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001. report	Energy and Carbon Emissions Outlook to 2020 (26 pages)	06/01/1999	P1/b(1)

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Miotkes <miotkes@ix.netcom.com>
08/24/99 11:33:09 AM

Record Type: Record

To: See the distribution list at the bottom of this message

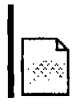
cc: Robert Z. Lawrence/CEA/EOP
Subject: Re: 2nd draft of China paper

Joe,

Please see my edits. In general, I think the paper is quite good.

As we go through additional iterations, we should try not to oversell the concept of emissions trading as another commodity market. Zhong insists that emission trading does NOT create any form of market. If Parties insist that ET is a new market, however, he warns that emission allowances must be commodities. An emissions market therefore could have serious WTO implications, which the Parties will need to consider (endlessly) before ET could begin. In other words, he labels allowance commodities in an effort to forestall the creation of any market whatsoever. We must be careful not play to his hand. The financial asset market is a better point of comparison.

As I said previously, we are also running a risk by using the paper to sell both CDM and ET. By lumping CDM with a discussion of ET and targets, we could taint CDM. If the goal of this effort is to try to sell the Chinese on the benefits of taking on a target, let's focus on ET and indexed targets. We should drop the discussion of CDM.

 - CHINA4.doc

Message Sent To:

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20502

August 16, 1999

MEMORANDUM TO:

Roger Ballentine	115 OEOB
Ian Bowles	360 OEOB
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David Sandalow	360 OEOB
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Jeff Miotke	647-0191
Richard Morgenstern	647-0753

FROM: Joe Aldy

SUBJECT: China paper

We understand that some individuals had difficulty downloading and/or opening the Word document of the China paper on Friday. In addition, some charts were inappropriately linked into that document. Attached please find a hard copy of the China paper with all charts in the appropriate order. We apologize for the delay in sending out this revised version.

8/13/99 Preliminary Draft; For Use in International Negotiations; Do Not Cite; Close Hold

The Economics of Greenhouse Gas Emissions Abatement in China

Over the past two decades, China has experienced an impressive rate of economic growth. Between 1980 and 1997, the size of the economy increased from the 16th largest to the 7th largest in the world, per capita incomes increased by nearly 400%, and energy consumption grew 112%. Like virtually all countries in the world, economic growth also resulted in the growth of greenhouse gas emissions, especially carbon dioxide.

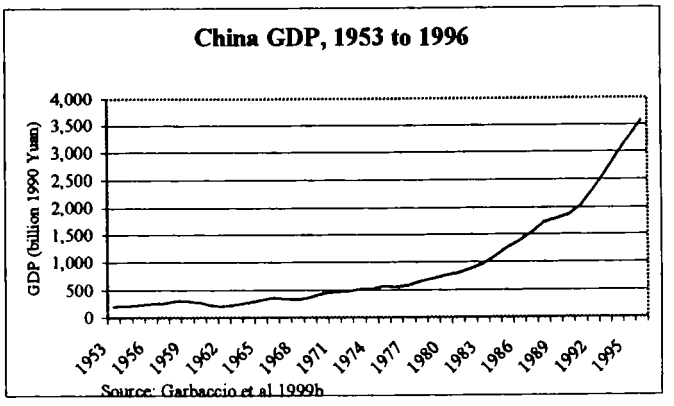
Emissions of greenhouse gases from all countries pose a risk to the global climate. International efforts to address these risks in Rio in 1992 and Kyoto in 1997 recognize the need to abate greenhouse gas emissions while sustaining economic development. Specifically, the Kyoto Protocol calls for the design of markets that will facilitate the transfer of capital and technology to the countries where emissions can be abated at least cost. A country that can abate greenhouse gas emissions at lower cost than others has the opportunity to attract investment for climate-friendly technology that abates emissions and can then sell emissions credits or allowances to higher cost countries. Effectively, Kyoto provides the potential for low-cost abating countries to create an export industry – whose export products are emissions abatement – which would be financed through foreign direct investment.

What is the potential for a fast-growing economy such as China's to create and benefit from such export industries? The economic literature indicates that China has the opportunity to abate more greenhouse gas emissions at a lower cost than any other country. Selling these abated emissions through the Kyoto mechanisms could attract billions of dollars of investment per year that would finance some technology leap-frogging in the energy generation and industrial production sectors. In addition, abating carbon dioxide, for example by improving combustion efficiency of coal power plants, would reduce emissions of local air pollutants that carry significant economic costs through lost worker days, additional health care expenses, and premature mortality. The potential is clearly available for China to be better off economically through the promotion of an emissions abatement export industry.

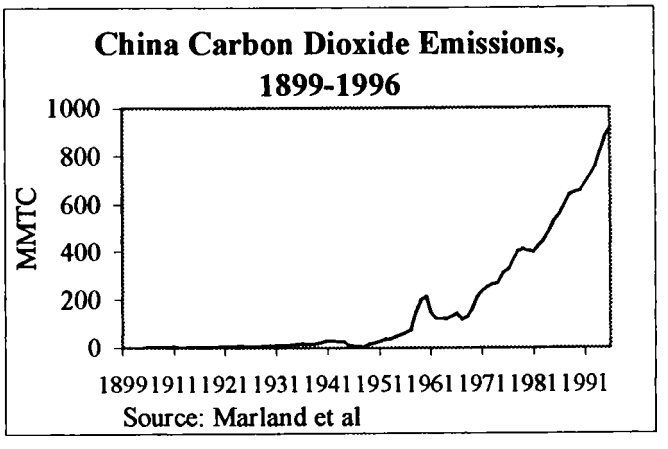
This paper provides an overview of this potential drawing from economic research on China conducted by academic, industry, and government analysts from around the world. First, the paper summarizes recent energy and economic trends as well as various projections of the Chinese economy under business as usual. Second, the paper presents a description of the trade-oriented mechanisms in the Kyoto Protocol that will promote capital and technology flows for emissions abatement. Third, it reviews the extensive economic modeling literature on the potential economic gains associated with participation in the Kyoto mechanisms. Fourth, the report discusses in detail some of the advanced technologies that would likely play an important role in improving the efficiency of the energy system while abating emissions. Finally, it describes the potential improvement in public health associated with abating emissions of local air pollutants that usually accompany carbon dioxide abatement.

I. Overview of China's Economic, Energy, and Environmental Trends

Historical Trends

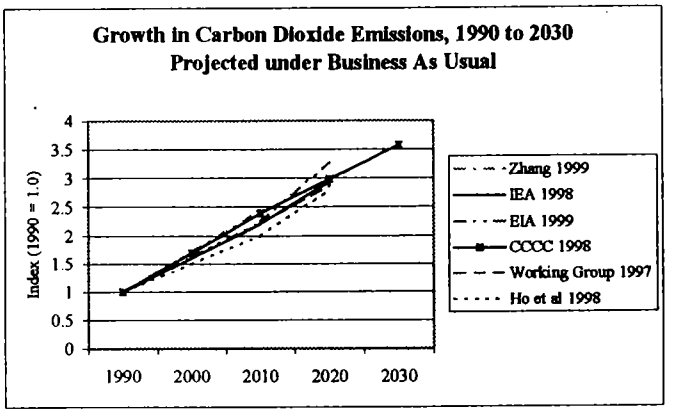


China's economy has grown at a very rapid rate over the past two decades (Figure X), averaging 10% growth per year between 1978 and 1997 (Zhang 1999). China achieved this economic growth through impressive productivity gains (cite?). Further, China has played a significant role in international trade, with exports as a share of GDP increasing from X% in 1978 to X% in 1996. Moreover, foreign direct investment has increased from X% in 1978 to X% in 1996, and has been concentrated in China's larger export industries, such as X, Y, and Z (true?; cite?).

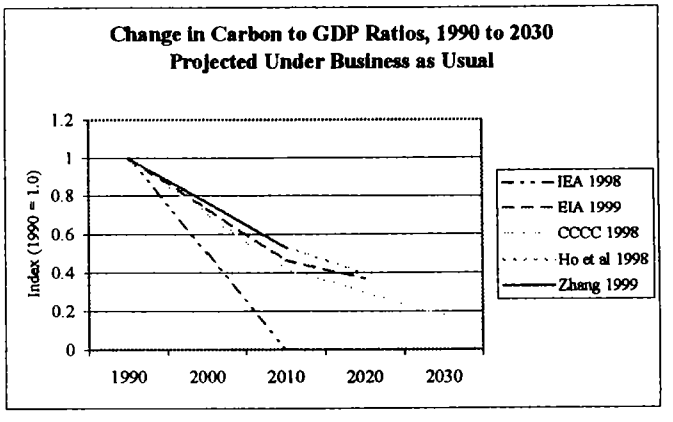


At the same time that China's economy has grown remarkably, its emissions of greenhouse gases has also increased substantially (figure X). While carbon dioxide emissions tend to increase when GDP rises, and decrease when GDP fall, the rate of emissions growth depends not only on GDP growth, but also on structural change (which varies through a country's economic development) and explicit government policies that affect the energy efficiency and carbon-intensity of energy supply in the economy.

A variety of researchers have made projections of China's carbon dioxide emissions, some as far into the future as 2030 (figure X). While the absolute levels of emissions in a given year in these forecasts may appear to vary somewhat, much of this appears to be due to different estimates of 1990 emissions. Emissions growth rates through 2010 across six different business as usual projections appear to be fairly similar. The differences in projections also appear to be influenced by different economic growth rate assumptions.

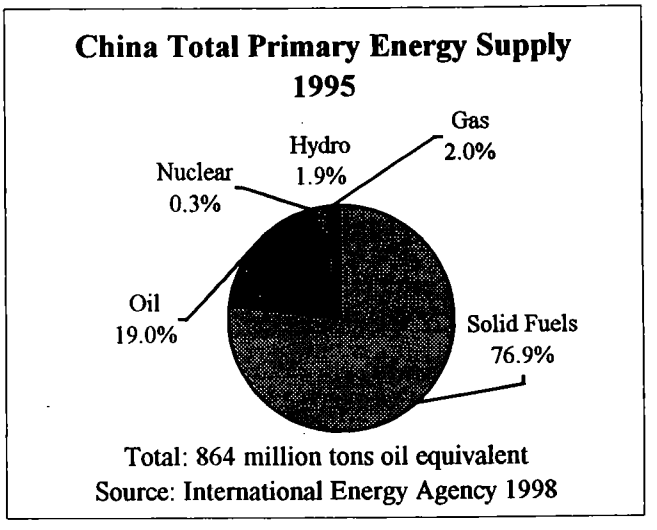


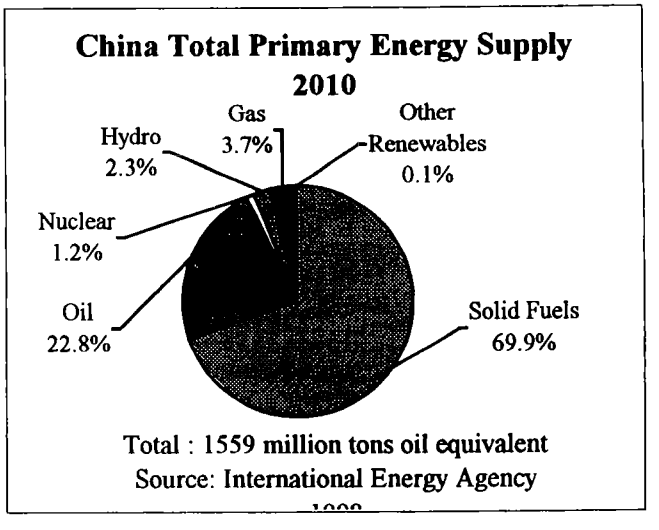
The carbon-to-GDP ratios across five of the China business as usual projections appear to follow similar rates of improvement (figure X). These forecasts illustrate that the recent decoupling of carbon emissions and economic growth will likely continue into the future.



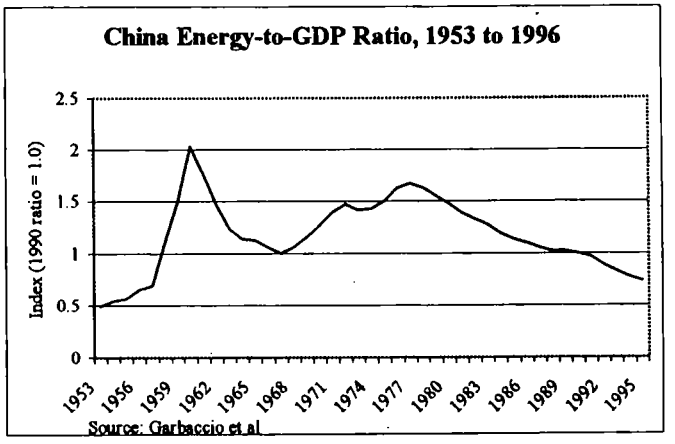
Projected Trends

Solid fuels (coal) comprised approximately ¾ of China's total primary energy supply in 1995, and under business as usual will continue to serve as the largest source of energy in 2010 (see Figures 5 and 6). As a share of energy, natural gas is projected to nearly double, and nuclear will quadruple, but combined these will comprise only 5% of total energy supply in 2010. Hydropower will increase by approximately 20%, and surpass oil as the second largest source of energy by 2010. Non-hydro renewable power sources will increase through 2010, but play only a minor role in the energy supply system.

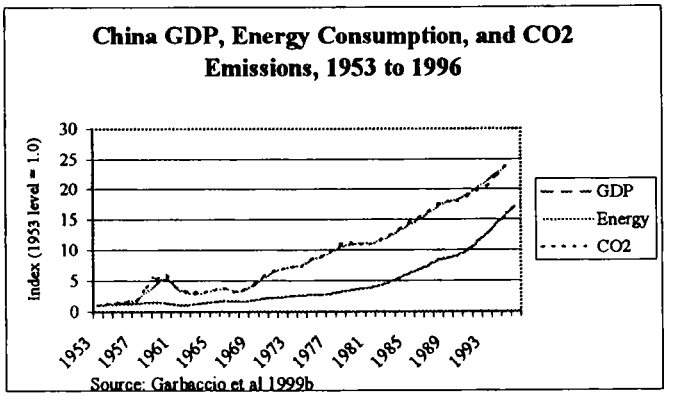




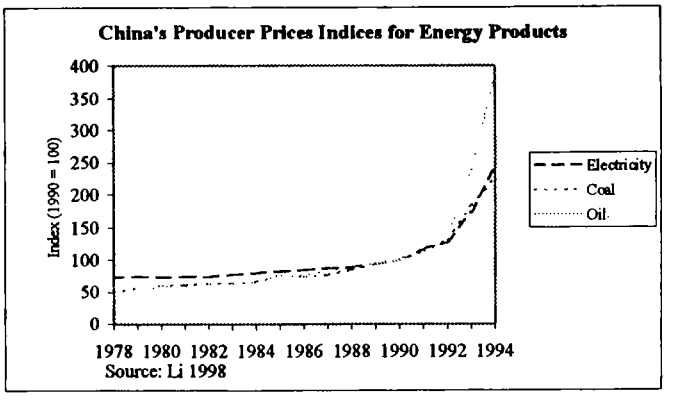
Prior to the late 1970s, the relationship between energy consumption and GDP was not stable over time (Figure X). However, since the implementation of market reforms in the late 1970s, the energy-to-GDP ratio has fallen significantly despite rising economic growth. While most developing economies have income elasticities of energy consumption of approximately 1.0 (or higher), China's over the past twenty years has averaged about 0.5 (Zhang 1999; IEA 1998). The current energy-to-GDP ratio is at its lowest point in China since the late 1950s (Garbaccio et al 1999b). Recent analysis of this trend in the energy-to-GDP ratio indicates that most of the improvement reflects within-industry technological change as opposed to structural change (Garbaccio et al 1999b).



Over the past 45 years, energy use and carbon dioxide emissions have grown more than GDP (Figure X). Specifically, carbon dioxide emissions and energy consumption track each other very closely. However, as reflected in Figure X, the improvement in the energy-to-GDP ratio over the past two decades reflects the much faster growth rate in GDP than in energy use and carbon dioxide emissions since 1978.



Energy subsidies in China have fallen over the past two decades, and the increase in energy prices is evident in the producer price indices for oil, coal, and electricity (see figure X). Zhang (1999) notes that the subsidy for coal has fallen from 61% in 1984 to 29% in 1995, while the petroleum subsidy has fallen from 55% in 1990 to 2% in 1995. However, the World Bank (1997b) estimated that for 1995-1996, China's energy subsidies averaged 20%. Li (1998) reports that the government still sets a plan energy price for industrial users that supply energy through the state plan, but market prices for other users. This transition to energy prices that better reflect supply and demand has helped contribute to China's improving energy efficiency (Zhang 1999).



II. Opportunities to Participate in Kyoto Flexibility Mechanisms

The Kyoto Protocol establishes three mechanisms that, if designed and implemented efficiently, could provide the foundation for a global emissions market. Through international emissions trading (Article 17), joint implementation (Article 6), and the Clean Development Mechanism (Article 12), an economic value would be assigned to an emissions reduction through a market.

Since greenhouse gas emissions have the same climatic consequences regardless of where in the world they occur, the least-cost approach to addressing the risks of climate change would be to reduce emissions wherever such reductions are cheapest. This uniform climatic effect of an emissions reduction implies that emissions abatement has the economic property of a commodity. This facilitates the evolution of a market, where entities that demand emissions abatement (e.g., those with high abatement costs) can funnel capital and/or technology to suppliers of abatement. In such a market, countries with low emissions abatement costs could take advantage of the opportunity to "produce" emissions abatement and to export these abated emissions, as certified emissions reductions or tradable allowances, at lower costs than other, higher-cost countries. Just as in the production of other commodities, low-cost producers could attract foreign direct investment to finance their export industry.

This potential evolution of an international emissions market reflects some of the experiences and lessons learned from the international trade in a variety of goods and services. The concept of gains from trade in emissions allowances is the same as it is for trade in goods and services. For example, Frankel (1999) notes that developing countries could "specialize in installing clean new-technology power-generation capacity, while industrialized countries specialize in producing the capital goods that go into those plants" (p. 4). Toman et al (1998) also note that "[t]hose countries which find themselves with lower abatement costs and more generous emission ceilings can generate a valuable commodity to export" (p. 3). Thus, developing countries would export emissions abatement, and use their export revenues to import, among other things, these new energy technologies.

The gains from trade in emissions allowances occur as a result of the large differences in marginal abatement costs across countries. Weyant and Hill (1999) note that "if the marginal cost in any country participating in a trading regime is higher than in any other participating country, it is advantageous to both countries for the higher cost country to buy emissions rights at a price that is between the two marginal costs" (p. xvii). However, before reviewing the estimated marginal costs across countries, it is important to understand how the Kyoto Mechanisms, specifically international emissions trading and the Clean Development Mechanism, could serve as the necessary foundation of an international emissions market.

A. International Emissions Trading

Articles 3 and 17 of the Kyoto Protocol allow countries with binding targets to lower the cost of meeting their targets by participating in international emissions trading. These binding targets take

the form of an "assigned amount" – the number of metric tons of greenhouse gases (counted in carbon dioxide equivalent) that may be emitted by sources within the country during the five-year commitment period running from 2008 through 2012. In emissions trading, one country transfers part of its assigned amount to another. This transfer of assigned amount lowers the number of tons of greenhouse gases that the first country may emit between 2008 and 2012, and raises the number of tons that the second country may emit by an equal amount. It is useful to think of each one-ton unit of assigned amount as a tradable allowance for one ton of emissions that may be transferred between countries.

Because the cost of controlling greenhouse gases differ by many times from country to country, emissions trading will allow substantial gains from trade in meeting the Kyoto targets. Countries that have relatively inexpensive ways to control greenhouse gases have incentives to reduce emissions by more than their targets require, because they can sell tradable allowances that they will not need to others. Countries facing the most expensive control measures have incentives to buy less costly allowances from others, and thereby increase the amount they may emit. Since greenhouse gases are global pollutants, the environmental impact of reducing them is the same no matter where the reductions take place. The same overall reduction is achieved, total costs are reduced, and both buyers and sellers gain from the savings allowed by trading.

A country that wants to increase the number of tons of greenhouse gases that it is allowed to emit would seek out other countries that are willing to sell some of their tradable allowances. Buying and selling countries could arrange their transactions directly or use brokers or exchanges. Because of the voluntary nature of trading, a selling country would engage in a trading transaction only if it makes that country better off.

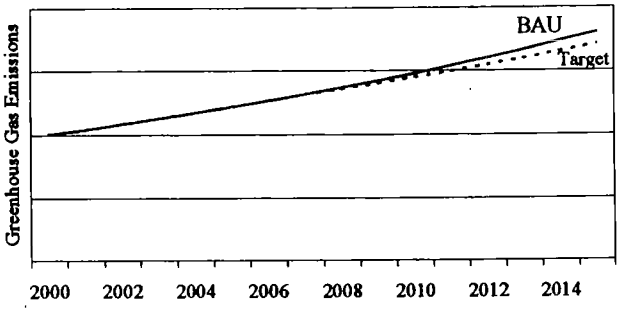
In addition to trading at the governmental level, some countries (including the United States) plan to use both domestic and international emissions trading at the company level as part of their program to meet their Kyoto commitments. Companies and other legal entities subject to these domestic trading programs (integrated with the international trading system) would have strong incentives to look constantly for innovative ways to abate their greenhouse gas emissions. Those who found inexpensive opportunities to abate their emissions could sell the allowances they do not need to other companies or countries who face higher costs. Further, some companies that have climate-friendly technology may find it cost-effective to transfer this technology to facilities in a low-cost abatement country in return for tradable allowances. These tangible rewards for innovation should provide the incentive for research and development and subsequent technological breakthroughs (Petsonk et al 1998).

As stated above, the Kyoto Protocol stipulates that countries must have an emissions target to engage in international emissions trading. Since the Kyoto Conference, several non-Annex I countries have expressed an interest in adopting emissions targets. Consistent with the Framework Convention on Climate Change, targets for non-Annex I countries should help promote their sustainable development. To do so, such targets should accommodate emissions growth. Unlike most Annex

B targets, which were set below most countries' current emissions levels, such a target for non-Annex I countries would be set above current emissions levels. To contribute to the international effort to address climate change risks, it would also be desirable for such targets to result in real abatement in emissions below levels that would otherwise occur during the commitment period – that is, below the projected business as usual (BAU) emissions level. This kind of target, often referred to as an emissions growth target, would provide for continued economic development but with a lower emissions growth rate.

If developing countries were to agree to binding limits, even if they involved only small cuts below Business as Usual (BAU) in the first budget period, then such targets, with trading, would imply gains for their economies and gains for the environment. Figure X provides an illustration of an emissions growth target. Such a target could be expressed as some percentage of a base year, in a similar fashion to Annex B targets, but with a different base year and a percentage greater than 100% to account for emissions growth.

Illustration of a Developing Country Growth Target



An emissions target could also take alternative forms. Some have expressed concerns about the uncertainty associated with business as usual emissions projections (Baumert et al 1999). A country that takes on a commitment for the 2008-2012 period that is fixed *now*, faces the risk, for example, that its economy will grow more rapidly than expected, resulting in an inadvertently stringent target. Alternatively, a country's economy could grow less rapidly than expected, resulting in an inadvertently lax target. There are, however, ways of designing targets to reduce uncertainty and mitigate these risks. In particular, targets could be indexed to future values of economic and other, possibly demographic, variables.

A target could, for example, be indexed to a country's economic performance between now and the start of the 2008-2012 commitment period (Frankel 1999). This approach is used in the private sector, where contracts are frequently indexed. This approach is also used in the public sector (e.g., the U.S. government provides cost-of-living adjustments for social security recipients). A target could then be specified in a way that depends on the future values of economic variables, such as GDP. For example, Baumert et al (1999) have argued for a carbon-to-GDP intensity measure as an appropriate form of developing country commitment. Zhang (1999) has specifically discussed a greenhouse gas emissions per unit GDP measure as the basis for a voluntary commitment by China around 2020.

Such targets would avoid the risk of inadvertent stringency associated with higher than projected economic growth between now and the beginning of the commitment period in 2008. Non-Annex I countries would face only the much smaller risk that emissions would be higher than expected, *given*

the economic conditions realized in 2007. Similarly, such targets would also avoid the risk of inadvertent laxness associated with lower than expected economic growth between now and the start of the commitment period.

B. The Clean Development Mechanism

The Clean Development Mechanism was incorporated in the Kyoto Protocol to 1) promote sustainable development; 2) contribute to the Framework Convention's climate objective; and 3) to assist Annex B parties in complying with their commitments (Toman et al 1998). The CDM allows for developed and developing countries to work together to design and implement projects in developing countries that abate greenhouse gas emissions from what they would have been otherwise. These projects must undergo a review process to certify the emissions reductions. In addition, a portion of the proceeds from the project must be used for an adaptation fund for low-income countries especially vulnerable to climate change and for administrative costs of the CDM.

An example, step-by-step, of a CDM project design, approval, and implementation process

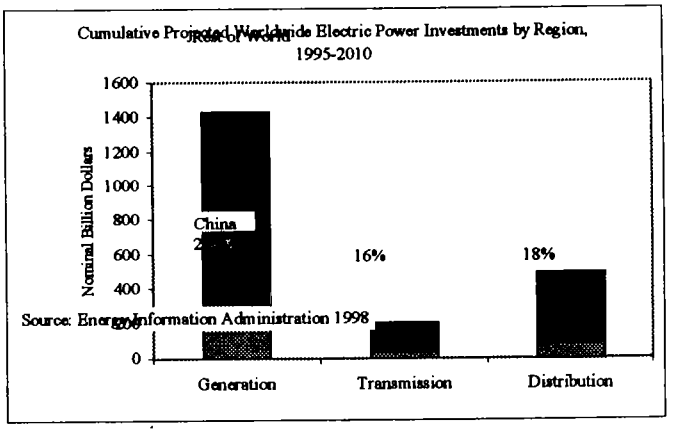
In addition to firms in developed and developing countries working together to design and implement specific projects, some have suggested that governments could cooperate to design project "fast-track" processes, or even sector-oriented efforts (Chayes 1998). To reduce some of the transaction costs associated with participating in the CDM, two countries could design a fast-track process that makes the project approval process more transparent to the private sector and simplifies the rules for approval. Alternatively, a developing country could consider designating an entire sector a CDM "project". For example, a country could identify a business as usual emissions forecast for its power sector, set this as an implicit sector-wide emissions target, and attract investment for projects and policies that abate the emissions from electricity generation.

However, even these efforts to promote sustainable development by increasing the number of CDM projects probably would not compare to the likely volume of capital and technology flows expected for a country with an emissions target that is actively participating in international emissions trading. The CDM carries with it several transaction costs, such as project approval and certification, the adaptation charge, and a charge to cover administrative expenses, that reduce the potential cost-effectiveness of this approach relative to a less-burdened trading system. It should also be noted that non-Annex I countries that adopt emissions targets could be able to participate as a host to CDM projects until the beginning of the commitment period, at which time, it would participate in international trading.

III. Economic Gains from Clean Development Mechanism and Emissions Trading

A variety of economic models have been developed throughout the world that can evaluate the potential economic gains from trade in emissions allowances. These economic tools effectively model trade in emissions as if they were any other internationally tradable commodity where both production costs and demand vary across countries. However, before reviewing the summary of model results for China, it may be useful to consider some relevant statistics regarding China's projected energy trends. These data will facilitate an understanding of and provide some context for the model results presented below.

A. Illustrative Energy and Economic Statistics



While China's economy is not expected to grow as fast in the future as it has in the past twenty years, it is still expected to grow at a strong pace. The International Energy Agency (1998) projects China's economy will grow 5.5% for the 1995-2020 period, and X projects economic growth of Y, while IEA projects OECD countries GDP to grow on average about 2% over this time period. Because of the higher growth rate, China has more opportunities than many OECD countries to reduce emissions relative to baseline projections by installing new carbon-efficient plants and adopting other new technologies. In contrast to retrofitting existing plants, new investment in carbon-efficient plants is a less costly approach to abate emissions.

The faster economic growth expected in China implies a higher rate of investment than most OECD countries. For example, investments in electric power generation in China are projected to comprise nearly ¼ of total world generation investment between 1995 and 2010 (see figure X). Many of these Chinese investment projects are likely to increase total generation, while a larger share of OECD investments will likely replace existing power plants. Current Chinese coal plants are about 25 to 33% less efficient than developed countries' coal plants (Fang et al 1998). Investing in power technologies with comparable efficiencies to developed countries' plants could significantly reduce Chinese emissions per unit of electricity generated. Further, one out of every six dollars expected to be invested in transmission systems around the world will be spent in China through 2010. Improving transmission efficiency in China – where transmission losses are twice those found in developed countries and can range up to 30% (Ni and Nien 1998) – through these investments can further reduce emissions per unit of energy consumed.

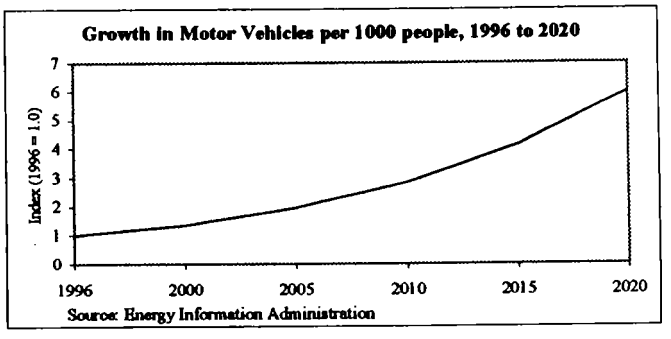
Differences in energy efficiency between China and developed countries also exist in various industrial sectors. Table X illustrates some of these differences in industrial production activities. As these

industrial sectors in China evolve, new investment could be leveraged by the value derived from generating emissions abatement to install more advanced, higher efficiency production technologies.

Table X. Comparison of Physical Energy Efficiency in Industrial Production between China and Western Countries

Production Activity	China	Western Countries
Industrial Boiler	55-60%	75-80%
Industrial Furnaces	20-30%	50-60%
Thermal Electrical Power	25-30%	35-40%
Steel Industry	1.0 tce/ton of output	0.7 tce/ton of output
Synthetic Ammonia	2.1 tce/ton of output	1.15 tce/ton of output
Cement	0.2 tce/ton of output	0.13 tce/ton of output

Source: Fang et al 1998, p. 125.



As per capita incomes continue to rise in China, the number of motor vehicles per capita is projected to increase much faster. Between 1996 and 2010, motor vehicles per capita is projected to triple, and then double again by 2020 (EIA 1999). Since Chinese fuel intensity in highway transport is 25% higher than in developed countries, and domestic-made vehicles consume 30-40% more fuel than comparable import vehicles (Lin and Polenske 1998), this growth in vehicle usage could significantly increase emissions. However, this differential in fuel economy also illustrates another potential opportunity to improve energy efficiency as the transportation sector continues to expand.

These various economic and energy statistics for China illustrate some of the differences between China's and developed countries' energy economies. This sample of statistics demonstrates qualitatively the potential opportunities for investment in China, through international emissions trading and the Clean Development Mechanism, to abate greenhouse gas emissions. For a more formal overview of these potential opportunities, results from economic models are presented.

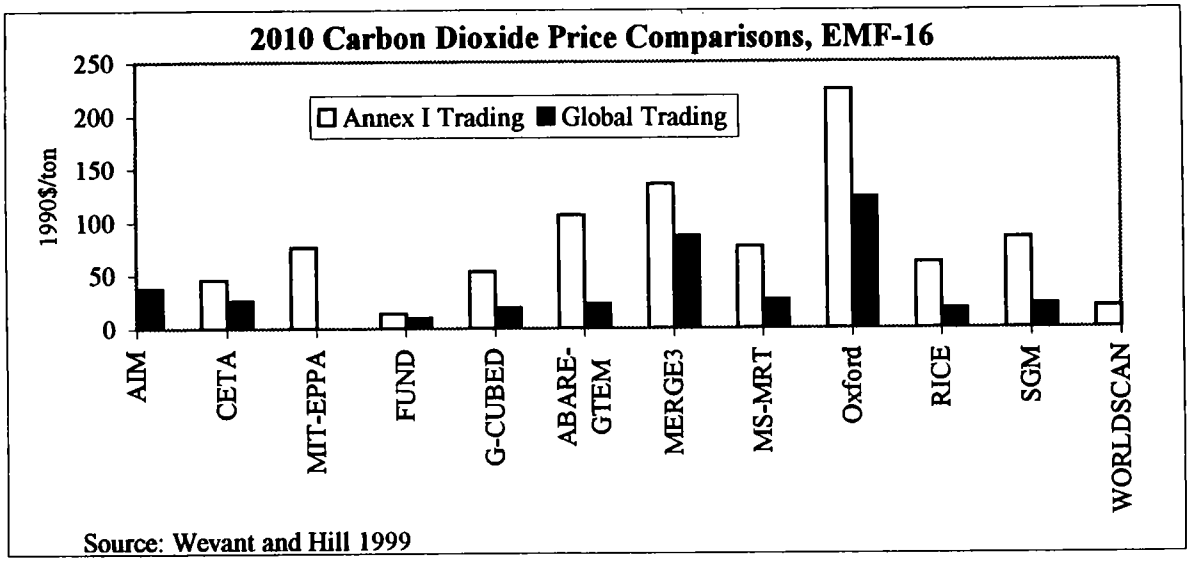
A variety of international energy-economic models have been used to evaluate the potential economic implications of the Kyoto Protocol. For example, the Stanford University Energy Modeling Forum coordinated a modeling comparison exercise involving 13 models developed by teams in Europe, the United States, Asia, and Australia. Further, the Organisation for Economic Cooperation and Development (OECD) hosted a workshop in 1998 where 9 modeling teams presented their assessments of the Kyoto Protocol. These models assess the projected marginal cost of abating carbon dioxide across countries and then estimate the extent of buying and selling in an international emissions market until no further economic gains can be achieved through subsequent trades – i.e.,

they find the market clearing price for an emissions allowance. These models provide estimates of marginal cost (e.g., the price of a tradable allowance or a CDM certified emission reduction), emissions abatement by country, capital transfers by country, and measures of total economic cost (or benefit for some countries that are net exporters of emissions allowances).

B. Illustrative Modeling Results

A large number of energy-economic models have evaluated the potential economic effects of an international emissions market under the Kyoto Protocol. Most of these models evaluate the potential emissions abatement in a country by assuming that such abatement occurs at least-cost. This effectively represents the effects of a domestic tradable permit system or a domestic emissions tax. In the case of China, emissions abatement is assessed in these models assuming that the incentive to abate is provided through an instrument comparable to the U.S. sulfur dioxide trading system, but where carbon dioxide is traded, or some of China's pollution discharge fees (Panayotou 1998), but where carbon dioxide is taxed. Since a project-oriented approach may not deliver least-cost abatement first like a tradable permit or tax system, some have argued that model results of emissions abatement at a given price for developing countries can serve at best as an upper bound on the volume of emissions abatement produced by these countries through the CDM (MacCracken et al 1999). Indeed, given the complexity of the CDM, some have made the assumption that a developing country would only be able to generate 15% the emissions abatement through the CDM that it would by adopting an emissions target set at 2010 business as usual and engaging in international emissions trading (Manne and Richels 1999). Thus, the model results presented below represent the potential under an efficient international trading system and serve as an upper bound on the potential volume of emissions abatement that could occur through the Clean Development Mechanism.

To evaluate the international emissions market under Kyoto, energy-economic models are designed to assess marginal costs across countries given the emissions targets established in Annex B of the Protocol. These models then estimate market clearing prices for an emissions allowance (the economic value of a ton of carbon) in various trading scenarios. In scenarios involving non-Annex I countries, these models assume that developing countries adopt emissions targets set at 2010 business as usual emissions levels and participate in international trading. Figure X presents results from 12 models that participated in the Stanford University Energy Modeling Forum Kyoto Protocol exercise (EMF-16).



While the price of a ton of carbon may vary across models, several common lessons can be drawn from these results. First, gains from trade, especially in expanding trading from Annex I countries to all countries, can be substantial. All the models found that marginal and total costs fell going from Annex I to global trading, because developing countries can undertake low-cost emissions abatement and sell their emissions abatement to OECD countries. Second, higher rates of economic growth in OECD countries increase demand for emissions allowances, while higher rates of economic growth in developing countries create more opportunities to substitute carbon-lean technology, and thus increase supply of low-cost emissions abatement. Third, countries with larger coal shares of total energy have more opportunities to abate emissions through energy efficiency and fuel switching that countries with smaller coal shares do not have. Including these countries with larger coal shares in international emissions trading can further reduce the cost of a ton of carbon (Bernstein et al 1998).

These model results provide illustrations of the possible characteristics of an international emissions market. What kind of role can China play in this emissions market? Many of these models indicate that substantial emissions abatement can occur at very low cost in China. For example, Garbaccio et al (1999a) completed a recent evaluation of a carbon tax on the Chinese economy. Such a tax could mirror other emissions and pollutant charges in China. Garbaccio et al designed a X-sector computable general equilibrium model based on China's 1992 I-O tables. They estimated three streams of carbon taxes necessary to abate emissions 5%, 10%, and 15% below business as usual over a 40-year period (see table X). Revenues from the carbon tax were recycled to the economy by proportional reductions in labor and capital taxes, although given the higher rates of taxation on capital than labor, this recycling promotes investment. While GDP falls below projected business as usual in the first year of these three simulations, the investment induced by recycling results in GDP growth above BAU after the first year in all scenarios. In this model, China's emissions could be abated by 15% below business as usual at a cost less than $10 per ton, which is well below the estimated Annex I emissions allowances prices in the EMF-16 model results. In this analysis, before

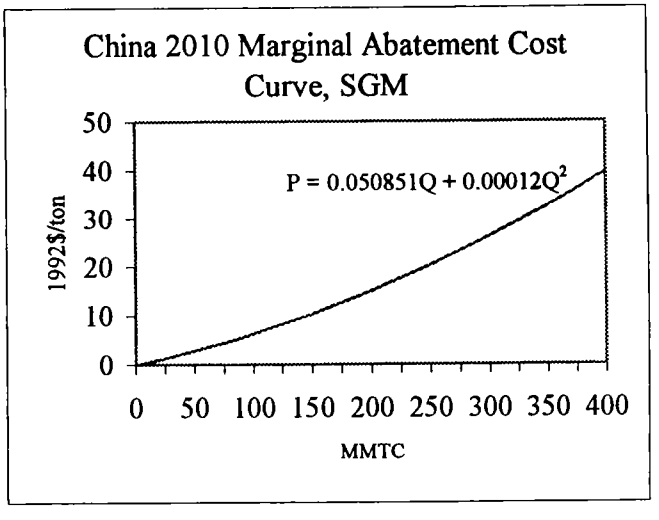
China exports one unit of emissions abatement, its economy is no worse off than before. Moreover, given the low marginal cost of abatement, every unit of abatement exported to an Annex I country under the 15% scenario would be profitable.

Table X. Garbaccio et al 1999a Results

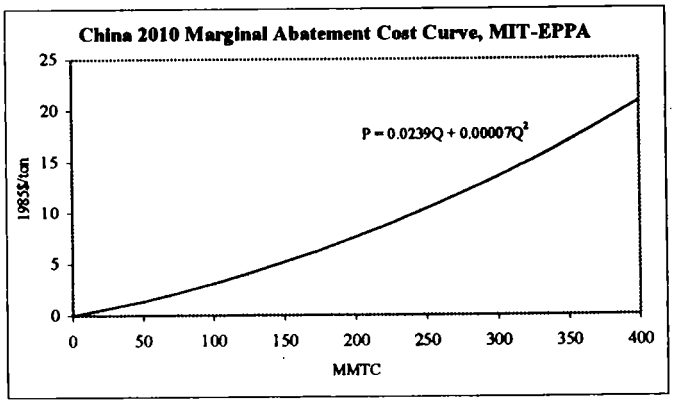
Emissions Abatement	5% below BAU	10% below BAU	15% below BAU
Price of Carbon	9 yuan/ton ($1.40/ton)	19 yuan/ton ($3/ton)	31 yuan/ton ($5/ton)
% Change in GDP	+%	+%	+%

A previous study by Zhang (1996) found that significant emissions abatement could also occur with relatively low carbon prices. Zhang designed a computable general equilibrium model of the Chinese economy, organized in 10-sectors based on 1987 I-O tables. While Garbaccio et al modeled the Chinese economy as a hybrid planned-market economy, Zhang modeled China as a fully market economy. He found that emissions could be abated to 20% below 2010 business as usual with a carbon tax of 205 yuan/ton ($18/ton), and 30% below 2010 business as usual with a carbon tax of 400 yuan/ton ($35/ton). These modest carbon prices generated very high GNP losses in Zhang's model, ranging between 1.5 and 2.8%. These results likely reflect only a partial, and less than optimal, recycling of carbon tax revenues to the economy, the more aggregated nature of the model (10 sectors versus 29 in the Garbaccio et al model), the full market nature of the representation of the Chinese economy (which would then not account for such characteristics of the energy sector as coal subsidies), and the older I-O table data. Other assessments of the Chinese economic potential to abate emissions illustrate that the costs are small, and clearly outweighed by export revenues.

For example, MacCracken et al (1999) employed the Second Generation Model (SGM) to evaluate the international emissions market assuming global participation. The SGM includes a China module, developed in coordination with Chinese energy-economic experts (see Figure X). They found that under global participation in the international emissions market, the price for a ton of carbon would be $26/ton (1992$), and China would find it profitable to abate 341 MMTC in 2010. With a target assumed to be set at 2010 business as usual, these 341 MMTC of abatement would be exported generating revenue equal to 0.3% of GDP.



Ellerman et al (1998) have also developed a global energy-economic model with a separate China module (see Figure X). In their assessment of global trading, they found that the market price for a ton of carbon would be $23.80 (1985$). At this price, China would find it economic to abate 436 MMTC in 2010. This estimate of emissions abatement is larger in absolute terms than the MacCracken et al estimate, but because Ellerman et al project a higher emissions growth rate for China, the projected abatement as a percentage of BAU is rather similar between these two models. If China had a target set at 2010 BAU, Ellerman et al estimate that it could export $10.4 billion in emissions allowances which would generate gains from trade of $6.2 billion.



Van der Mensbrugghe (1998) conducted several analyses of the Kyoto Protocol with the OECD's GREEN model. GREEN also includes a distinct China module. Van der Mensbrugghe found that under global trading, the international market price for a ton of carbon would be $19/ton (1985$). At this price, China would find it profitable to abate 228 MMTC. China would be able to export $4.3 billion in allowances under a 2010 BAU target. In this analysis, Van der Mensbrugghe assumed that China provided the incentive for in-country abatement through a carbon tax, revenues of which would comprise 1.4% of GDP. Moreover, by participating in the international emissions market, he found that China's GDP would increase 0.4% above 2010 BAU.

While not an explicit modeling exercise, the China Climate Change Country Study (CCCC; 1998) did evaluate several scenarios for emissions mitigation. The authors found that in its "policy" case, emissions could be abated over the next 3 decades such that 2030 "policy" emissions were 30% below 2030 business as usual emissions levels. Without accounting for any potential gains from exporting this emissions abatement, the authors found that this mitigation would not reduce economic output from the projected level.

While the modeling results reflect an efficient international emissions market, they do provide an upper bound on the potential from the CDM. As noted above, the CDM is project-oriented, and several of its attributes generate transaction costs relative to an efficient trading system. One international model developed by several Dutch analysts, WorldScan, has been modified to account for some of the characteristics of the CDM (Bollen et al 1999). While the analysts did not include an adaptation or administrative charge, or costs associated with project review and certification, they designed the model so that it would mimic the efforts of private firms to cost-effectively invest in large energy projects. Thus, CDM projects were analyzed only in the form of investments that alter the input intensities of existing production capacity or replace existing capital. With this assumption, and assuming no trading among Annex I countries, Bollen et al found that China could profitably

abate approximately 150 MMTC annually during the first commitment period through the CDM. The WorldScan model estimates that the price for the certified emission reduction would be $X/ton.

IV. Technology Diffusion with Kyoto Mechanisms

[Note: this section is still a work in progress. We would like to provide examples of technologies that could be deployed through participation in CDM and/or trading. These below are just some examples – ideas are solicited for which technologies to highlight and how to frame them.]

clean coal technology

Atmospheric Fluidized Bed Technology achieves thermal efficiency rates of 34-37% by combusting a circulating mixture of coal and gas. By injecting limestone directly into this process, the same amount of SO2 can be removed as will a traditional scrubber but at lower power costs (Fang, 1998).

Integrated Gasification Combined Cycle employs coal gasification along with gas turbines to achieve efficiency rates of 38-45% with SO2 removal technology in place (Fang, 1998).

renewable energy sources

China has extensive potential for the development of wind power especially along the coastline and in the north. Large scale wind projects could directly replace coal plant and can usually be brought on line within a year. China has at least two wind projects in effect now. One is an effort begun in the 1980s to subsidize rural elecrification which has generated 140,000 small systems, 15,000 technichians, and 42 Chinese enterprises engaged in wind power development. (Fang 1998)

Known geothermal reserves amount to approximately 3000 Mtce. The Yangbajing station of Tibet demostrates the potential of this technology. The plant takes advatages of underground water temperatures of 150-172C to generate an installed capacity of 25.2MW. The station supplies 60% of the electricity for the Tibet's capital Lhasa. (Fang 1998)

end-use energy efficiency technology

Before 1992, the Dalian Steel Plant in the Liaoning Province "newly cast ingots were allowed to cool to ambient temperature before being discharged into a soaking pit for the next stage" of production called blooming. The company carried our a project to discharge the ingots in a "hot state" for 750,000 yuan. The innovation saved 27% of the ingot heat and allowed a reduction in oil use of 2,000 tons of heavy oil annually. The project paid for itself in 6 months (Fang, 1998), but under a trading mechanism, this innovation would also generate emission credits.

coalbed methane recovery

transportation sector (?)

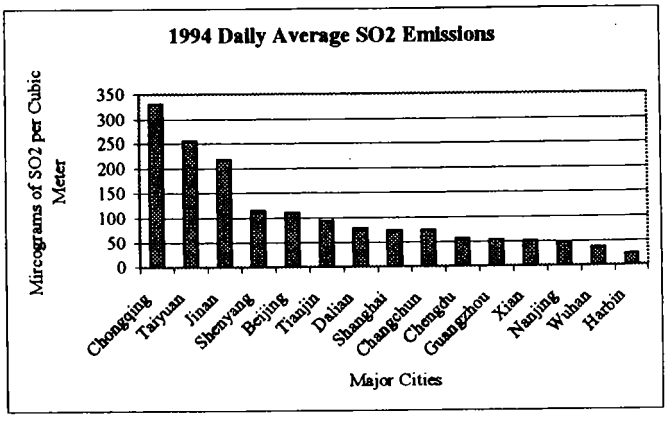
forestry project (?)

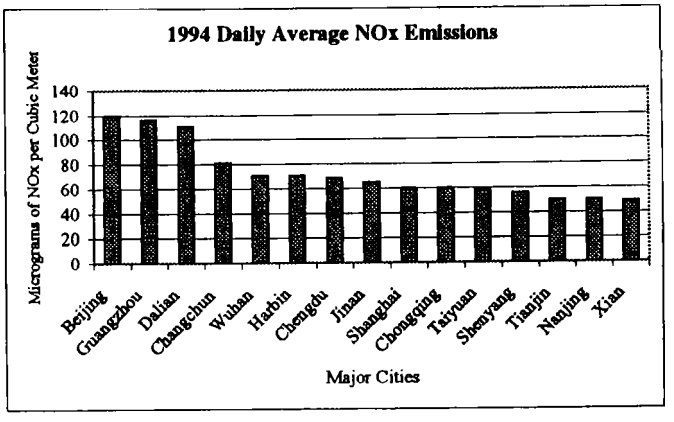
V. Local Air Quality Benefits from Abating Greenhouse Gas Emissions

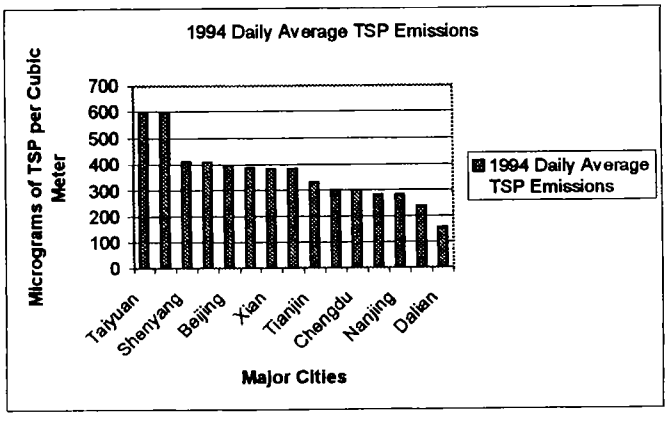
The same combustion processes that emit carbon dioxide and other greenhouse gases also generate numerous local air pollutants like sulfur dioxide and particulate matter. In its Report on the State of the Environment in China, the State Environmental Protection Administration noted that "atmospheric pollution results mainly from coal-burning" (SEPA 1998, p. 8). This is true for both global and local pollutants. By reducing carbon emissions through the use of coal substitutes and the adoption of more efficient coal combustion methods, China can simultaneously generate emission credits and improve the immediate quality of life of its citizens.

A. Local Air Quality

Local air quality is the most immediate environmental threat facing China. As figure X shows a number of China's cities regularly encounter more than 2 to 3 times the World Health Organization's recommendations for levels of sulfur dioxide (SO_2) and over 3 to 4 times the recommendations for total suspended particulates (TSP). These pollution levels and the health threats they engender make improvements in local air quality coterminous with carbon emission reductions under the Kyoto Protocol a compelling argument for participation in the emissions trading system through an emission cap or in flexibility mechanisms.







A recent years, the level of pollutants has stabilized (Figure X) due primarily to two countervailing effects (Florig 1997). First, more efficient power generation technology and the use of pollution control devices has reduced emissions from industrial sites. Second, household pollution, primarily a result of cooking and heating with coal, has increased substantially, leaving the total pollution levels constant. Estimates from the World Bank, however, expect particulate emissions to increase 39% between 1995 and 2010 and then decrease slowly there after (35% higher in 2020). They further estimate that household smoke will increase 90% between 1995 and 2020 and that SO_2 levels will increase by 150% (World Bank 199#). The difference in the trends between SO_2 and TSP

reflect the more widespread adoption of particulate removal technology versus clean coal technology and scrubbers. A more disturbing fact is that levels of indoor pollution are often higher then levels of out door pollution.

B. Costs of Local Air Pollution

A number of studies have analyzed the relationship between current high levels of local air pollutants and health problems. Xu Zhaoyi and associates at the Liaoning Public Health and Anti-Epidemic Station estimated that indoor and outdoor pollution cause 60% of urban chronic obstructive pulmonary disease cases (Florig, 1997). Research by Xu Xiping at the Harvard School of Public Health and his colleagues takes advantage of the unique structure of the Chinese public health system to demonstrate a relationship between levels of TSP and SO_2 and hospital visits (Xu et. al, 1995a; Xu et. al, 1995b). In one study, one-percent increases in SO_2 and TSP levels increased the number of non-surgical visits by 20% and 17% respectively. Xu Zhaoyi and Xu Xiping have also estimated the effects of pollution on mortality rates in Shenyang and Beijing respectively (Xu, 1998). Figures # and # demonstrate this relationship (charts coming). In Beijing, a doubling of SO_2 levels increased the mortality rate by 11% (a positive, but non-statistically significant relationship existed for TSP) while in Shenyang,1 mortality increased by 2% for each 100 $\mu g/m^3$ of SO_2 and by 1% for each 100 $\mu g/m^3$ for TSP. The World Bank estimates that the economic costs from only lost work hours, hospital and emergency room visits, and chronic bronchitis at $20 billion a year.

Researchers have also documented the effects of pollution on children. Liu Yulin of the Institute of Pediatrics in Beijing found that children's chances of contracting pneumonia doubled if they lived in a home with coal stoves or adults who smoked. He Qingci of the Wuhan Environmental Protection Institute showed that children from Wuhan's urban areas had lung capacities 5% smaller than children from the suburbs where outdoor TSP levels are 50% lower (110 $\mu g/m^3$ vs. 251 $\mu g/m^3$). Finally, Xu Zhaoyi found "up to four times more rhinitis, pharyngitis, and tonsillitis (inflammation of the mucous membrane, pharynx, and tonsils respectively) among children living in areas of heavier outdoor pollution" (Florig, 1997).

While these estimates demand consideration, they should be used with caution. This area of epidimiology has a relatively short history compared with other disciplines. As a result, many of the studies ignore the effects of pollution levels over time and may not adequately control for the presence of covariates that may magnify or diminish the effects of pollution levels on public health. This criticism withstanding, the Working Group on Public Health and Fossil-Fuel Combustion (1997) estimates the number of potential lives that could be saved from particulate matter alone through a 10% reduction from business as usual over the 2000 to 2020 period. Using estimates of the distribution of particulate matter in the United States, the authors project that 1.5 million premature deaths could be avoided in Centrally Planned Asia.2 Since the study assumes an immediate reduction

1 Note that Shenyang has the highest levels of TSP of all major cities. See Chart #.

2 Centrally Planned Asia includes China, Laos, North Korea, and Vietnam.

in the mortality rate after a reduction in PM concentrations, the actual number of premature deaths avoided may be beyond 2020. Additionally, the study does not account for other causes of death which brings into question the actual number of life-years these statistical lives represent. By assuming PM distributions similar to the United States, however, the authors underestimate the number of deaths because of China's higher reliance on coal and residential reliance on coal and biomass stoves.

C. Options for Carbon Dioxide Abatement and Local Air Quality Improvement

The future increases in pollution levels reflect the growth of numerous small pollution sources, including new power plants, household heating sources, and automobiles. China has set a goal of 95% electrification by the year 2000, and to that end, electricity capacity has increased by 200% between 1980 and 1994. Because Chinese generators tend to be small, to run for long life spans, and to have low efficiency levels, significant potential exists both to improve ambient air quality and to generate credits for carbon reductions under an emissions target. Even relatively simple policies like washing and screening coal could both improve air quality and generate more efficient power, reducing levels of carbon emissions (Murray and Rogers, 1998).

Similarly, to reduce congestion on public transportation and to improve commercial service, China has begun encouraging the use of automobiles. Between 1983 and 1990, the automobile stock increased from 1.8 million to 8.2 million and road transportation volume increased at an average annual rate of 13.5% for both passengers and freight while rail volume only increased 7.7% and 5.6% for passengers and freight respectively (Lin and Polensky, 1998). China's emissions standards and automotive technology are similar to those of the west in the 1970's; compared to foreign vehicles, Chinese vehicles emit "2.5 to 7.5 times more hydrocarbons, 2 to 7 time more nitrous oxides, and 6 to 12 times more carbon monoxide" (World Resources Institute 1998). These trends also offer substantial opportunities for simultaneous reductions in local air pollutants and carbon dioxide through stricter emissions standards, improved highway infrastructure, and the use of more recent automotive technology.

Finally, most Chinese residents rely on coal and biomass stoves for cooking and heating. These also constitute the main sources of indoor air pollution. If other energy options develop like natural gas or electricity, then the adoption of gas furnaces or electric appliances would provide an obvious route to reducing pollution levels. Absent these developments, however, options still exist. China's cities, for example, are very dense. This may allow a more centralized control of pollution emissions through large scale heating systems that service multiple housing units (Fang et. al, 1998).

The Chinese government could also pursue programs uniquely tailored to the conditions of various areas such as the very successful Chinese National Improved Stove Program. The stove itself featured an ash box to prevent spent fuel from obstructing the combustion of live fuel and a flue designed to remove pollutants from the cooking area. The stove achieved a 50% efficiency gain over standard models. By targeting distribution and advertising efforts at the county level, the government

ensured the acquisition of over 120 million stoves (Fang et. al, 1998). Other options include better insulation and promoting the use of honeycomb briquettes that have a 15% greater efficiency than standard coal briquettes (Fang et. al, 1998).

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Robert Lawrence, Joe Aldy - 8/6/99

- How do we get dev. countries to act like Annex I: ① - non-binding 1st period, binding 2nd period
② - Indexed targets (binding)
③ - "win only" targets
(% below BAU, but no penalty if you fail to comply) Basically this is a "country wide CDM". Similar to the Chayes idea of targeted industry idea nationwide. LDC would announce a target below BAU. ex: 8% growth BAU; 7% win only target, get bankable credits for anything below 7%. (No credit for 8% → 7% unless target is binding). Essentially an early credit program. (but need to analyze impact on permit prices in 2008.

Compliance
- Enforcement ideas - price cap on permits
- a country comes up short of target
- what about country that is not trading permits - what do you do with them if they don't meet their target.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
INTERNATIONAL ACTIVITIES

Date: **September 1, 1999**

Page(s): 5, including cover

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Subject: Memo from Bob Perciasepe and Bill Nitze, EPA re: China

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 1 1999

MEMORANDUM

TO: Frank Loy
Undersecretary of State

Robert Z. Lawrence
Member, Council of Economic Advisors

FROM: Robert Perciasepe
Assistant Administrator
Office of Air and Radiation

William A. Nitze
Assistant Administrator
Office of International Activities

RE: The Economics of Greenhouse Gas Emissions Abatement in China

We support the idea of engaging the Chinese at the highest levels on the issue of Chinese participation in the international effort to address climate change. We think an effective way to initiate an ongoing high level discussion of this issue would be to attach a short paper to the Vice President's letter, drawing from the CEA China paper. We feel strongly that U.S. analytical findings should be presented in a way which will resonate with the Chinese and speak to their domestic concerns. A suggested outline for such a paper is attached.

CEA has done an excellent job in pulling together the paper on climate economics in China. We hope that this document and others derived from it will form a major part of the US-China dialogue. We would suggest that providing a short paper to the Chinese at this time, in lieu of the full CEA paper, will be the most effective way to initiate a productive dialogue on the value of greenhouse gas goals among policy-makers. It is critical that Chinese experts have the opportunity to corroborate the potential benefits with their own economic analyses, leading to a productive high-level discussion of implications including areas of common interest.

We think it is important to present these ideas from the point of view of what is important to the Chinese. China has the opportunity to gain new resources for air pollution

mitigation and sustainable development by participating in global efforts to reduce climate change. We would begin the short paper with a portrayal of the costs of pollution to China and a sense of the technologies and investments that could sustain growth while improving the state of the environment. This approach would demonstrate how greenhouse gas mitigation strategies can add support and resources to actions needed to meet domestic priorities.

To that basic information we would add a summarized description of the additional gains the Chinese would accrue from participation in CDM and emissions trading, highlighting the idea that such participation would contribute fundamentally to Chinese economic modernization and providing some quantitative estimates of the potential for investment flows.

The cover letter conveying the short paper can strengthen our argument by describing key U.S. domestic actions on climate change, particularly in applying economic policies and instruments. The letter should also suggest follow-up actions, including the establishment of a high-level group to review the nexus of Chinese economic policy and mechanisms such as trading and CDM. In this way, we will build a greater degree of trust and confidence with the Chinese.

We look forward to discussing this approach further with you and others in the interagency group. We have already instructed staff to work with you in whatever way is necessary to convey this information, including producing a draft of our suggested paper by COB Thursday.

Attachment

cc: Ted Osius
Mike Orfini
Roger Ballentine
Joe Aldy

Outline for Short Paper to China

Basic Premise/Introduction

- The US and China are taking serious domestic actions to reduce the risk of global climate change (mention key actions).
- The US supports China's on promoting environmentally sustainable economic development.
- China has identified significant problems associated with air pollution from current patterns of energy production and uses. Air pollution is causing:
  - millions of illnesses and premature deaths among the Chinese people,
  - serious local and regional environmental damage, and
  - a significant "drag" on China's rate of economic growth.

  The US recognizes the priority China places on addressing these air pollution problems.
- China has the opportunity to gain new resources for air pollution mitigation and sustainable development (technology transfer and additional investment resources) by participating in global efforts to reduce climate change.
- The US proposes a process to bring leading experts from both countries together to seek consensus on the magnitude of the opportunity to attract new sustainable development resources through this means.
- China may be able to minimize its key air quality problems with solutions that also stimulate technology transfer and economic growth by participating in global efforts to reduce climate change.
- The US proposes a process to bring leading experts from both countries together to work on identifying areas of consensus and common ground for action by our two governments.

Human Health and the Environment - Public health and environmental damage from energy-related air pollution and other sources is a major and growing public policy concern in China. Many actions that reduce risks to human health and environmental would also reduce the risks of global climate change.

- The recent Asia Development Bank report on China documented the human cost of environmental pollution in terms of increased mortality and illness. (*Emerging Asia: Change and Challenges*. Asia Development Bank, Manila)
- China has identified its chief air quality problems as sulfur dioxide (SO2) and particulate matter (PM). World Bank (1997) has estimated the overall economic costs that SO_2 and PM pollution impose economic costs equal to 5 percent of GDP (World Bank 1997).
- It is possible to address these priority human health and environmental concerns in China while also reducing the risks of global climate change and stimulating the economy.
- The overlap between strategies to address China's priority human health/environment concerns and global climate change creates an opportunity to address multiple problems simultaneously, with increased effectiveness.

Investment Needs - To meet its sustainable economic growth goals, China has identified major industrial and energy infrastructure investment needs. Many of these investments would offer significant climate benefits. These benefits could enable China to generate additional flows of

investment capital and technology to accelerate sustainable development.

- Recent years have already shown rapid and dramatic improvements in the energy efficiency and carbon intensity of industry and energy infrastructure in China.
- China is planning to turnover and upgrade much of its industrial and energy infrastructure over the next two decades, offering substantial opportunities to reduce air pollution and to further slow the growth of greenhouse gases in China.
- Examples of projects which contribute economic, human health and climate benefits might include: 1) Liquid natural gas (LNG) infrastructure; 2) City-wide domestic/household heating; 3) more efficient motors; and, 4) renewable energy.
- These climate change benefits could result in significant financial flows to China.

Mechanisms to Address Climate Change - China has a major opportunity to use the proposed flexibility mechanisms of the Kyoto Protocol to increase investment and technology transfer to combat air pollution and promote sustainable development.

- CDM will provide significant opportunities for technology transfer and investment flows.
- An even larger flow of technology transfer and investment resources would be possible through international emissions trading, if China adopted a commitment to slow the growth rate of its greenhouse gas emissions.
- Preliminary estimates in the economics literature suggest that China could gain an additional technology transfer and investment flow of $__ billion per year.
- These additional resources would made available by Annex I countries that are already subject to emissions targets under the Kyoto framework, because they would benefit from the opportunity to reduce the cost of meeting those targets.

Commitment to Reduce GHG Emissions - The US wants to explore ways that China could frame a greenhouse gas emissions target that would increase technology transfer and investment resources available to China without inhibiting Chinese economic growth and development.

- A growth target -- with the amount of emissions indexed to the rate of Chinese economic growth -- could allow China to take full advantage of the potential benefits that emissions trading could offer.
- Under these circumstances, the United States could support the development of a growth target for China.

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BEIJING 01 OF 03 7082

USDOC FOR HBURROUGHS
TAGS: SENV, CH
SUBJECT: EPA TECHNICAL TEAM VISIT TO CHINA: 7/8-15/99
1. THIS CABLE WAS DRAFTED BY THE DELEGATION.

SUMMARY

2. THE US TECHNICAL TEAM VISIT JULY 8-15, 1999, DISCUSSED FOUR ONGOING TECHNICAL COOPERATION PROJECTS AND POSSIBLE ADDITIONAL AREAS FOR TECHNICAL COOPERATION. THE US PROPOSAL FOR A WORKSHOP ON PROJECT BASED CREDITING WAS REJECTED AGAIN. THE TEAM BELIEVES

THAT SDPC CONSIDERS ANY OFFICIAL COOPERATION WITH THE US ON CDM RELATED ISSUES TO BE A SIGNAL OF POLICY CHANGES FOR WHICH IT IS NOT YET PREPARED. IN ADDITION, NOW THAT WE HAVE A HIGH LEVEL BILATERAL STATEMENT OF INTENT, THE ONGOING TECHNOLOGY COOPERATION PROJECT IS BEING SLOWED SIGNIFICANILY AND MADE MORE COSTLY BY THE CHINESE SIDE. .AS A RESULT, THE TECHNICAL TEAM WAS NOT ABLE TO AGREE WITH CHINESE COUNTERPARTS ON A WORKPLAN FOR THE NEXT YEAR'S WORK AND WILL HAVE TO CONTINUE NEGOTIATIONS VIA FAX AND EMAIL. THE NATURAL GAS COOPERATIVE STUDY IS BEGINNING WITH A VERY SLOW START AND A REQUEST FROM CHINA FOR FAR MORE FUNDING THAN EPA BELIEVES IS NEEDED. THIS WILL ALSO REQUIRE FURTHER NEGOTIATIONS FROM WASHINGTON BY FAX AND EMAIL.

3. ECONOMIC AND ENVIRONMENTAL MODELING WORK AND THE PROJECT ON ASSESSMENT OF BENEFITS OF AIR POLLUTION AND PUBLIC HEALTH PROGRAMS WITH THE STATE ENVIRONMENTAL PROTECTION ADMINISTRATION (SEPA) ARE MOVING FORWARD CONSTRUCTIVELY. THE TECHNICAL TEAM IS CONCERNED, HOWEVER, BY A PROPOSAL FROM SDPC TO ENTER INTO A MORE FORMAL STATEMENT OF INTENT ON THE ECONOMIC WORK. BASED ON OTHER PROJECTS, THIS WOULD LIKELY SLOW THE WORK AND RAISE THE COST SIGNIFICANTLY.

4. SDPC APPEARS TO TAKE THE VIEW THAT ONCE PROJECTS ARE AGREED FORMALLY BETWEEN OUR GOVERNMENTS, THEY BECOME EFFECTIVELY STATEMENTS OF CHINESE POLICY. THEREFORE THEY ARE VERY CONCERNED ABOUT CONTROLLING AND PACING PROJECTS TO ENSURE THAT THEY DO NOT PRODUCE ANY RESULTS WHICH WOULD BE INCONSISTENT WITH CHINA'S POLICY POSITIONS. THIS PROBLEM IS MADE MORE DIFFICULT BY THE FACT THAT SDPC HAS A RELATIVELY SMALL STAFF (4 PEOPLE ON CLIMATE CHANGE) WITH A GREAT DEAL OF OTHER WORK. THE RESULT IS VERY SLOW PROGRESS ON CLIMATE CHANGE RELATED PROJECTS. THIS MAY IMPROVE OVER TIME AS WE WORK THROUGH THE INITIAL STAGES OF THE TWO FORMAL PROJECTS BUT IS NOT CLEAR. AS A RESULT, THE USG MAY NEED TO BE VERY CAREFUL ABOUT PUSHING ADDITIONAL JOINT TECHNICAL PROJECTS ON CLIMATE CHANGE THROUGH OFFICIAL CHANNELS.

OPENING MEETING WITH SDPC, JULY 8

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5. THE TECHNICAL TEAM VISIT BEGAN WITH AN OPENING MEETING WITH MADAM SUN CUIHUA, MR. MA AIMIN, AND MS LI LIYAN OF THE SDPC OFFICE OF NATIONAL COORDINATING COMMITTEE FOR CLIMATE CHANGE. US PARTICIPANTS WERE PAUL SCHWENGELS AND RICHARD GARBACCIO, USEPA, ROBERT BOYNTON AND STANLEY WATT, US EMBASSY, RON BENIOFF AND DEBRA LEW, NATIONAL RENEWABLE ENERGY LABORATORY (NREL), JEFFREY LOGAN, PACIFIC NORTHWEST NATIONAL LABORATORY (PNNL), AIMEE MCKANE, LAWRENCE BERKELEY NATIONAL LABORATORY (LBNL) AND PETER KEMENY, BURNS & ROE.

6. THIS MEETING TOUCHED ON A RANGE OF CLIMATE CHANGE TECHNICAL COOPERATION PROJECTS BETWEEN EPA AND CHINA:

1. THE CLEANER AIR AND CLEANER ENERGY TECHNOLOGY COOPERATION PROJECT
2. THE COOPERATIVE STUDY OF NATURAL GAS UTILIZATION IN CHINA
3. THE PROJECT TO ASSESS THE BENEFITS OF PROGRAMS TO REDUCE AIR POLLUTION AND PROTECT PUBLIC HEALTH.
4. ONGOING COOPERATION ON ECONOMIC AND ENVIRONMENTAL MODELING.

7. IN ADDITION, THE US TEAM RAISED AGAIN THE POSSIBILITY OF JOINT TECHNICAL WORK ON METHODS FOR PROJECT BASED GHG ACCOUNTING, AND FOREST PROJECTS FOR GHG REDUCTIONS. TWO COOPERATIVE PROJECTS

WERE PROPOSED DURING ADMINISTRATOR BROWNER'S VISIT IN MARCH, FOR POSSIBLE INITIATION AT THE CHINA-US FORUM ON ENVIRONMENT AND DEVELOPMENT IN APRIL. AFTER FAILURE TO ACHIEVE AGREEMENT ON SPECIFIC PROPOSALS, ADMINISTRATOR BROWNER PROPOSED A TECHNICAL WORKSHOP TO EXPLORE POSSIBLE COOPERATION ON THESE SUBJECTS.

8. THE SDPC PARTICIPANTS REJECTED THE IDEA OF A WORKSHOP ON PROJECT BASED CREDITING TOPICS. MADAM SUN STATED THAT THE US AND CHINA HAVE LARGE DIFFERENCES IN POLICY POSITIONS REGARDING CDM AND OTHER CREDITING MECHANISMS, AND WE ALREADY HAVE CHANNELS FOR DISCUSSION OF THESE ISSUES. SHE DID NOT RECOGNIZE ANY DISTINCTION BETWEEN TECHNICAL/METHODOLOGY WORK AND POLICY DISCUSSIONS. SHE REFERRED TO THE ONGOING HIGH-LEVEL POLICY DIALOGUE (AT THAT TIME SHE INDICATED THAT A MEETING MIGHT OCCUR

BEIJING 02 OF 03 7082

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ON JULY 19. NOTE: THE MEETING TO WHICH SHE REFERRED WAS A VISIT BY STATE U/S LOY TO BEIJING. THE VISIT HAS BEEN POSTPONDED TO THE FALL) AND INDICATED THAT THIS AS A SUFFICIENT CHANNEL FOR DISCUSSIONS ON PROJECT BASED CREDITING ISSUES. THE TEAM BELIEVES THATIT MIGHT BE MORE PRODUCTIVE TO INITIATE PROJECT BAED METHODS WORK INFORMALLY WITH TECHNICAL INSTITTIONS IN CHINA RATHER THAN ATTEMPTING TO PUSH AGEEMENT ON SUCH PROJECTS THROUGH OFFICIAL CHANNELS AT THIS TIME.

9. IN ADITION, SDPC PROPOSED THAT WE CONSIDER A FORMAL STTEMENT OF INTENT TO COVER OUR WORK ON ECONOMIC AND ENVIRONMENTAL MODELING. THE US DELEGATION AGREE TO CONSIDER THIS AND RESPOND LATER.

CLEANER AIR ANDCLEANER ENERGY TECHNOLOGY
COOPERATION (CACETC) POJECT MEETINGS

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10. BEGINNING LATE MORNING JLY 8 AND CONTINUING THROUGH JULY 13, THESE MEETINGS INCLUDED TWO WITH SDPC, AND A SERIES OF EXPERT MEETINGS ON SPECIFIC TECHNOLOGY AREAS. THREE REPRESENTATIVES OF THE CANADIAN GOVERNMENT PARTICIPATED IN THESE MEETINGS BASED ON THEIR INTEREST IN POSSIBLY JOINING THE PROJECT IN THE FUTURE. ALL MEETINGS WERE ATTENDED BY AT LEAST ONE SDPC REPRESENTATIVE. A NUMBER OF ADDITIONAL CHINESE AND US TECHNICAL EXPERTS AND INDUSTRY REPRESENTATIVES JOINED EACH EXPERT MEETING. SEVERAL

WORKPLANNING MEETINGS WERE ALSO HELD, INCLUDING NREL, TSINGHUA UNIVERSITY AND SDPC STAFFS.

11. THERE WAS A GREAT DEAL OF GOOD TECHNICAL DISCUSSION IN THE EXPERT MEETINGS AND A NUMBER OF VALUABLE SUGGESTIONS MADE REGARDING BARRIERS TO TECHNOLOGY TRANSFER AND POSSIBLE APPROACHES TO ADDRESS THESE BARRIERS.

12. THE FINAL MEETING WITH SDPC WAS CHAIRED BY MR. GAO GUANGSHENG, DIRECTOR GENERAL, OFFICE OF THE NATIONAL COORDINATION COMMITTEE FOR CLIMATE CHANGE. NOW THAT WE HAVE A VERY HIGH LEVEL

FORMAL AGREEMENT ON THIS PROJECT, SDPC IS TAKING A POSITION THAT RESULTS OF THE PROJECT REPRESENT GOVERNMENT POSITIONS, AND, THEREFORE, SDPC MUST MAINTAIN CAREFUL CONTROL OF THE PROJECT AT EVERY STEP TO ENSURE THAT IT PRODUCES ONLY THOSE RESULTS WHICH ARE CONSISTENT WITH CHINESE POLICY POSITIONS ON TECHNOLOGY TRANSFER.

13. THIS IS REFLECTED IN SEVERAL CLEAR DISAGREEMENTS BETWEEN THE US AND CHINESE SIDES ABOUT NEXT STEPS IN THE PROJECT. FIRST, SDPC WANTS TO SLOW THE PACE OF THE WORK. THE US PROPOSES TO CONTINUE WORK ON FOUR TECHNOLOGY AREAS IDENTIFIED IN THE STATEMENT OF INTENT, AND POSSIBLY ADD OTHERS, WHILE SDPC PROPOSES TO SELECT ONLY TWO OF THE TECHNOLOGIES FOR WORK IN THE FIRST YEAR WITH OTHERS TO BE ADDED LATER. THE US (AND CHINESE) EXPERTS HAVE IDENTIFIED A WIDE RANGE OF BARRIERS TO AND ACTIONS WHICH COULD PROMOTE EACH TECHNOLOGY, INCLUDING CAPACITY BUILDING, TECHNICAL ISSUES, POLICY.REFORMS AND INVESTMENT NEEDS. SDPC IS SIGNALING THAT DOMESTIC POLICY REFORMS SHOULD NOT BE INCLUDED AND THAT IT IS MOST INTERESTED IN TECHNOLOGY EXAMPLES WHERE CHINA CAN ARGUE THAT THE US SHOULD PROVIDE ADVANCED TECHNOLOGY AND TECHNICAL INFORMATION ON "PREFERENTIAL TERMS". FINALLY, THE SDPC AND TSINGHUA UNIVERSITY PARTICIPANTS ARE ARGUING THAT MORE FUNDING IS REQUIRED FROM THE US TO CARRY OUT THIS PROJECT. WE HAVE PROPOSED TO TRANSFER US$100,000 TO TSINGHUA UNIVERSITY IN THE FIRST YEAR AND TO PROVIDE SUBSTANTIAL ADDITIONAL SUPPORT THROUGH NREL AND OTHER US TECHNICAL EXPERTS FROM LABORATORIES AND CONSULTANTS. THIS IS A LARGER DIRECT SUPPORT THAT THE TECHNOLOGY COOPERATION AGREEMENTS PILOT PROGRAM (TCAPP) IS PROVIDING TO ANY OF THE OTHER 5 COUNTRIES CURRENTLY WORKING ON SIMILAR COOPERATIVE PROJECTS. THE CHINESE SIDE IS INDICATING THAT THIS IS NOT AN ADEQUATE AMOUNT OF FUNDING EVEN TO WORK ON TWO TECHNOLOGY AREAS.

14. THIS SERIES OF MEETINGS ENDED WITH AN IMPASSE. WE WERE NOT ABLE TO AGREE ON A WORKPLAN FOR THE NEXT YEAR'S WORK BECAUSE OF DISAGREEMENTS OVER THE NUMBER OF TECHNOLOGIES TO BE ADDRESSED AN] THE FUNDING TO BE PROVIDED. THE US DELEGATION AGREED TO TAKE TH] CHINESE PROPOSAL BACK TO WASHINGTON FOR DISCUSSIONS WITH EPA MANAGEMENT AND OTHER AGENCIES, AND TO PROVIDE ADDITIONAL COMMENT AND PROPOSALS OVER THE NEXT FEW WEEKS.

15. NATURAL GAS PROJECT MEETINGS: TWO MEETINGS (JULY 8 AND 13). WERE HELD WITH MR. ZHANG YUQING, DEPUTY DIVISION CHIEF, DEPARTMENT OF ECONOMIC FORECAST, SDPC WHO HAS BEEN IDENTIFIED AS

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SUBJECT: EPA TECHNICAL TEAM VISIT TO CHINA: 7/8-15/99
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THE POINT OF CONTACT FOR THE NEW PROJECT "COOPERATIVE STUDY OF NATURAL GAS UTILIZATION IN CHINA". THIS PROJECT IS GETTING STARTED MORE SLOWLY THAT THE US HAD HOPED AND MAY ALSO BE DIFFICULT TO IMPLEMENT. THE MEETINGS WERE A LITTLE MORE FORMAL AND DELIBERATE THAN WE HAD HOPED AND MADE LESS PROGRESS. THE SECOND MEETING WAS JOINED BY TWO REPRESENTATIVES OF THE UNIVERSITY OF PETROLEUM, BEIJING, WHICH WAS IDENTIFIED AS THE TECHNICAL LEAD ORGANIZATION FOR CHINA. THESE EXPERTS PRESENTED THEIR PRELIMINARY IDEAS ABOUT A WORKPLAN AND BUDGET WHICH APPEAR TO LEAN TOO FAR TOWARD RESEARCH AND AWAY FROM POLICY

RECOMMENDATIONS. THE BUDGET REQUESTED FOR THE CHINESE TECHNICAL TEAM IS ALSO FOUR TIMES WHAT EPA HAD BUDGETED. WE HAVE IDENTIFIED THESE DIFFERENCES OF VIEWS IN A PRELIMINARY WAY AND AGREED THAT PNNL (THE US TECHNICAL LEAD INSTITUTION) WILL WORK WITH THE UNIVERSITY OF PETROLEUM TO TRY TO DEVELOP A CONSENSUS JOINT PROPOSAL.

ECONOMIC AND ENVIRONMENTAL MODELING

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16. ON JULY 14, THE US TEAM MET WITH ZHOU DADI, DEPUTY DIRECTOR, AND SEVERAL OTHER STAFF OF THE ENERGY RESEARCH INSTITUTE (ERI) OF THE SDPC. PHILIP TSENG OF US DOE, (IN BEIJING TO CONDUCT TRAINING ON THE MARKAL/MACRO MODEL AT TSINGHUA UNIVERSITY), AND STANLEY WATT OF THE US EMBASSY ALSO PARTICIPATED IN THE MEETING AT ERI. IN ADDITION, DURING THE WEEK, RICHARD GARBACCIO ALSO MET SEPARATELY WITH ECONOMIC MODELERS AT THE DEVELOPMENT RESEARCH CENTER (DRC) OF THE STATE COUNCIL, AND THE CHINESE ACADEMY OF SOCIAL SCIENCES (CASS). THESE MEETINGS WERE FAIRLY POSITIVE, DEVELOPING A NUMBER OF IDEAS FOR CONTINUE COOPERATION AND MODEL COMPARISON WHICH COULD LEAD UP TO ANOTHER WORKSHOP POSSIBLY IN EARLY 2000. AS A RESULT OF THESE MEETINGS, THERE IS A STRONG CONSENSUS AMONG THE US TEAM THAT IT WOULD BE BEST TO KEEP THE TECHNICAL AND METHODS COOPERATION AS INFORMAL AND EXPERT-TO-EXPERT AS POSSIBLE. INITIATING A STATEMENT OF INTENT WITH SDPC ON THIS WOULD LIKELY SLOW PROGRESS AND INCREASE THE COST.

17. IF THE US AND CHINA DISCUSS POSSIBLE JOINT POLICY STUDIES ON CLIMATE CHANGE, THIS WOULD NO DOUBT BECOME A MORE FORMAL AND CAREFULLY CONTROLLED PROCESS. EVERY EFFORT SHOULD BE MADE TO KEEP THE TECHNICAL/METHODOLOGY WORK SEPARATED FROM A POLICY INITIATIVE SO THAT WE CAN KEEP THIS RELATIVELY CONSTRUCTIVE TECHNICAL TRACK MOVING FORWARD AND CREATING A FOUNDATION FOR POSSIBLE POLICY CHANGES IN THE FUTURE.

18. AIR POLLUTION AND PUBLIC HEALTH PROJECT: ON JULY 12, PAUL SCHWENGELS, RICHARD GARBACCIO AND JEFFREY LOGAN MET WITH MR. LUO YI, DIRECTOR, SCIENCE AND TECHNOLOGY DIVISION, SEPA WHO HAS BEEN IDENTIFIED AS OUR GOVERNMENT CONTACT FOR THE "COOPERATION TO ASSESS BENEFITS OF PROGRAMS TO REDUCE AIR POLLUTION AND PROTECT PUBLIC HEALTH". THIS MEETING WAS ALSO ATTENDED BY OTHER SEPA STAFF AND DR. LIU XIANDE OF THE NATIONAL RESEARCH CENTER FOR ENVIRONMENTAL ANALYSIS AND MEASUREMENT. THIS MEETING WAS VERY POSITIVE, INCLUDING A FAIRLY DETAILED TECHNICAL DISCUSSION. SEPA INDICATED STRONG SUPPORT FOR THE PROJECT AND SOME EXPERTISE IN THE TECHNICAL ASPECTS OF THIS WORK. BOTH SIDES AGREED TO EXCHANGE WRITTEN MATERIALS AND TO WORK TOGETHER CLOSELY ON DESIGN AND IMPLEMENTATION OF REMAINING STEPS IN THE PROJECT.

19. US BUSINESS REPRESENTATIVES: ON JULY 14, PAUL SCHWENGELS, RICHARD GARBACCIO, PHILIP TSENG, JEFFREY LOGAN AND DEBRA LEW MET WITH A GROUP OF US INDUSTRY REPRESENTATIVES AT A BREAKFAST MEETING WHICH WAS ARRANGED BY CHRISTOPHER ADAMS OF THE US EMBASSY AND PAMELA BALDINGER OF THE US-CHINA BUSINESS COUNCIL. THE MAJORITY OF THE PARTICIPANTS WERE FROM OIL AND GAS INDUSTRY AND THERE WAS A VERY USEFUL DISCUSSION OF CONCERNS OF US INDUSTRY ABOUT WORKING ON CHINA NATURAL GAS DEVELOPMENT, AND THE POSSIBLE WAYS THE NEW NATURAL GAS COOPERATIVE STUDY PROJECT COULD BE MOST HELPFUL. THIS DISCUSSION WAS VERY POSITIVE AND RESULTED IN A NUMBER OF CONCRETE IDEAS TO BE PURSUED IN THE STUDY PROCESS. INDUSTRY REPRESENTATIVES ALSO INDICATED A STRONG INTEREST IN PARTICIPATING AS REVIEWERS AND IN OTHER WAYS AS THE STUDY PROGRESSES. A FEW REPRESENTATIVES FROM OTHER ENERGY TECHNOLOGY AREAS HAD A DETAILED DISCUSSION OF THE CACETC PROJECT AND OTHER POSSIBLE TECHNOLOGY COOPERATION WITH DEBRA LEW AND PHILIP TSENG.

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WHITE HOUSE FOR COUNCIL ECONOMIC ADVISERS, YELLEN
WHITE HOUSE FOR OSTP, BEHRING
EPA FOR NITZE, GARDINER AND PERCIASEPE
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BEIJING 01 OF 10 16028

1. SUMMARY. On September 2, OES AA/S Melinda Kimble and members of the USG delegation to the first U.S.-China high-level climate change dialogue met with MOFA Treaties and Law Office Director-General Yin Yubiao and representatives from various Chinese ministries involved in climate change. The Chinese side reiterated familiar themes of developed countries' responsibility for the climate change problem, and the inability of developing countries to make international commitments on climate change and the need for technology transfer and capital assistance to developing countries. China, however, was making substantial efforts on its own to reduce emissions, including its population control programs.

2. The U.S. side discussed the U.S.'s positive experience in protecting the environment while achieving economic growth. The Kyoto Protocol was an excellent model for addressing climate change because it was comprehensive, including sinks as well as sources of greenhouse gases (GHG), and it provided important incentives for private sector to engage in technology

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transfer to reduce GHG emissions. Because technology was largely owned and developed by the private sector, it was important to create an environment to promote technology transfer. USEPA and USDOE officials outlined the areas of technological cooperation their agencies were pursuing with China that help address climate change.
END SUMMARY.

3. On September 2, OES AA/S Melinda Kimble and members of the USG climate change delegation met with MOFA Treaties and Law Office Director-General Yin Yubiao and representatives from various Chinese ministries involved in climate change. This meeting officially opened the first U.S.-China high-level climate change dialogue, as agreed to by President Clinton and President Jiang Zemin at the June Summit. (The inter-agency meeting at MOFA was followed by several additional meetings over two days with individual Chinese ministries.)

4. DG Yin opened the meeting by welcoming the U.S. delegation, and noting the importance that China attaches to climate change. He remarked that originally Vice Minister Yang Jiechi had wanted to participate, and had suggested the week of September 20. However, since the USDEL was only able to visit Beijing on September 1-2, Yin was representing VM Yang.

5. AA/S Kimble thanked Yin, and commented that President Clinton had made clear that environmental cooperation would be an important part of the U.S.-China relationship in the 21st century, and that there were many areas of potential cooperation. She pointed out that just as China has formed a climate change coordination group, the U.S. also has an inter-agency climate change policy-making process, and noted that her colleagues on the delegation represented several of those agencies.

6. Yin explained the recent changes in China's Climate Change Coordinating Group. State Development Planning Commission (SDPC) Chair Zeng Peiyan will be the new Chair, with the Group's coordinating office shifted from the China Meteorological Association to SDPC. (These changes are explained in detail in REFTEL.) Yin added that MOFA has responsibility for negotiations on climate change with other countries and is the focal point for other countries. (COMMENT: This remark may have been intended to express MOFA's dissatisfaction with the U.S. for arranging meetings with other ministries separate from the MOFA meeting. END COMMENT.)

BEIJING 02 OF 10 16028

7. Yin said the Chinese government believed climate change was a multilateral issue which should be settled through multilateral negotiations between developed and developing countries, as at last year's Kyoto Conference. China needed to coordinate its position with the G-77. However, China and the U.S. could exchange views to enhance their understanding of the issue.

8. Yin reviewed several issues of concern to China, which he said China has expressed in multilateral negotiations.

a) The UN Framework Convention on Climate Change (FCCC) and the Kyoto Protocol should be implemented in accord with the principle of common but differentiated responsibilities, and according to the capabilities of individual nations.

b) How to help developing countries realize sustainable development through addressing climate change.

c) How to enhance the capabilities of developing countries to address and adapt to climate change.

d) According to requirements of the FCCC, how developed countries can transfer technology to developing countries, including the establishment of a technology transfer mechanism.

e) How to develop new technologies, and in particular, how developed countries can help developing countries to develop new technologies.

f) Industrialized countries should provide capital assistance to developing countries to address climate change.

KIMBLE ON CLIMATE CHANGE AND ECONOMIC GROWTH

9. Kimble said that as the U.S. and China pursued cooperation, it was essential to understand our domestic political processes and political fora. Climate change was a problem which went into the heart of the development of our economies. If we were correct in our assessment of the problem, we had to change our economies in order to control greenhouse gas (GHG) emissions. At the same time, economic growth was essential for all economies. The U.S. believed it was essential to work together to find ways to grow our economies as well as control GHG emissions.

10. Kimble noted that the U.S. had pursued aggressive environmental protection measures for over forty years, and had increasingly found that environmental problems were often global and required global cooperation. A good example of U.S.-China environmental cooperation was under the Montreal Protocol on ozone protection.

11. Kimble remarked that climate change was a problem requiring global action and solution, but that the U.S. was in complete agreement with China that nations had common but differentiated responsibilities, and that it was important to recognize the unique circumstances each country faced in achieving sustainable growth and development. The U.S. was convinced that the Kyoto Protocol was an excellent model for the steps we needed to take on climate change. It was comprehensive, in that it included not just GHG sources, but also sinks. Under the Protocol, we could take credit for reforestation activities, which could also be used to protect watersheds, species habitat. Such efforts to improve use of land and water resources could help to control flooding such as that China and the U.S. had experienced.

BEIJING 03 OF 10 16028

KIMBLE ON FLEXIBILITY MECHANISMS

12. Kimble also spoke on two flexibility mechanisms contained in the Protocol: the Clean Development Mechanism and emissions trading, both of which could stimulate investment in developing countries. She noted that this is the first international agreement to potentially create economic incentives for international

environmental protection. She acknowledged that emissions trading is somewhat controversial as well as innovative, but stated that the U.S. has successfully pursued such an emissions trading system for four years to control sulfur dioxide. It was the most effective environmental regulatory program the U.S. has ever run, she said, and it was important to introduce this system to the international community.

13. Kimble added that it was important to get the implementation details right for these mechanisms, and not to foreclose options on emissions trading, in particular, before the Buenos Aires climate change conference (COP-4) in November. It would be helpful if China and the U.S. have a full understanding of each other's positions in order to streamline the negotiations between developed and developing countries in the FCCC process.

14. Regarding criticism, particularly in the media, over who has and has not done their share in reducing emissions, Kimble explained that the U.S. has taken significant action since we signed the FCCC in 1992 to reduce GHG emissions. However, faster economic growth and larger-than-expected energy consumption had influenced emissions growth. The President, however, has had several multisectoral initiatives to work on this problem, including in renewable and alternative energy, transportation and electricity restructuring. A new USD 6.36 billion investment in expanding these programs over the next five years will build a broader foundation for U.S. domestic action on climate change. At the same time, all countries must build political support for action on this issue.

15. Kimble noted that the U.S. and China had cooperated in many areas to address climate change, particularly in clean energy growth, improving the use of hydrocarbon fuels; clean coal; and developing renewable energy sources.

YIN: DEVELOPED COUNTRIES HAVE RESPONSIBILITY

16. Yin remarked that Kimble's comments had helped him to understand the U.S. position, and said the U.S. and China share some views, while on other questions they may differ. He then raised several questions on the implementing of the FCCC and the Kyoto Protocol according to the principles of common but differentiated responsibilities and the capabilities of the individual nations concerned. While the USDEL might have a clear picture already of China's views, he would repeat them since they were a matter of principle.

a) Whether GHG emissions are a major cause of climate change is a matter to be concluded by scientists.

b) The developed countries began emitting GHGs several hundred years ago during the industrial revolution.

c) Today, developed and developing countries both emit GHGs, but in two categories: for luxury and for survival, respectively.

d) Based on this knowledge, the FCCC provides for common but differentiated obligations.

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e) On principle, the developed countries are most responsible for climate change.

g) Therefore, the developed countries should take the first steps to reduce their countries' GHG emissions.

h) The per capita emissions in developing countries is very low, so it was impossible to restrict their emissions growth.

i) However, developing countries should contribute to reducing GHGs in accordance with the sustainable development strategies of their countries.

CHINA'S MEASURES TO ADDRESS CLIMATE CHANGE

17. China was still a poor developing country with an agrarian economy of 1.2 billion people. At present, it was impossible for the Chinese government to shoulder obligations to reduce GHGs. However, the Chinese government does not give free rein to GHG emissions. In accord with its sustainable development strategy, China was taking measures to address climate change. These measures were divided into four categories, which could be viewed as attempts to control climate change:

a) Controlling population growth is a fundamental State development policy. The Chinese government wants to stabilize China's population at 1.5 billion people by mid-century, when China joins the middle tier of developed countries. This will be a large contribution to the world.

b) Efforts to upgrade energy efficiency. Yin said that from 1981 to 1990, China's GDP increased 8.98 percent per year, while energy consumption increased at only 5.05 percent. From 1991 to 1994, GDP increased 11.7 percent per year, while energy consumption increased at 5.6 percent. Yin said these numbers show China's contributions to reducing emissions, and remarked that some experts believe China has done better than the U.S. in this regard. Yin admitted that China's energy efficiency is still much lower than the U.S., and said this showed the importance of technology transfer and technological cooperation projects with foreign countries.

c) Expand sources of clean and renewable energy. Yin said China was making obvious efforts to expand nuclear and hydro energy sources, and also was expanding solar and wind power. He said China faces technological and capital problems, though.

d) Expand afforestation, the development of ecological agriculture, and expand sinks. Yin said on these issues, China's position is similar to the U.S. He added that China will intensify afforestation following this summer's disastrous flooding in the Yangtze River basin.

18. Yin reemphasized that, to provide for basic human needs, China's economy and GHG emissions would grow for a long time. Therefore, China could not take on emissions reduction obligations. However, China would continue to take domestic efforts to reduce emissions growth.

YIN SUGGESTS AREAS TO STRENGTHEN COOPERATION

19. Yin emphasized several areas to strengthen cooperation: improving GHG reductions at the project

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level; improving China's capability to address climate

BEIJING 05 OF 10 160208

change; and technology transfer.

20. COOPERATION ON PROJECTS. China hoped for more projects with the U.S. and other developed countries to attain more technology and capital assistance. Yin was confident that if the U.S. could strengthen its efforts and explore new ways and means to cooperate with developing countries, it would bring benefits to China and for global environmental protection. This would be more effective than pressuring developing countries to shoulder obligations to reduce emissions.

21. ENHANCING THE CAPABILITY OF DEVELOPING COUNTRIES TO ADDRESS CLIMATE CHANGE. Yin remarked that developing countries would be most affected by two of the predicted effects of climate change: rising sea levels and increasing temperatures. Both the population and the economic demands of developing countries were growing. Thus, it was essential for the international community to focus not on restricting GHG emissions, but helping to achieve sustainable development. China and some other countries had formulated sustainable development strategies which emphasize environmental protection. In China's ongoing government restructuring, the State Council had elevated the State Environmental Protection Administration (NOTE: formerly the National Environmental Protection Agency. END NOTE.) to ministry-level status, demonstrating the government's emphasis on environmental protection. Of course, Yin noted, China and other developing countries face problems of technology and capital. Therefore, developed countries should intensify efforts to provide technology and capital to meet their obligations, and transfer these at concessional conditions to enhance developing countries' ability to address climate change.

22. NEW TECHNOLOGY TRANSFER. Yin said at a meeting in August last year, France raised an important point: the success of human beings in the next century depended on the invention of new technologies and their dissemination. Yin said developed countries possess many effective environmental protection technologies, but these play a limited role in GHG reduction efforts at present. He suggested that a new technology, when invented, can be disseminated to developing countries to help them address global climate change. He regretted that the French suggestion had attracted little support. Following Kyoto, China had raised the following questions:

a) Population: If the international community does not place importance on reducing population growth, how can we control the growth of GHGs?

b) In the absence of new technologies, will developed countries be able to reduce emissions?

c) How much can developing countries be expected to contribute if there is no technology transfer and capital assistance from developed countries?

23. Yin remarked that China had found the developed countries' inactivity in technology transfer to be very disappointing. Climate change was a global problem, and therefore, technology transfer requirements were

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different than in ordinary economic trade. Of course, transfer should not be granted free of charge, but at concessional conditions.

24. Last year, Yin said, in response to demand from the Conference of the Parties, China provided a list of fifteen priority technologies. Yin hoped developed countries could quickly take effective measures to build

a technology transfer mechanism.

25. Summing up, Yin said, given the present development stage of its economy, China adhered to the principles of common but differentiated responsibilities and the FCCC. China hoped the U.S. would seek ways to advance technology transfer and capital assistance. On this question, he suggested the USDEL could exchange views with Chinese ministries in their succeeding meetings.

MOFA COMMENTS ON U.S. POINTS: SINKS, CDM, TRADING

26. Liu Zhenmin, Counsellor in MOFA's Treaty and Law Department and lead climate change negotiator, responded to specific points raised in Kimble's opening statement. Liu said China and the U.S. shared similar positions on sinks and for that reason, the Chinese side had not raised this issue. He expected that decisions on land-use issues would be made at COP-4, and said that the Chinese position on this is flexible, and that the U.S. and China might be able to cooperate on this.

27. Liu explained that China was now researching the flexibility mechanisms, and thus it was hard for China to put forward a mature view on these. He expressed a preliminary opinion that CDM was easier for China to understand, and so China was doing deeper research on the CDM. Emissions trading was a very complicated problem, requiring longer studies. In general, the CDM seemed easier for China to accept. During the negotiations, China would actively participate, but must coordinate with the G-77, so sometimes would be restricted in what it could do.

28. Liu said two major goals should be reflected in the CDM design. A) As provided for in the Protocol, the CDM should be on both a project and voluntary basis. B) Technology and capital assistance should be additional to commitments of developed countries in the FCCC and the Protocol. The CDM, Liu said, should not fully replace technology transfer and capital assistance as provided for in the FCCC.

29. Liu further stated that the CDM should be put under the COP without intervention by other international organizations. China also disagreed with making the CDM a large international bureaucracy. As for project opportunities, China preferred bilateral projects. However, China had not discussed this issue with others, and this was only a preliminary idea.

LIU QUERIES THE U.S. SIDE

30. Liu raised the following questions for the U.S. side to discuss at lunch or in future meetings.

-- How does the U.S. see the two goals of the CDM, and

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how can these be achieved?

-- Which does the U.S. prefer for the CDM: bilateral or multilateral projects?

-- How does the U.S view the Executive Board of the CDM and what role should it play at different stages?

-- How will developing countries acquire emissions reduction credits? (NOTE: One notetaker thought this referred to "developed" countries. END NOTE.)

-- How does the U.S. understand the word "part" in Article 12, 3, b in the Kyoto Protocol?

-- Of the CDM and emissions trading, which is more

BEIJING 07 OF 10 16028

attractive to the U.S.?

-- Because most countries oppose hot air trading and deficit trading, how does the U.S. see the potential of emissions trading among Annex B countries?

KIMBLE: CREATE AN ENVIRONMENT TO PROMOTE TECHNOLOGY TRANSFER

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31. Kimble, returning to Liu's comments on afforestation and sinks, agreed that the U.S. and China shared some views, but pointed out that, given the decision to remit technical issues on sinks to other groups, it would be difficult to get a decision at COP-4. But she suggested that bilateral discussions on the issue could be held at upcoming sinks workshops in Rome and at the IPCC Plenary session in Vienna.

32. Regarding Yin's comments, Kimble said it is important to have an understanding of how the U.S. system works. The U.S. was very convinced that no economy can survive without growth. The developed and developing worlds cannot work on a long-term problem like climate change without sustained political support over many administrations for many policies. [NOTE: "Many administrations" was not captured in the translation. END NOTE.] The U.S. was in the process of building support for long-term action on climate change. Many officials, including the President and Vice President, were deeply involved in this effort.

33. Ultimately, long-term solutions needed new technology. At the same time, the U.S. assessment was that the Kyoto goals could be met with the flexibility mechanisms in the Kyoto Protocol. Kimble noted that the USDEL had brought copies of the Administration's assessment of the Kyoto Protocol's economic costs, which she provided to the Chinese side at the conclusion meeting. Technology transfer and new technology development were important aspects of the solution.

34. In this context, Kimble said, the CDM offered a new way of encouraging the private sector to be an active part of the solution. Technology development was driven by incentives. Technology was mostly owned, developed and diffused by the private sector. It was not possible for the USG to order companies to transfer technology. We had to work together to create an environment to promote technology transfer. The design of an

international emissions trading market and the project-by-project use of the CDM can spur technology transfer.

35. The U.S. also believed developing countries of a certain capacity could participate in the emissions trading market, consistent with their economic growth plans. Kimble said Council of Economic Advisers Chair Janet Yellen had outlined some of these ideas, and the USDEL hoped to discuss them further with China's technical ministries.

U.S. EPA, DOE OUTLINE TECHNICAL COOPERATION

36. Bill Nitze, Assistant Administrator for International Activities, USEPA, discussed activities and opportunities for technical cooperation. Nitze said EPA had engaged in broad cooperation with China since the S&T Protocol was established in 1980. This cooperation included efforts to address air and water pollution, hazardous waste, toxic chemicals, enforcement, and general environmental protection. Recently, many bilateral projects had focused on priorities identified by China under the S&T agreement:

-- EPA had played a role in creating air quality monitoring programs in eleven cities in China.
-- EPA was working with the State Environmental Protection Administration and provincial Environmental Protection Bureaus to improve clean production methods and environmental protection technologies.
-- Demonstration project of a regional center for hazardous waste, identified by the Chinese as a priority.
-- Cooperation in opening a coalbed methane clearing house in the Ministry of Coal Industry.
-- Demonstration of integrated gas combined-cycle (IGCC) power plant technology.

37. EPA, Nitze said, also was working with Chinese agencies on several energy efficiency improvement technology projects, including:

-- Ozone-free energy-efficient refrigerators, produced by China's Haier Corporation.
-- Collaboration on China's Green Lights program.
-- Supporting studies in energy efficiency in the buildings and cement sectors.
-- With USDOE, supporting Beijing's Energy Efficiency Research Center and Energy Technology Center.

38. Nitze said EPA was particularly excited about a new project to work on new transportation technologies that will affect urban air quality. He also was pleased that EPA's lead gas cooperation project would allow Beijing to eliminate leaded gas by 2000. In the future, EPA would like to cooperate with China on oil technologies. And, under USDOE lead, EPA would like to work with China on fuel cell technologies, which could take the carbon out of transportation.

39. Nitze said the U.S. and China were in broad agreement on where they want to go, but part of the problem, as Yin had said, was how to find the financial resources. Nitze believed there were sufficient resources if we could organize the proper political instruments. An additional area where the U.S. and China could cooperate is in the design of policies which would

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provide the right incentives for transfer of technologies.

USDOE ON TECHNOLOGICAL COOPERATION

40. Mark Mazur, USDOE Senior Policy Advisor, commented on four areas of cooperation between DOE and China: ENERGY EFFICIENCY: DOE was developing several demonstration projects:

-- Energy Efficient Building Feasibility Study: This project would show that there needn't be a tradeoff in comfort, convenience and energy efficiency, and that buildings can play an important role in China's efforts to increase energy efficiency.
-- Co-generation projects.
-- Motor Challenge: Increasing the efficiency of electric motors used in manufacturing, which were a large user of energy in China.

RENEWABLE ENERGY:
-- Rural electrification projects: Deploying solar photovoltaic systems for several hundred houses this year, to increase to several thousand over the next several years. DOE would also like to expand cooperation into wind energy.

FOSSIL ENERGY: DOE has cooperated with China for years on clean coal projects, which produce cleaner electricity generation, increasing air quality and lowering GHG

BEIJING 09 OF 10 16028

emissions. DOE is also helping to develop oil and gas resources in China; a forum on this will be held in November.

EX-IM BANK CLEAN ENERGY FACILITY: The Export-Import Bank has established a fifty million dollar credit facility for clean energy in China. A workshop will be held in Beijing September 22-23 to discuss how this financing would be provided.

THE U.S. SIDE ANSWERS OVER LUNCH

41. MOFA hosted a luncheon at which discussion continued on climate change and other environmental topics, most notably China's reaction to this summer's severe floods. AAS Kimble discussed a potential U.S. domestic trading system which will help the U.S. meet climate change reduction requirements as well as the U.S. emphasis on development of new technology. DOE's Mazur pointed out that the U.S. has numerous unexploited opportunities in the economy and the administration is proposing tax incentives to promote technologies to take advantage of these opportunities. The speed at which these opportunities can be exploited depends on congressional action on new administration initiatives.

42. Yin noted that in his opinion U.S. private sector companies should take the lead in climate change mitigation since many of these companies have large budgets and strong capabilities to deal with these issues. He reemphasized that the Chinese government understands the importance of environment and wants to improve the environmental situation in China. This will, however, take time since it requires both investment and upgrading technology and China would welcome more

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cooperation with the U.S. in environmental areas.

43. The U.S. side responded to some of the specific questions Liu had raised above, as follows:

-- The U.S. agrees that the CDM should be voluntary and on a project basis. We expect, given the private companies and foreign direct investment involved, that it would be additional.

-- The U.S. believes bilateral projects would be the easiest to develop; however, the U.S. does not exclude the possibility of multi-lateral projects in the right circumstances.
-- The U.S. does not want the Executive Board of the CDM to become a large bureaucracy.

-- The U.S. believes that both the CDM and emissions trading have roles to play, but we believe emissions trading is ultimately the more effective mechanism from a macroeconomic perspective. CDM, however, will continue to be potentially important for smaller, less advanced developing countries.

44. PARTICIPANTS:

Chinese Side

Yin Yubiao, Director-General, Department of Treaty and Law, Ministry of Foreign Affairs

Liu Zhenmin, Counsellor, Department of Treaty and Law, Ministry of Foreign Affairs

Sheng Guoquan, Director-General, China Meteorological Administration

BEIJING 10 OF 10 160028

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U.S. Side

Melinda Kimble, Assistant Secretary of State for Oceans, Environmental and Scientific Affairs

Bill Nitze, Assistant Administrator for International Activities, Environmental Protection Agency

Mark Mazur, Senior Policy Advisor, Department of Energy

Ray Squiteri, Senior Economist, Department of Treasury

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MESSAGE:

More coming. Here are 3 papers - self-explanatory

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ACTIONS BY DEVELOPING COUNTRIES TO CONTROL GREENHOUSE GAS EMISSIONS

Short-Term Technical Support
Contract No. LAG-I-00-98-00005-00
Task Order No. 6

Draft 2 - Not for Citation or Distribution

Prepared for:

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Office of Energy, Environment, and Technology
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ANNEX A
CHINA

A.1 SUMMARY

China is second only to the United States in emissions of carbon dioxide. It accounts for approximately 14% of global CO_2 emissions and its share is expected to increase in the coming years. China's ranking as a major emitter of greenhouse gases can be attributed to its large population (more than 1.2 billion people), its rapid economic growth and dramatic industrialization over the past two decades, and its increasing energy use which draws heavily on abundant indigenous coal resources.

Over the past decade, China has increased environmental spending, adopted market incentives, strengthened lawmaking and enforcement, and promoted nationwide environmental education as part of its efforts to curb GHG emissions. China has also made explicit policy choices regarding industrial structure, power generation, and the preservation of carbon sinks. Environmental problems associated with heavy reliance on coal would be even worse if China had not initiated a widespread energy conservation program in the early 1980s. This program reduced China's energy intensity by 4.5% each year for the past two decades.[1] From 1980-1990, China's energy effiicency programs resulted in energy savings equivalent to 100-140 million tons of coal and catalyzed conservation investments by Chinese industry of $5.7 billion.[2]

China's energy effiicency programs resulted in energy savings equivalent to 100-140 million tons of coal and catalyzed conservation investments of $5.7 billion.

[1] Pacific Northwest National Laboratory, 1998. *China's Electric Power Options: An Analysis of Economic and Environmental Costs*. Washington, DC

[2] Keegan, Patrick et al. 1996 "Seven More Developing Country Examples of Energy Efficiency and Renewable Energy Initiatives." *Examples in Action: Sustainable Energy Experiences in Developing and Transition Countries*. IIEC, Washington DC.

A.2 BASELINE CONDITIONS AND TRENDS

China is the most populous country in the world and the second largest producer of GHG emissions. In 1995 China's emissions of CO_2 totaled 3,192.5 million metric tons, approximately 14% of the world's total. A large amount in absolute terms, it looks slightly less so when considered in relation to China's population. CO_2 emissions per capita were 2.7 metric tons in 1995, far lower than in many industrialized countries. China's contribution to global emissions is expected to reach 15% by 2000 and 25% by 2050.[3]

Energy consumption is the primary source of China's GHG emissions and accounted for 80% of its 1990 emissions. China is the second largest energy consumer in the world. In 1995 China's total primary commercial energy demand was 1,240 mtce. Energy consumption has increased on average 4.5% per year over the last 15 years. Energy-related CO_2 emissions have increased steadily over the past two decades as well, more than tripling between 1971 and 1993.[4] Exhibit A-1 shows a breakdown of these emissions by sector in 1990. Power plants were responsible for approximately 183 million tons of carbon emissions, 29% of the country's total. Three quarters of China's power plants are coal-fired, a fact that explains the power sector's importance as a source of CO_2 emissions.

Exhibit A-1[5]

1990 Energy-Related CO_2 Emissions by Sector	
Sector	**Share of**
Industry	**75%**
Power	24
Energy production	11
Building materials	9
Iron and Steel	7.5
Chemical materials	7.5
Other	16
Agriculture	3%
Transportation	4%
Other	18%

[3] Rose, A. et al. 1996. "Global Warming Policy, Energy, and the Chinese Economy," Resource and Energy Economics, vol. 18, no. 1 (March), pp.1-30.

[4] OECD. *Climate Change Policy Initiatives 1995/96. Volume II: Selected Non-IEA Countries.* p.45

[5] Ye Ruqiu, China Environmental Protection Agency, "Studies on Climate Change Problems and Response Measures in China", published in Proceedings from the International Conference on National Action to Mitigate Global Climate Change, June 1994. UNEP Collaborating Center on Energy and Environment Risø National Laboratory, Denmark, June 1995. Beijing, PRC.

Coal is the largest contributor to energy-related CO_2 emissions. China consumes about 1.4 billion tons of coal each year and relies on coal more than any other country in the world (see Exhibit A-2).[6] In 1993 coal use accounted for 83% of total energy-related CO_2 emissions.[7] Both the power sector and the industrial sector are heavily dependent on coal. Industrial boilers are very prevalent in Chinese industry; there are an estimated 430,000 industrial boilers, most of which are coal-fired. Cement production is another source of CO_2 emissions. In 1990 cement production in China was about 210 million tons, producing emissions of about 29 mtC.

Exhibit A-2
Coal as a Source of Fuel in China

Use	% of fuel supply
Power Generation	76%
Industrial Fuel	75%
Household Energy	80%
Chemical Raw Materials	60%

The transport sector and residential sector are not major sources of GHG emissions. The transport sector contributed only 6.4% of total emissions in 1993 while the residential sector accounted for 13% of emissions. According to projections, the transport sector will still account for only 5% of CO_2 emissions by 2020. However, the absolute amount of energy consumed by the sector could increase from 45 mtce in 1990 to 173 mtce in 2020. China's forests are estimated to have been a net sink of atmospheric carbon in 1990, reducing total GHG emissions by about 1 percent.

A.3 BROAD ECONOMIC REFORMS AFFECTING GHG SOURCES AND SINKS

The Chinese economy is in the midst of a major transition from a command economy to a market-based one. This transition has resulted in rapid economic growth and a fourfold increase in the size of the economy in the past 15 years. Between 1978 and 1995 real GDP per capita grew by 8% per year.[8] Beginning in 1978, China launched a series of economic reforms that have liberalized markets for many products and services, introduced competition in industry, and contributed to China's integration with the world economy.

China's remarkable economic growth over the past two decades may be contributing to increased levels of GHG emissions. There are at least two factors, however, which suggest the link between economic growth (and the economic reforms that spurred that growth) and GHG emissions may not be as strong in China's case as in other countries. First, a World Bank analysis of the factors contributing to China's economic growth reveals that labor force improvements, a

[6] *Op. cit.* 1, p.1

[7] *Op. cit.* 3, p.45

[8] The World Bank. 1997. *China 2020: Development Challenges in the New Century*. Washington, D.C. p.1.

high savings rate, and structural change were important components of economic growth.[9] In fact, only 37% of China's annual economic growth is attributed to growth in capital inputs, according to the World Bank.

Second, China's energy intensity has fallen by 50%, or 4.5% per year, despite the high levels of economic growth. The decline in energy intensity is due in part to efficiency gains in the industrial sector. Changing demands for goods and services has altered China's product mix, producing some efficiency gains.

China's energy intensity has fallen by 50%, or 4.5% per year, despite high levels of economic growth.

The beneficial effects of some economic reforms on GHG emissions are discernible. These reforms are discussed briefly below.

A.3.1 Power Sector Reform

The Chinese government is in the process of restructuring its power sector, which has the potential to enhance energy efficiency and reduce GHG emissions. A more market-oriented power sector should expedite the introduction of improved management techniques, a reduction of transmission and distribution bottlenecks that perpetuate inefficient operation of generation plants, and the transfer of more advanced technologies.

China's power industry previously was overseen by the Ministry of Electric Power (MOEP), which was established in 1993 and whose role was to set energy policy, prepare industry regulation, and plan the industry's development. The MOEP owned all of China's generating assets other than those owned by companies not directly managed by the MOEP (i.e. foreign developers). The MOEP was officially dissolved in April 1998 and was replaced by the newly-formed State Power Corporation (SPC). In principle, this first step represents the "corporatization" of MOEP and is intended to facilitate market-based reforms and investment in the power industry.

In a second stage of reform that will follow, the functions of generation, transmission, and distribution will likely be unbundled. Generators would operate in a competitive market. Distribution and transmission would remain under the control of SPC and the Provincial Power Bureaus for the foreseeable future. A pilot competitive generation market is being established in the East China Power Group Area; if successful, the pilot project could lead to the establishment of competitive power markets throughout China.

[9] *Op. cit.* 4, p.4.

China's efforts to unbundle generation, transmission, and distribution will eliminate some of the discriminatory practices involved in the purchase of power from generation plants. For example, power sector reform will seek to ensure that power plants not owned by local distribution networks receive the same treatment as network-owned plants. The current favoratism shown to network-owned plants means that the more efficient foreign-owned plants are often passed over in favor of a locally-owned plant. Another objective of power sector reform will be to create a national high-voltage network. This would allow regional grids to sell surplus electricity into other regions where supply is insufficient to meet demand. Current transmission bottlenecks mean local power bureaus have limited options for meeting electricity demand and often resort to building new but small plants, which tend to be less efficient than large scale plants, and keeping existing units on line as long as possible. Both changes will mean a more efficient power industry that produces lower levels of GHG emissions.

A.3.2 Trade and Investment Liberalization

Liberalization of trade and investment policies have spurred foreign investment in China and increased competition for industries and businesses. The power sector in particular has attracted significant amounts of foreign public and private investment. From 1979 to 1996, 10% of total investment in the power sector came from abroad. As of early 1998, China had almost 57 GW of foreign-funded electric generation capacity in operation or under construction (China's total installed capacity is approximately 250 GW).

This investment has been critical to bringing in modern, efficient generation plants. The average thermal efficiency of China's power plants is 25-29%.[10] Older plants in particular can be quite inefficient, consuming as much as 25% of the electricity they generate. Based on a survey of U.S. developers investing in China's power sector, about one-third of the developers' plants use advanced generation technologies and one-fifth are cogeneration plants.[11]

To continue to exploit the environmental and efficiency benefits that foreign-funded power plants offer, the Chinese government recently stated that future foreign investment would be channeled into projects with a capacity exceeding 300 MW. This directive is meant to reverse the trend of provincial and local authorities building smaller power plants, which often have diseconomies of scale in design and operation. Approximately 40% of China's generating units are smaller than 100 MW and only 23% of capacity is in units larger than 300 MW.[12]

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[10] Blackman, Allen and Xun Wu. 1998. "Foreign Direct Investment in China's Power Sector: Trends, Benefits, and Barriers". Resources for the Future Discussion Paper 98-50, Washington, DC.

[11] *Op. cit.* 9, p. 27.

[12] *Op. cit.* 9, p. 3.

A.3.3 Energy Price Reforms

Over the past decade energy pricing in China has moved from central government control to a mix of market-driven allocation and government interventions. The result in most cases has been higher prices that more accurately reflect the true costs of supply.

Electricity Prices

China has instituted a number of pricing reforms in the electricity sector to increase the funding sources available to the power sector and to establish tariffs that allow power enterprises to recover the costs of providing power. As a result of these reforms, electric power prices have increased steadily since 1981. On average electricity prices rose 9% per year between 1981 and 1993. The average electricity tariff in 1996 was 283.4 yuan per MWh, 8.1% higher than the average tariff in 1995.[13]

As part of electricity pricing reforms, China established a new policy for the purchase of power from power plants constructed between 1986 and 1992 that are not financed by the central government and from all plants constructed after 1992. These newer plants charge wholesale tariffs that ensure revenues will be sufficient to cover the repayment of loan capital with interest. This new pricing policy produced significantly higher producer power prices. On average, prices of electricity from newer plants is 65-100% higher than prices of electricity generated by older power plants. The recently-promulgated Electric Power Law provides for further reform of electricity prices by providing the broad principles of a new pricing system keyed to the cost of supply of electricity.

Consumer tariffs have also been affected by pricing reforms. Consumers face two types of tariffs: administered prices and guidance prices. The former type of tariff, set by the government, is typically applied to the amount of electricity consumed up to the consumer's 1985 consumption level. Guidance prices are paid on any consumption that exceeds the customer's 1985 consumption level. This second tariff is a markup to cover the higher costs of power purchased from new plants.

Coal Prices[14]

Over the past 3 years, the government has raised or partly deregulated coal prices so that in most areas coal prices now cover the costs

Coal subsidies fell from 37% in 1984 to 29% in 1995; petroleum subsidies fell from 55% in 1990 to 2% in 1995.

[13] Personal communication with State Power Corporation representatives, 1998.

[14] Source for textbox: Zhang Zhongxiang. 1998. "Is China Taking Actions to Limit its Greenhouse Gas Emissions? Past Evidence and Future Prospect." Netherlands.

of production and delivery.[15] Current coal prices are close to the direct economic cost of bringing the coal to local markets.

Oil Prices
China has deregulated oil prices except in certain key sectors such as agriculture and the military. Certain levels of oil production can now be sold at market prices. The majority of petroleum product retail prices equal or exceed world prices.

A.4 SECTOR-SPECIFIC ACTIONS AFFECTING GHG SOURCES AND SINKS

Over the past two decades, China has implemented various sectoral programs that have limited China's emissions of greenhouse gases. These programs have targeted energy consumption in buildings and the industrial and residential sectors, fossil fuel use in power production, and the protection of carbon sinks. This section describes China's activities to reduce GHG emissions.

A.4.1 Reducing Energy Use in Industry and Buildings

Energy consumption per unit of output in Chinese industrial enterprises is variable, but overall it is higher than recognized best practices suggest it should be. In the buildings sector, energy consumption has increased steadily in recent years as urban residents purchase more applicances and demand higher quality heating, cooling, and lighting services. In both sectors, however, China has made significant strides in improving energy efficiency within industry and in the buildings sector.

During the 1980's, China developed a comprehensive set of policy directives, procedures, regulations, and technical assistance programs to promote energy efficiency in industry and buildings. Information dissemination efforts provided reference books on higher efficiency technologies, statistics on energy consumption for various production processes, and seminars on energy efficiency. These efforts were bolstered by training courses for technical managers.

Aggressive program targeting energy-intensive industries has achieved energy savings of 1,414 PJ over 15 years; efficiency improvements in steel industry have reduced consumption by more than 20%.

A key focal point of these policies and programs was China's energy-intensive industries such as steel mills and cement industries. In fact, the most impressive technical

[15] World Resources Institute, 1998. *China's Health and Environment.* Washington, DC. (From the WRI website http://www.igc.org/wri/wr-98-99/prc-laws.htm).

efficiency improvements occurred in the steel industry, where unit energy consumption fell by over 20% during the 1980s. The cumulative effect of energy efficiency measures over nearly 15 years has been energy savings of 1,414 PJ.[16] To achieve these savings, China encouraged the use of specific technologies and processes, such as the recovery of BOF gas and continuous casting.

The Chinese government developed detailed targets, guidelines, and standards on energy consumption and energy conservation for industrial enterprises. These various initiatives resulted in nearly $6 billion in investments in energy efficiency in China. Examples of China's energy conservation initiatives include the following:

- Energy consumption quotas were set to encourage enterprises to consume less energy. Higher prices were charged for any energy consumed above the quota amount. Enterprises that consumed less than their allotted amount received rewards. China also developed standards for energy consumption in several industries.

- To bolster energy efficiency initiatives in industrial enterprises, the Chinese government established special investment funds that provided capital at subsidized interest rates and set up energy conservation centers to offer technical assistance. The Energy Conservation Investment Company and the Energy Conservation Technological Renovation Fund are two primary channels for government investment in energy efficiency. The Energy Conservation Investment Company's funds have grown by 20% annually since 1990.[17]

- Three recently established energy service companies (ESCOs) will undertake a large backlog of efficiency projects, including electric furnace renovation, electric motor upgrades, insulation of pipes and furnaces, and boiler renovations. The World Bank estimates that these 3 companies will undertake projects valued at $730 million between 1997-2006.

China has now turned its attention to improving the efficiency of industrial boilers. Medium and small-scale industrial boilers (defined as boilers which produce less than 65 tons of steam per hour), of which China has more than 400,000, consumed over 350 million tons of coal in China in 1990, accounting for around 35% of the country's coal use and around 30% of GHG emissions from energy consumption.[18] Typical efficiency levels for Chinese coal-fired industrial boilers lie in the range of 60-65%. Similar coal-fired boilers of similar scale and application in developed

[16] Liu Zhiping and J. Liu, Y. Wang. 1996. "Energy Consumption in the Iron and Steel Industry in P.R. China." *Energy for Sustainable Development*, Volume III No. 3, p. 21.

[17] Hamburger, J. 1994. "Linking Energy and Environmental Policy in China." Advanced International Studies Unit, Global Studies Program, Battelle, Pacific Northwest Laboratory. Washington, D.C.

[18] World Bank project document, 1998. "China: Efficient Industrial Boilers" available from the World Bank website.

countries rarely operate below 80% net efficiency. If boiler operating efficiency levels in China were brought into line with those of similar sizes in developed countries, current coal consumption could be reduced by around 60 million tons per annum – a savings of nearly 20%.

China has also developed programs designed to reduce energy consumption in buildings. The building sector accounts for 25-30% of commercial energy use in China. Since 1990, building energy consumption has grown 4.4% per year. In 1994, buildings used about 370 Mtce of energy; coal and electricity respectively accounted for 73% and 21% of the total building energy consumption.[19] One of the best programs China has developed to curb rising energy consumption is the China Green Lights Program.

China Green Light Program will increase use of high efficiency lighting, saving 22 TWh of electricity per year and reducing CO_2 emissions by 7.4 million tons per year.

Established in 1996, the China Green Lights Program (CGLP) is one of China's key national energy conservation programs for the Ninth Five Year Plan. It is managed by the State Economic and Trade Commission and receives technical support from BECon. The project's primary objective is to increase the number of high-efficiency lights in use to 300 million units by 2000, which would generate 22 TWh of electricity savings each year and 7.4 million tons of carbon emissions avoided annually. A second objective is to stimulate increased production of CFLs. Already CFL production has grown from 38 million units in 1993 to around 100 million units in 1996; the number of lighting manufacturers has risen from about 400 in 1993 to 1,000 in 1997. Some of these manufacturers offer product guarantees to stimulate sales of their products.

The results from early pilot projects are promising: one province reduced its peak load by 300 MW as a result of increased use of CFLs. China also has issued its first national standards for efficient lighting. CGLP is currently developing regulations that will add or modify codes for lighting design in residential and commercial buildings.

China's institutional framework for implementing these and other energy conservation programs includes a series of specialized energy conservation units at different levels of government:

- ***Climate Change Coordination Group.*** This national level group was created in 1990 and charged with overall policy formulation for GHG emissions issues.

- ***Beijing Energy Efficiency Center (BECon).*** BECon is non-profit organization whose purpose is to promote energy-efficiency policies and business ventures in China. BECon was founded in 1993. BECon's early activities in the area of energy efficiency included:

[19] Nadel, Steven et al. 1997. *Energy Efficiency Opportunities in the Chinese Building Sector.* American Council for an Energy-Efficient Economy, Washington, DC.

initiating a pilot project in integrated resources planning in Shenzhen in southern China; providing training on energy efficiency standards; and developing a transportation plan for Beijing that takes energy efficiency into account.

- ***China Energy Conservation Investment Corporation (CECIC).*** CECIC was founded in 1994 and replaced the Energy Conservation Investment Company. CECIC has invested in and completed a number of energy conservation, material conservation, and environmental protection projects in energy-intensive industries.

- ***Energy Conservation Information Dissemination Center (ECIDC).*** Established in January 1998, ECIDC will develop a range of information products related to energy efficiency for dissemination among industrial enterprises.

A.4.2 Reducing Energy Use in the Residential Sector

Residential demand for electricity has grown by an average 17.8% per year since 1986 and is expected to continue growing by 15% annually for the next several years. Unmet demand for electrical appliances, including refrigeration and air conditioning, is the main cause of this high growth. In large cities such as Beijing and Shanghai, the market for refrigerators and televisions exceeds 95%s saturation. Air conditioners are now beginning to penetrate urban markets. In response to the growth in household appliances, China has passed minimum efficiency standards for refrigerators, air conditioners, clothes washers, fans, rice cookers, and irons. Standards for refrigerators and air conditioners are being tightened. China's Environmental Protection Agency also bestows Green Labels on refrigerators that do not use R-12, an ozone depleting refrigerant.

Chinese refrigerator designs are generally less than 10 years old and the efficiency of these units is generally better than in many developing countries. Under a joint program with the U.S. EPA, the energy efficiency of Chinese refrigerators should be improved further. This program is working with several Chinese agencies and one of China's major refrigerator manufacturers to develop and commercialize a refrigerator with thicker insulation and high efficiency compressors. This unit will consume less than half of the electricity of current models. The China Refrigerator Project was the first project to receive funding from both the GEF and the Montreal Protocol.

A.4.2 Reducing Fossil Fuel Use in Power Production

The Chinese government has developed a strategy for the sustainable development of the energy sector that involves increased use of clean coal technologies and more development of natural gas, coal bed methane, and renewable energy resources. China's achievements in this area to date include the following:

- China has encouraged foreign participation in natural gas exploration activities and increased its own exploration budget by 50%.

- More than 140,000 small-scale wind turbines provide electricity to China's rural populations, particularly in Inner Mongolia.

- Since 1990 China has installed wind farms with capacity of more than 160 MW, a 12-fold increase over the 1990 level. In comparison, world wind generating capacity increased only 150% between 1990-1995.[20]

- In 1989 China recovered 380 million m^3 of methane from more than 100 coal mines.

- Small hydropower stations (less than 25 MW) supply rural China with about one-fifth of its electricity needs. China currently has 6,000 small hydropower stations.

In addition, China recently agreed with the U.S. to establish the U.S.-China Energy and Environmental Technology Center, which will promote the use of advanced energy and environmental technologies.

Development of renewable energy is regarded by the Chinese as an important means to reduce the power sector's heavy reliance on coal and thereby reduce GHG emissions. Over the past 35 years, China has strongly supported the use of small hydropower, biogas, and small wind turbines for renewable energy sources. This was done in part to provide energy and electricity to rural, isolated populations. The New and Renewable Energy Development Program, announced in 1995 by the government of China, aims to lower production costs and increase the contribution of renewable energy resources to overall energy supply. A World Bank-Global Environment Facility project targeting windfarms and solar photovoltaics will also provide crucial support for the continued development of renewable energy in China.

[20] Ecological Economics Bulletin, "Wind Energy in China: Institutional Barriers," Volume 3, Number 3, Third Quarter 1998.

China's potential wind energy resources are large. The exploitable wind resources are estimated at 250 GW.[21] China's wind energy market has historically been developed for small-scale applications of domestically manufactured wind turbines. Recently, however, demand for larger (300-600 kW), imported wind turbines has increased. China has set a target of developing 1,000 MW of wind energy by 2000, which would require an investment of more than $1.2 billion.

With exploitable wind resources of 250 GW, China has embarked on active wind power development program; target set to develop 1,000 MW of wind energy by 2000.

China has devoted considerable R&D resources and efforts to establish a local manufacturing capacity for wind turbines. There are 11 national standards and 25 industrial standards that govern the development of small wind turbines. The manufacturing capacity and competence for large wind turbines is relatively nascent; China instead relies on imports of foreign technology.

A.4.4 Protecting Carbon Sinks

China is deficient in forest resources, with only 0.11 hectares per capita. The demand for forest products is also quite high, threatening China's stocks of forest resources. To meet demand and protect its forest resources, China has instituted the largest afforestation program in the world. Between 1984 and 1988, China planted an average of 3.25 million hectares per year; the net increase of forested land was about 0.65 million per year.[22] China has also initiated a large-scale protective afforestation program in North China. According to World Bank data, net decrease in forest area since 1990, if China continues to increase its forested area at the rate of the past 5 years, forests will cover more than 15% of its land area by the end of the century (up from 13.6%).

China has implemented the largest afforestation program in the world, planting an average of 3.25 million hectares per year between 1984 and 1988.

A.5 ACTIONS THAT EXPLICITLY SUPPORT THE UNFCCC OR CONTROL GHG EMISSIONS

Prior to the Rio Earth Summit in 1992, China hosted the Ministerial Conference of Developing Countries on Environment and Development. In 1992, China attended the Rio Earth Summit and

[21] *Op. cit.* 9, p.12

[22] World Bank, 1996. "China: Issues and Options in Greenhouse Gas Emissions Control." Wash. DC, p.50.

subsequently ratified the FCCC in 1993. Since the Rio Earth Summit, China has continued to support GHG emission reduction through the development of its Agenda 21 paper, a two-year climate change country study undertaken with support from the U.S. Country Studies program, and by establishing a National Climate Change Coordination Office. A number of studies on GHG emissions and national response strategies also have been completed. The Chinese government has also planned to compile a national inventory of GHG emissions and sinks, to project national energy use and GHG emissions, and to conduct a macroeconomic analysis of global warming.

China's Agenda 21 currently has 128 projects listed in 9 areas, with a total planned investment of over $5 billion. The nine project areas include: capacity building for sustainable development; sustainable agriculture; clean production; clean energy/transportation; natural resource conservation; environmental pollution control; regional development; population, housing and social services; and global change, desertification and biodiversity. By October 1996, 42% of the 128 projects had been completed with a total investment of $1.3 billion. Of this amount, China provided $0.96 billion.

China has supported environmental protection efforts, including the reduction of GHG emissions, through various legislative initiatives. China's first environmental law, the Environment Protection Law, was passed in 1979. Since then, China has enacted five pollution control statutes and ten natural resource conservation statutes, including the National Standards of Air Pollutants for Coal-Fired Power Plants, which became effective on January 1, 1997. Under the leadership of the Environment and Natural Resources Conservation Committee of the National People's Congress, China plans to enact an additional seven environmental statutes in 1998 and potentially 17 more in 1999. The United States, in comparison, has passed approximately 21 major environmental acts in the past four decades.

The Energy Conservation Law, enacted January 1, 1998, requires development of national energy efficiency standards, increased investment in clean and renewable energy, and retirement of older, inefficient products and equipment.

Perhaps the most important of China's legislative efforts for GHG emissions reduction is China's new Energy Conservation Law which came into force on January 1, 1998. This law was formulated with a view to promoting "energy savings throughout society, improving energy efficiency and economic benefits, protecting the environment, guaranteeing national economic and social development..." The law requires the government to formulate an energy conservation policy and incorporate it into the national economic plan. Other actions required under the law include the development of national energy efficiency standards, increased investment in clean energy and renewable energy, and the retirement of old, inefficient products and equipment.

China's Trans-Century Green Project is an important component of the Ninth Five Year Plan (1996-2000) and China's long-term environmental targets for 2010. Phase I of the Green Project Plan identifies more than 1,500 environmental projects, some of which will target air pollution and GHG emissions. China has identified approximately 30 projects to specifically address GHG emissions.

A.5.1 Global Environment Facility

To date, GEF funds have been approved for several projects in China and several other projects are in the pipeline. In addition, with support from the GEF, China has completed a climate change mitigation study that involved a comprehensive analysis of GHG abatement options and their relative costs. GEF-funded climate change projects in China include the following:

- Energy Conservation Promotion Project (World Bank-implemented)
- Capacity Building for the Rapid Commercialization of Renewable Energy
- Energy Conservation and Pollution Control in Town and Village Enterprises (UNDP-implemented)
- Efficient Industrial Boilers (World Bank-implemented)
- Development of Coal-bed Methane Resources
- High-Efficiency Refrigerator Project (UNDP-implemented).

Under the Efficient Industrial Boiler project, China will work to acquire advanced technologies and adapt them to Chinese conditions to improve the efficiency of boilers. The project will encompass approximately 20% of total industrial boiler output over a 20-year period. The technological upgrades will be bolstered by a training program and dissemination efforts. This project is being implemented in conjunction with a World Bank program to address industrial pollution in one of China's major urban centers (Chongqing). The project is expected to save 175 million tons of CO_2 emissions.

The Renewable Energy Development Project aims to develop state-of-the-art wind and solar PV technologies. The project's goal is to install 190 MW of grid-connected wind farms in four provinces and to supply about 200,000 PV systems to households and institutions in remote areas of China.

A.5.2 Joint Implementation

Following COP 1, the Chinese government initiated 3 AIJ projects:

- a coke dry quenching project at Beijing Captial Steel-Iron Group undertaken with Japanese cooperation

- the construction of a thermal power plant using CFBC technology with assistance from Norway
- a building energy efficiency project with assistance from the United States.

(1)

U/S Loy meeting with Eilleen Claussen
Wednesday, May 19, 1999, 3:00pm

Background

Eileen Claussen of the Pew Center on Global Climate Change and her assistant, Sophie Chou, will meet with U/S Loy and AA/S Kimble today at 3:00. They are hoping to receive a briefing on current USG climate change policy toward China.

Claussen may also discuss Pew's "Track II Diplomatic Effort". This is envisioned as a series of non-governmental fora/meetings to create an environment where people can discuss and brainstorm on climate change, focusing on the Kyoto mechanisms; a process for tech transfer; and equitable targets. The title deliberately does not refer to climate change, though this would definitely be the focus. The meetings would include participants from China, the U.S. and Europe. In the U.S. and Europe, participants would be non-governmental but influential; in China, it would largely be governmental to ensure that they are influential. This effort largely grew out of a discussion Claussen had with Environment Minister Xie Zhenhua at last September's Mansfield Retreat in Montana, which focused on climate change and China. The W. Alton Jones Foundation is also helping fund Track II.

Claussen and Chou were to have traveled to China this week to begin discussion of the Track II, but the trip was canceled due to the recent turmoil. At the suggestion of Minister Xie, they are working through the Friendship Association, a Chinese "NGO" which is affiliated with MOFA. The Pew Center is not clear how successful the Friendship Association would have been at attaining high-level meetings this week, had they made the trip.

The Pew Center is examining how to make this effort work: how to identify the right people, how to contact them and get them together, and how to facilitate the discussions that need to take place. Claussen may seek Frank's views on this. (NOTE: This question of making the right contacts with China to achieve such discussions is one to which no one in USG has yet found an answer. But it may be easier for an NGO like the Pew Center to achieve, in some respects.)

Pew also perceives a general need to bring the US and Europeans together to work on ways to achieve meaningful participation by developing countries.

Following for your background are:

a) Dan Reifsnyder's May 6 strategy paper;
b) a summary of diplomatic exchanges;
c) selected approaches to China which were raised at the May 6 meeting which we may wish to share with Claussen;
d) suggestions for how Pew may wish to proceed in China.

CLOSE HOLD DO NOT CITE OR QUOTE

-- *DRAFT* --

Discussion Paper on China Strategy

(5/6/99)

This paper suggests medium and near term goals for our climate change relationship with China but does not attempt to define or quantify meaningful participation.

Medium Term

- Bilateral:
  - -- Continue bilateral "co-benefits" efforts, particularly EPA's work on sulfur trading in China, that will create a domestic "experience pool" and foster acceptance of market-based approaches internationally
  - -- Consider launching a significant, new bilateral effort, based on our experience assessing potential climate impacts in the United States, to assess potential impacts in China
  - -- Based on work of task team on financing (see below), consider new USG or USG/private sector initiatives in key areas (e.g., industrial boilers)
- Multilateral:
  - -- Encourage other members of the G-77 (AOSIS, Africa, Latin America) to find their own voices
  - -- Intensify our bilateral relationships with other key developing countries (e.g., India)
  - -- Improve awareness of others' bilateral efforts with China and consider opportunities to coordinate with other Annex I countries (e.g., initiate a discussion of "approaches to China" in the Umbrella Group, consider discussing with EU (either with key Member States or with the Presidency/ Commission)

Near Term

- Bilateral:
  - -- Hold a second "High-Level" Policy Dialogue in July
  - -- Establish an interagency task force on financing to:
    - ~ determine why Europe and Japan can offer concessional interest rates
    - ~ how far we can go to match them
    - ~ consider approaches that could help "level the playing field" (e.g., agreement within the G-8 on "rules of the road")

-- Assess where U.S. assistance could be most effectively targeted (is new power plant construction the key issue, or is it industrial boilers?) and consider how better to support U.S. firms with relevant technology/expertise

- Multilateral:

  -- Win acceptance of holding COP-6 in the Spring of 2001

  -- Work out reasonable "principles" regarding the Kyoto flexibility mechanisms (good), or gain agreement to move forward with technical issues, deferring contentious "policy" issues to the future (better)

  -- Determine when China plans to submit its initial national communication under the UNFCCC and signal the importance we attach to this in bilateral discussions

  -- Win China's acquiescence in allowing developing countries, on a voluntary basis, to invite expert teams to their capitals as part of the "consideration process" for developing country national communications

Climate Change Diplomatic Exchanges, 1998-99

- CEA Chair Janet Yellen visits, April and June, 1999
- High Level Dialogue on Climate Change, September 1998, Beijing
- EPA Administrator Carol Browner visit to China, March 1999
- Environment and Development Forum, April 1999
- High Level Dialogue II (proposed for July 1999)
- Continued technical exchanges involving EPA, DOE, NOAA and other agencies.

Selected Approaches to China

- State to pursue second high-level climate change dialogue with China. (Letter from U/S Loy sent to Chinese Environment Minister.)
- State to explore with USIA establishing a visitors program with a climate change focus.
- EPA to continue and possibly expand bilateral co-benefit climate change initiatives.
- DOE to assess where energy assistance could be most effectively targeted, such as industrial boilers.
- CEA, with EPA and DOE, to explore further cooperation on economic modeling.

(2)

Suggestions for the Pew Center

- Convene climate change scientists and policy-makers in informal exchanges, such as the Mansfield Retreat.

- Work with China on study and economic modeling of opportunities under the CDM and emissions trading.

- Sponsor visits of Chinese climate change scientists and officials.

- Institutions to work with, aside from the State Environmental Protection Agency:
  - Tsinghua University, Global Climate Change Institute
  - The Environmental Research Institute, under SDPC

(2)

6/21/99, 4:46 PM

Substitute language on climate change for China letter

I would also like to explore how to bring our countries together in a positive way on reducing greenhouse gas emissions. I envision two types of complimentary cooperation that should proceed in tandem - one dealing with specific projects and studies and the other dealing with international efforts to mitigate climate change.

On the joint projects, we should continue our discussion of how forestry and other projects, including those that could produce emissions reduction credits, have the potential to support a wide variety of sustainable development goals relating to water quality, flood control, provision of energy, and sequestration of greenhouse gases. In addition to our ongoing cooperation on such efforts, EPA Administrator Carol Browner has proposed a joint U.S.-China workshop later this year to explore specific avenues for cooperation on project-level analysis of greenhouse gas emissions and related issues that can support such sustainable development efforts.

Concerning international efforts on climate change, Under Secretary of State Frank Loy has suggested that the next session of our high-level dialogue on climate change be held in July. This dialogue provides an important opportunity to explore topical issues of mutual concern and discuss the future of the international negotiations, and provides a broader context for our growing bilateral cooperation. It might consider the possible usefulness of a joint study by an expert-level group on the economic implications of any regime that reduces greenhouse gas emissions from a business-as-usual scenario. I look forward to your response to these suggestions.

NOTE:

1. *We need to avoid isolating the dialogue from the bilateral projects completely. It should not be viewed as having only a multilateral focus.*
2. *By raising the joint study idea, we may risk hurting the chances of the Chinese agreeing to the Dialogue now.*

(3)

SENSITIVE BUT UNCLASSIFIED

U.S.-China Forum on Environment and Development
April 9, 1999
Washington, D.C.

Environmental Policy Working Group
Meeting Report

Summary

The Environmental Policy Working Group was co-chaired on the U.S. side by Carol M. Browner, Administrator of the U.S. Environmental Protection Agency (USEPA), and Frank E. Loy, Under Secretary of State for Global Affairs. Xie Zhenhua, Minister of State of the State Environmental Protection Administration (SEPA), and Lu Shumin, Director-General, Department of America and Oceania Affairs, Ministry of Foreign Affairs, co-chaired the People's Republic of China delegation. Lists for both delegations are attached at Tab A.

The session, which met for three and a half hours, was divided into two interrelated parts: the first focussing on environmental issues of bilateral concern and cooperation, and the second concerning multilateral environmental matters. The agreed Agenda and Schedule is attached at Tab B.

On bilateral issues, the two sides exchanged views on the recent exchange of visits of Minister Xie and Administrator Browner, and then discussed cooperative environmental projects, including the on-going air quality monitoring project. A discussion then ensued on possible new air pollution control projects, industrial pollution prevention and energy efficiency issues, and possible expansion of U.S. Peace Corps activities in China into environmental education. Forestry cooperation, air quality/pollution management issues, air pollution and health issues, and municipal solid waste treatment and urban water issues were also discussed. After the conclusion of the Working Group meeting, six separate Statements of Intent on environmental cooperation issues were signed between USEPA and SEPA; and one between USEPA and the State Administration of Coal Industry of China. These were in addition to three Statements of Intent concluded earlier in the day, including one between USEPA and SEPA and two between USEPA and the State Development and Planning Commission of China. Copies of these Statements of Intent are attached at Tab C.

On multilateral issues, the two delegations exchanged views on global climate change, including the High Level Dialogue between the two governments on climate change, and Clean Development Mechanisms Issues and other environmental financing issues. Desertification issues and international forests issues were also discussed. The

two sides examined international chemicals issues, including the Persistent Organic Pollutants and Prior Informed Consent Regimes and associated agricultural issues, as well as biodiversity matters, specifically the Biosafety Protocol to the UN Convention on Biological Diversity.

Discussion

Bilateral Issues

Mr. William A. Nitze, Assistant Administrator for International Activities, USEPA, opened the discussion on bilateral environmental cooperation issues on behalf of Administrator Browner who was called away on urgent business. Mr. Nitze welcomed the Chinese participants and noted the importance of the Forum in engaging both sides on environmental issues, congratulating the Chinese side for the commitment to this effort and hard work to make the Forum a success. Because the meeting started late, both sides agreed to work quickly through the agenda.

Minister Xie captured the current state of industrial development and its impact to the environment in China. He noted that the many small and medium sized industries in China produce visible environmental impacts including groundwater pollution and acid rain. China is in need of a better groundwater resource management scheme and is prepared to spend over 100 trillion RMB on addressing the acid rain problem, he said. The environmental restoration effort will be initiated in the "key" cities, such as Beijing, he noted. In addition, protection and restoration of the marine environment is also important to the Chinese, the Minister stated.

Mr. Xie described some of the active efforts being made by China to protect the environment, including "total emissions control," the target of which is to hold emissions of certain pollutants (primarily SO_2) in certain areas to 1995 levels in the year 2010; ecosystem management including massive tree planting programs; CFC phase-out efforts; chemical waste management programs; and setting aside 7.6% of the country's land for nature reserves. With respect to lead phase-out in gasoline, 20 some cities have begun to use unleaded gasoline, the Minister noted. Sustainable development is the goal for eleven major key cities. In terms of greenhouse gas emissions reduction, Minister Xie described population control programs in terms of their benefit in limiting growth in energy consumption, as well as efforts to develop non-coal energy sources including nuclear, wind and solar.

Both sides reviewed the progress on bilateral cooperation since the last Forum meeting, including successful exchanges of visits between Minister Xie and Administrator Browner. Mr. Nitze also mentioned the success seen to date on the Air

Quality Monitoring Cooperation Project between USEAP and SEPA that involves the State of California. Mr. Wang Zhijia, Director-General, Department of International Cooperation, State Environmental Protection Administration, agreed with Mr. Nitze and further elaborated that up to eleven cities will have automated air monitoring systems purchased from Dasibi at the end of Phase I of the project. SO_2, a major concern to China, is included in the Air Monitoring Network Project.

Turning to new projects under discussion at this meeting, Mr. Nitze invited USEPA colleagues to describe several projects on which the U.S. and China had come to agreement. First, for the project on market-based mechanisms for SO_2 control, the signing of which had just been completed prior to this meeting and witnessed by the Vice President and Premier, Mr. Paul Stolpman, Director, Office of Atmospheric Programs, USEPA, briefly described U.S. efforts and the benefits and cost reductions incurred. Mr. Wang noted that SEPA is very interested in market mechanisms but noted that they are not the only way to control pollution, and that the U.S. and China need to move forward step by step. Mr. John Beale, International Programs Manager, Office of Air and Radiation, USEPA, described what the two sides intend to do for the Air Quality Management Assessment Project and the Industrial Pollution Prevention and Energy Efficiency Project. Mr. Stolpman also mentioned the Energy Efficient Building Project which was being discussed in the Commercial Cooperation Working Group of the Forum, noting that buildings are responsible for significant pollution levels and that more pollution is caused by working in an office building than by driving to work. Mr. Wang also expressed that China is interested in the U.S. expert recommendations on the implementation and development of clean coal technologies.

Ms. Ellen Paquette, Regional Director for Europe, the Mediterranean, and the Asia Region, U.S. Peace Corps, described a new agreement with China to expand next year its English-language training programs into environmental education. Most of the Peace Corps work in China has been related to teaching English, and Ms. Paquette said that environmental education could be incorporated into current lecture material. Mr. Wang welcomed suggestions from Peace Corps on ways to raise environmental consciousness in children and adults alike. Mr. Yao Changtian, Deputy Director-General, Department of Development Planning, State Forestry Administration, described China's efforts to reinforce protection of reserved areas, of which there are 926 in China, to prevent erosion through wetlands preservation and planting, and other programs. He emphasized that most of the ecological preservation efforts and minimization of deforestation and agricultural activities have taken place on the upstream portions of the Yangtze River. Mr. Gary Man, Program Coordinator for Asia and the Pacific, Office of International Programs, U.S. Forest Service, responded that there are many similarities between the forests of the U.S. and China, and that the U.S. Forest Service looked forward to continued cooperation with China.

Mr. David Gardiner, Assistant Administrator for Policy, USEPA, noted that the U.S. and China had not yet come to agreement on two projects relating to the Clean Development Mechanism (CDM) on project based crediting and forest sinks. Because these projects are between USEPA and the State Development and Planning Commission, they were not discussed in detail. The U.S. side noted a desire to hold workshops to further explore bilateral cooperation in this area. Mr. Nitze noted that new projects examining the co-benefits (in terms of public health and the economy) of air pollution and greenhouse gas emissions control measures, as well as new air pollution and health research projects, will make the benefits of environmental management more clear to policy makers and the public. Minister Xie agreed, noting that U.S. cooperation on monitoring, forecasting and benchmarking would be particularly helpful. He also suggested that USEPA consider cooperating on an analysis of the sources of air pollution in China.

Finally, the Chinese delegation described China's needs in the areas of solid waste and waste water management, noting the need for improving waste management beyond current waste burial programs. Nearly 70% of China's waste water is discharged without treatment and water pollution fees have not rectified the problem. The U.S. side noted the successful initiation of cooperation on landfill methane and solid waste management, initiated at a Mayor's workshop last month in Nanjing and co-sponsored by the UN Development Program.

Multilateral Issues

Under Secretary Loy opened the discussion by congratulating China on efforts it has undertaken to date to address environmental issues and praised the bilateral cooperation between the two sides on such matters. He noted, however, that the United States and China can't effectively address environmental problems independently, and that the two countries need to work together in multilateral fora considering such issues. Mr. Loy observed that the U.S. and China had worked effectively in such fora on some international environmental issues such as chemicals matters. He stated that the U.S. recognized that there exist differences of views between the two sides on a number of multilateral environmental issues, but said that the U.S. and China have a responsibility to all peoples. He stated that the U.S. and China have a special role given each others' influence, size and power. Mr. Loy then observed that perhaps no issue is more important in this regard than global climate change, and proposed that the U.S. and China hold another session of their High Level Dialogue on Climate Change this summer.

Global Climate Change

On global climate change, Under Secretary Loy observed that as the two largest emitters of greenhouse gases that contribute to climate change, the leadership of the U.S. and China in the international community is essential to solve this problem. He noted that the challenge is to build a global system to limit and reduce where possible the rate of emissions growth while protecting economic growth. Mr. Loy stated that with China's help, the incentives to energize technology, capital, and the international rules can be developed that will benefit China in the process.

Acting Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, Melinda L. Kimble, proceeded to provide a progress report on global climate change discussions since the last Forum meeting, specifically focussing on the first High Level Dialogue session held in September 1998 in Beijing. She stated that the two days of meetings with a number of Chinese ministries were productive, noting that views on the problem of climate change were exchanged, actions to address it were presented, and opportunities for bilateral cooperation were discussed. Ms. Kimble opined that the session was particularly valuable in helping to understand each government's position in the multilateral negotiations on climate change. She stated that at the meeting, the U.S. outlined why it believes China could benefit financially, technologically, and environmentally from taking on a greenhouse gas emissions target under the Buenos Aires Action Plan and the Kyoto Protocol that allows for very substantial growth in emissions, and participating in emissions trading. Ms. Kimble noted that the U.S. heard China's concerns at that time with this approach, but that the U.S. continues to believe that there may be opportunities to narrow the differences of views. She stated that it was clear that while the U.S. and China may have some differences in the negotiations, there was strong interest in opportunities to work together to address climate change and related issues. In this regard, and within the context of the multilateral UN Framework Convention on Climate Change, Ms. Kimble noted that the two sides had identified an ongoing interest in cooperative opportunities presented by carbon sinks and the Clean Development Mechanism. She concluded that both sides emphasized the need for continued and strengthened cooperation, and agreed to continue the Dialogue.

Under Secretary Loy then congratulated China for its outstanding work to produce the China Climate Change County Study, stating that it was a significant accomplishment involving many Chinese ministries and institutions. He noted that the U.S. was pleased to have recently received the English translation of the report, which was completed with assistance from the U.S. Country Studies Program, USEPA, U.S. Department of Energy, and the U.S. Agency for International Development. Mr. Loy then called on Todd Stern, Assistant to the President for Special Projects, and coordinator for U.S. climate change policy, to describe U.S. domestic programs to reduce emissions.

Mr. Stern noted that the U.S. is spending approximately $4 billion annually on climate change related projects, including $1.4 billion in research and development. He noted that these funding levels represented a 35% increase over the previous year, which was a 25% increase over the year before that. He stated that the U.S. was focussing particularly on high efficiency automobiles, bioenergy, energy and environmental technologies, and other forms of energy efficiency. Mr. Stern noted that in addition to other groups, the U.S. has an extensive consultative process with the energy sector.

Mr. Loy concluded that it is clear that the U.S. and China are both taking actions domestically to address climate change, and that the bilateral cooperation between the two countries on this issue is growing significantly. He stated that it is essential, as the two sides move forward with national and bilateral cooperation on climate change, to enhance cooperation in the multilateral negotiations, and in this regard, that the High Level Dialogue on Climate Change was very useful. He again proposed another session of the Dialogue to be held this summer, without great publicity or a repetition of previously stated positions, but rather as an exchange of ideas.

Minister Xie responded by stating that climate change was discussed at length in the working lunch held earlier in the day between the Vice President and Premier. He noted that China understands the measures that the United States is taking domestically to address climate change and asserted that China is likewise taking measures. The Minister agreed with the need for the U.S. and China to cooperate on this matter and opined that such cooperation could lead to business cooperation and assist with solving the trade deficit between the two countries. He stated his agreement with continuing the dialogue, but noted that it needed substance and that simply repeating old positions would not be meaningful. Under Secretary Loy concurred that a free discussion was needed – one that would not bind either side, that was low key, and that did not anticipate a result such as a communiqué. He stated that time needed to be taken to prepare and plan for the Dialogue so that effective and meaningful results would be obtained.

A discussion on Clean Development Mechanism (CDM) issues then ensued. Acting Assistant Secretary Kimble stated that, in the context of the Kyoto Protocol and the Buenos Aires Action Plan, the challenge is to develop a system that assists developing countries such as China to limit their emissions growth while pursuing sustainable economic development. The engine for such a system must be the use of market-based mechanisms such as the CDM and emissions trading. She noted the differentiated nature of the Kyoto Protocol with regard to emissions reductions and stated that developed countries had agreed to reduce their emissions. But the overall problem is one of global emissions growth, and in this regard the Kyoto Protocol must be used effectively.

Ms. Kimble noted that the U.S. has the technology available to assist China with it emissions, but restricting the mechanics of the CDM does not help in this process. She

also noted that the CDM could be beneficial to China with its forest sector, and that the CDM could become operational by 2000; therefore, there is increased urgency to China's participation in the CDM as soon as possible.

Gao Yanping, Director, Division of Environment, Department of Treaty and Law, Ministry of Foreign Affairs, responded that China agrees that climate change is an important issue and that the Kyoto Protocol and CDM are important legal instruments. She stated that China's gross domestic product on a per capita basis was low and that China's per capita greenhouse gas emissions were similarly low. Though China opposed emissions limitation commitments on developing countries, it would act responsibly and not refuse to make efforts to limit emission at home. Ms. Gao said many nations have not done in-depth study on the CDM, and that an international debate is needed. She said it will be necessary to first get clear principles and rules in place for the CDM, abiding by the UNFCCC and the Kyoto Protocol, following which we can gradually set up the mechanism in a step-by-step process. Ms. Gao noted that China had submitted its views to the UNFCCC Secretariat in February on the CDM and, in this regard, noted that China believes certain principles needed to be included, particularly regarding methodological and institutional issues.

Under Secretary Loy reiterated that the Kyoto Protocol is essentially a document of differentiated obligations that the U.S., along with others, recognize and support. He stated that China's position on the CDM appeared reasonable, and agreed that discussions are needed on the principles and institutions that would ensure that the CDM would be simple enough to use and would provide certainty that emissions reductions are real and measurable. He noted that the circumstances under which the U.S. would be able to submit the Kyoto Protocol to Congress for ratification would require some sort of increased participation by developing countries. Mr. Loy felt it was in the mutual interests of all to play an appropriate role in a global system with differentiated responsibilities. Mr. Loy further stated that on the matter of technology and technology transfer, the U.S. recognized that without the wide application of technology, the problem of climate change was unlikely to be solved. He hoped the two sides could discuss further at the High Level Dialogue the mechanisms needed to speed up the flow of technology. Ms. Kimble added that the U.S. had recently submitted its own technical papers on the CDM and other Kyoto mechanisms.

The discussion then turned to Environmental Financing Issues. USEPA Assistant Administrator for International Activities, William A. Nitze, opened the discussion by noting that the issue is one involving the dilemma of how to purchase environmental technologies. He suggested that in order to initiate cooperation between the U.S. and China on environmental finance, a first step might be to organize consultations between U.S. and Chinese financial and environmental experts. Mr. Nitze stated that the U.S. is not as effective as Japan or the European Union in providing attractive financing, but that

the U.S. is interested in providing assistance to the energy and electricity generating sectors. He proposed that the U.S. and China begin a dialogue on the issue of environmental project financing.

Minister Xie responded that without U.S. grants or low interest financing little could be done to aid in implementation of the UN Framework Convention on Climate Change. He concurred that Japan and the European Union have far more attractive financing packages than the U.S., and posed the question of why China should cooperate with the U.S. when the U.S. can't compete in this particular market. Under Secretary Loy agreed that China should purchase the most economical materials; David Sandalow of the Council on Environmental Quality and the National Security Council said that the U.S. has superior environmental technology and suggested the need for a dialogue on the issue. Minister Xie concluded by suggesting that perhaps there was a need to nationalize environmental technologies.

Desertification Issues

Ms. Gao opened the brief discussion on desertification issues by underscoring the severity of the problem in vast areas of China and the importance of the United Nations Convention to Combat Desertification (CCD) as a means of providing needed international technical and financial cooperation to China. She noted that 46 million square meters of China suffers from desertification and dryland degradation, or approximately 30% of China's land area, and nearly 20% of China's population. The negative effects of desertification, Ms. Gao stated, are extraordinarily serious in developing countries. She noted China's status as a party to the CCD and observed that the U.S. has still not ratified the CCD. She affirmed the importance of U.S. ratification of the CCD and expressed the hope that this would occur as soon as possible. We were reminded that at the last Conference of Parties (COP) in Dakar in November 1998, Congressman Donald Payne (D-N.J., and Ranking Minority Member of the House International Relations Subcommittee on Africa) indicated that the U.S. was in the process of ratifying the Convention. Ms. Gao stated that China was taking measures to address its desertification problems by supporting the CCD and appointing officials to address desertification/soil erosion. But, she stated, China needs financial resources and technology to do this effectively.

Ms. Kimble responded by noting that the U.S. has many areas subject to desertification and drought and has built an experience base on how to manage them. She reiterated the importance the U.S. attaches to the CCD. She informed the Chinese side that the U.S. has signed the Convention and has sent it to the United States Senate for advice and consent to ratification. She also stated that Secretary of State Albright had included the CCD in the urgent (top) category for legislative action by the Congress this year. She also noted that she would be chairing a forum of U.S. environmental and

business interests regarding the CCD in the next few weeks. The Chinese side indicated their strong desire to have U.S. ratification completed by the next COP to be hosted by Brazil in late 1999.

International Forests Issues

Mr. Yao Changtian, Deputy Director-General, Department of Development Planning, State Forestry Administration, led the brief discussion on multilateral forest issues by stating that management of forests in China is based on sustainable development principles. He noted that China has developed a reforestation plan and established a sustainable development center. Ms. Gao further said that China participates in many international meetings, including the UN Intergovernmental Forum on Forests (IFF), with an effort towards discussion of future international arrangements to promote sustainable forest management.

Brooks Yeager, Deputy Assistant Secretary of State for Environmental Affairs, responded by stating that the U.S. is encouraged by the importance Premier Zhu placed on forest issues in his opening address to the Forum earlier in the day. Mr. Yeager noted that the U.S. and China had worked closely at the recent UN Food and Agriculture Organization Ministerial Meeting on Forestry in drafting an action oriented ministerial declaration. Such collaboration, he stated, is not only very welcome but also essential if the U.S. and China are to bring about a positive outcome to the ongoing debate on forests in the United Nations.

Mr. Yeager then reiterated the U.S. position that we do not believe a new legally binding forest convention is the best vehicle to promote international cooperation for sustainable forest management. He noted that the U.S. is concerned about sterile negotiations that would take away from concrete actions on the ground, such as implementing criteria and indicators. Mr. Yeager stated that the U.S. wants to work with China in the IFF. With further regard to criteria and indicators, Mr. Yeager said that the U.S. highly valued the participation of China in the Montreal Process Working Group (MPWG) for Sustainable Forest Management. He noted that the U.S. looks forward to working with China at the next MPWG meeting, which the U.S. will host this fall, and that the U.S. hopes China will consider hosting a meeting.

China did not respond to the U.S. comments on the Montreal Process (on which they may not have been prepared). Ms. Gao stressed that consensus needs to be reached before discussion about the concrete elements of a legally binding instrument can be undertaken. She noted that China understands the U.S. position, and that the two countries' goals for sustainable forest management are the same.

International Chemicals Issues

Deputy Assistant Secretary Yeager opened the discussion by indicating U.S. satisfaction with the Prior Informed Consent (PIC) Convention and expressed optimism about its prospects for early ratification by the U.S. He expressed the U.S. hope that China too would be in a position to ratify at an early date. Mr. Yeager noted that the U.S. enjoyed a close and cooperative relationship with China during the PIC negotiations, and characterized both countries' positions as pragmatic and sensible.

Turning to the ongoing negotiations on a Convention on Persistent Organic Pollutants (POPs) through the UN Environment Program, Mr. Yeager indicated that the U.S. sought a practical and sensible agreement in this area as well and one that effectively addresses transboundary risks associated with the highest priority substances. He expressed a hope that the U.S. and China could find areas where they could work together in this regard.

Mr. Yeager noted that because of the considerable local risks posed by POPs releases, most countries across all regions of the world had already taken strong action on most of the POPs. He stated that the U.S. believes that the task of the negotiations was to build on this momentum by moving away from the relatively few remaining uses as alternatives become available. As an example, Mr. Yeager noted that China had already indicated under the voluntary Prior Informed Consent procedure that it had banned all of the POPs substances that had been listed under PIC, including such substances as DDT and chlordane. He stated that the U.S. view is that the Convention would be instrumental in directing resources through the Global Environmental Facility (GEF) and other mechanisms toward better addressing this problem. Mr. Yeager noted that on technical issues, such as criteria and technical exemptions, the U.S. and China were likely to have much in common. He stated that the U.S. believes that the first Criteria Experts Group report reflected an excellent technical outcome on this issue, and that the U.S. wants to ensure that we build on this outcome in future meetings.

Minister Xie deferred to Mr. Lu who stated that China had agreed to reduce the use of POPs, but that China needed the financial resources and technology to reduce the harmful effects of POPs. He stated that the international community must agree to an acceptable timetable to reduce the use of POPs. On the PIC Convention, Ms. Gao responded by indicating that the development of the PIC Convention was very positive and that China was doing its best to sign and ratify it, hopefully in the near future. With further regard to the POPs agreement, Mr. Gao Shangbin, Deputy Director, Department of Science and Technology, Ministry of Agriculture, expressed China's view that the Convention would need to take into account different conditions of developing countries, and that there would need to be differentiated obligations. He also stressed the importance of financing for the implementation of the agreement. Mr. Yeager responded

by stating that the U.S. recognized the need for technical assistance to developing countries.

Biodiversity Issues/Biosafety Protocol

As the Working Group meeting was running late when this agenda item was reached, it was decided to spend less than the allotted time on the Biosafety Protocol. Under Secretary Loy opened the discussion by saying that the United States was disappointed in the results of the suspended Biosafety negotiating session in Cartagena held last Fall. The U.S. is committed to achieving a Biosafety Protocol, but one that is practical and does not unduly hinder research or trade in biotechnology products, he stated. Mr. Wang responded that China too was disappointed by the outcome of the talks in Cartagena. He went on to say that China and other G-77 countries were very concerned about the role of big business in the negotiations. He claimed that China witnessed business representatives interacting with negotiators in the negotiating rooms in Cartagena. Mr. Wang went on to say that helping commercial activity is not the topic of the Protocol; protecting human health is the true topic.

Mr. Loy responded by noting that the U.S. cares about human health issues, but human health issues should be discussed in the Codex Alimentarus meetings under the auspices of the UN Food and Agriculture Organization. The Biosafety negotiating mandate is about protecting biological diversity. He reiterated that there are very important issues that still need to be discussed in the Biosafety Protocol negotiations, including the impact of the future agreement on the world trading system. Mr. Loy concluded the discussion up by saying that this technology is important to growing economies, and our countries need to discuss in-depth our differences.

Tab A – Delegation Lists
Tab B – Agenda and Schedule
Tab C – Concluded Statements of Intent

Drafted:OES/PCI:WEDilday
Cleared:OES:MLKimble, Acting (subs)
OES/E:BYeager (subs)
OES/PCI:JAMargolis (ok)
OES/ETC:SJCaswell (ok)
OES/ETC:EMConway (ok)
OES/ETC:JTuminaro (ok)
OES/EGC:DMarsh (ok)
OES/ENV:TTalley (ok)
G:NPurvis (subs)
Peace Corps:SBlanchard (ok)
USDA/USFS:GMan (ok)
EPA/OIA:MMBailey (ok)
EAP/CM:JFritz (ok)
OVP:TOsius (info)
Embassy Beijing:DBleyle (info)

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DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. report	Energy and Carbon Emissions Outlook to 2020 (26 pages)	06/01/1999	P1/b(1)

COLLECTION:
Clinton Presidential Records
Office of Environmental Initiatives
Roger Ballentine
OA/Box Number: 19509

FOLDER TITLE:
Climate Change International China [3]

2017-1093-F
ds458

RESTRICTION CODES

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P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
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P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
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Freedom of Information Act - [5 U.S.C. 552(b)]

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b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

To: Roger B.
Fr: Jeff S.

Painting China Green

The Next Sino-American Tussle

Elizabeth Economy

C.C. on pp. 17-19

When Chinese Premier Zhu Rongji meets President Bill Clinton and Vice President Al Gore in Washington in April, the political climate is unlikely to be auspicious. The United States and China have reached a virtual stalemate on each of their traditional agenda items. Negotiations over China's entry into the World Trade Organization have stalled; China's continued drive for reunification with Taiwan offers little potential for fruitful dialogue; and human rights remains an elusive area for compromise. Yet the Sino-American relationship may well define global prosperity and military security in the 21st century. Allowing it to deteriorate risks a future punctuated by frequent military and economic conflicts and global instability. Both sides are eager to sustain the illusion of progress produced by the recent presidential summits. Hence, a centerpiece of the talks will likely be a subject viewed by both as uncontroversial—environmental cooperation.

Chinese and American leaders believe that the environment is a low priority issue with plenty of common ground. This is a big mistake. The environment is as complex as other key diplomatic issues, featuring differing interests and priorities, weak Chinese institutions, Chinese defiance of international agreements, and conflict between Congress and the White House over how to achieve U.S. aims.

Moreover, environmental issues have direct and serious implications for other U.S. foreign policy objectives. A warmer Sino-American relationship is stymied by China's reluctance to seek any middle ground with the United States until it is in firm control domestically. But the environmental problems created by China's recent economic boom now threaten the country's fragile social, political, and economic infrastructure. This is a momentous issue, and the question is: Is China's economic growth sustainable? Progress in bilateral discussions rests on China's resolution of it. Fleeing to the environment as a short-term foreign policy sanctuary will be treacherous if these complications are ignored. If fully understood and thoughtfully addressed, however, China's environmental problems offer a unique opportunity for the United States to cooperate with China on a vital issue.

ELIZABETH ECONOMY is Deputy Director of Asia Studies and Fellow for China at the Council on Foreign Relations. She also served as Co-chair of the Woodrow Wilson Center's Working Group on Environment in U.S.-China Relations.

IT'S NOT EASY BEING GREEN

At first glance, the connection between China's environment and U.S. interests may appear tenuous. China is halfway around the world and unlikely to affect American air and water quality. But China's impact on the global environment should not be underestimated. China is one of the world's largest contributors to both global climate change (albeit a distant second to the United States) and ozone depletion. Its environmental practices affect Americans, from the rate of skin cancer to agricultural productivity to the frequency and scale of natural disasters. Moreover, China's need for grain has a direct and growing impact on U.S. farmers' interests. Beyond these direct effects, however, China's environmental policy influences the full range of U.S. interests in China: stability and security, human rights, democracy, and trade.

The environment is beginning to shape China's economic and political choices in important ways. The government reports large internal migrations due to scarcities, particularly of water. These migrants will complicate Beijing's efforts to manage the overpopulated coastal cities, with their millions of unemployed workers. Moreover, political conflict over land and water resources has become endemic, occasionally erupting into wide-scale violence. Over the past few years, for example, farmers from the Ningxia Autonomous Region have raided the more fertile land in Inner Mongolia for a favored plant. Thousands of police and local officials have been injured by the incursions. China's environmental practices alone may not challenge economic growth, but when combined with other trends, their consequences for social stability are magnified. A China in political and economic disarray cannot be a stabilizing force in the region or the world.

Regarding human rights, China's environment causes both concern and hope. China's environmental problems encroach on the most basic necessities of life: clean air and safe drinking water. Every year, 300,000 Chinese citizens die prematurely from air pollution–related diseases. In 1996, 50,000 people were affected by water pollution–related diseases. Sixty million people cannot get enough clean water for their daily needs. But U.S. politicians should also recognize environmental action's potential to propel political change. In the environment, perhaps more than in any other area, the Chinese government has opened the political space for dissent. Rather than devote significant financial resources to environmental protection (it spends slightly under one percent of GDP), the government has permitted the emergence of genuine nongovernmental organizations (NGOs) devoted to the environment. Helped by the media and the general public, which also discuss environmental policy with unusual openness, these NGOs criticize and expose the weaknesses of local environmental protection efforts. Grassroots environmental organizations have blossomed, many of them dominated by politically reform-minded Chinese intellectuals.

Finally, as the United States attempts to reduce its growing trade imbalance with China, it should not overlook the sale of technologies and products protecting the environment. The World Bank estimates that between 1995 and 2004, China will require about $100 billion of infrastructural investment in water conservation, treatment, and sanitation. The market for environmental goods and services, already estimated at around $4 billion, is growing

AP/WIDE WORLD PHOTOS

The road to prosperity? Yangtze River flooding, 1998

rapidly. American companies, however, still lag far behind their Japanese competitors in market share.

CHINA'S FAUSTIAN BARGAIN

Chinese leaders know they have a problem. They also realize that it is not just an environmental issue but an economic and political one. They have gambled that the rate of economic growth will outpace the rate of environmental degradation and resource scarcity. But their development practices have produced a costly environmental disaster; it is clear to anyone living in China that economic growth has come at the expense of the environment. The country's overwhelming reliance on coal has resulted in some of the world's worst air quality and acid rain that is damaging one-third of Chinese agricultural land. Eighty percent of wastewater and sewage is dumped untreated into rivers and lakes; in 1997, China's Environmental Protection Agency announced that water quality had deteriorated in every single major river system during the previous year. Fully 86 percent of the water in rivers flowing through China's cities is considered unsuitable for drinking or fishing.

This damage is haunting China's economic growth. Economists estimate the cost of environmental degradation and resource scarcity to be 8 to 12 percent of China's GDP. According to the World Bank, water scarcity and pollution alone annually cost China about $14 billion in lost industrial output and about $24 billion in crop loss. The health costs of air pollution will skyrocket—reaching $98 billion by 2020.

Perhaps the most dramatic example of the costs of China's decision to trade the environment for economic growth was 1998's flooding of the Yangtze River. Official indifference and decades of poor environmental choices—failing to protect wetlands and clear-cutting forests for timber, farmland, and industrial development—contributed to the unrelenting floods, which killed more than 3,000 people, destroyed 5 million homes, and inundated 52 million acres of land. The economic losses are estimated at more than $20 billion.

In the race between development and the environment, Chinese leaders have bet on development. Either because it had no choice—since the regime's legitimacy is predicated on continued rapid economic growth—or because it has decided to see who will blink first, China has placed the burden of global environmental problems on the rest of the world. Issues such as global climate change and ozone depletion are more diffuse and long-term than China's current woes. Chinese officials have resisted devoting financial resources to problems that they could blame on industrialized countries, a philosophy best summed up as "For China to play, the world must pay."

THE SILVER LINING

Despite these obstacles, the silver lining of the April summit is that the environment may finally receive the attention it deserves. The danger lies in assuming that environmental discussions should provide no more than an easy photo opportunity for Gore and Zhu. The Clinton administration tends to settle for nonsubstantive policy "wins"—in the words of one official, "find[ing] the low hanging fruit"—rather than fighting for difficult new programs. Congress, in turn, blocks substantive initiatives by withholding funding without offering constructive alternatives. The United States cannot afford this repeat performance. China now stands on a precipice of change as steep as that in 1979, when the leadership launched its economic reform program. Since then, China has embarked on wholesale economic restructuring, including a national infrastructure program, that will not only determine its own economic and environmental future but will also affect the world's. Washington must acknowledge that changing Beijing's environmental performance will take several decades. As with other contentious issues in the Sino-American relationship, from intellectual property rights to control over weapons technology transfers, China's capacity to enforce its environmental agreements is constrained by bureaucratic and regional conflicts. The United States must act quickly if it is to influence China's choices.

First, Gore needs to incorporate businesses, foundations, and NGOs from both countries into the U.S.-China Forum on Environment and Development. The forum, which Gore inaugurated in April 1996, serves as the umbrella for cooperation between both countries' bureaucracies. The low level of funding to date—less than $10 million in 1997—has limited joint ventures to small-scale workshops on topics such as natural disaster relief, water usage, and energy efficiency. Introducing new actors into the forum will provide fresh sources of funding and expertise, organize the disparate efforts of environmental organizations in China, advance U.S. trade interests, and nonthreateningly support Chinese NGOs. Forum-sponsored projects should address both U.S. priorities like global climate change and Chinese domestic needs. Ventures could involve reforestation, energy efficiency, and renewable energy.

Second, the United States urgently needs to soften China's recalcitrance on global climate change. Chinese leaders resist even minimal voluntary limits on

greenhouse gas emissions for fear that more significant future commitments will slow China's economic development. Since Congress is withholding funding for domestic global warming initiatives until it sees China and other developing countries move on this issue, the White House is desperate for progress. Yet it should resist the temptation to oversell any summit agreement. China's compliance will be weak because it lacks the will and capacity to address climate change, and the United States is bound to be disappointed. Instead, Washington should proceed along the two tracks that offer the best hopes for improving Beijing's performance. The bill proposed by Senators John Chafee (R-R.I.), Joseph Lieberman (D-Conn.), and Connie Mack (R-Fla.), which grants early action credit to companies that reduce greenhouse gas emissions, should be expanded to include actions undertaken in other countries. The administration should also refrain from high-profile demonstration projects unless they are funded by those whose business interests will profit. U.S. efforts should focus on activities with a long-term payoff, such as training Chinese officials and researchers in environmental planning and enforcement, rather than on projects with limited application elsewhere in China.

Why not CDM?

Third, it is time for Congress to clear the way for lifting sanctions on U.S. assistance programs to China imposed after Tiananmen Square. The U.S.-Asia Environmental Partnership, the Trade and Development Agency, and the Overseas Private Investment Corporation could all facilitate exports of environmental goods and services to China. For U.S. firms to compete, they need financial and organizational assistance. There is no rationale for maintaining sanctions that hurt only U.S. companies and limit American advancement of its own environmental interests.

GETTING IT RIGHT

Discord and distrust are hallmarks of the Sino-American relationship. Despite recent efforts by both U.S. and Chinese leaders to move beyond the current stalemate, little has been achieved. Domestic politics on both sides and weak institutions in China confound efforts to achieve compromise. Although both sides want China's emergence as a global power to proceed smoothly, neither is willing to forgo short-term interests for long-term gain.

In this rather bleak political climate, the environment offers a fresh start. Gore and Zhu have the opportunity to accomplish something significant. By addressing environmental protection Gore will also serve broader U.S. interests of human rights and democracy, U.S. business development, and international security. By influencing China's economic and environmental choices, the United States will fundamentally shape the China that will emerge in the 21st century. Ensuring that China becomes a constructive participant in the international system will take time. Progress on the environment, as on other issues, requires both sides to commit themselves to a long-term strategy of institution-building to enable China to meet its domestic challenges as well as its international obligations. This does not mean that the United States should allow China to ignore its commitments in the interim. But the United States is best served by engaging China and helping it develop the capacity to be a respected and effective international actor. America's interests in China are significant and growing. We should take the time to get the relationship right.

THE VICE PRESIDENT
WASHINGTON

June 22, 1999

OK
-AG

His Excellency
Zhu Rongji
Prime Minister
People's Republic of China
Beijing

Dear Mr. Premier:

I would like to add my personal expression of deep regret over the accidental bombing of your Belgrade embassy to the official messages conveyed by President Clinton and members of the Cabinet. My sincere sympathies go out to the families of the victims and the Chinese people.

When controversies cast a shadow over our bilateral relationship, it is especially important to press ahead in areas where we have clear common objectives. In that regard, I greatly appreciated the opportunity to co-chair with you the second session of the U.S.-China Forum on Environment and Development during your visit here. I believe we made important progress that will benefit both countries, and I share your view that cooperation on environment and development will become central to the U.S.-China relationship. Our work in this area must continue. To that end, I wanted to continue our correspondence by sharing with you some thoughts on the next steps we might take in the Forum.

Already, many Forum activities are underway, and more will take place over the next several months. The U.S. Department of Agriculture signed a Letter of Intent with China's National Bureau of Statistics to work on agricultural productivity and other issues. The National Oceanic and Atmospheric Administration will hold a workshop with the State Oceanic Administration and a symposium with the Chinese Meteorological Administration. Technical teams will visit China in June and early July to begin work under the package of environmental agreements reached in April. The Joint Commission on Science and Technology will continue our discussion of water and land use issues at its next meeting. Peace Corps remains committed to working with the State Environmental Protection Administration to develop an environmental education program. In addition to furthering our understanding of the areas in which these projects are taking place, these activities provide us with an opportunity to bring our people, and ultimately our countries, closer together.

FAX TRANSMITTAL # of pages ▸ 1
To Jeff Seabright From Ted Osius
Dept./Agency OCTF Phone # Fax #
Fax # 52311

Let me draw your attention in particular to next month's meeting of the U.S.-China Oil and Gas Industry Forum in Houston, Texas, which provides an opportunity to strengthen cooperation between the petroleum and gas sectors of both countries in support of our common energy and environmental objectives. The session will focus on natural gas production and market development, including interaction between the government and private sector, transportation, and market economics, as well as recent developments under the APEC Natural Gas Initiative. During the meeting in Houston, we plan to cover relevant "lessons learned" from the U.S. and other countries in setting up regulatory regimes which stimulate investment and promote the development of natural gas markets. We look forward to your representatives discussing the progress made toward reorganizing your state petroleum enterprises and developing your natural gas policy and market for natural gas. The U.S. petroleum and gas industry is ready to cooperate with yours and offers unparalleled, world-class technology and expertise.

I hope we can build on the significant achievements of the last Forum, including implementation of the $100 million Clean Energy Program agreed upon by the U.S. Export-Import Bank, Department of Energy, China Development Bank and State Development Planning Commission. Once the first projects are selected and move forward, the Ex-Im Bank would be pleased to discuss the possibility of additional financing – up to several billion dollars – for the purchase of U.S. equipment and services to address China's environmental, health and safety needs. Ex-Im Bank would also be open to discuss other potential financing structures, consistent with OECD export credit rules, including foreign hard currency guarantees.

I would also like to explore further joint steps to reduce greenhouse gas emissions. I envision two types of complementary cooperation that should proceed in tandem – one dealing with international efforts to mitigate climate change and the other dealing with specific projects. Concerning international efforts on climate change, Under Secretary of State Frank Loy has suggested holding the next session of our high-level dialogue on climate change in July. This dialogue provides an important opportunity to explore current and future issues of mutual concern related to the international negotiations, and provides a broader context for our growing bilateral cooperation. We might consider the possible usefulness of a joint study of the economic benefits to China of various forms of international action. On the joint projects, we should continue our discussion of how forestry and other projects, including those that could produce emissions reduction credits, have the potential to support a wide variety of sustainable development goals relating to water quality, flood control, provision of energy, and sequestration of greenhouse gases. In addition to our ongoing cooperation on such efforts, EPA Administrator Carol Browner has proposed a joint U.S.-China technical workshop later this year to explore project-level cooperation. I look forward to your response to these suggestions.

In order to continue the momentum we have achieved through the Forum, I propose that we ask Minister Zhu Lilan and Dr. Neal Lane to chair a ministerial-level session of the Forum late this year. I believe the Forum will continue to be an important focal point for our bilateral relations on environment and development issues.

Sincerely,

Al Gore

AG:to

OFFICE OF THE VICE PRESIDENT
WASHINGTON

June 21, 1999

Her Excellency
Zhu Lilan
Minister of Science and Technology
Beijing, People's Republic of China

Dear Minister Zhu:

I regret I did not have the opportunity to meet you during the second session of the U.S.-China Forum on Environment and Development in April. Clearly, the Vice President and Premier Zhu Rongji made important progress in advancing bilateral cooperation on environment and development. I have enclosed for your reference copies of reports from the four Forum working groups, and an English-language version of our joint statement at the conclusion of the Forum.

At an appropriate moment, the Vice President will write to Premier Zhu with his thoughts on the next steps we might take in the Forum. I look forward to further contact with you.

Sincerely,

Leon Fuerth
National Security Advisor
to the Vice President

Enclosures: As stated

cc: Ambassador Li Zhaoxing

OFFICE OF THE VICE PRESIDENT

WASHINGTON

U.S.-China Joint Statement
Second Session of the Forum on Environment & Development
April 9, 1999

At the invitation of President Clinton of the United States of America, Premier Zhu Rongji of the People's Republic of China paid an official visit to the United States from April 6 to April 14 of 1999. During the visit, Premier Zhu Rongji and Vice President Al Gore co-chaired the second session of the U.S.-China Forum on Environment and Development in Washington, DC, on April 9, 1999. The first session of the Forum was held in Beijing in March 1997.

Vice President Gore and Premier Zhu Rongji delivered opening remarks of the Forum. They agreed that the U.S. and China should work together to achieve our common goals of improving the standard of living of all people while protecting and preserving the world's natural resources. They charged the Forum's four working groups to find ways in which our cooperative efforts can further these goals. The Vice President and Premier also met with executives of American companies from the energy and environment sectors to discuss such issues as strengthening the cooperation in the area of environment protection between the business sectors of the two nations.

Vice President Gore and Premier Zhu Rongji had productive discussions on a variety of issues related to the Forum. They agreed that the United States and China will increase their efforts to improve, protect and preserve the world's natural resources by working together to combat global threats such as climate change, desertification, and loss of biodiversity, managing water resources, developing cleaner and more efficient sources of energy, minimizing air pollution and its effects on human health, and mitigating and reducing natural disasters.

During the Forum, several concrete steps were taken to further our cooperation on these issues. These include:

- The U.S. EPA and the Chinese State Environment Protection Administration and other counterparts signed 10 Statements of Intent outlining cooperation on air quality management, energy efficient buildings, clean air and energy technologies, the relation of air pollution to human health, and a feasibility study on sulfur dioxide.

- The United States and China agreed that Peace Corps will conduct the Environment Education Project in China.

- The U.S. and China agreed to utilize the U.S. Export-Import Bank's new $100 million credit line to finance, on the basis of mutual consent, projects focused on

renewable energy, energy efficiency, and clean coal technology. The Department of Energy hopes to provide expert assistance for this program.

- The United States and China agreed to consider a dialogue on land use management to further cooperative efforts to fight deforestation, desertification, destruction of wetlands and rangeland degradation.

- The U.S. and China will hold the Second Meeting of the Oil and Gas Industry Forum in Houston in July 1999.

- The U.S. and China will hold a joint seminar on water resource management in Arizona, April 19-22, 1999.

- The National Oceanic and Atmospheric Administration (NOAA) and the State Oceanic Administration have established a Joint Commission on Coastal Management to develop plans for the sustainable use of coastal ecosystems.

- NOAA, the State Oceanic Administration, and the Chinese Meteorological Administration will hold a joint workshop and a symposium on climate forecasting.

- The Department of Agriculture's Economic Research Service and China's State Statistical Bureau will sign a letter of intent to initiate a three-year cooperative research project, based on the results of China's first agricultural census, to study the linkages between the crop and livestock sectors, farm productivity and economies of scale, urban agriculture, and rural labor quality and migration issues.

- The United States and China agreed to continue the high-level dialogue on climate change agreed to at last year's presidential summit in China.

Vice President Gore and Premier Zhu expressed satisfaction with the activities of the Forum to date. They urged participants to further strengthen cooperation in the important areas covered by the Forum and agreed to encourage participation in Forum activities by business and other sectors. They decided that the next session of the Forum will be held under the auspices of the moderators in China, and the specific time will be decided through diplomatic channels.

Energy Policy Working Group of the
U.S.-China Forum on Environment and Development
April 9, 1999
Washington D.C.

The Energy Policy Working Group of the U.S.-China Forum on Environment and Development held its second session in Washington D.C. on April 9, 1999, at the U.S. Department of Energy. The meeting took place in conjunction with the second plenary session of the U.S.-China Forum on Environment and Development on April 9, 1999, under the co-chairmanship of Vice President Al Gore and Premier Zhu Rongji. The Energy Policy Working Group was co-chaired by Mrs. Song Mi, Director-General, Department of Basic Industries, State Development Planning Commission and Dr David J. Jhirad, Senior Advisor for International Affairs, Office of the Assistant Secretary for Policy and International Affairs, U.S. Department of Energy. A complete delegation list from both countries is attached.

The major outcomes of the meeting are provided below:

- Discussion of next steps in implementing the Export-Import Bank $100 Million Clean Energy Program

- Discussion of next steps in renewable energy cooperation, including projects underway to[1]:

  -- Complete Xiao Qingdao (PRONOUNCE: SHAW-CHIN-DOW) village power project in island off the coast of Shandong province;
  -- Completion of two bilingual reports: i) PV industry and technical status in China; ii) renewable energy business profile in 6 provinces;
  -- Development of an internet web site in both countries in support of renewable energy business development;
  -- Provision of technical assistance in 3 building designs using ground source heat pumps (totaling 2.5 million square feet) and training in exchange for China's commitment to purchase U.S.-made equipment;
  -- Upcoming completion of 240 Solar Home Systems in Inner Mongolia;
  -- Technical assistance for the Lanzhou Testing and Training Center;
  -- Updating a biomass resource database.
  -- Consideration of joint renewable energy forum and exhibition in Beijing, possibly in the spring of 2000.

- Review of the summary report of the first session of the U.S.-China Oil and Gas Industry Forum and plans for the next meeting in July 1999 in the United States.

[1] These are those projects using FY 1998 Funds

- Confirmation of plans for a natural gas utilization study, under a letter of intent signed by EPA and China's State Development Planning Commission.

- Discussion leading, in the next few months, to a new fossil energy technology development and utilization protocol between DOE and the appropriate Chinese government organization that reflects the recent Chinese Government reorganization and current areas of interest for cooperation.

- Discussion of plans for the development of a Coal Mine Methane Market Development Plan, a joint project between China's State Administration of Coal Industry and EPA.

- Discussion of plans for the next phases of cooperation in the "Technology Cooperation Agreement Pilot Project: Clean Air and Cleaner Energy Technology Cooperation", led by EPA with China's State Development Planning Commission.

- Reporting on status of several activities in energy efficiency:

  -- plans for the second meeting of the U.S.-China Energy Efficiency Steering Committee in June of 1999 in Beijing (Dates of June 24-25 have now been confirmed);
  -- the convening of a motor challenge workshop, concentrating on pumping systems in Beijing in the summer of 1999;
  -- status of a design study (to be completed) for an energy efficient building demonstration project in Beijing, being coordinated by DOE and China's Ministry of Science and Technology;
  -- confirmation of USG offer to continue to provide technical assistance in energy efficiency policies.

Summary

In opening the session, the U.S. Co-Chair reviewed desired outcomes of the meeting. These included: identifying/clarifying next steps in implementing the $100 million U.S. Export-Import Bank/DOE Clean Energy Program; exchanging views on energy policy developments; agreement on the second session of the Oil and Gas Industry Forum; identifying areas to strengthen cooperation in clean coal technology, energy efficiency and renewable energy; confirming cooperative agreements with EPA for a natural gas utilization study, coalbed methane market development plan, and technology characterization pilot project. The U.S. Co-Chair called attention to Premier Zhu's statement at the Forum plenary session that morning that energy cooperation was beneficial to the environment and also to improving the bilateral trade balance.

Energy Policy Developments

The U.S. Co-Chair made available a copy of his prepared remarks highlighting developments in U.S. national energy strategy since the March 1997 Forum meeting and distributed a copy of the "Comprehensive National Energy Strategy" released in April 1998.

The PRC co-chair reported on energy developments in the PRC since the March 1997 Forum. She noted rapid increase in energy and electricity demand and continued structural changes, including a decline in the percentage of coal in the energy mix to 74% and increased use of natural gas. She indicated that there had been an improvement in the management of coal mines, and a new system put into place to manage large-scale energy projects. She pointed to continued progress in energy conservation, with the ratio of energy use to GDP having fallen to 0.5, a 50% reduction since the late 1970s. Developments in other areas noted were: the delegation of the management of all state-owned coal mines to local governments; the establishment of a new national electric power corporation; a major restructuring of the petroleum industries; and a decision, as of June 1998, to link domestic crude oil prices to international ones.

The PRC co-chair indicated that, since the first meeting of the Forum, the PRC had focused on the following areas: reductions/closures in low-efficient, low-capacity fossil energy power plants; increases in the deployment of desulfurization technology; increased emphasis on solar, wind and other new technologies; efforts to restructure the electric power grids; attempts to lower the sulfur content of coal use; efforts to deploy coal gasification technology. In reference to energy cooperation, mention was made of the MOU for the $100 million Clean Energy Program and cooperation in other areas, such as oil and gas, and renewable energy. The PRC co-chair emphasized that the PRC would do its part to promote greater cooperation in the energy sector and explore areas to further improve bilateral cooperation.

The U.S. co-chair complimented the PRC on the restructuring of their electricity and petroleum sectors. He noted that, given the extensive amount of capital investment needed for energy expansion worldwide (an estimated $300 billion per year), much of this investment will have to come from the private sector. This indicates the need for continued energy reforms to attract investment needs. He complemented the PRC on reforms taken to date and encouraged the PRC on this path. He said that there were opportunities to make energy an important part of the trade balance and economic future of both countries and indicated that the U.S. would like to collaborate with China to bring advanced technologies to commercial reality.

$100 Million U.S. Export-Import Bank/DOE Clean Energy Program

U.S. Export-Import Bank officials discussed the program and next steps in implementing it. They noted that Ex-Im Bank Chairman Harmon looked forward to implementing the Clean Energy Program. China was already the largest customer of Ex-Im Bank, with cumulative exposure of almost $6 billion, and was one of the largest future markets for clean energy

technology. The Memorandum of Understanding for the Clean Energy Program was signed on March 29; signatories were the State Development Planning Commission; the China Development Bank; Ex-Im Bank; and the U.S. Department of Energy. Projects eligible for inclusion under the program include: wind; solar, and geothermal technologies; industrial cogeneration; energy efficiency building technologies; low nitrous oxide burners; and SO2 reduction technologies.

Under the terms of the MOU, both the U.S. Department of Energy and the Ex-Im Bank plan to encourage U.S. private industry to work with the relevant Chinese authorities to support the identification, assessment, and implementation of appropriate projects that will showcase innovative U.S. energy technologies that provide reliable, cost-effective, and environmentally-sound energy production and savings. Ex-Im Bank officials indicated that U.S. exporters and other interested parties could contact two Ex-Im Bank project officers for more information: Mr. Kyle Jackson at 202-565-3927 or Frank Wilson at 202-565-3920. In follow-up discussion, the Chinese Delegation indicated that they had already identified three potential projects for the Clean Energy Program; the Bao Ding solar energy cell project (still in feasibility study and approval stage); a power project in Inner Mongolia (a feasibility study has been submitted to the SDPC for approval); and a geothermal project, still in the proposal/formulation stage. The Chinese delegation indicated that they did have some difficulty with the U.S. loan terms because the financial profitability of all three of these projects were not high, although the social benefits were very high. The Chinese delegation asked whether there could be better interest rate terms available for the Ex-Im Bank program.

Ex-Im Bank officials responded that, with regard to the terms of the Clean Energy Program, there were two structures (direct loan or guaranteed loan). Under the latter, there was a possibility for the two negotiating parties (i.e., the U.S. company and Chinese buyer) to negotiate better terms. Ex-Im Bank officials indicated that each project being considered would be reviewed by Ex-Im Bank's energy and environment division. They noted that notification of the prospective projects could take various forms: project ideas submitted by SDPC to Ex-Im Bank or DOE; direct application by the U.S. exporter to Ex-Im Bank etc. Ex-Im Bank officials indicated that it would be worthwhile to explore other ways to discuss/identify projects of which the U.S. side might be aware which would qualify for this program. In regard to the potential eligibility of projects, Ex-Im Bank could issue a Letter of Interest to the U.S. exporter, and copy Chinese representatives at SDPC or CDB to notify them that the prospective project would qualify for the program.

The PRC co-chair indicated that the SDPC was likely to participate in the development of the first few projects for the Clean Energy Program. China would examine the projects to see if they are worthwhile. After the projects were approved and agreements signed among the parties, the CDB would make an application for the Clean Energy Program. Ex-Im Bank officials indicated that all three of the projects which the PRC co-chair had described would be eligible to apply for the Clean Energy Program -- there was no question about that. In regard to how to approach Ex-Im Bank for the Program, Ex-Im Bank officials noted that: DOE was interested in providing input and guidance; that the SDPC has identified mechanisms which they feel would

be appropriate and that if the PRC has projects it feels strongly about, they can contact Ex-Im Bank directly or go through DOE to see if the projects are suitable for the Clean Energy Program; China could invite the U.S. exporter to bid on given projects; and U.S. exporters would subsequently apply to Ex-Im Bank for a letter of interest or loan/loan guarantee. The PRC co-chair described her understanding that the proposed projects have to go through certain procedures. She asked if the SDPC was responsible for the selection of the projects and would they all have to fall under specified criteria. She also indicated her understanding that the U.S. exporters bidding on the projects could apply directly to Ex-Im Bank during the initial stages of negotiations for letters of interest. She said we should move the projects forward on this basis. Ex-Im Bank officials responded that this understanding was essentially correct. The SDPC would be a very important player on the Chinese side in identifying and selecting projects. Ex-Im Bank officials said that one suggestion would be that, after projects have reached the negotiating stage between the Chinese and U.S. company, it would help facilitate the process if DOE and Ex-Im Bank were notified about the projects. Subsequently, the U.S. exporter could approach Ex-Im Bank.

Oil and Gas Activities

An official from DOE's Office of Fossil Energy, also a U.S. member of the Steering Committee for the U.S.-China Oil and Gas Industry Forum, reported on the outcomes of the first session of the Forum in November 1998 and plans for the second session in July 1999. He noted that the November 1998 session was very successful and had resulted in agreement to continue this two-way dialogue with specific areas of focus for the second session. He noted that the summary report of the first session had already been agreed to by both sides in English and distributed copies of the Summary report. One of the action items emerging from the first meeting was to expand membership in the Steering Committee, from both U.S. industry and Chinese petroleum entities.

He indicated that this had been accomplished: all five of the Chinese petroleum entities were represented on the Steering Committee; and companies Phillips, Chevron, and ARCO had been added. He asked for reflections from the Chinese delegation on the first session. Mr. Zhu responded that, while he did not personally participate in the session, CNPC participants had prepared an internal report on the meeting and briefed all levels of their company. He noted that CNPC attached a great deal of importance to experience provided by the U.S. side, and exploration of China's long-term natural gas goals. He indicated that his government is seeking to adopt effective measures to encourage natural gas development and use and the development of a natural gas infrastructure. He said Chinese companies desired to cooperate with U.S. companies in initial work on large projects. A gas assessment was already underway with Exxon and an MOU had been signed with Enron for a long-distance natural gas pipeline. He indicated that, through the Forum, we can enhance and promote cooperation between our two industrial sectors. Both governments should encourage their industries to proceed with projects. He indicated that the willingness of U.S. companies to transfer technology would enhance their prospects.

DOE officials noted that the Forum Plenary session had included a Business Roundtable with U.S. CEOs and Premier Zhu Rongji and senior officials of his delegation. They noted that U.S. industry reportedly made 2 or 3 points in regard to the Chinese market: that they would like to establish long-term business partnerships with the PRC industry counterparts; that appropriate technology transfer could occur, but only on commercial terms; that U.S. industry would like to see reforms in China continue and be assured of adequate rates of return on investments; and that there must be equal and symmetrical access to information on R&D and end use markets.

In regard to LNG, a DOE official noted that the LNG roundtable in Beijing during Secretary Daley's recent visit provided a good opportunity to speak with Chinese officials, including Minister Bao Xu Ding of the SDPC, regarding the parameters of the announced LNG project in Guangdong province. He indicated that the U.S. welcomes the opportunity to continue this dialogue as to how the U.S. could be useful in facilitating the decision-making process on the project. He said there had been a positive response from the Chinese side regarding their willingness to review U.S. industry bids for the LNG facility. The DOE official also reiterated the USG offer to make available its technical exports to assist China in crafting a national natural gas policy.

In response, the Chinese delegation indicated that the local government in Guangdong had been authorized to go ahead with the LNG project and that the feasibility study for the project had already been concluded. He said such individual projects will be the responsibility of the local governments. He noted that future prospects for LNG were bright. He said that, in addition to LNG, China wanted to continue to develop its substantial offshore gas resources. He indicated that resources that could be exploited economically amounted to more than 3 billion cubic meters. China anticipated that total production from offshore areas is already 4 billion cubic meters and that this would rise to 10 billion by the year 2004. He noted successful projects already concluded, including Chevron effort to invest $40 million for gas exploration.

DOE officials noted that natural gas would be a special area of focus for the second session of the U.S.-China Oil and Gas Industry Forum and distributed a preliminary agenda for that session. China was asked to submit any additional topics as soon as possible to the Steering Committee so that the agenda could be finalized.

An official of the U.S. Department of Commerce, the Counselor to the Department of Commerce, described insights gained from U.S. industry in previous discussions and at the morning's Business Roundtable, as well as the Oil and Gas Industry Forum which he co-chaired in Beijing. He noted their interest in: mutual access to markets; exchanges on oil and gas industry practices to help identify areas where government practices and regulations could act as barriers to greater investment. He also indicated U.S. and Chinese industry's common interest in international projects for energy supplies to China, in both Central Asia and Russia. He encouraged China to work with Qatar for enhanced gas supplies and with other countries with whom the USG and China have common interests.

EPA/SDPC Cooperative Study of Natural Gas Utilization in China

An official of the U.S. Environmental Protection Agency next described plans for the "Cooperative Study of Natural Gas Utilization in China", under a Letter of Intent signed on April 9 between EPA and the State Development Planning Commission. He noted the benefits of natural gas because it had no emissions of SO2 or particulates and 60% fewer CO2 emissions compared to coal. Enhanced natural gas use would thus result in substantial reductions in China in all these emissions. He described the tentative schedule for the study with discussions with the SDPC to begin in a May visit to Beijing by EPA officials. That meeting would aim at confirming the schedule for the study. The goal is to initiate the study quickly and to report progress on it and seek inputs/comments at the next meeting of the U.S.-China Oil and Gas Industry Forum in July.

The Chinese Delegation responded that the PRC in very interested in improving air quality and had decided to embark on this study to reduce carbon emissions. It was noted that the State Council and one dozen Chinese agencies have jointly decided to embark on clean air projects, including a clean vehicle action plan. There was an agreement to phase out leaded gasoline in automobiles and to install devices to reduce tailpipe emissions. There were also efforts to promote use of LPG and CNG in vehicles and to promote electric vehicles. The clean vehicle action plan would be started with pilot projects in 12 cities, with the aim of gradually expanding the effort more widely. These pilot projects will open up opportunities for cooperation in natural gas – either CNG or LPG. The EPA official noted that EPA is very interest in looking at the transport sector as part of the natural gas study and opportunities for enhanced gas use in the sector. The Chinese delegate indicate that China's Ministry of Science and Technology would contact EPA to discuss this further.

A Sustainable Coal Industry

An official of China's State Power Corporation distributed a paper on "China's Power Industry and Environmental Impact" and made brief summary comments. He noted efforts by the PRC to improve the efficiency and reduce the environmental impacts from the production and burning of coal. Some progress has been made, but there is a need for a major effort to promote cooperation in advanced technologies. In 1985, the Minister of the Coal Industry signed a fossil fuel protocol with DOE; there has been progress under the agreement through 1997. China has also participated in clean coal technology conferences in Beijing and exchanged ideas on strengthened institutional arrangements between the FETC and Chinese institutions. A concrete issue is the need for an organizational institution to promote the exchange of information and exchange of personnel. China is hoping to apply advanced technology in the area of coal washing to reduce emissions from coal. Also, the
PRC is hoping to promote advanced technology for desulfurization. They would like the U.S. to cooperate with them in this field.

Currently, 500,000-600,000 boilers in China use coal. The PRC official indicated that there were opportunities to explore joint research in LNG. Reference was also made to the coal

liquefaction project in cooperation with HTI of New Jersey and disappointment that the 3 ton level test did not proceed due to lack of DOE funding. China indicated that this project was quite meaningful for the future and hoped that DOE would continue its support. The PRC official noted that coal burning was one of the major concerns in the energy sector in China and expressed his hopes that DOE will continue to implement specific cooperative projects. The PRC co-chair added that there were many problems associated with coal utilization in China and that increased attention was being given to the impact of coal on the environment and on air quality. China is one of the major coal producing countries; the issue is how to use policy as a lever to motivate industry to use clean coal technology and how to reduce its cost, so that it is more competitive. These questions would be a useful focal point for discussion between the two countries.

An official of DOE's Office of Fossil Energy responded to China's concern over the coal liquefaction project. He noted that there had been outstanding results from the benchmark tests completed for this project, but that DOE funding originally envisioned for the 3 million ton scale test had to be applied to repair some of the support facilities for the project. HTI is now modifying these units to make a successful test run in the future. DOE has included a request for the necessary funding for completing the 3 million ton test in its budget request for Fiscal Year 2000. If secured, this funding would be available in October of 1999. The PRC expressed disappointment in this slippage, noting that it also has cooperative projects with Germany and Japan, and hoped that U.S. project could proceed; otherwise, these two countries would have an advantage in this area.

In other areas, the DOE official noted the U.S. offer to have Chinese coal tested at an IGCC plant in Tampa, Florida. He noted that this could be extremely valuable to China and provide valuable technical information, otherwise only available by constructing a demonstration plant. He noted that China did not accept this offer last year, but now that the IGCC feasibility study had been completed, perhaps it would revisit this offer. The DOE official summarized cooperation already underway between the USG and PRC through the Energy and Environment Technology Center in Beijing. He pointed to the complexity of clean coal projects, with potential cooperation covering areas from coal preparation, and coal conversion to coal combustion and electric power generation. He also noted the complexity of organizations in China dealing with these efforts, at both the provincial and central government level. To streamline U.S. cooperation with China, DOE is looking toward making the Federal Energy Technology Center the focal point for managing clean coal technology cooperation with Chinese counterparts, and looking to develop a new fossil energy protocol which would include provisions for new institutional arrangements between FETC and counterpart Chinese research institutes. The Chinese delegation responded that there was a clean coal task force within the SDPC that should be the focal point for our future contacts and for managing bilateral clean coal technology cooperation. The PRC suggested that the upcoming U.S./Sino clean coal technology conference would be a good opportunity to exchange ideas on the elements of a new fossil energy protocol.

Coal Mine Methane Market Development Plan

An EPA official described a new coal mine methane market development plan to be developed over the next two years, under a letter of intent between EPA and China's State Administration of Coal Industry. He noted that enhanced development of coal mine methane has substantial potential in regard to: increased mine safety; environmental protection; reduction of greenhouse gases; and promoting economic development goals. The EPA official indicated that the PRC had made significant progress in coal mine methane recovery and use but that significant potential remained, on the order of 2-6 billion cubic meters. A number of U.S. companies, including Texaco, Arco, and Phillips, are involved in coalbed methane projects in the PRC. However, the barriers to enhanced development of coal mine methane included lack of information by western investors on potential projects, partially because of the small size of many of these projects. The EPA official said that the new coal mine market development plan would seek to develop an information database on coal mine methane projects that would be developed under the existing China Coalbed Methane Clearinghouse and distributed internationally to potential investors. The project would be undertaken over a two year period. The PRC responded that China is looking at ways to strengthen cooperation with foreign entities in this area, which was the basis for the establishment of the United China Coalbed Methane Company and incentives provided for investments in coalbed methane projects. The EPA official noted that in coal mine methane, as opposed to coalbed methane, there was a need for more engagement with the coal industry and more cooperation with Western companies. He also indicated that U.S. companies would be interested in how they might eventually receive greenhouse gas reduction credits for coal mine methane projects in China.

Technology Cooperation Agreement Pilot Project (TCAPP) or the "Cleaner Air and Cleaner Energy Technology Cooperation Agreement"

An EPA official noted that a letter of intent had been signed between EPA and the State Development Planning Commission to continue work under the Technology Cooperation Agreement Pilot Project or TCAPP which had been underway for two years. This cooperative program would now continue for three years. The goal would be to use the project as a model for technology cooperation under the Framework Convention on Climate Change and to share lessons learned under the project with other countries under the Convention. The EPA official distributed a handout on the TCAPP program. The PRC Delegation indicated that this was a very important project and that it had organized a task force to push this type of cooperation forward. The PRC noted that there were important issues which could be addressed through this work, such as the availability of matching funds for certain projects using the World Bank and other organizations.

Renewable Energy Cooperation

An official from DOE's Office of Energy Efficiency and Renewable Energy reviewed the status of cooperation under four cooperative annexes under the U.S./China Energy Efficiency and Renewable Energy Protocol signed in 1995. He noted that the four annexes for the protocol

covered: rural electrification; wind energy; renewable energy business development; and geothermal energy. In wind power development, he described the upcoming completion of the Xiao Qingdao village power project on an island off the coast of Shangdong Province, technical assistance for wind resource assessments, and technical support for a Wind Energy Center in Beijing. In renewable energy business development, the DOE official referred to the upcoming completion of two bilingual reports: one on the PV industry and its technical status in China; and renewable energy business profiles in 6 key provinces. In addition, an internet web site was being developed in both countries, and a regional rural electrification workshop was being planned. The DOE official also described plans for technical assistance in 3 building designs in China using ground source heat pumps and training in exchange for China's commitment to purchase U.S.-made equipment. The U.S. was also considering a proposal by China's Ministry of Science and Technology for a joint Renewable Energy Forum and Exhibition to be held in Beijing in the late fall of 1999; the most likely date appears to be in the spring of the year 2000. In rural electrification, another 240 Solar Home Systems were to be completed in Inner Mongolia; technical assistance was planned for the Lanzhou Testing & Training Center; and technical assistance was also under consideration in support of the SDPC's Brightness Program. In regard to biomass energy, a biomass resource database was being updated; there was continuing information exchange; and planning for a workshop on biogass and for training on geographic information systems.

In response, the PRC delegation noted that renewable energy applications are vital in China, because China still has 60 million people without electricity and there are long-term structural problems, including inadequate grid capacity and an inadequate distribution network. PRC official noted efforts to expand the electric power network in rural areas; and to further rationalize power generation needs. Environmental protection was of increasing priority. The basic principles being followed were to focus on hydropower development, development of nuclear power to a reasonable degree, increase the development of the electric grid and diversify away from coal use (which was still 75% of energy needs). Renewable energy would play an important role in bringing electric power to people in rural areas.

Energy Efficiency Cooperation

An official of DOE's Office of Energy Efficiency and Renewable Energy reviewed the status of cooperation with the PRC in energy efficiency and the next steps in this process. He emphasized that energy efficiency is a common challenge to both the U.S. and China and that there are substantial opportunities for improvements in both countries. He said that since most of the industrial production capacity built today will still exist 15 years from now, industrial technologies chosen today will affect patterns and efficiency of energy use for decades to come. He stressed that increasing energy efficiency not only reduces energy costs, waste and pollution, but can also promote productivity and product quality. The U.S. realized that the PRC had already taken important steps in energy efficiency including the enactment of the Law on Energy Conservation in January 1998. U.S.-China Bilateral cooperation in energy efficiency was conducted under the Protocol for Cooperation in the Fields of Energy Efficiency and Renewable Energy signed in 1995 between DOE and the then State Science and Technology Commission.

An energy efficiency steering committee between DOE and the SDPC has been established and held its first meeting in Beijing in May of 1997.

The Steering Committee has activities underway in ten areas: energy policy, information exchange, industrial process controls, lighting, finance, district heating, energy-efficient buildings, cogeneration, energy-efficient motor systems; and amorphous core transformers. Significant progress has been made in most of these areas since the first meeting of the Steering Committee. A second meeting is planned for June 1999 in Beijing. Electric motor systems have been identified as a particular area of emphasis, because electric motors consume about 50% of industrial electricity and significant energy savings are possible with more efficient motors and systems. Significant progress has been made in this area, including the completion of a motor market study and a motor challenge workshop held in Beijing in 1998. The next step planned is another motor challenge workshop in the summer of 1999, concentrating on pumping systems, and discussion of bilateral assistance in helping the PRC develop a motor challenge program in one province.

The U.S. and China had also collaborated on policies to promote energy policy, including a workshop held in Beijing in December 1997 in which over 40 Chinese officials participated. The DOE official indicated that the U.S. would be very happy to provide further technical assistance to China in the development of China's Law on Energy Conservation and its ongoing efforts to demonstrate energy standards, upgrade energy monitoring and data gathering and use energy appliance labeling.

In a third area, the U.S. and China are cooperating in a design study for an energy efficient building demonstration project. This work was being conducted under a Statement of Work signed in July 1998 between DOE and the Ministry of Science and Technology. It provides for a technical and financial feasibility assessment and the development of a project plan, including budget and cost shares for the U.S. private sector and China entities who might participate in the construction phase of the demonstration building. The building would be designed to incorporate a demonstration center for energy saving technologies and to house the Administrative Center for China's Agenda 21. The technical analysis portion of this effort is nearing completion. The U.S. National Resources Defense Council will lead an assessment of potential U.S. private sector contributions to the construction phase, should the project proceed.

Concluding Remarks

The U.S. and PRC co-chairs each took note of the many achievements in energy cooperation between the US and China and the next steps identified in this meeting of the Energy Policy Working Group. These include: the Ex-Im Bank Clean Energy Program, as well as cooperation in clean coal technology, energy efficiency, renewable energy, oil and gas, and coal mine methane. Both sides expressed the hope that following the meeting, these efforts would move forward and that there would be a continued exchange of information. The U.S. co-chair noted that a summary report of the meeting would be prepared within two weeks and suggested that the two sides share their written reports and the concrete steps that we can take to implement the

various outcomes that were identified. He also noted that there was a need for correspondence between the two sides on the possible role of various foundations under the Energy and Environmental Cooperation Initiative. He indicated that a number of foundations has expressed interest in participating under the Initiative and had written with specific ideas or proposals. It would be useful to exchange information with China on these proposals.

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Environmental Policy Working Group of the
U.S.-China Forum on Environment and Development
April 9, 1999
Washington, D.C.

The Environmental Policy Working Group was co-chaired on the U.S. side by Carol M. Browner, Administrator of the U.S. Environmental Protection Agency (USEPA), and Frank E. Loy, Under Secretary of State for Global Affairs. Xie Zhenhua, Minister of State of the State Environmental Protection Administration (SEPA), and Lu Shumin, Director-General, Department of America and Oceania Affairs, Ministry of Foreign Affairs, co-chaired the People's Republic of China delegation. Lists for both delegations are attached.

The session, which met for three and a half hours, was divided into two interrelated parts: the first focussing on environmental issues of bilateral concern and cooperation, and the second concerning multilateral environmental matters. The agreed Agenda and Schedule are also attached.

On bilateral issues, the two sides exchanged views on the recent exchange of visits of Minister Xie and Administrator Browner, and then discussed cooperative environmental projects, including the on-going air quality monitoring project. A discussion then ensued on possible new air pollution control projects, industrial pollution prevention and energy efficiency issues, and possible expansion of U.S. Peace Corps activities in China into environmental education. Forestry cooperation, air quality/pollution management issues, air pollution and health issues, and municipal solid waste treatment and urban water issues were also discussed. After the conclusion of the Working Group meeting, six separate Statements of Intent on environmental cooperation issues were signed between USEPA and SEPA; and one between USEPA and the State Administration of Coal Industry of China. These were in addition to three Statements of Intent concluded earlier in the day, including one between USEPA and SEPA and two between USEPA and the State Development and Planning Commission of China.

On multilateral issues, the two delegations exchanged views on global climate change, including the High Level Dialogue between the two governments on climate change, and Clean Development Mechanisms Issues and other environmental financing issues. Desertification issues and international forests issues were also discussed. The two sides examined international chemicals issues, including the Persistent Organic Pollutants and Prior Informed Consent Regimes and associated agricultural issues, as well as biodiversity matters, specifically the Biosafety Protocol to the UN Convention on Biological Diversity.

Bilateral Issues

Mr. William A. Nitze, Assistant Administrator for International Activities, USEPA, opened the discussion on bilateral environmental cooperation issues on behalf of Administrator Browner who was called away on urgent business. Mr. Nitze welcomed the Chinese participants and noted the importance of the Forum in engaging both sides on environmental issues, congratulating the Chinese side for the commitment to this effort and hard work to make the Forum a success. Because the meeting started late, both sides agreed to work quickly through the agenda.

Minister Xie captured the current state of industrial development and its impact to the environment in China. He noted that the many small and medium sized industries in China produce visible environmental impacts including groundwater pollution and acid rain. China is in need of a better groundwater resource management scheme and is prepared to spend over 100 trillion RMB on addressing the acid rain problem, he said. The environmental restoration effort will be initiated in the "key" cities, such as Beijing, he noted. In addition, protection and restoration of the marine environment is also important to the Chinese, the Minister stated.

Mr. Xie described some of the active efforts being made by China to protect the environment, including "total emissions control," the target of which is to hold emissions of certain pollutants (primarily SO_2) in certain areas to 1995 levels in the year 2010; ecosystem management including massive tree planting programs; CFC phase-out efforts; chemical waste management programs; and setting aside 7.6% of the country's land for nature reserves. With respect to lead phase-out in gasoline, 20 some cities have begun to use unleaded gasoline, the Minister noted. Sustainable development is the goal for eleven major key cities. In terms of greenhouse gas emissions reduction, Minister Xie described population control programs in terms of their benefit in limiting growth in energy consumption, as well as efforts to develop non-coal energy sources including nuclear, wind and solar.

Both sides reviewed the progress on bilateral cooperation since the last Forum meeting, including successful exchanges of visits between Minister Xie and Administrator Browner. Mr. Nitze also mentioned the success seen to date on the Air Quality Monitoring Cooperation Project between USEAP and SEPA that involves the State of California. Mr. Wang Zhijia, Director-General, Department of International Cooperation, State Environmental Protection Administration, agreed with Mr. Nitze and further elaborated that up to eleven cities will have automated air monitoring systems purchased from Dasibi at the end of Phase I of the project. SO_2, a major concern to China, is included in the Air Monitoring Network Project.

Turning to new projects under discussion at this meeting, Mr. Nitze invited USEPA colleagues to describe several projects on which the U.S. and China had come to agreement. First, for the project on market-based mechanisms for SO_2 control, the

signing of which had just been completed prior to this meeting and witnessed by the Vice President and Premier, Mr. Paul Stolpman, Director, Office of Atmospheric Programs, USEPA, briefly described U.S. efforts and the benefits and cost reductions incurred. Mr. Wang noted that SEPA is very interested in market mechanisms but noted that they are not the only way to control pollution, and that the U.S. and China need to move forward step by step. Mr. John Beale, International Programs Manager, Office of Air and Radiation, USEPA, described what the two sides intend to do for the Air Quality Management Assessment Project and the Industrial Pollution Prevention and Energy Efficiency Project. Mr. Stolpman also mentioned the Energy Efficient Building Project which was being discussed in the Commercial Cooperation Working Group of the Forum, noting that buildings are responsible for significant pollution levels and that more pollution is caused by working in an office building than by driving to work. Mr. Wang also expressed that China is interested in the U.S. expert recommendations on the implementation and development of clean coal technologies.

Ms. Ellen Paquette, Regional Director for Europe, the Mediterranean, and the Asia Region, U.S. Peace Corps, described a new agreement with China to expand next year its English-language training programs into environmental education. Most of the Peace Corps work in China has been related to teaching English, and Ms. Paquette said that environmental education could be incorporated into current lecture material. Mr. Wang welcomed suggestions from Peace Corps on ways to raise environmental consciousness in children and adults alike. Mr. Yao Changtian, Deputy Director-General, Department of Development Planning, State Forestry Administration, described China's efforts to reinforce protection of reserved areas, of which there are 926 in China, to prevent erosion through wetlands preservation and planting, and other programs. He emphasized that most of the ecological preservation efforts and minimization of deforestation and agricultural activities have taken place on the upstream portions of the Yangtze River. Mr. Gary Man, Program Coordinator for Asia and the Pacific, Office of International Programs, U.S. Forest Service, responded that there are many similarities between the forests of the U.S. and China, and that the U.S. Forest Service looked forward to continued cooperation with China.

Mr. David Gardiner, Assistant Administrator for Policy, USEPA, noted that the U.S. and China had not yet come to agreement on two projects relating to the Clean Development Mechanism (CDM) on project based crediting and forest sinks. Because these projects are between USEPA and the State Development and Planning Commission, they were not discussed in detail. The U.S. side noted a desire to hold workshops to further explore bilateral cooperation in this area. Mr. Nitze noted that new projects examining the co-benefits (in terms of public health and the economy) of air pollution and greenhouse gas emissions control measures, as well as new air pollution and health research projects, will make the benefits of environmental management more clear to policy makers and the public. Minister Xie agreed, noting that U.S. cooperation on monitoring, forecasting and benchmarking would be particularly helpful. He also suggested that USEPA consider cooperating on an analysis of the sources of air pollution in China.

Finally, the Chinese delegation described China's needs in the areas of solid waste and waste water management, noting the need for improving waste management beyond current waste burial programs. Nearly 70% of China's waste water is discharged without treatment and water pollution fees have not rectified the problem. The U.S. side noted the successful initiation of cooperation on landfill methane and solid waste management, initiated at a Mayor's workshop last month in Nanjing and co-sponsored by the UN Development Program.

Multilateral Issues

Under Secretary Loy opened the discussion by congratulating China on efforts it has undertaken to date to address environmental issues and praised the bilateral cooperation between the two sides on such matters. He noted, however, that the United States and China can't effectively address environmental problems independently, and that the two countries need to work together in multilateral fora considering such issues. Mr. Loy observed that the U.S. and China had worked effectively in such fora on some international environmental issues such as chemicals matters. He stated that the U.S. recognized that there exist differences of views between the two sides on a number of multilateral environmental issues, but said that the U.S. and China have a responsibility to all peoples. He stated that the U.S. and China have a special role given each others' influence, size and power. Mr. Loy then observed that perhaps no issue is more important in this regard than global climate change, and proposed that the U.S. and China hold another session of their High Level Dialogue on Climate Change this summer.

Global Climate Change: On global climate change, Under Secretary Loy observed that as the two largest emitters of greenhouse gases that contribute to climate change, the leadership of the U.S. and China in the international community is essential to solve this problem. He noted that the challenge is to build a global system to limit and reduce where possible the rate of emissions growth while protecting economic growth. Mr. Loy stated that with China's help, the incentives to energize technology, capital, and the international rules can be developed that will benefit China in the process.

Acting Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, Melinda L. Kimble, proceeded to provide a progress report on global climate change discussions since the last Forum meeting, specifically focussing on the first High Level Dialogue session held in September 1998 in Beijing. She stated that the two days of meetings with a number of Chinese ministries were productive, noting that views on the problem of climate change were exchanged, actions to address it were presented, and opportunities for bilateral cooperation were discussed. Ms. Kimble opined that the session was particularly valuable in helping to understand each government's position in the multilateral negotiations on climate change. She stated that at the meeting, the U.S. outlined why it believes China could benefit financially, technologically, and environmentally from taking on a greenhouse gas emissions target under the Buenos Aires Action Plan and the Kyoto Protocol that allows for very substantial growth in emissions, and participating in emissions trading. Ms. Kimble

noted that the U.S. heard China's concerns at that time with this approach, but that the U.S. continues to believe that there may be opportunities to narrow the differences of views. She stated that it was clear that while the U.S. and China may have some differences in the negotiations, there was strong interest in opportunities to work together to address climate change and related issues. In this regard, and within the context of the multilateral UN Framework Convention on Climate Change, Ms. Kimble noted that the two sides had identified an ongoing interest in cooperative opportunities presented by carbon sinks and the Clean Development Mechanism. She concluded that both sides emphasized the need for continued and strengthened cooperation, and agreed to continue the Dialogue.

Under Secretary Loy then congratulated China for its outstanding work to produce the China Climate Change County Study, stating that it was a significant accomplishment involving many Chinese ministries and institutions. He noted that the U.S. was pleased to have recently received the English translation of the report, which was completed with assistance from the U.S. Country Studies Program, USEPA, U.S. Department of Energy, and the U.S. Agency for International Development. Mr. Loy then called on Todd Stern, Assistant to the President for Special Projects, and coordinator for U.S. climate change policy, to describe U.S. domestic programs to reduce emissions.

Mr. Stern noted that the U.S. is spending approximately $4 billion annually on climate change related projects, including $1.4 billion in research and development. He noted that these funding levels represented a 35% increase over the previous year, which was a 25% increase over the year before that. He stated that the U.S. was focussing particularly on high efficiency automobiles, bioenergy, energy and environmental technologies, and other forms of energy efficiency. Mr. Stern noted that in addition to other groups, the U.S. has an extensive consultative process with the energy sector.

Mr. Loy concluded that it is clear that the U.S. and China are both taking actions domestically to address climate change, and that the bilateral cooperation between the two countries on this issue is growing significantly. He stated that it is essential, as the two sides move forward with national and bilateral cooperation on climate change, to enhance cooperation in the multilateral negotiations, and in this regard, that the High Level Dialogue on Climate Change was very useful. He again proposed another session of the Dialogue to be held this summer, without great publicity or a repetition of previously stated positions, but rather as an exchange of ideas.

Minister Xie responded by stating that climate change was discussed at length in the working lunch held earlier in the day between the Vice President and Premier. He noted that China understands the measures that the United States is taking domestically to address climate change and asserted that China is likewise taking measures. The Minister agreed with the need for the U.S. and China to cooperate on this matter and opined that such cooperation could lead to business cooperation and assist with solving the trade deficit between the two countries. He stated his agreement with continuing the dialogue, but noted that it needed substance and that simply repeating old positions

would not be meaningful. Under Secretary Loy concurred that a free discussion was needed – one that would not bind either side, that was low key, and that did not anticipate a result such as a communiqué. He stated that time needed to be taken to prepare and plan for the Dialogue so that effective and meaningful results would be obtained.

A discussion on Clean Development Mechanism (CDM) issues then ensued. Acting Assistant Secretary Kimble stated that, in the context of the Kyoto Protocol and the Buenos Aires Action Plan, the challenge is to develop a system that assists developing countries such as China to limit their emissions growth while pursuing sustainable economic development. The engine for such a system must be the use of market-based mechanisms such as the CDM and emissions trading. She noted the differentiated nature of the Kyoto Protocol with regard to emissions reductions and stated that developed countries had agreed to reduce their emissions. But the overall problem is one of global emissions growth, and in this regard the Kyoto Protocol must be used effectively.

Ms. Kimble noted that the U.S. has the technology available to assist China with it emissions, but restricting the mechanics of the CDM does not help in this process. She also noted that the CDM could be beneficial to China with its forest sector, and that the CDM could become operational by 2000; therefore, there is increased urgency to China's participation in the CDM as soon as possible.

Gao Yanping, Director, Division of Environment, Department of Treaty and Law, Ministry of Foreign Affairs, responded that China agrees that climate change is an important issue and that the Kyoto Protocol and CDM are important legal instruments. She stated that China's gross domestic product on a per capita basis was low and that China's per capita greenhouse gas emissions were similarly low. Though China opposed emissions limitation commitments on developing countries, it would act responsibly and not refuse to make efforts to limit emission at home. Ms. Gao said many nations have not done in-depth study on the CDM, and that an international debate is needed. She said it will be necessary to first get clear principles and rules in place for the CDM, abiding by the UNFCCC and the Kyoto Protocol, following which we can gradually set up the mechanism in a step-by-step process. Ms. Gao noted that China had submitted its views to the UNFCCC Secretariat in February on the CDM and, in this regard, noted that China believes certain principles needed to be included, particularly regarding methodological and institutional issues.

Under Secretary Loy reiterated that the Kyoto Protocol is essentially a document of differentiated obligations that the U.S., along with others, recognize and support. He stated that China's position on the CDM appeared reasonable, and agreed that discussions are needed on the principles and institutions that would ensure that the CDM would be simple enough to use and would provide certainty that emissions reductions are real and measurable. He noted that the circumstances under which the U.S. would be able to submit the Kyoto Protocol to Congress for ratification would require some sort of increased participation by developing countries. Mr. Loy felt it was in the mutual interests of all to play an appropriate role in a global system with differentiated

responsibilities. Mr. Loy further stated that on the matter of technology and technology transfer, the U.S. recognized that without the wide application of technology, the problem of climate change was unlikely to be solved. He hoped the two sides could discuss further at the High Level Dialogue the mechanisms needed to speed up the flow of technology. Ms. Kimble added that the U.S. had recently submitted its own technical papers on the CDM and other Kyoto mechanisms.

The discussion then turned to Environmental Financing Issues. USEPA Assistant Administrator for International Activities, William A. Nitze, opened the discussion by noting that the issue is one involving the dilemma of how to purchase environmental technologies. He suggested that in order to initiate cooperation between the U.S. and China on environmental finance, a first step might be to organize consultations between U.S. and Chinese financial and environmental experts. Mr. Nitze stated that the U.S. is not as effective as Japan or the European Union in providing attractive financing, but that the U.S. is interested in providing assistance to the energy and electricity generating sectors. He proposed that the U.S. and China begin a dialogue on the issue of environmental project financing.

Minister Xie responded that without U.S. grants or low interest financing little could be done to aid in implementation of the UN Framework Convention on Climate Change. He concurred that Japan and the European Union have far more attractive financing packages than the U.S., and posed the question of why China should cooperate with the U.S. when the U.S. can't compete in this particular market. Under Secretary Loy agreed that China should purchase the most economical materials; David Sandalow of the Council on Environmental Quality and the National Security Council said that the U.S. has superior environmental technology and suggested the need for a dialogue on the issue. Minister Xie concluded by suggesting that perhaps there was a need to nationalize environmental technologies.

Desertification Issues: Ms. Gao opened the brief discussion on desertification issues by underscoring the severity of the problem in vast areas of China and the importance of the United Nations Convention to Combat Desertification (CCD) as a means of providing needed international technical and financial cooperation to China. She noted that 46 million square meters of China suffers from desertification and dryland degradation, or approximately 30% of China's land area, and nearly 20% of China's population. The negative effects of desertification, Ms. Gao stated, are extraordinarily serious in developing countries. She noted China's status as a party to the CCD and observed that the U.S. has still not ratified the CCD. She affirmed the importance of U.S. ratification of the CCD and expressed the hope that this would occur as soon as possible. We were reminded that at the last Conference of Parties (COP) in Dakar in November 1998, Congressman Donald Payne (D-N.J., and Ranking Minority Member of the House International Relations Subcommittee on Africa) indicated that the U.S. was in the process of ratifying the Convention. Ms. Gao stated that China was taking measures to address its desertification problems by supporting the CCD and appointing officials to

address desertification/soil erosion. But, she stated, China needs financial resources and technology to do this effectively.

Ms. Kimble responded by noting that the U.S. has many areas subject to desertification and drought and has built an experience base on how to manage them. She reiterated the importance the U.S. attaches to the CCD. She informed the Chinese side that the U.S. has signed the Convention and has sent it to the United States Senate for advice and consent to ratification. She also stated that Secretary of State Albright had included the CCD in the urgent (top) category for legislative action by the Congress this year. She also noted that she would be chairing a forum of U.S. environmental and business interests regarding the CCD in the next few weeks. The Chinese side indicated their strong desire to have U.S. ratification completed by the next COP to be hosted by Brazil in late 1999.

International Forests Issues: Mr. Yao Changtian, Deputy Director-General, Department of Development Planning, State Forestry Administration, led the brief discussion on multilateral forest issues by stating that management of forests in China is based on sustainable development principles. He noted that China has developed a reforestation plan and established a sustainable development center. Ms. Gao further said that China participates in many international meetings, including the UN Intergovernmental Forum on Forests (IFF), with an effort towards discussion of future international arrangements to promote sustainable forest management.

Brooks Yeager, Deputy Assistant Secretary of State for Environmental Affairs, responded by stating that the U.S. is encouraged by the importance Premier Zhu placed on forest issues in his opening address to the Forum earlier in the day. Mr. Yeager noted that the U.S. and China had worked closely at the recent UN Food and Agriculture Organization Ministerial Meeting on Forestry in drafting an action oriented ministerial declaration. Such collaboration, he stated, is not only very welcome but also essential if the U.S. and China are to bring about a positive outcome to the ongoing debate on forests in the United Nations.

Mr. Yeager then reiterated the U.S. position that we do not believe a new legally binding forest convention is the best vehicle to promote international cooperation for sustainable forest management. He noted that the U.S. is concerned about sterile negotiations that would take away from concrete actions on the ground, such as implementing criteria and indicators. Mr. Yeager stated that the U.S. wants to work with China in the IFF. With further regard to criteria and indicators, Mr. Yeager said that the U.S. highly valued the participation of China in the Montreal Process Working Group (MPWG) for Sustainable Forest Management. He noted that the U.S. looks forward to working with China at the next MPWG meeting, which the U.S. will host this fall, and that the U.S. hopes China will consider hosting a meeting.

China did not respond to the U.S. comments on the Montreal Process. Ms. Gao stressed that consensus needs to be reached before discussion about the concrete elements of a

legally binding instrument can be undertaken. She noted that China understands the U.S. position, and that the two countries' goals for sustainable forest management are the same.

International Chemicals Issues: Deputy Assistant Secretary Yeager opened the discussion by indicating U.S. satisfaction with the Prior Informed Consent (PIC) Convention and expressed optimism about its prospects for early ratification by the U.S. He expressed the U.S. hope that China too would be in a position to ratify at an early date. Mr. Yeager noted that the U.S. enjoyed a close and cooperative relationship with China during the PIC negotiations, and characterized both countries' positions as pragmatic and sensible.

Turning to the ongoing negotiations on a Convention on Persistent Organic Pollutants (POPs) through the UN Environment Program, Mr. Yeager indicated that the U.S. sought a practical and sensible agreement in this area as well and one that effectively addresses transboundary risks associated with the highest priority substances. He expressed a hope that the U.S. and China could find areas where they could work together in this regard.

Mr. Yeager noted that because of the considerable local risks posed by POPs releases, most countries across all regions of the world had already taken strong action on most of the POPs. He stated that the U.S. believes that the task of the negotiations was to build on this momentum by moving away from the relatively few remaining uses as alternatives become available. As an example, Mr. Yeager noted that China had already indicated under the voluntary Prior Informed Consent procedure that it had banned all of the POPs substances that had been listed under PIC, including such substances as DDT and chlordane. He stated that the U.S. view is that the Convention would be instrumental in directing resources through the Global Environmental Facility (GEF) and other mechanisms toward better addressing this problem. Mr. Yeager noted that on technical issues, such as criteria and technical exemptions, the U.S. and China were likely to have much in common. He stated that the U.S. believes that the first Criteria Experts Group report reflected an excellent technical outcome on this issue, and that the U.S. wants to ensure that we build on this outcome in future meetings.

Minister Xie deferred to Mr. Lu who stated that China had agreed to reduce the use of POPs, but that China needed the financial resources and technology to reduce the harmful effects of POPs. He stated that the international community must agree to an acceptable timetable to reduce the use of POPs. On the PIC Convention, Ms. Gao responded by indicating that the development of the PIC Convention was very positive and that China was doing its best to sign and ratify it, hopefully in the near future. With further regard to the POPs agreement, Mr. Gao Shangbin, Deputy Director, Department of Science and Technology, Ministry of Agriculture, expressed China's view that the Convention would need to take into account different conditions of developing countries, and that there would need to be differentiated obligations. He also stressed the importance of financing for the implementation of the agreement. Mr. Yeager responded

by stating that the U.S. recognized the need for technical assistance to developing countries.

Biodiversity Issues/Biosafety Protocol: As the Working Group meeting was running late when this agenda item was reached, it was decided to spend less than the allotted time on the Biosafety Protocol. Under Secretary Loy opened the discussion by saying that the United States was disappointed in the results of the suspended Biosafety negotiating session in Cartagena held last Fall. The U.S. is committed to achieving a Biosafety Protocol, but one that is practical and does not unduly hinder research or trade in biotechnology products, he stated. Mr. Wang responded that China too was disappointed by the outcome of the talks in Cartagena. He went on to say that China and other G-77 countries were very concerned about the role of big business in the negotiations. He claimed that China witnessed business representatives interacting with negotiators in the negotiating rooms in Cartagena. Mr. Wang went on to say that helping commercial activity is not the topic of the Protocol; protecting human health is the true topic.

Mr. Loy responded by noting that the U.S. cares about human health issues, but human health issues should be discussed in the Codex Alimentarus meetings under the auspices of the UN Food and Agriculture Organization. The Biosafety negotiating mandate is about protecting biological diversity. He reiterated that there are very important issues that still need to be discussed in the Biosafety Protocol negotiations, including the impact of the future agreement on the world trading system. Mr. Loy concluded the discussion up by saying that this technology is important to growing economies, and our countries need to discuss in-depth our differences.

U.S.-China Forum on Environment and Development

ENVIRONMENTAL POLICY WORKING GROUP

April 9, 1999
U.S. Department of State

Agenda and Schedule

Loy Henderson Auditorium

10:00-12:15 pm Opening Plenary Session
10:00-10:25 am – Vice President/Premier Address
10:30-10:35 am – Dr. Lane/Mme. Zhu Remarks
10:35-10:45 am – Introduction of Working Group Chairs
10:45-11:15 am – Water Management Discussion
11:15-11:30 am – Coffee/Tea Break
11:30-12:15 pm – Working Group Chairs Presentation of Working Group Goals/Issues

12:15-1:30 pm U.S.-China Environment Working Group Luncheon
Henry Clay Room, Eighth Floor, U.S. State Department

Room 1105 – U.S. State Department

2:00-2:30 pm Introduction and Welcoming Remarks
(U.S./EPA & State Dept. – China/SEPA and MFA)

2:30-3:55 pm Discussion of Bilateral Issues

A. Progress Reports since last Forum Meeting — 10 minutes
   1. Minister Xie and Administrator Browner Exchange of Visits (China – U.S./EPA)
   2. Air Quality Monitoring Cooperation Project (U.S./EPA – China)

B. New Air Pollution Control Projects (U.S./EPA – China) — 15 minutes

C. Industrial Pollution Prevention and Energy Efficiency (U.S./EPA – China) — 10 minutes

D. Environmental Education (U.S./Peace Corps – China/MFA & SEPA) — 10 minutes

E. Forestry Cooperation/Ecological Forest Environment Development Issues (China/SFA - U.S./EPA & USDA) 10 minutes

F. Air Quality/Pollution Management Issues (U.S./EPA – China) 10 minutes

G. Air Pollution and Health Issues (U.S./EPA – China) 10 minutes

H. Municipal Solid Waste Treatment Strategy Development and Urban Water Environmental Issues (China/MOC – U.S./EPA) 10 minutes

3:55-4:10 pm Coffee/Tea Break

4:10-5:25 pm Discussion of Multilateral Issues

A. Progress Reports since last Forum Meeting 10 minutes
High-Level Global Climate Change Dialogue
(U.S./State Dept. – China)

B. Global Climate Change 20 minutes
1. Clean Development Mechanism Issues
(U.S./State Dept. – China/MFA)
2. Other Environmental Financing Issues
(U.S./EPA – China/MFA)

C. Desertification Issues (China/MFA – U.S./State Dept.) 5 minutes

D. International Forests Issues (China/SFA – U.S./State Dept.) 10 minutes

E. International Chemicals Issues 20 minutes
POPs Regime/PIC Regime/Associated
Agricultural Issues (U.S./State Dept. – China/MOA)

F. Biodiversity Issues 10 minutes
Biosafety Protocol (U.S./State Dept. – China)

5:25-5:50 pm Closing Remarks
(U.S./EPA & State Dept.– China/SEPA & MFA)

5:50-6:00 pm Signing Ceremony of Environmental Cooperation Statements of Intent Between the U.S. and China (U.S./EPA – China)

U.S.-China Forum on Environment and Development

ENVIRONMENTAL POLICY WORKING GROUP

April 9, 1999
U.S. Department of State, Room 1105

U.S. Delegation

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U.S.-China Forum on Environment and Development

ENVIRONMENTAL POLICY WORKING GROUP

April 9, 1999
U.S. Department of State, Room 1105

People's Republic of China Delegation

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LU Shumin, Director-General, Department of America and Oceania Affairs, Ministry of Foreign Affairs (Head of Delegation)

WANG Zhijia, Director-General, Department of International Cooperation, State Environment Protection Administration (Deputy Head of Delegation)

RAO Bin, Deputy Director-General, Department of Science and Technology, Ministry of Construction

YAO Changtian, Deputy Director-General, Department of Development Planning, State Forestry Administration

ZHAO Yingmin, Director of the Minister's Office, State Environmental Protection Administration

ZHANG Shingang, Director, Bilateral Relations Division, State Environmental Protection Administration

GAO Yanping, Director, Division of Environment, Department of Treaties and Laws, Ministry of Foreign Affairs

GAO Shangbin, Deputy Director, Department of Science and Technology, Ministry of Agriculture

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SHU Qing, Consultant, Department of International Cooperation, State Environmental Protection Administration

GUO Jing, Embassy of the People's Republic of China in the United States, Washington. D.C.

4/8/99

Science for Sustainable Development Working Group of the U.S.-China Forum on Environment and Development
April 9, 1999
Washington, D.C.

Neal Lane, Assistant to the President for Science and Technology and co-chair for the Science for Sustainable Development Working Group, opened the meeting noting that this year marked the 20th anniversary of U.S.-Chinese collaboration in science and technology. He expanded on the important role played by science and technology in U.S.-Chinese relations, and especially for this Forum. Because science and technology has the twin goals of promoting environmental production while improving economic growth, he said, they are the root of all future progress.

Dr. Lane then proceeded to outline the range of discussions to be held that afternoon. The working group would first hear a report on progress made since the last Forum meeting in Beijing in March 1997. Topics included areas of interest to both countries - natural disasters, agriculture, water, coastal management, climate science and environmental monitoring. The working group would then move to address new issues, including ideas on biocomplexity, sustainable development, and land use.

Dr. Lane concluded his opening remarks by stating that his goal for the meeting was to develop further ways in which the U.S. and China could cooperate on the new issues presented before the working group. He was eager to hear the ideas which his Chinese colleagues were ready to present.

Madam Zhu Lilan, Minister for Science and Technology and co-chair of the Working Group with Dr. Lane, next proceeded to make her opening remarks. She stressed the importance of following the United Nation's Agenda 21, which seeks to build coordination between a nation's economic and environmental activities. The role of science and technology, she said, is important in "eliminating contradictions" between these two activities. Science and technology will be important in finding solutions to the questions of population control, eliminating poverty, developing new energy sources, and maintaining sustainable development.

The question of how to raise the standard of living while having an eye to the environment, is now a big issue for Chinese society, she said. The Chinese government is looking to use international cooperation to solve some of the problems they face. Today the U.S. and China will look at the problems with water, land use, and the mitigation and remediation of natural disasters.

Madam Zhu noted that at the working lunch with Vice President Gore and Premier Zhu Rongji, the topic of improving development programs through market mechanisms was discussed. She believed however, that in order to be truly effective, the power of the markets had to be combined with the promise of science and technology. This way the

U.S and China could have sustainable development on one hand, and cooperation in science and technology on the other.

Natural Disasters

Dr. D. James Baker, Under Secretary of Commerce and Administrator of the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce, spoke first in updating the Working Group on progress made since the last meeting. One of the Forum's big successes in the past year was the Natural Disaster Mitigation and Reduction Workshop held in November 1997. Dr. Baker co-chaired the workshop with Chinese Vice Minister of State for Science Deng Nan. Dr. Baker reported that in depth discussions were held at the workshop at the technical level, with many experts in the field in attendance. This workshop, he said, was a good example of the strength of the Environment and Development Forum. Currently, the Joint Report of the Natural Disaster Workshop is available, and the proceedings will be available shortly.

Kay Goss, Associate Director of the Federal Emergency Management Administration (FEMA), next described the increasing dialogues which have been taking place between the U.S. and China, in part as a result of the Forum's Natural Disaster workshop. She noted that since March 1997, there has been a growth in exchanges on emergency management between FEMA and the Chinese Ministry of Civil Affairs, the Chinese Academy of Sciences, Chinese firefighters, Chinese river basin managers, and the Chinese Peoples' Liberation Army. In total, FEMA has met with over 20 Chinese delegations, and the fields covered include flood planning, disaster relief, fire fighting, and earthquake mitigation.

Putting the work of FEMA into a larger context, Ms. Goss noted how disaster relief is vital to maintaining a nation's infrastructure, building sustainable development practices, strengthening the government, and social well being. The Memorandum of Understanding, which FEMA is preparing to sign with the Chinese, will be able to help both governments in all these capacities.

Ms. Goss also noted FEMA's work with the Vice President in planning to solve the Year 2000 (Y2K) computer problem. FEMA is preparing contingency plans for the Y2K problem, and will be prepared to respond in case of emergencies.

Finally, Ms. Goss introduced the issue of the Global Disaster Information Network (GDIN), which will hold its second meeting from May 11-14, 1999, in Mexico City. GDIN was established in an effort to integrate all sources of disaster management information. The theme of the upcoming meeting will be to work on preparedness into the new millenium.

In his response to the presentations by Dr. Baker and Ms. Goss, **Wu Jisong**, Director General of the Department of Water Resources and Hydrology in the Ministry of Water Resources, focused on four points: the current status of preparedness, government efforts

to mitigate natural disasters, successes of the U.S.-China cooperation in natural disasters, and possibilities for future cooperation.

Mr. Wu noted first that the number and frequency of natural disasters in China is very high. To quantify this in economic terms, Mr. Wu asserted that 3-6% of China's GNP is annually lost due to natural disasters. In 1997 the drought, intense storms, and coastal flooding caused the most damage, while in 1998 earthquakes and flooding were the major cause of damage. The economic loss from the 1998 flooding alone is estimated by the Chinese to stand at almost $30 billion.

In an attempt to mitigate these damages and prevent future loss, Mr. Wu noted that the government has approached the problem on three fronts. First, the Chinese government has enacted six laws, which will bind future economic development planning with plans for mitigating natural disasters. Second, the Chinese government has advanced many new engineering projects, which will work to prevent and reduce the effects on natural disasters on the ground. Finally, the Chinese government took several steps to fight natural disasters on a more technical level. They have engaged in capacity building and have established three disaster-monitoring systems. One is an earthquake forecasting-center, another is a marine-disaster forecasting-center, and the third is medium-term climate forecasting-center.

While reviewing the current status of U.S.-Chinese cooperation, Mr. Wu noted the success of the Natural Disaster Workshop, noted earlier by Dr. Baker of NOAA, and mentioned the upcoming seismic disaster cooperative projects undertaken jointly by the National Science Foundation (NSF) and Chinese Seismic Bureau (CSB).

Finally, Mr. Wu turned to the prospect of future cooperation between the U.S. and China. Mr. Wu stated that the U.S. and China should work for more exchanges of data and information; that the two countries should cooperate on developing observational equipment and technology, and forecasting future natural disasters; and the two sides should further cooperate on developing emergency response planning. Lastly, he said, the two countries should work to exchange their respective technologies and experience. Mr. Wu placed special emphasis in learning from the experience of the U.S. government with the New Deal program during the Roosevelt Administration. He posed four questions regarding this program:

- What influence did the improvement of the water sector have on the development of the national economy?
- How did the New Deal program aid the development of water conservancy and hydropower? What types of projects were undertaken (e.g. the construction and improvement of reservoirs, the diverting of water projects, hydropower and irrigation projects, etc.)?
- What policies were adopted to assist the development of the water sector by the government?
- Who financed the New Deal projects (the Federal government, local government, private companies, etc.), and were certain funds directed only to

certain targets (e.g. were Federal funds used mainly on big and medium-sized projects)? Also, was there any insurance coverage on the projects?

In response to the Chinese presentation, Dr. Baker stated that he was pleased with the U.S.-China cooperation on disasters. He appreciated the opportunity to learn from the Chinese experiences, but more importantly, felt that this was an opportunity for the both U.S. and China to learn not only about natural disasters, but also how to study them in the future.

In response to a question from the U.S. delegation, Director Ni stated that although China already has a disaster management system similar to GDIN, it will consider cooperating with the other GDIN member nations if a patch or cross over between the two systems is possible.

Climate Science

The issue of climate variability, impacts and scientific understanding was next on the agenda and again introduced by Dr. D. James Baker of NOAA. Dr. Baker focused his comments on the socio-economic utility of improved climate forecasting capabilities. The ability to accurately forecast seasonal to interannual climate variability for such events as El Nino promises significant returns and savings for societies and economies. However, the ability to deliver specific forecasts useful to specific users in agricultural, water resource management and other industries requires further advances in understanding of the physical forces underpinning climate variability. Accurate, timely forecasts promise to improve the efficient allocation of resources and produce lowered stable prices of agricultural, energy, and other natural resources. As two key countries, the U.S. and China have great potential to make contributions to the understanding and predictability of climate variation. The relative expertise, resources, strengths and geographic position of the U.S. and China indicate cooperation should be strengthened in climate forecasting research, applications, observations and assessments. Stronger international cooperation promises efficiencies in conducting certain research and development projects in this area, especially as we look to begin a new century.

Dr. Baker announced the upcoming U.S.-China Climate Workshop and Symposium on seasonal to interannual climate variability that will be held in Beijing in September 21-24, 1999. NOAA and the Chinese Meteorological Administration and State Oceanic Administration, will co-host these events. Delegates from other Asian regional nations will be invited to attend to increase the utility and relevancy of the meetings to improved research and science initiatives. Items already on the draft agenda include: national climate program overviews of the U.S. and China, climate theory and processes, modeling and prediction, observations and data-set generation and assimilation, theoretical studies of El Nino and extreme events (monsoons, hurricanes, and other events), and prediction modeling and real time forecasting.

Concluding his remarks, Dr. Baker noted the good relationship NOAA shares with key science agencies in China, including the Chinese Oceanic Administration, the Chinese

Meteorological Administration, the Chinese Academy of Sciences and the Ministry of Science and Technology. These relationships have been built on the 20-year history of the US-China Science and Technology Agreement and through associated cooperative projects, such as TOGA, South China Sea Monsoon Experiments and others. It was his hope that the forthcoming U.S.-China Climate Workshop and Symposium will contribute to the science agenda and the sustainable development agenda for the next 20-year period.

Ding Yihui, Director General of the National Climate Center, China Meteorological Administration, responded to Dr. Baker's presentation. He stated that much of the China's research on climate variability has focused on studying the 1998 floods and studying short-term climate protection.

According to Ding Yihui and the research carried out by his office, the main factors behind the 1998 Yantze River floods were ENSO-El Nino, above normal snow fall on the Tibet Plateau, a weak monsoon season, and other factors. Understanding these factors has help China develop an accurate climate prediction and weather forecasting model, based on predicting where the rain belt would move.

Ding Yihui also noted China's recent progress in developing what he called the NCC Model System. The NCC Model System is a short-term climate prediction system, which combined several oceanic, atmospheric and regional models. Since the last meeting of the Forum, forecasting maps based on this system were distributed throughout China, and actual events were found to coincide with the models.

Ding next listed some of China's most recent and successful meteorological experiments. These include: South China SMEX, which studied monsoons; HUBEX, which studied river basins; TIPEX, which studied Tibet; and HUMEX, which also studied monsoons. Many of these experiments were successful, Ding stated, due to the cooperation between the U.S. and China with their respective doppler radar technologies.

Ding Yihui lastly raised some areas for potential future cooperation. He advocated jointly studying the causes and mechanisms behind meteorological events such as typhoons and monsoons, and arranging for an exchange of relevant data from both countries.

Integrated Coastal Management

Once again, Dr. Baker of NOAA began the discussion. Dr. Baker noted that at the previous U.S. China Environment and Development Forum (Beijing, 1997), coastal management was an important topic on the sustainable development agenda and one for which increased cooperation was called. In the U.S. the coastal regions contain over 50% of the population and produce approximately 33% of GDP. Coastal regions in China are similarly vital with 60% of GDP derived from coastal regions and 40% of the population inhabiting the area. Coastal areas of both countries continue to develop at a significantly

higher rate than interior areas. The coastlines of both countries are among the longest in the world and share many common problems.

Since the last Forum meeting, a joint integrated coastal management panel was established in September 1998. This panel is a tangible result of the Forum's ability to concentrate attention and results in shared national priorities.

Three partner reserve and marine sanctuaries were established in 1997 and 1998 between China and U.S. to promote improved management of marine protected areas, specifically addressing local management challenges for coral reefs (Florida-Hainan Province), mangroves (Florida-Guangxi) and wetland habitats (Maryland/Virginia-Tianjin). In June 1999, local Chinese marine-reserve managers will visit these sister sanctuaries in the United States to learn U.S. management approaches and begin drafting Chinese management plans for application in China's context. NOAA provided management training at an Integrated Coastal Management–Marine Protected Areas (ICM-MPA) Management Workshop, March 22-26, 1999, in Hainan Province to 35 Chinese coastal resource managers. Training topics included: introduction and application of ICM principles in coastal regions, promotion of ecotourism for MPA's, and education and outreach in MPA management.

The Second Meeting of the ICM Joint Coordination Panel (JCP) will be held in July 1999 to define the second phase of the US-China ICM work plan covering 1999 to 2001 period.

Ni Yuefeng, Director General of the Department of Science and Technology at the State Oceanic Administration, responded to Dr. Baker's comments by noting China's comprehensive management of its coasts. China has passed legislation regarding the use of territorial seas, continental shelves and exclusive economic zones, laying submersed cables, conducting oceanographic studies, protecting the marine environment, traffic safety, and the exploitation of mineral and oil resources. According to Director Ni, between 1989 and 1995, 3663 marine zones were divided and classified for their protection.

Director Ni also noted that comprehensive management experiments were also conducted on these marine zones and tideland resources.

To further improve its coastal management, Director Ni stated that China will continue to reform and strengthen its legal system and enforcement mechanisms. As an example, in 1998 custom authorities were empowered to enforce these coastal management regulations. Director Ni predicted that the Chinese government will soon empower even more agencies to enforce its coastal management regulations.

Director Ni completed his presentation with suggestions for future U.S.-Chinese cooperation on coastal management. He advocated the establishment of a demonstration area to set up models and train the next generation of coastal managers. He also

advocated the U.S. and China expand their cooperative research on the sustainable use of coastal resources.

Sustainable Development

The U.S. delegation opened the discussion on Sustainable Development Progress with a presentation by **Dr. Rosina Bierbaum**, Associate Director for Environment in the White House Office of Science and Technology Policy. Her presentation was focused on three central themes: Integrated Environmental Monitoring and Research; Integrated Science for Ecosystem Challenges (ISEC); and the Ecosystem Report Card.

With regard to Integrated Environmental Monitoring and Research, Dr. Bierbaum discussed that the latest thrust in U.S. policy is to link the thousands of National and Regional environmental survey centers. The project is based on combining highly detailed information from index sites, medium-level information from the national and regional surveys, and mass data from inventories and remote-sensing programs. This will give the U.S. the ability to monitor progress in sustainable development on a national scale.

Moving the discussion to the Integrated Science for Ecosystem Challenges (ISEC) project, Dr. Bierbaum informed the Working Group of the initial priorities of ISEC. They include (1) Biodiversity and Species Decline, (2) Harmful Algal Blooms and Hypoxia Eutrophication, (3) Habitat Conservation and Ecosystem Productivity, and (4) Information Management and Integrated Assessments.

Finally, Dr. Bierbaum reported on the development of the Ecosystem Report Card. Dr. Bierbaum stressed that it is not enough to merely monitor and research the status of ecosystems. It is just as important to assess any progress or further degradation in an ecosystem's health. The goal is to develop standardized indicators, similar to economic indicators, which could be openly used to measure ecosystem health. Dr. Bierbaum noted that the Vice President is firmly behind the Ecosystem Report Card concept, and has challenged OSTP to work with citizen groups to develop the Report Card by 2001. The first draft of the Report Card should be completed by May 1999.

Wang Weizhong, Director of the China Agenda 21 Administration Center, presented China's progress on sustainable development. Mr. Wang stated that his nation's progress on sustainable development has been focused around the United Nations Agenda 21. From China's perspective, the crux of Agenda 21 is that sustainable development is not limited to environmental concerns only. The economy too is an integral part of any sustainable development plan.

Mr. Wang reported that the co-dependence of environmental and economic concerns is appropriately reflected in the current 5-year plan, recently passed by the Chinese government. The next step, he said, is to strengthen the laws, which will enforce this 5-year plan. China has passed six new environmental laws, for a total of 395. China's next hurdle will be enforcement of these laws.

With the acceptance of the 5-year plan, the Chinese government is encouraging regional and local governments to adopt their own sustainable development plans. These plans should reflect the uniqueness of each area's income base, climate and risk to natural disasters.

Mr. Wang also expanded upon the importance of science and technology for the future. He discussed how the Ministry of Science and Technology (MOST) has prepared a plan to use science for social development. Currently 29 pilot programs in sustainable development have been sponsored by MOST. These programs seek to make more comprehensive use of the natural resources available.

Finally, Mr. Wang expressed his interest in promoting international cooperation. He outlined these nine areas where immediate action could be taken:

1) Capacity Building
2) Sustainable Agriculture
3) Cleaner Industry
4) Clean Energy and Transportation
5) Sustainable Utilization of Natural Resources
6) Pollution Control
7) Combating Poverty
8) Population Health and Human Settlement
9) Climate Change and Biodiversity

Mr. Wang closed by reviewing China's perspective on sustainable development and Agenda 21. He felt that the policies geared toward sustainable development required strengthening. The policies should be based regionally, and work towards capacity building. Reflecting what Dr. Bierbaum had said earlier, a standardized set of indicators also needs to be established, in order to make available a continuous standard of measurement. Second, China needs to promote Agenda 21 at the local levels. As he said earlier, sustainable development policies need to be found at the national, regional, and local levels. Third, sustainable development would be helped if both the U.S. and China worked together to promoted the transfer of environmentally sound technologies. Finally, China will work to establish a national sustainable development network system. With this project, they hope to work closely with FEMA.

Responding to Mr. Wang's presentation, Dr. Baker of NOAA stated that he was very impressed with the Agenda 21 plan. He noted that in the U.S., sustainable development is approached from a broad, national perspective. As an example, he cited the President's Council on Sustainable Development. He also noted that in the U.S., stewardship, rather than exploitation of our natural resources, is used to guide our actions.

Ms. Goss of FEMA also responded to Mr. Wang's presentation. She expressed her enthusiasm for the community based projects proposed by Mr. Wang. Local projects, she said, help to institutionalize sustainable development policies. As an example, she cited FEMA's practice of having disaster management based locally, where they can bring

together public and private resources. Ms. Goss raised the possibility of having a "sister-cities" exchange with the Chinese to further learn from each other's best practices.

Ms. Goss also expressed interest in Mr. Wang's statement on technology transfer. She proposed that maybe the U.S. and Chinese could work together to look at date compiled by each government's scientists, and transfer it to the public sector.

Mr. Wang responded positively to Ms. Goss's "sister cities" idea, and to her ideas on technology transfer. Mr. Wang noted that a technology transfer agreement already exist between China, Japan and UNESCO, which is similar to the one between the U.S., India and Singapore.

Mr. Wang also noted that one problem China was facing with its sustainable development program was the large number of indicators, over 140, which were used to measure progress. This made it difficult for local officials to assess the success of their community-based projects.

On all these projects, Mr. Wang expressed an interest in working more with the United States.

Liu Yanhua, Director General in the Department of Rural and Social Development, in the Ministry of Science and Technology, was also enthused with the "sister city" proposal. He noted that mayors from 20 different Chinese cities participating in the Agenda 21 program will be the U.S. shortly. This visit could be the first step in developing the sister city idea into an actual program.

Biocomplexity

Dr. Rita Colwell, Director of the National Science Foundation (NSF), gave the final presentation regarding progress toward sustainable development. The focus of her presentation was biocomplexity, which she defined as looking at scientific phenomena at many scales, and realizing the interconnectedness of all things. She quoted John Muir, the American naturalist, who said, "When we try to pick out anything by itself, we find it hitched to everything else in the universe."

The biocomplexity paradigm requires that scientists form different countries, cultures, and disciplines work together, as global events such as pollution and infectious diseases do not respect national boundaries or human divisions.

As an example of the biocomplexity model, Dr. Colwell cited the recent work to understand the toxicity cycle of the Chesapeake Bay. Another example of biocomplexity theory in use is NSF's Integrated Science for Ecosystem Challenges program. In this program, the value of biodiversity is related in terms of economic gains, and is estimated at hundreds of billions of dollars to the U.S. economy each year.

Water Resource Management

Dr. Dennis Hjeresen, Program Manager at Los Alamos National Laboratory, began the discussion on the U.S.-China Water Resources Management Workshop, which was to be held in April 1999, in Tuscon, Arizona. Forty-six Chinese and over one hundred U.S. water management experts were expected to be in attendance.

Dr. Hjeresen began by outlining the objectives of the Workshop. He said the Workshop was designed to: 1) Identify and prioritize key areas for cooperation and follow-up activity; 2) Enhance commercial opportunities; 3) Provide the basis for a bilateral agreement; and 4) Publish its proceedings.

Dr. Hjeresen also outlined possible next steps for the Workshop. These include delivering its recommendations to the Vice President, the Premier, the Forum, and through them to participating Agencies and Ministries, and/or Congress; developing resources to create a sustainable program; and/or establishing a joint Project Office to plan, coordinate, and execute program activities.

In concluding his remarks, Dr. Hjeresen presented a plan for the Forum's consideration, which would build upon the Water Workshop. He outlined a plan for the U.S.-China Water Resources Management Program in which a coordinating body would work to develop bilateral, water resources agreements between the two nations. It could also maintain a database of all existing cooperative activities, and conduct follow-up workshops and conferences in order to maintain a dialogue.

Qin Dahe, Director General in the Department of Resources and Environment, within the Chinese Academy of Sciences, presented China's perspective on the Water Workshop. Noting the different problems faced by different regions in China, i.e. water conservation in the north, water quality control in the south, and while acknowledging the low efficiency of water usage over-all in China, Mr. Dahe stated that China's priority in water management was the sustainable use of new resources. New resources to be exploited include glaciers, underground desert water, and water gained from wetlands. Watershed management in the Yellow and Yangtze River basins is also important.

In order to address these concerns, the Chinese will focus their research in the areas of water conserving technology in farming, recycling water, technology for developing new water resources, and watershed management.

Mr. Dahe closed his presentation by proposing several areas for collaboration between the U.S. and China. The list of possibilities included:

1) Technology to increase water-use efficiency
2) Technology to prevent erosion, salinization, and desertification
3) Managing watersheds
4) Sustainable use of other water sources
5) Package technology for high-value crops for sustainable agriculture
6) Developing databases and support systems

7) Wetlands management.

Agriculture

Deputy Under Secretary in the Department of Agriculture, **James Schroeder**, opened the discussion on Agriculture. He stated that the U.S. has three objectives in its agricultural cooperation with China. First, the U.S. seeks to increase technological cooperation. Second, the U.S. seeks to have specific technologies exchanged. Third, the U.S. seeks a resolution to the trade dispute between the two countries.

Mr. Schroeder noted the work of the U.S. Trade Representative and MOFTEC, in negotiating an agreement on cooperation. The agreement included sections technology cooperation and scientific exchanges, cooperation in developing agricultural sectors, and resolving future trade disputes. This agreement will become a very important road map for the future, but it has not yet been signed.

Unfortunately, the agreement has been caught up in politics. Mr. Schroeder warned that if the agreement is not signed, China would encounter problems with the private sector. (NOTE: The Agricultural Trade Agreement was signed the next day, April 10.)

Miley Gonzalez, Under Secretary in the Department of Agriculture, further elaborated on the U.S. position on agriculture. He reiterated Mr. Schroeder's hopes for a quick signing of the U.S.-Chinese trade agreement, as it would encourage cooperation between the two countries.

He stated that it was important to the U.S. for research in agriculture to increase. Feeding the world's population will become one of the greatest threats to global stability in the next century. For this reason, sharing information is of mutual benefit.

As a positive example of sharing information, Mr. Gonzalez mentioned the Joint Research and Education Program carried out in the field of forestry. This program, he noted, has helped resolve some of the problems the U.S. and China have faced. It could be used as a model for future cooperation.

Mr. Gonzalez closed by noting that this century's global economy has had an industrial base. It has relied heavily on fossil fuels. In order to have sustainable development, the economy of the 21st century will need to be bio-based.

The Chinese report on agriculture was given by **Wang Xiwu**, Director General of Science and Technology in the Ministry of Agriculture. Mr. Wang stated that China continues to feed 22% of the world's population with only 7% of its arable land. This provides a powerful incentive for the Chinese to follow sustainable development practices.

According to Mr. Wang, currently China is facing five problems. First, their huge population is putting enormous pressure on the quality and quantity of food in China.

Second, there are enormous shortages in natural resources. This includes both land and water. Third, China is in a situation of runaway pollution. Fertilizer run-over into the rivers is particularly egregious. Fourth, China has a poor emergency response infrastructure. The Chinese will have to develop more and better tactics to stave off natural disasters. Fifth and finally, China must alleviate the level of poverty faced by most citizens.

To counter these problems, Mr. Wang laid out a course of action. First, China must protect its basic farmland. Over 70% of its farmland is dry, and in need of technological solutions. China must also work more with the international community, and learn from its neighbors. Third, the Chinese must implement a restoration plan, whereby they will improve the low-yield and degraded grasslands. Two thirds of China today falls into this category. China must at the same time harness new resources to ease its water shortage. Finally, China must follow the ecological agricultural practices as outlined in the Agenda 21.

Mr. Wang did offer up two specific areas for cooperation between the U.S. and China. First, Mr. Wang suggested that U.S. and Chinese scientists work together to examine and compare various models of agricultural development. Second, the Chinese are looking to develop a renewable energy source for rural areas, and U.S. cooperation would again benefit both sides.

Land Use

The final item on the Working Group's agenda was the issue of land use. Land Use is an issue which the Vice President had asked the Working Group to begin to address, and this was the first time the issue had been discussed. **Dr. Neal Lane** made a presentation on behalf of the U.S. to explore interest in a joint dialogue on land use management. Dr. Lane began by stressing the importance of proper land use management, and noting that both the U.S. and China suffer from land degradation – including deforestation, wetlands disturbance, and rangeland degradation. He explained that U.S. experts who came together to discuss this idea tried to answer three basic questions: 1) What are the most pressing land use challenges; 2) Where is there greatest benefit from bilateral cooperation; and 3) Where is the expertise and resources to address this issue? Dr. Lane presented four categories or possible discussion topics for a land use dialogue: land degadation, land use choices and their impacts, urban land use planning and livability issues, and tools available for land and other resource management. Dr. Baker introduced Margaret Davidson and Tony LaVoi, of NOAA's National Ocean Service, who made an abbreviated presentation which highlighted the benefits of using Geographic Information System (GIS) technology to assess land use and to aid land use management decisions.

Dr. Lane proposed that if both sides agreed that land use management was worthy of further discussion, a group could be constituted to consider a bilateral dialogue on the issue. Madame Zhu agreed.

The Chinese also noted that in the past, their land use policies had led to soil degradation, which in turn led to food shortages. Land use was inefficient, and much of the territory was not used at all. Development of land resources was also constrained by environmental factors.

Since the 1990s, however, China has begun to develop strict land use policies, which have encouraged good farming and forestry practices. Unfortunately, to date this process has been long, expensive, and mostly restricted to urban areas. The Chinese have been successful though in increasing the use of their urban land. They would also like to increase the amount of land under cultivation, and use urban land even more efficiently by increasing construction density.

The Chinese have also increased the amount of their cultivated land through better planning, and are proud that they have enhanced their intensive land use methods to maximize the exploitation of the resources available to them. They plan to further enhance reform of land use measures, including looking at realistic resource pricing.

In outlining areas where Chinese sustainable development practices could be aided through international cooperation, the Chinese gave five examples. First, the Chinese want to make sustainable use of their construction lands. Second, the Chinese want to further study sustainable use of agricultural lands. Third, the Chinese want to develop a strategy for sustainable use of currently unused lands. Fourth, the Chinese want to study market mechanisms, which help maximize land use. Finally, the Chinese wish to further investigate re-assessing land use policies with the help of new technologies, such as GIS and internet technologies.

Conclusion

Madam Zhu Lilan concluded the Chinese presentations at the Working Group by recognizing the success of the Forum, while acknowledging the effects of time limitations on the discussions.

The meeting ended with both Dr. Lane and Madam Zhu encouraging the delegations to continue to work together on these important issues, and toward the next affirmative step the Forum can take, rather than waiting for the next meeting of the Forum. If the U.S.-China Environment and Development Forum is to be a success in the future, emphasis needs to be placed on the actions which rise from these gatherings and the success of collaborative activities.

Commercial Cooperation Working Group of the
U.S.-China Forum on Environment and Development
April 9, 1999
Washington, D.C.

The Commercial Cooperation Working Group (CCWG) of the U.S.-China Forum on Environment and Development met on Friday April 9, 1999 at the U.S. Department of Commerce, from 2:00 to 5:30PM. Co-chairmen were Deputy Assistant Secretary of Commerce for Basic Industries Alan Bowser and Deputy Director General Dai Yunlou of the Department of America and Oceania Affairs of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) of the People's Republic of China.

The U.S. delegation was composed of representatives of the departments of Commerce, Energy, Housing and Urban Development, and Interior, as well as the Export-Import Bank of the United States. Representatives of several private U.S. companies were also part of the U.S. delegation at the CCWG, the only working group of the U.S.-China Forum with private-sector participation. Private-sector members of the U.S. delegation included representatives of the Coalition for Employment Through Exports, Enron, Ford Motor Company, Lemna International, the National Association of Home Builders (NAHB), the National Ocean Industry Association (NOIA), and Phillips Petroleum.

The Chinese delegation included representatives of MOFTEC, the Ministry of Science and Technology, the Ministry of Construction, China Petroleum Equipment Corp., China Petrochemical Group Corp., State Power Corporation, and the State Environmental Protection Agency. U.S. observers noted that the Chinese delegation was relatively younger than might have been expected, with most members apparently in their 30s or 40s. In addition to Mr. Dai (who was based at the Chinese Embassy in Washington for three years and speaks English well), a number of other members of the Chinese delegation made presentations during the course of the CCWG.

Given the extensive agenda and the fact that the CCWG was meeting in Washington, the U.S. delegation was large. U.S. delegates frequently rotated in and out of seats at the CCWG conference table, with major changes occurring at the two breaks. The smaller Chinese delegation remained constant throughout the CCWG.

This report is composed of 11 sections that correspond to the various items on the CCWG agenda. It is based on notes compiled by Rachel Halpern and Michael Beeman, both international trade specialists with the Energy Division of the U.S. Department of Commerce. Padraic Sweeney, also an international trade specialist with the Energy Division, edited the report and wrote the introduction. For more information regarding the CCWG and this report, contact Mr. Sweeney at (202) 482-0135.

Welcoming Remarks

DAS Bowser welcomed the Chinese delegation, and noted that both the U.S. and China agree on the importance of protecting the environment while developing economically.

Deputy Director General Dai of MOFTEC applauded the Commerce Department's years of cooperation with his Ministry. He emphasized that the protection of the environment is an important priority for the Chinese Government, and welcomed the increase over the past few years of U.S. investments in this field. Mr. Dai listed some of the recent achievements in this field, including the development of a network of data on earthquakes in the region, and the development of a computer-assisted weather forecasting system. He welcomed the signing during Secretary of Commerce William Daley's recent trip to China of several contracts and other agreements between U.S. and Chinese companies in the environmental and energy efficiency sectors, the total value of which he gave as more than $1 billion.

Oil and Gas Industry Forum

Counselor to the Department of Commerce Jan Kalicki thanked the Chinese Government for its help in putting on a successful Oil and Gas Industry Forum, which resulted in the two sides agreeing on a work program to develop regulations concerning oil and gas investment, identify measures to help China increase its use of natural gas, and address barriers to U.S. investment in China's hydrocarbon resources. Kalicki then expressed concern that last year the U.S.-China trade deficit was nearly twice the level of 1994, and that U.S. exports to China have remained a small percentage of U.S. global exports for more than a decade–1.8 percent in 1985 and 2.1 percent today. He urged the Chinese delegation not to allow this to let U.S.-China commercial relations deteriorate.

Department of Energy Senior Advisor Andy Vitali announced that the second Oil and Gas Forum will take place in Houston in July, and distributed a draft agenda. He welcomed China's efforts to increase gas use, and suggested that China could benefit from U.S. experience in moving from its current dependence on coal.

Dai Yunlou stressed China's need for U.S. financing, both public and private, and investment in the power sector. He asserted that there is currently about $7.3 billion of foreign direct investment in the power sector, a number that needs to be increased. He noted that foreign investment and financing is especially needed in central and western China, and in equipment and facilities to protect the environment. China has already introduced cleaner power facilities with U.S. cooperation, Mr. Dai went on, and would like to see more cooperation in this area. He said that China does not provide any guarantees on the investor's rate of return, so that investors are encouraged to control costs.

Another member of the Chinese delegation discussed China's petroleum industry. Recently, the Chinese Government restructured the petroleum industry, and now the China National Petroleum Company (CNPC) has integrated upstream and downstream operations. China has imported $360 million worth of oil and gas equipment from the United States (he did not specify during

what time period). Recent agreements with Phillips Petroleum, ARCO, and other U.S. companies were important examples of cooperation between the U.S. and Chinese oil and gas industries. China welcomes investment in the oil and gas sector, and will continue making reforms to attract such investment.

DeAnn Craig of Phillips Petroleum presented a list of reforms that China should implement to attract more investment in the energy sector. 1) China must strengthen the rule of law, and increase transparency in its legal and regulatory system. 2) Investors must be assured that oil and gas regulations will not be changed arbitrarily; they must know which laws apply to them and which agencies to deal with, and they must know that these agencies are independent of politics. 3) China should increase foreign companies' access to oil and gas resources, and not reserve its most promising resources for domestic firms. 4) Companies need to have access to all geological and seismic data. 5) The power, refining, and petrochemical sectors must be opened up to foreigners as well. 6) Investors also must be able to profit from their investments; the Chinese Government should remember that it is competing with other countries for investment dollars. Currently, U.S. companies have invested $6-7 billion in China's energy sector, but will probably recoup only about half. One improvement would be increasing companies' ability to import equipment and fuel if it is more cost-effective.

Off-Shore Mock Lease Sale

Carolita Kallaur of the Department of the Interior's Minerals Management Service's (MMS) described her agency's role as manager of the outer continental shelf's hydrocarbon resources and as collector of revenue from federal and Indian lands. She noted that MMS is the "cradle to grave regulator" for companies working on the outer continental shelf, and emphasized that foreign companies bid for leases on an equal basis with U.S. companies.

Bob Stewart of the National Ocean Industry Association described the concept of a mock lease sale, a training exercise in which participants learn about the bidding process from both a regulator's and a company's perspective. He suggested that China may be interested in holding such an exercise with his organization.

The Chinese side expressed interest in the mock lease sale, and asked for written information.

Environmental Commercial Priorities

Carlos Montoulieu, Acting Deputy Assistant Secretary of Commerce for Environmental Technology Exports, described the activities of the Environment Subgroup of the bilateral Joint Commission on Commerce and Trade. The Subgroup has implemented 26 projects over the past 4 years, including an urban air quality monitoring project and several water resource projects.

Joe Hillings of Enron urged China to solve its environmental problems using proven, market-based approaches to attain environmental goals, rather than implementing increased regulation. He noted that by 1985, such programs saved US firms over $5 billion dollars and helped them achieve their intended environmental objectives. By 2000, these programs will have saved US

industry more that $20 billion dollars. The benefits of these emissions trading programs go beyond cost savings. He encouraged China to adopt market-based environmental programs like emissions trading and water discharge trading not only to meet increasing demands for better air and water quality, but also to promote innovation in pollution control, easier permitting, and simpler, more efficient systems to administer.

Viet Ngo of Lemna International recommended that China make a commitment to solving environmental problems now to avoid repeating other countries' mistakes. He encouraged China to prevent future problems by taking advantage of the environmental solutions available from U.S. companies. He described a $120 million joint venture to provide waste water collection services in Guangzhou which was established in 1997. The joint venture project will provide a Build-Operate-Transfer (BOT) wastewater collection and treatment service plant to the City of Guangzhou to help clean the Pearl River, an important drinking water source for southern China. The project faces many obstacles before construction can begin. By contrast, such projects in other developing countries like Turkey or Poland, take approximately two years or less to arrive at an equivalent point. To help such projects move forward quickly and encourage lively U.S. private sector involvement, the Chinese government should encourage local governments to streamline the permitting process. The central government should itself issue permits faster, cut taxes and import duties on environmental projects, establish bilateral agreements to expedite urgent projects, encourage early U.S. private sector participation by co-sponsoring design and planning studies for major environmental projects, and set up deadlines for local authorities to meet air and water quality standards.

The Chinese delegation applauded U.S.-China cooperation in the environmental sector. Air and water treatment are priorities, and China would like to increase cooperation in this area. Only 100 of China's cities have water treatment facilities. To aid U.S. companies seeking to enter the Chinese market, the Chinese urged the U.S. Government to expand its own support for U.S. companies, because they are lagging behind European companies. The signing of the Phase II Letter of Intent for the urban air quality monitoring agreement was warmly welcomed by the Chinese delegation.

Wang Tianxi of the Chinese Ministry of Construction reported that the Ministry is responsible for many urban environmental projects. Wastewater treatment is a priority for China, and there are 306 water support projects planned for next year. The Chinese government would like U.S. financing for urban projects.

Alternative Fuel Vehicles

Chen Chuanhong of the Chinese Ministry of Science and Technology (MOST) described the development of alternative fuel vehicles as a critical part of China's environmental protection strategy. MOST is promoting alternative fuel vehicles (AFVs) and electric vehicles. There are AFV programs in 22 Chinese cities, including Shanghai, and a total of approximately 6000 AFVs in China. The Chinese Government is interested in AFV development in other countries and what other governments are doing to promote them.

Jim Wilson, Director of the Commerce Department's Office of Energy, Infrastructure, and Machinery stressed that government incentives are the key to getting alternative fuel vehicles on the road. He recommended that China work with U.S. companies which have technology and equipment that China can use. The Commerce Department and China's State Administration for Machinery Industry will sponsor a seminar on alternative fuel vehicles in Beijing in June to discuss these issues.

Dennis Schuetzle of the Ford Motor Company described how Ford has been working with China on development of an AFV strategy that would allow China to reduce emissions in an economical way. Ford has sponsored workshops and conferences on the subject, and has also done a study of the potential for using coal as a transport fuel in China. Ford is now concentrating on compressed-natural gas and liquefied-petroleum gas (LPG) vehicles in China, and is working with Chinese organizations on new formulations of diesel fuel. Ford also has a visiting scientist program that enables Chinese scientists to come to work at Ford labs. Schuetzle recommended that China develop incentives, mandates, and infrastructure to support gas and LPG vehicles, and promote the development of renewable energy. Ford hopes to establish an environmental vehicle center in Beijing to support AFV development and the retrofitting of existing vehicles.

The Chinese side reported that the government will make major investments in alternative fuel vehicles. The national government will contribute the equivalent of $6 billion for this purpose, with the balance coming from the provinces. China's Minister of the Environment was to visit Ford the week after the meeting of the Forum on Environment and Development, to explore options for alternative fuel vehicles. The Chinese side asked that at the alternative fuel vehicle seminar, exhaust systems and catalytic converters be put on the agenda.

Housing Initiative

Elinor Bacon of the Department of Housing and Urban Development (HUD) announced that Commerce Department and HUD along with China's Ministry of Construction are developing workplans to implement the U.S.-China Housing Initiative. The initiative will be coordinated through the U.S.-China Residential Building Council, which will be co-chaired by the Secretaries of Commerce and Housing and Urban Development and the Minister of Construction. The Residential Building Council will draw on housing expertise from the U.S. private sector and government agencies involved in environmentally efficient housing materials and design. Also, during Secretary Daley's recently-completed mission, the departments of Commerce and HUD and Ministry of Construction initialed a memorandum of understanding to work on topics of mutual interest, including housing finance and low-income housing programs.

Chris Twarok of the Commerce Department's Forest Products and Building Materials Division noted that residential construction raises important environmental issues. Energy efficient materials should be introduced to Chinese builders and the Residential Building Council will be an effective forum to expose China to the wide-variety of energy-efficient and affordable materials and techniques the United States can offer. He mentioned that the National Institute of Standards and Technology will conduct a workshop on building codes and standards that will be

targeted directly at Chinese officials instrumental in their housing reform. Also, the Environmental Protection Agency and China's State Environmental Protection Agency were about to sign a letter of intent on a cooperative project.

Katalin Vaughn of the National Association of Home Builders discussed her organization and its high level of interest in environmentally efficient housing development, building, and design.

Wang Tianxi of the Ministry of Construction and Zhang Shigang of the State Environmental Protection Agency noted that China's residential housing market is very large. The current five-year plan calls for construction of 1.2 billion square meters of housing. The Chinese Government would like China to upgrade the quality of its housing construction and has developed a new system to promote housing standards. The Chinese Government also wants to cooperate on projects to save energy, and in developing loans for residential housing.

Finance

David Bowie of the Commerce Department's Office of Finance stressed that the U.S. Government is committed to promoting investment by American firms in China, and is working to help improve the availability of both official and private financing. In pursuit of this goal, the Department of Commerce and the Department of Energy co-sponsored a seminar on project finance with China's SDPC last September in Beijing. Bowie emphasized that because lenders and investors must identify and mitigate risk before committing funds, the Chinese government should continue to improve the investment climate in China. Currently, companies find the investment environment less than hospitable, which increases the likelihood that they will invest their capital elsewhere. A more favorable investment climate in China will include fair and transparent regulatory practices, a streamlined and transparent project approval process with clear lines of responsibility among government entities, support for the sanctity of contracts and stronger application of the rule of law to commercial life. The Chinese Government should engage investors in discussions about proposed reforms.

Frank Wilson of the Export-Import Bank of the United States reported that Ex-Im Bank has financed $15 billion worth of U.S. exports to China since it opened there in 1982, and is dedicated to being a reliable partner with China in efforts to improve that country's economy. However, new business in China has leveled out at about $1-1.5 billion per year. Ex-Im Bank would like this to increase, and has signed a MOU that dedicates $100 million for new energy/environmental projects next year. Ex-Im Bank's current exposure in China is $5 billion, and it would like to increase this to $10 billion over the next 5 years.

Ed Rice of the Coalition for Employment Through Exports noted that the coalition's members are all interested in China. He noted that projects must be designed to meet private lender standards because even with Ex-Im Bank guarantees, a portion of each project must be financed privately.

Mr. Dai expressed admiration for Ex-Im Bank's work in China, and recommended that the U.S. side discuss systemic problems with the SDPC. The Chinese State Environmental Protection

Agency and the SDPC will sponsor a conference on related issues in the near future. The Chinese delegation promised to provide their U.S. counterparts with information about it.

Meteorological Satellites

The Chinese side expressed concern that the U.S. government quickly approve the export by IBM to China of a computer that will improve weather forecasting.

Commercial Projects

Jay Brandes, Deputy Director of the Commerce Department's Advocacy Center, noted that progress has been made recently on a number of commercial projects in the environmental sector. In particular:

- Enron has signed a MOU with the China National Petroleum Company (CNPC) to build a gas pipeline from the Sichuan Basin to the city of Wuhan in southern China. The pipeline is expected to be completed in 2000, and it will be first pipeline in China built with foreign equity participation.
- Dasibi Environmental Corporation signed an agreement for Phase 2 of its urban air quality monitoring project; Ex-Im Bank has approved a loan for Phase 1.
- The Ex-Im Bank has signed a memorandum of understanding to provide $100 million for financing clean energy projects in China.
- Dessen International has signed a contract with a Chinese company to build 100 homes in Shanghai using American designs and technology.
- Ellicott International of Baltimore Maryland signed a memorandum of understanding with the China Water Investment Corporation to sell the material to build 20-40 dredges in China to mitigate floods.

Brandes then urged that the service contracts for the Xi Lang wastewater treatment be executed promptly so that the project can proceed.

Year 2000 Problem

Assistant Secretary of Commerce for Trade Development Mike Copps advised the group that Y2K may cause major problems in the energy and environmental sectors because of their dependence on technology. He noted that Secretary Daley and the Chinese Minister of Information co-hosted a Y2K conference recently in Shanghai, and said that there may be another such event in Beijing in May.

Dai agreed that the Y2K problem is serious, and said that the government had 18 different agencies working on it.

Discussion

A Chinese official recommended that, because China is primarily an agricultural country, that agriculture, which was considered in another Forum working group, should be on the agenda of

the next Commercial Cooperation Working Group.

The Chinese side stated that the Working Group should also address barriers to Chinese exports. The U.S. government should eliminate sanctions on China, such as the restriction on the U.S. Trade and Development Agency operating in China. In return, the Chinese government will encourage Chinese companies to import more U.S. goods and to work with U.S. companies.

DAS Bowser and Deputy Director Dai agreed that the CCWG had produced a useful discussion of a broad range of bilateral commercial issues. They recognized that these issues were the subject of ongoing consultation between U.S. and Chinese government agencies, companies, and other entities. They agreed to meet in Beijing in June to further explore how they might cooperate in advancing the United States' and China's mutual interests in these areas.