

## **Stanford Kyoto Trans-Asia Dialogue on “Energy, Environment, and Economic Growth in Asia”**

September 11, 2009 17:00 – 18:30

Kyoto International Community House Event Hall

### **<<Moderator>>**

- **Dr. Masahiko Aoki** (Henri and Tomoye Takahashi Professor Emeritus at Stanford University, USA)

### **<<Panelists>>**

- **Ambassador Michael Armacost** (Former U.S. Ambassador to the Philippines and Japan, USA)
- **Dr. Xue Lan** (Dean, School of Public Policy & Management, Tsinghua University, China)
- **Ms. Melissa Guzy** (Group Leader, VantagePoint Venture Partners, USA)
- **Dr. Prodipto Ghosh** (Former Indian Climate Change Treaty Negotiator, and Distinguished Fellow, The Energy and Resources Institute, India)
- **Ms. Ton Nu Thi Ninh** (Former Vietnamese Ambassador to the European Union and President, Tri Viet University Project., Vietnam)

### **<<Comments by>>**

- **Dr. Jim Sweeney** (Director, Precourt Center for Energy Efficiency, Stanford University, USA)
- **Dr. Makio Miyagawa** (Deputy Director General for Global Issues, Ministry of Foreign Affairs, Japan)
- **Ambassador Hyun Cho** (Ambassador, Ministry of Foreign Affairs and Trade, The Republic of Korea)
- **Dr. Jiang Kejung** (Energy Research Institute, National Development and Reform Commission, China )

**Aoki:** I am acting as a chair today, thank you very much, my name is Aoki. Thank you very much for coming to this symposium in spite of your busy schedule today. As just was introduced this meeting is sponsored by Stanford University and Kyoto City as you'd already know. Prime Minister-elect Hatoyama has received a Ph.D. in Engineering in Stanford University. And in August, under Obama Administration, we have the new ambassador; Ambassador John Roos is also the graduate from the undergraduate course as well as the school of Law of Stanford University. Those two representative figures are alumni members of Stanford University. We hope that we will be able to have the deep involvement of the communication between the two countries, so that we will be able to solve all the issues related to the global matters. And, between Stanford University and Kyoto, we do have the long standing relationship in the past 20 years already. Stanford University does have a lot of networking, we do have campus in many places around the world. For one or two years, students are seconded to study in the various campuses around the globe. It was 20 years ago when the Japanese economy was very prosperous and picking up, Stanford University has decided to create the campus here in Kyoto with the cooperation of the Kyoto City. At that time, we have received a lot of sponsorship and assistance, one hundred million yen was funded from Kyoto City. I believe that's per capita 200 yen donation and contribution from the Kyoto citizens. In the past 20 years, from Stanford University, approximately 500 students studied here. And Japan Center located here does have the networking with Harvard and Yale. And those school have also sent students as many as 700 to Kyoto Japan Research Institutes (KCJS). Based on such a good and deep relationship Japan and United States, we hope that we will be able to deepen and have a better and closer relationship. And using a part of the funds from Kyoto City, Stanford University, at this time, not limiting our sources to Japan, but from Korea and China and south-east Asia, and India including south Asian countries, we have decided to have the dialogues on the common global issues and we wanted to create the forum so that we would be able to have the gathering of such expertise. And it was the first meeting. As the first meeting, we have selected the theme which is the global issue, environmental issue, the energy issue for our discussion purposes. As you know the Kyoto Protocol was established and founded in this very place. And this international protocol was discussed and accorded in this very place. And in the coming month this year in Copenhagen, the next COP meeting is going to be held. In the past two days, yesterday and today, from the different countries, the experts got together here to discuss this very serious issue. Ambassador Hyun Cho from ROK

and Ambassador Makio Miyagawa have also attended in the meeting. And we did have a very good, fruitful discussion today and yesterday. Of course it was not possible to invite everybody here on this podium on the platform, but we have selected the experts among the participants today for this purpose. So I will give you 5-10 minutes to each panelist on this podium. It will be followed by a free discussion and questions and answers. As for the introduction of each speaker and panel, when I ask each person to take the floor, I will just introduce the title and the name.

First of all, Distinguished Fellow, Ambassador Michel Armacost, you are going to be a first batter. 19 years ago exactly, on the very place I was acting as the chair and I have asked Ambassador Armacost to take the floor at that time. That was the inauguration of this Stanford Japan Center with the presence of our crown prince. At that time Ambassador Armacost has given us the greetings as the ambassador. But as the member of the panel, I would like to once again ask Ambassador Armacost to take the floor which gives me great privilege. Now Ambassador Armacost, you have the floor, please.

**Armacost:** It's lovely to be back in Kyoto, the city that is closely associated to the effort to deal effectively with the consequences of high energy use. And it's lovely to be a part of this dialogue which has brought together people from all corners of Asia and they represent the views of different cultures and interests of different countries. But I'd like call to approach to this energy and environmental issues never practical end, and not as the member of their own countries but as citizens of the regions and world. I want to make a very brief comment about an American Perspective on energy and environment. And I would start with proposition that we have unusually well and dull by nature with lots of energy; we have oil, we have gas, we have hydro, we have coal, we have a lot of nuclear plants. But we have noticed in recent years the constraints on our position in the world, as an example we are the largest energy consumers in the world and yet 2/3 of the new demands for energy coming now from developing countries and emerging markets particularly China and India. Our demand has been growing by leaps and bounds for decades. But our supply has been steadily declining. So, as we used to import 25% of our oil 35 years ago, now we are approaching 60%. And the trajectory of the gas import is a very similar one. Last year we got nearly 50% of our oil imports from virtually neighboring countries; Canada, Mexico, Venezuela, as little further away. But inescapably those supplies are running down. And we are having a lot of supplies further away in areas like Africa, Southeast Asia, and the Caspian Basin. Some of those new sources are marked by

corruption there, plague by civil strifes, so the uncertainty is somewhat greater. We have good relations with many, but don't take Americans would look at any of them as quite as reliable supplier as Canadian or Mexican neighbors. We have to recognize that however the new production comes on line and from where and for the next few decades we'd all be dependent on the Middle East. They have lined and shared the global oil reserves, that's inescapable. And the unfortunately the geopolitics of the region has become a lot more strained because of wars in Iraq and Afghanistan, the tension that exists between Iran and us, Iran and European, not to mention Iran and Israel. And our situation has become a lot more complicated too for the decades. We busied ourselves in Middle East mainly promoting stability, helping without US Forces to preserve the local balance of forces, maintaining an access reliable we hope to oil energy supplies in the region and serving as a broker between Israel and its neighbors. More recently we got much more involved in the region with large numbers of military forces. The turbulence of the region has increased and returned to be held accountable for whatever goes wrong in our world, a lot more difficult situation from our stand point. The alternatives to oil, gas are of course coal and nuclear. Coal, we have a lot of coal, but it increases our carbon footprint in a way that concerns a lot of Americans. We have more nuclear plants than any country in the world, 104 I think, now. But we haven't started any nuclear plant since 1979 when the Three Mile Island Incident occurred. The climate for that is changing, but it does not change overnight. And we have the risks of nuclear proliferation to worry about. Carbon management has become a high preoccupation in the United States, as a central feature of our debate. I am not sure the scale and the cost of that are very well understood, but I do know it's going to throw the cost of energy up, and it is going to force us probably happily to constrain our demand a hassle on fuel. We are very attracted to the alternative-fuels; like wind, solar and biomass, there are lot of work going on. But I think thoughtful people in America understand perfectly well that it will occupy even in a successful case a trivial portion of our energy that we use on the daily bases. That leads us a limitation with which we have to live up with, it reminds Americans of when politicians talk about the energy, the independence is not at all being realistic. We know that like every other country, more approximate realistic objective is the energy security, which forces us to figure out ways to conserve on energy, to increase the undeclared domestic supplies that forces our dependence to our external suppliers, to improve efficiency with which we use energy, to work on alternatives however far in future those would represent a portion of our supply, and to improve the

ways in which we can coordinate with others to deal with emergencies or disruptions of supply. So we are becoming more a normal country I suppose in these respects on energy related issues. Now we do have a new administration. I think the very eloquent President who is very clear in expressing his objectives in the variety of foreign policy issues. He has pushed energy and global climate change up on the American priority. He has made clear that we will approach these issues with multi-lateral spirits and in concert with the friends around the world. And we are reminded particularly by this dialogue that in many respects we share a very powerful interest with our Asian friends. After all most Asian countries import large portion of their fuel. And while we know that as the energy demand goes up the competition with other importers will intensify. We also know that the most of issues I just mentioned, we share important opportunities for cooperation with our Asian friends. We know it is more true in the issue of efficient use of energy, where Japan provides a wonderful model of what can be done in a relatively short time if you put your mind to it. So in that respect and in many others, we know that there are opportunities to work with our Asian friends. And I think the dialogue over the last two days suggested the most ways in which we can do some. It's great pleasure to be with you today.

**Aoki:** Thank you very much. Now that we listen to the representative from China, an energy consuming and a big CO2 emitting country just like the United States. We would like to hear from the panel. China has not ratified the Kyoto Protocol, so we would like to know that the posture of China, how they are going to deal with the climate change. So the Chinese perspective, should be mentioned by the representative Dr. Xue Lan. Prof. Xue Lan is from a well known University in China, Tsinghua University. He is the Dean of the School of Public Policy & Management. In the School of Public Policy & Management, Tsinghua University, they do have the funds from Toyota for the development of the industries and environment management. CIDEG is the program launched there among the Chinese University and private sectors in China. This is indeed the first environmental research institute in China. I am sure that there must be a lot of fruits he can illustrate. Prof. Xue Lan would you like to take the floor please.

**Xue:** Thank you Prof. Aoki. It is a great pleasure to be invited to this dialogue at Kyoto, a beautiful place and the birth place of the Kyoto Protocol. First of all I have to make sure that I am not actually an expert of the issue of the climate change, I am more of a policy analyst. So my alternation on this issue is from more of a public policy angle. I would like to focus on two issues. One is what the

China's position has been, and what has been debated in China.

China's overall position in the climate change issue has quite consistent with other developing countries. China assigned the Kyoto Protocol, and China has been actively participating in all international negotiations on climate change, and also has been engaged in variety of discussions, such as with the US and so on. And domestically China is also doing a great deal in terms of reducing CO<sub>2</sub> emissions and improving energy efficiencies. One example is that in the 11<sup>th</sup> 5year plan which started in the year of 2005, China committed to reduce 20% of energy intensity in 5 years, and also to reduce the environmental pollutions by 20%. It looks like that commitment will continue in the upcoming 12<sup>th</sup> 5year plan which will start in the year of 2011. In other area, China has been doing a great deal of investment in alternative energies and clean technologies. Chinas has recently made a major investment in wind and solar technology, also a major ambitious plan in nuclear technology. Those are the some of the things that has been going on in China. But at the same time in terms of further progress and further commitment in activities in climate change, there is need to clarify some of the issues which are also being actively debated in China. There are scholars and some people who are advocating for more committed positions from China on climate change. They say that as a major country in the world, China should take more responsibilities given its recent economic development. For example, my colleague, Prof. Angang Hu, who is also a well known policy analyst, has been proposing that there should be a linkage between climate change reduction with Human Development Indicators. On that scores China has recently made a tremendous progress so therefore China should make more commitments. On the other side there are also people who have different views. They are basically arguing China is still a developing country with some major challenges and problems. There are some issues outlined by the people who are in this position. For example, China still has a great population increase every year and that itself increases the demand for the energy use. Also China's energy supply is very heavily dependent on coal. In China's current energy consumption, 70% is coal. That itself is very CO<sub>2</sub> intensive. And also this China's current development stage is where it is making a great investment in the infrastructure; in building roads, housing and so on, which is also quite energy intensive and CO<sub>2</sub> intensive.

The other issue is China's industrial structure. China's industrial structure is quite heavy compared to that of other countries. Close of 50% of China's GDP is from manufacturing, and its great deal is

from the heavy industries. And another point is that China is a large exporter. The 20 - 30% of the manufacturing output of the heavy industries will be exported to other countries, to many developing countries. Those are the debates currently going on in China and ultimately will influence on our policy.

I think this Stanford Kyoto Trans-Asian Dialogue organized here is very useful for us to understand better and also to inform the public about this issue, and hopefully that will improve the understanding and therefore the policy positions.

**Aoki:** Next, I would like to call upon Dr. Prodipto Ghosh of India. Dr. Ghosh is Distinguished Fellow, at the Energy and Resources Institute of India. And in India, he is an expert of energy and environment. He is a member of the advisory committee to the Prime Minister. At the time of the Kyoto Protocol, he was one of the delegation members of the Indian Delegation. India, as you know, is developing rapidly together with China, has a big population as well. Therefore, the question is what sort of policy China and India would be taking in the future. This would have a big impact and implication on the global climate change. So we are very happy to have Dr. Ghosh participate in this meeting.

**Ghosh:** Thank you Prof. Aoki, and let me express my grand gratitude to the Stanford Kyoto Dialogue for inviting me to participate in this wonderful event. Of course as Prof. Aoki has mentioned, this is not my first visit to Kyoto, I was here in Kyoto well past midnight when the Kyoto Protocol was agreed. I am glad to be back in the city once, once again, so this is my third visit to Kyoto.

Now, the point is when we discuss the climate change, we often tend to neglect history. But we are in Asia, how can we as Asians forget our history? Let me start at the appropriate point about the long standing historical and cultural ties between Japan and India. 2000 years ago, the message of Buddha, which is not simply a religious message, it's a message which goes to the heart of how to live and how to live sustainably. There are many passages of the Buddhism to the quest for the sustainable life style and livelihood. Of course Buddhism has grown and flourished in Japan. It has not died in India; it has simply got absorbed in the broad canvas of Hindu practices. But in India there exists many centers of Buddhist learning, and we are always happy to welcome scholars from Japan. We also have many Japanese visitors coming to visit the sites associated with Buddha.

Now, in the most of two millennia since then, the Asian empires; China, India and Japan, they were among the largest and most powerful and wealthiest in the world. It's not just something you see in

the western history books, but it is of course an accomplished fact. Now, to take the story of Japan and India relations further, we value very much the Japanese support for India's freedom struggle. This happened during the Second World War when the both countries were undergoing the dramatic experiences. But in India we still value very much the Japanese support to the important Indian freedom movement. Now as I said for these two millennia, Asia was really the economic, cultural center of the world. However in the mid-18century, there are many debates among the historical scholars, Asian came under various degrees of western dominance; India became under a full dominance of British, China came under less severe dominance but still a certain amount of influence over its policies. Japan had a traumatic experience of western diplomacy. The level of development we see in Asia can be traced to these traumatic experiences of the 18<sup>th</sup> and 19<sup>th</sup> centuries. In the case of Japan, it responded to this western influence by deciding as the ignition that they must acquire the science, diplomacy, industrial power, education and infrastructure of the western civilization. In the case of India and China, the industrialization process was not allowed to happen. We became passive markets for the western world. Which is why what we see when India came to independence in 1947 through the traumatic experiences of the country, we had just 5% of the population who had electricity. Our life expectancy at that time was less than 40 years. Our literacy rate was less than 25%. Every few years we would have a famine in the land, we had a large number of the dead from epidemic diseases. India has made tremendous efforts at the situation, and we have improved in many dimensions. But at this point in time, India's developing challenges are still extremely formidable. Over 80% of our population, more than 800 million people, which is more than the population of that of America and Europe combined, live on less than 2 dollars a day; less than 200 yen a day. 24% of our people, which is about the population of the United States, live on less than 1 dollar a day; less than 100 yen a day. 480 million people still live without electricity. 70% of our people still use our traditional biomass for their energy needs. These developing challenges are huge. All we ask for is that we must be given the necessity, the environment and space to be able to bring our people to an acceptable level of human well-being. But in doing so, as I said we shared the same cultural traditions, we shared the same tradition of frugality and sustainability. For example, Japan is well known for its high recycling rates of household waste. And India also, in every household in India, rich or poor, they recycle almost everything. Most Indians are vegetarians. They are extremely frugal in their use of electricity, water and so on. India is

extremely conscious of the challenges and vulnerability to climate change. India has traditionally been tormented by cyclones and other kinds of natural disasters, floods, droughts, epidemic diseases. And our agriculture is still at gamble on monsoon rains. Our food security depends critically on monsoon rains. We are only too conscious of the fact that climate change can wreak havoc on our developing prospects. We take climate change very seriously.

If we look at India's domestic actions, which have defect of addressing the climate change. On the question of our actions to climate change, we spend 2.6% of our GDP on various actions to address to the climate change. To put this in a perspective, this is more than our annual defense expenditure. With respect to the energy sector, for more than 30 years, we have an exclusive ministry to promote the recyclable energy diplomacies. In terms of solar, wind, biomass, we are among the top handful countries, maybe the 4<sup>th</sup> in the world, in the respect of use of these energies. But let me put it the other way also, that fully 25% of our total energy comes from our traditional biomass. But we need to use the sources simply. In terms of energy pricing, according to the data of IEA, India has the highest energy prices whether of electricity or gasoline as a percentage of the per capita income of any country in the world. The relative price of energy is important, but energy is on the whole very seriously taxed. Fully 30% of the revenue of the federal government comes from energy taxes. Of course there are some energy subsidiaries. These include the budget for farmer use and village, household kerosene for lighting. But those are very small. Energy prices in India, including those in the industrial sector, are among the highest in the world. Our gasoline prices are among the highest in the world. In our developing efforts, there has also been a strong focus on the services sector as opposed to the heavy industries. What we find is that the growth of the services sector which is less energy intensive than the heavy industrial sector, has grown much more rapidly than the other sector of the economy. In terms of its economic structure, India's proportion of the services sector, more than 50%, it resembles more of a developed country than a developing one. All these show up in the obligate data on the energy use.

In terms of per capita GH G. emissions, India's emissions are just about 1.2 tons of CO<sub>2</sub> per capita. This is about 1/20 of US, and less than 1/10 of Japan. Maybe this reflects our poverty. But nevertheless the energies are used very responsibly. The energy intensity of our GDP, how much energy is used to produce 1 dollar of GDP, has drastically come down. The turning point was in 1980's, when our per capita GDP was just 600 dollars. It is now at about 1.5 kilograms of fuel

equivalent per a dollar of GDP. This blesses us better than the most OECD countries, in fact at the same level of Japan. All this has not happened by accident. It has happened because we are conscious of the need of frugality and sustainability, and to assure energy security. It has a major impact on our mitigation efforts.

Now, let us look at UN Framework Convention on Climate Change, again the current negotiation are not happening without history alone. The Framework Convention was agreed in Rio in 1992. It set a very clear principle; the principle of “common but differentiated responsibilities” among developed and developing countries. This principle carried over into the Kyoto Protocol and Bali Action Plan, under which one branch of negotiations are starting to be focused on the second commitment period of Kyoto Protocol. Under the Bali Action Plan, the actions of the developing countries are being considered. What the Bali Action Plan says is that it respects to the developing countries. They are to undertake nationally appropriate mitigation actions, supported by neighbored technology, finance and capacity building. And they are brought to accountable in terms of monitoring, reporting and verification. We have engaged in the negotiations under the UN Framework Convention on Climate Change and the Bali Action Plan. The Bali Action Plan says very clearly that it is meant for the full and comprehensive implementation of the UN Framework Convention with full understanding of its principles and provisions. Our ideas have been fully consistent with the provisions of the Bali Action Plan and the UN Framework Convention on Climate Change. Our perception of why the negotiation has grown so difficult is because we see some countries are seeking to go beyond the balance of responsibilities and entitlements which are given in the structure of the Bali Action Plan and the UN Framework Convention on Climate Change. What we have been asked to do is to sacrifice our development by undertaking the mitigation actions. Using current technologies, without the necessary provision of finance and technology transfer, will have defect of reducing our growth rate, our over deprivation efforts, and keeping our people in poverty for another generation more. It is something we find very problematic. We are seeking to address along with the rest of the nations of the world, a comprehensive, lasting and serious arrangement which is fair to all concerns to this climate change. We hope that if we can operate in the structure, we can find a solution. But it seems to me that there are a number of dark clouds over the negotiations. Before I end, I would like to say that we would like to see a cartwheel principle which is implicit in the UN Framework Convention on Climate Change, being established

in the arrangements under the Bali Action Plan, that all human beings have equal right to the global environmental space. We cannot have an imminent distinction between the first class and the second class existence of the world. Our permanent division of the world between rich and poor, rich man in his castle and poor man at the gate, such a solution would not be acceptable. But within the format of the Bali Action Plan and the UN Framework Convention on Climate Change, we are prepared to look at all proposals and suggestions from our negotiating partners. I am happy to be speaking in this dialogue, and I am grateful for the opportunity to be here. Thank you very much.

**Aoki:** Thank you very much. We listened to the comments by China and India which are two giants in Asia from the different perspectives. We entertained the various important points and comments.

And of course there are a lot of different countries in Asia, represented by Vietnam for example, how do they think about the global warming cost? I believe Vietnam is one of the countries which will be very much impacted. So we would like to entertain the comments of the representative from Vietnam, I believe this lady, Mme. Ninh, Ambassador Ninh, is the most appropriate person to hear the comment. This was the first meeting to get an acquaintance with Mme. Ninh. I was very much impressed by reading her CV. She studies in Sorbonne and Cambridge in the midst of the Vietnam War. It was in 1972 that she went back to Vietnam and joined in the National Liberalization Front. Through her efforts and contribution, after some time she was sent to the various places including EU as a diplomat and ambassador. She is quite active as the representative of NGO. And also she is currently the president of the Tri Viet International University Project, and is trying to create the university now. So we would like to hear her and Vietnamese perspective on how they look at environmental issues today. Madame, you have the floor, please.

**Ninh:** Thank you Prof. Aoki. I don't think we have a better venue than Kyoto to hold the first Stanford Kyoto Trans-Asia Dialogue devoted to energy, environment and the economic growth of Asia. I am grateful for this opportunity to say a few words about the special problematic and dilemma that is opposed to Vietnam by the need to develop, to grow, but also to be sustainable and responsible in the community of nations which Vietnam at long last joined again after the end of the war back in 1975.

You need to remember the starting point of Vietnam after those long decades of war. Over the past two decades Vietnam has switched to being a fast developing market economy country with the accompanying fast developing consumer society. It has brought along environmental problems and

dilemmas. One of which is, for example, as we welcome growing volumes of FDI, we know that companies that come through that channel do not always maintain the same kind of environmental standard when they are brought as when they are at home. So the Vietnamese government, as many developing country government, is hesitating between taking a very strict stands and the risk of carrying away the investors who then might go to a less demanding or strict country. But it has also to take care of its country's environment. That's the problem.

Another dilemma is the Vietnamese youth. Vietnam is a very young nation, 60% of Vietnamese people are under 30. After the decades of deprivation, they start enjoying the fruits of consumer society and sometimes do so in un-bright fashion. This poses the problem of what kind of life style we need to inculcate to the population as a whole, or more particularly young population. As a late comer to the world community and world integration, I must say that Vietnamese government is committed to being a responsible global citizen. And it has ratified and signed the Kyoto Protocol right from 1997 and 5 years later t has passed the environmental law and conducted the coastal zone vulnerability assessment studies and so forth. As you may remember, Vietnam has a lot at stake in adapting and preparing to climate change. It is considered one of 8 most vulnerable countries to sea level rise. If the sea level water rises by 1 meter, the experts estimate that 40, 000 square meters of coastal area will be submerged. And Vietnam's GDP will be cut down by 10%. In other words, it's no joke, it's very real to the Vietnamese government. But it should also be made very real to the population for the strategies and policies to work. So there is a growing awareness promotion movement going on in Vietnam, which young people overall support. Recently, in May I remember, many young people supported the WWF movement for the Earth Hour event. In Vietnam we need to reconcile again the dilemma or problems; first of all the modernity and the development and the right retention of the values of our culture, among which Buddhism, which was mentioned by Dr. Ghosh, with our culture of frugality and thrift and responsibility to your offspring, the same spirit as the Brundtland definition of the sustainability. It is very consonant to the Buddhist culture in Vietnam. Therefore I think the particular emphasis has to be put on education. My last words will be to say that for Vietnam we see this as a common endeavor, a common responsibility, and Vietnam will certainly work hand in hand with any developed or developing countries. We emphasize with the kind of historical rational of Dr. Ghosh. We do understand, in fact we would agree on most of what Dr. Ghosh said. On the other hand we believe we need to move on and we need to act. We

need to act in concert. And I believe Vietnam should act very much with Japan. Japan is a country with whom Vietnam has a lot cultural affinities, and has very developed FDI or ODA. And in Japan also, there is a lot of interests in developing educational exchanges. You might be surprised to know in Kyoto there are more than 100 Vietnamese PhD students. Several of them were encouraged to go to Japan in the so-called “run-zu-hwa(?)” eastward movement of such a number of Vietnamese professors, who think that it’s alright to go to the US and UK, but we also need to look east, that was back in the 1930’s also. This is the renewal of the old eastward movement. And I think with Japan we may learn, cooperate, exchange and share on many things, but more particularly on an environmental protection and on a sustainable development. We hope that among the students who are here, several of them will choose the environmental science and management and climate change adaptation. I would like to thank the organizers for this opportunity to engage the Kyoto citizens in this session. Thank you.

**Aoki:** Thank you very much for the excellent presentations by each member of the panel. As you see this problem of the environment and energy is very complicated and diverse. There’s a questions of geopolitics, and how to save energy, then how to allocate the emission rights across the countries, and then again there is a problem on distribution and property rights in global commons. So this could of course be a political problem but also an issue of fairness and so forth. It has to be discussed and agreed. And also as the last two speakers spoke very eloquently on questions of human behaviors and value system and so forth, those matters are important and very complicated. One issue which is not yet presented is that possibility of the development of the new technologies. Of course, given the technology we have to consider how to save the energy usage, how to allocate the existing energy and so forth. Technology is an important aspect of this problem. So I would like to invite my colleague at Stanford University, Professor Jim Sweeney. He is a specialist on energy problem in the US. And if you could particularly talk a little bit about how US is trying to deal with this problem with a development of new technologies, like a so-called the smart-grid and so forth. It may be interesting to the audience.

**Sweeney:** Let me move up this way, so I am not talking to the back of many people’s heads. First, let me say thank you to Professor Aoki, one of my colleagues at Stanford, for asking me up.

I think the first time I was in Kyoto was about 1978, many many years ago. Some of you might not even be born at that point of time. It remains to be such a beautiful and graceful city.

The technology in the US, through our subject, I won't try to cover the broad range of things other than the specifics of the smart grid, because it's getting a lot of attention in the United States.

You can think of two elements of the smart grid. One, I call it as "upstream element". This is the high voltage transmission lines that bring the electricity from the places where it's generated to the localities where it's going to be used. And that involves a lot of information technology. Very low electricity lines will have much lower losses than the ones we currently have, and much more controllable ones using the information technology that allows us to better integrate the enormous sensible system. I don't want to talk about much about that right now, because it's the second part that I think is coming immediately that will be important not just for the United States, but I believe for Japan and the rest of Asia. I call it "downstream part" of the smart grid.

At this moment throughout the northern California, we are installing so-called "smart meters". These are technologies quite available right now, that instead of allowing us just to see how much electricity was used over the course of the month, they read the use of electricity instantaneously. One was just installed at my home actually two weeks ago, so I can look, in front of my house, I go out there and open the box and I can read the exactly the rate at which I am using the electricity. Why is it significant? Well, most people in this room, and most people in the United States, really don't know the relationship between the actions they take and the use of electricity; you turn on the television or turn it off, you don't get the immediate feed-back or signal about the consequences of that for your use of electricity. If you leave your computer on or turn it off, or you turn up the air conditioning or turn down the air conditioning, do you know the consequences? Generally you don't have the information feedback. The smart grid downstream element, once you have these meters that reads instantaneously, it's not much of a tricked integrated home area networks into the walls. That was happening in northern California. Once you have the home area network, then you can have dashboards of information devices that will allow you to understand instantaneous use of electricity. Then you can have this ambiguation software that allows you to sort out the instantaneous use of electricity, sort out how much the television is using, and your lights are using, your computer is using, and your refrigerator. That allows you to get the instant feedback to make decisions about the use. Anybody who has driven a Prius, notices the little meter on the Prius, that shows you the fuel consumption, notices that's the powerful motivative for competing with yourself for reducing your use of fuel. That's happening right now, and it's an interesting challenge that this

is going to allow people have feedback instantly to their electricity use. And developing that well be combination of technology, software and human behavior, human's deciding on what way they want to respond.

So, from the intellectual point of view, it's so wonderful opportunity to look at the systems, the technology, the human behavioral response, and integrate them together. Now let me stop because that was fairly longer than I was invited to speak. Thank you.

**Aoki:** Thank you very much. So that was a new dimension that was added to this dialogue here for your reference and for your interests. Another note of technology is that last year I attended a conference on environment in Europe, and Thomas Schelling, who is a Nobel Memorial Prize winner of a game theory, talked about the emission straightening and how China and India should be brought in to allocate these rights of emission. He also said regarding a certain outcome 10 or 15 years ahead, it would probably be rather difficult to enforce such an agreement with such uncertainties.

We tend to be pessimistic sometimes or we may become optimistic at times, but I think it is for certain that the international cooperation and negotiation do present difficulties and conflicts. But technology, I think, allows us to promote international cooperation. As was mentioned in the earlier meeting, in Indonesia, when there was a volcano eruption, there was a cooling down of the air, because the sulfur was emitted to the atmosphere so the radiation was emitted leading to cooling. Therefore a certain amount of sulfur could be emitted to the atmosphere at the level that is not harmful to fend off this sort of radiation, which is called Geo-Engineering technology, was talked about. Geo-Engineering of course is also an important space technology as well, and I believe these are some of the new ideas which could call for new types of international cooperation based on new technologies. This is an issue that calls for cooperation and often threatens by conflicts. Therefore the point is how to deal with such a big and important topic in a successful way.

Now I'd like to open the floor for discussion with the participants. Please restrict your question to one, and please be brief with your question. We would like to make a brief response, so that we can entertain as many questions as possible from the audience. Those of you who have a question, please raise your hand.

**Questioner:** Thank you very much. I joined somewhat late so perhaps I have not heard everything. But regarding to the CO<sub>2</sub> emission rights, do you think the emission trading would be a savior for the global environment? I would like to have some elaboration on the specific idea. Will the emission

trading system be a savior for the global environment?

**Ghosh:** Well, the emissions trading is the way of accomplishing a certain over-all level of emission reductions at the least possible cost globally. But in order to undertake this trading, you need in the first place the allocation of the property rights. And that goes to the question of what the emission rights of across the companies or countries are, whoever needs to introduce the emission trading. The answer is of course “Yes” if you have managed to solve the problem of allocations of emission rights, then the next stage is that we must set the emission trading regime to accomplish this over all structure at the least possible cost.

**Aoki:** Here is Ambassador Cho Hyun from Korea, who is a specialist in the negotiations. I think you are going to negotiate in the Copenhagen Conference. Would you like to make some comment of that?

**Cho:** Thank you. Let me just add one point regarding to the emission trading. Yes, it is a great scheme, but it will not reduce the emission dramatically. So we have to make another scheme to reduce the over-all emission of CO<sub>2</sub>. And on a separate track, we can make the trading, so that our economy can run under the limited amount of emission. Thank you.

**Questioner:** My name is Yoshida, one of the Kyoto citizens. I have question to US and China representatives. In coming December at COP meeting in Copenhagen, an agreement has to be made as to how the post Kyoto Protocol can be dealt. But because of different conflicts of the different countries, we are not quite sure whether we are able to reach the agreement in the coming COP. Is it really possible to reach the agreement? In such circumstances, the US and China counts for 40% of emission of the world. Those are two representatives of developed and developing countries. I believe, to be successful in the Copenhagen meeting, the agreement between the two nations is the must and critical. Is it possible to reach the agreement? The personal comments are also welcomed.

**Armacost:** I must say “I don’t know”. Unfortunately I don’t represent our government anymore, I live 3,000 miles away in California. We have come back to the negotiation as far as I am aware, we haven’t tabled the position. I think the problem here basically is political. The Chinese, if I understand their position, have often regarded the emissions caps be the potential limit to their future growth. I think that’s the view shared in India. And the US it’s difficult politically to justify or explain, rationalize the cost of the emissions cap, if the countries now that are contributing the large emissions are not covered. So that’s the kind of gap we’ve had whether or not we can find the position that reconciles those two different views, and that enables both governments to explain and

agree with their respective publics. Generally the protocol is going to be a genuine challenge. So I am not sure what the Obama administration is going to come up with. I do not think they are kind of over loaded at the moment, because they have inherited the recession. They put forward the gigantic stimulus bill which is increasing our debtness enormously. They are wrestling with the reform of the medical care in the US. There are differences in views how much it is going to cost, but you can extend the coverage to 40+ million additional people, the bill would be pretty high. And there are uncertain costs of scheme on climate change. There are so many uncertainties. I don't know how the administration is going to sort this out in a way this manageable politically. I hope they will. But I have flown a little far and am not following every new right now.

**Xue:** First of all, I am not the negotiator. I don't know what the situation around the negotiation table. I am just offering my personal view. I think from my observation and what I see, further unlikely in Copenhagen there would be some specific commitment to be produced like what happened in Kyoto. But at the same time, I am hoping that maybe they negotiate and reach some agreement on some general principles, framework, actions, commitments, or whatever which can be produced based on that. For example, as mentioned, China is indeed major emitter of CO<sub>2</sub>, greenhouse gases. But at the same time China could argue that China has the largest population in the world, and China is at the developing stage as outlined. Probably at this time that indeed we generate more gasses, in fact maybe many of the Chinese products are actually exported to other countries, which actually consume a lot of energy. So I think the key is to have a general framework. One framework I think that might be useful to think about is so-called the Green Development Rights. It's a framework basically viewing the emission of the CO<sub>2</sub> as a fundamental right for the development. So if we follow that, then there's a way to calculate the historical burdens of different countries, then what should be allocated to them. And then, based on that, we should have more historical responsibilities. Then those countries can share the financial resources and technologies. I think that's the way to move forward, one of the alternatives that we should consider.

**Aoki:** At the Copenhagen meeting we will also have Mr. Miyagawa who would be attending as the negotiator representing Japanese delegations. So now I would like to call upon Mr. Miyagawa for some words on this matter.

**Miyagawa:** Thank you very much. I think this is a big interest for all of you. Perhaps I should mention something that is very basic. Let me talk about the one thing we are facing as a big difficulty. The

negotiation only allows us three more months to think about. We are making a progress, but there is still a gap between the positions of the different parties. Let me talk about the position of the Japanese government. We have the term “energy, environment and the economic development” as the title on the stage, from 1960’s to 1970’s Japan has given great efforts in developing its economy, and we faced the big issue of pollution and environment. We have made a great effort to take up the challenge and to bring about the solutions. We are facing the issue of the greenhouse gases nowadays. The difficulty with the greenhouse gases is that the gasses do not have the national boundaries. Therefore there are many emitters. They may give efforts to try to reduce the emissions but there could be free-riders as well who do not make efforts. When there is pollution in the air and water, the nearby countries close to the pollution source may wish to take actions to respond these pollutions. But atmosphere is rather difficult to visualize, so to speak, and the emitters may not notice what is happening in the air. So some countries may not take actions.

Now let’s talk about energies. We have the oil and coal, but these fossil fuels may ultimately be depleted. Those countries which are still sustainable under such a situation are which have achieved the energy efficiency in less energy. Apart from the greenhouse gases, I think we are trying to ask different countries to become more energy efficient so that they would be using less energy, like oil and coal, and yet be able to develop economically. How it could be done by each country is a big question to many countries. It is first of all important that the countries realize that should be the way to go, also by enhancing the economic efficiency. This morning a rocket was launched by the Mitsubishi Heavy Industries. The company is also developing an airplane with a capacity of about 100 seats. For the first time, we may be able to create our own domestic developed jet plane. The best part of this jet plane is that the fuel usage could be reduced by 20%. Japan may have the opportunity to contribute in the fuel efficiency of the jet planes in the futures as well. By working on technology development to reduce the use of fuel, we may be able to enhance our competitiveness ultimately. Reducing use of oil and coal is important in order to be ready for those times when such resources are depleted. And at the same time, we hope to enhance our competitiveness by using the technology development. By doing so, I think we may be able to ultimately contribute toward the reduction of the greenhouse gases. However, we cannot just accept the free-riders. I think everyone has to do its part that is expected. But that is not recognized by all parties and all countries. That leads to the difficulties in the negotiations. I am sincerely

hoping that all countries would come to the recognition and work with us.

**Aoki:** A question was raised about China and the US's willingness to participate positively in the agreement. Actually, besides Prof. Xue Lan, there are a couple of the participants from China. One is Ms. Hu Shuli; she is an editor of a very important private business magazine in China. The other one is Mr. Jiang Kejung; he is a researcher at the Energy Research Institute of the National Development and Reform Commission of the government, and he is doing a quite bit of the research work to prepare for a discussion in Copenhagen. So, according to your research outcome, what would you think is the willingness of the Chinese government to engage in this international discussion?

**Jiang:** Thank you very much. I'd like to talk very briefly about our support to Chinese delegations. I am not the member of the negotiators in COP, I only join the negotiations in the IBCC process. But for the last several months, I do see the turn for collaboration rather than fighting. We will see each other in COP. Just like what I see in EU; they would go ahead with the 30% emission reduction target. This time we are happy to hear from Japan their 25% emission reduction target. This actually makes the negotiators in China think more. We also have a lot of discussions about what Chinese can do. We have just published a paper to talk about China's domestic actions. Even this afternoon in another room, they are discussing about the commitment in Copenhagen, or what China can actually do for the greenhouse gases mitigation. We have to combine these two into one together. For example, even though China's delegations already rejected to cap any target, it's not because China cannot do it, but because the negotiation process had some political argument; who the developing countries are and who the developed countries are, China can make some commitment. For example, one option is the intensity target of CO<sub>2</sub> by GDP. We think there could be some way to go ahead. From my personal point of view, China can also do some regional based approach inside the Copenhagen together with MRV of the action. This is some way we can work together with the other countries to make a Copenhagen Agreement happen. So far the feeling I've got from China side is that everybody thinks the Copenhagen Agreement is very important right now. We should go ahead with the committed and full support to make a Copenhagen Agreement happen. This is actually what was said by the Chinese Minister a month ago as an official declaration from his report to the Congress. This seems to me to be a very positive signal positive from the Chinese side. So far I have a little bit more confidence for a Copenhagen Agreement to happen. This is my report.

Thank you.

**Aoki:** I think it's about the time to put an end to this meeting. If there's a short question or comment, we can entertain one more question from the floor, please. There was someone in the back raising a hand?

**Questioner:** I am a citizen of Kyoto and a businessman in the field of electric components companies supplying electric components of eco cars, such as hybrid cars and electric vehicles. I would like to ask each panelist if Kyoto introduces very attractive, nice new vehicles, what do you think of electric vehicles and hybrid cars now produced by Japanese automobile makers? And if you come back here, what kind of technology would you like to see to solve the issues on the energy and environment?

**Aoki:** Representing the whole panel, would any of you like to respond? Xuelan?

**Xue:** Well, I think if the technology is really good, I am sure there would be a great market. But my impression is that it's much more important that Kyoto set the good examples for the world; the lifestyle, the city that maintains its elegance, efficiency. As you know, China and many other developing countries are going through the urbanization processes. Kyoto is a beautiful example of how you can improve your life quality, go through the urbanization processes, but maintain the tradition the harmony with the environment. I think that's much much more useful and has much more a profound impact in the world. So I believe Kyoto is a great example and there are lots which can be exported.

**Aoki:** Mme. Ninh, would you like to say something?

**Ninh:** Of course as a concerned citizen, if I can afford I would definitely buy an electric car. Except that frankly the problem behind it that is to say is the structure of electric power generation. That is to say, in Vietnam the structure is mostly coal or thermal generation of power. You still have the problem. Perhaps electric cars can be a part of the solution, but the power generation diversifying and moving to other than coal or thermal forms of the generation might also be necessary measures.

**Aoki:** Would you like to ask a question very briefly?

**Questioner:** I would like to be very brief. The question is to either Dr. Ghosh or Mme. Ninh for the future economy growth. Japan was quite dependent on the heavy industries, but it's very difficult to be dependent on the heavy industries for your future growth. In China I believe there has been a good development. But is there any alternative path you would be able to take, not too much dependent

on the heavy industries?

**Ghosh:** Well, I have mentioned in my presentation that India is not particularly dependent on heavy industries. In fact the largest growth in the economy has been the sector of services. So India has actually more than 50% of its economy in services. But the point is that the heavy industries produce metals and steels. Someone has to produce them. Of course India is not without a steel plant. But on the whole it's not the major of our economic plans. Let me also say one more thing, that India is the foremost recycler of the steels. So, much of the India's steel production comes from the recycling scrap steel which we import. And India also breaks ships which are completely dead and recovers steels and all the other materials. So, since we need steels, one of the ways to go is to recycle all the steels and metals that we can. And certainly in India we are doing that.

**Aoki:** Thank you very much. I wish we could continue the interesting dialogue between the citizens of Kyoto and the participants of the forum, from the US and all the corners of Asia. We have our own very intensive interesting discussions. I hope you enjoyed the discussion. Please join me in applauding the panels for their contributions. Thank you very much.