THE BROOKINGS INSTITUTION
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THE ECONOMIC AND POLITICAL EFFECTS OF AIR POLLUTION IN HONG KONG AND CHINA

A CNAPS Roundtable Luncheon with

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PROCEEDINGS

RICHARD BUSH: Ladies and gentlemen, if I could have your attention, please, why don't we get going?

Please be sure to have your Valentine's dessert. It is quite good. I recommend it. The catering staff outdid themselves on that.

I am Richard Bush, the Director of the Center for Northeast Asian Policy Studies here at The Brookings Institution, and it is my pleasure to welcome you to today's roundtable luncheon.

First of all, I would like to say that we are very pleased to acknowledge the cooperation and support for today's event from Robert Keatley, who is the editor of *Hong Kong Journal*. For those of you who don't know the *Hong Kong Journal*, I highly recommend it. It is an electronic quarterly devoted completely to developments in Hong Kong. The URL is www.hkjournal.org. It was founded by Bob, who is sitting right over there, and it is really an outstanding resource. As an example, the January 2007 issue has articles by Anson Chan and Regina Ip, among others. Not too shabby. I highly recommend it for anyone who wants to keep up to date on what is going on in Hong Kong.

Let me also acknowledge Susanne Wong from the Hong Kong Economic and Trade Office. Nice to have you here today, Susanne.

It is a very great pleasure to welcome Christine Loh to Brookings today. Christine is the founder and Chief Executive Officer of Civic Exchange, which is an independent, non-profit, public policy think tank in Hong Kong. Civic Exchange makes an outstanding contribution to public policy discourse in Hong Kong. There are many organizations that call themselves think tanks in Hong Kong. Civic Exchange is one that really deserves the title.

Christine has a varied career as a commodities broker and legislative counselor. She has a wide array of interests and expertise. We are very fortunate to have her here today. Her topic is *The Economic and Political Effects of Air Pollution in China and Hong Kong*.

She will speak for a while, and then my colleague, David Sandalow, who is the Energy and Environment Scholar here at The Brookings Institution, and who worked in the State Department and the National Security Council Staff during the Clinton Administration, will offer a few comments.

Christine?

[Applause]

CHRISTINE LOH: Richard, thank you very much. It is always great to come to Brookings. We tried to build our think tank like yours, so it is enormous praise for us to hear that you consider us deserving of the name think thank.

What I would like to do is to just run through the PowerPoint with you quickly. You may have particular interest in certain parts of it. I am not going to show too many numbers or pollution details. That is for the talk tomorrow morning at the Woodrow Wilson Center at the China Environment Forum. I thought today we will talk about air pollution or air quality as a political and economic issue rather than as an environmental issue. Of course, these issues are not disconnected, but I would like to focus more on the political and the economic dimensions of air quality.

I will touch on China as a whole. You will be seeing some satellite aggregate pictures of pollutants. I will focus quite a lot on Hong Kong, which is also a proxy for Southern China as a whole and, of course, it is part of the China development story.

Well, I am just going to run through some numbers very quickly. These are numbers that you read regularly in international media. I am not going to read everything out. Basically, the pace of urbanization and industrialization in China has just been tremendous for the last 25 years.

Just so that we have a reference point, in about the mid-1950s, 60 percent of Japanese were still in agriculture. Today in Japan, there are only 3 percent of the population that engage in agriculture. Just imagine -- with this tremendous urbanization process, by about 2040, what would be the proportion of people living in rural areas and engaged in agriculture?

Again, construction is something that I think is tremendously important. Just look at the square footage of buildings that China is putting up and at the pace of development.

Now these are numbers you probably know very well, so I am not going to go into the details. We all know China is the biggest coal consumer in the world. It will continue to be a very substantial coal consumer for decades to come. Obviously, that leads to SO2 and other types of emissions. Every ton of SO2 emissions causes 2,500 euros/dollars worth of economic loss, and we can see how much SO2 we are talking about in China.

The increase in consumption you know very well. Look at the kind of ecological footprint that would be left from importing aluminum into China or producing aluminum in China. The water and the energy that is required to do this, again, is tremendous. So you have seen these graphs before.

Excuse me for going really fast. I think this puts us in the context. We are going to go into the numbers, but every chart that you look at in China is basically like this. This just happens to be about energy consumption.

Here we were just looking at the kind of proportion of energy percentages that will come in the future. If anybody is interested in this, I can send this along later.

Cars—well, we are very worried about cars. There were 5.7 million cars sold in 2000, 7.2 million cars in 2005, probably quite a few more in 2006. By 2020, well, the industry predicts 55 million cars in China.

If we were to take a look in terms of the problems, again, these are the numbers that appeared in the popular press a lot in the last year. As the cities continue to urbanize, right now, two out of three cities are considered moderately or severely polluted. Believe me, moderately polluted is pretty polluted.

These are aggregate pictures, satellite pictures. This is particulate pollution in the year 2000. Particulates are these particles. The smaller the particles, the deeper they can get into our bloodstream. Particles can be so small that there is no way our nostrils can filter them out. So they enter into the lungs, and they are small enough to actually get into the bloodstream. This is what public health scientists all over the world now are very worried about.

When people see blue on these pictures, everybody thinks it is very good and on this scale, yes, the more blue, the deeper the blue, the better. In the year 2000, you can see that in the industrial heartland of China around Beijing, things were not so good. While the orange is a light orange, it is actually pretty high on the pollution load.

These pictures from 2005 were given to me by the University of Science and Technology in Hong Kong. We collaborate very closely with them on data research on air quality. They are the leading group of aerosol scientists in Hong Kong. The photos have been taken from satellite feeds, so these pictures are actually well known to people who look at satellite images, but they are not yet so well known to other people.

The scientists describe this as a super-regional pollution trend. They call it super-regional because they are seeing that pollution is covering a massive amount of space (in terms of geographical area). This is not just SO2, sulfur dioxide coming from coal-burning power plants. This kind of super-regional trend is something quite new, and this is extremely worrying for people who are looking at this kind of problem.

We were looking at what happens in the city. These are again aggregate data coming from the respective cities. So you can see that in 2004, which was one of the most polluted years in Hong Kong, it was pretty bad. When you have so many days in the medium to the dark color, those are very bad days. It is not just the dark one that is really bad; the one next to it is pretty bad, too.

The Air Pollution Index (API) is derived from the air quality standards used in particular jurisdictions. If your air quality standards are relatively loose, then your API is, by definition, relatively loose. The ones in China, in Hong Kong are relatively loose. If we were to transpose that to D.C., I don't know how bad it would be.

The Olympics, of course, it is the key driver in China right now to try and clean up. The quote that I have: "Beijing will leave the greatest Olympic games and environmental legacy ever" is taken from a publication by the International Olympic Committee at the time that they compared the cities that were competing to host the 2008 Olympics. The IOC did a publication that simplified all bidding documents they received. They put them side by side, and those words came from the Chinese bid. If anybody is interested to have a copy of that report, let me know and I can email that to you. It is quite an interesting report now in the sense that we are going into the final phase of China preparing for the Olympics.

It also says that the air and water quality at all venues and in Beijing generally is expected to be within WHO standards. Well, I think it is going to be very hard for us to meet that.

The issue about the Olympics is, as China tries to clean up, what will the Olympic teams be doing? You might remember that the Olympic teams were very concerned just before the Olympics in Mexico because Mexico City at that time was one of the most polluted cities in the world, and you had teams that were really just sitting somewhere else and flew into Mexico City at the last minute. They were trying to make sure that their athletes were not there too long because breathing the air there could impact their performance.

So are we going to start hearing that kind of talk? I have no idea. I don't have any connections with people who are the captains of the sports But you will notice that in the last half year or so, there has been an increasing number of reports coming out of the Chinese media -- so it is not like China doesn't care -- and coming out of the international media that talk about the poor environmental state in Beijing, and particularly people focus a lot on air quality. I do see that this is going to become a growing topic of debate.

What is Beijing going to do? Obviously, we need to deal with the number of cars and exhaust fumes and so on. You have already read in the paper that some of the bigger industrial enterprises are moving farther out of Beijing. Restaurants are being asked right now to install new ventilation systems. You might ask if restaurants really matter. Well, they really matter when you are talking about a dense urban environment because what the Beijing authorities are trying to do is to clean up as much as they can. Restaurants are not unimportant.

They are going to give everybody a big Olympic holiday. If people stay home, that will reduce the pollution load. They are going to ban private vehicles, or you have to be very special to drive in a car during the time of the Olympics. They are going to close petrol stations. There will be no construction work probably for a month or two prior to the Olympics.

What is most interesting is the last item there. They are going to temporarily close the major polluting sources in several provinces, possibly up to five provinces. Scientists

are now working to give advice to the Beijing authorities on the pollution path. What the Chinese government is most interested in is to see if they can choose what and who they are going to close down, based on science as much as possible. It is important to know how the air flows in August, and there are tests going on, and possibly even a trial shutdown. The policymakers will have to decide who is going to get shut down. The scientists will inform them, but it will be the politicians who will decide. No doubt, that will involve compensation because you are asking a factory to close down for maybe two months and what that involves, I can't even begin to fathom.

If we look at Southern China, you will see a tremendously fast pace of development from 1979 to 2004. I have shown this to quite a few people, and people usually say, it doesn't look like Hong Kong has developed much. Well, actually, if you look carefully, there is a lot more development there, too. Of course, the bigger area behind Hong Kong is the Pearl River Delta.Let us not forget the physical size of this area. The whole area is only the size of the Bay Area in California. So this is not a very large place, and the density is therefore extremely high.

To plot hazy days (there is a scientific formula for this) - if it is over a certain level of humidity, you remove those days from the calculation. If we plotted those days where scientifically it is considered a hazy day, the results are clear. I know some of you used to visit or live in Hong Kong. Some of you keep going back to Hong Kong and you remember 1980s. That is the early starting point, and I certainly remember clear, clear days, beautiful clear days, especially in the winter. Well, not anymore. You can see in 2004 going into 2005, there are some months where maybe we have only five not-hazy days.

I remember in the year 2000, I used to argue with people who would say to me, "I don't know if pollution has gotten any worse." I was already saying we are losing visibility, but somehow it took about three years for people to truly say, "Yes, we have a problem." So it is interesting that this is the frog-in-hot-water-syndrome. When you are there everyday, it is true you do not notice right away.

We look at this chart and say we should have been screaming murder by 1992, but we didn't. It wasn't until about 2002 or 2003 that people began to say, "Is there a problem?" Now, by 2004 and 2005, everybody says there is a big problem because 2004 was actually the worst year.

We talked about air quality standards just now and we talked about the Air Pollution Index. Here you can see the World Heath Organization (WHO) standards. The WHO standards are recommended standards based on health. If you think about it, why would you want to have air quality standards if not to be an indicator to tell us how it is affecting our health? The WHO set their standards based on the latest understanding of health. They make no reference to how much it costs to clean up.

If you look at the WHO standards, where China has its standards, and where Hong Kong has its standards, you might say, "Gee, how is it possible for Hong Kong to

still be using air quality standards that are so loose?" That is because we set them in 1987. It wasn't a long time ago, but in 1987 the understanding of the impact of different types of pollutants on the human body, just compared to today, was much less sophisticated.

Here is another way of looking at it. Look at the Hong Kong standards. We see, for example, Yuen Long. I am sure many of you will know Yuen Long is in the New Territories. Again, people used to say, "I am moving to Yuen Long to enjoy cleaner air." Well, you wouldn't do that today because actually Yuen Long is one of the most polluted areas. We will discuss why that is the case in a moment.

But you see where the WHO standard is set, and you see where the Hong Kong standard is set. Well, this has become a political problem. People in Hong Kong are asking: "Is my health being protected at all?"

This is just another way to make it easy for us to look at it. We look at all the pollutants, and we look at the WHO standards, and in fact last year in 2006 the WHO tightened its standards again. We will see in a minute how many cities, even in the U.S., meet those standards. As I said, they set these standards using the latest health knowledge.

You can see quite clearly where we are in Hong Kong. Your most polluted city in terms of air is Los Angeles. This (chart) is about respirable suspended particulates (RSP), those particles again. This is not SO2 or nitrogen oxides (NOx). Since this is the one that people are now most worried about in terms of health, you can see where we (Hong Kong) are.

The new WHO guidelines are way down there (chart). Paris is just about fine. Vancouver is pretty good. New York is close. London needs to work harder, and Los Angeles is way up there. Boy—Hong Kong, Shanghai, Guangzhou are not doing well.

This is another way of looking at the different pollutants. We have a great team in Hong Kong that compares cities' pollution problems, because when you are down, you want to say, "Am I really so bad? Is there somebody worse than me?" Tokyo is much better than Hong Kong, and Los Angeles is much better.

The good news, of course, is that other people have actually cleaned up. I always say to people that comparing these charts is not actually disheartening because what we want to do next is say, "How have people cleaned up?"

I worked with a number of public health scientists. We published a report in the middle of last year whereby we tried to look at the health costs. These are the numbers relating to the air pollution concentration. It is now 200 percent higher than the WHO guidelines. There are 6.8 million family doctor visits a year in Hong Kong related to air pollution, respiratory problems. That is virtually every person at least once a year. We can save 64,000 hospital bed-days a year if we could take out some of these people with

respiratory problems. Public health doctors have worked out that aggravated deaths due to higher air pollution are 1,600 per year.

In terms of the value of benefits, for Hong Kong it is not necessarily how much money we are spending because, for example, if you lose a day of work due to having to be in the hospital for respiratory problems, that has a cost related to it. The public health scientists reckon -- this is Hong Kong dollars, not U.S. dollars -- in terms of the value of the benefits that we can gain from better air quality will be equivalent to 20 billion Hong Kong dollars a year.

We do have a political problem because at the top of the government, they feel pretty threatened that Hong Kong is now being constantly described in local and international media as bad. Robert, you will remember this quote from our Chief Executive to Robert Keatley, and that is one reason you want to read his web site because this particular interview is on it. It says: "In fact, the air is not so bad at all. It is not inferior to Washington, D.C. By Asian standards, we are better than Seoul". Well, may be just; any of the mainland cities, yes; better than Taipei, no; slightly behind Singapore, well, not quite slightly (Singapore is much better); and behind Tokyo, that is true.

And he says: "I am sure we are going to meet whatever WHO standards they put up". You saw from those graphs that we are a long, long way from the WHO standards right now.

More recently, in November 2006, our Chief Executive also said we have "the most environmentally friendly place for people, for executives, for Hong Kong people to live". Actually, that created quite a stir in Hong Kong. He was widely criticized for making this kind of statement, but we all know politicians go into denial sometimes. Our interest is not to keep bashing him on his denial stage but to help him to come out of the denial stage.

This is the sort of thing that is helping or not helping as the case may be. In the summer of 2006, Merrill Lynch put out an analyst report stating that "skilled professionals are departing Hong Kong because of the air quality. More will follow. Singapore stands to be a major beneficiary, and the investment response is clear".

For the first time in Hong Kong, we had an analyst saying -- because in that report it actually names a number of companies – "sell." Sell stock in those companies. Buy shares in Singapore office landlords; sell Hong Kong office landlords. This was quite shocking to Hong Kong.

The ECA is an international human resource organization, and they do rankings for cities that are nice for international executives to work in. Singapore is ranked number one in Asia. Hong Kong is ranked 32, down 12 places since 2004 and 2005. You can see that once people understood that we are polluted, our ranking dropped. They really gave us a hard time. Shanghai is ranked 89. Beijing is ranked 106. Again, these places have all been ranked down, and part of the reason is the environmental condition.

In Hong Kong, there is growing political pressure on the government to do more, and it is going to need a comprehensive plan. Earlier we talked about other cities that have done it. The good news is, it can be done. It can be done, but it requires multi-pronged action, and it is going to require action in all these areas (chart): power generation, transport, shipping, port management, manufacturing, use of fuels, and so on.

There is another layer of activity we can be doing - those are what I call the market mechanisms. These are going to be taxes -- people don't usually like to hear that -- or emissions trading. In Hong Kong and Guangdong, there will be a new emissions trading scheme. We don't know all the details of the scheme yet. We don't quite know exactly when the scheme is going to start, but it will involve the power plants in Hong Kong and the Pearl River Delta It is a voluntary scheme. It might be one of those that we can build upon and learn how we can use market mechanisms to help lower pollution because, as you can see, we have a big problem.

I am a Non-executive Director of the Hong Kong Stock Exchange. I make no bones about it - since getting on the stock exchange board, I have been trying to persuade them that the trading opportunities of the future are going to be in water and air. If we accept that water and air will no longer be free in the future because they are going to be scarce commodities, then in terms of developing markets for them, that is the future. At least that is my personal opinion.

The stock exchange is about to hire consultants to help us think through how we can provide a trading platform for environmental products. That will include the major emissions. That will include carbon and perhaps in the future, in the distant future, also water. At least that is what I think. For now, I have managed to persuade my fellow directors on the Hong Kong Stock Exchange that we will look at air pollutants.

At Civic Exchange in September last year, we said to the Chief Executive in Hong Kong that there are many, many things we can do in Hong Kong in these four areas, including market mechanisms like emissions trading, to improve air quality. If we did everything starting in 2006 (see chart) … well, we didn't start yet, but, you can imagine that in five years, we can actually reap a lot of benefits.

I think with the financial sector, organizations like Merrill Lynch now writing the kind of reports that they are, with the international pressure, with also the pressure of the Olympics, people talking about environmental conditions in China, it is going to have a direct impact on Hong Kong. We cannot run away from the problem that we have, and what we have to do is to dramatically clean up.

How about climate change? I am not going to go into this, but I just want to show you some neat pictures. Concerning rising sea levels, we can all have our own opinion about how fast the sea is going to rise. This is today (chart). One meter means we lose that much. Here you can have a look: one meter, three meters, four meters, six meters (series of charts).

You might say, six meters, isn't that 100 years away? Not if you look at storm surges. If we are going to have more intense storms, bigger storms, wetter storms, what it means today is when we have a storm surge, when we have a typhoon, it is already at three to four meters. If the sea level rises by this (show) much, the storm surge is going to go up to six meters. That is why we can't ignore this.

In the U.S. there is a lot of talk about how fast the ice caps are now melting, and we need to watch that very carefully. Here is what is going to be impacted (chart showing area in the PRD). Again, this has tremendous political and economic impact. Our entire transportation logistics, and the maritime export production system in the Pearl River Delta, are going to be affected.

So, there we are. Thank you very much.

[Applause]

DR. BUSH: Thank you very much, Christine, very stimulating. I am sure a lot of people have questions, but before we let them ask the questions, we will let David have the first shot.

David?

MR. SANDALOW: Thank you, Christine. That was fascinating.

I have just a few thoughts to get the conversation going before we have a chance to ask Christine some questions. I was looking this weekend at my favorite magazine, which is called the *Funny Times*. I don't know if anybody here gets the *Funny Times*, but if you don't, I recommend it. It's a monthly compilation of humor. One of my favorite features is what they call "Obvious Headlines." They pull real headlines from real newspapers, such as "Man Killed: Police Suspect Homicide." Or, "Police Raid Gun Shop: Find Weapons." Or my favorite was "Islamic Center Has Muslim Ties."

So one obvious headlinearound the world these days is "Growing City Struggles with Air Pollution." It is happening everywhere. One lesson I take from Christine's presentation is that there are lots of cities around the world that could benefit from hearing what Hong Kong and, in particular, Christine are doing. This phenomenon of urban air pollution is global at this point. It's not just in Asia , but in South America -- in Chile in Mexico City, which may have the worst air pollution in the world. It's in Eastern EuropeIn our nation, of course, we have struggled mightily with terrible air pollution over the past 30 years.

One of the things the world has learned over the course of the past 30 years, as Christine mentioned, is that one can succeed in these efforts. These are big problems, but that they can be addressed. These problems are not surprising when you have dense human population using motor vehicles. These motor vehicles are running 98 percent on

petroleum. By the way, 98 percent of the British thermal units (BTUs) burned to move vehicles in our world come from petroleum. Petroleum is a rich toxic soup of pollutants. It is also very rich in energy, which is one reason that it powers our vehicles, but it has lots of nasty stuff in it. So people in high concentrations generate a lot of pollutants in urban areas. In lots of places, we also have industries that are co-located with city centers, which makes air pollution problems worse.

But we have succeeded in many places, including the United States, in making a lot of progress. There are three lessons that I draw from the successes so far. One of them is start with the science. Not surprisingly, when you are dealing with largely invisible gases, human intuition alone is not enough. There end up being some counter-intuitive and somewhat surprising results. Some of these gases, particularly precursors of smog, interact in ways that are complex. Efforts like what Christine was reporting in Beijing in preparation for the Olympics -- doing a trial shutdown and looking at the results – these are very important. To really nail down the science is key.

A second lesson from around the world is to use markets. Emissions trading has been an incredibly potent tool in the United States, particularly for handling local air pollution problems. The city of Los Angeles has used a program called RECLAIM. Essentially, our entire regulatory regime for managing local air pollutants in the United States has been built around this very powerful idea of emissions trading, which works extremely well.

A third lesson is to mobilize the public. Democracy and environmental protection go hand in hand in a lot of places, really everywhere. In order to sustain the type of momentum needed to clean up the air in the face of interests that perceive themselves to be hurt by the cleanup, you need an engaged public.

I heard all these themes in your speech, Christine.

Before turning it back to questions for Christine, I will broaden the frame a little bit, as Christine did at the end, and talk about another obvious headline these days, which is "Last Year Set Hottest on Record." 2006 in the United States was the warmest year ever. 2005, globally, was the warmest year ever. The 10 warmest years on record have all been since 1990. We are in the middle of an epic change in the global climate.

Why is this happening? There are a lot of different ways you could come at that. On one level, the most basic answer is that for millions, literally tens of millions of years, living things have died, decomposed, fossilized, turned into coal and oil beneath the planet's surface. We have lots of rich carbon deposits underneath the surface of the planet, which over the course of the past 150 years, we have been taking out and combusting. When we combust that carbon, it turns into carbon dioxide which stays in the atmosphere for about 100 years That carbon dioxide is a heat-trapping gas. The human species is moving this huge reservoir of carbon sitting underneath the surface and putting it into the atmosphere where it is warming the planet.

Another answer is the massive growth of the human population. It took 10,000 generations to get a billion people on this planet, 10,000 generations. Then over the course of the past century, we have gone from a billion to six billion people. So it is not surprising that the intuitions that we have about managing the planet are no longer entirely appropriate and that we need to quickly change them.

About a decade ago now -- it is amazing it was that long -- I took a trip to China with Vice President Al Gore, and one of the major objectives he had on this trip was to impress upon the Chinese leadership the importance of this issue. In an age before PowerPoint, we literally traveled on Air Force Two with flipcharts that he would turn up to show the graphs and science. We had a very polite reception, and the Chinese leadership absorbed a lot of what the Vice President and others were saying and essentially looked back at us and said: "You know, you are right. This is a really important problem. Since the per capita emissions in the United States are about eight times what our per capita emissions are, maybe once the United States gets really serious about addressing this, we in China will get serious about addressing it, too."

About a week later, I was back in my home state of Michigan, and I made a somewhat similar presentation to a group of auto industry executives. Those auto industry executives looked at me and said: "You know, you are right. And, since if we start to take on this problem seriously, our Chinese competitors will have a cost advantage, once you get the Chinese to really take on this issue, then we will, too."

I think that over the course of the past decade, we started to learn how to overcome that fundamental challenge, and it has to do in part with market tools and emissions trading. It has to do with the United States taking a first step. This is, I think, about to happen.

Interestingly, all of the Democratic candidates for president as well as the front runner in the Republican presidential race, John McCain, are strongly in favor of taking on this issue. If either a Democrat or John McCain is our next president, we are going to have a president ready to sign global warming legislation. I think the odds at Vegas that either a Democrat or John McCain will be our next president would be reasonably high. It might not happen.

I think we are moving towards taking a big step in the United States, and I think these types of cooperative discussions and exchanges are important in terms of the global warming problem and in terms of local air pollution problems of the kind that we are discussing.

Having Civic Exchange and Christine Loh here in Washington and coming to Brookings is a wonderful and important part of the solution. I am delighted to be able to welcome her here.

[Applause]

DR. BUSH: Christine, why don't you come back up to the podium and field the questions yourself? There is no need for me to get in the middle.

If you would raise your hand and wait for the microphone and identify yourself so Christine knows who is asking the question. I saw Richard Shin's hand up first.

MS. LOH: Yes, thank you.

QUESTIONER: Hi, my name is Richard Shin from LECG.

I am an economist, so the first question I have is really with the cost estimates. Obviously, this pollution is a serious problem. I think you outlined very well what the problems are, but the question is: What would it cost? What would the total estimated cost be and who would bear that cost in terms of is it going to be consumers, is it going to be somehow through taxation, or is it going to be somehow a corporate system?

Obviously, some kind of marketing system on emissions would impose some of the costs on the companies themselves, which will be passed through to the consumers. That is the first question.

One really short question: I was at a talk where the Under Secretary of the Department of Energy was talking about how the U.S. has shifted from doing all kinds of research on pollution issues from particulates to purely global warming, from SO2 emissions to CO2 emissions, reducing CO2 emissions. It seems like it is a vast, a major shift in our policy in terms of doing research, et cetera. Is China thinking about a similar type of issue?

I know that for Hong Kong, it seems like the particulates are a more serious problem at this point, but overall, I think the U.S. has kind of shifted that way.

MS. LOH: Yes, I think your second question is actually a really important question about whether we should now focus on carbon. And, do other emissions still matter? Well, on the basis that there is never one fix for all problems, it is the carbon challenge and actually also the environmental challenge that are, by definition, multi-pronged. Cleaning up carbon is going to have some impact on your other fuels but not everything. So I think if we also care about public health, then we have really got to do both.

Maybe in the United States, and I am speaking out of ignorance here, maybe in the past there has been a lot of effort looking at the different pollutants but less so with carbon. So maybe they are catching up on trying to understand carbon emissions, but it doesn't actually mean that you and everybody else, including the Chinese, shouldn't be looking at continuous investment in the evidence.

As David reminded us, very often people in power -- doesn't matter whether they are American or Chinese or European -- sometimes people in power have a D-Day fix for

what they think the problem is. Generally, I think administrators and politicians want to know what that one great big thing is. They want to know whether there is one button that they can press that will deal with most of the problem. So they always say, "what is the most impactful thing that I can do and I am going to do that". But, actually, with the environment and with carbon, there isn't one single thing that you can do. It is about really multi-tasking. How we can get the political process to design and calibrate policy across the board is really a real challenge.

Going back to your problem about costs, yes, if we were to say to a power company, you have got to now add new equipment or you must have flue gas desulfurization, how much is that going to cost you? You can calculate that. Then you can say it is going to go towards electricity charges or they are going to have to take a slice out of profit, whatever. We can calculate that.

What we don't do very well is calculate the external costs, as you know. The question here, as I see it, is not so much to be able to say how much is going to cost the bus company, the taxi company, the shipping owners because we can do that actually. They will tell you what the number is, and then you can check it and see whether they have set it too high. But in terms of the external costs, that is what we need to put together, the cost to business to make the transfer.

Look at us in China with this kind of pollution, and we are just looking at air right now. We know also from evidence today, from Chinese evidence, that the water pollution is causing more cancer. It seeps into the soil, the food. This whole web of life that sustains us on a day-to-day basis is under threat. The clean-up is going to cost billions of dollars, and they have already told us on air and water alone, it is somewhere around 4 percent of China's GDP. When you add everything else, it is going to be much higher.

Just imagine the children today that are growing up in Beijing. I mean if we look at the pictures that we have already looked at. We know the first 12 years of their lives is where the development process settles in. This will have a tremendous impact on their health for the rest of their lives. It is going to have a tremendous impact on their future health. For people who are older, people who already have some weaknesses, the public health bill for the Chinese authorities as a contingent liability for the nation is going to be huge.

I think we need to spend more time trying to understand the external costs.

The last thing I want to say on this issue is there is actually now a new way of looking at environmental clean-up and even lowering carbon emissions. We are now going to be looking at these things as economic drivers. I think this is the only way to start looking at it. The external costs are so high, that if we don't clean up, it is actually going to have other impacts on us.

How can we use the clean-up,use market mechanisms, including emissions trading, to actually be new economic drivers? If you think like I do, that water and air are

no longer going to be free, and that clean-ups will be new ways for the world to build wealth, we are going to start looking at this picture very, very differently.

I tend to see the trends going this way. I talk to the financial sector a lot in Hong Kong. The hedge funds that I talk to are already investing in some of these areas, and I don't mean CDMs [clean development mechanisms]. These folks are buying things up. Well, we won't go into that for now because I can stand here and go on for half an hour. But the main thing is people are looking now for investments that are environmentally related, and I see this as a positive sign.

QUESTIONER: Thank you, Christine. I am Gene Martin with the U.S. Institute of Peace.

I used to live in Guangdong. The problem with Hong Kong trying to clean up is pollution does not respect borders and it all flows downriver or comes across the border and so forth. What sort of attitude are you getting from Guangdong authorities in terms of their concerns about the environment, both water and air? Hong Kong can't do it alone.

MS. LOH: First of all, I think there are good national policies now coming down. I think the top Chinese leaders are interested in this. The attitude they are beginning to spread throughout the country is that government officials are going to be judged not only by the economic growth that they can bring to their counties and provinces, but also clean-ups or enforcing the law.

Secondly, in Guangdong, there has been a recent effort in the last year to identify highly polluting factories. Now whether they are going to be closed down or encouraged to be relocated, we will see. We will see how well that process is done. But we are now beginning to see certain movements that we didn't see before.

Thirdly, we are now seeing Hong Kong talking about this a lot more, and I hope what we can do is energize all those people from Hong Kong who have their manufacturing enterprises across the borders to see what they can do to clean up. I was just saying at this table that the U.S. Department of Commerce has come up with a nifty idea called P2E2, which they are implementing in Hong Kong. They are trying to get Hong Kong-owned factories across the borders to engage. There is a financing scheme involved to upgrade their environmental quality, quite a clever scheme. If you want to know more about it, I can provide more information.

It is going to be that sort of stuff that will get people talking, and hopefully they will actually take some action.

QUESTIONER: I am Tom Reckford with the World Affairs Council.

On a trip last year to Beijing, I noted a couple of areas where there seem to be a bit of improvement. The city seemed a lot greener than it had, say, 10 years ago, more parks, more trees, more flowers, and a factory district to the north of the Forbidden City

had been turned into a district for artists' studios. Is this too little, too late? Does it not matter that much or is there a little hope in these areas?

MS. LOH: What the Chinese government wants to do is to transform Beijing into a lush city with lots of trees and plants. The problem is it doesn't necessarily mean just because we have more grass and trees, that it is environmentally cleaner as we could see with the air and the water pollution. There is also a debate in China about the loss of heritage because tracts of old Beijing have been lost.

If we look at what is happening in Hong Kong, maybe we see a forerunner of the issue being debated in other parts of China as well. Hong Kong is not Beijing. Hong Kong was never the center of imperial power. In fact, some of the older things that we have, our heritage in the south, have to do with village life, have to do with colonial architecture and heritage.

Recently, there was an interesting episode in Hong Kong. Many of you might have been on the Star Ferry. The piece of water in front of the Star Ferry is now being filled up, and the Star Ferry itself is being moved a couple of hundred meters further towards Kowloon. They have built a new Star Ferry, and the old Star Ferry that has a little clock tower was going to be pulled down. What surprised everybody was on the last day of the Star Ferry, thousands of people -- this was completely spontaneous -- flooded out. They all wanted to ride on the Star Ferry for the last time. You had people who were trying to get on the last ferry at midnight. Of course, the media was all over this. It was a very touching moment.

As they interviewed people, people said: Well, this has been a big part of my life. There is a lot of collective memory involved. We wanted to be a part of this.

Then, surprisingly after that, there were lots of young people gathering and saying we want to save the clock tower. Now, the clock tower is not the Forbidden City. So, again, some people were saying, well, architecturally is this worth saving? But what was coming from the young people and other people who wanted to preserve this, was that this is us. Not every city has an imperial palace. Not all of us can have the Great Wall and the Coliseum and what-not, but this is us, so we want to keep it.

In any case, it was torn down. In fact the Chief Executive has been saying in recent days that he was very much taken by this because the people who came out were not the usual suspects. It wasn't the usual NGOs who were fighting government on this, that, and the other. This seemed like just a really spontaneous group of Hong Kong people.

So is this a message? Is this a message that Hong Kong has come of age in terms of history and culture and our self-identity?

I think this kind of discussion is also going to take place or is taking place in many, many parts of China.

I think there was a hand up at the back, yes.

QUESTIONER: I am Yingling Liu.

I just have a follow-up question about Hong Kong investments in mainland China. All of us know here that the central government has pretty strict regulations on environmental protection that are unfortunately stronger on paper than in action. Many of the local governments for most of the time are acting on their own, and some of the local governments use excuses like loosening or much less environmental protection standards to attract investments. Over the years, do you observe any chance of relocating investments from Hong Kong from those areas which have strict environmental protection standards to less strict environment standards like investing in central China?

Also, in Hong Kong, have you done anything to promote corporate social responsibility among the business community who want to invest in mainland China? Thank you.

MS. LOH: Yes, I completely agree with you because one of the problems is that as factories relocate elsewhere, many are going to poorer districts where they can get away with worse environmental standards. I think what we would like to do in Hong Kong is to use it as a fulcrum because we do have a huge number of Hong Kong investors across the border, and all the multinationals who are doing manufacturing and other manufacturing support services out of Hong Kong in China. We have not been as responsible as we should be.

If we look at the history, what we see in the 1980s was the relocation of Hong Kong manufacturing from Hong Kong itself into the Pearl River Delta, which brought tremendous vitality to southern China in building up China's export model. A lot of people on both sides of the border got very rich. 25 years later, as we can see, it is the moment of truth. What we have done, as we can see from here, is we have devastated this place, and we are asking ourselves, what will come in the next 25 years?

If we regard 1980 to 2005 as phase one, you could say this is the "get rich quick" phase. Now you told us when we got rich, we were going to have to clean up. Well, this is payback time.

What I like to think in terms of what we must do in Hong Kong is we must continue to articulate what we can do, particularly in southern China, because that is part of our region. The way that we are going to do it is by multiple ways. I work for a think tank, and what we try to do is provide the perspective, the data, the analysis of the data to say what is happening and what you can do. We look at comparative policy solutions.

For example, we are looking at the ports. Cleaning up port operations for Hong Kong and Shenzhen is very important. We are looking at, for example, best practices around the world. We are very impressed with Long Beach in California. They have a

green port policy that I think is a front runner best practice in the world. We want to learn from others. We want to articulate through our ship owners, our ship liners, our port operators. Many of these are big companies. We want to work on them.

We want to get Greenpeace and the Friends of the Earth to use the data. They will do the kind of advocacy that they are good at. What we will try and do is - we also have much more ability to talk to the financial sector because they are interested in the future of these companies - to provide some perspective as to what the future is going to be.

My own sense is, well, you have the stick, which is the data. The data does not lie. Secondly, you have the carrot, solve the problem. How are we going to solve the problem? The third one is can we come up with some clever ideas of how we can, at least in looking at the whole economic picture, be able to articulate that some will lose but a lot will gain.

The last thing is getting the politics right. We have the kind of politics in Hong Kong right now where the established businesses are entrenched in our political system. That is a barrier. The people who are advising our government very often are members of the legislature. They are members of the cabinet.

So we have to work doubly hard in civil society with, for example, even the business community because companies are saying, "We are having problems hiring international staff to come to Hong Kong." This is an indicator. This is the flashing red point. Hong Kong wants to be a regional and global financial sector. Well, those are the first guys who don't want to come because money managers don't need to be anywhere in particular today. That is why that Merrill Lynch report was rather upsetting for the authorities.

There are many different things that we need to pull. Corporate social responsibility, yes, that is another angle to come at it. That is why I talked about the Department of Commerce P2E2 scheme. It is a clever scheme. It might get some of the businesses to move faster, rather than slower.

I have a report of the P2E2 scheme here if anybody is interested. I can give a couple of those out. I also have the E-version of a climate change report and an emissions trading report for people who are interested. I need your name card if you would like to receive them.

QUESTIONER: I am Kathryn Mohrman from the Hopkins-Nanjing Center.

I am curious to know how important environmental issues are in current political discourse in Hong Kong with the election of the new Chief Executive. Is it in the top three? Is it in the top 10? Because it is comparing with other issues as well.

MS. LOH: Yes, the government did a poll in 2005 when Mr. Tsang became Chief Executive and the environment was ranked number three, in particular, in air quality. If

you have a day like this (chart), it goes way up. As I said, today with so much international press also about this, I don't think this problem is going to go away. That is number one.

A lot of the polling, if you ask people what is your number one concern -- I am sure Americans are the same -- they will say jobs, but it doesn't mean they don't care about anything else and it doesn't mean that if they haven't ranked environment as number one, [a bad environment] doesn't have a social-political-economic impact on society. I think the environment has gotten to a stage where everybody is looking at it. The Chief Executive acknowledged this is a problem, although he doesn't yet quite understand the magnitude of the problem, and we need to work on getting him to focus on solutions.

The last thing I want to say is just this: There are solutions, and if you don't like the Civic Exchange solutions, we can re-juggle those around. The other thing about clean-up is there are only so many things you can do. If you want to clean up the vehicles, there are only so many things you can do. Other people in other parts of the world have gone through that path. It is a well-trodden path. What we need is really just the political will to do it.

One last thing -- Hong Kong's government has more money in their pockets than anybody else. We have a trillion Hong Kong dollars. That is a lot of money if we look at the government's consolidated account. Any time we need to spend some money on clean-up, we got it, so, no excuse. If Michael Bloomberg had the kind of accounts that we have in Hong Kong…

[Applause]

DR. BUSH: Thank you, Christine, for a really stimulating luncheon.

Thank you, Bob Keatley, for your support.

Hkjournal.org and Christine's web site, civic-exchange.org, are two outstanding resources on what is going on in Hong Kong.

Thank you all for coming.

[End of Transcript]