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[Climate Change Issues] [Folder 2] [4]

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Council of Economic Advisers

Memorandum

To: Jeff Frankel August 28, 1997

From: Jon Haveman

Subject: Net Exports data for high energy industries.

The following tables present a fair amount of net exports data for the United States, Annex 1 countries and Non-Annex 1 countries. In your e-mail, you only mention the US, but I thought that the aggregate Annex 1 and nonAnnex 1 data would really answer the question a little better - all the while recognizing that net-exports and comparative advantage have a somewhat tenuous link. These data are for 1992. The US aggregate net-exports numbers (column 1 in the first table) could probably be obtained relatively easily for a more recent year, but almost none of the other numbers in the table could without a great deal of difficulty.

Turning first to the US, it appears as though the US is a net-IMporter in every industry except for Chemicals and Paper (column 1). Net exports vis a vis non-Annex 1 countries in particular, are positive in these 2 industries as well (column 3). This apparently suggests that -- pollution externalities aside -- the US would rather exclude the nonAnnex 1 countries than include them. This is complicated by the fact that when you aggregate over the net exports with non-annex 1 countries (add up column 3), the US is a net exporter of these goods.

United States
1992 US dollars (thousands)

Industry	Net Exports		
	Net Exports	Net Exports with non-Annex 1	
Cement	-251,592	-192,579	-59,013
Chemicals	18,474,974	5,024,727	13,550,247
- Inorganic	966,300	-23,343	989,643
Glass	-2,341,891	-1,701,501	-640,390
Metals	-10,133,481	-8,280,060	-1,853,421
- Aluminum	-753,690	-744,942	-8,748
- Steel	-6,206,960	-5,646,776	-560,184
Paper	54,976	-4,169,457	4,224,433
Total	5,254,578	-9,226,291	15,280,869

The story is very different when looking at the Annex 1 countries as a group. As a group, the Annex 1 countries are net-EXporters of everything except for aluminum vis a vis the nonAnnex 1 countries (column 1). It would appear as though the interests of the US were diametrically opposed to those of the other Annex 1 countries.

Annex 1

1992 US dollars (thousands)

Industry	Net Exports	Total Exports to:	
	Annex 1	Annex 1	non-Annex 1
Cement	514,590	1,517,392	828,095
Chemicals	49,454,001	223,654,539	73,138,220
- Inorganic	2,221,421	16,589,668	5,878,740
Glass	4,244,144	33,159,151	9,018,053
Metals	8,835,147	99,025,368	35,094,639
- Aluminum	-2,484,699	7,353,999	1,252,587
- Steel	15,415,120	59,348,346	25,761,998
Paper	10,159,322	64,062,628	13,776,217
Total	72,692,614	419,901,686	131,027,129

The bottom line, I believe, is that the US has a ready secondary source of supply for these goods should the nonAnnex 1 countries join in the agreement. That is, I believe that the terms of trade hit that the US would take from nonAnnex 1 compliance would be offset by sources within the Annex 1 group. I don't think that this superficial analysis really provides us with the basis to say that the US (from a strictly economic point of view) cares one way or another whether the nonAnnex 1 countries join in.

Note: The data in these tables were generated by aggregating up from 4-digit SITC r.2 industries. The concordance is not completely accurate in the sense that some of the included 4-digit industries are really a part of more than one industry. The industry numbers are therefore subject to a positive error. There is no reason to believe that this error is large enough to alter the above inferences.

Council of Economic Advisers

Memorandum

To: Jeff Frankel August 26, 1997

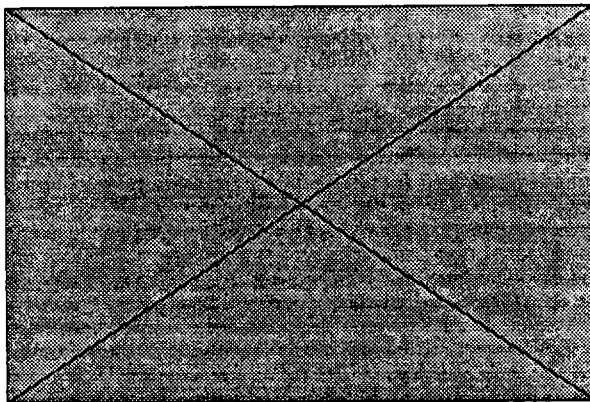
From: Jon Haveman

Subject: Simple model of the economic effects of CO2 reductions.

I've been thinking about emission reductions as more a decline in technology, rather than as an input. Basically, I was running up against problems with resource allocation/utilization/supply. In other words, what does one do with the fact that when you tax emissions, a country is not using up its allocation of emissions. How one defines a country's allocation is another issue entirely. Also, taking the approach that emissions are an input, you get into rather more complicated models than I think are necessary. I'm not certain of the adequacy of modeling it as technology change, but until you and I have a chance to talk, that's what I'm thinking about.

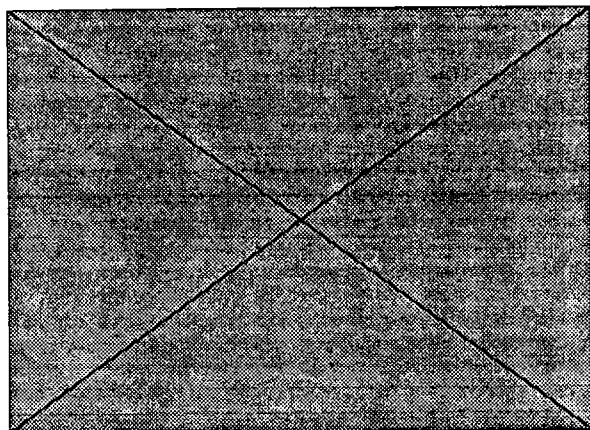
The first approach is a model with perfect competition, constant returns, a continuum of goods and a single input, labor (among other assumptions). There is some technology for producing each good that differs across countries; we'll play around a bit later with the relationship between technology differences across countries and emissions. Let's just assume 2 countries for the time being, I presume Annex 1 and non-Annex 1 countries. I'll call them the US and LDC, resp.

Figure 1



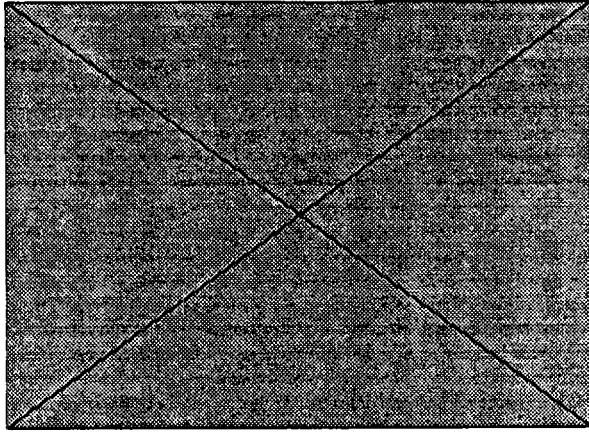
Taking the point of view of the US, rank all goods according to the labor required to produce one unit in the LDC relative to the labor required in the US. Going from left to right in figure 1, the US then has a comparative advantage in the goods on the left and the LDC has a comparative advantage in the goods on the right; there will be one good (z) somewhere in the middle that is produced by both countries. Assuming that US wages are equal to one, the wage in LDC is determined by the inverse of the labor requirements ratio for of good z.

We can now ask of the simple model, what is the impact of a unilateral emission reduction on the part of the US. We want to think about this in several different situations: a) the rate of emissions declines as US comparative advantage declines (from left to right), b) the rate of emissions expands as US comparative advantage declines, and c) the rate of industry emissions is essentially random. This final option is a challenge to model as it will imply a reordering of industries if the rate of emissions is non-monotonic around the jointly produced good. Therefore, instead of random, consider uniform emissions across goods, or, a uniform cost of emission reduction.



A) The US has a comparative advantage in high emission goods. Consider Figure 2. The way to represent a unilateral reduction of emissions in the US is by shifting down the line representing the productivity ratios in a way that is bigger for goods on the left (goods produced in the US) and smaller for goods on the right (goods produced in the LDC). If we hold wages in the US constant, we can make several inferences regarding prices and wages in the LDC. First, prices of goods produced in the US will rise; essentially labor requirements have risen in each industry. Second, wages in the LDC will rise. This second effect is due to a leftward shift in the jointly produced good and a reduction in the productivity ratio for that good. Wages in LDC rise because in order to get labor for production in the new industries, they must be bid away from the old industries. Finally, prices of goods initially produced in LDC will now rise; this being a consequence of the higher wages.

In terms of welfare consequences, prices of all goods have risen relative to US wages. The standard of living (SOL) in the US is therefore reduced. Note that LDC wages need not rise and prices of initially produced LDC goods need also not rise; in this case, the SOL in LDC has also fallen.



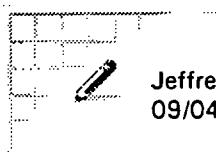
B) US comparative advantage in Low emission goods. Consider figure 3. Shift the productivity ratio in a fashion opposite that in figure 2; down more on the right and less on the left. The consequences of this shift are similar, but slightly different from (a). First, prices in US rise, although by less than in (a). Second, wages in LDC rise. Third, prices of initially produced LDC goods rise.

The welfare consequences in this case again represent a loss for US (smaller than in a), but potentially a gain for LDC. This gain comes about from the likely event that wages in LDC rise by more than prices of initially produced US goods.

C) The third case is similar to both A and B, except that the ambiguity surrounding welfare in LDC is greater. It is less clear whether wages in LDC rise by more than prices in US. The US again suffers a decline in welfare.

The second question we might ask of the model is: suppose the US has already limited emissions, what are the welfare consequences of LDC reducing its emissions? The answer is simply the reverse of the above. If the US has a comparative advantage in high emissions industries, then the US will likely gain, if the US has a comparative advantage in low emissions industries, then the US will likely lose. If there is no particular pattern of emissions relative to comparative advantage, then the impact on the US is ambiguous.

I'll turn my efforts towards producing results from a 2-factor model, but I'll be surprised if the intuition turns out to be entirely different. I'm thinking that the only difference will be presence of distributional issues, but we'll see.



Jeffrey A. Frankel
09/04/97 01:16:32 PM

Record Type: Record

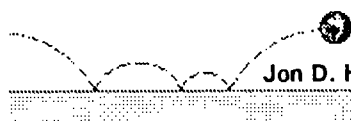
To: Jon D. Haveman/CEA/EOP
cc: Randall W. Lutter/CEA/EOP, Adele C. Morris/OMB/EOP, Joseph E. Aldy/CEA/EOP
bcc: Records Management
Subject: Re: Revised memo on competitiveness

Jon,

Yes, share it with our friends in Treasury (nowhere else as of yet). BUT, first, it MUST include two sentences saying that it is important to have the developing countries participate -- for reasons other than competitiveness (especially, that: without them our sacrifice will have been largely in vain; their emissions will undo our cuts for two reasons: free-riding and leakage). This is not the point of your memo. But we can't have a document with CEA name on it that anyone could misquote as saying that CEA says that LDC participation is not important !!

JF

Jon D. Haveman



Jon D. Haveman

09/03/97 01:28:04 PM

Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP
cc:
Subject: Revised memo



EMITNEXA.WP[Let me know if you'd like me to circulate this.

I've decided that looking at both high and low energy sectors is sufficient to get around the comparative advantage/net exports problem I raised before. The memo therefore contains contrasting information for high and low energy industries. The bottom line is still a lack of evidence supporting the position that the US will experience a worsened export position if the Annex 1 countries stay out....the LDCs appear to be net exporters energy-intensive products.

Jon

Council of Economic Advisers

Memorandum

To: Jeff Frankel September 3, 1997

From: Jon Haveman

Subject: Net Exports data for high energy and low energy industries.

An issue has been raised regarding the participation of less developed countries in the emission reduction efforts. The issue is basically that the trade position of US industries would be adversely affected if LDCs did not participate. The argument is theoretically correct if the United States is a net exporter of products requiring relatively more energy in their production and a net importer of products requiring relatively little energy. If this were the case, unilateral emission reductions taken on by the Annex 1 countries would likely have an adverse terms of trade effect for the United States.

The following tables present net exports data for the United States, Annex 1 countries and Non-Annex 1 countries for 1992. The US aggregate net-exports numbers (column 1 in the first table) could probably be obtained relatively easily for a more recent year, but almost none of the other numbers in the table could without a great deal of effort; in particular, the division between Annex 1 and non-Annex 1 trade.

Products with High Energy Content

Turning first to industries using relatively more energy in the production process, it appears as though the US is a net-IMporter in every industry except for Chemicals and Paper (column 1). Net exports vis a vis non-Annex 1 countries in particular, are positive in these 2 industries as well (column 3). This suggests that the US does not have a particularly strong export position in energy intensive industries. This is complicated by the fact that when you aggregate over the net exports with non-annex 1 countries (add up column 3), the US is a net exporter of these products.

United States
1992 US dollars (thousands)

Industry	Net Exports		Next Exports
	Net Exports	with Annex 1	with non-Annex 1
Chemicals	18,474,974	5,024,727	13,550,247
- Inorganic	966,300	-23,343	989,643
Paper	54,976	-4,169,457	4,224,433
Petroleum Products	-1,929,337	-1,630,863	-298,474
Stone, Clay & Glass Prod	-2,341,891	-1,701,501	-640,390
- Cement	-251,592	-192,579	-59,031

Grand Tackler, ABARE, Australia

10/21/97

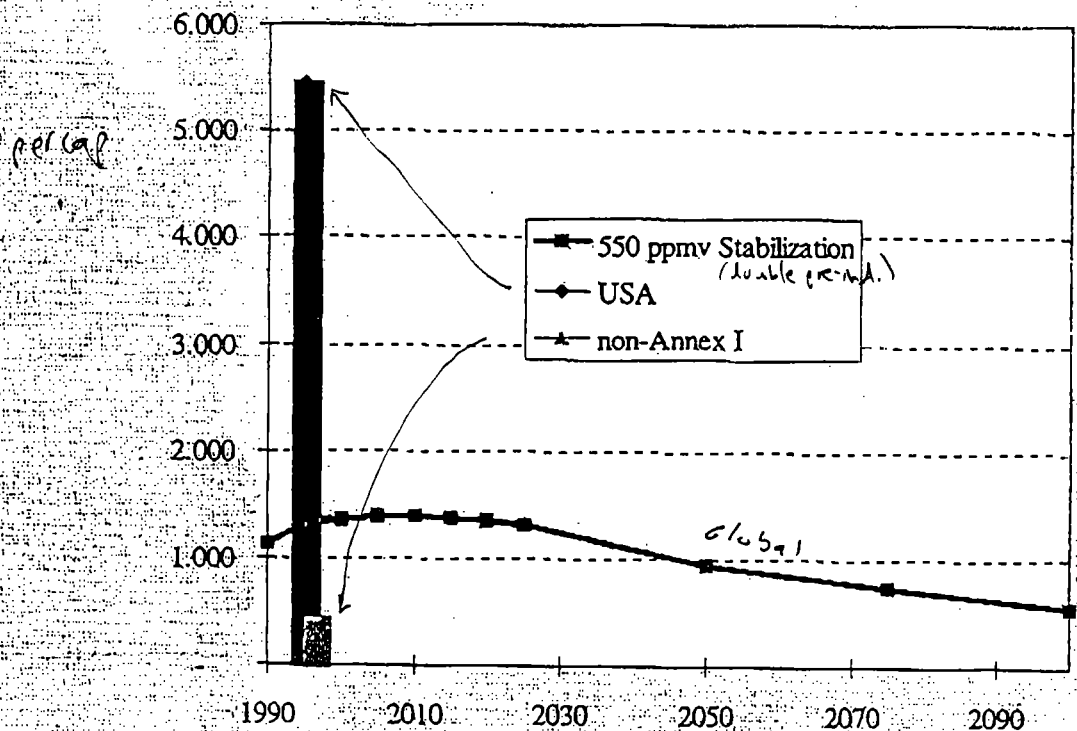
~~1990 by 2010~~ 1F LDCs in:

$\Rightarrow$ \$10 permit prices + targets pulled ^{everyone's} ~~their~~ ^{target} down by 10-20% for everybody

transfer: 5-10% of GDP received by the Indias

Equal % reduction in GNE.

1995 Carbon Emissions Per Capita and Per Capita Emissions to Stabilize CO₂ at 550 ppmv



GCC

7/21/97

LDCs

in WH conf. center

Evolution

by 2005

Korea

5,000

Robt. Gillingham

Byrd resolution

New scheduled commitments in same time period
Newly inserted

Berlin mandate says LDCs only have to advance existing commitments.

Tues mrg. (LDCs)

4Q

What more need to know?

Are we in right place re our position?

What diplomatic strategy?

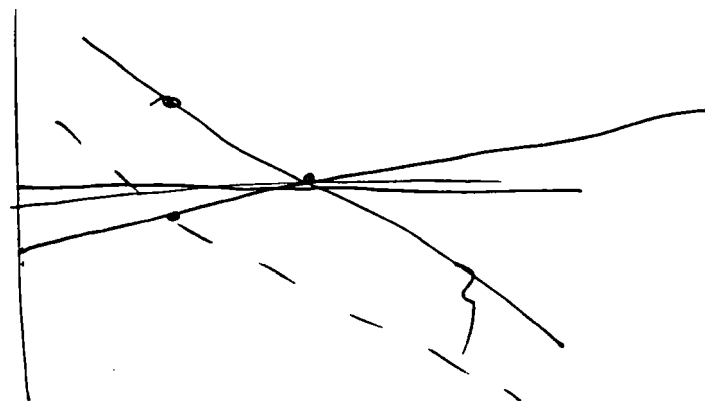
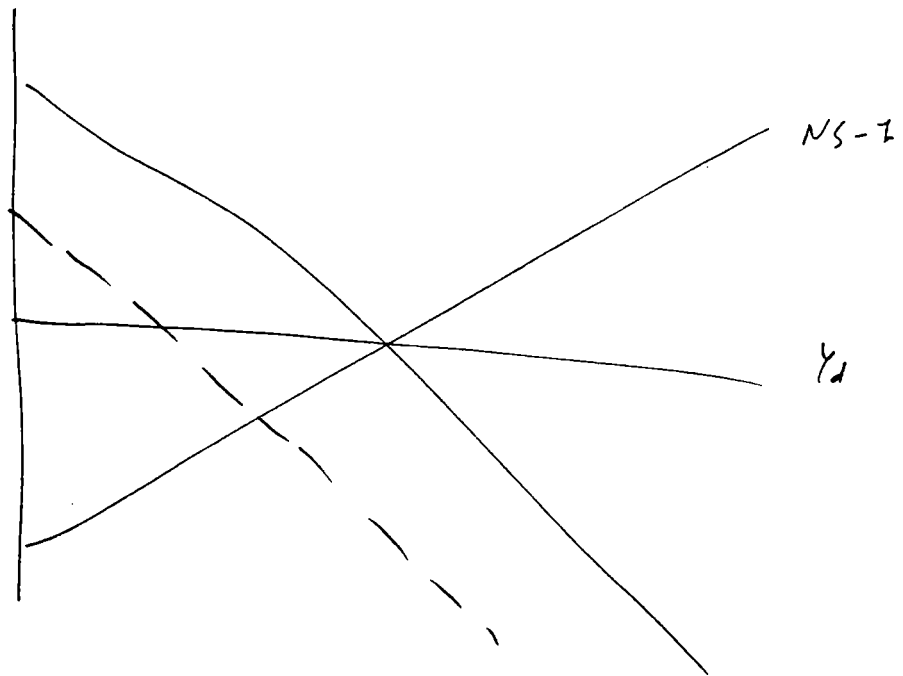
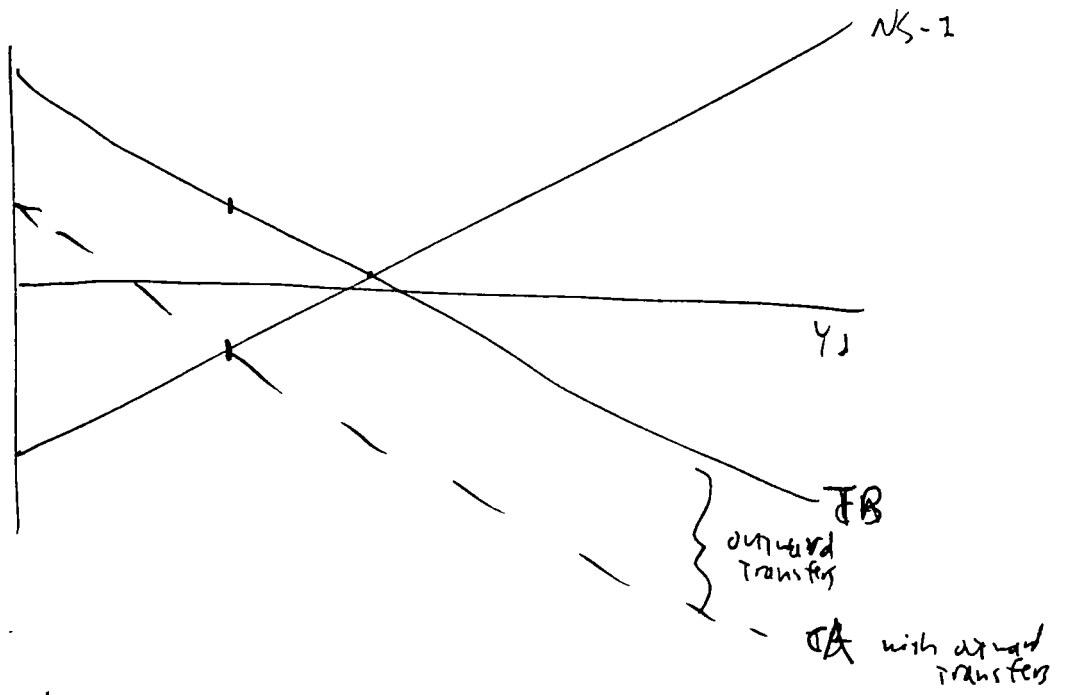
What domestic political strategy?

next phase.

techn. strategy

competitiveness
trade
relocation
free-rider

Leakage $\Rightarrow$ little net gain ?



Email

- Next wk memo
- Reply to Janer
- Say on Tech.

Jay: This is Mexico's FDI Data. They warn that 95 data isn't comparable to previous data but you can look at US shares from year to year. (In blue)

FOREIGN DIRECT INVESTMENT BY COUNTRY OF ORIGIN
(Millions of dollars)

YEAR	TOTAL	UNITED STATES	GREAT BRITAIN	GERMANY	JAPAN	SWITZERLAND	FRANCE	SPAIN	SWEDEN	CANADA	NETHERLANDS	ITALY	OTHER
1980	1,622.8	1,078.6	48.6	170.8	123.1	111.4	19.5	80.0	10.9	17.5	0.0	-29.3	-8.3
1981	1,701.1	1,072.1	40.9	146.3	212.1	74.9	10.3	101.8	15.3	5.2	0.0	5.1	17.1
1982	626.5	426.1	7.4	39.9	65.4	23.1	6.8	40.4	-2.0	8.1	0.0	1.9	9.4
1983	683.7	266.6	49.0	110.0	3.8	16.2	110.0	12.9	29.1	22.1	0.0	1.0	63.0
1984	1,429.8	912.0	44.3	152.5	35.6	59.8	8.7	11.7	61.1	32.5	0.0	0.5	111.1
1985	1,729.0	1,326.8	56.4	55.5	79.3	141.2	10.7	14.0	5.5	34.9	0.0	0.6	4.1
1986	2,424.2	1,206.4	104.3	218.6	142.2	34.1	316.9	93.7	24.6	40.6	0.0	4.0	238.8
1987	3,877.2	2,669.6	430.9	46.9	132.8	95.2	31.2	125.8	36.7	19.3	0.0	2.8	286.0
1988	3,157.1	1,241.6	767.6	136.7	148.8	86.3	152.4	34.1	32.5	33.9	0.0	0.0	523.2
1989	2,499.7	1,813.9	44.7	84.7	15.7	194.4	16.5	44.0	6.9	37.4	47.8	6.6	187.1
1990	3,722.4	2,308.0	114.4	288.2	120.8	148.0	181.0	10.8	13.3	56.1	126.1	4.6	351.1
1991	3,565.0	2,386.1	74.1	84.6	73.5	68.0	500.5	43.5	13.8	74.2	121.1	1.9	123.7
1992	3,599.6	1,651.7	426.8	84.9	86.9	315.2	68.9	37.2	2.0	88.4	83.1	7.5	747.0
1993	4,900.1	3,503.6	189.2	111.4	73.6	101.7	76.9	63.5	2.4	74.2	88.3	4.6	610.7
1994	8,026.2	4,004.5	1,099.5	374.9	699.9	52.9	63.2	151.8	17.1	163.5	385.7	14.3	998.9
1995	6,534.4	4,176.3	614.8	153.8	535.9	145.9	137.5	29.7	141.1	77.9	60.7	-1.0	461.8

Source: INEGI's database and Dirección General de Inversión Extranjera de SECOFI

Note:

Statistics corresponding from 1980 to 1994 are the amounts of FDI reported to the Registro Nacional de Inversiones Extranjeras (RNIE) plus the amount of FDI involved in investment projects authorized by the Comisión Nacional de Inversiones Extranjeras.

On the other hand and due to a change in SECOFI's and Banxico's measuring methodology for 1995, the amounts corresponding to this year refer to the real FDI (FDI actually realized in that period) plus the amount of fixed assets imports made by the maquiladoras. Therefore, these amounts are not comparable or additive to the years before.

Note: these data appear to be flows. I don't have data from Mexico on the stock of US FDI in Mexico.

INTERNATIONAL FINANCIAL INSTITUTIONS AND CLIMATE CHANGE (Draft 2/17/98)

Importance of the International Financial Institutions

The international financial institutions (IFIs), in particular the World Bank and the regional development banks, represent one of the most promising avenues for promoting cleaner growth in developing country power sectors. Despite increasing private sector funding for large-scale LDC investments in the power sector, loans and loan guarantees by the IFIs, and the policies which guide them, continue to have a major impact on power generation projects. In many cases, private sector investors are unwilling to put their money at risk without at least some IFI involvement; so that even where IFI funding is minimal or only on the level of risk guarantee, the environmental requirements of these institutions drives the environmental baseline of the entire project. Moreover, significant IFI investment in renewable energy and energy efficiency could help speed the development of markets for these clean technologies.

The MDBs recognize these important power sector opportunities, but have had difficulty overcoming LDC resistance to power sector reform (which is clearly the number one impediment) and refocusing their own programs. Obstacles include: weak borrower commitment to policy implementation -- in particular to stated energy efficiency and climate goals; an unsuitable mix of skills among staff; a staff incentive system which favors traditional large power projects; a lack of staff accountability in enforcing environmental standards; and a failure to mainstream and rationalize climate policies. A concerted effort is needed to bring change.

Possible MDB Initiatives

The U.S. could build on its existing aggressive advocacy in the MDBs backed up by high-level Administration support, Executive Board action, and leverage through upcoming replenishment negotiations. Elements of this approach could include:

1. The World Bank Energy and Environment Strategy: The World Bank is currently developing an Energy and Environment Strategy, which provides an important opportunity to influence the Bank's programs into the next century. The strategy is likely to cover a range of issues including the Bank's approach to market-based energy policy reforms, integration of energy and environment considerations into country strategies, and investment in conventional power projects, end-use efficiency and alternative energy. We should consider urging the Bank to add consideration of climate change factors as an integral part of the new strategy. At the same time, we need to increase pressure on the Bank to effectively implement its 1993 Power Sector and Energy Efficiency policies, which many Bank task managers have treated more as best-case guidelines rather than strict lending requirements. Effective implementation of these policies would by themselves have had an extremely positive impact in reducing greenhouse gases, even though that was not their original intent. Donors and Executive Directors will need to hold the MDBs accountable -- and through them, the borrowers -- for implementing environmental policies and strategies in the mainstream lending portfolio.

We expect the next draft of the energy and environment strategy to be made available to governments in March. Participation of USG agencies with relevant technical and policy expertise will be especially important as we review and develop a US position on the strategy.

2. Country Power Sector Development Plans: The World Bank has not implemented existing policies effectively enough to base lending in the energy sector on cost-effective investments in energy conservation (including demand management and end-use efficiency) and renewables. Such policies should be incorporated into all World Bank country assistance strategies, reducing constraints on investment in energy efficiency and renewables, so that more win-win investments will be identified and financed by the MDBs and the private sector. Market sector reforms, especially elimination of subsidies for fossil fuels and support for effective energy regulatory bodies to enforce domestic regulations, should be required by the MDBs as a condition for lending to the power sector.

3. Increase Overall MDB Investment in Environment-Friendly Power Projects: Increasing availability of private financing for conventional power projects has reduced the need for MDB lending, which should provide an opportunity for the MDBs to refocus their lending on win-win investments in energy efficiency and renewable energy. Below are several approaches we could consider, ranging from more market-based to more prescriptive. These approaches are not mutually exclusive, and we may want to propose several of them to increase the likelihood of success:

- Internalization of environmental and social costs into MDB project cost-benefit analysis: The project mix in MDB power sector lending likely would shift if environmental and social costs (e.g., shadow pricing) were incorporated into the cost-benefit analysis for proposed projects, which forms the basis for the banks' project selection criteria.
- Explicit treatment of carbon impact of MDB lending: The MDBs could make systematic estimates of the carbon emission impact of their power sector lending and identify appropriate opportunities for "offset" activities. We need to bear in mind that the responsibility for financing offsets rests largely with the borrowing country.
- Mainstreaming of Global Environment Facility experience into MDB activities: The MDBs, in particular the World Bank, would benefit from greater collaboration with the GEF to finance demonstration and pilot projects in non-traditional areas. Most importantly, the MDBs need to "mainstream" the lessons learned from such pilot projects into ordinary MDB lending.

4. Bundling small projects: Renewable and energy efficiency projects are much smaller than traditional large power projects, so overhead costs can be relatively high. Bundling these projects so that the value of the loan is comparable to that of larger projects would reduce some of these overhead costs and allow the MDBs to provide the necessary international support to overcome domestic LDC obstacles.

5. Strengthening MDB staff-skill mix: We have already made a start on MDB staff skills diversification, and we need to intensify our work in this area. As noted by a draft World Bank OED report on lending to the power sector, strategies to refocus the Bank's portfolio to make it more environmentally benign will "require that Bank staff develop new expertise involving an understanding of end users, the private sector, financial markets, and new technologies." One approach would be to create a specialized unit focusing on the development of projects in energy efficiency and renewable energy (already used successfully in the World Bank's Asia department).

6. More creative use of MDB guarantees and insurance mechanisms: The MDBs' guarantee and political risk insurance mechanisms could be used more creatively to facilitate private sector, climate friendly investments in the power sector. Environmental standards in these institutions, such as the IFC and MIGA (where such standards are not as stringent as those of the direct lending institutions such as IDA and IBRD), are currently under review and could be tightened. Perceived risk is clearly an element inhibiting greater investment in energy efficiency and renewable energy. The MDBs can also help address some of the "national security" concerns that governments may have regarding privatization of their power sectors or transnational energy projects such as gas pipelines. MDB policy advice and participation in transnational projects provides comfort to private investors and governments, who know that the influence of the MDBs will be brought to bear if one of the partners makes unreasonable demands or violates an agreed contract.

7. Targeting corruption in the power sector: Corruption is an important issue in public, concession, and private operations in the energy sector with their big-ticket project components and correspondingly high stakes for sellers, governments, and consumers. All concessions, Buy-Operate-Transfer, and Power Purchase Agreements in which the IFIs participate should be awarded through "international" competitive bidding.

Negotiating Strategy

Replenishment Negotiations: MDB replenishment negotiations may provide leverage for achieving US objectives. Key negotiations include IDA-12 (1998), the MIGA general capital increase (1998), and the GEF replenishment (concludes 4/98). The draft GEF replenishment agreement calls for the World Bank to prepare in 1998 a strategy and timetable for integrating global environment activities in the Bank's policies and programs, including its country dialogue, country assistance strategies, and country economic and sector work.

Bilateral and Multilateral Contacts: Over the past decade, the U.S. more so than any other donor has pressed the MDBs on environmental and social issues, but often without support from other donors. The U.S. should begin to raise the role of MDBs in addressing climate change at every appropriate opportunity, such as the G-8 and in bilateral meetings, with a focus on Ministries of Finance and Foreign Affairs more so than Environment ministries. We should actively engage our most likely and influential allies in the current MDB context, including the Canadians, Scandinavians, Dutch, Swiss and Italians. Also key, but less likely to lend initial support, are

Germany and the UK.

BACKGROUND

Developing Country Power Sector Opportunities

Less-developed countries (LDCs) account for a large and growing share of world greenhouse emissions: 30 percent today, but over half by 2025. Clearly, no international climate initiative will be effective if these countries are not engaged. Many low-cost and even negative-cost opportunities for emissions mitigation are located in LDCs, and tapping these opportunities will be essential in finding globally efficient solutions to the global warming problem. The power sector is a logical place to start because of its importance in carbon emissions and the large scale of its projects. The discussion here reflects conversations with the World Bank, advocacy groups, and private sector contacts.

Market reforms. The elimination of subsidies, price controls, inefficient regulations, and unsound relationships between industrial and financial enterprises represents an enormous win-win opportunity in many countries. Such reforms are recognized as central by the World Bank and sit at the top of the wish list of many private energy sector groups. Many power sector improvements -- from plant design to grid management -- will follow naturally from market reforms. The central nature of market reforms puts them at the head of our agenda despite the fact that large impediments exist -- primarily within LDCs but also within the IFIs -- which have prevented significant headway in this area.

Win-Win Projects. A large number of specific projects represent win-win opportunities for action in the near term. This "low-hanging fruit" includes projects to retrofit existing plants, improve power and heat distribution, and increase end-use efficiency. Together they can significantly reduce carbon emissions. For example, estimates from the World Bank suggest that carbon emissions in China can be reduced by 300 million metric tons in 2020 through low- or no-cost opportunities.

Future Power Generation. Ultimately, LDC carbon emissions will depend on the choice of fuel generation technology. Even in the near term, the IFIs can encourage LDCs to implement advanced coal technologies and renewables at low incremental cost. In addition, early efforts to overcome the national security concerns of some countries (such as China) in relying on external sources for natural gas will provide an essential foundation for appropriate development.

Other Issues:

The World Bank Carbon Fund. The World Bank's Environment Department is actively promoting the idea of a carbon fund, where the Bank would generate (at least initially) and certify all projects; and administer (for a 5% fee) the resultant trading in carbon shares by governments and the private sector. Bank staff have indicated they believe this fund to be compatible with the proposed Clean Development Mechanism (CDM).

In our view, this initiative is inadvisable for several reasons. Perhaps most importantly, it would divert needed effort from reforming the Bank's mainstream power sector portfolio, which has a far greater potential impact on greenhouse gas emissions. It also places the Bank in a position of both generating and benefiting from carbon trading, which represents an inherent conflict of interest: the Bank would have little motivation for decreasing baseline carbon emissions in its power sector projects. Finally, the LDCs themselves appear strongly opposed to any role for the MDBs, especially the World Bank, in the future CDM; and the proposed Carbon Fund appears to have little support among other donors. For all these reasons, we should attempt to refocus the Environment Department and Bank management on addressing the larger, but ultimately more important, problems of the mainstream power sector portfolio.

MDB Lending to China. China presents special difficulties to the US as we try to use the MDBs to advance our climate change objectives. By law, the US cannot support MDB projects in China unless they are focused on meeting basic human needs, and most power sector projects do not meet this test. There are indications that Congress may restrict even further our ability to support MDB projects in China. We also need to be cautious about holding existing Chinese policies up as a model for LDC power sectors, which could limit our ability to push for actions the Chinese have resisted strongly, including privatization and increased transparency in the sector.

DEPARTMENT OF THE TREASURY
WASHINGTON

March 11, 1998

cc: JAF
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MEMORANDUM FOR DISTRIBUTION

FROM: Joe Eichenberger *JEB*

RE: Global Environment Facility (GEF) Assembly

PAGES: 5 total

This fax is to confirm the meeting tomorrow, March 12, to develop a position on the proposed World Bank Carbon Investment Fund (CIF) and to discuss the the Bank's Energy and Environment Strategy. The meeting is from 2:30-3:30 in Main Treasury Room 2127. If you plan to attend, please provide your name and birthdate by COB Wednesday to Ms. Dianne Graham or Ms. Earline Hoffman at tel: 622-1810, fax: 622-1228.

The proposed agenda is as follows:

1. Proposed U.S. position on the Carbon Investment Fund
2. Initial discussion of three Bank energy/environment policy issues:
 - Shadow pricing
 - Carbon accounting and offsets
 - Quotas for lending
3. Initial discussion on process to address the revised draft Bank Environment Strategy for the Energy Sector

A draft position paper on the CIF is attached. We will try to circulate a paper on the three additional topics prior to the meeting.

attachment

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	Bill Antholis	456-5334	456-2198
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CEQ/NSC	Jon Gruber	622-2633	622-0563
	Bill Schuerch	622-2536	622-0154
Treasury	Michael Kaplan	477-2967	548-1549
WB/OUSED			

DRAFT
World Bank's Proposed Carbon Investment Fund (CIF)
Proposed USG Position

-DRAFT -

Basics of CIF: The World Bank has proposed the creation of a Carbon Investment Fund (CIF), which would act as a market intermediary by pooling government and private sector finance and investing in projects that result in carbon emissions reductions in client countries. The Bank views the CIF as an instrument to finance the "carbon component" of a regular World Bank Group pipeline project. The resulting carbon reductions could be traded or used as offsets for the investors' own emissions. Eventually, the CIF would be a well-diversified portfolio of carbon offsets, which will reduce considerably the risks of investing in carbon reducing projects. With standardized deals, a CIF could limit transactions costs. The Bank claims that a CIF would be competitive with future players in the market; the Bank would not have a privileged position. As competition increases over time, the role of the Bank is intended to gradually diminish.

Proposed USG Position: The CIF has a number of positive features. For one, it has helped develop our thinking about how offsets trade might develop and could further sharpen our views about the operation of such transactions. In addition, it may help shift a portion of Bank-financed projects -- although not necessarily Bank operations -- toward somewhat more advanced energy technologies. Finally, it may help lower initial transactions costs for offset trades. However, there remain a number of unresolved issues and serious concerns about the proposal. We believe these should be resolved before the Bank Board considers approval of the launch of a CIF.

1. Bank Additionality/Market Impact. As a general rule, the USG has opposed any Bank operation that would supplant the private sector. The investor and trading functions described in the CIF proposal appears to be roles that, judging from experience with emission trading in the United States, the private sector could easily assume. Therefore, we question what additionality the Bank would bring to the transaction, especially if it uses its pipeline projects as the investments. Moreover, there is a real risk that, given the Bank's dominant role in some countries' economies and its lending relationship to member governments, the CIF could create serious price distortions in the fledgling carbon offsets market and stymie its development.

- As a major market actor and middleman in jointly implemented carbon offset projects, the Bank probably has enough market influence to set the price of offsets in certain markets. If over time the Bank were to pay a higher "rent" on carbon mitigation/sinks projects to host countries than the market would allow, this would undermine the ability of private actors to negotiate best prices and would displace some investors from entry into carbon markets or at least impede their timely entry. This could easily offset the potential benefits from potentially lower transaction cost through Bank-brokered investments.
- Has the Bank sought the views of the private sector as it has developed the CIF? Does the Bank have a clear "exit strategy" to turn over a pilot effort to the private sector?

2. Potential Conflicts for the Bank. The CIF proposal has the Bank playing potentially conflicting set of roles: a development bank, a promoter of greenhouse gas reduction, a carbon market regulator and

-2-

trader, and an offset investor. The Bank also has a credibility problem, having long supported fossil fuels development to meet the demands of economic growth, and having failed to follow its own energy and environment policies.

- As a carbon investor, the Bank would face disincentives to require a best-practice baseline, since lenient baselines would reduce the price per unit of carbon offsets. Lower baselines would allow the Bank to expand its CIF business and bring in increased concessional (GEF and CIF generated) financing to its overall energy pipeline and to specific projects. Potential CIF beneficiaries also have an strong incentive to propose the lowest possible baseline energy development scenario in order to gain concessional financing and CIF-generated investment. This appears to reward countries that do not reform or that reform slowly. How would the Bank address these perverse incentives?
- The Bank's net impact over the past several years has to increase carbon emissions. It is unclear that the CIF would alter this net impact, since carbon investments would still presumably be in the Bank's regular portfolio. Can the Bank credibly advocate and facilitate greenhouse gas (GHG) mitigation while increasing overall GHG emissions?
- The CIF's proposed regulatory role for the Bank in the emerging carbon market involves ensuring the use of rigorous, transparent methodologies for determining baselines as well as for monitoring and accounting carbon emissions and offsets. Existing Bank policy calls for the Bank to help countries establish integrated energy strategies that fully exploit economically sensible energy efficiency and renewables -- which should be part of energy baselines. However, in very few cases has the Bank ensured that countries "mainstream" win-win environment into their CASs and project pipeline. If the GEF experience is any guide, there is a risk that a new CIF product line could undermine mainstreaming efforts, with the Bank viewing the CIF as a source of revenue rather than a catalyst for energy reform. Given the poor track record in complying with its own mandatory policies, can the Bank act as a credible regulator, or developer of regulatory regimes?

3. **Jumping the Gun?** To date, the international community has not agreed on methodologies needed for carbon markets or the Clean Development Mechanism to function -- determining and adjusting baselines; estimating, monitoring, and verifying emissions reductions/sequestration; accounting carbon credits and settling trades, etc. Nor has it determined how the resulting carbon offsets of IDA or foreign aid projects should be credited.

- Does the Bank propose to operate a CIF in the absence of internationally agreed methodologies? If so, what methodologies would be applied, and at whose cost? What role does the Bank propose to play in developing and implementing international methodologies, and how would these efforts be financed?

4. **Relationship to Bank Board, the GEF and other MDBs.** There are a number of unresolved questions about how the CIF will be governed and how it will related to other institutions, especially the GEF and the regional development banks. There are two concerns from USG perspective: (1) that the

-3-

CIF not undermine other institutions, and (2) that the CIF not weaken Bank accountability to its shareholders.

- The Bank and the GEF have proposed a strategy in which the CIF would focus on short-term mitigation measures like fuel-switching, and the GEF would focus on longer term measures like renewable energy and energy efficiency. However, the CIF offers to fully fund upgrades to cleaner fossil fuel technology plus large additional cash payments, while the GEF only offers grant financing for energy project costs, and regular Bank assistance offers at best small technical assistance grants and IDA concessional loans. Bank staff may tend to prefer CIF involvement over GEF involvement for related reasons. How would these problems be addressed?
- What CIF oversight role does Bank management propose for the Bank Board? Would each project still be subject to normal Board review?

Treasury: OASIA/IDB 3/11/98



DEPARTMENT OF THE TREASURY
WASHINGTON

March 9, 1998

cc: JH
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MEMORANDUM FOR DISTRIBUTION

FROM: Truman Semans *TS*
RE: World Bank and Climate Change
PAGES: 4 total

The World Bank Board is preparing to consider a new Environment Strategy for the Energy Sector, and Bank management are also proposing the Carbon Investment Fund (CIF) for Board Approval.

Joe Eichenberger will chair an interagency meeting to develop a U.S. position on the CIF and discuss the Strategy. The meeting is tentatively scheduled for this Thursday, March 12, from 2:30 - 4:00 p.m. in Main Treasury, Room 2127. If you plan to attend, please provide your name and birthdate to Ms. Earline Hoffman or Ms. Dianne Graham at 622-1810 (fax 622-1228).

We will circulate a draft position paper on the CIF prior to the meeting. Attached are U.S. comments on the previous draft of the Bank Strategy, sent to Robert Watson on early October. The latest draft strategy can be found at <http://www.worldbank.org/html/fpd/ienpd/ienpd.html>.

The meeting time and place will be confirmed with a following fax.

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	Bill Schuerch	622-2536	622-0154
	Joe Eichenberger	622-1228	622-1810
WB/OUSED	Michael Kaplan	477-2967	548-1549

U.S. Comments: World Bank Energy and Environment Strategy (7/22 draft)

We welcome the opportunity to comment on this important Bank paper, which is the result of a productive dialogue between Bank divisions. We support the goal of "ensuring that energy services are supplied and used at the lowest economic cost including social and environmental externalities." Please note that we are preparing separate comments on the proposed Carbon Initiative.

Relation to Existing Policy. At the outset, the paper should clearly state that the 1993 electric power sector and energy efficiency policy papers remain binding Bank policy. If changes are proposed in Bank policy, these should be clearly listed and evaluated.

- It might be worthwhile to consider a thorough OED review of Bank implementation of existing energy and environment policies, recommending steps to rectify any shortcoming, including staffing, staff training, and internal incentive structures. We welcome the Bank's views on this.
- The Strategy should clearly state existing Bank policy that countries not willing to undertake fundamental reforms will be ineligible for loans to any part of the energy sector, particularly for use of IDA funds.

The Role of the World Bank Group. The Strategy should clearly distinguish between the Bank Group's role, as a public sector institution, and that of the private sector. When and why are Bank lending services for energy justified? Where should non-lending services be applied?

- The Strategy should encompass all parts of the Bank Group, including IFC and MIGA, helping ensure that sound environmental policy guides all types of Bank Group assistance.
- The Bank should focus on capacity-building and other technical assistance that allow markets to function well and account for costs and benefits to society of energy development. The Bank should also increase both direct lending and technical assistance for energy efficiency and renewable energy.

Country Assistance Strategy. Stronger emphasis on energy and environment issues in the Country Assistance Strategy process is a top priority.

- The "Indicators" should include energy and natural resource data from World Development Indicators such as on demand growth for energy services in key sectors, energy intensity trends, costs and prices associated with energy production and use, etc.
- CASs should be based on integrated energy supply and use strategies that account for local/regional environmental externalities and fully integrate energy efficiency and renewable energy. All planned assistance, regardless of sector or type of assistance, including to transport and other energy end-use sectors, should be consistent with these national energy strategies.

Internal Reforms. The document acknowledges that institutional and capacity factors within the Bank may undermine the Bank's ability to support sustainable energy. The Strategy should propose specific internal improvements that allow the Bank to be more effective.

Sequencing Assistance and Reforms. Restructuring and price reforms should be central pillars of Bank assistance. However, reforms that promote energy efficiency and renewable energy resources should proceed

simultaneously with pricing reform and should be fully integrated into planning for restructuring. Price reforms alone fail to capture large segments of energy efficiency and some approaches to restructuring may yield net negative environmental performance.

- The paper should outline the particular types of Bank Group assistance needed to ensure optimum environmental performance in each main type of energy sector restructuring situation (commercialization, privatization, unbundling, competition).
- In particular, the Bank should aggressively support the development and implementation of energy efficiency codes and standards (or implementation at the national level of existing regional standards) -- especially for appliances, motors, and buildings.

Hydroelectricity. We recommend that discussion of hydro be dropped from the Strategy until the conclusion of the international panel on dams co-sponsored by the Bank. The implication that Bank experience with large hydroelectric projects has been positive is clearly inaccurate. Clearly, no other single type of sectoral project has a more problematic track record, and the recent OED study of hydro has been strongly criticized both within and outside the Bank.

Beyond the issues noted above, we have the following additional comments:

Internalizing Externalities. We welcome analysis on internalizing environmental and other externalities into sectoral and project planning. We believe a useful medium-term objective is to identify and internalize local and regional externalities -- costs to human health, infrastructure, and the environment -- into energy supply and end-use development decisions.

Trade and Investment. The Bank should encourage reduction in barriers to trade and investment in clean energy technologies and pollution abatement equipment. Reforms that facilitate joint ventures may be especially important, since considerable anecdotal evidence indicates extensive application of these technologies won't work with imported equipment.

Procurement. Corruption is an important issue in both public and private operations in the energy sector, with its big-ticket project components and corresponding high stakes for sellers, governments and consumers. We recommend that the Bank Group have a policy on contracting and completion arrangements in private sector operations (as does the EBRD). Also, the proposed industry-linked advisory function raises problems of insider advantage.

Concessions/BOTs/PPAs. To avoid real or perceived corruption, the Bank Group should require "international" competitive bidding (not single source or national competitive bidding or unspecified "competitive" bidding) for the award of all concessions, BOTs, PPAs, etc. in which the Bank Group participates.

Carbon Fund. We are preparing separate comments on the proposed Carbon Initiative. While it has some interesting elements, it raises a number of serious and unresolved issues. Perhaps the greatest concern is that the Bank, with a huge portion of its business in financing fossil fuel-fired power plants, faces a serious conflict of interest in also managing the first and largest international fund for jointly implemented carbon mitigation at the project level. At this stage, it is premature to include this proposal in the Strategy.

Transportation. The document should build on the Transport Sector Review completed in 1995 with specific steps for improved Bank support of environmentally sustainable transport systems.

Adele C. Morris

03/11/98 10:47:45 AM

Record Type: Record

To: Randall W. Lutter/CEA/EOP, Joseph E. Aldy/CEA/EOP, Jeffrey A. Frankel/CEA/EOP

cc:

Subject: Carbon Investment Fund -Forwarded

I'll cover issues related to role of international financial institutions. (See attached material on the World Bank's Carbon Investment Fund.)

Adele

----- Forwarded by Adele C. Morris/CEA/EOP on 03/11/98 10:00 AM -----



Ray.R.S.Squitieri @ MS01.DO.treas.sprint.com

03/11/98 09:03:00 AM

Record Type: Record

To: Adele C. Morris

cc:

Subject: Carbon Investment Fund -Forwarded

Date: 03/11/1998 09:53 am (Wednesday)

From: Ray Squitieri

To: adele

Subject: Carbon Investment Fund -Forwarded

Here's the note about the meeting on Thurs. You're welcome to attend, though I'd also be happy to fill you in later if you can't make it.

9/13/97 draft

FEDERAL GOVERNMENT LEADERSHIP on ENERGY AND CARBON EMISSIONS REDUCTIONS

The Federal Government has a record of accomplishment in improving energy efficiency and reducing carbon emissions in its own facilities and vehicles:

- Energy efficiency in federal buildings has improved so that energy use per gross square foot has declined 8% from 1990 to 1996
- When combined with federal government downsizing, total energy usage in buildings is down 15% in that same period
- Energy use in federal vehicles and equipment dropped 21% during that same period
- Overall, the federal government's total energy usage in 1996 was 18% below 1990 levels
- Carbon emissions from the federal government's energy usage has also declined by ...% from 1990 to 1996
- With an energy bill of over \$11 billion in 1990, the federal government brought that down to \$8 billion in 1995, saving taxpayers over \$3 billion per year

Now, the federal government could undertake a "[7] point plan" to continue this leadership over the next decade, to keep the government's energy use and carbon emissions below [1990 levels] by [2010].

Options for the actions that could be included in such a plan have been identified by an interagency working group and are in the process of being refined. A working draft is attached.

Proposals for Improving Federal Facility Energy Efficiency and reducing Carbon Emissions

The following ideas for Federal Energy Efficiency are split into "A" and "B" lists. The "A" list represents ideas that appear to have good potential as a Presidential initiative. The "B" list items are lower priority or not as fully developed. Those with a check in front of them have been written up in "one-pager" format and are attached. Those with an "r" in front had a one-pager, but it needs to be rewritten due to consolidation of proposals or a shift in focus.

"A" List

1. ✓ **Promote the use of ESPCs and disseminate guidelines for scoring.**
2. ✓ **Reinvent Federal Procurement**
 - **Training and Outreach:** Publish best practices guide on buying for the environment (FEMP/OFPP). Expand government-wide training on energy efficiency -- both buildings construction and energy-efficient products. Sponsor another "Buy Environmental" trade fair similar to the one held for recycled products in 1992.
 - **Practices and Procedures:** Establish FEE-led or OMB-led interagency implementation group, which would review management directives and edit, update, and consolidate Executive Orders on energy and the environment to the maximum extent practical. Use alternative contracting vehicles to acquire energy efficient and environmentally-preferable products. Specify purchase of products in the top 25 percent of class for energy efficiency or conforming to Energy Star standards whenever possible. Raise the visibility/placement of the Federal Environmental Executive -- move to CEQ -- and expand the FEE's role to include energy efficiency. (DOE, EPA)
3. r **PNGV-like programs for large engines (DOD).** medium and heavy diesels, managed by DOD/TACOM (Tank and Automotive Command), and turbines for aircraft, managed by NASA and DOD.
4. r **Sustainable design for Federal facilities.** This would include:
 - "Cool Communities" strategies (reflective roofs, additional trees, lighter-colored paving),
 - passive solar designs,
 - increased use of geothermal heat pumps,
 - increased use of and solar and renewable energy, and

- increased use of combined heat and power systems.
5. **Million Solar Roofs.** Federal facilities will participate in the Million Solar Roofs program
 6. **Consolidation, demolition, and recycling of excess military facilities (DOD).**
 7. ✓ **Allow ESPCs to be used for all facilities where Federal funds pay the energy bills even indirectly (i.e. public housing). (DOE)**
 8. **Continued downsizing of the Federal government**
 9. **Use popular National Park facilities as energy efficiency demonstration and education sites**
 10. **Executive Order for agencies to reduce carbon emissions**

“B” List

1. ✓ Restore some direct Federal funding for energy-efficiency projects (\$150-200 million).
2. Create a “Cool Roofs” initiative (a subset of Cool Communities type activities) for smaller government offices and residential facilities. (Big office buildings don’t have a large enough (roof area)/(building volume) ratio for this to make much difference) (EPA).
3. ✓ Improve coordination across many programs and agencies that have a significant impact on Federal energy expenditures: Weatherization, LIHEAP, housing subsidy program, Bureau of Indian Affairs. (DOE)
4. Increased use of combined heat and power at Federal facilities (EPA).
5. ✓ Support the use of State Grant funds to facilitate use of ESPCs and utility financing by State governments wherever possible. (The States can use the grant money for this purpose already, so there’s not much new here.) (DOE)
6. ✓ Create a FEMP “SWAT” team that would provide consulting on energy waste and would be paid from a fraction of the savings they deliver to the client agencies. (DOE)
7. ✓ Support an Energy Bank bill to provide a revolving fund for energy-efficiency investments in Federal facilities. (DOE)
8. ✓ Allow sale of electricity from any Federal facility that can support a cogeneration load. (DOE)
9. ✓ Support bulk (guaranteed) procurement of energy-efficient equipment to provide an incentive for manufacturers to begin production of advanced products. (DOE)
10. ✓ Allow ESPCs to be used for mobility energy (i.e. ships, planes, trucks). There are two interpretations for this. A tight definition just expands ESPC use to ships for “hotel load” energy use -- HVAC, laundry, lighting, etc. A broad definition would allow ESPC financing for retrofitted/new trucks and propulsion energy on ships and planes. (DOE)
11. ✓ “Green Power” Purchasing: include a requirement for some renewable energy in power purchase contracts.

"A" List Background Papers

These papers provide details about the initiatives on the "A" list -- i.e. those that are the best candidates for announcement as Presidential initiatives.

Initiative 1: Promote the use of ESPCs

Short Title: Promote the use of Energy Savings Performance Contracts (ESPCs) at Federal facilities.

Description: ESPCs allow Federal facilities to have energy efficiency improvements made and financed by private-sector contractors, with the investment repaid through payments based on the energy savings that are achieved. Such contracts are currently in use, but not yet widely. This initiative would promote the use of ESPCs and would provide specific guidance on scoring, desirable terms, etc. to ensure that agency procurement officials feel comfortable with the process and understand that it is approved by OMB.

- Agencies will have to score the full potential liability (total payments under the contract) as advance contract authority, but will only need to have appropriations in hand sufficient to cover the first year's payments.
- Because of long-term uncertainty over government downsizing and the potential for changes in facility usage, OMB recommends ESPC contingent liability periods of no more than 7 years. ESPCs with contingent liability periods extending more than 7 years should undergo a review by senior-level agency management.

Potential Benefits: Somewhere between \$3 billion to \$6 billion of investments are needed in Federal facilities to achieve the Administration's efficiency-improvement goals. It will be difficult or impossible to finance that through direct appropriations, so ESPCs will be needed as the major funding channel. The efforts are intended to reduce Federal energy consumption per square foot of non-industrial facilities by 30 percent by 2005, relative to a 1985 baseline. (We have already achieved about a 15 percent reduction.) This will translate into a savings of about \$500 million per year compared to current levels of energy spending.

Affected and Lead Agencies: OMB to issue guidance and encouragement to agencies. DOE and DOD to continue with multiple-award contracts ("super ESPCs") that will allow individual ESPC projects to be awarded with only "mini competitions."

Potential Problems and Costs: The government will be exposing itself to contingent termination-cost liabilities in the off chance that the government decides to close or dispose of a building where ESPC improvements have been made. The probability of this occurring in any given ESPC facility is judged to be sufficiently small that the policy as a whole is still very beneficial. Agencies will have to seriously consider the expected use of a facility over the life of a proposed ESPC, however.

Initiative 2: Reinvent Federal Procurement

When Federal energy managers are queried about problems or barriers to implementation, inevitably, they often identify procurement and policy constraints as major obstacles to accomplishing their job. The following management and procurement initiatives are recommendations to boost and highlight the Federal Government's role as a leader in responsible energy spending and make it easier and cheaper to get results.

- Develop a Best Practices Guide on Buying for the Environment to serve as a resource for agencies to use in establishing new programs for conserving energy and purchasing efficient quality products or services at the lowest cost but with the highest rate of return.
- Establish a high level interagency implementation group on "Federal Energy Consumption" headed by OMB to address policy concerns and assign initiatives for wide-spread implementation
- Encourage/Direct systematic reviews of agency building specifications and design, facility management and other management directives and training materials and eliminate existing biases that inhibit the purchases of energy-efficient products and services
- Expand and publicize available training initiatives on energy efficiency by subsuming and highlighting the importance of energy conservation issues in existing management training programs to make scarce training dollars go further.
- Consolidate Executive Orders...a single point of contact for implementation concerns, reporting, and coordination of the *five* White House awards programs established by them will facilitate implementation, information dissemination and get more exposure for results attained in the Federal agencies.
- Establish and make better use of contracting vehicles for green purchasing. By establishing more multiple award contracts (MACs) and GSA multiple award schedules (MAS) for energy products and services, and by modifying GSA Advantage (an on-line catalog) to highlight them, Federal agencies could procure energy efficient products and services faster and cheaper.
- Develop targeted monetary and non-monetary incentives to prompt both program and contracting personnel to acquire more energy efficient products and services, without undermining competition or value.

These recommendations and initiatives would go a long way in reinvigorating lagging federal implementation of energy conservation and environmental programs. Although consensus still needs to be reached on some details of the approaches, implementation could begin immediately

and possibly be accomplished within the next six months. High-level involvement and attention from OMB should prompt more aggressive action Government wide.

Initiative 3: PNGV-like programs for large engines

1. **Short Title:** Partnership for Next Generation Compression Ignition Engine
2. **Brief Description:** Establish consortium of medium/heavy diesel engine manufacturers and research organizations, to include commercial, academic and government laboratories, with the expressed purpose of accelerating technology transfer of advanced compression ignition engine technologies from research to manufacturing. The consortium shall function to (1) assure a strong competitive U.S. diesel engine and commercial heavy vehicle industrial base, (2) develop the most environmentally compliant and fuel efficient compression ignition engines that are technologically achievable and (3) integrate unique military engine performance / configuration requirements into commercial designs to ensure a common industrial base.
3. **Potential Benefits:** Coordination of non-competitive research related to diesel engine technologies will promote resource leveraging and more efficient applications of advanced technologies. Promoting direct interaction of manufacturing elements in advanced research planning and execution will accelerate technology adoption, thereby making fleets more fuel efficient and environmentally compliant in an accelerated time frame, while making research more relevant to customer needs. Government consortium sponsorship will enable greater influence over direction of technology R&D and allow DOD to buy and support future engines with minimal modifications, making both production and logistics considerations more cost effective.
4. **Affected and Lead Agencies:** Affected Agencies should include Department of Defense, Department of Transportation and Department of Energy. The lead agency should be Department of the Army, U.S. Army Tank-automotive and Armaments Command (TACOM), Tank Automotive Research, Development and Engineering Center (TARDEC), National Automotive Center (NAC).
5. **Potential Problems & Costs:** Problems include (1) Collaboration and sharing of advanced technologies amongst competitive medium/heavy engine and heavy vehicle manufacturers, (2) Integration of unique military engine requirements (i.e., power density, configurations, etc.) into commercial designs that are driven by market forces and (3) Uncertainties related to future fuel types and standards (e.g., uniformity).

Intitiave 4: Sustainable design for Federal facilities

Short Title: Sustainable Design in Federal Construction

Brief Description: Sustainability applies to both individual building design and to entire community or campus/base designs.

- A sustainable building is designed to be energy efficient, easily maintained, and environmentally responsive. It is characterized as being thermally efficient, using renewable energy sources, restricting on-site water consumption, using recycled materials, minimizing waste products, avoiding contaminants, and providing clean indoor air conditions. It is also built as much as possible with recycled or recyclable materials. These objectives are typically realized by employing state-of-the-art and innovative building technologies that have been selected considering life-cycle costs.
- Sustainable development concepts for a Federal campus or military base include "cool community" initiatives, such as light-colored roofs and paving, the planting of additional trees, use of native plant species and low-chemical landscaping, and community systems such as district heating and cooling, environmentally-friendly water treatment, building layouts that minimize traffic and the need to drive, and possibly the use of innovative on-base/campus transportation systems.

Ongoing Activities: GSA is currently developing "green" design concepts. Using an actual courthouse project as a model, a panel of industry experts in sustainable design has developed recommendations for sustainable courthouse design. Currently, we are evaluating the costs and potential benefits of these recommendations in order to provide an economic basis for "green" design decisions. The recommendations and analysis will be used to revise the GSA Facilities Standards document. TVA has incorporated Sustainable Architecture in the holistic design of their Facilities Services Environmental Program that has resulted in: 81.5 % reduction in office waste to landfills; the purchase of 8M dollars worth of sustainable and recycled content building materials; 5,008 cubic meters of renovation waste diverted from landfills and the reduction of energy requirements by 22.7%.

Potential Benefits: Sustainable design should result in facilities that are life-cycle cost effective due to lower energy costs, offer lower maintenance costs, and result in less environmental degradation. Energy savings should be able to reach 30 percent relative to today's conventional practices. As Federal facilities generally have a life expectancy of over 50 years, these results have significant long term benefits to the Government and the country.

Affected and Lead Agencies: All agencies employing GSA design and construction services will benefit from sustainable design. Agencies that should take the lead and coordinate findings are those who have significant construction activity, including GSA, Department of Defense,

Department of Energy, Department of Veterans Affairs, Postal Service, Department of Interior, and Department of State.

Potential Problems and Costs: Sustainable design may have higher initial costs than conventional building construction, although on a life-cycle basis it should cost no more, and probably less. This will require a training and policy emphasis on life-cycle cost approaches to construction planning and budgeting. Effective commissioning practices, throughout the delivery process, must be offered to insure that expectations are realized, especially through Value Engineering and other design phase evaluation/selection practices.

Initiative 5: Federal Participation in Million Solar Roofs.

Short Title: Million Solar Roofs Program

Brief Description: On June 26 President Clinton announced the Million Solar Roofs Initiative. This Initiative will partner the Federal government with businesses and communities to install solar systems on one million roofs in the U.S. by 2010. The Department of Energy will lead the initiative to work with local partners to remove market barriers and strengthen demand for building applications of solar technologies. Agencies will be asked to lead by example and participate in local programs and maximize use of cost-effective solar technologies in Federal buildings.

The Federal sector is the largest single user of energy in the country and pays over \$3.8 billion annually to power and space condition 500,000 buildings. Within this building stock there is a potential to install large numbers of cost effective solar thermal and electric energy systems. These systems include photovoltaic systems, solar concentrating systems for heat and electric power, solar flat plate systems for hot water heating, solar air heating systems, and solar swimming pool heating systems. FEMP currently plans to fund the installation of the majority of these systems through a number of energy savings performance contracts targeted toward specific technologies. This will allow the private sector to finance and install these energy and cost saving systems and be reimbursed from the energy savings that they deliver to the facilities. Current FEMP contracting plans call for the following contracts to be put in place over the period from 1996 to 1998.

Solar Thermal Concentrating	\$30 million	Awarded
Photovoltaics	\$50 million	In process
Solar Air Heating	\$30 million	Award in FY 1998
Solar Thermal (flat plate, etc.)	\$50 million	Award in FY 1998
Solar Swimming Pool Heating	\$30 million	Award in FY 1998

In total these contracts will be valued at \$190 million. Additional contracts can be awarded where the contract value is exceeded for any given system.

In addition, FEMP intends to identify the most likely systems for repeat installation in Federal facilities and to provide packaged procurement specifications and catalogue listings so that agencies can buy the systems using available appropriations and purchase orders which include installation and checkout services. Combined with the ESPC purchasing above, the penetration of the solar systems should reach a total of 20,000 units in 2010. This is roughly the same percentage of the total 1,000,000 roof goal as the Federal energy use is to the national energy use, or 2%. It represents a larger percentage (4%) of Federal solar roofs delivered as a part of the

number of Federal roofs available when compared to the percentage (1.5%) of non-Federal solar roofs as part of the available roofs in the general population.

Potential Benefits: Reduce local emissions of CO₂, SO₂, NO_x and particulate matter. Increased local employment in solar deployment fields. Reduced energy costs, particularly in areas with high-utility rates or local incentives such as net-metering.

Affected & Lead Agencies: DOE, DOD, HUD, EPA, USDA, DOI, DOJ

Potential Problems and Costs: Contracting approval for periods over ten years.

Initiative 6: Consolidation, demolition, and recycling of excess military facilities

Initiative 7: Allow ESPCs to be used for all facilities where Federal funds pay the energy bills, even indirectly (i.e. public housing)

Short Title: Allow ESPC/FREE Savings to be used for all facilities where Federal money supports the energy bills even indirectly (i.e. public housing rent subsidy payments)

Brief Description: Current Federal mandates for agencies require only that they save energy in Federally-owned and leased facilities. Agencies have begun to adapt to the lack of appropriations and substituted ESPC to capture the existing energy savings in those Federal buildings. There are several Federally subsidized buildings where the owners have been encouraged to enter into ESPC contracts as a mechanism for cutting energy use and lowering the subsidy required. In general, this has met with limited success, in part, because the facilities have limited expertise in the contracting process. However, the use of Federal ESPC expertise and contracts in federally subsidized buildings could rapidly expand the energy and cost savings in those buildings.

Potential Benefits: Increase cost and energy savings could accrue to the taxpayers and better living conditions could be provided to the citizens of subsidized facilities.

Affected & Lead Agencies: DOE, HUD, HHS, SSA, BIA

Potential Problems and Costs: More complex business environment would drain existing senior resources from other Federal priorities for a short time. Legislative change required.

Initiative 8: Continued downsizing of the Federal government

Initiative 9: Use popular National Park facilities as energy efficiency demonstration and education sites

Initiative 10: Executive Order for agencies to reduce carbon emissions

"B" List Background Papers

These papers provide details about the initiatives on the "B" list -- i.e. those that are less likely candidates for announcement as Presidential initiatives but are still under consideration.

Initiative B1: Restore some direct Federal funding for energy-efficiency projects.

Short Title: Restore Some Direct Federal Funding for Energy-Efficiency Projects

Description: Until recently, the largest energy-using agencies (DOD, GSA, and DOE) received direct appropriations to fund energy-efficiency improvements at their own facilities, and DOE also received appropriations for a small fund to provide grants to smaller agencies that did not have a line-item for efficiency improvements. In FY95, the funding for these three agencies' efficiency programs totaled \$370 million (\$271m at DOD, \$46m at GSA, and \$7m for the FEMP Fund). In FY97 it is virtually zero, except for funding for a small office in DOD. This proposal would restore \$150-200 million (\$100-145m for DOD, \$35-40m for GSA, and \$15m for the FEMP Fund.)

Potential Benefits: Not all efficiency improvements can or should be financed by ESPCs. In fact, the return to the government is larger if we fund some of the projects directly. In addition, the presence of some direct funding will leverage the ESPC possibilities and will raise the visibility and influence of efficiency programs within all agencies.

Affected and Lead Agencies: OMB the lead on including the funding in agency requests; affected agencies are DOD, GSA, and DOE.

Potential Problems and Costs: Cost: \$150-200 million. Congress has cut such direct funding before -- it will require high-level support as a real priority to get such funding restored in the future.

Initiative B2: Create a “Cool Roofs” initiative for smaller government offices and residential facilities. (EPA).

Could be considered as included in Initiative 4 on the A List -- Sustainable development.

Initiative B3: Improve coordination across many programs and agencies that have a significant impact on Federal energy expenditures. (DOE)

Short Title: Improve coordination across many programs and agencies that have a significant impact on Federal expenditures for energy; Weatherization, LIHEAP, Housing subsidy payment, Bureau of Indian Affairs.

Brief Description: Currently several different Federal agencies pay costs of energy in a variety of different programs. These expenditures include itemized energy cost payments as well as non-itemized payments in the form of housing allowances, rent subsidies, and other expenses. In the aggregate, the amount the Federal government is spending on energy is far in excess of the \$8 billion per year that is tracked as direct energy spending by the agencies. The only authority that FEMP has to address energy expenditures is for the Government owned or leased buildings. Agencies that are responsible for the various indirect payments do not generally apply the same directed energy management strategies that have recently been successful in Federal facilities to the non-Federally owned buildings despite the fact that the Federal government spending is affected by energy consumption in those buildings.

This program would expand the use of Federal government contracts to help bring energy savings to the Federal subsidized facilities. A combination of transferring lessons learned and application of private financing would be used to lower the indirect payments to the facilities in accordance with the energy cost reductions delivered.

Potential Benefits: This has the potential of lowering Federal payment requirements across several agencies while providing a similar or better quality of life for the poor who are most affected by energy use and the fluctuations in energy use.

Affected & Lead Agencies: DOE, HUD, BIA, HHS

Potential Problems and Costs: The diversity of the Federal subsidy programs will make the coordination activities daunting, but the most important for subsidized housing can easily be identified. New contracts will need to be negotiated that will allow the Federal agencies to recover the savings based on savings delivered to the subsidized facilities. Legislation will be required.

Initiative B4: Increased use of combined heat and power at Federal facilities (EPA).

Initiative B5: Support the use of State Grant funds to facilitate use of ESPCs and utility financing by State governments. (DOE)

Short Title: Support the use of State Grant funding programs to increase use of ESPC and utility financing wherever possible.

Brief Description: Currently State grant funding for energy management is dependent on appropriations and many State energy offices are completely dependant on this source of funding for the bulk of their activities. The alternative approach is to follow the model proposed and implemented by FEMP for using funds generated from the savings that FEMP helps implement to pay back the cost of the initial FEMP investment. This requires a high leveraging of funding with private sector energy management funds from such sources as Energy Service Companies, utilities, or bond funding placed by the states. The State Energy Offices would then become the center for managing these highly leveraged funding sources and could rapidly expand the use of energy efficiency and renewable energy in state and local facilities. This will speed the reduction of fossil fuel use well beyond the reduction that would be possible if only the annual Federal appropriations were used.

Potential Benefits: Rapidly increases the rate at which state and local governments capture the necessary funds to implement energy saving projects. Some States have begun to implement these types of programs with DOE funding.

Affected & Lead Agencies: DOE State programs and Federal Energy Management Program

Potential Problems and Costs: Most states will need both education on benefits of this approach and the mechanics of the self-financing process from those that have already implemented it, FEMP and some State Energy Offices. State legislatures may need education on changes to legislation.

Initiative B6: Create a FEMP "SWAT" team that would provide consulting on energy waste and would be paid from a fraction of the savings they deliver to the client agencies. (DOE)

Short Title: Create an energy 'SWAT' team to attack energy waste and to be paid from a fraction of the savings they deliver to the agency. Growth of the organization would only be in accordance with their performance in saving energy and dollars. (See FEMP 98 budget)

Brief Description: Currently agencies have small energy management staffs that are generally assigned to specific regions of their departments. This proposal would create a self funded team that would be charged with providing assistance to any and all Federal agencies on a fee for service basis with the fee being paid when the agencies start to reap the savings from the project. The only thing that this organization could spend the savings on would be to generate additional savings.

Potential Benefits: This would alleviate the constant problem of insufficient up front funding to spend on 'non-mission' priorities such as energy. The use of private financing for the projects would eliminate the need for appropriations and would speed the generation of energy savings in Federal operations.

Affected & Lead Agencies: DOE (in process), DOD (Army possible)

Potential Problems and Costs: Legislation is required in some cases but most agencies have the authority to proceed with this approach but merely need to behave more entrepreneurially than in the past.

Initiative B7: Support an Energy Bank bill to provide a revolving fund for energy-efficiency investments in Federal facilities. (DOE)

Short Title: Support the Energy Bank Bill to provide a revolving fund for energy efficiency in Federal facilities

Brief Description: The Energy Bank Bill would create a revolving fund for energy management funding.

Potential Benefits: The bill will not solve all funding problems but will provide at least a base level of funding that would not be as easily subject to the annual appropriations shortfalls and competing budget requirements. Stable funding would ensure both continuing energy saving projects and help to maintain the human infrastructure that is essential to completing both appropriated and privately financed projects.

Affected & Lead Agencies: All agencies. DOE has been proposed as the lead agency for managing the fund.

Potential Problems and Costs: The current version proposes to have agencies provide a percentage of their energy expenditures to seed the fund. Agencies are reluctant to provide the funds under those conditions. Other suggestions propose an energy bond issue or similar Treasury borrowing process to capitalize the fund.

Initiative B8: Allow sale of electricity from any Federal facility that can support a cogeneration load. (DOE)

Short Title: Allow sale of electricity from any Federal facility that can support a cogen load.

Brief Description: Several Federal facilities have large thermal loads for building heating or process activities. This energy need is often met by simply burning fossil fuels to generate heat. The sites often do not generate electricity from the fossil fuel use because they are not allowed to sell the excess electricity off of the Federal facility into the marketplace.

A more efficient way to generate this heat would be to use the fossil fuel to generate electricity and use the waste heat from the process to supply the thermal load. This cogeneration process requires less fossil fuel use to provide the same amount of useful energy.

Potential Benefits: Lower costs of operation could be achieved by allowing the electricity sold on the market to be a credit toward the facilities fuel bill. Lower energy use would result from comparable thermal loads and lower environmental emissions would result from the same quantity of energy used.

Affected & Lead Agencies: DOE, DOD, Coast Guard, VA, GSA, others

Potential Problems and Costs: This will require a change in legislation to allow excess cogenerated electricity to be sold into the marketplace consistent with the demands of the existing thermal load at the Federal site.

Initiative B9: Guarantee procurement of specific energy-efficient equipment as an incentive to begin manufacturing

Short Title: Support bulk procurement of energy efficient equipment to draw innovative efficient equipment into the market (e.g. DLA a-lamp purchase)

Brief Description: There are many products which can be built and sold in large quantity but have been delayed in their entry into the marketplace by lack of an existing market. In recent years, the Defense Logistics Agency proposed to guarantee the procurement of an energy efficient light bulb (the A-lamp) which would cost more initially but would save money over its operating life. DLA was prepared to guarantee a certain purchase level to begin large-scale production at a worthwhile price.

This approach would identify those energy saving technologies which could be widely deployed in the market place but have failed to reach cost effective production merely because the market development was holding back the cost cutting from lost economies of scale. Several technologies would be reviewed and the best would be selected for the start of a demand pull purchasing strategy. The combined buying power of the Federal sector would be leveraged by additional ordering from state and other large institutional buyers. The subsidizing of non-cost effective products across the program is not envisioned, although subsidies in early years with guaranteed additional saving to balance the subsidy in later years is an option.

Potential Benefits: Speeds the introduction of additional energy efficient products into the market while cutting Federal costs.

Affected & Lead Agencies: DOE, GSA possible, DOD/DLA possible

Potential Problems and Costs: This process requires a commitment to buy products that will involve a large aggregation of demand across several Federal and non-Federal organizations.

Initiative B10: Allow ESPCs to be used for mobility energy (i.e. ships, planes, trucks). (DOD)

Short Title: Allow ESPC to be used for mobility energy (ships, planes, trucks, etc.)

Brief Description: Building energy is only about 1/2 of the total energy cost within the Federal sector. Mobility energy is roughly equal in cost to building energy use. Techniques to improve the efficiency of mobility energy use are limited compared to building energy efficiency methods. For example, ESPC authority only extends to building energy reductions. The extension of this authority to reduce energy use in mobile equipment would greatly expand the amount of energy and cost savings that could be delivered to the taxpayers. The initiative can be constructed to either apply only to "hotel loads" on mobile platforms (HVAC, lighting, laundry, etc.) or it could be applied to all energy use on the platform, including primary propulsion.

Potential Benefits: While energy and cost savings would accrue, the ability to improve mission performance of many mobile equipment is by far the greatest benefit. These improvements accrue largely to DOD and enhance the war fighting capability of the services with improvement in range, payload, capacity, endurance, and addition of redundant systems.

Affected & Lead Agencies: DOE, DOD, Transportation (USCG&FAA), NASA

Potential Problems and Costs: In some mobile equipment, tracking energy savings would be difficult if the savings were simply shifted to additional steaming hours or flying hours. There is no cost benefit provided by current accounting practices for the improved readiness this might provide. Legislative change would be required.

Initiative B11: "Green Power" Purchase Requirement

Short Title: Electricity Purchase Portfolio Standard

Brief Description: Encourage the use of electricity generating sources that are beneficial to climate change in any electricity purchase for a Federal facility. As a minimum the amount of renewable energy that is purchased through any electricity purchase contract should be in the same proportion as that specified by the State Public Utility Commission as a proportion of all electric power produced by renewable sources. Individual facilities should procure, as their first option for supply, additional percentages of electricity from renewable sources where it is the most economical energy source over the life cycle of the facility. In coordination with the purchase of renewable energy supplies, agencies and facilities should incorporate efficiency savings mechanisms in the portfolio of options and allow the use of cost savings from efficiency services to further reduce energy load on the system and thereby reduce the expense of the renewable energy system purchased.

Potential Benefits: No increased cost to the Government for delivered fossil energy reductions and expanded renewable energy delivery. Government minimum renewable energy use will be driven by state mandates for their portfolio mix of energy sources.

Affected & Lead Agencies: All agencies will see fossil energy use decline. GSA and DOD are the principle contracting organizations.

Potential Problems and Costs: Has the potential to set possible cost savings aside from efficiency measures to be used in whole, or in part, to cover possible increases in electricity costs. However, adherence to Federal life-cycle costing standards would minimize any potential to increase cost of power delivered above the minimum required by State portfolio standards.

10/30/97

Climate Treaty/National Security Exemption

1. Scope and Rationale (DoD)
2. Current Diplomatic Situation (State)
3. Legislative Developments (DoD)

chris ENVW security

Bob Harris
State
Langer

Joint Staff
J5 Global Div.
J5

Chris Wick
Dave Wiseman
vice director

Sherry

Jim Seaton

NSC staff
defense policy

Nicholas Lapham, Tullis

Peter

x

Rafe

DOD GCC
Nat. sec. exemptn.
Sit. rm.

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Sen. Inhofe hearing. Thus war
Sen Arms Serv. Comm. Subm on readiness
DOD, State, CEA

(1)

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time

DOD 1.47. of US E cons.
at which half military ops & training,
of which 20-30% peacetime military activities outside U.S.

(2)

war
time
operations.

GCC Disincentive for allies to let troops be stationed they
participate in PKOs

insuring fuel supplies, landg rts., etc. in other countries

Concerned about HFCs. Ships have a lot.
where do bunker fuels inventories count
Price of fuel was taken off the table.

Policy, to make

- It's late. Time to raises problems might have been before Pres announced his policy
- Effect on P. fuel. Lots of things fluctuate in the economy & affect P.O.D costs.
 ΔP_{gas} from OIL (even season) expected to be in range of absolute yearly fluct.s
- NOW P. fuel? Eg. P. fuel
But becomes \$, under int. tradg.
- will reduce risk of ~~war in the~~ need to fight war in middle East

Don

11/10/97

Testimony wrd.
if proposed protocols are signed

STAFF
Sue B. Hines
Don Reisberg.

Dep.'s mtg. to discuss nat. ser.

Bruce DeCrombez

Staffs of force
arrangements.

SOPA Agreement
for untaxed price.

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DeCanio

1/17/97

Rick Howarth

UCSC

Endogenous discount rate OLG model

Diffusion studies
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(mktg. info)

· S shaped curve

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Env. Info. Center

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DeCanio, S. M. J. 1997



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

OFFICE OF
AIR AND RADIATION

FAX MEMORANDUM: 10 Total Pages

TO: Jeff Frankel, CEA, (202) 395-5046
FROM: Skip Laitner, EPA/OAP *Skip Laitner*
SUBJECT: An EPA Working Paper on Technology and Climate Change
DATE: September 15, 1997

Attached is a copy of the draft paper I gave last week to the North American Conference of the International Association of Energy Economics. Since I referenced Janet Yellen's recent testimony, I thought CEA should have a copy of it for internal review. Please let me know if you have any questions or comments.

WYMIWYG (What You Measure is What You Get): The Benefits of Technology Investment as a Climate Change Policy¹

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INTRODUCTION

In a June 26, 1997 speech to a United Nations environmental conference, President Clinton acknowledged that "concentrations of greenhouse gases in the atmosphere are at their highest levels in more than 200,000 years and climbing sharply." If that trend does not change, the President noted that the resulting climate changes would "disrupt agriculture, cause severe droughts and floods and the spread of infectious diseases." In underscoring the fact that no nation can escape the danger of climate change, the President stated that: "We must create new technologies and develop new strategies like emissions trading that will both curtail pollution and support continued economic growth. We owe that in the developed world to ourselves, and equally to those in the developing nations. Many of the technologies that will help us to meet the new air quality standards in America can also help address climate change. This is a challenge we must undertake immediately."

Drawing on the guidance of the President's statement to the United Nations, it is clear that any future climate change policies adopted by the United States should be anchored by a technology-based investment strategy. Recent modeling efforts by an Interagency Analytical Team (IAT) found that the accelerated use and development of energy efficient and low-carbon technologies can substantially reduce the costs of U.S. greenhouse gas reductions. Indeed, a number of the modeling results suggest that with the right mix of technologies, the economy can actually be strengthened by a technology-based strategy. This is

because the right mix of technologies can convert wasted resources into productive assets. As Janet Yellen, Chair of the Council of Economic Advisers, recently commented, "if we do it dumb, [climate change policy] could cost a lot, but if we do it smart, it will cost much less and indeed could produce net benefits in the long run." (Yellen 1997). This opportunity is also underscored by a June 1997 NGO study entitled, *Energy Innovations*. A detailed analysis of the technology opportunities within the United States indicated that an innovative path could reduce U.S. carbon emissions 10 percent below 1990 by the year 2010. At the same time, consumers would save \$530 per household, and the economy would support 800,000 more jobs by 2010 compared to present path projections (Energy Innovations 1997).

Despite the opportunity inherent to an investment-led climate strategy, a number of studies continue to find that the economy will be the real loser should the United States make any attempt to cap carbon emissions at or below anything close to 1990 levels. A study for the American Petroleum Institute, for example, found that carbon abatement strategies could lead to GDP losses by 3.0 percent or more. (Bernstein 1997). Yet, a close review of such studies suggests that a WYMIWYG phenomenon may be at work — "What You Measure is What You Get." In a different context this point was dramatically made by a WRI review of 16 of the more widely accepted economic models which have been used to evaluate different climate change policies. (Repetto and Austin, 1997). In their landmark review, the WRI researchers found that the macroeconomic impacts of stabilizing greenhouse gas emissions are likely to be

1. A draft paper given to the 18th Annual North American Conference of the USAEE/IAEE, September 7-10, 1997, San Francisco, CA, USA.

modest, and if improved technology assumptions and environmental benefits are factored into the modeling runs, the results are likely to be positive. Focusing more on the technology perspective, Greening (1997) suggests that if a policy or set of policies reduces per unit factor prices of capital and energy, the marginal product of those factor inputs will increase. "Provided that this policy has sufficiently low transaction costs associated with it," she notes, "then an energy efficiency policy should increase rates of economic output."

BACKGROUND AND CONTEXT

In June 1996, the Department of Energy (DOE) and the Environmental Protection Agency (EPA) sponsored a joint workshop where more than 50 experts from inside and outside the government made presentations on technical issues associated with our capability to reduce those greenhouse gas emissions in the next century. As part of that workshop, the Interagency Analytical Team (IAT) released what were then preliminary results on the economic effects of emission reduction proposals.

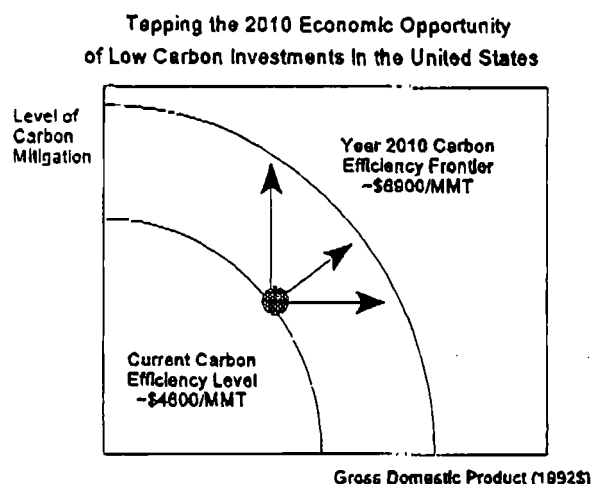
Since that June 1996 workshop, the IAT has more fully explored the "technology option" as a climate change strategy. As part of the review, the IAT developed a better set of assumptions about the opportunity for technology improvements, and then developed a new set of modeling runs that lead to a better understanding of the economic dimensions of the climate change policy problem. Preliminary results of the IAT effort were released in mid-July by Yellen (1997) in remarks before the House Commerce Subcommittee on Energy and Power. Unfortunately, the complete sets of modeling runs were not yet integrated within the IAT reports. As a result, the public received only the "best" of the bad news, with the good news yet to come.

This paper describes those missing technology assessments. It first discusses the opportunity for technology to both reduce greenhouse gas emissions and strengthen overall economic activity within the United States. Second, it reviews the IAT model selection and, in particular, the use of Markal-Macro which is an integrated energy supply and demand modeling system (Markal) and a macroeconomic model (Macro). Markal-Macro is especially useful for translating technology assumptions into economic impacts.

The development of the technology assumptions was done primarily by staff members from DOE and EPA — the agencies that have the primary responsibility for the Administration's energy and environmental policies. The IAT also included members from the Departments of Commerce, Treasury, Labor, and State, as well as members of the White House staff. The author was one of several co-chairs of the various IAT task forces.

What is the technology opportunity?

The common perception among policy makers and industry leaders is that the twin objectives of protecting the environment and encouraging continued economic



growth are inherently contradictory. Because of the "unavoidable tradeoff" between the environment and the economy, a battle is constantly being waged between industry, government and interest groups regarding how much of the environment should be sacrificed for the benefit of the economy — or vice versa. From a technology perspective, however, it becomes increasingly clear that these two goals are not necessarily contradictory. The reason is that the U.S. economy is not operating at its optimal level of energy efficiency. In economic jargon, this means that the country is operating well "within" rather than "on" its production possibilities frontier (PPF). This is illustrated in the figure above.

Based upon a set of IAT runs from the Markal-Macro model, the data suggest that the U.S. economy now obtains about \$4,600 dollars of value-added (measured as GDP in constant 1992 dollars) for every

million metric tons (MMT) of carbon emitted to the atmosphere. Using a reasonable set of technology assumptions (described later in this paper), it appears that by the year 2010, the economy could be obtaining at least \$6,900 of GDP for every million metric tons of carbon emitted. As it turns out, the base case forecast suggests that the normal rate of efficiency improvement will obtain about 30 percent of this "carbon gap." Perhaps more important, implementing a set of policies which encourage the development and deployment of energy efficient and low-carbon technologies can close this gap to the benefit of both the climate and the economy (DOE 1997, Energy Innovations 1997, Krause 1996, Laitner, et al., 1995, OTA 1991).

How have other studies approached the problem?

Typical of many analytical perspectives is a recent policy brief published by the Brookings Institution (McKribbin and Wilcoxon 1997). In explaining the value of tradable permits, the authors ask us to suppose that a particular firm has an abatement cost of \$100 per ton of carbon while a second firm has a higher cost of \$200 per ton. If greenhouse gas emissions are to be reduced by a total of 20 tons, with each firm sharing the responsibility to reduce emissions equally, the total abatement cost is estimated to be \$3,000. Yet, in continuing their discussion, the authors offer no information about the possible production savings made possible by the \$3,000 investment. In effect, this and many other such analyses examine only the cost side of the ledger. By definition, then, any analysis that evaluates only the abatement cost of a given climate policy would tend to show a loss in the overall level of economic activity.

How does Markal-Macro Improve the Analysis?

As described in other documentation, the IAT process relied on three primary models and a number of other analytical tools and models to feed information into the modeling runs. The three major economic models were the DRI Macroeconomic Model, the Second Generation Model, and the Markal-Macro Model already referenced.

The DRI Macroeconomic Model is a macroeconomic and energy-end use model maintained by

DRI/McGraw-Hill. It has a strong representation of U.S. energy supply and consumption, and it contains a reasonable level of detail for approximately a dozen industrial sectors. The Second Generation Model (SGM) is a computable general equilibrium (CGE) model maintained by Battelle's Pacific Northwest Laboratory. Its strength lies in its ability to model the long-term path of climate change policies including key aspects of international trade. It also has a strong representation of energy supply technologies but has very little industry detail. The model contains 8 energy-related sectors, two economic sectors, and the household and government sectors.

Finally, the Markal-Macro model is a dynamic linear optimization model that contains a technology rich, "bottom-up" perspective. Markal-Macro is a domestic model which is maintained by DOE's Office of Policy and International Affairs and EPA's Office of Planning and Program Evaluation. It was this model that was used to examine the question of whether an investment-led technology policy might lower the cost associated with climate change mitigation.

The Markal-Macro model was used to establish a Base Case, and then to simulate the effects of a carbon constraint on energy service demand, choice of fuels, substitution of capital/labor for energy, and the penetration of energy-efficient and low-carbon technologies. The model has two parts to its modeling system. The first part is Markal (short for Market Allocation) which is an energy model that contains the dynamic linear programming routine that is run over time in five-year intervals, from the period 1990 through 2025. The second is Macro which is a macroeconomic model with an aggregated view of long-term economic growth. While maintaining the technological richness and flexibility of Markal, Markal-Macro adds price elasticity on demands for energy services and links changes in the energy system to the level of economic activity. The Markal-Macro solution maximizes consumer welfare over the solution period, optimizes aggregate investment, and provides a least-cost energy system that will meet the endogenously determined demand for energy services (Markal-Macro, 1997).

The advantage, then, of Markal-Macro is that it: (a) allows both a "bottom-up" and a "top-down" perspective within an economic and accounting framework, and (b) allows the user to explore and

compare different assumptions about the cost and energy bill savings of technology and technology choices. As an example, in a set of runs referenced as a "Technology Investment Case," Markal-Macro shows the level of investment increasing by an average of 0.8 percent over the period of analysis compared to a reference case. It also shows that — despite a carbon constraint and, therefore, higher energy prices — the cost of energy services (including both the incremental cost of investment and the annual energy bill) actually declining by an average of 1.7 percent compared to a reference case. At the same time, Markal-Macro shows GDP (measured in constant 1992 dollars) increasing by an average 0.32 percent over the study period.

THE MODEL SCENARIOS

The Reference Case

The domestic energy and emissions baseline forecasts for all three IAT models were benchmarked to the Energy Information Administration's *Annual Energy Outlook 1997* (AEO97). Adapting the AEO97 base case assumptions, Markal-Macro forecasts an average U.S. economic growth rate of 2.1 percent annually in the years 1995 through 2010, tapering off to 1.4 percent in the period 2010 through 2020. A slower population growth, coupled with only very modest productivity improvements, is the reason for the decline in the economic growth rate.

At the same time, the nation's energy intensity is expected to decline 0.9 percent and 0.7 percent annually in those same two periods. This is because of technology assumptions that parallel those in AEO97 and the expected rates of efficiency improvement given normal capital stock turnover in the absence of either a carbon constraint or other energy price signals. The net result is a projected growth in the nation's total energy use that rises from 90.9 quads in 1995 to 107.9 quads in 2010 and 115.2 quads in 2020.

Carbon emissions are expected to rise to 1,767 million metric tons (MMT) in 2010 and 1,940 MMT in 2020. By 2020, baseline emissions will be an estimated 600 MMT above the 1990 levels — a level of reduction that is commonly discussed as an interim target to help achieve overall climate stabilization. These results are

summarized in Table 1 that follows at the end of this paper.

The Behavioral and Technology Cases

While there were many different model runs within the IAT process, in Markal-Macro the alternative scenarios generally focused on two separate cases. The first was a largely behavioral response to a carbon constraint capped at the 1990 levels of carbon emissions (1,340 MMT). The second was a technology investment case that assumed both the existence of presently cost-effective but underutilized technologies, and the development and deployment of cost-effective but advanced technologies. This scenario was also capped at the 1990 level of carbon emissions.

With some differences, the behavioral case assumes the same set of technology assumptions as found in AEO97. Before the emissions cap is imposed, it is assumed that energy intensity will decline 1.0 percent in the year 2000, and decrease linearly to 1.25 percent between 2000 and 2010, and remain at 1.25 percent per year between 2000 and 2020. This modest improvement is based upon the assumed policy announcement effect: the actions that take place because of an international agreement on climate change will generate an increased willingness to invest in energy efficient technologies. In Markal-Macro, this response is generated by lowering hurdle rates to 80 percent of the base case assumptions.

The technology investment case adopts the same hurdle rate assumptions as in the behavioral case, but in this scenario, both consumers and businesses have a richer and deeper mix of technologies from which to choose. The technology choices parallel those generally found in the DOE Interlaboratory Study and the *Energy Innovations* Study previously cited.

RESULTS OF TECHNOLOGY ASSUMPTIONS

The behavioral case and the technology investment case offer an important comparison of economic impacts resulting from climate policies that stabilize at 1990 levels of greenhouse gas emissions. Again, Table 1 provides this comparison.

Perhaps the most immediate result is the cost of carbon between the two alternative scenarios. In the behavior case the carbon price in 2010 rises to \$145 per metric ton (in 1995 dollars), falling to only \$129 in 2020. As might be expected, the impact on GDP is small but negative. In 2010 GDP is 0.05% lower in the behavioral case compared to the base case, or \$9,150 billion compared to \$9,205 billion (measured in constant 1992 dollars). On the other hand, carbon prices in the technology case start in 2010 at \$87 per metric ton, falling to as little as \$24 per ton by 2020. At the same time, the net gains in GDP are positive throughout the period of analysis. In 2010, the level of GDP is 0.23% above the base case, increasing from \$9,205 billion to \$9,226 billion.

The reason for the net positive impact on GDP needs to be seen from several perspectives. First, the carbon constraint, in the absence of better technology choices, increases the cost of carbon. This, in turn, increases overall energy prices. Second, the higher energy prices coupled with a limited set of cost-effective technologies decrease the demand for energy services which tends to weaken economic activity. In the year 2010, for example, energy service demand is down by about 8 percent in the behavior case compared to the reference case. As a result, both investment and the cost of energy services are down, 2.80 percent and 3.61 percent, respectively. Hence, GDP declines in the behavioral case compared to the base case.

On the other hand, the improved assumptions about technology choices in the technology investment case allow businesses and consumers to respond to the price signal by investing in more cost-effective technology. This pattern decreases the cost of carbon since more tons of carbon are removed as a result of both energy-efficient and low-carbon technologies. This can be seen in two ways. First, energy service demand for the year 2010 is down only 0.8 percent in the technology case compared to the base case. Second, while total investment is down slightly in the year 2010 (-0.15 percent), total capital is up as a result of higher investment levels in earlier years (0.58 and 1.75 percent for the years 2000 and 2005, respectively). These conditions nudge economic activity to 0.23 percent above the base case forecast for 2010.

POLICY IMPLICATIONS

Under the United Nations Framework Convention on Climate Change (UNFCCC), 153 countries are working in a combined effort to draft an international treaty aimed at reducing atmospheric greenhouse gases to help prevent global climate change. Initial efforts to reduce emissions to 1990 levels by 2000 have not been successful. For this reason the United States and other negotiators have agreed that a new legally binding target should be set which is both "real and achievable." In so doing the United States has also made it clear that while the *targets* must be binding in order to achieve results, *individual measures* should not be binding to give each country maximum flexibility in the implementation of the treaty. Through a differentiated approach, policy makers will have the freedom to develop national strategies which meet treaty obligations without jeopardizing economic growth and prosperity.

For the United States, a national climate change mitigation policy should be anchored by a productivity-led investment strategy — one that is focused on the promotion and diffusion of cost-effective energy-efficient and emerging renewable energy technologies that are now widely available but underutilized. This type of policy will provide the market with a clear and unambiguous signal about the importance of a climate change mitigation policy. At the same time, a productivity-led strategy will allow innovators from all economic sectors to take advantage of emerging investment opportunities resulting from increased demand for energy efficient technologies.

An effective climate policy needs to ask: (1) how much "underutilized technology" is now available; (2) how much near-term technology can be reasonably made available; and (3) how much long-term technology needs to be developed through research and development programs? Models such as Markal-Macro cannot answer that question since they can only choose from among the technologies that are previously entered into their respective databases. Indeed, there is evidence that the base case assumptions of Markal-Macro itself do not adequately capture the full set of currently available technologies now on the market (Laitner 1997). Moreover, there is no ability for Markal-Macro and other models to incorporate endogenous technological change in response to either price or policy signals.

Estimates of Existing Potential

Several major studies have already established the existence of an efficiency gap which can contribute to an investment-led climate policy major. The *Energy Innovations* study shows, for example, that through 2010 the technology generally exists to reduce the nation's energy intensity (measured as the number of Btus of primary energy per dollar of GDP) at a rate consistent with the technology investment case evaluated by the Markal-Macro model (see, Table 1). In addition, there is strong evidence that the potential may be understated, especially in the industrial sector, since efficiency technology investments also lead to other production cost savings not captured by such models (Elliott, et al, 1997).

Estimates of the R&D Potential

Numerous studies show a very high private and social rate of return to investment in research and development (R&D) programs. Mansfield (1991) notes, for example, that "[d]ozens of economists working independently with quite different sorts of models and entirely different kinds of data have found that the social rate of return from industrial innovations and R&D has been very high, frequently 40 percent or more. This is a remarkable fact, and one that policy-makers should recognize." DeCanio (1997) provides a table of almost two dozen studies showing an average social rate of return to R&D of 60 percent. The Council on Economic Advisors (1994) reports estimated social rates of return on R&D range as high as 50 to 100 percent. CEA suggests that the high rates of return are a strong indication that both firms and society as a whole are underinvesting in R&D.

Such evidence indicates a significant potential to improve both the economic and environmental welfare by increasing aggregate R&D, including R&D in energy efficient technologies. We know that it is possible to increase aggregate R&D substantially; this is a policy decision having mainly to do with the funding of graduate education for scientists and engineers, and with the availability of jobs and equipment for those researchers upon completion of their degrees. DeCanio notes that we have the historical experience of the post-Sputnik push that demonstrates the feasibility (and benefits) of an increase in society-wide R&D. The time

lag for beginning to see the effects of such an effort would be three years at the most. Breger (1997) found that after 20 years, 1.3 Quads of energy could be saved for each \$100 million of R&D devoted to energy efficiency technologies.

Some analyses have suggested that if the current pattern of R&D programs are changed to emphasize the development of technologies which can help mitigate the problems of global climate change, the opportunity costs may be substantial. However, there is no evidence that the present allocation of R&D monies is optimal. Even if it were known that the social rate of return to energy-efficiency R&D were lower than the return to some other kinds of R&D, it would still be justified to increase energy-efficiency R&D if: (1) the environmental benefits augment the other economic benefits sufficiently; or (2) it is not possible (perhaps for political reasons) to increase R&D in the other sectors. A social rate of return of 40 percent is still quite attractive, even if some other (unobtainable) opportunity offers 50 percent.

Estimates of the Economic Costs of Promoting Technology

There are two categories of costs which must be accounted for within any modeling exercise. The first is the actual level of technology investment. The second is the R&D and program costs associated with delivering the technologies to the market and in making both consumers and businesses aware of those investment opportunities. Similarly, there are at least three categories of benefits that should be included within an economic analysis. These include: (1) the direct energy bill savings driven by the investments made necessary with a proposed climate policy; (2) the environmental benefits created by the investments and not captured within the usual modeling framework; and (3) the spillovers created by either the investment or the R&D and program costs. The latter benefit generally stems from the nonenergy productivity gains made possible by the energy-efficient technologies (Elliott, et al., 1997) and the social rates of return referenced by DeCanio (1997) and others. The results from the Markal-Macro technology investment case captures only the direct investment costs and the energy bill savings. Hence, this tends to make the results highly conservative since: (a) the nonenergy benefits are not captured in the analysis; and (b) the R&D and program costs are quite small in

comparison to the actual level of direct investment. Still, it is helpful to provide at least a working estimate of the costs and benefits associated with stabilizing greenhouse gas emissions to 1990 levels. For this we turn to the DOE Interlaboratory Study and the *Energy Innovation Study*.

The DOE analysis suggests a cumulative investment on the order of \$400 billion would be necessary to stabilize carbon emissions with a \$50 per ton cost of carbon in the years 1997-2010. This will generate a cumulative savings of about \$700 billion within the same period (in 1995 dollars). The *Energy Innovation Study* suggests a \$333 billion investment that would yield a \$550 billion savings (in 1993 dollars). Both studies, then, suggest a net positive gain for the economy.

The DOE analysis then suggests that the noninvestment costs would be about 7.0 percent of the cumulative investment, or about \$28 billion. In a separate estimate, Laitner (1997b) estimates the combined R&D and program costs to be on the order of \$21 billion (in 1995 dollars) over the period 1997 through 2010. This is about 5.0 percent of the total technology investment estimated by the DOE study.

CONCLUSION

The emerging evidence suggests that the United States is in a strong position to reduce carbon and other greenhouse gas emissions through a technology-led investment strategy. While the total investment appears to hover around \$400 billion, it is worth noting that in the period 1998 through 2010, the AEO97 forecast indicates the United States will generate a total investment of \$17.2 trillion (in 1992 dollars). If the Lab Study numbers are right, the roughly \$400 billion investment (in 1995 dollars, or ~\$375 billion in 1992 dollars) is about 2.2 percent of the total investment otherwise anticipated by AEO97 (Laitner 1997b). In other words, we are talking about diverting only 2 to 3 percent of the typical investment pattern away from less-efficient and more carbon-intensive technologies into a more productive mix of technologies. Moreover, the associated transaction costs appear to be quite low, on the order of 5-7 percent of the total investment required to stabilize emissions by 1990. In keeping with Greening's comments about the marginal product of

capital and energy (Greening 1997), then an energy efficiency and low-carbon policy "should increase rates of economic output." This is now supported by the analysis generated within the IAT process using the Markal-Macro model.

ACKNOWLEDGMENTS

I wish to thank the Environmental Protection Agency's Office of Atmospheric Programs and the staff within the Atmospheric Pollution Prevention Division for supporting my work in this area. However, the views expressed in this paper do not necessarily reflect those of either the EPA or the Clinton Administration.

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Table 1. Summary of Markal-Macro Simulation Results

	1995	2000	2005	2010	2015	2020
GDP (Billion 1992 Dollars)						
Base Case	6,739	7,554	8,387	9,205	9,884	10,569
Behavioral Case	6,739	7,540	8,380	9,150	9,813	10,481
Technology Case	6,739	7,559	8,428	9,226	9,907	10,614
Total Primary Energy Consumption (Quads)						
Base Case	90.9	97.6	103.5	107.9	110.4	115.2
Behavioral Case	90.9	95.4	98.4	91.9	94.9	97.5
Technology Case	90.9	91.9	92.8	91.2	93.7	96.6
E/GDP (Thousand Btu's Per 1992\$ of GDP)						
Base Case	13.49	12.92	12.34	11.72	11.17	10.90
Behavioral Case	13.49	12.65	11.74	10.04	9.67	9.30
Technology Case	13.49	12.16	11.01	9.89	9.46	9.10
Carbon (Million Metric Tons)						
Base Case	1,424	1,583	1,691	1,767	1,824	1,940
Behavioral Case	1,424	1,526	1,579	1,340	1,340	1,340
Technology Case	1,424	1,448	1,457	1,340	1,340	1,340
Cost of Energy Services (Percent Change from Base Case)						
Behavioral Case	0.00%	-0.55%	-1.03%	-3.61%	-4.10%	-2.72%
Technology Case	0.00%	-2.11%	-1.34%	-2.63%	-1.49%	-0.97%
Level of Technology Investment (Percent Change from Base Case)						
Behavioral Case	0.00%	0.00%	-0.79%	-2.80%	-2.09%	-3.91%
Technology Case	0.00%	0.58%	1.75%	-0.15%	0.49%	1.50%
Marginal Cost of Carbon (\$1995 Per Ton)						
Behavioral Case	NA	NA	NA	145	134	129
Technology Case	NA	NA	NA	87	52	24

Tell -

That was very good - why
isn't that our position? No options
needed.

Tim

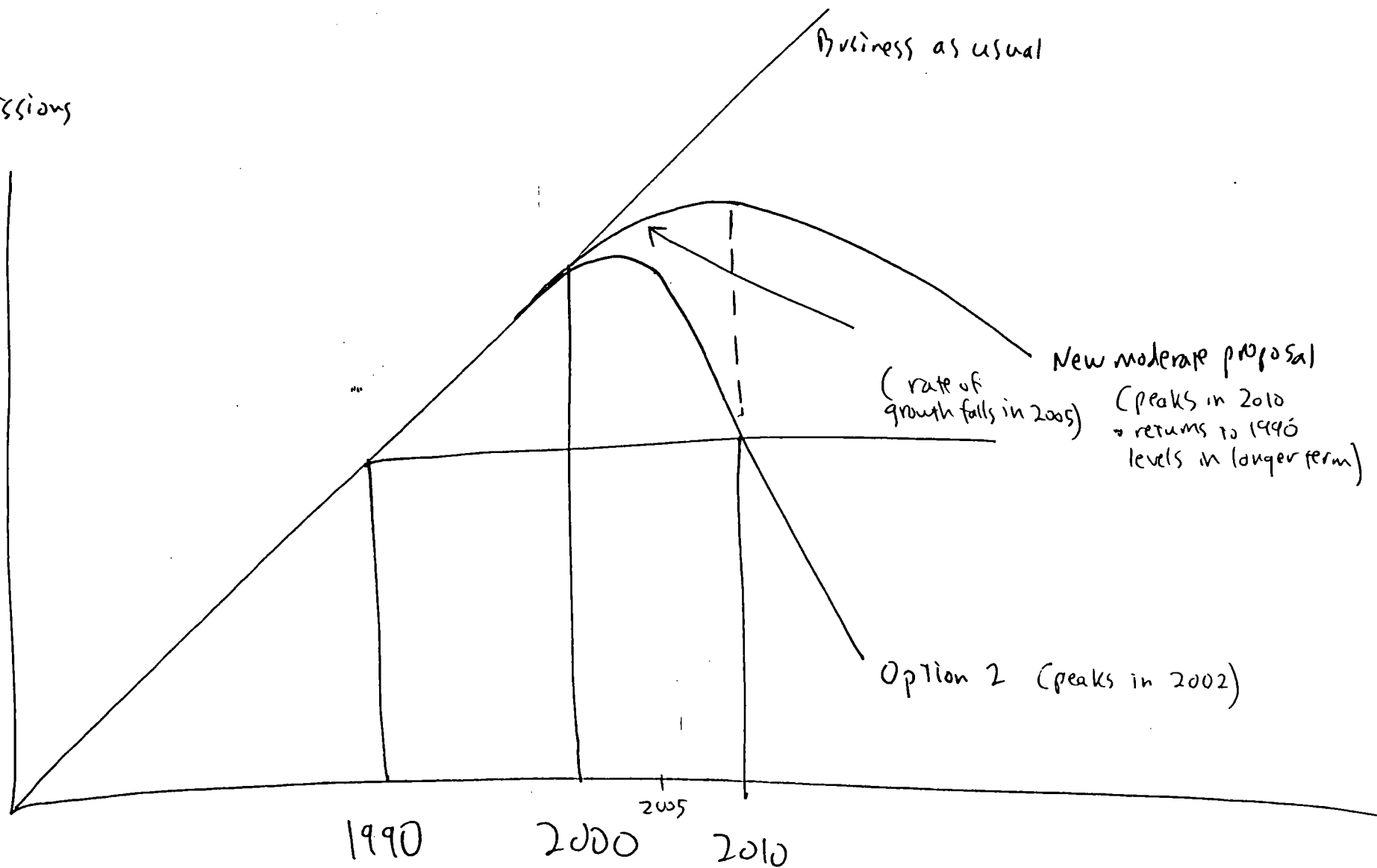
Proposed agenda

1. Wishful thinking (AEEIs...)
 2. CEA preferred policy, in the absence of political constraints
 3. CEA preferred policy, in the presence of political constraints
 4. What must be decided this week
 5. Other major details
 - serious LDC participation.
 - Banking & borrowing
 - Budget window
 - JT
 - int. trading
 - enforcement penalties
- public mtg.

"Emissions should level off in the medium term, and eventually return below 1990 levels."

More specifically, the rate of growth of emissions should begin to diminish by 2005, and they should plateau in 2010-2020, turn down thereafter, reattain 1990 levels in the longer term, and eventually decline further.

Emissions



Very moderate option on GCC

- Emission levels should peak by 2010, and begin to decrease thereafter.
- Emission levels should return to 1990 levels in the longer term [e.g., 2030], and continue to decrease thereafter.
- The U.S. is prepared to support some moderate measures immediately, such as a phased-in end to energy subsidies by 2005.

Dep Sec of Tr.
1. Help ~~L.S.~~, if asked?

2. If so, what suggestions?

- (i) explain blow up
- (ii) milder path
- (iii) level of language
- (iv) other arrows?

3. If so, what should be our relationship to such suggestions?

4. What do we want to convey qua CEA.

option 2

convey
only

5. At some level +



DEPARTMENT OF THE TREASURY
WASHINGTON

March 25, 1998

MEMORANDUM FOR DISTRIBUTION

FROM: Helen Walsh *HW*
RE: World Bank and Climate Change
PAGES: total

Attached are additional materials for the Thursday meeting on the World Bank Carbon Fund proposal and other possible Bank climate measures. The meeting will be from 11:00-12:00 in the Treasury Annex First Floor Conference Room (north across Pennsylvania Avenue from the Main Treasury Building, with entrance facing Lafayette Park).

If you plan to attend and have not yet provided your name and birthdate to Ms. Dianne Graham or Ms. Earline Hoffman by COB Wednesday (TEL 622-1810, FAX 622-1228), please by 10:00 a.m. Thank you.

Attachments

- Agenda
- Agency comments
- Draft Carbon market functions paper

*cc: JAF
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RL
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IFIs and the Environment**March 26, 1998*****Agenda***

1. Continued Discussion of World Bank's Proposed Carbon Investment Fund
 - Agency Positions (written submissions attached)
 - Possible World Bank Role (Draft Functions paper* attached)
 - World Bank Request for Consultations on USG Position
2. Preliminary Discussion of Paper on Shadow Pricing, Offsets and Quota or Benchmark for Energy Efficiency/Renewables Projects
3. Other Business
 - Additional Options: Subsidies/Energy Pricing
 - NGO Request for Policy Papers

* State is drafting separate paper on CDM, which we have not yet seen.

DRAFT
**Draft Functions of CDM/Carbon Investment Fund
and Possible Role for World Bank
(3/25/98 4:00 p.m.)**

I. Description of Market Functions

A. Offsets Traders

- *Functions:* Handles the purchases and sales of offsets for its own account or for clients' accounts, making mkt between those who have excess offsets and those who need offsets.
- *Desired characteristics:* trading skills, adequate financial resources to back up trades, ethical standards, presumably subject to some form of regulation (NASD).
- *Potential Conflicts with Other Functions:* possible conflict if also trading on own account.

B. Offsets Creators

- *Functions:* Finds investment projects that will generate offsets; works with regulatory body to obtain certification of emissions reductions.
- *Desired characteristics:* could be private or public sector, although goal is to create largely private sector market in order to mainstream environmental concerns into largest volume of investment flows. It may be necessary to have transparent international public institution pilot efforts, provided a clear exit strategy is in place; some ethical standards enforced by intergovernmental body (in absence of clear international enforcement), no conflicts of interest.
- *Potential Conflicts with Other Roles:* Should be separate from any regulatory roles.

C. Offsets Bundlers

- *Functions:* Puts together packages of emissions reduction projects; promotes standardization to facilitate packaging.
- *Desired Characteristics:*
- *Potential Conflicts with Other Roles:*
-

D. Certifiers and Verifiers

- *Functions:* These entities ("operational entities" in Kyoto Agreement?) would be responsible for verifying that emissions are actually occurring, certifying offsets as being above the agreed baseline and unique (no double counting of same emissions); ensures appropriate methodology for such functions; promotes standardization to facilitate packaging. Ensures that offsets derived from developing countries are properly taxed for CDM purposes.
- *Desired Characteristics:* high standards of financial probity and professional integrity that are recognized internationally; specialized knowledge of GHG calculation methodologies. Possible candidates might include major accounting firms, environmental engineering

firms, international agencies.

- *Potential Conflicts with Other Roles:* no conflicts of interest that might influence determination of amount of offsets, i.e., no financial holdings in offsets or investment related to them.

E. Regulator(s) of Markets and Operational Entities

- *Functions:* ultimate authority for certifying, registering, and verifying emissions, i.e., these regulatory functions are delegated to operational agencies, clearing houses or other entities, which can lose their status if they do not properly perform their functions; sets methodology for calculating offsets. May also license traders and other market participants (or delegate this to stock exchange or SROs like NASD); some enforcement capability to act against fraud (delicensing) or trading violations; sets fees to pay for regulatory expenses and provide for adaptation funds.
- *Desired Characteristics:* government agency; high standards of professionalism and integrity that are recognized internationally

F. Adaptation Institution(s) (part of CDM)

- *Functions:* Accepts adaptation funds derived from CDM fees. Responsible for disbursement of these funds to those most at risk from climate change. Evaluates requests/projects for adaptation; organizes normal due diligence and project cycle procedures -- including evaluation and portfolio oversight -- of typical IFI (though services can be contracted to other public or private sector institutions).
- *Desired Characteristics:* Governed by Parties to FCCC or subset; Board and management structure are operationally oriented versus political.

G. Settlements

- *Functions:* provides international clearinghouse/stock exchange function; provides complete trade data for verification of national carbon "accounts" to Regulators. Registers emissions so no double counting.
- *Desired Characteristics:* Highly transparent; closely linked to COP and FCCC Secretariat.

II. World Bank Role

The World Bank's proposed Carbon Investment Fund (CIF) would act as a market intermediary by pooling government and private sector funds and investing in projects that result in carbon emissions reductions in client countries, in effect creating a mutual fund of projects that pay offset dividends to investors. The Bank views the CIF as an instrument to finance the "carbon component" of a regular World Bank Group pipeline project. The resulting carbon reductions could be traded or used as offsets for the investors' own emissions. Eventually, the CIF would be

a well-diversified portfolio of carbon offsets, which will reduce considerably the risks of investing in carbon reducing projects. With standardised deals, a CIF could limit transactions costs. The Bank claims that a CIF would be competitive with future players in the market; the Bank would not have a privileged position. As competition increases over time, the role of the Bank is intended to gradually diminish.

This proposal appears to have the World Bank play the roles of Offset Creator, Trader, Bundler and Certifier/Verifier. This last regulatory role presents an obvious conflict of interest. The World Bank probably should not perform any regulatory function, since it has a portfolio that could be affected by rulemaking and enforcement of those rules. However, it has and will probably continue to contribute to analysis that underlies rules that COP and regulators would adopt.

Could or should it engage in other functions? Would look at a number of considerations: whether Bank involvement would negatively affect the development of the offsets market;

MAR 20 1998

cc: Bill, Helen,
Mary, Ray,
JGruher,
DWilcox

MEMORANDUM TO: TRUMAN SEAMAN
CC: DAVID SANDALOW
FROM: JEFFREY HUNKER
SUBJECT: COMMENTS ON WORLD BANK STRATEGIES

Thank you for the opportunity to comment on both the World Bank Energy and Environment Strategy and the proposed Carbon Investment Fund. These views reflect those of the Department of Commerce, which has a strong interest in outcomes which promote economically efficient mechanisms for greenhouse gas trading, incentives for energy-efficient infrastructure, and a successful Clean Development Mechanism. While our interests reflect the broader environmental agenda, this memo will focus on the Bank's strategy as it relates to advancing the US climate change agenda -- because that is the locus of intense interest.

To summarize:

- The Carbon Investment Fund (CIF) as proposed is seriously flawed. We concur with the views of the Treasury comments;
- We are highly skeptical -- given the record of the Bank -- as to the effectiveness and impact of the proposed Energy and Environment Strategy (EES). It is too general and too diffuse to suggest that it will have any real effect;
- We are particularly concerned that both the CIF and the EES appear to be add-ons to existing Bank operations, which, together with the GEF and other mechanisms, present a confusing patchwork that is supposed to address a new set of 'environmental' issues -- while indicating little changes in its core operations.
- We believe that the Bank needs to adopt an approach that integrates incentives that promote investment in environmentally appropriate projects with actions that promote an economically efficient greenhouse gas trading/Clean Development Mechanism (CDM) system. Such an approach will -- not incidentally -- support US diplomatic objectives.
- A new approach would both 1) set incentives for Bank lending across all projects to reduce greenhouse gas emissions, 2) promote a Bank role in opening its projects for competitive bidding for CDM projects, and 3) encourage the Bank to engage in developing a market for CDM credits.

Background

It is important to note that the Bank has four potential functions with regard to greenhouse gas emissions reduction and trading (or its variants, like CDM):

- *pooling of investment funds* for projects that, while promoting other Bank objectives, also reduce greenhouse gas emissions (perhaps from a business as usual case);
- *identifying, structuring, and investing in projects* (note that these functions could be disaggregated -- so that the Bank could pool funds for investment in non-Bank projects);
- *verifying greenhouse gas reductions* (from an established baseline) for projects invested in, thereby developing 'reduction credits';
- *trading or otherwise making a market in such credits.*

The CIF as proposed would place all four such functions within the Bank. Such a combination is seriously flawed for several reasons already identified in the Treasury comments, especially, conflicting incentives within the Bank; and competition with appropriate private sector roles.

An Alternative to the Current Bank Proposals

Both Bank proposals -- the CIF and EES -- are flawed as proposed. Instead of trying to fix them -- an impossible task given that one of their fundamental failings is that they are incremental to a Bank system that has failed to deliver on earlier commitments -- we recommend the following:

1) *The Bank should adopt a policy of ensuring zero net greenhouse gas emissions from its energy and energy-related lending.* Such a policy goal could be accomplished by greater emphasis on renewable energy, or by investment in offsetting emissions projects (e.g.: reforestation). In any case, cost of offset investments should be charged against the originating project. Such a policy would for the first time create an incentive structure for Bank lending that was climate-friendly.

Note that the issue of hydro-electric power remains outstanding, and would need to be clarified.

2) *The Bank should open its project portfolio/pipeline for competitive bidding for CDM projects.* CDM credits -- applicable from 2000 on -- are the most relevant greenhouse gas credit mechanism for the immediate future. By opening its project pipeline for competitive bidding by interested parties (governments, corporations, etc) and making the process transparent, we remove much of the concern about conflicting incentives within the Bank structure. We would envision that the Bank would capture a portion of the greenhouse gas credits established for itself for subsequent trading, as mentioned below.

3) *The baseline verification should be done by a non-Bank entities or entities.* We suspect that there will emerge -- and the Bank actions can do much to encourage -- a vigorous private or non-Bank industry in providing such services.

4) *The Bank should be encouraged to trade, barter, and otherwise help establish a market in greenhouse gas emissions credits.* As one of multiple players in an emerging market for CDM

credits, we see a useful role for the Bank in helping to create active interest and trading in these credits. The key point is that the Bank will be only one of many players in such a market -- in contrast to the current CIF proposal, which would establish the Bank as a predominant role

We would appreciate further dialogue with you about this important issue. Please call me to discuss.

Date: 3/23/98**FAX TRANSMISSION**TO: Truman SemansFax: 622-1228Tel: 622-1229PAGES: 1

FROM: Pam Pearson, Office of Environmental Policy
OES/ENV, Room 4325
Department of State
Washington, DC 20520

Fax: 202-647-5947
e-mail: ppearson@state.gov

Tel: 202-647-1123

**SUBJECT: Consolidated State Department Comments on CIF and
"Bank Approaches" papers**

On the CIF position paper, we have two changes to request in the para.
on "USG Position":

add to first sentence, "a number of positive features, including the fact
that it is a rare forward-thinking initiative to reduce carbon
emissions."

To the final sentence of that para., add, "...and we should sit down with
project designers at the Bank to discuss our concerns as soon as
possible, and in any case prior to the Board seminar."

Also, at the bottom of the same page, perhaps amend the question
re:consulting the private sector to reflect the need for "broad-based
consultation" or something similar; It's obvious from the current "pilot"
participants list that at least some private actors have been contacted.

Along the lines of the second change, we request that Treasury ask
USED to schedule such a meeting.

Regarding the second paper on methodologies available to the Bank to
address climate change, we agree with the general thrust of the Treasury
paper and have no specific comments.



UNITED STATES DEPARTMENT OF COMMERCE
International Trade Administration
Washington, D.C. 20230

Options for World Bank Role in Addressing Climate

Comments U.S. Department of Commerce Office of Finance

The Office of Finance supports Treasury's recommended positions on shadow pricing, carbon accounting and offsets, and establishing quotas for energy efficiency and renewable energy associated with World Bank operations. We believe that adoption of any or all of these positions, especially shadow pricing, would demonstrate continued U.S. commitment to the environmental impact of projects financed by World Bank¹.

From a Commerce point of view, we would like to see that infrastructure and other sectors in which the United States is competitive are not neglected when new policy proposals are developed at the multilateral development banks. While implementation of Treasury's recommended positions may hasten the reduction of the World Bank lending to the energy sector (and thus reduce the business opportunities for these types of U.S. suppliers), we can envision that these losses could more than be offset by an increase in business opportunities in fuel switching, energy efficiency, "clean energy", renewable energy, and other types of energy projects. Increased World Bank financing for the latter types of energy projects may also spur development of alternative energy firms by creating a new market for these products. Our industry desks covering environmental technologies and renewable energy support this initiative.

Prepared by: MFuchs/TD/SIF/OF/ext. 3277

¹ We note that Eximbank was the first export credit agency to adopt environmental procedures and guidelines in 1995 and that OPIC is required by statute to assess the environmental impact of projects under consideration for political risk insurance and financing.



**U.S. Department of Energy Comments on Draft Paper Prepared by
Department of Treasury Entitled:
"Options for a World Bank Role in Addressing Climate, Proposed USG Positions"**

The paper prepared by Treasury does a good job of explaining the issues and laying out the associated pros and cons.

With regard to the first issue, **Shadow Pricing**, we concur that in spite of its lack of precision, the use of shadow pricing forces acknowledgment that carbon emissions have a price which must be recognized as part of the facility/project planning and investment decision process. However, we wish to note that it is unclear whether the "shadow price" applied by the Bank would actually be charged, and, if so, how the funds generated would be used. While we support the proposed positions, we would like more details on the terms under which the shadow price is applied and any linkage that may be contemplated with other Bank initiatives on climate such as carbon offsets (discussed below).

With regard to the second issue, **Carbon Accounting and Requiring Offsets**, we agree that accounting for the carbon emissions from energy related projects should be made a routine reporting requirement by the Bank. Further, the establishment of standardized methodologies for such carbon accounting at both the project and country levels will contribute to the perceived credibility of the information reported to the Bank. This will help to address leakage concerns and potentially make for a smoother graduation for some countries into accepting an emissions limitation commitment. We also feel that there may be a role for some limited form of carbon offsets program, possibly linked/coupled with the "revenues" collected through shadow pricing. Therefore, we support the proposed position, but wish to note that it is unclear whether the Bank intends to apply shadow pricing in conjunction with a carbon accounting/offsets program.

With regard to the third issue, **Establishing Quotas**, we agree with the establishment of growth targets, but strongly disagree with phase out of support of primary energy supply projects by 2005. By all accounts, fossil fuels, particularly coal, will for the foreseeable future remain the fuel of choice for many of the countries whose energy sector is expanding most rapidly. Having the Bank involved provides an opportunity to use its financial leverage to influence the technology choices that are made, such as greater application of cogeneration and clean coal technologies. Given that most of the growth in developing countries will not be met with environmentally benign technologies, the Bank can continue to provide an important role in insuring that, at a minimum, marginal improvements in the efficiency and emissions associated with a given project will continue to be made so that the rate of emissions growth is slowed in the near-term, with the longer term goal of stabilization and reduction.

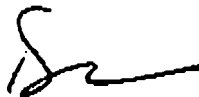
We would be pleased to discuss these comments further. Thank you for the opportunity to comment.



U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

MEMORANDUM

March 19, 1998

TO: Bill Schuerch, Treasury
FROM: DAA/G/ENV, David F. Hales 
CC: G/ENV/EET, Jeff Seabright
G/ENV/EET, Leslie Cordes
SUBJECT: World Bank Climate Options Paper

USAID supports Treasury's efforts to advance GHG considerations in World Bank lending and welcomes the opportunity to comment on the draft paper. We note that the paper suggests a role for development assistance in meeting these objectives. USAID is prepared to expand its direct assistance to the Bank in support of the goals noted in Treasury's paper. Below are specific comments:

Shadow Pricing: We believe that the proposed inclusion of a carbon shadow price in individual loan reviews would help force the Bank to address climate considerations in its lending practices, but would also (and perhaps more importantly) help develop a broader analytic foundation for the internalization of environmental/health/economic externalities. USAID is prepared to provide direct bilateral support to the Bank in meeting this challenge. Bank staff, however, seems reluctant to take a project specific approach to shadow pricing, preferring instead to focus on the broader sectoral strategy outlined in the new energy/environment strategy paper. USAID assistance could help overcome some of the obstacles in implementing this approach.

Offsets: We support the offset approach as a complement to shadow pricing and believe that it should be proposed as an immediate non-binding goal of the Bank rather than waiting till 2005. This would help increase incentives for renewable and efficiency lending without setting hard targets. This option may also be the most palatable to the Bank.

Targets: The offset approach outlined above would help generate 'internalized' targets which may be more attractive to Bank staff.



TO: Truman Semans

FROM: Jackie Krieger, OPPE
Tracy Narel, OAR
Christopher Herman, OIA

RE: Comments on World Bank GHG Options

This responds to your request for comment on options for World Bank programs to reduce greenhouse gas emissions.

(1) Shadow Pricing

The proposed Treasury position is to support expansion of Bank shadow pricing efforts and efforts to identify "win-win" project opportunities "upstream", to address emissions with local and regional as well as global impacts, and to integrate this work into normal project development. EPA tentatively supports this position.

Specific comments:

Pros and Cons:

Second bullet: The second sentence suggests that GHG reductions, unlike reductions of conventional pollutants, may not have domestic benefit. Yet GHG reductions resulting from energy efficiency improvements could well result in domestic savings. This is not gainsay the major point that shadow pricing might, as a spin-off, help improve GEF analysis.

Third bullet: It is true that developing country borrowers have not committed to GHG reductions and are not obligated to cover costs associated with achieving "global" benefits. It is also true that such borrowers may "resist" shadow pricing on these grounds. It seems to us however that the argument mistakenly implies a borrower entitlement to Bank funds. Neither the Bank nor donor countries are obliged to support carbon-intensive projects; both are entitled to the information, including information about energy alternatives, that shadow-pricing might produce; both may fairly elect to support such alternatives in country dialogue and lending operations; both, like the borrower itself, make their own decision in the last analysis.

Fourth bullet: It is true that shadow prices are imprecise and that eligible costs vary in consequentiality. But these qualities does not constitute a "con", given that they are no more imprecise than other guesstimates which are often, even typically, accepted as the basis of project economic analysis, e.g., in deriving consumer surplus or travel demand. And it can be expected that weighting factors or good practice protocols will emerge to avoid make-work exercises.

Proposed bullet: A bullet might address how a "shadow pricing" initiative would 'advance "meaningful contributions"' under the Byrd Resolution.

(2)

Proposed position:

First bullet: It is important that shadow pricing be comprehensive. Just as assigning a zero cost to emissions distorts energy "market", so might assigning costs only to "global" pollutants or only to air emissions. There is considerable danger, due to lack of comprehensiveness and the persistent practice of valuing water as "free", that the exercise could have the perverse effect of encouraging large-scale hydro projects. This danger could be avoided by a separate policy on dams involving adequate weighting of up-and down-stream hydrologic, social and ecosystem impacts.

Second bullet: Using GEF to fund shadowpricing exercises at the national energy planning level may be appropriate. The danger is that without GEF funds, which are limited, countries would decline to conduct any exercise, notwithstanding the potential for local benefit. Using GEF for analysis at the level of a conventional carbon project seems inconsistent with GEF goals.

(2) Carbon Accounting/Offsets

The proposed Treasury position would initiate energy sector gross carbon accounting and "work towards" end-use sector gross carbon accounting. A date certain would be set by which time the Bank would be expected to demonstrate a net carbon reduction in its developing country operations. EPA tentatively supports the Treasury position which, however, may need clarification in some respects.

--what is an "offset" here? Is it physical, e.g., a ton of carbon sequestered in sinks, or is it conjectural, e.g., a ton of carbon avoided in renewables, price reform or some other form of carbon demand management? EPA tentatively recommends the former. Even assuming that reasonable scoring conventions were agreed (e.g., how to derive a counterfactual baseline), the latter would present considerable room for manipulation of results. It could however lead directly to Bank support for renewable and energy efficiency projects. The former would be easier to count, would promote Bank support for reforestation if not necessarily protection of intact forests, and would constrain carbon projects to the pace of carbon sequestration projects without necessarily inviting Bank support for non-carbon energy projects. It is possible, even likely, however, that the constraint of an indirect approach would have that effect.

--would the offset requirement apply to Bank operations on an economy-wide basis or to operations in selected sectors? Limiting the offset requirement to the power sector could divert carbon-intensive operations into other sectors, i.e., transportation, primary production. EPA tentatively urges that it apply at least to power, primary production, transportation, forestry and mining.

--could the target date be calibrated to the ambitiousness of the offset requirement?

(4)

project materials of the staff response. The recent Coal India II project is a disturbing example of a first-rate expert analysis of carbon inefficiency in coal extraction that was virtually ignored in a coal expansion project that funded and perpetuated old carbon-inefficient technologies.

(5) Bank Support for Private Sector Energy Projects

Bank support for the private sector is increasing. The relation of shadow pricing, carbon accounting and subsector growth objectives to private sector guarantees, lending to intermediaries and funds, etc., should be developed.

(6) Transportation

The Bank should support development of sustainable transport planning capability in developing countries, at a minimum through a proactive program of technical assistance for integrated transport planning and demand management. Support currently is focussed, rather perversely, on improving and disseminating the Bank's highway design and capacity models. Transportation (dominated by gas-powered motor vehicles) is expected to be the fastest growing carbon-emitting sector in developing countries as well as one of the largest contributors to high levels of urban air pollution and congestion. Capacity expansion ultimately exacerbates these negative trends. Transport- and transport demand management are complex subjects requiring technical capacity and planning capabilities not available in many developing countries.

(3)

Selecting a fairly-distant target date, e.g., 2005, suggests a fairly ambitious carbon offset requirement.

Pros and Cons:

Second bullet: It is not clear why the second and third sentences are germane. They seem to be true-but-irrelevant. To state that Bank projects are part of the baseline does not Claiming that Bank involvement "reduces emissions below the (counterfactual) baseline" that would otherwise have prevailed is not the same as claiming that the Bank's portfolio already offsets carbon production with equivalent or greater carbon sequestration or non-carbon alternatives. Price reform, if actually implemented, that would not have occurred without Bank involvement allows the Bank to make the former, but irrelevant, claim--unless, of course, Bank support, although linked to price reforms, diluted and forestalled market pressures that might have led to sector reform sooner.

Third bullet: An offset requirement could also lead to renewed Bank support for large-scale hydropower projects. EPA urges that needed strategies to reduce Bank-generated carbon emissions be accompanied by measures to reduce risk of perverse consequences.

Potential bullet: A bullet might address how "carbon accounts and offsets" would 'advance "meaningful contributions"' under the Byrd Resolution.

(3) Quotas for Energy Efficiency and Renewable Energy

The proposed Treasury position would seek annual growth targets in the number and value of energy efficiency and renewable energy projects. It would not seek a portfolio share for these subsectors. It would seek to end Bank support for primary energy supply projects by a date certain. EPA tentatively supports this position.

Pros and Cons

For ease of reference, a bullet format would be helpful.

"Blunt object" is forensics. Do you mean "blunt instrument"?

(4) Energy Efficiency Analysis

EPA urges that consideration be given to seeking energy efficiency analysis in projects in the power (including coal mining) and industrial sectors. Such analysis would highlight opportunities for energy efficiency components. It should be linked to explicit discussion in

To: Tommy Semans
From: Ray Squitieri
Subject: Draft position paper on the World Bank and climate change

The draft position paper on the World Bank and Climate Change makes a good case. The three possible approaches discussed -- shadow pricing, requiring offsets, and adopting lending quotas are all worth considering. At the same time, I wonder if draft doesn't occasionally lose sight of the forest.

First, shouldn't energy subsidies be our first target? I know we have conflicting evidence on this. Several years ago, calculations made with OECD's GREEN model several years ago showed that eliminating energy subsidies would reduce carbon emissions by 18 percent, compared with the baseline. I also recall a more recent WB research paper that concluded that restructuring in the FSU had rendered most of fat previously contained in energy subsidies. Perhaps we should consider a condition that limits WB loans to countries that have made progress in eliminating energy subsidies?

Second, there is something to be said for shadow pricing, but isn't it a better idea, at least in principle, simply to adjust existing taxes so they better reflect the carbon content of fuels? Shadow pricing is based on the same idea, but introduces additional opportunities for rent-seeking and market distortions; it won't take the affected parties long to see this. We have seen the unintended consequences of shadow pricing already, in New York, Massachusetts, and several other states, where public utilities commissions have applied "adders" to electricity generated by out-of-favor fuels. The result has been to produce an industry whose product is neither cheap nor green.

Third, and most generally, we should be careful about asking the World Bank to divert resources from its central mission, which is to improve the lives of the world's poor. Traditionally -- and appropriately -- the Bank has addressed its mission by focusing on long-term growth in poor countries. We should cast a skeptical eye on anything that diverts resources from this objective. The World Bank's 1992 Development Report (under the general direction of Larry Summers) made this point emphatically. Pointing out the great opportunities for improving lives in poor countries, the report noted that : " ... investments with real rates of return as low as 5 percent could do more for future generations than investments in large reductions of greenhouse emissions."

MEMORANDUM TO: TRUMAN SEAMANS
CC: DAVID SANDALOW, MIKE COPPS, JEFFREY HUNKER
FROM: NAZIR BHAGAT Ph: 482-3855
SUBJECT: COMMENTS ON WORLD BANK STRATEGIES

I would like to add to Jeffrey's comments on a new approach for the Bank. Specifically, Jeffrey's recommendations were to: "1) set incentives for Bank lending across all projects to reduce GHG, 2) promote a Bank role in opening its projects for competitive bidding for CDM projects, and 3) encourage the Bank to engage in developing a market for CDM credits." My comments on each are as follows:

1. Setting Incentives for Bank Lending:

I propose that the Bank be urged to accept a CAFE like constraint on all new power plant lending it does. Thus, the Bank should formally commit that the portfolio of power plant projects that it will approve in the year 1999 (and each succeeding year) will have an average Emissions per Kilowatt Hour of power delivered to be X percent below the average emissions/KWH of project portfolio it approved in the last five years. The standard of X percent for a particular year should include credits for emission reductions due to any projects to modernize and improve the energy efficiency of existing power plants and T&D systems that the Bank approves in that year.

I suggest that the X percent should be negotiated first within the G-7, and then the OECD and/or Annex-I, prior to its wider discussion and adoption of a specific target by the Bank. Moreover, the X percent target should be set for the initial few years and the percentage should be revised (presumably tightened gradually) periodically to reflect new data and technologies.

2. Competitive Bidding for CDM on Bank Projects:

If proposal 1 above is accepted, then the Bank will need to track the projected Emissions per KWH of Bank projects prior to their approval. Moreover it would be in the Bank's interest to reduce the average emissions per KWH on its portfolio. Thus, it would be in the Bank's interest to act as a matchmaker and help the developers of proposed high emission power projects to seek out firms that can help reduce emissions and include the emission reduction portion as an integral part of the project submitted to the Bank for approval. Presumably, the issue of proving "additionality" would be easier for such two part projects.

3. Engage in Developing A Market For CDM Credits:

The Bank's role in developing a market for CDM credits should be approached with care because the CDM rules are yet to be negotiated at COP 4. Whether the Bank itself can generate any CDM credits (if, for example, the average Emissions/KWH on its portfolio falls below its established target) is yet to be decided. However, even if the Bank is allowed to generate credits, the Bank generated credits will be only a small part of the total. Hence, the Bank role in developing a market for CDM credits should be primarily as a catalyst and facilitator, as recommended by Jeffrey.

DEPARTMENT OF THE TREASURY
WASHINGTON

March 23, 1998

cc: JAF
JY
AM
PL
JA

MEMORANDUM FOR DISTRIBUTION

FROM: Truman Semans *TS*
RE: World Bank and Climate Change
PAGES: 3 total

Bill Schuerch will chair a follow-up meeting on the Bank's Carbon Fund proposal and other possible Bank climate measures this Thursday, March 26, 11:00-12:00 in the Treasury Annex First Floor Conference Room (north across Pennsylvania Avenue from the Main Treasury Building, with entrance facing Lafayette Park).

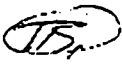
If you plan to attend the meeting, please provide your name and birthdate to Ms. Dianne Graham or Ms. Earline Hoffman by COB Wednesday (TEL 622-1810, FAX 622-1228). Thank you.

DEPARTMENT OF THE TREASURY
WASHINGTON

March 25, 1998

MEMORANDUM FOR RAFF POMERANCE
BARBARA GRIFFITHS
DAVID SANDALOW
PETE JORDAN
WILLIAM NITZE
JIM HESTER
DAVID HALES
BROOKS YEAGER

CC: Distribution and GEF Working Group

FROM: Truman Semans 
Office of Multilateral Development Banks
TEL (622-1229,

RE: U.S. Statement for GEF Assembly

PAGES: 4 total

Attached is an expanded speech outline for the main U.S. intervention in next week's tri-annual meeting of GEF Participants in New Delhi. DAS Bill Schuerch requests that you provide us any views by 3:00 p.m. tomorrow, Thursday, March 26.

A main objective of the speech is to help counterbalance expected developing country pressure for an Assembly communique that undermines existing GEF policies, such as limiting recipient support to "incremental costs" of protecting the global environment, or that weakens the GEF/IFI reform mandate established by donors through the GEF-2 replenishment agreement.

Please provide comments via fax to 622-1228. Please call me at 622-1229 if you have any questions.

Thank you.

GEF INTERAGENCY WORKING GROUP FAX DISTRIBUTION

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DoS (OES/L)	Sue Biniarz	736-7115	647-2282
EPA (OSP)	Paul Horowitz	565-2093	564-9109
EPA (OLA)	Chris Herman	565-2409	564-6463
EPA (OPPE)	Kurt Johnson/Clare Breidenich	260-6405	260-4497/9472
NGO Rep.	Sheldon Cohen	(703) 841-1283	(703) 841-2644
OMB	Nancy Schwartz, Cheryl Anderson	395-5770	395-3720, 395-3948
USDA	DeAndrea Beck	690-0892	720-8875
USDA	Richard Affleck	690-0847	690-1918

Draft Outline for U.S. Remarks at First Global Environment Facility Assembly

April 1-3, 1998, in New Delhi, India

(5+ minute speech)

- Thank Government of India, Chairmen, GEF CEO and Secretariat, Implementing Agencies heads and Agency staff.
- U.S. strongly supports GE, its goals, and cooperation between all countries to address regional and global environmental threats. Administration firmly committed to fulfil past and current pledges of financial support.
 - o Call for stronger support from developing countries and transition countries, especially newly industrialized countries and countries that do not yet contribute. Encourage more than the current contributions from countries with large populations, large economies such as Brazil, Mexico, China, India, and Russia.
 - o Urge countries to identify ways to direct domestic resources toward economic development options that also protect environment. Does not mean sacrificing development -- need to focus on opportunities justified by improving human health, welfare, long-run economic security.
 - o Domestic resources will always have far greater impact on development paths than foreign investment and ODA. U.S. reaping tangible rewards in this way. For example, effective codes and standards have reoriented private investment toward energy efficiency while increasing economic efficiency and cutting harmful air pollution.
- Believe that GEF's success, and maximum impact from available resources, requires carefully set goals, strategies for reaching goals, and performance measures. U.S. government currently undertaking such process, and similar approach important for GEF.
 - o GEF's history is one of improvement, from pilot phase, to reorganization, to its first operational period. But Overall Performance Evaluation shows need for firm steps toward full maturity.
- Top priority for improvement is mainstreaming global environment. First is mainstreaming environment protection into work of the Implementing Agencies and other IFIs. The complement is country-level mainstreaming -- full integration of global environment protection into countries development plans and programs.
 - o To keep further reforms on track, need rapid implementation of GEF-wide performance indicators, strengthened monitoring and evaluation, better data tracking at all Agencies, and clear plans for independent overall performance evaluation prior to next replenishment.

(2)

-- Several other key areas for GEF improvement:

- o Specific steps to facilitate private sector investment in environmentally sustainable development.
- o Possible additional Implementing Agencies and more direct project implementation through NGOs, PVOs, and regional development banks.
- o More strategic global allocation of GEF resources to address best opportunities for positive impacts.
- o More rigorous application of incremental costing. Fundamental to the GEF. Incremental costing too loose in recent projects. If complexity a problem, train recipients better in economic analysis of environment -- would support better country decisionmaking by better accounting true costs and benefits of development options.
- o Continued attention to cost containment and administrative efficiency as GEF grows.

-- Finally, hope soon to see day when other countries join in pushing hard within the IFI boards for increased emphasis on sustainable development.

-- Thanks again to India, generous hosts, etc.

Drafted by Treasury/OASIA/IDB; March 25, 1998

C:\GEF\ASSEMBLY\SPRECH4.WPD



DEPARTMENT OF THE TREASURY
WASHINGTON

March 13, 1998

cc: JAF
AW
KLL
JY

MEMORANDUM FOR DISTRIBUTION

FROM: Truman Semans *TS*
RE: World Bank and Climate Change
PAGES: 7 total

Please see, attached, a rough draft position paper on three possible approaches to increasing World Bank support of climate change mitigation -- shadow pricing, carbon accounting and offsets, and lending targets/quotas. This draft is not yet cleared in Treasury at the DAS level. Please provide us any comments by COB Thursday, March 19 at fax (202) 622-1228.

attachment

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Options for a World Bank Role in Addressing Climate
Proposed USG Positions

Rough Draft

This paper discusses three proposals for reducing carbon emissions associated with World Bank's operations and sets forth possible USG policy positions on them: (1) whether to use shadow carbon pricing to internalize the cost of carbon emissions in the Bank's energy portfolio, (2) whether to insist on the Bank including "offsets" for projects that produce an increase in carbon emissions, either as part of individual loans or part of its overall portfolio, and (3) whether to urge the Bank to adopt quotas for energy efficiency and renewables. A key underlying issue is the degree to which these and other initiatives would (a) advance "meaningful contributions" in line with the Byrd Resolution, and (b) achieve real climate change mitigation.

(1) Shadow Pricing

Under this proposal, the Bank would be asked to include the cost of carbon emissions in the economic rate of return calculations of projects through the use of shadow prices. This would internalize the global and local economic externalities that are not currently taken into consideration. A range of shadow carbon prices could be used, depending on the extent to which the costs would be fully internalized. For example, the lower end of the range (e.g., \$5 per ton) might represent an analysis that takes into account only the costs associated with health problems, while the upper range would incorporate all the identified local externalities plus the global costs related to the impact on climate change.

The Bank has already piloted shadow pricing (based on a USAID model) on a number of projects, with interesting results. The Carbon Backcasting Study analyzed the effect of using a shadow price on carbon emissions for a sample of recently approved energy loans to determine whether the shadow price could adversely affect their economic analyses, and whether a shadow price would encourage investment in low-carbon alternatives. The results showed that a significant share of projects (10-40 percent depending on the shadow price) would have had a negative rate of return, while a number of clean energy investments become significantly more attractive with carbon costs included. The Bank's Global Overlays program has identified win-win project opportunities in specific countries that the Bank could finance as alternatives to higher carbon options.

Pros and Cons:

-- Applying a shadow price, even if it does not fully internalize costs, would give a more accurate picture of the costs and benefits of projects than current Bank practice. Once the true costs are understood, there may be greater willingness on the part of borrowers to choose low-carbon energy production paths, and greater borrower interest in pursuing the cost savings of energy efficiency projects. Over time, these choices would lead to sounder energy policies in developing countries, more efficient use of World Bank resources, and lower carbon emissions than would have otherwise occurred.

-- Better data on global and local externalities would help identify which costs are and are not eligible for Global Environment Facility (GEF) funding. Shadow pricing that distinguishes between local versus global impacts may be justifiable given higher domestic benefits for borrowers -- measures to reduce local pollution often have ancillary carbon reduction benefits. Finally, there is an inherent appeal in project evaluation being done on the basis of a comprehensive, all-in cost estimation.

-- However, borrowers are likely to resist, arguing that they have no binding commitment to reduce emissions, much less to select projects on the basis of global costs and benefits. It can also be argued that baseline energy development only includes projects with sufficiently high local economic return, whereas the Convention obligates Annex I countries to cover costs associated with "global" benefits.

-- Shadow pricing is not as precise as other economic measures on which projects are typically judged. For example, where should the line be drawn on the cost of local externalities of carbon emissions? One can make a solid argument for including health costs, but should it also include the costs of sandblasting walls of buildings more frequently? These types of issue mean that shadow pricing can require significant additional time and expense in project preparation.

Proposed Position

- Support expansion of the Bank's shadow pricing efforts, efforts to identify win-win project opportunities upstream in the project pipeline development process. Address not only carbon but also sulfur, nitrogen oxides, and particulates.
- Support covering the cost of this work as a normal part of the project development process, i.e., out of the Bank's operating budget, and ultimately paid for by the borrowers. If needed (and possible), offer U.S. bilateral support. (As fallback, agree to use of GEF funds for sectoral shadow pricing studies if done in the context of borrowers' national climate action plans.)

Carbon Accounting and Requiring Offsets

Under this proposal, the Bank would be required to keep track of the change in carbon emissions associated with its projects and provide "offsets" for projects that produce an increase in carbon emissions, either as part of individual loans or part of its overall portfolio. Currently, the Bank does not keep a tally of what level of carbon emissions growth results from Bank operations, although it often claims that many high-carbon projects are better off with Bank involvement than without.

Pros and Cons

-- Accounting for Bank-related carbon emissions could provide leverage to reduce Bank support for high carbon projects and augment support for carbon reduction (including forestry sinks). Carbon accounting by borrower, project, or region could also leverage efforts to push specific developing countries toward stronger climate commitments, cleaner alternative projects and better underlying policies.

-- Accounting for gross, direct carbon emissions resulting from Bank projects is feasible in the power sector. Beyond that, however, the task becomes difficult. First, accounting is much less straightforward for other sectors, including primary energy supply and transport. Second, the Bank and its borrowers argue that all Bank projects are, by definition, part of the baseline. Third, the Bank claims that its net contribution is to reduce emissions below the baseline scenario, owing to its efforts at rationalizing energy prices and promoting increased efficiency through sector reforms.

-- Requiring the Bank to offset its portfolio carbon emissions could increase the flow of energy efficiency, renewable energy, and "clean" fossil fuel projects. However, such a requirement would run into a host of technical challenges, including the determination of methodologies for baselining and measuring additionality (which have not yet been agreed under the Climate Convention). An offsets requirement would not necessarily result in the most economically efficient portfolio, although the parallel use of shadow pricing externalities could help address this. Accounting and offsets would be most workable for the power sector and could mesh with existing Bank climate-related initiatives (Solar Energy Initiative, Photovoltaic Market Transformation Initiative, possibly the Carbon Investment Fund).

Proposed Position

- Call for the Bank to begin accounting gross emissions resulting from projects in the energy sector and to work toward methodologies for carbon accounting in end-use sectors. Set a general goal for making Bank operations achieve net reductions in developing country emissions growth beginning in [2005].

Establishing Quotas for Energy Efficiency and Renewable Energy

The Bank acknowledges that it has not succeeded in providing sufficient support for renewables and efficiency, despite strong policy mandates. Setting quotas for lending could be used to shift Bank support toward clean energy away from primary and secondary energy production.

Pros and Cons

Lending targets or quotas are a "blunt object." A main strength of their use is simplicity: they allow easy measurement of success or failure, and they are easily understandable to a broad audience. The signal they send may be able to penetrate the Bank's bureaucracy better than finer policy instruments, provided upper management passes quotas on to regional operations

departments.

However, quotas have historically promoted economically inefficient outcomes. At least in the short run -- until the Bank improves its expertise -- minimum quotas for clean energy could lead to bad investments, given the Bank's high failure rate for efficiency and renewables projects. In addition, the costs of preparing efficiency and renewables projects are higher than for many "normal" projects.

Reduction targets for primary energy production projects might be viable, especially since these projects can be increasingly financed through the private sector alone.

Proposed Position

- Do not push for quotas on energy efficiency and renewables, but establish growth targets of [15% annually] for the number and value of these projects. If possible, offer bilateral assistance (or secondment) in the short-term for staff training and project preparation.
- Call for the Bank to phase out support of primary energy supply projects by [2005].

Conclusion: A U.S. push on any of these items would require support at the World Bank Board from several other countries. Typically, few other Board members support such activist approaches on environment at the Bank. The G-7 appear increasingly willing to push "mainstreaming" of environment at the Bank. However, winning support for any of the three measures discussed here would likely require considerable diplomatic effort. Each of the initiatives would increase the costs of doing business for the Bank. Providing bilateral assistance, at least in the early stages, could improve our prospects of winning support from the Bank and other countries. Finally, it would take some time for the measures to be adopted by the Board, let alone implemented by the Bank. We should not expect these measures to be a quick fix.

Subject: Carbon Investment Fund
Folks --

We are having an interagency meeting on Thurs at 3:00 p.m. in the Grant Room (office director to chair) to talk about four issues that David Sandilow asked us to consider interagency:

- USG Position on World Bank's Carbon Investment Fund (draft position paper attached)
- proposal to have WB use shadow prices for carbon emission in projects.
- proposal to have WB offset carbon emissions
- " quotas for WB projects in energy efficiency and renewable resources.

Would welcome attendance from your shop...also would appreciate your review of the attached paper by COB today, if possible. It is a variant of earlier drafts that you have seen and cleared.

World Bank's Proposed Carbon Investment Fund (CIF)
Proposed USG Position

--DRAFT --

Basics of CIF: The World Bank has proposed the creation of a Carbon Investment Fund (CIF), which would act as a market intermediary by pooling government and private sector finance and investing in projects (some of which would be projects in the World Bank Group's regular pipeline) that result in carbon emissions reductions in client countries. The carbon reductions could be used or traded as offsets for the investors' own emissions. Eventually, the CIF would be a well-diversified portfolio of carbon offsets, which will reduce considerably the risks of investing in carbon reducing projects. With standardised deals, a CIF could limit transactions costs. The Bank claims that a CIF would be competitive with future players in the market; the Bank would not have a privileged position. As competition increases over time, the role of the Bank would gradually diminish.

Proposed USG Position: The CIF raises a number of interesting issues and has positive features. For one, it has helped develop our thinking about how offsets trade might develop and could further sharpen our views about the operation of such transactions. In addition, it may help shift a portion of Bank-financed projects -- although not necessarily Bank operations -- toward somewhat more advanced energy technologies. Finally, it may help lower initial transactions costs for offset trades. However, there remain a number of unresolved issues and serious concerns about the proposal. We believe these should be resolved before the Bank Board considers approval of the launch of a CIF.

1. Bank Additionality/Market Impact. As a general rule, the USG has opposed any Bank operation that would supplant the private sector. The investor and trading functions described in the CIF proposal appears to be roles that, judging from experience with emission trading in the United States, the private sector could easily assume. Therefore, we question what additionality the Bank would bring to the transaction, especially if it uses its pipeline projects as the investments. Moreover, there is a real risk that, given the Bank's dominant role in some countries' economies and its lending relationship to member governments, the CIF could create serious price distortions in the fledgling carbon offsets market and stymie its development.

- As a major market actor and middleman in jointly implemented carbon offset projects, the Bank probably has enough market influence to set the price of offsets in certain markets. If over time the Bank were to pay a higher "rent" on carbon mitigation/sinks projects to host countries than the market would allow, this would undermine the ability of private actors to negotiate best prices and would displace some investors from entry into carbon markets or at least impede their timely entry. This could easily offset the potential benefits from potentially lower transaction cost through Bank-brokered investments.

- Has the Bank sought the views of the private sector as it has developed the CIF? Does the Bank have a clear "exit strategy" to turn over a pilot effort to the private sector?

2. **Potential Conflicts for the Bank.** The CIF proposal has the Bank playing potentially conflicting set of roles: a development bank, a promoter of greenhouse gas reduction, a carbon market regulator and trader, and an offset investor. The Bank also has a credibility problem, having long supported fossil fuels development to meet the demands of economic growth, and having failed to follow its own energy and environment policies.

- As a carbon investor, the Bank would face disincentives to require a best-practice baseline, since lenient baselines would reduce the price per unit of carbon offsets. Lower baselines would allow the Bank to expand its CIF business and bring in increased concessional (GEF and CIF generated) financing to its overall energy pipeline and to specific projects. Potential CIF beneficiaries also have a strong incentive to propose the lowest possible baseline energy development scenario in order to gain concessional financing and CIF-generated investment. This appears to reward countries that do not reform or that reform slowly. How would the Bank address these perverse incentives?
- The Bank's net impact over the past several years has to increase carbon emissions. It is unclear that the CIF would alter this net impact, since carbon investments would still presumably be in the Bank's regular portfolio. Can the Bank credibly advocate and facilitate greenhouse gas (GHG) mitigation while increasing overall GHG emissions?
- The CIF's proposed regulatory role for the Bank in the emerging carbon market involves ensuring the use of rigorous, transparent methodologies for determining baselines as well as for monitoring and accounting carbon emissions and offsets. Existing Bank policy calls for the Bank to help countries establish integrated energy strategies that fully exploit economically sensible energy efficiency and renewables -- which should be part of energy baselines. However, in very few cases has the Bank ensured that countries "mainstream" win-win environment into their CASs and project pipeline. Given the poor track record in complying with its own mandatory policies, can the Bank act as a credible regulator, or developer of regulatory regimes?

3. **Jumping the Gun?** To date, the international community has not agreed on methodologies needed for carbon markets or the Clean Development Mechanism to function -- determining and adjusting baselines; estimating, monitoring, and verifying emissions reductions/sequestration; accounting carbon credits and settling trades, etc. Nor has it determined how the resulting carbon offsets of IDA or foreign aid projects should be credited.

- Does the Bank propose to operate a CIF in the absence of internationally agreed methodologies? If so, what methodologies would be applied, and at whose cost? What role does the Bank propose to play in developing and implementing international methodologies, and how would these efforts be financed?

4. **Relationship to Bank Board, the GEF and other MDBs.** There are a number of unresolved questions about how the CIF will be governed and how it will related to other institutions, especially the GEF and the regional development banks. There are two concerns from USG perspective: (1) that the CIF not undermine other institutions, and (2) that the CIF not weaken

Bank accountability to its shareholders.

- The Bank and the GEF have proposed a strategy in which the CIF would focus on short-term mitigation measures like fuel-switching, and the GEF would focus on longer term measures like renewable energy and energy efficiency. However, the CIF offers to fully fund upgrades to cleaner fossil fuel technology plus large additional cash payments, while the GEF only offers grant financing for energy project costs, and regular Bank assistance offers at best small technical assistance grants and IDA concessional loans. The only Bank staff may tend to prefer CIF involvement over GEF involvement for related reasons. How would these problem be addressed?
- What CIF oversight role does Bank management propose for the Bank Board? Would each project still be subject to normal Board review?

DEPARTMENT OF THE TREASURY
WASHINGTON

March 11, 1998

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MEMORANDUM FOR DISTRIBUTION

FROM: Joe Eichenberger *TTS for*

RE: World Bank and Climate Change

PAGES: 5 total

This fax is to confirm the meeting tomorrow, March 12, to develop a position on the proposed World Bank Carbon Investment Fund (CIF) and to discuss the the Bank's Energy and Environment Strategy. The meeting is from 2:30-3:30 in Main Treasury Room 2127. If you plan to attend, please provide your name and birthdate by COB Wednesday to Ms. Dianne Graham or Ms. Earline Hoffman at tel: 622-1810, fax: 622-1228.

The proposed agenda is as follows:

1. Proposed U.S. position on the Carbon Investment Fund
2. Initial discussion of three Bank energy/environment policy issues:
 - Shadow pricing
 - Carbon accounting and offsets
 - Quotas for lending
3. Initial discussion on process to address the revised draft Bank Environment Strategy for the Energy Sector

A draft position paper on the CIF is attached. We will try to circulate a paper on the three additional topics prior to the meeting.

attachment

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Proposed USG Position: The CIF has a number of positive features. For one, it has helped develop our thinking about how offsets trade might develop and could further sharpen our views about the operation of such transactions. In addition, it may help shift a portion of Bank-financed projects -- although not necessarily Bank operations -- toward somewhat more advanced energy technologies. Finally, it may help lower initial transactions costs for offset trades. However, there remain a number of unresolved issues and serious concerns about the proposal. We believe these should be resolved before the Bank Board considers approval of the launch of a CIF.

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trader, and an offset investor. The Bank also has a credibility problem, having long supported fossil fuels development to meet the demands of economic growth, and having failed to follow its own energy and environment policies.

- As a carbon investor, the Bank would face disincentives to require a best-practice baseline, since lenient baselines would reduce the price per unit of carbon offsets. Lower baselines would allow the Bank to expand its CIF business and bring in increased concessional (GEF and CIF generated) financing to its overall energy pipeline and to specific projects. Potential CIF beneficiaries also have an strong incentive to propose the lowest possible baseline energy development scenario in order to gain concessional financing and CIF-generated investment. This appears to reward countries that do not reform or that reform slowly. How would the Bank address these perverse incentives?
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3. **Jumping the Gun?** To date, the international community has not agreed on methodologies needed for carbon markets or the Clean Development Mechanism to function – determining and adjusting baselines; estimating, monitoring, and verifying emissions reductions/sequestration; accounting carbon credits and settling trades, etc. Nor has it determined how the resulting carbon offsets of IDA or foreign aid projects should be credited.

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-3-

CIF not undermine other institutions, and (2) that the CIF not weaken Bank accountability to its shareholders.

- The Bank and the GEF have proposed a strategy in which the CIF would focus on short-term mitigation measures like fuel-switching, and the GEF would focus on longer term measures like renewable energy and energy efficiency. However, the CIF offers to fully fund upgrades to cleaner fossil fuel technology plus large additional cash payments, while the GEF only offers grant financing for energy project costs, and regular Bank assistance offers at best small technical assistance grants and IDA concessional loans. Bank staff may tend to prefer CIF involvement over GEF involvement for related reasons. How would these problems be addressed?
- What CIF oversight role does Bank management propose for the Bank Board? Would each project still be subject to normal Board review?

Treasury: OASIA/IDB 3/11/98



DEPARTMENT OF THE TREASURY
WASHINGTON

March 9, 1998

MEMORANDUM FOR DISTRIBUTION

FROM: Truman Semans *TS*
RE: World Bank and Climate Change
PAGES: 4 total

The World Bank Board is preparing to consider a new Environment Strategy for the Energy Sector, and Bank management are also proposing the Carbon Investment Fund (CIF) for Board Approval.

Joe Eichenberger will chair an interagency meeting to develop a U.S. position on the CIF and discuss the Strategy. The meeting is tentatively scheduled for this Thursday, March 12, from 2:30 - 4:00 p.m. in Main Treasury, Room 2127. If you plan to attend, please provide your name and birthdate to Ms. Earline Hoffman or Ms. Dianne Graham at 622-1810 (fax 622-1228).

We will circulate a draft position paper on the CIF prior to the meeting. Attached are U.S. comments on the previous draft of the Bank Strategy, sent to Robert Watson on early October. The latest draft strategy can be found at <http://www.worldbank.org/html/fpd/ienpd/ienpd.html>.

The meeting time and place will be confirmed with a following fax.

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WB/OUSED	Michael Kaplan	477-2967	548-1549

U.S. Comments: World Bank Energy and Environment Strategy (7/22 draft)

We welcome the opportunity to comment on this important Bank paper, which is the result of a productive dialogue between Bank divisions. We support the goal of "ensuring that energy services are supplied and used at the lowest economic cost including social and environmental externalities." Please note that we are preparing separate comments on the proposed Carbon Initiative.

Relation to Existing Policy. At the outset, the paper should clearly state that the 1993 electric power sector and energy efficiency policy papers remain binding Bank policy. If changes are proposed in Bank policy, these should be clearly listed and evaluated.

- It might be worthwhile to consider a thorough OED review of Bank implementation of existing energy and environment policies, recommending steps to rectify any shortcoming, including staffing, staff training, and internal incentive structures. We welcome the Bank's views on this.
- The Strategy should clearly state existing Bank policy that countries not willing to undertake fundamental reforms will be ineligible for loans to any part of the energy sector, particularly for use of IDA funds.

The Role of the World Bank Group. The Strategy should clearly distinguish between the Bank Group's role, as a public sector institution, and that of the private sector. When and why are Bank lending services for energy justified? Where should non-lending services be applied?

- The Strategy should encompass all parts of the Bank Group, including IFC and MIGA, helping ensure that sound environmental policy guides all types of Bank Group assistance.
- The Bank should focus on capacity-building and other technical assistance that allow markets to function well and account for costs and benefits to society of energy development. The Bank should also increase both direct lending and technical assistance for energy efficiency and renewable energy.

Country Assistance Strategy. Stronger emphasis on energy and environment issues in the Country Assistance Strategy process is a top priority.

- The "Indicators" should include energy and natural resource data from World Development Indicators such as on demand growth for energy services in key sectors, energy intensity trends, costs and prices associated with energy production and use, etc.
- CASs should be based on integrated energy supply and use strategies that account for local/regional environmental externalities and fully integrate energy efficiency and renewable energy. All planned assistance, regardless of sector or type of assistance, including to transport and other energy end-use sectors, should be consistent with these national energy strategies.

Internal Reforms. The document acknowledges that institutional and capacity factors within the Bank may undermine the Bank's ability to support sustainable energy. The Strategy should propose specific internal improvements that allow the Bank to be more effective.

Sequencing Assistance and Reforms. Restructuring and price reforms should be central pillars of Bank assistance. However, reforms that promote energy efficiency and renewable energy resources should proceed

simultaneously with pricing reform and should be fully integrated into planning for restructuring. Price reforms alone fail to capture large segments of energy efficiency and some approaches to restructuring may yield net negative environmental performance.

- The paper should outline the particular types of Bank Group assistance needed to ensure optimum environmental performance in each main type of energy sector restructuring situation (commercialization, privatization, unbundling, competition).
- In particular, the Bank should aggressively support the development and implementation of energy efficiency codes and standards (or implementation at the national level of existing regional standards) -- especially for appliances, motors, and buildings.

Hydroelectricity. We recommend that discussion of hydro be dropped from the Strategy until the conclusion of the international panel on dams co-sponsored by the Bank. The implication that Bank experience with large hydroelectric projects has been positive is clearly inaccurate. Clearly, no other single type of sectoral project has a more problematic track record, and the recent OED study of hydro has been strongly criticized both within and outside the Bank.

Beyond the issues noted above, we have the following additional comments:

Internalizing Externalities. We welcome analysis on internalizing environmental and other externalities into sectoral and project planning. We believe a useful medium-term objective is to identify and internalize local and regional externalities -- costs to human health, infrastructure, and the environment -- into energy supply and end-use development decisions.

Trade and Investment. The Bank should encourage reduction in barriers to trade and investment in clean energy technologies and pollution abatement equipment. Reforms that facilitate joint ventures may be especially important, since considerable anecdotal evidence indicates extensive application of these technologies won't work with imported equipment.

Procurement. Corruption is an important issue in both public and private operations in the energy sector, with its big-ticket project components and corresponding high stakes for sellers, governments and consumers. We recommend that the Bank Group have a policy on contracting and completion arrangements in private sector operations (as does the EBRD). Also, the proposed industry-linked advisory function raises problems of insider advantage.

Concessions/BOTs/PPAs. To avoid real or perceived corruption, the Bank Group should require "international" competitive bidding (not single source or national competitive bidding or unspecified "competitive" bidding) for the award of all concessions, BOTs, PPAs, etc. in which the Bank Group participates.

Carbon Fund. We are preparing separate comments on the proposed Carbon Initiative. While it has some interesting elements, it raises a number of serious and unresolved issues. Perhaps the greatest concern is that the Bank, with a huge portion of its business in financing fossil fuel-fired power plants, faces a serious conflict of interest in also managing the first and largest international fund for jointly implemented carbon mitigation at the project level. At this stage, it is premature to include this proposal in the Strategy.

Transportation. The document should build on the Transport Sector Review completed in 1995 with specific steps for improved Bank support of environmentally sustainable transport systems.

INTERNATIONAL FINANCIAL INSTITUTIONS AND CLIMATE CHANGE (Draft 2/17/98)

Importance of the International Financial Institutions

The international financial institutions (IFIs), in particular the World Bank and the regional development banks, represent one of the most promising avenues for promoting cleaner growth in developing country power sectors. Despite increasing private sector funding for large-scale LDC investments in the power sector, loans and loan guarantees by the IFIs, and the policies which guide them, continue to have a major impact on power generation projects. In many cases, private sector investors are unwilling to put their money at risk without at least some IFI involvement; so that even where IFI funding is minimal or only on the level of risk guarantee, the environmental requirements of these institutions drives the environmental baseline of the entire project. Moreover, significant IFI investment in renewable energy and energy efficiency could help speed the development of markets for these clean technologies.

The MDBs recognize these important power sector opportunities, but have had difficulty overcoming LDC resistance to power sector reform (which is clearly the number one impediment) and refocusing their own programs. Obstacles include: weak borrower commitment to policy implementation -- in particular to stated energy efficiency and climate goals; an unsuitable mix of skills among staff; a staff incentive system which favors traditional large power projects; a lack of staff accountability in enforcing environmental standards; and a failure to mainstream and rationalize climate policies. A concerted effort is needed to bring change.

Possible MDB Initiatives

The U.S. could build on its existing aggressive advocacy in the MDBs backed up by high-level Administration support, Executive Board action, and leverage through upcoming replenishment negotiations. Elements of this approach could include:

1. The World Bank Energy and Environment Strategy: The World Bank is currently developing an Energy and Environment Strategy, which provides an important opportunity to influence the Bank's programs into the next century. The strategy is likely to cover a range of issues including the Bank's approach to market-based energy policy reforms, integration of energy and environment considerations into country strategies, and investment in conventional power projects, end-use efficiency and alternative energy. We should consider urging the Bank to add consideration of climate change factors as an integral part of the new strategy. At the same time, we need to increase pressure on the Bank to effectively implement its 1993 Power Sector and Energy Efficiency policies, which many Bank task managers have treated more as best-case guidelines rather than strict lending requirements. Effective implementation of these policies would by themselves have had an extremely positive impact in reducing greenhouse gases, even though that was not their original intent. Donors and Executive Directors will need to hold the MDBs accountable -- and through them, the borrowers -- for implementing environmental policies and strategies in the mainstream lending portfolio.

We expect the next draft of the energy and environment strategy to be made available to governments in March. Participation of USG agencies with relevant technical and policy expertise will be especially important as we review and develop a US position on the strategy.

2. Country Power Sector Development Plans: The World Bank has not implemented existing policies effectively enough to base lending in the energy sector on cost-effective investments in energy conservation (including demand management and end-use efficiency) and renewables. Such policies should be incorporated into all World Bank country assistance strategies, reducing constraints on investment in energy efficiency and renewables, so that more win-win investments will be identified and financed by the MDBs and the private sector. Market sector reforms, especially elimination of subsidies for fossil fuels and support for effective energy regulatory bodies to enforce domestic regulations, should be required by the MDBs as a condition for lending to the power sector.

3. Increase Overall MDB Investment in Environment-Friendly Power Projects: Increasing availability of private financing for conventional power projects has reduced the need for MDB lending, which should provide an opportunity for the MDBs to refocus their lending on win-win investments in energy efficiency and renewable energy. Below are several approaches we could consider, ranging from more market-based to more prescriptive. These approaches are not mutually exclusive, and we may want to propose several of them to increase the likelihood of success:

- Internalization of environmental and social costs into MDB project cost-benefit analysis: The project mix in MDB power sector lending likely would shift if environmental and social costs (e.g., shadow pricing) were incorporated into the cost-benefit analysis for proposed projects, which forms the basis for the banks' project selection criteria.
- Explicit treatment of carbon impact of MDB lending: The MDBs could make systematic estimates of the carbon emission impact of their power sector lending and identify appropriate opportunities for "offset" activities. We need to bear in mind that the responsibility for financing offsets rests largely with the borrowing country.
- Mainstreaming of Global Environment Facility experience into MDB activities: The MDBs, in particular the World Bank, would benefit from greater collaboration with the GEF to finance demonstration and pilot projects in non-traditional areas. Most importantly, the MDBs need to "mainstream" the lessons learned from such pilot projects into ordinary MDB lending.

4. Bundling small projects: Renewable and energy efficiency projects are much smaller than traditional large power projects, so overhead costs can be relatively high. Bundling these projects so that the value of the loan is comparable to that of larger projects would reduce some of these overhead costs and allow the MDBs to provide the necessary international support to overcome domestic LDC obstacles.

5. Strengthening MDB staff-skill mix: We have already made a start on MDB staff skills diversification, and we need to intensify our work in this area. As noted by a draft World Bank OED report on lending to the power sector, strategies to refocus the Bank's portfolio to make it more environmentally benign will "require that Bank staff develop new expertise involving an understanding of end users, the private sector, financial markets, and new technologies." One approach would be to create a specialized unit focusing on the development of projects in energy efficiency and renewable energy (already used successfully in the World Bank's Asia department).

6. More creative use of MDB guarantees and insurance mechanisms: The MDBs' guarantee and political risk insurance mechanisms could be used more creatively to facilitate private sector, climate friendly investments in the power sector. Environmental standards in these institutions, such as the IFC and MIGA (where such standards are not as stringent as those of the direct lending institutions such as IDA and IBRD), are currently under review and could be tightened. Perceived risk is clearly an element inhibiting greater investment in energy efficiency and renewable energy. The MDBs can also help address some of the "national security" concerns that governments may have regarding privatization of their power sectors or transnational energy projects such as gas pipelines. MDB policy advice and participation in transnational projects provides comfort to private investors and governments, who know that the influence of the MDBs will be brought to bear if one of the partners makes unreasonable demands or violates an agreed contract.

7. Targeting corruption in the power sector: Corruption is an important issue in public, concession, and private operations in the energy sector with their big-ticket project components and correspondingly high stakes for sellers, governments, and consumers. All concessions, Buy-Operate-Transfer, and Power Purchase Agreements in which the IFIs participate should be awarded through "international" competitive bidding.

Negotiating Strategy

Replenishment Negotiations: MDB replenishment negotiations may provide leverage for achieving US objectives. Key negotiations include IDA-12 (1998), the MIGA general capital increase (1998), and the GEF replenishment (concludes 4/98). The draft GEF replenishment agreement calls for the World Bank to prepare in 1998 a strategy and timetable for integrating global environment activities in the Bank's policies and programs, including its country dialogue, country assistance strategies, and country economic and sector work.

Bilateral and Multilateral Contacts: Over the past decade, the U.S. more so than any other donor has pressed the MDBs on environmental and social issues, but often without support from other donors. The U.S. should begin to raise the role of MDBs in addressing climate change at every appropriate opportunity, such as the G-8 and in bilateral meetings, with a focus on Ministries of Finance and Foreign Affairs more so than Environment ministries. We should actively engage our most likely and influential allies in the current MDB context, including the Canadians, Scandinavians, Dutch, Swiss and Italians. Also key, but less likely to lend initial support, are Germany and the UK.

BACKGROUND

Developing Country Power Sector Opportunities

Less-developed countries (LDCs) account for a large and growing share of world greenhouse emissions: 30 percent today, but over half by 2025. Clearly, no international climate initiative will be effective if these countries are not engaged. Many low-cost and even negative-cost opportunities for emissions mitigation are located in LDCs, and tapping these opportunities will be essential in finding globally efficient solutions to the global warming problem. The power sector is a logical place to start because of its importance in carbon emissions and the large scale of its projects. The discussion here reflects conversations with the World Bank, advocacy groups, and private sector contacts.

Market reforms. The elimination of subsidies, price controls, inefficient regulations, and unsound relationships between industrial and financial enterprises represents an enormous win-win opportunity in many countries. Such reforms are recognized as central by the World Bank and sit at the top of the wish list of many private energy sector groups. Many power sector improvements -- from plant design to grid management -- will follow naturally from market reforms. The central nature of market reforms puts them at the head of our agenda despite the fact that large impediments exist -- primarily within LDCs but also within the IFIs -- which have prevented significant headway in this area.

Win-Win Projects. A large number of specific projects represent win-win opportunities for action in the near term. This "low-hanging fruit" includes projects to retrofit existing plants, improve power and heat distribution, and increase end-use efficiency. Together they can significantly reduce carbon emissions. For example, estimates from the World Bank suggest that carbon emissions in China can be reduced by 300 million metric tons in 2020 through low- or no-cost opportunities.

Future Power Generation. Ultimately, LDC carbon emissions will depend on the choice of fuel generation technology. Even in the near term, the IFIs can encourage LDCs to implement advanced coal technologies and renewables at low incremental cost. In addition, early efforts to overcome the national security concerns of some countries (such as China) in relying on external sources for natural gas will provide an essential foundation for appropriate development.

Other Issues:

The World Bank Carbon Fund. The World Bank's Environment Department is actively promoting the idea of a carbon fund, where the Bank would generate (at least initially) and certify all projects; and administer (for a 5% fee) the resultant trading in carbon shares by governments and the private sector. Bank staff have indicated they believe this fund to be compatible with the proposed Clean Development Mechanism (CDM).

In our view, this initiative is inadvisable for several reasons. Perhaps most importantly, it would divert needed effort from reforming the Bank's mainstream power sector portfolio, which has a far greater potential impact on greenhouse gas emissions. It also places the Bank in a position of both generating and benefiting from carbon trading, which represents an inherent conflict of interest: the Bank would have little motivation for decreasing baseline carbon emissions in its power sector projects. Finally, the LDCs themselves appear strongly opposed to any role for the MDBs, especially the World Bank, in the future CDM; and the proposed Carbon Fund appears to have little support among other donors. For all these reasons, we should attempt to refocus the Environment Department and Bank management on addressing the larger, but ultimately more important, problems of the mainstream power sector portfolio.

MDB Lending to China. China presents special difficulties to the US as we try to use the MDBs to advance our climate change objectives. By law, the US cannot support MDB projects in China unless they are focused on meeting basic human needs, and most power sector projects do not meet this test. There are indications that Congress may restrict even further our ability to support MDB projects in China. We also need to be cautious about holding existing Chinese policies up as a model for LDC power sectors, which could limit our ability to push for actions the Chinese have resisted strongly, including privatization and increased transparency in the sector.

DEPARTMENT OF THE TREASURY
WASHINGTON

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Comments:

Paper on IFIs + climate change.

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-4-

Market reforms. The elimination of subsidies, price controls, inefficient regulations, and unsound relationships between industrial and financial enterprises represents an enormous win-win opportunity in many countries. Such reforms are recognized as central by the World Bank and sit at the top of the wish list of many private energy sector groups. Many power sector improvements -- from plant design to grid management -- will follow naturally from market reforms. The central nature of market reforms puts them at the head of our agenda despite the fact that large impediments exist -- primarily within LDCs but also within the IFIs -- which have prevented significant headway in this area.

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MDB Lending to China. China presents special difficulties to the US as we try to use the MDBs to advance our climate change objectives. By law, the US cannot support MDB projects in China unless they are focused on meeting basic human needs, and most power sector projects do not meet this test. There are indications that Congress may restrict even further our ability to support MDB projects in China. We also need to be cautious about holding existing Chinese policies up as a model for LDC power sectors, which could limit our ability to push for actions the Chinese have resisted strongly, including privatization and increased transparency in the sector.

Source: Methane Emissions from Livestock

Emissions inventories are available from National Communications for 1990 and/or 1995 for most countries. The inventory estimates are comparable in that they rely on the IPCC methodologies (or similar methods). Emissions projections were available for many key countries, which were used as analogues for making projections for the other countries. All of the emissions projections are "Business as Usual" estimates and do not include control measures.

The attached table lists the data used for each country. The first column lists each Annex B country. The second column indicates the source of the 1990 and 1995 emissions estimates. The third column, titled *Projection Type*, indicates the extent to which emissions reduction measures are reflected in the future emissions estimates for each country. These are based on a review of the National Communications and other reports. "BAU" signifies that a Business as Usual scenario is used, with no reduction measures. The last column describes the methodologies and assumptions used to estimate emissions for each country.

Approach

Source Summary: Methane is emitted as part of the normal digestive process of livestock, with ruminant animals being the key source (cattle, buffalo, sheep, goats). Emissions are driven by the size of the livestock populations and how they are managed. Future emissions will be primarily driven by the demand for livestock products (primarily milk and meat).

Key Trends: Restructuring of the livestock industries is ongoing throughout most of the Annex B countries. Specifically, Western European countries, U.S., Australia and others are reducing government production supports, which is expected to limit growth in future production. Eastern European countries are experiencing significant reductions in their livestock production as part of the restructuring of their economies, and this reduction is expected to continue through 2000. Production in Eastern Europe is expected to increase following this decline.

Approach: Methane emissions data were collected and estimated for: 1990 and/or 1995 based on each country's national inventory; and 2000, 2005, and 2010 based on country-specific projections from national communications.

1. The Second National Communication was the first source consulted. The most recent national inventory was used (typically 1995). If projections were available through 2010, they were used. BAU emissions projection was used, if available. In some cases, the projection combined the enteric fermentation and manure emissions. In these cases, the projection was broken out using the 1995 emissions inventory percentages. If both an inventory and a projection were available, no subsequent research was conducted for the country. If one or both were not available from this source, step 2 was used.
2. The First National Communication was the second source consulted. The most recent national inventory was used (typically 1990). If projections were available, they were used. In most cases, the First National Communication did not include a detailed projection.
3. No national communication was available for several countries (Croatia, Ireland, Romania, and Spain). For these countries, the inventory estimates reported using the Corinair method were used. Because these inventories reported total emissions from all of agriculture, the analysis broke out the livestock emissions based on the breakouts from analogue countries. For example, Hungary was used as the analogue to break out emissions for Croatia.
4. For Ukraine, a detailed study of mitigation options was used for the inventory and projection. These data combined enteric fermentation and manure emissions, so the breakout was developed from the percentages in Poland and Estonia.
5. In those cases in which a projection of future emissions was not available from national communications, the following assumptions were used to develop estimates of future

emissions:

- For Eastern European countries without projections, it was assumed that the country would experience a decline in emissions through 2000, followed by an increase. This trend is consistent with economic projections, and was also observed in those countries, like Ukraine, for which projections were available. The projection for Ukraine, for which a detailed agriculture projection was prepared, was used as an analogue for these countries.
- For Western European countries without projections, it was assumed that emissions would remain constant over time, reflecting the pattern in several countries in which the livestock sectors are being restructured.

Limitations

The livestock industries in Eastern Europe are undergoing rapid and radical restructuring. Livestock populations have declined significantly in all countries and are not expected to start to recover until the year 2000 or beyond. Methane emissions are declining significantly and are expected to continue declining in the next two to three years. Future emissions remain uncertain, particularly in the large livestock countries, due to high uncertainty about future economic trends. Therefore, the future estimates of methane emissions for Eastern European countries are particularly uncertain.

The restructuring of the livestock industries in Western Europe is more modest by comparison, and is expected to result in relatively constant production and emissions for a period of time. Although significant shifts in international trade agreements could affect production in individual countries, large impacts on emissions are not anticipated.

A: Methane Emissions from Ruminant Livestock from Annex B Countries, Data Sources and Meth

Annex B Country	1990/1995	Projection Type	Estimation Methods
Algeria	2 NC	BAU	Ruminant livestock data were reported for 1995, and aggregate agricultural emissions were reported for 1990 and projection years. The disaggregated estimates were calculated by applying the 1995 breakdown to 1990, 2000, 2005, 2010 aggregated agricultural methane estimate
Angola	1 NC	BAU	1990 reported emissions assumed constant throughout series
Armenia	2 NC	BAU	Ruminant livestock data were reported for 1995, and aggregate agricultural emissions were reported for 1990 and projection years. The disaggregated estimates were calculated by applying the 1995 breakdown to 1990, 2000, 2005. The emissions after 2005 were considered to be constant.
Azerbaijan	1 NC	BAU	Emissions data were reported ruminant livestock data for 1990 only. The Ukrainian emission growth pattern was used to project future emissions.
Bahrain	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
Bangladesh	Corinair	BAU	The 1990 Corinair agricultural emissions estimates were disaggregated using the Hungary breakdown percentages. The Ukrainian emissions growth patterns were used to project estimates.
Belize	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
Bhutan	1 NC	BAU	The 1st National Communication reported livestock manure emissions estimates to 2005. These were assumed to remain constant for 2010.
Bolivia	1 NC	BAU	The aggregate emissions reported for 1990 were broken down using the 1991 breakdown. 1995 emissions were estimated using the 1993 reported estimate scaled to the decline over 1991-1993. Future emissions were assumed to remain constant.
Bosnia and Herzegovina	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
Brazil	1 NC	BAU	The 1st National Communication reported livestock manure emissions estimates for 1990 and 2000. The 1995 estimates were obtained by interpolating the 1990 and 2000 estimates. Emissions after 2000 were assumed to remain constant.
Bulgaria	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
Burkina Faso	1 NC	BAU	The 1st National Communication reported livestock manure emissions estimates for 1990 and 2000. The 1995 estimates were obtained by interpolating the 1990 and 2000 estimates. Emissions after 2000 were assumed to remain constant.
Burundi	2 NC	BAU	There are reported disaggregated emissions for 1990 only. The 1990 breakdown was applied to reported 1995 - 2000 aggregate agricultural emissions. Emissions after 2000 assumed constant.
Cameroon	2 NC	BAU	The 2nd National Communication reported livestock emissions estimates to 2000. These were assumed to remain constant to 2010.
Canada	Corinair	BAU	Livestock emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using UK's breakdown percentages. The UK emission growth pattern was also used to project future emissions.
Chad	1 NC	BAU	The 1st National Communication reported livestock emissions estimates for 1990 and 2000. The 1995 estimates were obtained by interpolating the 1990 and 2000 estimates. Emissions after 2000 were assumed to remain constant.
Chile	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
China	1 NC	BAU	The 1st National Communication reported livestock emissions estimates for 1990 and 2000. The 1995 estimates were obtained by interpolating the 1990 and 2000 estimates. Emissions after 2000 were assumed to remain constant.
Czechia			No data available.
Dominican Republic			No data available.
Dominica	1 NC	BAU	1990 livestock emissions were broken out of the reported 1990 aggregate agriculture emissions based on Belgium's breakdown. These emissions were assumed to remain constant throughout the series.

o			No data available.
rlands	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
ealand	2 NC	BAU	There was disaggregated agriculture emissions for 1990 and 1995. The 1995 breakdown applied to the reported aggregate future emissions to estimate emissions from this source.
y	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
	1 NC	BAU	The 1992 reported estimated was used for 1990. There were no other estimates. Emission 1995-2010 were estimated based on Ukraine's pattern of emissions.
al	1 NC	BAU	In the 1 NC, Portugal reported livestock emissions estimate for 1990 only. Emissions were assumed to remain constant after 1990.
nia	Corinair	BAU	Livestock emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using Hungary's breakdown percentages. The Hungarian emission growth pattern also used to project future emissions.
	1 NC	BAU	There was a reported estimate for 1990 only. Future emissions were based on the Ukrainian growth pattern
ia	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
ia			No data available.
	Corinair	BAU	Livestock emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using France's breakdown percentages. The French emission growth pattern was used to project future emissions.
en	2 NC	BAU	Aggregate livestock and manure emissions were reported for each year. Livestock emission were broken out using Norway's breakdown of agricultural emissions.
rland	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
e	Mitigation Study	BAU	Reported aggregate emissions from the Mitigation Study were broken out used Estonia and Poland's breakdown of agricultural emissions.
	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.

Source: Methane Emissions from Livestock Manure

Emissions inventories are available from National Communications for 1990 and/or 1995 for most countries. The inventory estimates are comparable in that they rely on the IPCC methodologies (or similar methods) and livestock data. Emissions projections were available for many key countries, which were used as analogues for making projections for the other countries. For the Netherlands, the emissions projections include emissions control measures. With the exception of Netherlands, the projections are considered to be "Business as Usual" (BAU).

The attached table lists the data used for each country. The first column lists each Annex B country. The second column indicates the source of the 1990 and 1995 emissions estimates. 1 NC and 2 NC are the First and Second National Communications, respectively. The third column, titled *Projection Type*, indicates the extent to which emissions reduction measures are reflected in the future emissions estimates for each country. These are based on a review of the National Communications and other reports. "BAU" signifies that a Business as Usual scenario is used, while "Full" indicates that the estimates reflect the full range emission reduction measures defined to date, including methane recovery. The last column describes the methodologies and assumptions used to estimate emissions for each country.

Approach

Source Summary: Methane is emitted from livestock manure when it decomposes anaerobically. This anaerobic decomposition occurs primarily at large confined animal management facilities that manage manure as a liquid and store it in lagoons, pits, or tanks. Large dairy and swine farms are the major source of emissions. Emissions are driven by the size of the livestock populations, climate, and how the manure is managed.

Key Trends: In addition to the restructuring of the livestock industries that is ongoing throughout most of the Annex B countries, significant concerns regarding local environmental impacts are affecting manure management practices. Efforts in some Western European countries to reduce nitrogen-related emissions, reducing total manure nitrogen excretion, may also reduce methane emissions from manure. However, the overall trend toward larger confined animal facilities with anaerobic manure treatment will tend to increase methane emissions. The trend in manure management emissions in Western Europe is affected by opposing forces: animal population growth and larger facilities drive emissions up, but environmental concerns move in the other direction. Eastern European countries are experiencing significant short-term (1995-2000) reductions in their livestock production as part of the restructuring of their economies. Production (and hence emissions) is expected to increase post-2000 in these countries.

Approach: Methane emissions data were collected and estimated for: 1990 and/or 1995 based on each country's national inventory; and 2000, 2005, and 2010 based on country-specific projections from national communications.

1. The Second National Communication was the first source consulted. The most recent national inventory was used (typically 1995). If projections were available through 2010, they were used. The Business as Usual (BAU) emissions projection was used if available. If BAU estimates were not available, emissions projections that include control measures were used. In some cases, the projection combined the enteric fermentation and manure emissions. In these cases, the projection was broken out using the 1995 emissions inventory percentages. If both an inventory and a projection were available, no subsequent research was conducted for the country. If one or both were not available from this source, step 2 was used.
2. The First National Communication was the second source consulted. The most recent national inventory was used (typically 1990). If projections were available, they were used. In most cases, the first national communication did not include a detailed projection.
3. No national communication was available for several countries (Croatia, Ireland, Romania,

and Spain). For these countries, the inventory estimates reported using the Corinair method were used. Because these inventories reported total emissions from all of agriculture, the analysis broke out the livestock emissions based on the breakouts from analogue countries. For example, Hungary was used as the analogue to break out emissions for Croatia.

4. For Ukraine, a detailed study of mitigation options was used for the inventory and projection. These data combined enteric fermentation and manure emissions, so the breakout was developed from the percentages in Poland and Estonia.
5. In those cases in which a projection of future emissions was not available from national communications, the following assumptions were used to develop estimates of future emissions:
 - For the Eastern European countries without projections, it was assumed that the country would experience a short-term decline in emissions (to 2000) followed by an increase. This trend is consistent with the 1990-1997 livestock populations data from the FAO and was also observed in those countries for which projections were available (e.g., Ukraine). The projections for Ukraine were used as an analogue for these countries.
 - For Western European countries without projections, it was assumed that emissions would remain constant over time, reflecting the pattern in several countries in which the livestock sectors are being restructured.

Limitations

The livestock sectors in Eastern Europe are undergoing rapid and radical restructuring. While emissions are declining significantly in the near term, future emissions remain very uncertain, particularly with large livestock populations. Expectations are that livestock production (and hence emissions) increase post-2000, but the timing of the turnaround will depend on the pace of the overall economic restructuring taking place. The restructuring in Western Europe is modest by comparison, and is expected to result in relatively constant production for a period of time. Increases in the use of large confined animal facilities will likely increase emissions in some countries (e.g., France). Efforts to reduce the local environmental impacts of manure management may affect future emissions significantly. The net impact of these efforts, however, is uncertain.

B: Methane Emissions from Livestock Manure from Annex B Countries, Data Sources and Method

Annex B Country	1990/1995	Projection Type	Estimation Methods
Algeria	2 NC	BAU	There are reported livestock manure emissions data for 1995, and aggregate agricultural methane emissions data for 1990 and projection years. The disaggregated estimates were calculated applying the 1995 breakdown to 1990, 2000, 2005, 2010 aggregate agricultural methane data.
Angola	1 NC	BAU	1990 reported emissions are assumed to remain constant throughout the series
Armenia	2 NC	BAU	There are reported livestock manure emissions data for 1995, and aggregated agricultural methane emissions data for 1990 and projection years. The disaggregated estimates were calculated by applying the 1995 breakdown to 1990, 2000, 2005, 2010 aggregated agricultural methane data.
Australia	1 NC	BAU	There are reported livestock manure data for 1990 only. The Ukrainian emission growth pattern was used to project future emissions.
Austria	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Azerbaijan	Corinair	BAU	Livestock manure emissions estimates were broken out of the 1990 Corinair aggregate agricultural methane estimates using Hungary's breakdown percentages. The Ukrainian emission growth pattern was used to project future emissions.
Bahamas	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Bangladesh	1 NC	BAU	The 1st National Communication reported livestock manure emissions estimates to 2005. They were assumed to remain constant for 2010.
Barbados	1 NC	BAU	The 1990 reported aggregate agriculture emissions were broken down using the reported 1995 breakdown. The 1995 value was estimated using the 1993 reported estimate scaled to the decline over 1991-1993. Future emissions were based on the growth pattern of the Ukraine
Belize	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Bhutan	1 NC	BAU	The 1st National Communication reported emissions from livestock manure for 1990 and 2000. The 1995 estimate was interpolated from the 1990 and 2000 estimates. Future emissions assumed to remain at 2000 levels.
Bolivia	2 NC	BAU	There are reported emissions estimates from 1990 to 1994. Reported future aggregate emissions were broken out using the 1994 breakdown.
Bosnia and Herzegovina	1 NC	BAU	The 1st National Communication reported emissions from livestock manure for 1990 and 2000. The 1995 estimate was interpolated from the 1990 and 2000 estimates. Future emissions assumed to remain at 2000 levels.
Brazil	2 NC	BAU	There are reported disaggregated emissions for 1990 only. The 1990 breakdown was applied to reported 1995 - 2000 aggregate agricultural emissions. Emissions in 2005 and 2010 were assumed to remain at 2000 levels.
Bulgaria	2 NC	BAU	The 2nd National Communication reported livestock manure emissions estimates to 2000. They were assumed to remain constant to 2010.
Burkina Faso	Corinair	BAU	Livestock manure emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using UK's breakdown percentages. The UK emission growth pattern was used to project future emissions.
Burundi	1 NC	BAU	The 1st National Communication reported emissions from livestock manure for 1990 and 2000. The 1995 estimate was interpolated from the 1990 and 2000 estimates. Future emissions assumed to remain at 2000 levels.
Cambodia	2 NC	BAU	The 2nd National Communication reported emissions estimates for 1990 -1994, and then for 2000, 2005, and 2010. The 1994 estimate was used for 1995.
Cameroon	1 NC	BAU	The 1st National Communication reported emissions from livestock manure for 1990 and 2000. The 1995 estimate was interpolated from the 1990 and 2000 estimates. Future emissions assumed to remain at 2000 levels.

enstein			No data available.
nia			No data available.
bourg	1 NC	BAU	1990 livestock manure emissions were broken out of the reported 1990 aggregate agriculture emissions based on Belgium's breakdown. These emissions were assumed to remain constant throughout the series.
o			No data available.
riands	2 NC	Full	The 2nd National Communication reported emissions estimates for each year. Large reduction expected due to improved manure handling.
ealand	2 NC	BAU	There was disaggregated agriculture emissions for 1990 and 1995. The 1995 breakdown was applied to the reported aggregate future emissions to estimate emissions from this source.
y	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
	1 NC	BAU	The 1992 reported estimate was used for 1990. There were no other estimates. Emissions 1995-2010 were estimated based on Ukraine's pattern of emissions.
al	1 NC	BAU	There is an emissions estimate for 1990 only. Emissions were assumed to remain constant at 1990.
nia	Corinair	BAU	Livestock manure emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using Hungary's breakdown percentages. The Hungarian emission growth pattern was also used to project future emissions.
	1 NC	BAU	There was a reported estimate for 1990 only. Future emissions were based on the Ukrainian growth pattern.
ia	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
ia			No data available.
	Corinair	BAU	Livestock manure emissions estimates were broken out of the 1990 Corinair aggregate agricultural estimates using France's breakdown percentages. The French emission growth pattern was used to project future emissions.
en	2 NC	BAU	Aggregate livestock emissions were reported for each year. Livestock manure emissions were broken out using Norway's breakdown of agricultural emissions.
rland	2 NC	BAU	The 2nd National Communication reported emissions estimates for each year.
e	Mitigation Study	BAU	Reported aggregate emissions from the Mitigation Study were broken out using Estonia and Poland's breakdown of agricultural emissions.
	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.

Source: Methane Emissions from Other Agriculture Sources

Emissions inventories are available for 1990 and/or 1995 for fewer than half of the Annex B countries for these minor sources. The attached table lists the data used for each country. The first column in the table lists the countries. The second column indicates the source for the 1990/95 inventory, typically the First or Second National Communication (1 NC and 2 NC, respectively). The third column indicates that the emissions projections are Business as Usual. The final column presents comments on how the data were used.

Approach

Source Summary: Methane is emitted in varying amounts from other agriculture activities including: rice cultivation, agriculture residue burning, land conversion, and savannah burning. Methane emissions from rice cultivation results from the anaerobic decomposition of organic material in flooded rice fields. Methane emissions from burning activities results from incomplete combustion. Land conversion results in methane emissions when burning is used to clear land.

Key Trends: No significant trends are evident in these sources in the Annex B countries.

Approach: Fewer than 50% of the Annex B countries included these emissions in their inventories. The only significant emissions are reported by Australia, Italy, and Japan, with rice production being the most significant source in these countries. For the countries with emissions inventory estimates but no projections, future emissions were assumed to be constant.

1. The Second National Communication was the first source consulted. The most recent national inventory was used (typically 1995). If projections were available through 2010 they were used. The Business as Usual (BAU) emissions projection was used if available. If BAU estimates were not available, emissions projections that include control measures were used. If both an inventory and a projection were available, no subsequent research was conducted for the country. If one or both were not available from this source, we went to step 2.
2. The First National Communication was the second source consulted. The most recent national inventory was used (typically 1990). If projections were available, they were used. In most cases the first national communication did not include a detailed projection.
3. No national communication was available for several countries (Croatia, Ireland, Romania, and Spain). No emissions were estimated for these countries.
4. For Ukraine, a detailed study of mitigation options was used for the inventory and projection.
5. In those cases in which a projection of future emissions was not available from national communications, the emissions were assumed to remain constant:

Limitations

These sources of emissions are insignificant in many Annex B countries, accounting for the considerable amount of missing estimates. While considerable work remains to better estimate emissions from rice cultivation, the cultivation practices are well characterized in the Annex B countries making the emissions estimates reasonably reliable.

G: Methane Emissions from Other Agricultural Sources from Annex B Countries, Data Sources and Methods

Annex B Country	1990/1995	Projection Type	Estimation Methods
Albania	2 NC	BAU	There were reported disaggregated agricultural emissions estimates for 1995 and aggregate agricultural emissions for 1990 and 2010. The 1990 and 2010 aggregate emissions were disaggregated according to 1995 breakdown. Emission estimates for 2000 and 2005 were interpolated.
Algeria	1 NC	BAU	No reported emissions.
Belgium	2 NC	BAU	Belgium reports only emissions from rice cultivation for 1995. 1995 emissions assumed constant for 1990 and into the future.
Bulgaria	1 NC	BAU	Bulgaria reports other agricultural emissions for 1990. 1990 emissions were held constant through the series.
Croatia	2 NC	BAU	There were reported disaggregate other agricultural emissions estimates for all years.
Cyprus	Corinair	BAU	No reported emissions.
Czechia	2 NC	BAU	There were other agricultural emissions estimates for 1990 and 1995. The 1995 emissions held constant into the future.
Denmark	1 NC	BAU	No reported emissions.
Egypt	1 NC	BAU	There were other agricultural emissions estimates for 1990 and 1995. The 1995 emissions held constant into the future.
Estonia	2 NC	BAU	No reported emissions.
Finland	1 NC	BAU	No reported emissions.
France	2 NC	BAU	No reported emissions.
Germany	1 NC	BAU	No reported emissions.
Greece	2 NC	BAU	There were reported disaggregate other agricultural emissions estimates for all years. These emissions estimates included forest burning and rice cultivation.
Hungary	2 NC	BAU	No reported emissions.
Iceland	Corinair	BAU	No reported emissions.
Italy	1 NC	BAU	Italy reported other agricultural emissions estimates for 1990 and 2000. The 1995 estimate interpolated and the 2000 estimate was held constant for 2005 and 2010.
Japan	2 NC	BAU	Japan reported other agricultural emissions for 1990 and 1994 and "other" emissions for 2000, 2005, and 2010. 1995 emissions were assumed to be the 1994 estimates. Aggregate projections were disaggregated using 1995 breakdown.
Korea	1 NC	BAU	No reported emissions.
Lithuania			No Data available.
Latvia			No Data available.
Luxembourg	1 NC	BAU	No reported emissions.
Malta			No Data available.
Netherlands	2 NC	BAU	No reported emissions.
New Zealand	2 NC	BAU	There were reported disaggregate other agricultural emissions estimates for all years.
Norway	2 NC	BAU	No reported emissions.
Poland	1 NC	BAU	For Poland, the 1 NC reports disaggregate agricultural emissions for 1992. The 1992 estimate was used as the 1990 emissions estimate. The 1990 estimate was held constant into the future.
Portugal	1 NC	BAU	No reported emissions.
Romania	Corinair	BAU	No reported emissions.
Russia	Country Study	BAU	The Russia Country study reports disaggregate agricultural emissions for 1990. The 1990 estimate was held constant into the future.
Slovakia	2 NC	BAU	No reported emissions.
Slovenia			No Data available.
Spain	Corinair	BAU	No reported emissions.

en	2 NC	BAU	No reported emissions.
rland	2 NC	BAU	No reported emissions.
e	Mitigation Study	BAU	All reported estimates from the Mitigation Study were disaggregated.
	2 NC	BAU	No reported emissions.

Source: Methane Emissions from Coal Mining

Emissions inventories were available from National Communications 1990 and/or 1995 for most countries. The inventory estimates are comparable in that they rely on the IPCC methodologies (or similar methods) and coal mine data. Emissions projections were available for many key countries, which were used as analogues for making projections for the other countries. For two countries (France and UK), the emissions projections include emissions control measures. With the exception of these two countries, the projections are considered to be "Business as Usual" (BAU). Additional analysis is continuing to cross-check these emissions projections with BAU coal production projections.

The attached table lists the data used for each country. The first column lists each Annex B country. The second column indicates the source of the 1990 and 1995 emissions estimates. 1 NC and 2 NC are the First and Second National Communications, respectively. The third column, titled *Projection Type*, indicates the extent to which emissions reduction measures are reflected in the future emissions estimates for each country. These are based on a review of the National Communications and Reports. "BAU" signifies that a Business as Usual scenario is used, with no reduction measures. "Partial" indicates that the estimates reflect a portion of emission reduction measures that have been defined to date. The last column describes the methodologies and assumptions used to estimate emissions for each country.

Approach

Source Summary: Methane is released from coal mines during the mining of coal, and is released directly from the coal post-mining. Underground mined coal is the primary source and surface-mined coal and "brown coal" are relatively minor sources. Emissions are driven by coal mining at relatively few gassy underground mines. A portion of the methane in and around the coal seam can be recovered and used for energy, so that methane emissions during mining can be reduced.

Key Trends: Economic restructuring in Eastern Europe has had a significant impact on coal production and the coal industry: coal production has declined significantly and many large gassy underground mines have been idled. This pattern is seen strongly in Russia, the region's largest coal producer. With the integration of East Germany, total German coal production has also declined significantly.. Australia projects significant increases in emissions in the absence of measures to reduce emissions. France and the UK, while smaller coal producers, have initiated methane recovery programs to reduce their emissions

Approach: Methane emissions data were collected and estimated for: 1990 and/or 1995 based on each country's national inventory; and 2000, 2005, and 2010 based on country-specific projections from national communications. In most cases where no emissions data were presented in the available materials, we were able to verify that there is no coal production in the country (e.g., Denmark, Finland, Iceland, Luxembourg, Portugal, Switzerland).

1. The Second National Communication was the first source consulted. The most recent national inventory was used (typically 1995). If projections were available through 2010, they were used. The Business as Usual (BAU) emissions projection was used if available. If BAU estimates were not available, emissions projections that include control measures were used. In some cases, where the projections combined coal, oil, and gas emissions, the 1995 source breakout percentages were applied to the projections. If both an inventory and a projection were available, no subsequent research was conducted for the country. If one or both were not available from this source, step 2 was used.
2. The First National Communication was the second source consulted. The most recent national inventory was used (typically 1990). If projections were available, they were used. In most cases, the first national communication did not include a detailed projection.

3. No national communication was available for several countries (Croatia, Ireland, Romania, and Spain). For these countries, the inventory estimates reported using the Corinair method were used. These inventories reported total emissions from all extraction and distribution of fossil fuels. As an initial approach for these countries, coal emissions were broken out from these reported aggregate emissions based on the breakouts from analogue countries. For example, France was used as the analogue to break out emissions for Spain. Additional research is currently underway to improve this methodology.
4. For Russia, a detailed country study report was used that included a 1990 inventory estimate¹. This estimate was scaled according to the projected change in solid fuel use reported in the first national communication.
5. For Ukraine, a detailed study of mitigation options was used for the inventory and projection². These data included emissions factors and activity factors for coal mining and post-mining activities. The emissions estimates were developed using these factors.
6. In those cases in which a projection of future emissions was not available from national communications, the following assumptions were used:
 - For several Eastern European countries without projections, Ukraine and Germany was used as an analogue country.
 - For several Western European countries without projections, it was assumed that emissions would remain constant over time.

Additional research is being conducted to develop improved emission projection estimates for these countries, based on EIA coal production forecasts where available.

Limitations

The coal sector in Eastern Europe is undergoing significant restructuring. Little information is available on how the restructuring is affecting production at the gassiest mines, which drive emissions. While emissions are declining significantly in the near term due to reductions in coal production, future emissions remain uncertain. In Western Europe, several key countries are reporting methane recovery programs to reduce emissions. Because these programs are new, their impacts on future emissions remain uncertain. Emissions from this sector are extremely specific to mine geology and mining practices. Coal production forecasts are a first step toward improving future emissions estimates. A more thorough and accurate assessment of the mine characteristics and practices for each country could significantly improve projections.

B: Methane Emissions from Coal from Annex B Countries, Data Sources and Methods

Annex B Country	1990/1995	Projection Type	Estimation Methods
Algeria	2 NC	BAU	Emissions from coal mining were reported for 1995 only. For the other years in the series, total fugitive emissions were reported. For 1990, the aggregate fugitive emissions estimate was broken down using percentage written in text of 2 NC. The aggregate projected fugitive emissions for 2010 was broken down using the 1995 breakdown. Estimates for 2000 and 2005 were interpolated.
Armenia	1 NC	BAU	Reported fugitive emissions are not broken down. Emissions from coal mining was assumed zero due to small coal production in country
Austria	2 NC	BAU	Aggregate fugitive emissions are reported for 1990, 2000, and 2005. These estimates were broken down using Germany's emissions breakdown. The estimate for 2010 was projected Germany's coal emissions growth rate. Emissions for 1995 were determined through interpolation.
Bulgaria	1 NC	BAU	An estimate for 1990 is reported. Future emissions are based on Ukrainian emission growth patterns.
Croatia	2 NC	BAU	Emissions are reported for 1990 and 1995; future emissions are part of reported aggregate fugitive emissions. The projected aggregate emissions were broken down using 1995 breakdown
Czechia	Corinair	BAU	Coal mining emissions estimates for 1990 were broken out of the 1990 Corinair aggregate fugitive estimates using Hungary's breakdown percentages. Future emissions estimates were based on Hungary's emission growth rate.
Denmark	2 NC	BAU	Emissions are reported for 1990 and 1995; future emissions are part of reported aggregate fugitive emissions. The projected aggregate emissions were broken down using 1995 breakdown
Egypt	1 NC	BAU	Emissions are reported for every year to 2005. Emissions are assumed to remain constant in 2010.
Estonia	1 NC	BAU	Estimates are reported for 1990 and 1995. 1995 estimates are assumed to remain constant. The bulk of the emissions are from oil shale mining, coal mining is minimal in Estonia.
Finland	2 NC	BAU	No data available.
France	1 NC	Partial	Emissions reported for 1990 and 2000 only. The estimate for 1995 was interpolated from 1990 and 2000. Emissions were assumed to be constant after 2000. Reductions are expected due to the change in coal production and recovery of gas from 2000.
Germany	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Greece	1 NC	BAU	The 1st National Communication reports emissions estimates for each year.
Hungary	2 NC	BAU	Emissions are reported for 1990 and 1995. Emissions are assumed to remain constant at 1995 levels throughout the series.
Iceland	2 NC	BAU	Iceland had no reported emissions.
Ireland	Corinair	BAU	Coal mining emissions estimates were broken out of the 1990 Corinair aggregate fugitive estimates using UK's breakdown percentages. The UK emission growth pattern was also used to project future emissions.
Italy	1 NC	BAU	Emissions reported for 1990 and 2000 only. The estimate for 1995 was interpolated from 1990 and 2000. Emissions were assumed to be constant after 2000. Reductions are expected due to the change in coal production and recovery of gas from 2000.
Japan	2 NC	BAU	The 2nd National Communication reported emissions estimates for 1990 -1994. The 1994 estimate was used for 1995. Future emissions were a part of aggregate emissions from fossil fuels. These estimates were broken down based on the 1995 breakdown.
Korea	1 NC	BAU	No reported emissions
Luxembourg			No data available.
Norway			No data available.

bourg	1 NC	BAU	No reported emissions
o			No data available.
rlands	2 NC	BAU	No reported emissions
ealand	2 NC	BAU	Emissions are reported for 1990 and 1995; future emissions are part of reported aggregate fugitive emissions. The projected aggregate emissions were broken down using 1995 break
y	2 NC	BAU	Emissions are reported for 1990 and 1995; future emissions are part of reported aggregate fugitive emissions. The projected aggregate emissions were broken down using 1995 break
	1 NC	BAU	The 1992 reported estimated used for 1990. Emissions for 1995 and after were estimated Germany's future coal production pattern.
al	1 NC	BAU	No reported emissions
nia	Corinair	BAU	Coal mining emissions estimates were broken out of the 1990 Corinair aggregate fugitive estimates using Hungary's breakdown percentages. Emissions were assumed to remain con at 1990 levels throughout the series.
	Country Study	BAU	A 1990 estimate is reported. Emissions for 1995 and after were determined by scaling the estimate with reported solid fuel use from the 1st National Communication.
ia	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
ia			No data available.
	Corinair	BAU	Landfill emissions estimates were broken out of the 1990 Corinair aggregate waste estimate using France's breakdown percentages. Future emissions were based on French emissions growth patterns.
en	2 NC	BAU	No reported emissions
rland	2 NC	BAU	No reported emissions
e	Mitigation Study	BAU	Used reported emissions and activity factors from the Mitigation Study to estimate inventory projections
	2 NC	Partial	Emissions are reported for 1990, future emissions are part of reported aggregate fugitive emissions. The projected aggregate emissions were broken down using 1990 breakdown. Emissions recovery programs in assumed to be in place in 2000.

Source: Methane Emissions from Landfilling of Waste

Emissions inventories are available from National Communications for 1990 and/or 1995 for most countries. The inventory estimates are comparable in that they rely on the IPCC methodologies (or similar methods) and country-specific waste management data. Emissions projections were available for many key countries, which were used as analogues for making projections for the other countries. Many countries included emissions control measures in their emissions projections. Consequently, the emissions projections are a mixture of "Business as Usual" (BAU) estimates and projections that reflect various degrees of control measures being implemented.

The attached table lists the data used for each country. The first column lists each Annex B country. The second column indicates the source of the 1990 and 1995 emissions estimates. 1 NC and 2 NC are the First and Second National Communications, respectively. The third column, titled *Projection Type*, indicates the extent to which emissions reduction measures are reflected in the future emissions estimates for each country. These are based on a review of the National Communications and other reports. Possible emission reduction measures include waste diversion, methane recovery, and reduced landfilling. "BAU" signifies that a Business as Usual scenario is used, with no reduction measures. "Partial" indicates that the estimates reflect the effects of implementing some of the emission reduction measures defined to date. "Full" indicates that the emissions estimates represent the effects of implementing the fullest extent of emission reduction measures possible. The last column describes the methodologies and assumptions used to estimate emissions for each country.

Approach

Source Summary: Methane is produced and emitted from the anaerobic decomposition of organic material in landfills. Emissions are driven by the amount of organic material deposited in landfills, the extent to which the material decomposes anaerobically, and the extent to which landfill methane is collected and combusted (e.g., used for energy). Because it takes many years for organic material to break down in landfills, the emissions today are driven by past landfill disposal practices.

Key Trends: Significant efforts are underway in most Annex B countries to improve waste management practices. The nature and consequences of these improved practices, however, tend to differ between Western and Eastern Europe. Among Western European countries, efforts are underway to promote recycling and incineration and to reduce landfilling. Several countries also report plans to recover and use landfill methane for energy. Overall, methane emissions from landfills in Western Europe are expected to remain constant or decline due to these trends. In Eastern Europe, improved waste management may include increased use of improved landfills as a means of waste disposal. This may result in the construction of new landfills and the increased utilization of current landfills in these countries, causing an increase in methane emissions from this source.

Approach: Methane emissions data were collected and estimated for: 1990 and/or 1995 based on each country's national inventory; and 2000, 2005, and 2010 based on country-specific projections from national communications.

1. The Second National Communication was the first source consulted. The most recent national inventory was used (typically 1995). If projections were available through 2010, they were used. The Business as Usual (BAU) emissions projection was used if available. If BAU estimates were not available, emissions projections that include control measures were used. Japan and several Western European countries, including Finland, Italy, Norway, Netherlands, Switzerland, and the UK, accounted for control measures in their projections. These measures generally included methane recovery and waste reduction. In some cases where the projections combined landfill and wastewater emissions, the 1995 source breakout percentages were applied to the projections. If both an inventory and a projection were available, no subsequent research was conducted for the country. If one or both were not available from this source,

step 2 was followed.

2. The First National Communication was the second source consulted. The most recent national inventory was used (typically 1990). If projections were available, they were used. In most cases, the First National Communication did not include a detailed projection.
3. No national communication was available for several countries (Croatia, Ireland, Romania, and Spain). For these countries, the inventory estimates reported using the Corinair method were used. Because these inventories reported total emissions from all waste treatment and disposal, the analysis broke out the landfill emissions based on the breakouts from analogue countries. For example, Russia was used as the analogue to break out emissions for Romania.
4. For Russia, a detailed country study report was used that included an inventory for landfills. Future emissions were assumed to remain constant. This assumption reflects reduced economic activity in the near term, along with increased use of landfilling.
5. For Ukraine, a detailed study of mitigation options was used for the inventory and projection.
6. In those cases in which a projection of future emissions was not available from national communications, the following assumptions were used:
 - For several Eastern European countries without projections, emissions were assumed to remain constant over time. This assumption reflects reduced economic activity in the near term, along with increased use of landfilling.
 - For several Western European countries without projections, such as Luxembourg and Austria, it was assumed that emissions would remain constant over time. Emissions from Ireland were assumed to decline, based on the reported pattern in the UK. These assumptions reflect the anticipation of increased recycling and diversion of waste from landfills, along with methane recovery.

Limitations

Continued attention to waste management issues is affecting current and future landfill emissions. Nevertheless, in many countries the amount of organic material landfilled annually is not well known. In particular, additional research is needed to assess the accuracy of the projections that landfill emissions remain constant in Germany (reported in the Second National Communication) and in Russia (assumed to be constant). After the U.S., these two countries are the largest landfill methane emitters among Annex B countries. As described above, some of the projections include emissions reduction activity, while others are Business as Usual.

B: Methane Emissions from Landfills from Annex B Countries, Data Sources and Methods

Annex B Country	1990/1995	Projection Type	Estimation Methods
Albania	2 NC	BAU	There are reported landfill emissions estimates for 1995, and aggregate waste methane emissions estimates for 1990 and projection years. The disaggregated estimates in the table were calculated by applying the 1995 breakdown to 1990, 2000, 2005, 2010 aggregated waste methane emissions estimates.
Armenia	1 NC	BAU	The 1990 reported emissions are assumed to remain constant throughout the series
Austria	2 NC	Full	Reported aggregate waste estimates for 1990, 2000, and 2005 were broken down using Germany's waste breakdown for those years. A decline in emissions over time was assumed to be from control measures. The 1995 estimate was interpolated from 1990 and 2000 estimates. The 2005 estimate was held constant for 2010.
Bulgaria	1 NC	BAU	There are reported emissions estimates for 1990 and 2020. Estimates for 1995-2005 were estimated through straight-line interpolation between 1990 and 2020.
Croatia	2 NC	BAU	There are reported landfill and total waste emissions data for 1990 and 1995. Future emissions are reported for aggregate emissions from waste. Future landfill emissions were broken out from using the 1995 breakdown.
Czechia	Corinair	BAU	Landfill emissions estimates for 1990 were broken out of the 1990 Corinair aggregate waste estimates using Hungary's breakdown percentages. Future emissions estimates were estimated by scaling the 1990 estimate by Croatia's population growth rate.
Egypt	2 NC	BAU	Landfill emissions were reported for 1990 and 1995. Future landfill emissions were broken out from reported future aggregate waste emissions using the 1995 breakout.
Finland	1 NC	BAU	The 1st National Communication reported landfill emissions estimates to 2005. These were assumed to remain constant for 2010.
France	1 NC	BAU	There are reported estimates for 1990 and 1995. The 1995 estimate was assumed to remain constant throughout the projection period.
Germany	2 NC	Full	Reported aggregate waste emissions estimates for all years are broken down using the 1990 waste emissions breakdown from the 1st National Communication. Future emissions reflect significant recovery and waste diversion measures.
Greece	1 NC	Partial	The 1st National Communication reported emissions from landfills for 1990 and 2000. The estimate was interpolated from the 1990 and 2000 estimates. Future emissions were assumed to remain at 2000 levels. Future emissions estimates reflect waste diversion and gas collection planned from 2000.
Hungary	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Iceland	1 NC	BAU	Reported 1990 emissions were held constant throughout the time series.
Ireland	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
Italy	2 NC	BAU	Methane emissions from landfills are reported to the year 2000. Emissions were assumed to remain constant in 2005 and 2010.
Japan	Corinair	Full	Landfill emissions estimates were broken out of the 1990 Corinair aggregate waste estimate using UK's breakdown percentages. The UK emission growth pattern was also used to project future emissions.
Korea	1 NC	Full	The 1st National Communication reported emissions from landfills for 1990 and 2000. The estimate was interpolated from the 1990 and 2000 estimates. Emissions trend to 2000 reflect waste diversion and methane recovery. Future emissions were assumed to remain at 2000 levels.
Lithuania	2 NC	Full	The 2nd National Communication reported emissions estimates for 1990 -1994, and then for 2000, 2005, and 2010. The 1994 estimate was used for 1995. Future emissions reflect reduced landfilling and increased methane recovery efforts.

	1 NC	BAU	The 1st National Communication reported emissions from landfills for 1990 and 2000. The estimate was interpolated from the 1990 and 2000 estimates. Future emissions were assumed to remain at 2000 levels.
en stein			No data available.
nia			No data available.
bourg	1 NC	BAU	The 1990 estimates were broken out from the reported aggregate waste emissions using Belgium's breakdown. The 1990 reported emissions were assumed to remain constant throughout the series.
o			No data available.
lands	2 NC	Full	The 2nd National Communication reports emissions estimates for each year. Future emissions reflect reduced landfilling and increased methane recovery.
ealand	2 NC	Partial	The 2nd National Communication reports emissions estimates for each year. Future emissions reflect a small amount of methane recovery measures.
y	2 NC	Full	The 2nd National Communication reports emissions estimates for each year. Future emissions reflect waste diversion, methane recovery, and growth prevention measures.
	1 NC	BAU	The reported estimate for 1992 was used for 1990. Emissions were assumed to remain constant at 1990 levels throughout the series.
al	1 NC	BAU	No emissions data were reported. The 1990 estimate was determined by using France's emissions per capita. Future emissions were scaled using Portugal population forecasts.
nia	Corinair	BAU	Landfill emissions estimates were broken out of the 1990 Corinair aggregate waste estimate using Hungary's breakdown percentages. An emissions per capita was determined and applied to the Romanian population forecast to project future emissions.
	Country Study	BAU	The 1990 reported emissions estimate was assumed to remain constant throughout the series.
ia	2 NC	BAU	The 2nd National Communication reports emissions estimates for each year.
ia			No data available.
	Corinair	BAU	Landfill emissions estimates were broken out of the 1990 Corinair aggregate waste estimate using France's breakdown percentages. An emissions per capita was determined and applied to Spain's population forecast to project future emissions.
en	2 NC	Full	The 2nd National Communication reports emissions estimates for each year. Future emissions reflect methane recovery and diversion of waste.
land	2 NC	Full	There are reported landfill emissions data for 1995, and aggregated waste emissions data for 1990 and projection years. Landfill emissions estimates were calculated by applying the 1995 breakdown to 1990, 2000, 2005, 2010 aggregated agricultural methane data. Future emissions reflect measures to divert waste.
e	Mitigation Study	BAU	Ukraine's Emissions Mitigation Study reported emissions for each year.
	2 NC	Full	Landfill and total waste emissions estimates were reported for 1990 only. Landfill emissions were broken out from the aggregate waste emissions reported for the remaining years using the 1990 breakdown. Future emissions reflect measures to reduce landfilling and increase methane recovery.

Pre-Kyoto Baselines Projections

1990 Annex I Emissions Estimates (MMTCE)											
Country	Energy		Forest		Methane		Nitrous Oxide		HFC/PFC/SF6		Total
AUSTRALIA	79	nat com	36	nat com	36	nat com	5	nat com	1	nat com	156
NEW ZEALAND	7	nat com	-6	nat com	11	nat com	4	nat com	0	(nat com: 0.3)	17
JAPAN	307	nat com	-23	nat com	9	nat com	9	nat com	12		314
U.S.A.	1361	(nat com: 1353)	-282	(nat com: -125)	170	nat com	36	nat com	24	nat com	1309
CANADA	127	nat com	0	nat com	21	(nat com: 18)	8	nat com	2	nat com	158
BULGARIA	23	cs	-2		8	cs	0	(cs: 2)	0		28
ESTONIA	10.3	cs	0.5		4	cs		(cs: 0.2)			15
HUNGARY	19	cs	-1		3	cs	0	(cs: 0.4)	0		21
SLOVAKIA	16	nat com	-1	nat com	3	nat com	1	nat com	0	(nat com: 0.1)	19
CZECH REPUBLIC	45	nat com	-1	nat com	6	nat com	2	nat com	0	nat com	52
POLAND	108	(rivm: 101)	-0.4		32	(rivm: 26)	6	(rivm: 7)	0		146
ROMANIA	47	rivm	-1		11	rivm	0	(rivm: 3)	0		57
RUSSIA	1029	eia	-107		180	(rivm: 270)	0	(rivm: 15)	0		1102
UKRAINE	194	cs	-14	cs	68	(cs: 58)	4	(cs: 3.4)			251
ICELAND	1	nat com	0	nat com	0	(nat com: 0.1)	0	(nat com: 0.03)	0	(nat com: 0.1)	1
MALTA	1	iea	0		0		0		0		1
NORWAY	10	nat com	-3	nat com	3	nat com	1	nat com	1	nat com	12
SWITZERLAND	13	nat com	-1	nat com	2	nat com	1	nat com	0	nat com	14
AUSTRIA	16	nat com	-4	nat com	4	nat com	1	nat com	0	nat com	17
BELGIUM	33	nat com	-1	nat com	4	nat com	3	nat com	0.1	nat com	40
DENMARK	16	rivm	-1		2	rivm	0	(rivm: 1)	0		17
FINLAND	15	nat com	-7	nat com	2	nat com	2	nat com	0	nat com	11
FRANCE	104	nat com	-9	nat com	20	(nat com: 17)	16	nat com	1	nat com	133
GERMANY	277	nat com	-8	nat com	38	(nat com: 33)	20	nat com	2	nat com	328
GREECE	22	rivm	0		0	(rivm: 2)	0	(rivm: 1)	0		22
IRELAND	8	nat com	-1	nat com	5	nat com	3	nat com	0	nat com	15
ITALY	112	(rivm: 115)	-10		22	rivm	0	(rivm: 4)	0		124
LUXEMBOURG	3	rivm	0		0		0	rivm	0		3
NETHERLANDS	47	nat com	0	(nat com: -0.4)	7	nat com	4	nat com	2	nat com	61
SWEDEN	16	nat com	-9	nat com	2	nat com	1	nat com	0.4	nat com	10
PORTUGAL	11	rivm	0		1	rivm	0	(rivm: 2)	0		12
SPAIN	61	rivm	-1		12	rivm	0	(rivm: 3)	0		72
U.K.	158	nat com	5	nat com	30	(nat com: 26)	10	nat com	1	nat com	205
European Union	883		-42		147		58		7		1070
Total	4294		-453		717		136		49		4742

NOTES:

1) The figures in these columns represent our best estimates pre-Kyoto. Sources are shown in the comment field. In case of a discrepancy between the source and the value in the pre-Kyoto table, the value reported by the source is shown.

2) The sources cited in these table are the following: (a) nat com: the synthesis report of the Second National Communications, FCCC/SBI/199719/Add.1; (b) cs: data from the USCSP,

"Greenhouse Gas Emission Inventories: Interim Results from the U.S. Country Studies Program" and "Global Climate Change Mitigation Assessment: Results for 14 Transitioning and Developing Countries"; (c) iea: The IEA's "CO₂ Emissions from Fuel Combustion: A New Basis for Comparing Emissions of a Major Greenhouse Gas, 1972-1995"; (d) eia: DOE/IEA "International Energy Outlook 1997, with Projections to 2015"; (e) rivm: Bilthoven, Netherlands' National Institute of Public Health and the Environment's "Greenhouse Gas Emission Accounting"

3) The forest sequestration estimate for the US includes forest soil carbon which was not included in the US Second National Communication to the UN FCCC.

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Pre-Kyoto Baselines Projections

	1995 Annex I Emissions Estimates (MMTCE)										
Country	Energy		Forest		Methane		Nitrous Oxide		HFC/PFC/SF6	Total MMT	
AUSTRALIA	88	nat com	36	nat com	40	nat com	0	nat com	0.4	nat com	165
NEW ZEALAND	7	nat com	-4	nat com	11	(nat com: 9)	4	nat com	0	(nat com: 1)	19
JAPAN	332	nat com	-25	nat com	9	nat com	9	nat com	22		348
U.S.A.	1443	(nat com: 1422)	-238	(nat com: -117)	177	nat com	37	(nat com: 40)	40	(nat com: 37)	1459
CANADA	136	nat com	0	nat com	25	(nat com: 21)	9	nat com	2	nat com	173
BULGARIA	17	iea	-1		7		0		0		23
ESTONIA	8	(iea: 5)			4		0		0		12
HUNGARY	16	iea	-1		3		0		0		18
SLOVAKIA	13	nat com	-1	nat com	2	nat com	1	nat com	0	(nat com: 0.1)	15
CZECH REPUBLIC	35	nat com	-1	nat com	5	nat com	2	nat com	0	nat com	40
POLAND	102	(iea: 92)	0.0		30		6		0		139
ROMANIA	34	iea	0		8		0		0		42
RUSSIA	773	(iea: 653)	-160		127		0		10		750
UKRAINE	116	cs	-18	cs	48	(cs: 29-41)	2	(cs: 1.4)	1		148
ICELAND	1	nat com	0	nat com	0	(nat com: 0.1)	0	(nat com: .03)	0	(nat com: .02)	1
MALTA	1	iea	0		0		0		0		1
NORWAY	10	nat com	-4	nat com	3	nat com	1	nat com	1	nat com	12
SWITZERLAND	12	nat com	-1	nat com	2	nat com	1	nat com	0	(nat com: 0.3)	14
AUSTRIA	17	nat com	-4	nat com	4	nat com	1	nat com	0		18
BELGIUM	33	nat com	-1	nat com	4	nat com	3	nat com	0	(nat com: 0.3)	40
DENMARK	17	iea	0		2		0		0		19
FINLAND	15	nat com	-4	nat com	2	nat com	2	nat com	0	nat com	15
FRANCE	105	nat com	-13	nat com	19	nat com	15	nat com	0	nat com	127
GERMANY	243	nat com	-8	nat com	32	(nat com: 28)	19	nat com	3	nat com	289
GREECE	21	iea	0		2		0		0		23
IRELAND	9	nat com	-2	nat com	5	nat com	2	nat com	0	nat com	15
ITALY	116	iea	-12		19		0		0		123
LUXEMBOURG	0	(iea: 2)	0		0		0		0		0
NETHERLANDS	50	nat com	0	(nat com: -.5)	7	nat com	5	nat com	3	nat com	65
SWEDEN	16	nat com	-8	nat com	2	nat com	1	nat com	0	(nat com: 0.5)	11
PORTUGAL	0	(iea: 14)	0		0		0		0		0
SPAIN	0	(iea: 22)	0		0		0		0		0
U.K.	148	nat com	3	nat com	26	nat com	8	nat com	1	nat com	186
European Union	773		-44		120		55		8		930
Total	3934		-466		625		128		85		4306

NOTES:

1) The figures in these columns represent our best estimates pre-Kyoto. Sources are shown in the comment field. In case of a discrepancy between the source and the value in the pre-Kyoto table, the value reported by the source is shown.

2) The sources cited in these table are the following: (a) nat com: the synthesis report of the Second National Communications, FCCC/SBI/1997/19/Add 1; (b) cs: data from the USCSP, "Greenhouse Gas Emission Inventories: Interim Results from the U.S. Country Studies Program" and "Global Climate Change Mitigation Assessment: Results for 14 Transitioning and Developing Countries"; (c) iea: The IEA's "CO2 Emissions from Fuel Combustion: A New Basis for Comparing Emissions of a Major Greenhouse Gas, 1972-1995", (d) eia: DOE/EIA "International Energy Outlook 1997, with Projections to 2015"; (e) rivm: Bilthoven, Netherlands' National Institute of Public Health and the Environment's "Greenhouse Gas Emission Accounting"

3) The forest sequestration estimate for the US includes forest soil carbon which was not included in the US Second National Communication to the UN FCCC

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Pre-Kyoto Baselines Projections

	2010 Annex I Emissions Estimates (MMTCE)										
Country	Energy		Forest		Methane		Nitrous Oxide		HFC/PFC /SF6		Total
AUSTRALIA	104	nat com	36	nat com	47	nat com	0	nat com	3	nat com	189
NEW ZEALAND	10	nat com	-6	nat com	11	(nat com: 9)	4	nat com	0.2	(nat com: 2)	19
JAPAN	417	(nat com: 369)	-15	nat com	9	nat com	11	nat com	40		461
U.S.A.	1757	(nat com: 1669)	-227	(nat com: -109)	152	nat com	34	nat com	91		1807
CANADA	150	nat com	0	(nat com: NR)	25	(nat com: 21)	7	nat com	5	nat com	187
BULGARIA	28		-1		7		0		1		34
ESTONIA	9				4						13
HUNGARY	19		-1		3		0		2		23
SLOVAKIA	15	nat com	-2	nat com	2	nat com	1	nat com	0	(nat com: NR)	16
CZECH REPUBLIC	45	nat com	-1	nat com	6	nat com	2	nat com	2		55
POLAND	116		0		34		6		2		158
ROMANIA	47		0		0		0		1		48
RUSSIA	933	(eia-872)			130		0		53		1116
UKRAINE	163	cs	-19	cs	50	(cs 31-43)	4	cs	4		201
ICELAND	1	nat com	0	(nat com: NR)	0	(nat com: 0.1)	0	(nat com: .04)	0	(nat com: .04)	1
MALTA	1		0		0		0		0		1
NORWAY	13	nat com	-4	nat com	2	nat com	1	nat com	1	nat com	14
SWITZERLAND	13	nat com	-1	nat com	1	nat com	1	nat com	1		15
AUSTRIA	20	(nat com: 16)	0	(nat com: NR)	0	(nat com: NR)	0	(nat com: NR)	1		21
BELGIUM	35	nat com	-1	nat com	0	nat com	0	nat com	0	(nat com: NR)	34
DENMARK	14		-1		2		0		0		15
FINLAND	17	nat com	-6	nat com	1	nat com	2	nat com	1	nat com	15
FRANCE	113		0	(nat com: NR)	22		0	(nat com: NR)	0	(nat com: NR)	135
GERMANY	233	nat com	-5		18	nat com	14	nat com	1	(nat com: 5)	261
GREECE	30		0		2		0		0		32
IRELAND	11	nat com	-2	nat com	6	nat com	2	nat com	0	(nat com: NR)	17
ITALY	150		-13		13		0		0		150
LUXEMBOURG	1		0		0		0		0		1
NETHERLANDS	46	nat com	0	(nat com: -0.5)	4	nat com	6	nat com	1	nat com	57
SWEDEN	17	nat com	-6	nat com	2	nat com	1	nat com	1	nat com	15
PORTUGAL	21		0		0		0		0		21
SPAIN	94		-1		0		0		0		93
U.K.	162	nat com	2	nat com	19	nat com	4	nat com	1.7	nat com	190
European Union	944		-33		89		30		6		1056
Total	4805		-275		572		101		211		5415

NOTES:

1) The figures in these columns represent our best estimates pre-Kyoto. Sources are shown in the comment field. In case of a discrepancy between the source and the value in the pre-Kyoto table, the value reported by the source is shown.

2) The sources cited in these table are the following: (a) nat com: the synthesis report of the Second National Communications, FCCC/SBI/199719/Add.1; (b) cs: data from the USCSP, "Greenhouse Gas Emission Inventories: Interim Results from the U.S. Country Studies Program" and "Global Climate Change Mitigation Assessment: Results for 14 Transitioning and Developing Countries"; (c) iea: The IEA's "CO2 Emissions from Fuel Combustion: A New Basis for Comparing Emissions of a Major Greenhouse Gas, 1972-1995"; (d) eia: DOE/EIA "International Energy Outlook 1997, with Projections to 2015"; (e) rivm: Bilthoven, Netherlands' National Institute of Public Health and the Environment's "Greenhouse Gas Emission Accounting"

3) The forest sequestration estimate for the US includes forest soil carbon which was not included in the US Second National Communication to the UN FCCC

4) Analysts in OAR coordinated with DOE to arrive at an agreed-upon range of aggregate emissions of HFC/PFC/SF6 of 260-380 MMTCE in 2010, with a best guess of 330 MMTCE. The difference between what is in our table (211) and our best independent guess (330) can be largely explained by the EU's failure to quantify these gases in their projections. Although it is difficult (impossible) for us to allocate these emissions to each country in 2010, it is believed that France, Germany, UK, Italy, and Spain are underestimating their future emissions by around 120 MMTCE in aggregate

5) NR = data not reported

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SCOPING PAPER: INDUSTRY CONSULTATIONS

Draft: March 6, 1998

"We must continue to encourage key industry sectors to prepare their own greenhouse gas reduction plans. And we must...remove the barriers to the most energy efficient usage possible. There are ways the federal government can help industry to achieve meaningful reductions voluntarily, and we will redouble our efforts to do so."

-- President Clinton, October 22, 1997

Background:

In his climate change address at the National Geographic Society auditorium on October 22, 1997, President Clinton challenged American industries to develop their own action plans, and he pledged for his Administration to work with state and local governments to remove any barriers to greater energy efficiency. In urging companies to take early action, the President also committed to ensure that firms receive appropriate credit for their achievements.

There are a number of industrial sectors that have expressed interest in working with the Administration on climate change policy, although some are more advanced in their thinking than others.

- The Task Force convened interagency meetings last fall with three sectors that were prepared to make proposals to the Administration: steel, cement and airlines. Natural gas, renewable and energy efficiency firms continue to want to play a key role.
- Task Force and agency staff had very productive individual meetings last fall with electric utilities, pulp and paper, natural gas and a couple of petroleum companies. Although they are still trying to evaluate their posture toward the issue in the wake of the Kyoto agreement, there are progressive companies in each sector that we should engage soon to help influence the evaluations others are making.
- Since the Kyoto Conference, other key sectoral players have stepped forward to express interest in being involved: appliance manufacturers, chemicals and aluminum.
- Additionally, the Administration has good relations with a set of industry leaders active in the President's Council on Sustainable Development, DOE's Industries of the Future and Climate Challenge programs and EPA's "Green" and Climate Wise partnerships.

Besides these groups, there are other important industries that are likely to be interested in participating as this effort matures.

This paper outlines a process to deliver agreements with industries that volunteer to enter emission reductions agreements. This approach is attractive to both sides:

- Participating industries will be able to jump start their search for low cost reductions, benefit from federal support in such efforts, and be poised to help shape and take advantage of

credit for early actions.

- The Federal government gets a head start on emission reductions and a cooperative audience to help inform remaining policy and implementation decisions.

L PROCESS

A. In General --

1. **Goals** The consultations should maintain a clear focus on enabling industries to meet the President's challenge of developing early voluntary action plans within nine months. Industries will be encouraged to make commitments as close as possible to the Kyoto target. Also, firms will be the most forthcoming if meetings are designed to --
 - strategize on removing barriers;
 - assure early credit;
 - and inform federal climate policy development (e.g. the \$6.3 billion incentive package; the emissions trading program design; federal energy use; and the ongoing international negotiations).
2. **CEO Vision** The consultations will be most successful if those active in the discussions have directions from their CEO's. (The alternative -- if they do not have CEO cover for what they are doing, they will be conservative.) Prior to sectoral meetings, a senior White House or Cabinet official [or a high-level former CEO] should speak with at least two key CEO's about the talks in order to assure their engagement.
3. **Crosscutting** There will be a crosscutting effort to cut across all groups on some overall design questions. This could assure that each group benefits from lessons of the others, and it could help us achieve a coherent overarching policy structure. The issue of credit for early action and perhaps emissions trading will be discussed in separate, expedited inter-agency fora.
4. **Agencies** From the onset, the effort needs to take advantage of agency expertise and abilities, particularly their strengths to carry out follow-up actions.
5. **Strategy** This approach is designed to empower firms ready to begin addressing their greenhouse gas responsibilities to get started with the assurance that they will not be penalized for acting early and, in fact, will be rewarded.

B. Operational Considerations

1. **Background Analyses**
Documents will be prepared for each sector compiling background information currently available in the agencies. These papers will be used

to inform the Federal teams and provide some basis for discussions with the private sector.

2. Scoping Mtg. We should convene a small "scoping group" to plan each consultation. It should contain a few select industry leaders combined with a few federal experts. This group can help strategize about the best way to frame questions, how the effort should be defined for that sector, and how to ensure the best outcomes.
3. Attendance We should be inclusive of as many companies as possible. Pending review of FACA requirements, the meetings would be more constructive if they were "off the record." It might also be useful to have a follow up meeting to vet any ideas with others involved with the sector (academics, labor leaders and public interest groups).

On the federal side, we should assemble expert teams from relevant agencies (Energy, EPA, Commerce, Agriculture, Transportation, Defense, Interior, NASA, State, USTR, AID) and White House offices (NEC, CEQ, OSTP, OMB, NSC). We should select a leader for each sectoral team to help focus activities, drive the process and serve as a point of contact.

4. Guidance Sectors will be asked to prepare in advance of the consultations information on industry historical emissions, future trends, and potential reductions. For example, they could determine what the industry's baseline was in 1990 (or 1995 for those gases), what the scenarios are for 2008 to 2012 and what actions could bring the greatest improvements on those scenarios. It could also be beneficial to review the industries' competitive situation in the international economy, its business trends (including energy and environment) and its research and development plans. The ultimate goal is to reach agreement on a voluntary reduction plan, either collectively or individually.
4. Industry Kick-Off After the scoping meetings, the next activity will be a kick-off meeting with industry. The Federal teams will invite the wider industry membership to participate and set the timeline for action. When industry has had time to draft a preliminary response, the Federal teams will follow-up, review the plans and respond to agency requests.
5. Follow Up The federal team should ensure that ideas are submitted for expedited consideration in the policy process. Agencies should have primary responsibility to carry out follow-up activities, pursuant to their proper authorities, under coordination by White House offices.
6. Phases Because some industries have already begun to think in terms of early action, the consultations will proceed in at least 3 overlapping phases. At the end of scoping meetings with one phase, not only will consultations

begin with those industries, but a new set of sectors will begin scoping meetings. This will give some industries more time to learn about opportunities for emission reductions and will help moderate the burden on Federal resources.

C. Time Line

A time line has been developed to describe the actions and responsible parties for the tasks required to develop agreements with several industry sectors by October.

1. Initial Preparations (present -- early March)
The goal of the initial phase is to prepare the Federal government to effectively engage the private sector. Tasks will include the preparation of planning documents (including sector analyses), the establishment of the Federal leadership structure, and the finalization of the list of sectors.
2. Scoping Meetings (Phase 1 -- March; Phase 2 -- April - May; Phase 3 -- May - June)
The goal of the second stage is to plan industry consultations in conjunction with representatives of each sector. Tasks will include contact with selected sector CEOs and Cabinet members or other senior White House personnel, scoping meetings with a subgroup of each industry sector leaders, a roll-out event, and input from labor and environmental groups.
3. Industry Consultations (April -- August)
The goal of the third stage is to encourage voluntary emissions reductions commitments from the industry sectors, improve understanding of technology opportunities, and identify and reduce barriers to these reductions. The focus will be on holding industry consultations through a series of meetings: an industry kick-off to present charge to full industry membership and then meetings with Federal teams to review commitment plans and plan implementation.
4. Agreements and Follow-Up (September -- October)
The goal of the final phase is to ensure agreements are finalized and set into motion. Draft agreements will be prepared with responsibilities/activities for both industry and Federal agencies. There will be a roll-out event before work continues on remaining industries, beginning a second phase of scoping meetings and full industry consultations.

II. SPECIFIC GROUPS

There are specific players in key industries that can provide important inroads into most of the major emissions sectors. I would recommend that we begin consultations with the groups that have already expressed interest (Phase I). As we build a track record of success, it will be easier to bring others on board.

Phase I Sectors

Energy Intensive Industries

The industrial sector represents one-third of all end use emissions. Seven highly energy intensive industries emit 80 percent of the greenhouse gases from industrial manufacturing. Four of these are being considered for inclusion in the first phase of consultations. In addition, the cement industry is among the highest ranking industrial carbon emitters, due to carbon dioxide released during the calcification process and a high energy intensity.

1. Steel
2. Aluminum
3. Pulp and Paper
4. Chemicals
5. Cement

Electric Power

Electric utility emissions comprise one-third of U.S. source emissions.

6. Electric Power

Transportation

The transportation sector represents a final third of U.S. end use emissions. Autos and light trucks constitute the bulk of the transportation sector emissions (52%), with airlines emitting an additional 15%. Freight trucks bring the total highway emissions to 74%.

7. Airlines
8. Fleets

Future Growth Industries

Industry sectors whose emissions are projected to rise in the future also need to be a part of the consultations.

9. Telecomm/ Electronics

Phase II & III Sectors

The remaining industries in the broad sectoral categories above will be covered in subsequent phases.

Energy Intensive Industries

10. Glass
11. Foundries
12. Refineries

Electric Utilities/Fuels/Buildings

- 13. Buildings
- 14. Natural Gas
- 15. Renewables
- 16. Efficiency
- 17. Mining

Transportation

- 18. Automobiles
- 19. Railroads

Other

- 20. Appliances
- 21. Vendors
- 22. Agriculture

III. Addendum

A: Industry Plans for Early Reductions -- A one-page summary description

B: Time Line -- Details on the activities planned through October

ADDENDUM A: INDUSTRY PLANS FOR EARLY REDUCTIONS

Draft: March 4, 1998

We must continue to encourage key industry sectors to prepare their own greenhouse gas reduction plans. And we must ...remove the barriers to the most energy efficient usage possible. There are ways the federal government can help to achieve meaningful reductions voluntarily, and we will redouble our efforts to do so."

-- President Clinton, October 22, 1997

GOAL:

Develop plans of action to achieve early voluntary reductions in greenhouse gas emissions in key sectors of the economy with the goal of making as much progress as possible toward the targets set in Kyoto.

RATIONALE:

To the extent that cost-effective reductions in greenhouse gases can be achieved in the near to medium-term through voluntary efforts, the burdens associated with meeting future targets will be reduced and the rate of build-up of greenhouse gases will be slowed.

INDUSTRY'S ROLE:

To develop a plan for reducing greenhouse gas emissions beyond "business as usual." Building on existing government-industry partnerships, the plan should identify:

- an emissions reduction goal;
- the path forward for achieving that goal using cost-effective measures;
- barriers to achieving reductions that could be removed;
- incentives that could be created to encourage such reductions;
- possible changes in federal procurement or practices;
- options for reducing emissions through trading or sequestration;
- opportunities for achieving reductions abroad; and
- a longer-term research and development strategy.

FEDERAL GOVERNMENT'S ROLE:

To facilitate the development and implementation of industry plans by:

- inventorying existing programs and resources with the potential to reduce greenhouse gas emissions;
- where appropriate, provide collaborative support to facilitate a broad based industry dialogue, to contribute technical and analytic assistance, and to provide other assistance in the development of industry plans for early action;
- working cooperatively, wherever possible, to remove barriers and create new incentives for reducing emissions; and
- developing guidelines for early credit for qualifying reductions.

WHY PARTICIPATE:

Participating industries will be able to jump start their search for low cost reductions, benefit from federal support in such efforts, and be poised to help shape and take advantage of credit for early actions.

TIMETABLE:

Kick-Off Meetings with Initial Sectors	March-April
Plan Preparation	April-August
Initial Sector Plans Presented	September-October
Additional Plans and Implementation.....	November and beyond

ADDENDUM B: TIME LINE

Draft: March 6, 1998

I. Initial Preparations (present -- early March)

Goal: To prepare the Federal government to effectively engage the private sector.

- (1) Prepare planning documents that will be used as templates to guide the consultations for all sectors.
 - Finalize template for Sector Analyses; analyses will include sections on sector emissions, options for emissions reductions, current sector activities, and barriers to or opportunities for emissions reductions. [WHCCTF: 3/2]
 - Draft Sector Analyses for 1-2 sectors; assignments made for agency leads for remaining sectors [Agencies (DOE/EPA): 3/2]
 - Draft questions to be addressed in consultations [WHCCTF: 3/2]
- (2) Establish Federal leadership structure
 - Assemble an Assistant Secretary Council, with representatives of each relevant agency, to give oversight and guidance. [WHCCTF/Agencies: late February/early March]
 - Establish technical teams from the agencies to be responsible for each sector [WHCCTF/Agencies: late February/early March]
- (3) While consultations will occur with the full list of industries categorized in the scoping paper, initial meetings will proceed in a phased manner to immediately address those industries who are already close to making voluntary commitments to reduce emissions.
 - Narrow the list of industries to 6-8 for Phase I of scoping meeting and full consultations; determine broad strategy for remaining sectors on the list [WHCCTF/Agencies: early March]

Preliminary list: steel, airlines, electric utilities, aluminum, pulp & paper and cement; possibly buildings, autos, chemicals, fleets, electronics
 - Select a member of the Assistant Secretary Council to join each sector group [WHCCTF/Agencies: early March]

- Draft Sector Analyses for 6-8 sectors prepared and approved [*Agency leads: second week of March*]

(4) Present work to Assistant Secretaries Council for discussion [*WHCCTF/Agencies: second week of March*]

II. Scoping Meetings (Phase 1 -- March; Phase 2 -- April - May; Phase 3 -- May - June)

Goal: To plan industry consultations in conjunction with representatives of each sector.

- (1) Establish contact with selected sector CEOs through calls and/or meetings with Cabinet members or other senior White House personnel. Timing might vary from sector to sector and could be held before or parallel to scoping meetings.
 - Contact at least two CEOs from each sector to assure their engagement. [*WHCCTF: varies*]
- (2) Hold a preliminary, scoping meeting with a subgroup of each industry sector leaders to help plan the full industry consultations. It will be important to have appropriate industry people at these meetings who have the ability to at least informally speak for their CEOs and/or industries.
 - Identify a small number of principal players in each sector from the private sector [*Agency leads: early March*]
 - Draft agenda for scoping meeting to include discussions on the structure of the consultations (agenda, questions, etc.), participants, and review of draft sector analyses [*WHCCTF: early March*]
- (3) The scoping meetings could probably be done in two weeks, holding about three each week. [*WHCCTF/Agency teams: 3/15 - 3/30*]
- (4) Roll-out event to lay out plans (vision, scope, time table)
 - Two parts: POTUS or VPOTUS meeting with CEOs followed by a larger briefing of DC representatives from key sectors [*WHCCTF: mid to late March*]
- (5) Input from labor and environmental groups is also highly desirable. Teams for these "sectors" will also be assembled, and their efforts will be incorporated into the industry consultations.

III. Industry Consultations (April -- August)

Goal: To encourage voluntary emissions reductions commitments from the industry sectors, improve understanding of technology opportunities, and identify and reduce barriers to these reductions.

- (1) Before the start of the Phase I consultations, the input from the scoping meetings should be incorporated into the Sector Analyses.
 - Finalize questions for industry and other inputs for consultations [WHCCTF/Asst Sec Council: 4/15]
 - Using the other documents, draft an options workbook matching barriers and potential opportunities with existing options available to sectors (inventory of Federal "carrots") [WHCCTF/Asst Sec Council: 4/15]
- (2) The actual industry consultations will involve as broad a participation within each sector as possible. The consultations will require a series of meetings. First, an industry kick-off to present charge to full industry membership. Second, meetings with Federal teams to review commitment plans and plan implementation. [Agency teams/WHCCTF: 1st set, end April - late May; 2nd set, July - early Aug.]
- (3) At the earliest appropriate time, the labor and environmental groups will be incorporated into the process. Their exact participation may vary from sector to sector.
- (4) We will also convene consultations with industries offering technological solutions in a way that informs and enhances the emission reduction agreements with emitting industries. These may take the form of separate meetings, depending on what works best with a given sector.
- (5) Industry teams will present draft agreements to the Assistant Secretary Council. [Agency leads: end August]

IV. Agreements and Follow-Up (September -- October)

Goal: To ensure agreements are finalized and set into motion.

- (1) The draft agreements will include responsibilities/activities for both industry and Federal agencies. The industry section will include their commitments on emissions reductions. The Federal agency section would include the help already available to sectors and potential agency actions to address barriers identified. Ideally, endorsements from labor, environments and some relevant state agencies will be

solicited. [*Agency teams: September*]

- (2) A roll-out event by senior administration officials with presentations by industry and by agencies. [*Mid-October*]
- (3) Continue work on remaining industries, beginning a second phase of scoping meetings and full industry consultations. [*End of October*]



White House Climate Change Task Force

734 Jackson Place, N.W. • Washington, DC 20503

March 4, 1998

MEMORANDUM TO DISTRIBUTION

FROM: Dirk Forrister, Chair *Dirk Forrister*

SUBJECT: Meeting on Industry Outreach

I would like to remind you of the meeting **Thursday, March 5, from 3:00 to 4:30 p.m. in the White House Conference Center in the Lincoln Room (724 Jackson Place, NW)** for the first meeting of an Assistant Secretaries' Industry Consultation Council. I have attached several documents to help you prepare for the meeting.

The draft agenda is as follows:

- I. Overview of Project Goals and Approach
- II. Organizational Structure and Process
 - Industry's Role and Participation
 - Federal Role and Participation
- III. Timetable
 - Phase I Sectors
- IV. Next Steps

I hope to see you tomorrow. Please call me before selecting substitutes if you are not able to attend or if you would like to bring additional staff (space is limited). If you have any other questions, you may call me or Lisa McNeilly at (202) 343-1060.

Attachments:

- "Scoping Paper: Industry Consultations"
- "Addendum A: Industry Plans for Early Reductions"
- "Addendum B: Questions for Industry"

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Jeff Frankel	CEA	395-6947
Marty Spitzer	PCSD	408-1655

Total pages: 11

SCOPING PAPER: INDUSTRY CONSULTATIONS

Draft: March 4, 1998

"We must continue to encourage key industry sectors to prepare their own greenhouse gas reduction plans. And we must...remove the barriers to the most energy efficient usage possible. There are ways the federal government can help industry to achieve meaningful reductions voluntarily, and we will redouble our efforts to do so."

-- President Clinton, October 22, 1997

Background:

In his climate change address at the National Geographic Society auditorium on October 22, 1997, President Clinton challenged American industries to develop their own action plans, and he pledged for his Administration to work with state and local governments to remove any barriers to greater energy efficiency. In urging companies to take early action, the President also committed to ensure that firms receive appropriate credit for their achievements.

There are a number of industrial sectors that have expressed interest in working with the Administration on climate change policy, although some are more advanced in their thinking than others.

- The Task Force convened interagency meetings last fall with three sectors that were prepared to make proposals to the Administration: steel, cement and airlines. Natural gas, renewable and energy efficiency firms continue to want to play a key role.
- Task Force and agency staff had very productive individual meetings last fall with electric utilities, pulp and paper, natural gas and a couple of petroleum companies. Although they are still trying to evaluate their posture toward the issue in the wake of the Kyoto agreement, there are progressive companies in each sector that we should engage soon to help influence the evaluations others are making.
- Since the Kyoto Conference, other key sectoral players have stepped forward to express interest in being involved: appliance manufacturers, chemicals and aluminum.
- Additionally, the Administration has good relations with a set of industry leaders active in the President's Council on Sustainable Development, DOE's Industries of the Future and Climate Challenge programs and EPA's "Green" and Climate Wise partnerships.

Besides these groups, there are other important industries that are likely to be interested in participating as this effort matures.

I. PROCESS

A. In General --

- I. Goals The consultations should maintain a clear focus on enabling industries to

meet the President's challenge of developing early voluntary action plans within nine months. Industries will be encouraged to make commitments as close as possible to the Kyoto target. Also, firms will be the most forthcoming if meetings are designed to --

- strategize on removing barriers;
- assure early credit;
- and inform federal climate policy development (e.g. the \$6.3 billion incentive package; the emissions trading program design; federal energy use; and the ongoing international negotiations).

2. **CEO Vision** The consultations will be most successful if those active in the discussions have directions from their CEO's. (The alternative -- if they do not have CEO cover for what they are doing, they will be conservative.) Prior to sectoral meetings, a senior White House or Cabinet official (or a high-level former CEO) should speak with at least two key CEO's about the talks in order to assure their engagement.
3. **Crosscutting** There will be a crosscutting effort to cut across all groups on some overall design questions. This could assure that each group benefits from lessons of the others, and it could help us achieve a coherent overarching policy structure. The issue of credit for early action and perhaps emissions trading will be discussed in separate, expedited inter-agency forum.
4. **Agencies** From the onset, the effort needs to take advantage of agency expertise and abilities, particularly their strengths to carry out follow-up actions.

B. Operational Considerations

1. **Background Analyses** Documents will be prepared for each sector compiling background information currently available in the agencies. These papers will be used to inform the Federal teams and provide some basis for discussions with the private sector.
2. **Scoping Mtg.** We should convene a small "scoping group" to plan each consultation. It should contain a few select industry leaders combined with a few federal experts. This group can help strategize about the best way to frame questions, how the effort should be defined for that sector, and how to ensure the best outcomes.
3. **Attendance** We should be inclusive of as many companies as possible. Pending review of FACA requirements, the meetings would be more constructive if they were "off the record." It might also be useful to have a follow up meeting to vet any ideas with others involved with the sector (academics, labor leaders and public interest groups).

On the federal side, we should assemble expert teams from relevant agencies (Energy, EPA, Commerce, Agriculture, Transportation, Defense, Interior, NASA, State, USTR, AID) and White House offices (NEC, CEQ, OSTP, OMB, NSC). We should select a leader for each sectoral team to help focus activities, drive the process and serve as a point of contact.

4. **Guidance** Sectors will be asked to prepare in advance of the consultations information on industry historical emissions, future trends, and potential reductions. For example, they could determine what the industry's baseline was in 1990 (or 1995 for those gases), what the scenarios are for 2008 to 2012 and what actions could bring the greatest improvements on those scenarios. It could also be beneficial to review the industries' competitive situation in the international economy, its business trends (including energy and environment) and its research and development plans. The ultimate goal is to reach agreement on a voluntary reduction plan, either collectively or individually.
4. **Industry Kick-Off** After the scoping meetings, the next activity will be a kick-off meeting with industry. The wider industry membership and the Federal teams will attend to describe the process to the private sector and to set the timeline for action. When industry has had time to draft a preliminary commitment, the Federal teams will follow-up, review the plans and respond to agency requests.
5. **Follow Up** The federal team should ensure that ideas are submitted for expedited consideration in the policy process. Agencies should have primary responsibility to carry out follow-up activities, pursuant to their proper authorities, under coordination by White House offices.

C. Time Line

The following time line describes the actions and responsible parties for four major activities: initial preparation, scoping meetings, industry consultations, and agreements and follow-up.

1. Initial Preparations (*present -- early March*)

Goal: To prepare the Federal government to effectively engage the private sector.

(1) Prepare planning documents that will be used as templates to guide the consultations for all sectors.

- Finalize template for Sector Analyses; analyses will include sections on sector emissions, options for emissions reductions, current sector activities, and barriers to or opportunities for emissions reductions.

WHCCTF: 3/2

- Draft Sector Analyses for 1-2 sectors; assignments made for agency leads for remaining sectors

Agencies (DOH/EPA): 3/2

- Draft questions to be addressed in consultations

WHCCTF: 3/2

(2) Establish Federal leadership structure

- Assemble an Assistant Secretary Council, with representatives of each relevant agency, to give oversight and guidance.

WHCCTF/Agencies: late February/early March

- Establish technical teams from the agencies to be responsible for each sector

WHCCTF/Agencies: late February/early March

(3) While consultations will occur with the full list of industries categorized in the scoping paper, initial meetings will proceed in a phased manner to immediately address those industries who are already close to making voluntary commitments to reduce emissions.

- Narrow the list of industries to 6-8 for Phase I of scoping meeting and full consultations; determine broad strategy for remaining sectors on the list

WHCCTF/Agencies: early March

Preliminary list: steel, airlines, electric utilities, aluminum, pulp & paper and cement; possibly buildings, autos, chemicals, fleets, electronics

- Select a member of the Assistant Secretary Council to join each sector group

WHCCTF/Agencies: early March

- Draft Sector Analyses for 6-8 sectors prepared and approved

Agency leads: second week of March

(4) Present work to Assistant Secretaries Council for discussion

WHCCTF/Agencies: second week of March

2. *Scoping Meetings with Phase I Industry Sectors (March)*

Goal: To plan industry consultations in conjunction with representatives of each sector.

(1) Establish contact with selected sector CEOs through calls and/or meetings with Cabinet members or other senior White House personnel. Timing might vary from sector to sector and could be held before or parallel to scoping meetings.

- Contact at least two CEOs from each sector to assure their engagement.

WHCCTF: varies

(2) Hold a preliminary, scoping meeting with a subgroup of each industry sector leaders to help plan the full industry consultations. It will be important to have appropriate industry people at these meetings who have the ability to at least informally speak for their CEOs and/or industries.

- Identify a small number of principal players in each sector from the private sector

Agency leads: early March

- Draft agenda for scoping meeting to include discussions on the structure of the consultations (agenda, questions, etc.), participants, and review of draft sector analyses

WHCCTF: early March

(3) The scoping meetings could probably be done in two weeks, holding about three each week.

WHCCTF/Agency teams: 3/15 - 3/30

(4) Roll-out event to lay out plans (vision, scope, time table)

- Two parts: POTUS or VPOTUS meeting with CEOs followed by a larger briefing of DC representatives from key sectors

WHCCTF: mid to late March

(5) Input from labor and environmental groups is also highly desirable. Teams for these "sectors" will also be assembled, and their efforts will be incorporated into the industry consultations.

3. Industry Consultations (April -- August)

Goal: To encourage voluntary emissions reductions commitments from the industry sectors, improve understanding of technology opportunities, and identify and reduce barriers to these reductions.

(1) Before the start of the Phase I consultations, the input from the scoping meetings should be incorporated into the Sector Analyses.

- Finalize questions for industry and other inputs for consultations

WHCCTF/Asst Sec Council: 4/15

- Using the other documents, draft an options workbook matching barriers and potential opportunities with existing options available to sectors (inventory of Federal "carrots")

WHCCTF/Asst Sec Council: 4/15

(2) The actual industry consultations will involve as broad a participation within each sector as possible. The consultations will require a series of meetings. First, an industry kick-off to present charge to full industry membership. Second, meetings with Federal teams to review commitment plans and plan implementation.

Agency teams/WHCCTF: 1st set, end April - late May; 2nd set, July - early Aug.

(3) At the earliest appropriate time, the labor and environmental groups will be incorporated into the process. Their exact participation may vary from sector to sector.

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(5) Industry teams will present draft agreements to the Assistant Secretary Council.

Agency leads: end August

4. Agreements and Follow-Up (September -- October)

Goal: To ensure agreements are finalized and set into motion.

(1) The draft agreements will include responsibilities/activities for both industry and Federal agencies. The industry section will include their commitments on emissions reductions. The Federal agency section would include the help already available to sectors and potential agency actions to address barriers identified. Ideally, endorsements from labor, environments and some relevant state agencies will be solicited.

Agency teams: September

(2) A roll-out event by senior administration officials with presentations by industry and by agencies.

Mid-October

(3) Continue work on remaining industries, beginning a second phase of scoping meetings and full industry consultations.

End of October

II. SPECIFIC GROUPS

There are specific players in key industries that can provide important inroads into most of the major emissions sectors. I would recommend that we begin consultations with the groups that have already expressed interest (Phase I). As we build a track record of success, it will be easier to bring others on board.

Phase I Sectors

Energy Intensive Industries

Seven industries emit 50 percent of the greenhouse gases from the industrial sector (which is a full third of the emissions from end use sectors). Four of these are being considered for inclusion in the first phase of consultations. In addition, the carbon dioxide released during the calcification process means that the cement industry is also included here.

1. Steel
2. Aluminum
3. Pulp and Paper
4. Chemicals
5. Cement

Electric Utilities/Fuels/Buildings

Electric utility emissions comprise one-third of U.S. source emissions. The fuels producer and building sectors crosscut all the industry sectors listed, but none of the fuels producers are likely to be addressed during this first phase.

- 6. Electrics
- 7. Buildings

Transportation

The transportation sector represents a final third of U.S. end use emissions. Especially in the case of automobiles, the presence of so many individual emitters will prove extremely challenging.

- 8. Airlines
- 9. Automobiles
- 10. Fleets

Future Growth Industries

Industry sectors whose emissions are projected to rise in the future also need to be a part of the consultations.

- 11. Telecomm/ Electronics

Phase II Sectors*Energy Intensive Industries*

- 12. Glass
- 13. Foundries
- 14. Refineries

Electric Utilities/Fuels/Buildings

- 15. Natural Gas
- 16. Renewables
- 17. Efficiency
- 18. Mining

Transportation

- 19. Railroads

Other

- 20. Appliances
- 21. Vendors
- 22. Agriculture

III. Addendum

- A: Industry Plans for Early Reductions -- A one-page summary description
- B: Questions for Industry -- Sample questions to be considered by industry

ADDENDUM A: INDUSTRY PLANS FOR EARLY REDUCTIONS*Draft: March 4, 1998*

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- barriers to achieving reductions that could be removed;
- incentives that could be created to encourage such reductions;
- possible changes in federal procurement or practices;
- options for reducing emissions through trading or sequestration;
- opportunities for achieving reductions abroad; and
- a longer-term research and development strategy.

FEDERAL GOVERNMENT'S ROLE:

To facilitate the development and implementation of industry plans by:

- inventorying existing programs and resources with the potential to reduce greenhouse gas emissions;
- where appropriate, provide collaborative support to facilitate a broad based industry dialogue, to contribute technical and analytic assistance, and to provide other assistance in the development of industry plans for early action;
- working cooperatively, wherever possible, to remove barriers and create new incentives for reducing emissions; and
- developing guidelines for early credit for qualifying reductions.

WHY PARTICIPATE:

Participating industries will be able to jump start their search for low cost reductions, benefit from federal support in such efforts, and be poised to help shape and take advantage of credit for early actions.

TIMETABLE:

Kick-Off Meetings with Initial Sectors	March-April
Plan Preparation	April-August
Initial Sector Plans Presented	September-November
Additional Plans and Implementation.....	November and beyond

ADDENDUM B: QUESTIONS FOR INDUSTRY*Draft: March 4, 1998***BACKGROUND**

- Describe the nature of the industrial sector. Include number and size of firms, industrial output and sales, overseas investments and exports, and a general description of the economic forecast for the industry including future sales and any projected changes in structure, technology or market position of the industry.
- Identify current sources of greenhouse gas emissions. Where possible, include estimates of baseline emissions and of projected future emissions. Also, specifically identify energy use (total and per unit of output).
- Discuss technological options for greenhouse gas reductions (e.g. energy efficiency or renewable energy). This would include an estimate of relative cost effectiveness of options identified. Options that sequester greenhouse gases may also be included here. Include existing activities, especially those in partnership with government, to reduce emissions of greenhouse gases.
- Explore ways to include labor and environmental group leaders (or other relevant parties outside the industry) in the process.

EMISSIONS REDUCTION GOAL

- Describe in detail the emissions reduction goal in relation to the Kyoto baseline, including the time frame for achieving the reduction. Identify which companies within the industry are cooperating to achieve the goal.
- Identify emissions reductions that would be possible before the first Kyoto budget period if credit for early action was available.
- Include an action plan showing the actions to be taken by industry and how the goal will be achieved.
- Identify barriers to achieving reductions and who might remove them. Include potential incentives to encourage reductions that could be created and who might create them. Focus on possible changes in government (Federal, state or local) practices or procurement.
- Identify long term R&D needs to achieve additional reductions in greenhouse gas emissions for the industry.
- Identify the impacts on competitiveness, productivity, jobs, further environmental benefits or other auxiliary outcomes from meeting the greenhouse gas emissions reduction goal.



White House Climate Change Task Force

734 Jackson Place, N.W. • Washington, DC 20503

March 10, 1998

MEMORANDUM TO DISTRIBUTION

FROM: DIRK FORRISTER

SUBJECT: TIME CHANGE -- Meeting on Industry Outreach

We just learned of an inadvertent scheduling conflict with a meeting involving most of you at the Treasury Department on Thursday afternoon. In the spirit of collegiality and good government, I want to accommodate your schedules in hopes that you will do the same for us sometime. The start time for Thursday's meeting on Industry Outreach will be pushed back by a half-hour to 3:30 p.m. We have coordinated with Treasury, and Jill Eichenberger's meeting on the World Bank and Climate Change should complete its main points by 3:30. I will also endeavor to keep this meeting to an hour, allowing us to end at the regularly scheduled time. To recap, the meeting will be Thursday, March 12, from 3:30 to 4:30 p.m. in the White House Conference Center's Lincoln Room (726 Jackson Place).

The main goal of the meeting will be to gather your input and suggestions on process for the industry consultations. The basis for discussion will be the draft scoping paper distributed last week. The draft agenda is as follows:

- I. Overview of Project Goals and Approach
 - General description of what is to be accomplished and guiding principles
- II. Organizational Structure and Process
 - Federal Role and Participation (role of this Council, activities of agency technical teams, connection between consultations and other climate work)
 - Industry's Role and Participation (voluntary commitments, scoping meetings and consultations, connection to current agency efforts)
- III. Timetable
 - Proposed Activities through October
 - Need for phased approach and discussion of Phase I sectors
- IV. Next Steps
 - Future meetings of Council

If you have any other questions, you may call me or Lisa McNeilly at (202) 343-1060.



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AGENDA

— April launch (formal)

INDUSTRY CONSULTATIONS

Thursday, March 12

3:30 to 4:30 p.m.

White House Conference Center

- I. Overview of Project Goals and Approach
 - General description of what is to be accomplished and guiding principles
- II. Organizational Structure and Process
 - Federal Role and Participation (role of this Council, activities of agency technical teams, connection between consultations and other climate work)
 - Industry's Role and Participation (voluntary commitments, scoping meetings and consultations, connection to current agency efforts)
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- Voluntary Actions