to obtain older ice samples, and fortunately at the most remote and coldest station on earth Vostok, which had acquired mythical status among polar specialists, another series of samples existed. Although a core 2,200 meters deep was drilled by Russian Antarctic expeditions there was a need for appropriate analysis equipments. Lucky for Dr. Lorius and his two companions, with the support from the Arctic and Antarctic Institute of Leningrad, the Geographic Institute of Moscow, and the National Science Foundation (U.S.), they were able to set foot on Vostok station in the midst of cold war in 1984. Information obtained from the ice core were more than expected and for the first time a series of results undisturbed by any ice flow for over 150,000 years included all the last climatic cycle which took place in the quaternary era.

Once back in France, Dr. Lorius gathered a squad of specialists and conducted a thorough study on the treasured samples (2,000 samples taken from 3 tonnes of ice cores) he brought back. As a result, various facts became clear. It was disclosed that a long ice age occurred between the current interglacial period and the interglacial that existed about 120,000 years ago. This record was of global significance as indicated by the close link with the variations in sea level obtained from marine sediments data. The close correlation between atmospheric concentration of methane and carbon dioxide and climatic change during glacial and interglacial periods became a hot topic and the results were introduced in the editorial and other articles in *Nature* in 1987, also decorating the cover of the journal.

With this success, it became possible to earn support from France for the Greenland Ice Core Project (GRIP) organized by several European countries. Through three expeditions to Summit in Greenland, the drilling reached to the bedrock at the depth of 3038m in July 1992. The drilling point location chosen was adequate and the GRIP team was able to obtain a continuous

data set outside Antarctica covering a period rather similar to that obtained at Vostok station but not including the previous interglacial. The results obtained by the GRIP project in Greenland proved that there were sudden major climate change in the last glacial period and during the deglaciation following it, and it was stressed that there was a complex and unstable relationship among ice, ocean and the atmosphere.

Contributed in Fulfilling and Supporting Promising Research Projects in High Latitudes as President of French Institute of Polar Research and Technology

In 1989, Dr. Lorius was requested to reorganize polar research and established the French Institute of Polar Research and Technology (IFRTP) becoming the first president in 1992. In 1993 the drilling at Vostok station in Antarctica reached the depth of 2755m covering a period of 250,000 years which corresponds to two cycles of glacial-interglacial climate change.

While continuing his own research activities, Dr. Lorius put efforts in planning Antarctic ice sheet deep drilling program at the international level. For this ambitious plan, participation of ten countries from Europe were necessary. The objective was to confirm from another site data on climate and greenhouse gases obtained from the Vostok record, extend the time scale over several climate cycles and identify the issue of major climate instability such as that occurred during deglaciation. The EPICA (European Project for Ice Coring in Antarctica) project entered the execution phase at the end of 1996 supported by EU with funding from nations and through European Science Foundation. The site of drilling was close to the new wintering over station Concordia located at the place- Dome C- Dr. Lorius' team explored 20 years ago. EPICA project successfully provided in 2004 the longest ice paleorecord covering the past 800,000 years.

Warned Current Unprecedentedly High Greenhouse Gas Concentration Level Directly Connected to Human Activity .

In 1998 the joint team of Russia-France-USA reached at Vostok the depth of 3623m and obtained a continuous ice sheet record for the past 420,000 years. Dr. Lorius recognized that there were four long cold and relatively shorter warm periods, namely glacial and interglacial periods, along this time scale and disclosed that during those periods atmospheric concentration of carbon dioxide fluctuated between minimum 200ppm (parts per million) and maximum 300ppm; during the last deglaciation carbon dioxide concentration increased by 40% and methane gas level doubled. Current atmospheric concentration of carbon dioxide has now reached almost 390 ppm and is increasing further. The current level has far exceeded the natural fluctuation range for the past 420,000 years, showing the impact of human activity. Dr. Lorius describes that the results obtained from the research on past glacial records gives credit to those arguments that the earth will continue to warm up through the 21st century and might potentially cause a disastrous effect on water supply, agriculture, health, biodiversity and human living conditions in general. One could understand the importance of the argument when it became known that the temperature and the sea level were a little higher than now during the previous interglacial 130,000 years ago.

Dr. Lorius has made a total of 22 summer and winter expeditions to the polar ice sheets in Greenland and particularly in Antarctica, which represents more than six years spent in the Polar Regions. He has published over 100 articles in professional journals, among which Nature and Science, and authored several books on Antarctica, his experience there and on its research. As operations in Antarctica, ice core analysis and interpretation require a lot of people's cooperation and participation, various achievements accomplished could be said to be those of

the group he led, but without Dr. Lorius' highly prominent perspective, tenacity and organizational skill in forming international teams as a researcher, such research results could not be achieved so early.

Dr. Lorius has been motivated by an undying longing for the upper latitudes, the appeal of diverse polar explorations and his fondness for that icy realm, home to the snowy petrel and the emperor penguin. Greater awareness of the risk human become to face acquired "through his study of ice cores", which were "vast subjects" requiring scientific learning has prompted Dr. Lorius to respond to media requests. He has stated that although alarm *raised was heard in case of the ozone layer depletion* and some improvement had been noted, for the issue on climate only statements of intention had been heard so far. We have to maintain the pressure to ensure new technologies is developed and human attitudes continue to evolve, though that's easier said than done. From ice core studies Dr Lorius believes we now entered in a new era, the "anthropocene", in which humans control the environment of our planet which is now a major and urgent international challenge.

Biographical Summary

1932	Born in Besancon, France
1955	Researcher, Antarctic Committee, National Center for Scientific Research
1957-1958	Participated in the IGY Antarctic Expedition
1961	Researcher CNRS
1962	Earned doctorate degree from the Sorbonne University
1979-1983	Associate Director, Laboratory of Glaciology and Geophysics of the Environment (LGGE)
1983-1988	Director LGGE
1984-1986	Chairman, French Polar Expeditions
1986-1990	Chairman, Scientific Committee on Antarctic Research (ICSU)
1992-1998	President, French Institute on Polar Research and Technology
1993-1995	Chairman of EPICA Project
1987-1994	Corresponding member, French Academy of Sciences
1994-	Member, French Academy of Sciences
1998-	Director Emeritus of Research CNRS

Awards

1989	Humboldt Prize
1989	Belgica Medal
1994	Italgas Prize
1996	Tyler Prize for Environmental Achievement
1997	Seligman Crystal (<u>International Glaciological Society</u>)
2001	Balzan Prize for climatology
2002	The CNRS Medaille d'Or
2004	Petit Larousse illustré
2006	EGU Vladimir Ivanovich Vernadsky Medal
2008	SCAR medal

Professor José Goldemberg (Brazil)

Prof. Goldemberg being a nuclear physicist participated fully in the discussion of nuclear energy in the late 1960's when Brazil decided to introduce nuclear power in the energy matrix of the country, which led him to make a thorough study on energy problems, and in 1973 immediately after the oil crisis he promoted the production of bio-ethanol, thus making major contributions in formulating and promoting energy policies in Brazil. In the 1980's he designed an energy strategy which contributed to global sustainable development in which he devised a pioneering concept of "technological leapfrogging" for the developing countries where they could develop through strategies by introducing innovative technologies, and with this concept he made a significant contribution in promoting renewable energy for a sustainable development. In 1992 as the Environment Minister of Brazil, he was active in preparing for the Rio Earth Summit and afterwards he exhibited strong leadership on environmental issues including energy, global warming, ethics, policies and deforestation, not only in Brazil domestically but also internationally including United Nations and other organizations, and in particular, he contributed in the implementation of many policies associated with improvements on energy use and conservation.

Nuclear Physicist turned Energy Analyst

Prof. Goldemberg was born on May 27, 1928 in Brazil. He started his scientific activities in 1950 as a researcher in nuclear physics at the University of São Paulo (USP) and in 1951 and 1952 made two extended research visits at the universities of Saskatchewan (Canada) and Illinois (USA). After obtaining his PhD in 1954 at the USP, in the 60's he spent two years as research associate in the High Energy Physics Laboratory of the Stanford University. There he studied the scattering of electrons by nuclear magnetism, a technique that permitted the measurement of the static magnetic moment of nuclei, and also the giant resonance induced by the electrons. He then returned to Brazil and continued an active research in the field of nuclear research at USP.

The Brazilian government decided to introduce nuclear energy in the late 60's. Later, this nuclear energy plan was described as a response to the Oil Crisis in 1973 and to balance the Brazilian foreign trade. Prof. Goldemberg was fully involved in the nuclear debate and this led him to a thorough study of energy problems, in order to better understand the possible alternatives for Brazil and the world in general. During the period, he extended his visit to the Center for Energy and Environmental Studies at Princeton University, which completed his transition from a pure nuclear physicist to an energy analyst, thus become to get involved in energy policies.

Prof. Goldemberg realized that while improvements in the efficiency of energy use would be essential in order for the industrialized countries to reduce dependence on fossil fuel, for developing countries where energy demand itself was high, he proposed that the increased demand should preferably come from renewable energy sources such as biomass, an approach substantially different from the paradigms existing at that time. As a consequence, he developed the "leapfrog strategy", by which a developing country could incorporate the available most efficient and modern technologies, but also at the same time introducing innovative ones, leapfrogging over some of the historic steps toward industrialization.

Vision on Sustainable Energy to the Earth Summit

In the 80's, together with R. H. Williams of the United States, A. K. N. Reddy of India and T. B. Johansson of Sweden who were all physicist turned energy analyst, Prof. Goldemberg wrote a remarkable book: "Energy for a Sustainable World", proposing a new vision on energy issues different from the past. In the conventional approach, it was assumed that total energy use and Gross Domestic Product (as the measure of growth) were correlated and thus the level of energy use became an indicator of human welfare, the higher the better. Consequently, the central task of energy planning was to expand energy supply to satisfy the demand and bring about a sustainable energy system. Prof. Goldemberg et al, in this book, described the importance of a normative approach to energy planning by incorporating from the start, broad societal goals aimed at facilitating the achievement of, not merely a sustainable energy system, but what is more crucial, a *sustainable world*. This approach involved economic growth as a necessary but not a sufficient condition. It defined that at the most fundamental level the level of goals of society should be equity, economic efficiency, environmental harmony, long-term viability, self-reliance, and peace. Energy production and use should be compatible with these societal goals and in order to achieve that, adopted an "end-use methodology" for the energy problem, and instead, inputs of energy were regarded only as means to the end of providing a wide range of energy services like lighting and cooking. He appealed that the world would become more equitable, economically viable and environmentally sound by adopting the energy strategy. With the book he showed an image of the future in which it was possible to build an energy future for the year 2020 where renewables play an important role and the total world energy consumption and emission of greenhouse gases would possibly be controlled. He expressed what was essential for this future was the adoption by the developing countries, early in the process of their development, of efficient end-use technologies like the ones used in the industrialized countries. Such vision exhibited by the book was incorporated in the UN Brundtland report, that led to the UNCED-92 Conference of Rio de Janeiro, and his vision, innovative ideas and influence were recognized worldwide.

Renewable Energy — Bioethanol Production from Sugarcane

In regards to renewable energy, Prof. Goldemberg had a major role for the adoption of the Alcohol Program in Brazil after the Oil Crisis in 1973, in which large amounts of ethanol were produced from sugarcane to replace gasoline. Brazil owes a lot to his accomplishments in becoming a world renowned bio-alcohol utilizing country. He also had an important influence to persuade the Brazilian government in the use of natural gas, in addition to oil, in the energy matrix. In 1982, he became the president of the Energy Company of the State of São Paulo, and was responsible for the generation and management of some 10,000MW of hydroelectric power, and at the same time introduced ideas about energy conservation that were a novelty in Brazil then.

From Making Contribution in Raising Scientific Levels to Active Participation in National and International Affairs

From 1986 to 1990, Prof. Goldemberg served as Rector of the University of São Paulo, the largest of Brazil and perhaps the most respected of the southern hemisphere and directed his effort in raising the scientific level and performance of the university. During the period, he was chosen, as a scientist, in the work of the Intergovernmental Panel of Climate Change (IPCC). Also during his term, he established two academic units with great importance in issues such as energy, environment, development and public policies, which were the Institute of Advanced Studies and the Institute for Electrotechnics and Energy. The former carries out studies linked to

public policies and environmental problems, and the latter conducts applied research on energy utilities as well as work on renewable energy sources.

In the early 1990's, Prof. Goldemberg was chosen by the President as secretary of state for science and technology, and later as interim secretary of the environment. In that capacity he was responsible for the local organization of the UNCED-92 conference and took a very active role in its preparatory process and the Climate Convention adopted in Rio-92, showing leadership at the Earth Summit.

Supporting Energy Problems in Developing Countries

Although dealing with important responsibilities related with the public administration, Prof. Goldemberg was never distant from scientific concern, as demonstrated by his very numerous books and other publications in scientific journals. In 1993 he spent a semester at Princeton University teaching the interrelations of energy, environment and development and later wrote an important book on the subject. And with the support of the Rockefeller Foundation, the Dutch government, and other foundations, together with R. H. Williams *et al.* who jointly wrote the book "Energy for a Sustainable World", established the International Energy Initiative (IEI), a southern-conceived, southern-led, and southern-located south-north organization. IEI has a mandate in the developing countries to disseminate a perspective on energy in which the level of energy services is taken as the measure of development, and initiate and strengthen technological capability in energy analysis, planning, and implementation. IEI also conducted the publication of *Energy for Sustainable Development*, a journal devoted to energy in developing countries, a graduated course taught at the USP for energy analysis from all over Latin America, and seminars in several countries in Asia, influencing activities on energy in developing countries.

Prof. Goldemberg has written numerous papers and articles, and he has been very productive in the publication in the field of energy. Among them, especially important, is a book printed in 2000, edited by him as the Chair of the meeting sponsored by the World Energy Council and the United Nations titled "*World Energy Assessment-Energy and the Challenge of Sustainability*". From 2002 to 2006, he served as secretary of state for the Environment of the State of São Paulo and put into practice many of his ideas on sustainability, preservation and wise use of the environment.

Prof. Goldemberg pioneered the "technological leapfrogging" concept and approach to Southern development, and by providing courageous leadership established a nuclear-free zone in the Southern Cone of Latin America and provided many contributions analyzing and promoting the role of renewable energy in sustainable development. He also led the Rio Earth Summit in 1992 and introduced the ideas that led to the Clean Development Mechanism (CDM) in Kyoto.

The biggest environmental threat the world faces today is global climate change. Meeting this challenge will require not only new energy strategies and policies but also the full involvement of major developing countries and abundant North-South cooperation. Prof. Goldemberg has recognized the importance of climate-friendly energy strategies and furthered securing cooperation of major developing countries such as Brazil and China, contributing in forging the type of North-South partnerships. He has a worldwide reputation for innovation and committed leadership, and his active contribution will continued to be seen in the future.

Biographical Summary

1928 Born in Santo Angelo, Brazil
1950 Graduated University of São Paulo
1954 Earned PhD in Physical Sciences from University of São Paulo
1955-1967 Associate Professor University of São Paulo
1967- Professor of Physics University of São Paulo
1970-1978 Director of the Institute of Physics University of São Paulo
1983-1986 President of the Energy Company of the State of São Paulo
1986-1990 Rector of University of São Paulo
1990-1991 Secretary of State of Science and Technology, Brazil
1991-1992 Minister of State of Education, Brazil
1992 Acting Secretary of State of Environment, Brazil
1995-2000 Chairman of the Board, International Energy Initiative
2002-2006 Secretary of State for the Environment of the State of São Paulo

Awards

1991 85 Mitchell Prize for Sustainable Development
2000 Volvo Environmental Prize

Remarks from the Award Recipients upon Notification of their Selection

Dr. Claude Lorius

It is time for me to have a look at my career as a “polar ice researcher” and this is not so simple.

A long list of scientific papers is of course a benchmark value but researchers, like all the human beings, have a tendency to be lenient toward the estimation of their own work.

This prestigious award allows me to put forward another criterion: the wise men’s eyes that have made for sixteen years the reputation of the "Blue Planet Prize".

When looking at the prize-winners who have been selected for the past years, I have always found the board’s choices very judicious because honouring people who worked hard to keep our Planet Earth environment alive, a topic which is a great challenge for the humans’ future.

I certainly did not expect to join them one day. This award gives me the serenity of a well done job and a fresh impetus to continue on my way.

Finally, I would like to add one more word to mask my emotion: Thank you to all of you, dear ladies and sirs and to all the ones who have been by my side along the way.

Professor José Goldemberg

I’m honored to accept the Blue Planet Prize 2008 because of its nature, created to “reward the efforts to contribute to the humankind’s pool of scientific knowledge as well as the conservation of the global environment and a harmonious coexistence of people and nature”.

As a physical scientist, my work has focused on the causes of environmental degradation and the technologies which can be used to reduce their impact, without jeopardizing the economic growth of developing countries. In doing so I came across the concept of “technological leapfrogging” which means the adoption – early in the process of development –of modern and non-polluting technologies avoiding thus retracing the polluting trajectory followed in the past by today’s industrialized countries.

In addition to producing scientific knowledge, publishing articles and books, I participated actively in the public debates and in Government of Brazil proposing and implementing policies and actions leading to a sustainable development which was often not easy and required great determination. I’m very thankful towards the distinguished selection panel for having recognized my contributions.

Message to the Japanese public

Dr. Claude Lorius

It was while deciphering the Antarctic ice archives that I realized that we only have one Earth welcoming human beings who have learnt to adapt to the slow natural changes of their environment.

With the Anthropocene we have entered, for the last two centuries, a new age in which mankind is dominating the future of its planet.

This is how emissions of greenhouse gases are responsible for the current global warming, its impacts and also very imminent disasters.

Time is running out for this great challenge that only an international governance of citizens, states and economists could take up.

Professor José Goldemberg

My philosophy on global environment conservation originates from the fact that a good part of today's environmental problems, at all levels – local, regional and global – are the result of the use of fossil fuels, which supply approximately 80% of all the energy used in the world. The result is an energy system which is not sustainable. What's essential for a long lasting development is the adoption of modern, energy saving and renewable technologies, particularly for developing countries which adopt them early in their development process.