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Global Climate Change International Issues

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International Climate Change Negotiations: An Overview

I. Rio Earth Summit, 1992-- UN Framework Convention on Climate Change

A. Industrialized nations aim for 1990 levels by 2000

B. Developing countries adopt policies and measures, but no aim similar to year 2000 goal

II. Current Round of Negotiations: Kyoto, December 1997

A. "Realistic, Achievable and Binding" Targets

1. EU proposal
2. Small island states proposal
3. "Differentiation"-- Australia, Canada, Norway

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1. International emissions trading
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THE WHITE HOUSE

Office of the Press Secretary
(New York, New York)

For Immediate Release June 26, 1997

REMARKS BY THE PRESIDENT IN ADDRESS TO THE UNITED NATIONS SPECIAL SESSION ON ENVIRONMENT AND DEVELOPMENT

The United Nations
New York, New York

6:30 P.M. EDT

THE PRESIDENT: Thank you very much. Mr. President, Mr. Secretary General, ladies and gentlemen: Five years ago in Rio, the nations of the world joined together around a simple but revolutionary proposition, that today's progress must not come at tomorrow's expense.

In our era, the environment has moved to the top of the international agenda because how well a nation honors it will have an impact, for good or ill, not only on the people of that nation, but all across the globe. Preserving the resources we share is crucial not only for the quality of our individual environments and health, but also to maintain stability and peace within nations and among them. As the father of conservation in our nation, John Muir, said, "When we try to pick anything out by itself, we find it hitched to everything else in the universe."

In the years since Rio, there has been real progress in some areas. Nations have banned the dumping of radioactive wastes in the ocean and reduced marine pollution from sources on land. We're working to protect the precious coral reefs, to conserve threatened fish, to stop the advance of deserts. At the Cairo Conference on Population and Development, we reaffirmed the crucial importance of cooperative family planning efforts to long-term sustainable development.

Here in America, we have worked to clean up a record number of our toxic dumps and we intend to clean 500 more over the next four years. We passed new laws to better protect our water, created new national parks and monuments, and worked to harmonize our efforts for environmental protection, economic growth and social improvement, aided by a distinguished Council on Sustainable Development.

Yesterday, I announced the most far-reaching efforts to improve air quality in our nation in 20 years, cutting smog levels dramatically, and, for the first time ever, setting standards to

lower the levels of the fine particles in the atmosphere that form soot. In America, the incidence of childhood asthma has been increasing rapidly. It is now the single biggest reason our children are hospitalized. These measures will help to change that, to improve health of people of all ages, and to prevent as many as 15,000 premature deaths a year.

Still, we here have much more to do, especially in reducing America's contribution to global climate change.

The science is clear and compelling: We humans are changing the global climate. Concentrations of greenhouse gases in the atmosphere are at their highest levels in more than 200,000 years, and climbing sharply. If the trend is not changed, scientists expect the seas to rise two feet or more over the next century. In America, that means 9,000 square miles of Florida, Louisiana, and other coastal areas will be flooded. In Asia, 17 percent of Bangladesh, land on which six million people now live, will be lost. Island chains such as the Maldives will disappear from the map, unless we reverse the predictions.

Climate changes will disrupt agriculture, cause severe droughts and floods and the spread of infectious diseases, which will be a big enough problem for us under the best of circumstances in the 21st century. There could be 50 million or more cases of malaria a year. We can expect more deaths from heat stress. Just two years ago, here in the United States in the city of Chicago, we saw the tragedy of more than 400 of our citizens dying during a severe heat wave.

No nation can escape this danger. None can evade its responsibility to confront it. And we must all do our part -- industrial nations that emit the largest quantities of greenhouse gases today, and developing nations whose greenhouse gas emissions are growing rapidly. I applaud the European Union for its strong focus on this issue, and the World Bank for setting environmental standards for projects it will finance in the developing world.

Here in the United States, we must do better. With 4 percent of the world's population, we already produce more than 20 percent of its greenhouse gases. Frankly, our record since Rio is not sufficient. We have been blessed with high rates of growth and millions of new jobs over the last few years, but that has led to an increase in greenhouse gas emissions in spite of the adoption of new conservation practices. So we must do better, and we will.

The air quality action I took yesterday is a positive first step, but more must follow. In order to reduce greenhouse gases and grow the economy, we must invest more in the technologies of the future. I am directing my Cabinet to work to develop them. Government, universities, business and labor must work together. Al these efforts must be sustained over years, indeed, over decades. As Vice President Gore said Monday, "Sustainable development requires sustained commitment." With that commitment, we can succeed.

We must create new technologies and development 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 can also help us to address climate change. This is a challenge we must undertake immediately and one in which I personally plan to play a critical role.

In the United States, in order to do our part, we have to first convince the American people and the Congress that the climate change problem is real and imminent. I will convene a White House Conference on Climate Change later this year to lay the scientific facts before our people, to understand that we must act, and to lay the economic facts there so that they understand the benefits and the costs. With the best ideas and strategies and new technologies and increased productivity and energy efficiency, we can turn the challenge to our advantage.

We will work with our people and we will bring to the Kyoto conference a strong American commitment to realistic and binding limits that will significantly reduce our emissions of greenhouse gases.

I want to mention three other initiatives briefly that we are taking to deal with climate change and to advance sustainable development here and beyond our borders.

First, to help developing nations reduce greenhouse gas emissions, the United States will provide $1 billion in assistance over the next five years to support energy efficiency, develop alternative energy sources and improve resource management to promote growth that does not have an adverse effect on the climate.

Second, we will do more to encourage private investment to meet environmental standards. The Overseas Private Investment Corporation will now require that its projects adhere to new and strengthened environmental guidelines, just as our Export-Import Bank already does as I hope our allies and friends soon will. Common guidelines for responsible investment clearly would lead to more sustainable growth in developing nations.

Third, we must increase our use of new technologies even as we more to develop more new technologies. Already, we are working with our auto industry to produce cars by early in the next century that are three times as fuel-efficient as today's vehicles. Now we will work with businesses and communities to use the sun's energy to reduce our reliance on fossil fuels by installing solar panels on one million more roofs around our nation by 2010. Capturing the sun's warmth can help us to turn down the Earth's temperature.

Distinguished leaders, in all of our cultures we have been taught from time immemorial that, as Scripture says, "One generation passes away and another comes, but the Earth abides forever." We must strengthen our stewardship of the environment to make that true and to ensure that when this generation passes, the young man who just spoke before me and all of those of his generation will inherit a rich and abundant Earth.

Thank you very much. (Applause.)

END 6:42 P.M. EDT

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From Bill Antholis

Using A Border Adjustment To Take The Lead On Climate Change Without Encouraging Runaway Shops

By Frank Muller and Andrew Hoerner

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Negotiations are currently underway through the Framework Convention on Climate Change (FCCC) for a new binding agreement by industrialized countries to reduce their emissions of greenhouse gases over the next few decades. The agreement is due to be signed in Kyoto, Japan, this December. It implements a key principle of the convention that was signed by President Bush in 1992 and ratified by the U.S. Senate: that developed countries should take the lead in combating climate change. Nevertheless, on July 25, in what has become known as the Byrd Resolution (after its chief sponsor), the Senate resolved that the United States should not sign the agreement unless it includes "new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period." Underlying this resolution are concerns that the Kyoto agreement will cause a loss of American jobs to China and other developing countries. Are these concerns justified? If so, does the Byrd resolution solve the problem? Is there a better solution?

Will the Kyoto agreement cause widespread loss of American jobs to developing countries?

No. An effective agreement will lead over time to lower employment in some industries, such as coal mining and higher employment in others, such as natural gas, energy efficiency and renewable energy technologies. But it will not cause widespread loss of American jobs to developing countries. Two-thirds of US carbon dioxide emissions come from energy used in transportation and buildings -- activities that by their nature cannot be exported. The remaining one third comes from manufacturing. In most of manufacturing, except for a few energy-intensive industries, energy is too small a cost factor for emissions limits to provide any real incentive for relocating overseas. Furthermore, American coal miners will not lose their jobs to China because emissions limits will apply equally to all coal consumed in the United States regardless of its origin.

Is there a risk of runaway shops in energy-intensive manufacturing?

Yes. It is widely recognized that to achieve long-term reductions in US carbon dioxide emissions at least cost will require an economy-wide incentive as well as incentives and other measures targeted to individual sectors. The two main options are a carbon tax or a system of tradable carbon emission permits. Either would raise the cost of energy from fossil fuels. Energy is a significant cost factor in a small number of industries including aluminum, pulp and paper, iron and steel, and basic chemicals (see attached table). Energy costs have always influenced where investments are made in these industries. Following the fuel price increases of the 1970s, for example, aluminum production was relocated from Japan and (to some extent) Europe to countries with cheaper electricity, such as Australia. Similarly, future investments might be redirected from countries where energy costs are expected to rise due to carbon dioxide emissions limits to countries with lower emissions constraints or no limits at all. In total, the industries facing this risk account at most for about 1 percent of US employment. In other words, critics have vastly exaggerated the magnitude of the runaway shop problem. Nevertheless, these

industries provide good jobs that form an important part of the economic base of some regions of the country.

Does relocation overseas of energy-intensive production help protect the climate?

No. Carbon dioxide has the same impact on the global climate system wherever emitted. In some cases, a marginal reduction in global emissions may be achieved, if efficient new greenfield plants overseas displace aging US production capacity. But, in other cases, displacement may involve greater utilization of existing inefficient power plants or manufacturing capacity in a developing or transition country, resulting in a net increase in global emissions. More importantly, though, the relocation option greatly weakens the economic incentive for developing more efficient production technologies and substitute low-emission products. The climate change convention's goal of stabilizing atmospheric greenhouse gas concentrations can only be achieved through a transition to sustainable production and consumption patterns. Simply shifting emissions around the world puts off the task of undertaking this transition. And from a political perspective, the threat of job displacement is used by special interests to undermine climate protection efforts, not only in the United States but also in every other developed country.

Does the Byrd resolution solve the runaway shop problem?

No. Even if developing countries agree at Kyoto to accept specific scheduled commitments on the same timetable as developed countries, this would not greatly diminish the risk of runaway shops. Senator Byrd himself has accepted that commitments will need to vary among countries according to level of development. Whereas industrial countries will be required to reduce emissions below current levels, developing countries at most will face limits to future growth. An American steel corporation, for example, could still move production and emissions to Mexico or Indonesia and export steel back to the United States without either country breaching its treaty commitments. Countries like China, India, and Indonesia with relatively low per-capita emissions (one-tenth of US levels or lower) would likely have considerable room within their emissions "budgets" to accommodate expansion in energy-intensive manufacturing for export to industrial countries. The Byrd resolution fails to address this problem, yet threatens to undermine the negotiations by reneging on earlier agreements by the United States.

Do joint implementation and international emissions trading solve the runaway shop problem?

No. US negotiators have proposed that the Kyoto agreement allow joint implementation (JI) between industrial and developing countries and emissions trading among industrial countries. Some proponents of JI and international trading have argued that these schemes address jobs concerns by promoting emissions reductions in developing countries and enabling affected US firms to reduce their compliance costs. Under JI, a firm could invest in a low-cost emission reduction project in a developing country and gain a credit for a share of the reductions against its own domestic emissions. Under international trading, a firm would purchase emission rights (directly or indirectly) from another industrial country with lower emission reduction costs that is able to do better than its treaty commitments. Whatever the merits of JI and international trading

in enhancing flexibility and lowering costs, though, they do not necessarily solve the runaway shop problem.

At best, JI and international trading would reduce, but not eliminate, the cost disadvantage imposed on US-based energy-intensive manufacturers by an effective emission-reduction agreement. Under such an agreement and a JI regime that provides real and verifiable emission reductions in developing countries, not just paper reductions, emission credits would be unlikely to cost less than around $20 per ton of carbon. The purchase of such credits would still impose a significant cost disadvantage on energy-intensive plants selling into highly competitive global markets.

At worst, the expansive JI and trading schemes advanced by some proponents within the Administration and environmental community could actually promote footloose corporate behavior. For example, in the JI case, a US steel firm could invest in improving the efficiency of a steel plant in Brazil (or alternatively Mexico or Indonesia) as part of a joint venture deal that also included construction of a new steel plant. The firm could use the emission reduction at the upgraded plant to gain a credit under JI against its US emissions while also importing steel from the new plant to displace its highest-cost US capacity. Similarly, in the case of tradable permits, an aluminum major facing high electricity costs for its eastern US plants (or the coal-based utility which supplies it) might invest in Russia's inefficient and underutilized power supply and aluminum industries and close its oldest US plants. As Russia is expected to easily meet its treaty commitments, the deal could be partly financed through the sale of internationally tradable emission rights to the US utility. In these cases, JI and international trading form an integral element of the financing of deals that shift American jobs overseas.

Why not simply exempt energy-intensive industries from emission limits?

The manufacturing sector or particular energy-intensive industries could be exempted from a carbon tax or permit scheme. However, this would increase the cost to the economy as a whole by requiring a greater emission reduction effort in other sectors. It also would greatly diminish the incentive to improve production technologies in the exempted industries, develop substitute low-emission products and generally shift to more sustainable consumption patterns. Moreover, as the BTU tax debate demonstrated, exempting heavy industry would undermine broader support for the tax or permit scheme.

What is a border tax adjustment?

Under the "destination system" of border tax adjustments (BTAs), traded goods are subject to the taxes of the importing ("destination") country and exempted from the taxes of the exporting ("origin") country. For instance, gasoline trucked from Toronto to Buffalo is exempted from paying gasoline tax in Canada and subject to gasoline tax in New York, at the combined New York/federal tax rate. BTAs are a necessary part of a tax on national or in-state consumption, and are a nearly universal feature of sales, excise, value added and other taxes. Because BTAs are required for consistent treatment of a consumption tax base they are regarded as a normal part of the tax and not as a form of local favoritism.

How can a border tax adjustment solve the runaway shop problem?

BTAs are the most straightforward way to prevent firms in low-tax jurisdictions from preying on energy-intensive industries in high tax jurisdictions. A BTA system would rebate the tax on fuels used to produce energy-intensive exports (such as metal ingot and certain bulk chemicals), thus maintaining the competitiveness of exports. A comparable tax would be imposed on imports of energy-intensive basic materials to put foreign firms on a level playing field in the home market. This BTA system is a natural part of a tax on fuels used to produce goods consumed domestically.

BTAs should be distinguished from tariffs and other forms of industry protection. Energy-intensive manufacturers (e.g. basic chemicals, aluminum) already undertake large investments in developing countries that sometimes displace American production and jobs. Various factors make such investments attractive including lower resource costs and the prospect of winning large new markets. A BTA ensures that job displacement is not accelerated by the FCCC, but does not favor domestic over foreign production or otherwise alter underlying market conditions. Aluminum or ethylene production that already would have been shifted overseas, for example, will still be shifted. But it won't be shifted because of climate protection policies.

Why are border tax adjustments controversial?

Some advocates of unbridled free trade argue that BTAs for taxes on carbon embodied in energy-intensive traded goods are or should be barred by the General Agreement on Tariffs and Trade (GATT). (BTAs on the fuels themselves are universally accepted.) There are three major arguments for this position:

The basic policy argument. Many GATT experts take seriously the conclusion of the never-adopted Tuna-Dolphin decision that trade measures can be based only on taxes on *products*, and not on taxes on *processes*.

The practicality argument. Some administrators have argued that such BTAs would be *hard to enforce* or *easy to abuse*.

The technical legal argument. Some legal scholars argue that the rebate of taxes on embodied fuels is barred by the GATT Subsidies Code's ban on rebating *prior stage cumulative indirect taxes*.

Does the GATT forbid border tax adjustments on "process" taxes?

No. The GATT allows BTAs on taxes that fall "directly or indirectly" on like products. It was the intent of the original GATT negotiators that process as well as product charges be border adjustable. This language was first introduced in 1946 by U.S. negotiator Oscar B. Ryder at the London Preparatory Committee as part of the process of drafting the Havana Charter, the precursor to GATT. The Brazilian delegate, Mr. Rodrigues, demanded to know what was meant by the addition of the term "or indirectly." Mr. Ryder replied that the language was to allow border adjustments on "a tax, not a tax on a product as such, but on the processing of a product, which are covered by the word 'indirectly' here ." The process/product distinction proposed by the Tuna-Dolphin Panel, like the Tuna-Dolphin decision itself has never been adopted by the GATT contracting parties or by the World Trade Organization (WTO).

Can border tax adjustments be administered effectively?

Yes. A BTA system for carbon taxes would be no more complicated than the BTA systems already in place for many other taxes. For instance, the U.S. administers border tax adjustments on hundreds of chemicals under the Superfund toxic chemical excise tax. BTAs apply to all taxed chemicals, and to all products manufactured primarily from a taxed chemical. If the producer documents the amount of taxed chemical used in the manufacture, the tax is based on the documented amount. Otherwise, it is taxed at a rate set by Treasury regulation, based on the amount of the taxed chemical that is used to manufacture the same product in the U.S. under the predominant method of production. This tax was held by the GATT to be consistent with international trade rules. The Ozone-Depleting Chemicals (ODC) Tax has similar BTA provisions, except that it is a "process" tax, in that it applies to products manufactured with taxed substances but not physically incorporating them, such as electronic parts cleaned with ODCs.

BTAs on the embodied carbon in energy-intensive goods would be administratively identical to the BTAs on these existing taxes. For plausible carbon tax rates, only a handful of energy-intensive basic materials -- fewer than are covered under the existing Superfund chemical excise -- would have price increases great enough to justify border adjustment.

Are border tax adjustments on taxes on embodied carbon barred as "prior stage cumulative indirect" (PSCI) taxes.

No. Border adjustment of carbon taxes is clearly not barred by the ban on PSCI taxes, for two reasons. First, the Uruguay Round Amendments to the GATT specifically excluded taxes on fossil fuels from the scope of the PSCI tax ban. Second, energy taxes are not PSCI taxes because they are not "cumulative." Although energy is used in every phase of the manufacturing process, each unit of fuel is taxed only once. This contrasts with the standard example of a PSCI tax, the cascade tax. A cascade tax is a tax on the value of all products sold, including goods used as materials in the manufacture of other goods. Cascade taxes cumulate, because the tax on, for example, sheet steel used to make an automobile, becomes part of the cost of manufacturing the automobile and the tax is *itself taxed again* when the automobile is sold. Cascade taxes were once common in Europe, but are now extinct in all but a few developing nations, having been replaced by VATs (which, like energy taxes, are not cumulative).

If the United States chooses a domestic emission trading scheme rather than a carbon/energy tax, could such a scheme include a border adjustment?

The Clinton Administration has not proposed specific domestic policies to implement the proposed Kyoto agreement. Current thinking within the Administration, however, favors a domestic tradable permit scheme over a carbon/energy tax. Such permits either would be auctioned by the government (most likely to coal, oil and gas companies at the point where carbon fuels enter the economy) or given away under "grandfathering" rules (most likely to utilities and other major industrial emitters). In principle, a border adjustment (at the current market price of permits) could be levied on imports and

rebated on exports of energy-intensive products as part of such a scheme. Doing so, however, would raise different and more difficult international legal and policy issues than in the case of a tax.

Whereas border adjustments on consumption taxes have long been used and accepted under international trade rules, this is not true for environmental requirements like emissions permits. In implementing a border-adjusted permit scheme, the United States could not rely on the above mentioned BTA provisions of Article III of the GATT, except by analogy, and therefore probably would have to claim an environmental exemption under Article XX from GATT trade rules otherwise prohibiting import charges and export subsidies. Such a scheme, therefore, would be more vulnerable than a BTA to a challenge through the WTO by a country seeking to exploit the climate change convention for competitive advantage. GATT and WTO dispute panels have not looked favorably on claims for environmental exemptions. Indeed, to date, no country has successfully defended the use of Article XX to justify an environmental policy measure that runs foul of GATT provisions. Given this history, the availability of border adjustments for tradable permits cannot be guaranteed without a multilateral agreement specifically allowing them as part of the Kyoto accord.

Although elements of the trade community might object to including such provisions in the Kyoto accord, there are precedents for including even stronger trade provisions in multilateral environmental agreements (e.g., Montreal Protocol, Convention on International Trade in Endangered Species). Article 5.3 of the FCCC states "Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade." The earlier discussion makes clear that BTAs do not constitute "arbitrary or unjustifiable discrimination" within the meaning of this article. Although legally different, the trade policy arguments for allowing border adjustments for auctioned emission permits are virtually identical. However, in the case of grandfathered permits, the trade community might legitimately argue that border adjustments at the market price of the permit unjustifiably discriminate in favor of domestic producers by overcompensating them for the actual costs imposed by the emission permit scheme. In summary, the runaway shop problem can be avoided with a border-adjusted carbon tax but achieving the same goal with tradable permits may require a specific provision in the Kyoto agreement overriding GATT trade rules.

Frank Muller is Director and Andrew Hoerner is Research Director of the Environmental Tax Program. For a more detailed discussion of border tax adjustments, see J. Andrew Hoerner and Frank Muller, "Carbon Taxes for Climate Protection in a Competitive World," Center for Global Change, University of Maryland, June 1996 (available from the authors, and also published in an abbreviated form by the Swiss Federal Office for Foreign Economic Affairs in E. Staehelin-Witt and H. Blöchliger, "Ökologisch orientierte Steuerreformen," Verlag Paul Haupt, Bern, Switzerland, 1997.)

For further information, contact Frank Muller (E-mail: fgmuller@igc.org; Fax: 202-775-0819; Ph: 202-331-5521).

Direct Cost Impact of a $50 per ton Carbon/Energy Tax for the 24 Most-Affected Manufacturing Industries				
Industry Groups and Industries	Energy Tax (% of Shipments)	Employment (1,000s)	Cumulative Employment (% of manufacturing)	Cumulative Value of Shipments (% of manufacturing)
Lime	23.9%	4	0%	0%
Primary Aluminum	15.0%	20	0%	0%
Cement Hydraulic	13.7%	16	0%	0%
Alkalies and Chlorine	9.9%	8	0%	0%
Industrial Gases	8.4%	9	0%	1%
Nitrogenous Fertilizers	8.0%	7	0%	1%
Paper Mills	7.4%	130	1%	1%
Electrometalurgical Products	7.2%	5	1%	1%
Paperboard Mills	6.2%	51	1%	2%
Blast Furnaces and Steel Mills	5.9%	177	3%	3%
Industrial Inorganic Chemicals nec	3.9%	79	3%	4%
Beet Sugar	3.7%	8	3%	4%
Synthetic Rubber	3.7%	12	3%	4%
Cellulosic Manmade Fibers	3.7%	11	3%	4%
Pulp Mills	3.5%	17	3%	4%
Wet Corn Milling	2.8%	10	3%	4%
Flat Glass	2.7%	13	3%	4%
Industrial Organic Chemicals nec	2.4%	101	4%	6%
Glass Containers	2.3%	35	4%	6%
Primary Nonferrous Metals nec	2.3%	11	4%	7%
Mineral Wool	2.2%	18	4%	7%
Gray and Ductile Iron Foundries	2.1%	76	5%	7%
Petroleum Refining	2.0%	74	5%	12%
Pressed and Blown Glass nec.	2.0%	33	5%	12%

Source: Analysis by J. Andrew Hoerner using energy consumption estimates from the U.S. Department of Energy's Manufacturing Energy Consumption Survey. Employment and value of shipment data is from the National Bureau of Economic Research's Productivity Database. Manufacturing industries are defined at the four digit SIC level. All data is for 1991.

Notes: The tax would apply to all fossil fuels at a rate of $50 per ton of carbon and to large-scale hydro and nuclear electricity at the national average rate for utility fossil-fired generation. Such a tax is at the high end of proposals by advocates of stronger climate change policy, and ideally would be phased in over 5-10 years. It translates into 13 cents per gallon on gasoline, and measured in terms of its impact on electricity is about three times President Clinton's 1993 Btu tax proposal. Due to high transportation costs and other factors, some of the above industries (e.g., cement) face limited international competition, and therefore little risk of job exports. All manufacturing accounted for 15.3 percent of U.S. non-farm employment in 1996.

COUNCIL OF ECONOMIC ADVISERS

MEMORANDUM

To: Jeff Frankel August 29, 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 with Annex 1	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 Annex 1	Total Exports to: 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.

Jeffrey A. Frankel
08/29/97 08:42:28 AM

Record Type: Record

To: Jon D. Haveman/CEA/EOP
cc: Joseph E. Aldy/CEA/EOP, Randall W. Lutter/CEA/EOP
bcc:
Subject: Re: Net Exports of energy intensive industries

Jon

Thanks for your memo. Very interesting. It confirms surprisingly strongly our suspicions that adverse "competitiveness" effects on a few energy-intensive industries might be offset in other sectors. (You mention that checking whetehr net exports are positive is not the same as comparative advantage. How seriously do you think we should we take this, in practice?) Regarding your last sentence, do you think this line of argument is too "superficial" to allow us to say "there is evidence against the view that excluding LDCs would have a substantial adverse effect on overall US "competitiveness" "? As opposed to "we can't say anything."?

Your list of energy-intensive industries overlaps almost perfectly with the list of six that we cited in a paper (author Peter Orszag, NEC) on LDC participation and US competitiveness. The only exceptions are Glass is on your list and not ours, and petroleum refining was on our list but not yours. (Obviously we import crude; but I don't know if we import or export refining services?) So you might add oil refining.

Should we correct for the fact that, these days, the US is a net importer of the average industry (i.e., we run a trade deficit)? This would be the easiest first step to generalizing the analysis to more sectors. Another possibility would be to figure out what are the LEAST energy intensive industries, and to see whether we import or export them.

Make any revisions to your memo appropriate. Include at the beginning a couple paragrpahs explaining the relevance. (The conclusion at the end shouldn't pertain to whetehr we care at all on economic grounds, but whetehr we care regarding "competitiveness", or -- if you'd rather avoid the word -- regarding trade effects. We certainly care a lot whether the LDCs are in terms of economic cost per unit reduction in GHG concentrations.) Then let's send a copy to Orszag, and Gruber at Treasury.
JF

Jon D. Haveman

Jon D. Haveman
08/28/97 08:46:51 PM

Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP

cc:
Subject: Net Exports of energy intensive industries

Jeff,

I have generated some net-exports data for the following industries:

Paper and Allied Industries (SIC 26)
Chemicals and Allied Products (SIC 28)
Inorganic Chemicals (SIC 281)
Stone, Clay, and Glass Products (SIC 32)
Cement, Hydraulic (SIC 3241)
Primary Metal Industries (SIC 33)
Blast Furnace and Basic Steel Products (SIC 331)
Primary Aluminum (SIC 3334)

If these are not the industries that I should have been focusing on, please let me know. The data can very easily be altered to cover an alternative set of industries. The data are enclosed in the following WP document.

Jon

EMITNEX.WP

August 19, 1997

Comments on "Additionality in the Context of Joint Implementation", August 13 Draft
Office of Economic Policy, Treasury Department

1) The central problem with this paper is that it does not sufficiently acknowledge the *fundamentally difficult task of establishing that emissions reductions are incremental.* Each of the approaches proposed involves comparisons to a counterfactual that is not observed, only modelled. As such, the guarantee of additionality is only as good as the models themselves. The memo presents no evidence on the quality of the predictions from these types of models, nor a sufficiently rich discussion of the technical difficulties inherent in applying these types of modelling exercises in the context of JI.

To see this, compare the approaches listed in this paper to the best possible approach: JI with binding developing country committments on emissions levels. This simply amounts to international trading with developing countries included. In such a world, we are guaranteed incrementality: to claim credit for a unit of emissions reduction, a company in the U.S. will have to buy a permit in the developing country for one unit of emissions. This will by definition guarantee that emissions in the developing country drop by one unit, since there is a fixed total of emissions credits in that country. Thus, additionality is assured, since there is now one fewer units of total emissions from other sources in the developing country.

Now, compare to this the best possible modelling approach. Under this approach, engineering specialists draw up a prediction about the future path of generation power sources (for example) in the developing country. But any prediction is just that, and as such will have some error. In some cases, the prediction will understate the pace of technological advance in the developing country, so that companies will get credit for building a type of plant that would have been built anyway. In some cases, the prediction will overstate the pace, so that companies will not build a plant because they are not getting credit. In any case, given that all models make prediction errors, there will be resulting error rates in our ability to assign JI credit. So there is *no way to guarantee additionality without binding developing country committments.*

This is not to say that there is JI is completely non-additional under the proposed approaches. Indeed, the methodologies suggested are clever and are probably the best that we can do without committments from developing countries. But while the paper acknowledges potential problems such as those described above in the fourth paragraph, it then immediately turns into the fifth to "assuring additionality". A footnote in that paragraph offers the appropriate caveat, but the implication is that additionality can be assured nonetheless.

This problem can be partially addressed by making three straightforward changes:

a) A new fourth paragraph on the first page should discuss the benchmark case: international trading. It should bring out the key points made above: that any JI approach which revolves around modelling baselines can only approach, and can never achieve, the additionality that would be guaranteed if developing countries were brought into an international trading regime.

b) Footnote 4 should be brought into the text and amplified.

c) Terms like "high accuracy" should be prefaced by "relatively"; these options are the highest accuracy of those listed, but may be very low accuracy relative to the ideal benchmark of international trading.

2) Do we have any evidence on how accurate the forecasts of counterfactual technology paths are likely to be? If we had done forecasts based on available data for the U.S. or some other country 10 years ago, would we have predicted anything like our current pattern of technology adoption for generation and other activities? This goes to the heart of these type of modelling approaches to establishing additionality.

3) As CEA and Treasury highlighted in their comments on an earlier draft, different approaches to modelling the processes of technological diffusion are likely to yield very different answers for the counterfactual. How will this uncertainty be resolved? This is a particularly salient question given the "all or nothing" aspect of JI. If there is some penetration of a particular type of generation, but it has not fully diffused, the company might get no credit at all. This will provide a particularly strong incentive for firms to promote the engineering estimates that support their case. How will these pressures be resisted, given the true uncertainty in the estimates?

One particular logistical difficulty will be deciding which country will be responsible for determining the counterfactual. If we let the developing countries themselves model the counterfactual, one could imagine an "engineering bidding war", where each of several countries engineers compete to make their baseline look the least advanced (thus making their country more attractive for investment by presenting more opportunity for additionality). This could be rectified by an objective U.S. or third party engineer, but this might raise a difficult set of sovereignty issues.

4) Option 3 provides the closest alternative to true additionality through developing country committments, by measuring changes in sector specific emissions patterns. But once again, it must be recognized that emissions are projected based on out of sample modelling. How accurate are our models? Once again, it would be constructive to assess how well existing models would do at predicted observed emissions history based on data that ended 10 years ago.

5) Options 4 and 5 strike us as the most problematic, since they are the most subjective. Any option which is strongly influenced by the type of proposal made by the firm, rather than by objective evidence to support additionality, will simply reward firms that are best at making their case, not those that are guaranteeing the most additionality. This will lead to huge inefficiencies ("rent-seeking losses") as firms devote substantial resources to making a case look as good as possible, rather than devoting those resources to the investment itself.

THE WHITE HOUSE

WASHINGTON

August 15, 1997

cc: JS
JA

NOTE FOR CLIMATE CHANGE POLICY OVERSIGHT GROUP

FROM: PETER ORSZAG
DAVID SANDALOW

Subject: Summer Reading

Attached is a summary of workgroup activity underway.

Also attached are papers on:

1. Joint Implementation "Additionality"

2. International Emissions Trading, and

3. Developing country commitments.

Additionality in the Context of Joint Implementation

Issue:

The U.S. is calling for joint implementation (JI) with credit to be included in the new agreement adopted in Kyoto under the Framework Convention on Climate Change (FCCC). JI is a mechanism by which a private entity in a country with an emissions budget (developed countries) invests in greenhouse gas mitigation projects in a country without a budget (developing countries). In exchange, the investor (and its country) receives credit towards its emission budget.[1]

There is a broad consensus among countries and private parties that for JI to make sense, the emission reductions that give rise to JI credit must be "additional" to -- above and beyond -- reductions that would have happened anyway in the baseline case. Consider the case where a developer wants credit for building a low-GHG-emitting plant rather than a high-GHG-emitting plant. If the high-emitting plant truly represents what would have happened in the baseline case, then it would be appropriate to give the developer credit for the difference in emissions between the high and low-emitting plant. But if the low-emitting plant would have been built anyway (because its technology represents the business-as-usual case), then credit would not be appropriate. The project would have no environmental benefit.

The principal problem identified to date is that the question "what would have happened anyway" is extraordinarily difficult to answer. Experience in the U.S. pilot program on JI indicates that analysts can differ over whether a proposal will go forward without the reward of JI credit, or conversely that it will be implemented only if credit is available.

The consequences of "getting it wrong" are large in both directions. If credit is given systematically for projects that would happen anyway, then the use of these credits to meet developed country obligations will result in higher global emissions. Consider only one area in which JI projects may be undertaken: energy efficiency improvements. The energy efficiency of electric power projects and other industrial projects in developing countries is expected to improve significantly over the next 10-20 years, reflecting the normal penetration of better technologies. Indeed, a key part of the U.S. negotiating position is to require countries to undertake "no regrets" reductions in emissions that are economically justified on their own. Preliminary analysis by EPA suggests that currently anticipated improvements in the efficiency of energy production and use in developing countries will reduce their expected emissions growth in 2010 by as much as 865 million tons of carbon, as compared with growth on the basis of existing technologies.[2] If credit were given for projects in developing countries without accounting for these expected improvements, a large amount of excess carbon emission credits could be awarded. Developed countries, as a whole, only

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[1]Note that several modelers have interpreted JI to mean international trading between Annex I and non-Annex I countries. This interpretation is not correct and is not adopted here.

[2]Recent SGM model runs.

need 750 million tons of carbon reductions to reach 1990 levels by 2010.[3]

On the other hand, if the standard of "additionality" is set too high (i.e., if unrealistic improvements are taken into the baseline case), or if projects are choked off by transaction costs associated with resolving baseline and additionality questions, then the large potential savings associated with JI will be lost.

The issue discussed in this paper is how "additionality" for JI can be assured on a practical basis in the Kyoto agreement. Since there are a large number GHG mitigation opportunities available in the developing world which are inexpensive compared to domestic opportunities, it would greatly benefit the U.S. if practical methods could be developed to assure additionality. To that end, this paper presents and develops six options for addressing additionality. All of the options are briefly evaluated in terms of their development costs, ongoing costs (transaction costs for project developers and verification costs for verifiers), comprehensiveness of applicability, accuracy,[4] and robustness over time. A final section presents stakeholder positions on JI and additionality in particular, to the extent that agencies are familiar with such positions.

The extent to which the issues surrounding additionality need to be addressed prior to Kyoto is uncertain. Some would argue that the agreement need only reference a method for addressing additionality or simply reference the need to address additionality. The details of a method for addressing additionality could be worked out by Parties post-Kyoto. Others see the resolution of issues related to additionality, to the degree possible, as essential prior to Kyoto. As discussed above, the consequences of getting additionality "wrong" are large.

Option 1. Forward-Looking Benchmarking:

A set of benchmarks could be developed and internationally agreed upon for specific technologies and practices associated with JI. JI projects would be considered additional if the technology they employed were lower-emitting (more efficient) than the benchmark emission level. Credits would be calculated as the difference between the performance of the JI technology or practice and the benchmark performance level.

From a practical standpoint, these benchmarks would have to be developed and negotiated following Kyoto. JI provisions in the Kyoto agreement would have to include a description of the option and a call for the subsequent adoption of guidelines by the Parties to the agreement. The first set of benchmarks would be applicable to JI projects undertaken in the first budget period. They would

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[3]This number is based on the Interagency Analytic Team's (IAT) results. IAT's baseline projections of energy use and fuel mix were based on DOE's Annual Energy Outlook (1997), and the International Energy Administration's 1997 World Energy Outlook.

[4]None of the options can truly be "accurate" at determining additionality since it is impossible to answer the question "what would have happened anyway." The paper presumes, however, that some methods are better at answering this question than others.

need to be updated and renegotiated for subsequent budget periods, reflecting improvements in the baseline ("would have happened anyway") case over time.

Several simple examples may serve to illustrate the benchmark concept.

Some JI proposals involve upgrades of existing energy production facilities. Consider a proposal to reduce the emissions of an electric power plant, by increasing the efficiency (improving the heat-rate) of the generator or by switching fuels. A benchmark would be developed for the expected future of such facilities. For illustration, that might take two forms:

- Based on economic forecasts, estimated technology penetration rates, and other factors, it may be agreed that in the business-as-usual case, these facilities would continue to be operated indefinitely without upgrade. In that case, the benchmark would reflect the emissions rate of the current facilities and credit would be given for improvements made.
- Alternatively, forecasts may show that the proposed technologies are already penetrating these markets and that these upgrades are expected to take place in the business-as-usual case. In that case, the benchmark would reflect these improvements, and no credit would be given for making them.

Other JI proposals involve projects to meet new power demand with lower emissions. Proposals include building lower-emitting power projects (e.g., renewable, gas-fired, or very efficient coal-fired plants) in place of building relatively inefficient coal-fired plants. A benchmark would be developed for the emissions-intensity of base case power production facilities, with credit given for lower-emitting projects. For illustration:

- Based on economic forecasts, estimated technology penetration rates, and other factors, it may be agreed that the baseline case is the construction of high-emitting plants, with credit given for alternative technologies with lower emissions per kilowatt-hour output. On the other hand, it may be agreed that a certain penetration of gas, wind, or other technologies is already expected, and thus JI credit should not be given to low-emitting projects which are part of that expected technology penetration.

Similar benchmarks could be developed for other technologies, such as new automobiles (carbon per mile per vehicle), or steel mills (tonnes carbon per tonne of steel). Similar issues are presented by projects to enhance the sequestration of carbon in forests or soils. A range of projects have been proposed, from preservation of existing forests, to changing logging practices (e.g., selective logging rather than clear-cutting), to the creation of tree plantations. Benchmarks for logging projects might be in tonnes of carbon emissions per board feet of lumber.

Forecasting and negotiating benchmarks for these expected emissions futures will be complex. Consideration should be given to ways to reduce such complexity. Can a single set of global benchmarks can be used, or do they will need to be regionally- or nationally-specific? Moreover, should the energy sector benchmarks be fuel neutral (tonnes of carbon equivalent emissions per unit MWh) so that it is less difficult to determine the appropriate benchmark from which to determine additionality.

The characteristics of this option are:

- *High accuracy* -- This option is likely to be highly accurate since it attempts to account for many of

the factors which affect "what would have happened anyway" such as changing economic conditions and rates of technology penetration.

- *Low verification costs* -- Once benchmarks are developed, it would be easy for verifiers to evaluate additionality. A project's emissions are either less than a benchmark or they are not.
- *Low transaction costs for project developers* -- Additionality could be determined quite easily. A project's emissions are either less than a benchmark or they are not.
- *Uncertain comprehensiveness* -- The comprehensiveness of this option depends on the extent to which benchmarks can be developed and negotiated. To the extent benchmarks are developed for a broad set of technologies and practices, the option would be fairly comprehensive. Comprehensiveness is important because the larger the set of JI mitigation opportunities, the lower the cost of reducing greenhouse gas emissions.
- *High development costs* -- Such costs would be high because countries would have to conduct a great deal of data collection and analysis to determine appropriate benchmarks and would have to negotiate benchmarks internationally.
- *Low robustness over time* -- The benchmarks not only have to be developed and negotiated initially, but they also have to be updated over time.

Option 2. Historical Benchmarking

Historical benchmarking works on the same basic principle as forward-looking benchmarking. Benchmarks are developed for technologies and practices associated with JI projects. JI projects are considered additional if the technology they employ is lower-emitting than the benchmark.

The difference between this option and the first option is that in this option the benchmarks are not negotiated at the beginning of each budget period for the entire budget period based on economic forecasts, estimated technology penetration rates, and other factors. They are instead determined on a project by project basis based on historical emissions in the sector of the project. Consider a proposal to build a lower-emitting power project (e.g., renewable, gas-fired, or even very efficient coal-fired plants) in place of a relatively inefficient coal-fired plant. The benchmark might be the average emissions intensity of coal-fired power plants in that country in the past year. Credit would be given for the difference between the emissions intensity of the benchmark and the emissions intensity performance of the project if it is lower than the benchmark.

The benchmark would not take into account factors which affect the emissions intensity of JI technology or practices as a particular JI project progresses. In this example, for instance, energy efficiency improvements in baseline coal technology in the country of the project would not be accounted for in calculating the credit for the project. Such changes would not be ignored, however. As a each new JI project is implemented, a new benchmark is utilized. Since more and more efficient processes would be implemented over time, the emissions intensity of the benchmarks would fall over time. Thus the extent to which JI credits could be created in a sectors where emission intensity is decreasing over time would diminish over time.

Presumably the methods for determining such benchmarks, rather than the benchmarks themselves, would be negotiated internationally.

The evaluation of this option is very similar to evaluation of Option 1 except that this option has lower development costs, is more robust over time, may be more comprehensive, and is less accurate. The option has lower development costs because only methods, not benchmarks, have to be developed and negotiated. The option is more robust over time because neither benchmarks nor methods would have to be renegotiated every budget period. The option may be more comprehensive to the extent that it is easier to develop methods to determine additionality rather than actual benchmarks. The option is less accurate because individual projects would be getting credit from a benchmark that does not take into account forward-looking factors which will affect what would have happened anyway such as business as usual technology penetration. Moreover, the use of average emission intensities in formulating historical benchmarks can be problematic. Averages can change slowly or be weighted down if, even as new less greenhouse gas intensive technologies are introduced, old inefficient technologies continue to be used.

Option 3. Measuring Additionality From Sector-Specific Emission Baselines

This option would involve the development of sector-specific (rather than project or technology specific) emission baselines in countries which wish to host JI for the sectors in which each country wishes to host JI. These baselines would constitute a quantitative determination of projected future GHG emissions for relevant sectors. The emissions baseline for each sector would be based on such factors as forecasted economic growth, expected penetration rates of technologies or practices, and adopted and projected policies and measures affecting the sector. Before a JI project could be deemed additional, a determination would first have to be made that emissions from an entire sector in a developing country are below the emissions baseline. The same methodologies used to report and verify emissions by Annex I countries could be used for this assessment of actual emissions. Then, the host country in conjunction with project developers, could attribute the "surplus" emission reductions to specific projects deemed worthy.

The characteristics of this option are:

- *High accuracy* -- This option is likely to be highly accurate since it attempts to account for many of the factors which affect "what would have happened anyway" such as changing economic conditions and rates of technology penetration.
- *Uncertain robustness over time* -- This option would be robust to the extent that developing countries do not change their emissions baselines or methods for allocating surplus emission reductions over time.
- *Uncertain transaction costs for project developers* -- The process used to allocate surplus emissions reductions to projects would vary by country and possibly by sector within a county. To the extent that such allocation systems are straightforward and transparent, transaction costs would be low.
- *Uncertain verification costs* -- Such costs would depend on how this option is implemented by countries.
- *Uncertain comprehensiveness* -- To the extent that all host countries develop baselines for all sectors available for investment from JI, this option would allow a broad set of projects to be eligible for JI and as a result potentially many countries. To the extent that some countries may do not develop baselines such comprehensiveness would be limited.
- *High development costs* -- Such costs would be high because countries would have to conduct a great deal of analysis to determine the appropriate emission baselines. The availability of

international guidelines, developed for Annex I countries, for determining actual emissions would reduce the costs of determining sector-wide surplus emissions.

- *Low political feasibility* -- Political feasibility is not a criteria on which the other options have been evaluated since many of these ideas are new and it is very unclear how countries would react to them. It is possible to predict that this option would be very unpopular with developing countries, however. They are likely to view this option as a step toward their acceptance of national, quantitative, GHG emission reduction commitments.

Option 4. Defining Additionality As Overcoming Project-Specific Barriers

An option, which is being advanced internationally by the International Energy Agency, would involve assessing whether a project breaks ground by overcoming barriers (institutional, financial, technological, informational, policy, financing, or market) specific to that project in the country where it is proposed. A project would be deemed additional if it is demonstrated that the existence of such barriers is inhibiting the project from going forward, that the project would represent an innovation in overcoming those barriers, and that JI credit would supply the necessary incentive to go forward. The IEA has developed a typology of barriers which provides developers and evaluators with a framework for identifying and evaluating barriers.[5] The typology defines and categorizes generic barrier types for specific sectors (power generation, transport, etc.).

The characteristics of this option are:

- *High comprehensiveness* -- The barrier typology can easily be expanded to include multiple project types.
- *Low development costs* -- To the extent that many of the development costs of this option have already been borne by the IEA (or are currently being borne as they further develop it), this option would have minimal development costs.
- *High robustness over time* -- The barrier typology can be adjusted as needed fairly easily.
- *Moderate transaction costs and investor uncertainty for project developers* -- Transaction costs and investor uncertainty will be lowered by the standardization presented by the barrier typology, but it will be unclear to project developers which additionality arguments will be accepted by reviewers. Consistency of decisions by reviewers is not guaranteed since decisions will be made on a case by case basis.
- *High verification costs for organizations determining compliance* -- Review on a project by project basis of unique additionality arguments is resource-intensive.
- *Low accuracy* -- Low probability of accuracy results from the difficulty of digesting subjective arguments about additionality and then making a determination of additionality. Also, both parties selling and buying credits would have incentives to promote the existence of barriers that might not exist.

Option 5. Assess additionality using a general set of guidelines

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[5]Not yet published International Energy Agency paper titled "Activities Implemented Jointly Under the FCCC."

This option would provide for project by project judgments of additionality based on information provided by project developers. Project developers and evaluators would use a general set of guidelines to develop and evaluate additionality arguments. This is similar to the approach currently used by the U.S. Initiative on Joint Implementation (USIJI). For example, in the original guidelines for development of a project proposal USIJI asks, regarding additionality, that project developers include a discussion of the following subjects in their project proposal:

(1) How the existence of the USIJI program helped or could help overcome any barriers to develop or implement the project;

(2) A discussion of whether the specific measures taken by the project to reduce or sequester greenhouse gas emissions are required by existing laws or regulations applicable in the U.S. or host country; and

(3) A description of the prevailing technologies and management practices now used in the host country and how the specific measures proposed in the project differ from them.[6]

The characteristics of this option are:

- *Low development costs* -- Guidelines used for existing JI programs could be compiled.
- *High robustness over time* -- General guidelines can be adjusted as needed fairly easily.
- *High comprehensiveness* -- General guidelines are not project specific and can be comprehensively-applied.
- *High transaction costs and investor uncertainty for project developers* -- High transaction costs and investor uncertainty result from the lack of standardization of the process. Which arguments will work? Which will not? Consistency of reviewer decisions is not guaranteed since they will be developed on a case by case basis.
- *High verification costs* -- Review on a project by project basis of unique additionality arguments is resource-intensive.
- *Low accuracy* -- Low accuracy results from the difficulty of digesting subjective additionality arguments and then making a determination of additionality.

Option 6. Employing safeguards such as discounting

Given that any method to determine additionality is likely to be imperfect, this option would employ safeguards, such as discounting, in addition to whatever method is adopted for addressing additionality. In this way the overall quantity of credits created through JI, some of which may have happened anyway, could be reduced. Other options for safeguards include phasing out JI in some future year, or limiting the scope of JI (e.g. developed countries might be limited to meeting 10% of their emission reduction targets trough JI).

This option cannot be evaluated like other options since the results are dependent on which safeguard is selected and which method to address additionality is used in combination with the safeguard.

Stakeholder Positions On JI And Additionality

[6]Description of the U.S. Initiative on Joint Implementation, 1994.

Most business NGOs involved in the climate change debate are supportive of including JI in the Kyoto agreement, while most environmental NGOs are opposed to such inclusion. Two organizations actively involved in the climate change debate support the inclusion of JI in the Kyoto agreement only on the condition that the emission reductions associated with JI are both credible and verifiable (Environmental Defense Fund, Business Council for Sustainable Energy).[7] [8]

Several stakeholders not only have positions on JI but have also developed positions on the topic of additionality. The Edison Electric Institute has suggested that a form of historical benchmarking be used for the electric power sector.[9] If JI is included in the Kyoto agreement, the U.S. Climate Action Network suggests that credits be based on clear criteria and benchmarks, rather than "an inherently subjective and unverifiable project-by-project determination of what would otherwise have happened"[10] The Environmental Defense Fund takes the opposite tack and suggests that additionality be determined on a project by project basis. They specifically reject the benchmarking approach stating that past U.S. use of centrally-defined best available technology (BAT) standards failed; a one-size-fits-all approach to BAT overlooks the differences among nations and among regions within nations; and efforts to develop definitions of BAT will likely deteriorate into difficult and divisive trade negotiations.[11] Finally, the Center for Clean Air Policy has recommended that the U.S. drop the additionality test altogether for 1) projects that reduce net emissions (fuel switching, efficiency improvement and other projects that reduce emissions at existing facilities) and 2) all renewable energy projects. They argue that dropping the additionality test would make credits produced by these projects more fungible, increase transparency and reduce the transaction costs associated with the current JI process both here and abroad. They also recommend the discounting of JI project credits to account for uncertainty and to improve the credibility of JI generally."[12]

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[7]Facsimile from Annie Petsonk of the Environmental Defense Fund to Lisa Carter of the U. S. Environmental Protection Agency dated February 7,1997

[8]BCSE "Position Statement -- Global Climate Change" 1997

[9]Letter to Eileen B. Claussen , Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, March 24, 1997 from Edison Electric Institute.

[10]Letter to Eileen B. Claussen , Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, May 2, 1997 from the U.S. Climate Action Network.

[11]Facsimile from Annie Petsonk of the Environmental Defense Fund to Lisa Carter of the U.S. Environmental Protection Agency dated February 7, 1997.

[12]Letter to Bob Dixon from Edward A. Helme, Director, Center for Clean Air Policy, dated June 26, 1997 which accompanies a paper titled "Integration of Joint Implementation into an Annex I Greenhouse Gas Trading System."

Office of Economic Policy

Department of the Treasury • Washington, D. C. 20220

FAX

Date: August 12, 1997

Number of pages including cover sheet: 1

	Name	FAX Number	Phone Number
To:	Jeff Frankel	395-6947	
From:	David Wilcox	202-622-2633	

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

Comments are due on this cob today. We should coordinate this afternoon on what comments we want to deliver.

Wilcox

Additionality in the Context of Joint Implementation

Issue:

The United States is calling for joint implementation (JI) ~~with credit~~ to be included in the Kyoto ~~new~~ agreement ~~negotiated in Kyoto under the Framework Convention on Climate Change~~. Joint Implementation is a mechanism by which a private entity in a country with an emissions budget (developed countries) invests in greenhouse gas mitigation projects in a country without a budget (developing countries). In exchange, the investor (and its country) would receive credit towards its emission budget.

There is a broad consensus among countries and private parties that for JI to make sense, the emission reductions that give rise to JI credit must be "additional" to -- above and beyond -- reductions that would have happened anyway in the baseline case. Consider the case where a developer wants credit for building a low-GHG-emitting plant rather than a high-GHG-emitting plant. If the high-emitting plant truly represents what would have happened in the baseline case, then it would be appropriate to give the developer of the low-emitting plant credit for the difference. But if the low-emitting plant would have been built anyway (because its technology represents the business-as-usual case), then credit would not be appropriate. In that case, the project would ~~have no environmental benefit~~ actually result in environmental harm: emissions in the developing country would be the same as in the BAU case, while emissions in the developed country would be higher.

The principal problem ~~identified to date is that the question "what would have happened anyway" is extraordinarily difficult to answer at the project level~~. Experience in the US pilot program on JI indicates that reasonable analysts can differ over whether a proposal offers sufficient financial return that it should be expected to go forward without the additional reward of JI credit, or conversely that it will be implemented only if credit is available. While baseline trend projections can be made for sectors, countries, or regions, the question is often imponderable at the project level. (JI is extremely difficult to estimate the baseline in a credible fashion at the project level, which is what would be required.)

The consequences of "getting it wrong" are large in both directions. If credit is given ~~systematically~~ for projects that would happen anyway, then the use of these credits to meet developed country obligations will result in higher global emissions. Consider only one area in which JI projects may be undertaken, energy efficiency improvements. The energy efficiency and emissions intensity of electric power projects and other industrial projects in developing countries are expected to improve significantly over the next 10-20 years, reflecting the normal penetration of better technologies. Indeed, a key part of the US negotiating position is to require countries to undertake "no regrets" reductions in emissions that are economically justified on their own. Preliminary analysis by EPA with one economic model (SGM) suggests that currently anticipated improvements in the efficiency of energy production and use in developing countries will reduce their expected emissions ~~growth~~ in 2010 by as much as 865 million tons of carbon, as compared with ~~growth~~ on the basis of existing technologies. If credit were given for projects in developing countries without accounting for these currently expected improvements, a large amount of excess carbon emission credits could be awarded. Developed countries only need 750 million tons of

the level that would be attained with

carbon reductions to reach 1990 levels by 2010.

On the other hand, if the standard of "additionality" is set too high (i.e., if unrealistic improvements are taken into the baseline case), or if projects are choked off by transaction costs associated with resolving baselines and additionality on a project-by-project basis, then the large potential savings associated with JI will be lost.

The issue discussed in this paper is how "additionality" can be assured on a practical basis within the framework for JI that is negotiated in Kyoto. Since there are a large number GHG mitigation opportunities available in the developing world which are inexpensive compared to domestic options, it would greatly benefit the U.S. if practical methods could be developed to assure additionality. To that end, this paper presents and develops the most widely-discussed option for addressing JI additionality: "benchmarking". Several other options for addressing additionality are also briefly presented, but are not developed in detail. [Two attachments to the paper present recent stakeholder positions on JI and on additionality in particular, to the extent that agencies are familiar with them.]

Benchmarking

A set of benchmarks could be developed and agreed to for technologies and practices associated with joint implementation projects. These benchmarks would be internationally-agreed-upon determinations for specific technologies or practices. JI projects would be considered additional if the technology they employed were lower-emitting (more efficient) than the benchmark level. Credits would be calculated as the difference between the performance of the JI technology or practice and the benchmark performance level.

From a practical standpoint, these benchmarks would have to be developed and negotiated following the Kyoto meeting in December. JI provisions in the Kyoto agreement would have to include necessary criteria and call for the subsequent adoption of guidelines by the Parties to the agreement. The first set of benchmarks would be applicable to JI projects undertaken in the first budget period. They would need to be updated and renegotiated for subsequent budget periods, reflecting improvements in the baseline ("would have happened anyway") case over time.

Although more elaboration is necessary, several examples may serve to illustrate the benchmark concept.

Some JI proposals involve upgrades of existing energy production facilities. Consider a proposal to reduce the emissions of an electric power plant or district heating plant, by increasing the efficiency (improving the heat-rate) of the generator, or by switching fuels. A benchmark would be developed regarding the expected future of such facilities. For illustration, that might take two forms:

- Based on economic forecasts, estimated technology penetration rates, and other factors, it

may be agreed that in the business-as-usual case, these facilities would continue to be operated indefinitely without upgrade. In that case, the benchmark would reflect the emissions rate of the current facilities and credit would be given for improvements made.

- Alternatively, forecasts may show that the proposed technologies are already penetrating these markets and that these upgrades are expected to take place in the business-as-usual case. In that case, the benchmark would reflect these improvements, and no credit would be given for making them.

Other JI proposals involve projects to meet new power demand with lower emissions. Proposals include building lower emitting power projects in place of building relatively inefficient coal-fired plants (e.g., renewable, gas-fired, or even more efficient coal-fired plants). A benchmark would be developed for the emissions-intensity of base case power production facilities, with credit given for lower-emitting projects. For illustration:

- Based on economic forecasts, estimated technology penetration rates, and other factors, it may be agreed that the baseline case is the construction of high-emitting plants, with credit given for alternative technologies with lower emissions per kilowatt-hour output. On the other hand, it may be agreed that a certain penetration of gas, wind, or other technologies is already expected, and thus should not be given JI credit.

but not 100%? If not 100%, how would it be decided in any individual case whether that plant would have been built?

Similar benchmarks could be developed for other technologies, such as new automobiles (carbon per mile per vehicle), or steel mills (tonnes carbon per tonne of steel). Similar issues are presented by projects to enhance the sequestration of carbon in forests or soils. A range of projects have been proposed, from preservation of existing forests, to changing logging practices (e.g., selective logging rather than clear-cutting), to the creation of tree plantations. Benchmarks might reflect tonnes of carbon emissions per board feet of lumber.

biomass in the baseline?

Forecasting and negotiating benchmarks for these expected emissions futures will be complex. Consideration should be given to whether a single set of global benchmarks can be used, or whether they will need to be regionally- or nationally-specific.

Other Potential Options For Addressing Additionality

Several other approaches to additionality have been suggested, but do not seem as attractive as the benchmark approach:

1. Defining additionality as overcoming project-specific barriers

Difficult to do but in the right spirit

One option, which is being advanced internationally by the International Energy Agency, would involve assessing whether a project breaks ground by overcoming barriers (institutional, financial, technological, informational, policy, financing, or market) specific to that project in the country where it is proposed. A project would be deemed additional if it is demonstrated that the existence of such barriers is inhibiting the project from going forward, that the project would represent an innovation in overcoming those barriers, and that JI credit would supply the necessary incentive to go forward. The IEA's research in this area, which defines and categorizes generic barrier types for specific sectors (power generation, transport, etc.), provides developers and evaluators with a framework for identifying and evaluating barriers.[1]

2. Measuring additionality from quantitative, sector-specific baselines

In some ways this seems more realistic than project-level

This option would involve the development of sector-specific, rather than project-specific, baselines in countries which wish to host JI ~~for the sectors in which the countries wish to pursue JI.~~ These baselines would constitute a quantitative determination of projected future GHG emissions from relevant sectors in such countries. The quantitative baseline for each sector would be based on such factors as expected penetration rates of technologies or practices, estimates of capital stock turnover, and adopted and projected policies and measures or legally required performance standards affecting the sector. For a JI project to be deemed additional, a determination would have to be made that the project is not already accounted for in the baseline projection for that sector in that country.

Why was it rejected? Need to state rationale.

3. Assess additionality using a general set of guidelines

This option would provide for project by project judgments of additionality based on information provided by project developers. Project developers and evaluators would use a general set of guidelines to develop and evaluate additionality arguments. This is be similar to the approach currently used by the United States Initiative on Joint Implementation. For example, in the original guidelines for development of a USIJI project proposal USIJI asks, regarding additionality, that project developers include a discussion of the following subjects in their project proposal:

garbled?

(1) How the existence of the USIJI program helped or could help overcome any barriers to develop or implement the project;

(2) A discussion of whether the specific measures taken by the project to reduce or sequester greenhouse gas emissions are required by existing laws or regulations applicable in the U.S. or host country

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[1]Not yet published International Energy Agency paper titled "Activities Implemented Jointly Under the FCCC."

For each of (1), (2), & (3), it would be helpful to explain why they were rejected in favor of benchmarking.

(3) A description of the prevailing technologies and management practices now used in the host country and how the specific measures proposed in the project differ from them.[2]

Employing safeguards such as discounting

Given that any method to determine additionality is likely to be imperfect, this option would employ safeguards such as discounting to reduce the chance of giving credit for emission reductions happening anyway. In this way the overall quantity of excess credits created through JI could be reduced. Other options for safeguards include phasing out JI in some future year, or limiting the scope of JI (e.g. developed countries might be limited to meeting 10% of their emission reduction targets trough JI).

My sence is that the costs of implementing the "benchmarks" approach need to be spelled out much more completely.

- administrative burden
  [would engineers have to be on staff? presumably so]
- range of possibilities extends only as far as list of eligible projects
- distortions between included vs not included projects
- heterogeneities — every project is unique
- how to deal with penetration ratios less than 100%.

[2]Description of the U.S. Initiative on Joint Implementation, 1994.

Stakeholder Positions on Joint Implementation In General

Opposed to JI with credit in Kyoto

Sierra Club[3]
Climate Action Network
Atmospheric Alliance
Center for International Environmental Law
Biomass Energy Advocates
Environmental and Energy Study Institute
Friends of the Earth
Greenpeace
Natural Resources Defense Council
Ozone Action
Physicians for Social Responsibility[4]

In favor of JI with credit in Kyoto

International Climate Change Partnership[5]
Global Climate Coalition[6]
Edison Electric Institute[7]

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[3]Comments of Carl Pope, Executive Director, Sierra Club titled "Evaluation and Assessment of the U.S. Initiative on Joint Implementation" and dated January 24, 1997, in response to USIJI request for comments on the U.S. Initiative on Joint Implementation in 61 Federal Register 5940-81 on November 22, 1996.

[4]Letter to Eileen B. Claussen, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, May 2, 1997, from the U.S. Climate Action Network

[5]"International Climate Change Partnership Views on Key Issues in the Climate Change Protocol Negotiations" June 1997

[6] GCC Home page (http://www.worldcorp.com/dc-online/gcc/ji.html) subpage titled "Joint Implementation: A Strategy Option for Global Emissions Reductions"

[7]Letter to Eileen B. Claussen, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, March 24, 1997 from Edison Electric Institute, titled "EEI Recommended Clarifications of Proposed Protocol"

Conditionally in favor of JI with credit in Kyoto

Business Council for Sustainable Energy (BCSE)

"...market-based tools such as joint implementation should be allowed between Parties with obligations under the protocol, but only for clearly verifiable and quantifiable emissions reduction projects."[8]

Environmental Defense Fund

"There are strong environmental and development policy reasons to favor such joint implementation....In the absence of an adequate rule-based framework, joint implementation between budget and non-budget nations will neither provide credible environmental benefits nor foster a culture of compliance in participating countries."[9]

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[8]BCSE "Position Statement -- Global Climate Change" 1997.

[9]Facsimile from Annie Petsonk of the Environmental Defense Fund to Lisa Carter of the U. S. Environmental Protection Agency dated February 7, 1997

Stakeholder Positions On Additionality And Benchmarking:

Edison Electric Institute

"...the protocol text should reflect workable criteria for joint implementation (JI) that enhance, rather than inhibit, development of overseas projects and recognition of full credit for those projects. In particular, the additionality criteria under the ground rules for the U.S. Initiative on Joint Implementation (USIJI) have proved to be a barrier to widespread development of JI projects. In the enclosed clarifications we suggest alternative language...."

The alternative language deletes Section 2(b) of the Article on joint implementation which reads "Projects must produce a reduction in emission that is additional to any that would otherwise occur."

The alternative language also suggests that for projects involving the electric power sector the greenhouse gas benefits of a project be determined "by calculating the difference in carbon emissions per KWH between that of the project (after its completion) and the national average of generating facilities in the Party in which the project is located that were producing electricity during the year that construction of the project was authorized at higher cots (cents per KWH) than the project (after its completion).[10]

Environmental Defense Fund

This excerpt

[EDF has developed extensive comments on ~~additionality~~ this subject. ~~It is attempted here~~ ~~to~~ show the general flavor of their comments and to provide their comments on the benchmark option.]

"How should what would have occurred be determined? The question of "what would have occurred" in the absence of any particular JI project is a highly project-specific one, and will vary from nation to nation, and even across regions within nations, according to levels of development, availability of capital, and other constraints. Thus it is not a question that can be answered by a single formula. It must be analyzed on a project-by-project or case-by case basis...."

"....Other proposals suggest that there should be an agreed international construct defining the best available technology (BAT) that might otherwise have been implemented, and that JI credit should only be awarded for activities that are more efficient that this collectively-defined BAT. The past twenty years of environmental policy in the United States,

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[10]Letter to Eileen B. Claussen , Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, March 24, 1997 from Edison Electric Institute.

however, have demonstrated that centrally-defined BAT approaches all too often lead to costly, innovation-stifling regulation, and should therefore be avoided. Moreover, a one-size-fits-all approach to BAT overlooks the differences among nations and among regions within nations...Finally, in the international arena, efforts to develop centralized definitions of BAT will likely deteriorate into difficult and divisive trade negotiations."[11]

Center for Clean Air Policy

"We recommend that the U.S. drop the additionality test for 1) projects that reduce net emissions (fuel switching, efficiency improvement and other projects that reduce emissions at existing facilities); and 2) all renewable energy projects, which clearly do not increase GHG emissions. Dropping the additionality test would make credits produced by these projects more fungible, increase transparency and reduce the transaction costs associated with the current JI process both here and abroad. We also recommend the discounting of JI project credits to account for uncertainty and to improve the credibility of JI generally."[12]

U.S. Climate Action Network

"...if emission credits are to be consider for JI projects, we believe that they must be based on clear criteria and benchmarks, rather than an inherently subjective and unverifiable project-by-project determination of what would otherwise have happened."[13].

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[11]Facsimile from Annie Petsonk of the Environmental Defense Fund to Lisa Carter of the U.S. Environmental Protection Agency dated February 7, 1997.

[12]Letter to Bob Dixon from Edward A. Helme, Director, Center for Clean Air Policy, dated June 26, 1997 which accompanies a paper titled "Integration of Joint Implementation into an Annex I Greenhouse Gas Trading System."

[13]Letter to Eileen B. Claussen , Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, May 2, 1997 from the U.S. Climate Action Network.

check GDP growth assumptions for FSU, China

MEMORANDUM

TO: Jeff Frankel

FROM: Joe Aldy

DATE: August 27, 1997

RE: International transfers attributable to Annex I and worldwide permit trading

International trade in carbon emissions should allow for firms in the United States to purchase lower cost reductions abroad. While these reductions through international trade should reduce the costs of complying with a climate agreement, they would also result in substantial transfers of income across countries. Based on the latest round of SGM modeling runs[1], we assessed the magnitudes of these transfers by country.

Countries Buying Permits

Regardless of trading scheme (Annex I or worldwide), the U.S. is the largest buyer of permits in the year 2050 under four targets and timetables scenarios: Peak in 2015, 1990 Levels in 2010, -10% of 1990 Levels in 2010, and 1995 Levels in 2010. With the exception of the period 2010 to 2030 in the 1995 scenario with Annex I trading, the U.S. is always the largest buyer of permits in the world (see attached charts). Under these scenarios, the U.S. would buy between about $25 billion and $80 billion of permits in 2050 under Annex I trading, and between approximately $25 billion and $40 billion of permits in 2050 under worldwide trading from other countries.

Scenario	Value of Permits Purchased by U.S. in 2050, Annex I only	Value of Permits Purchased by U.S. in 2050, Worldwide
Peak in 2015	$57 billion	$25 billion
1990 in 2010	$54 billion	$24 billion
-10% of 1990 in 2010	$79 billion	$38 billion
1995 in 2010	$25 billion	$24 billion

In addition to the U.S., Western Europe and Japan are significant purchasers of international permits, ranking second and third by 2050 in all scenarios. In the 1995 Level in 2010 with Annex I trading only scenario, every Annex I country is a purchaser of permits by 2050 except for the Former Soviet Union nations and Australia.

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[1] These are the runs received on 8/21/97.

Countries Selling Permits

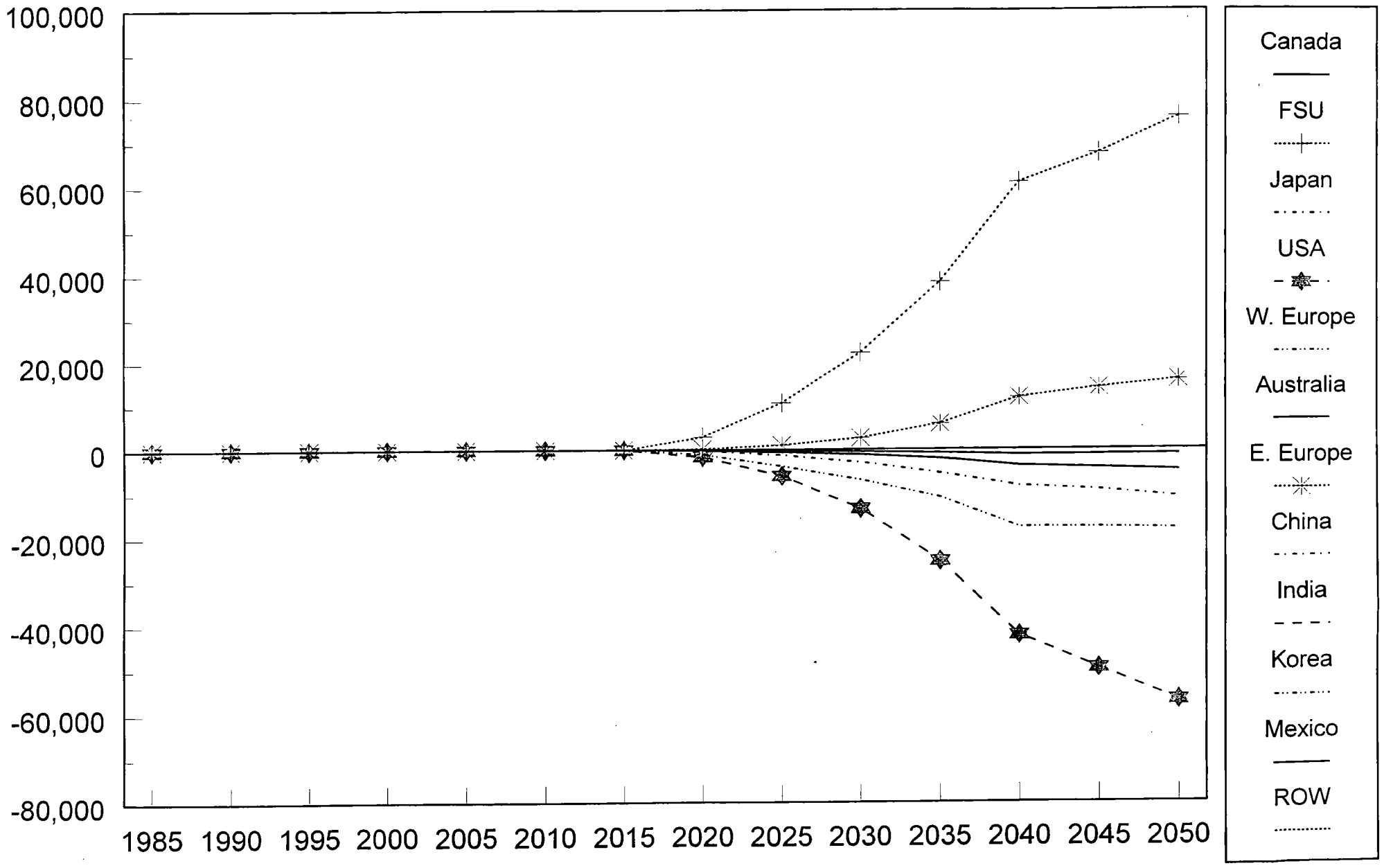
In all of the Annex I trading only scenarios, Former Soviet Union nations are the dominant sellers by 2050, with Eastern Europe second in all but the 1995 Level scenario. For worldwide trading, China is the dominant seller in all scenarios by 2050, followed by the Former Soviet Union and then the conglomeration of the Rest of the World (except for the 1995 scenario, where the Former Soviet Union countries buy permits). Eastern Europe becomes a purchaser of permits by 2050 in the worldwide trading cases. Under these trading schemes, the Former Soviet Union and China would receive substantial cash inflows for their permits.

Scenario	**Value of Permits Sold by FSU in 2050, Annex I only**	**Value of Permits Sold by China in 2050, Worldwide**
Peak in 2015	$76 billion	$22 billion
1990 in 2010	$73 billion	$21 billion
-10% of 1990 in 2010	$108 billion	$36 billion
1995 in 2010	$30 billion	$31 billion

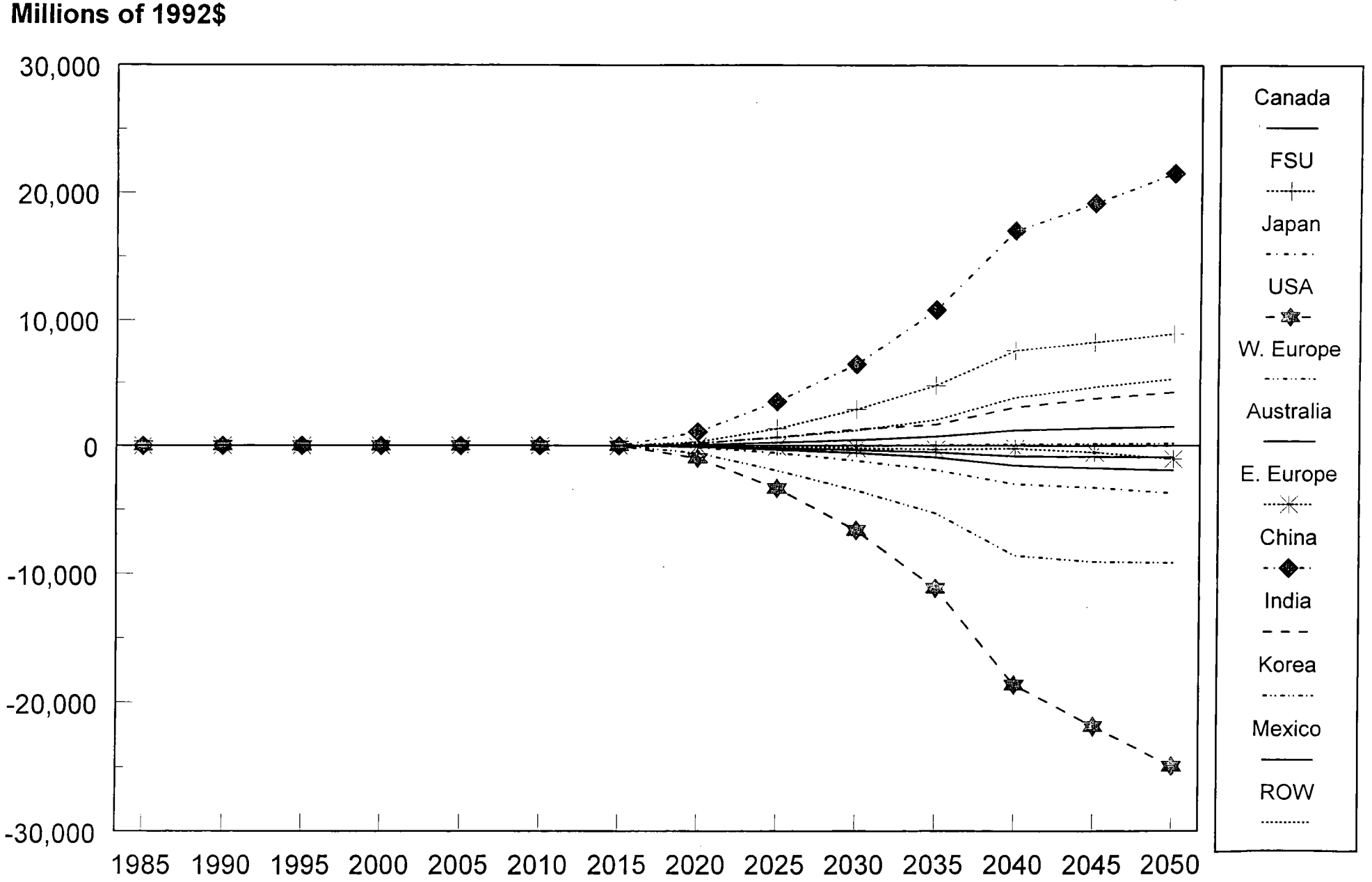
Note that SGM generates outputs for the following countries and regions:

Australia
Canada
China
Eastern Europe
Former Soviet Union
India
Korea
Mexico
Rest of the World
United States
Western Europe

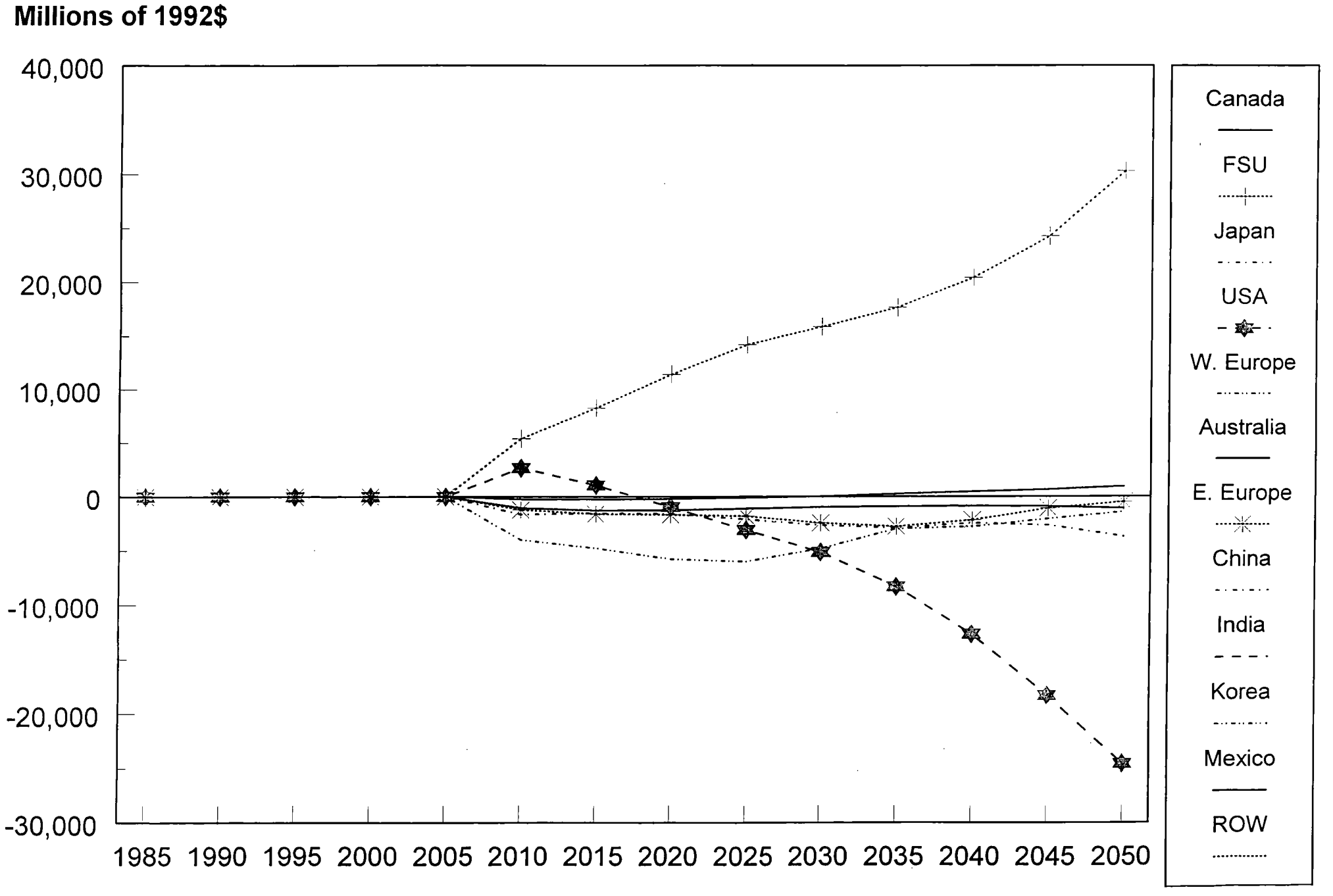
International Transfers from Permit Trading, Peak in 2015, Annex I Trading, SGM12



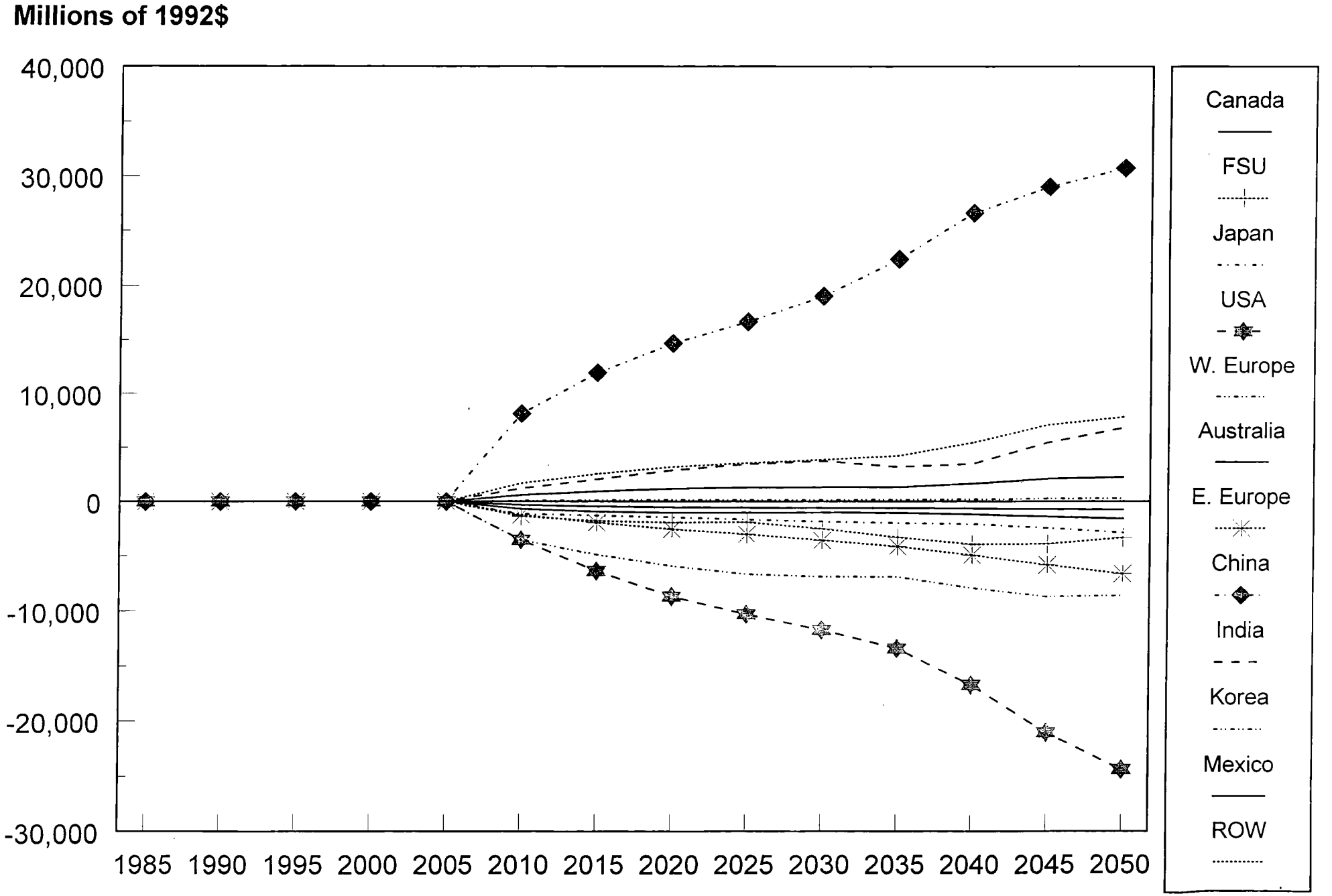
International Transfers from Permit Trading, Peak in 2015, Worldwide Trading, SGM13



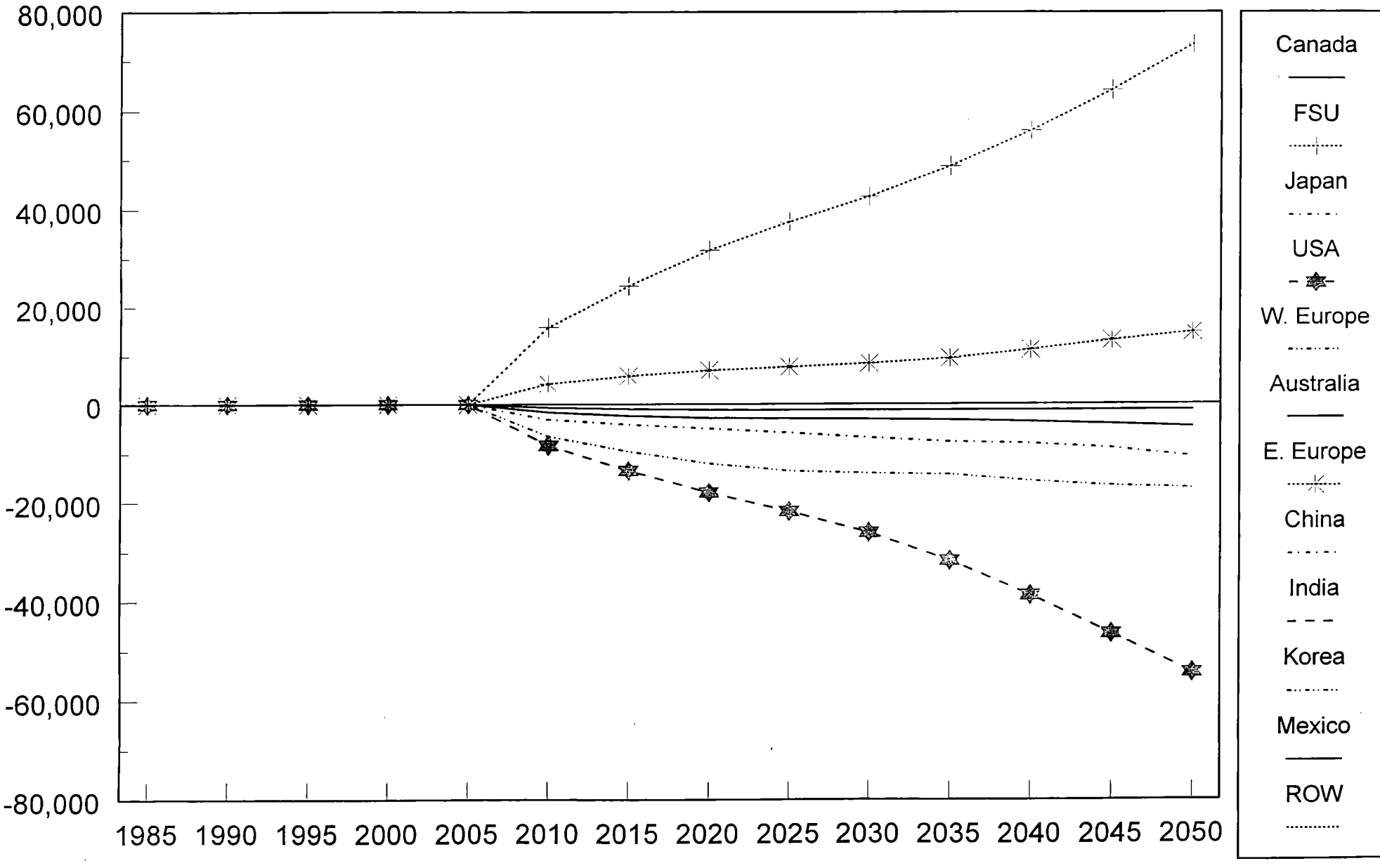
International Transfers rrom Permit Trading, 1995 in 2010, Annex I Trading, SGM6



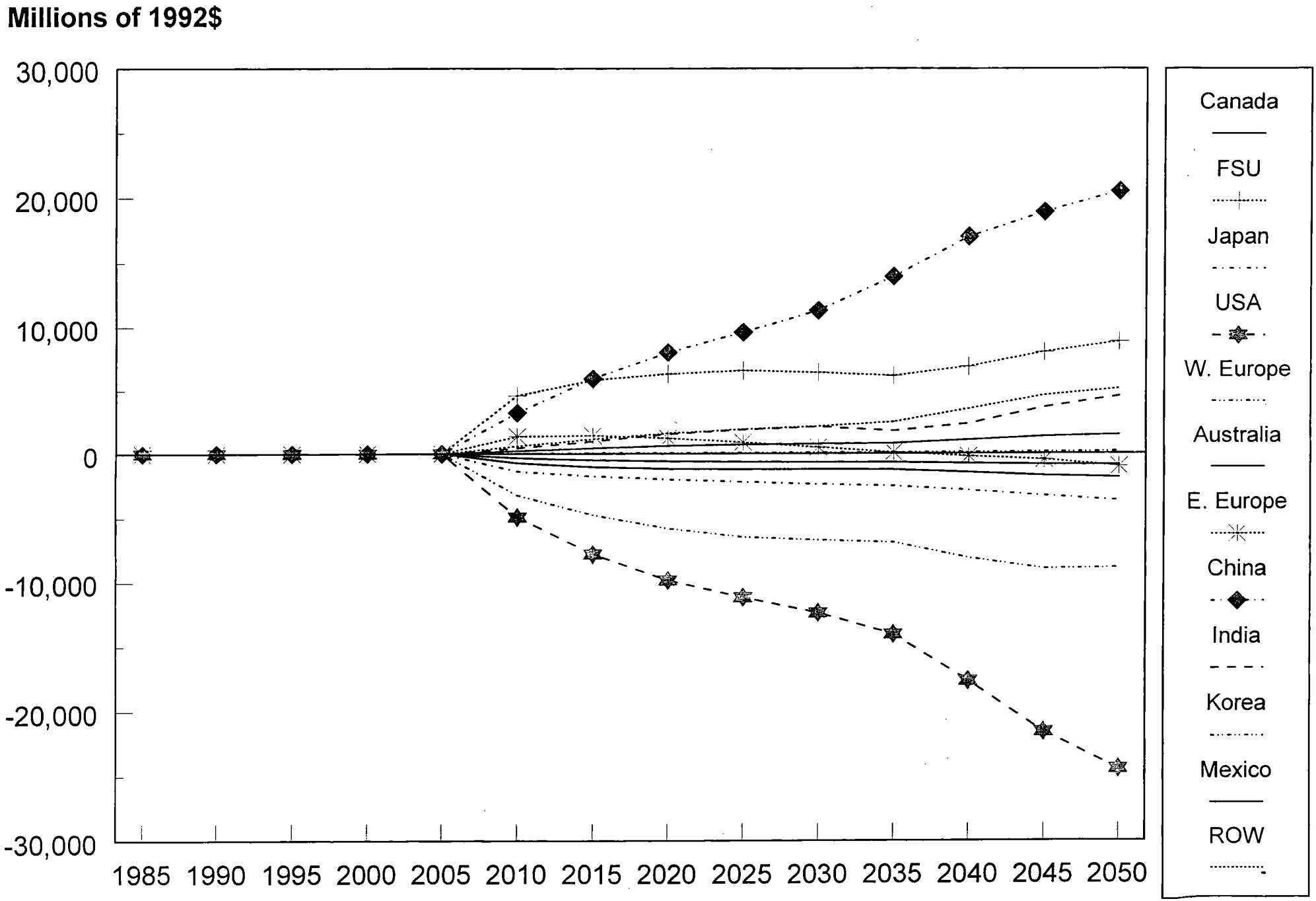
International Transfers from Permit Trading, 1995 in 2010, Worldwide Trading, SGM7



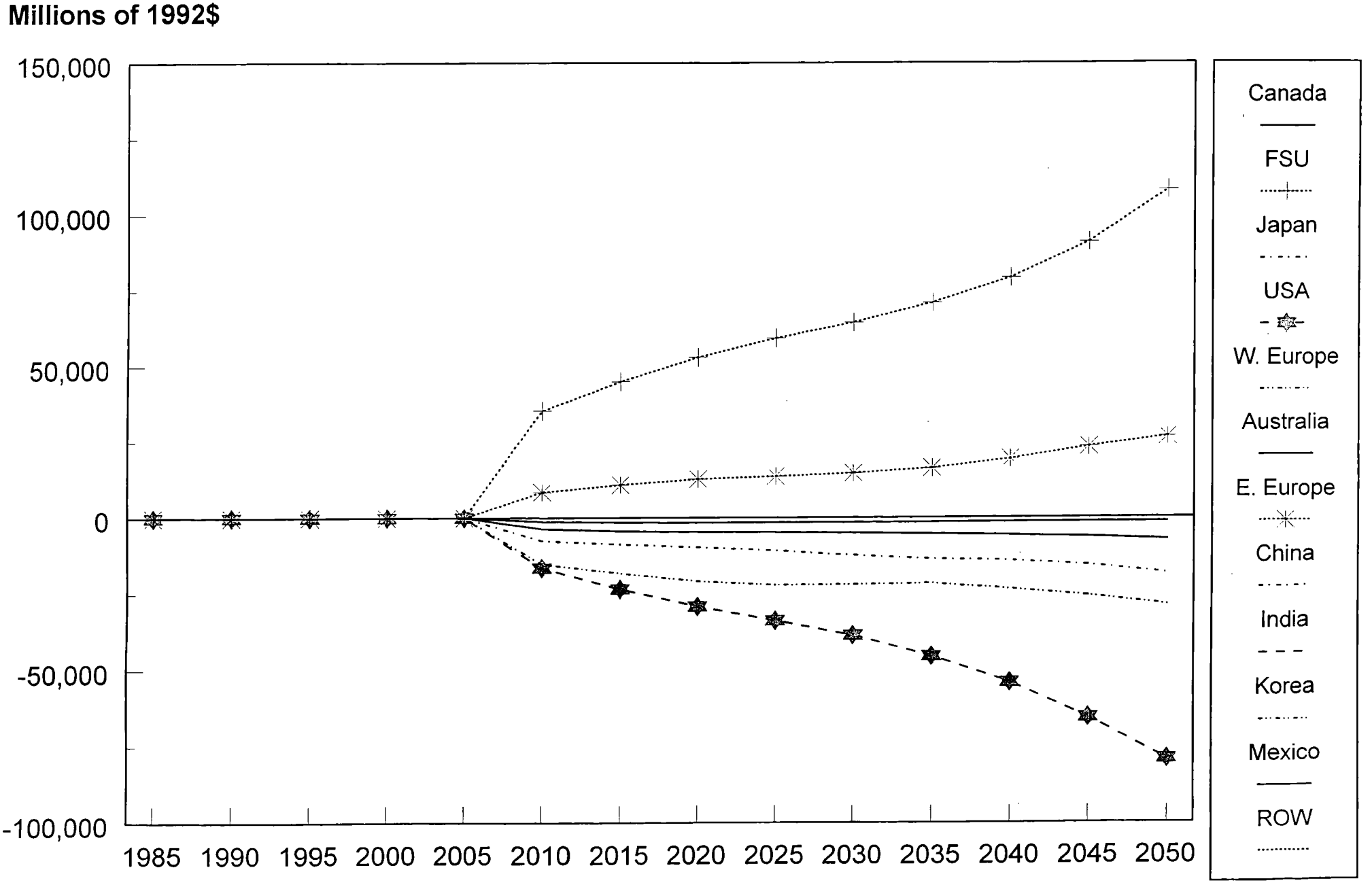
International Transfers from Permit Trading, 1990 in 2010, Annex I Trading, SGM3



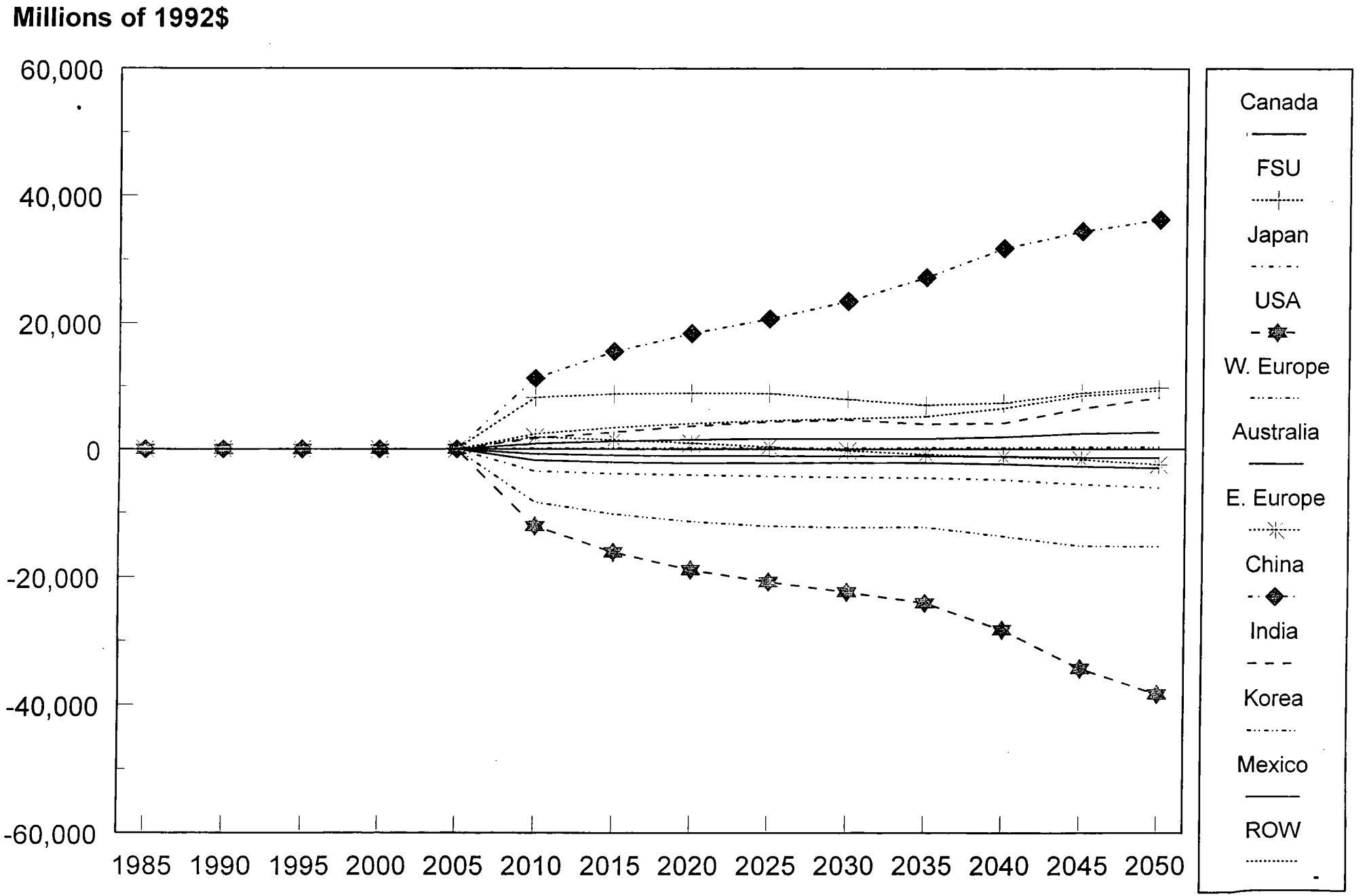
International Transfers from Permit Trading, 1990 in 2010, Worldwide Trading, SGM4



International Transfers from Permit Trading, -10% of 1990 in 2010, Annex I Trading, SGM9



International Transfers from Permit Trading, -10% of 1990 in 2010, Worldwide Trading, SGM10



August 19, 1997

Comments on International Emissions Trading Paper
Office of Economic Policy, Treasury Department

1) Points 1 and 2 under commonly asked questions should be struck. This is an overly optomistic picture of the benefits of trading, and we address this set of issues in more detail in the domestic emissions trading paper. These points do not need to be made here.

2) There should be some discussion of an "international escape clause", to parallel the domestic escape clause discussion in another paper. International trading provides a natural escape clause for the U.S.; if growth in demand in the U.S. is particularly rapid, we can buy permits from abroad. But what happens if the worldwide demand for permits rises so quickly that they become prohibitively expensive internationally? In this case, we should have some mechanism for allowing a loosening of the worldwide restrictions embedded in this trading scheme.

THE WHITE HOUSE

WASHINGTON

August 15, 1997

cc: JS
JA
Lutter

NOTE FOR CLIMATE CHANGE POLICY OVERSIGHT GROUP

FROM: PETER ORSZAG
DAVID SANDALOW

Subject: Summer Reading

Attached is a summary of workgroup activity underway.

Also attached are papers on:

1. Joint Implementation "Additionality"

2. International Emissions Trading, and

3. Developing country commitments.

U.S. Views: International Greenhouse Gas Trading System

The U.S. has proposed an international greenhouse gas (GHG) trading system as a mechanism to achieve greenhouse gas emission reductions cost effectively.

Effective policies for slowing and eventually halting global climate change must minimize the cost of achieving substantial reductions in global emissions. The key to lowering costs is to allow maximum flexibility in reducing emissions, while ensuring the strict accountability of all parties involved. Such flexibility and accountability can best be attained through a system of binding emissions budgets, with international trading. Allowing trading between nations with low and high marginal costs of abatement could reduce the costs of achieving significant emission reductions by as much as 50 percent. The ultimate effectiveness of a trading system in lowering the costs of reducing emissions will depend on its ability to keep transaction costs low, and its success in creating and maintaining the credibility of the commodity being traded.

Creating an international emission trading system requires three initial conditions: a legally-binding allocation of emission authorizations (or starting emission budgets); a standardized and verifiable system of measurement and reporting that enables actual emissions to be matched to authorized amounts; and an effective mechanism to ensure that all Parties are complying with their obligations.

Preconditions for Participation in International Greenhouse Gas Trading System

Legally Binding Emissions Limit. Legally binding emission limits or budgets are a necessary precondition for any international greenhouse gas emissions trading system. The U.S. expects that an international agreement will identify a comprehensive list of greenhouse gas sources and sinks, and establish the legal limit as a uniform percentage of those emissions from 1990. According to the U.S. proposed protocol, the budgets would cover a fixed period of "x" years (where x would be at least 3 years, but no greater than 10 years). Under this approach, each Party would receive its initial budget allocation for the budget period in "tonnes of carbon equivalent emissions allowed", hereafter referred to as "tonnes-allowed".

Measurement and Reporting Systems. Verifiable measurement and annual reporting of emissions is a critical precondition to any international trading system. Adequate mechanisms for measuring and reporting actual emissions of greenhouse gases must exist so that compliance with legally binding emission limits can be verified. The current IPCC guidelines allow a wide range of options for emissions measurement; therefore, standardized methods would be needed to ensure a consistent, minimum level of accuracy for all Parties. Each Party would provide annual emissions and budget adjustment reports to the FCCC Secretariat, which would record, track, and publish annual emissions inventories and budget balances.

Compliance Mechanisms. All Parties must be able to credibly demonstrate compliance with their emission targets. In addition to international mechanisms to assure compliance with budget commitments, parties should be encouraged to build mechanisms domestically. Before participating in emissions trading, a Party must meet certain requirements. First, the Party must have an adequate monitoring and reporting system for tracking its emissions of greenhouse gases; and second, the Party must establish a certification and verification mechanism (which could mean identifying a government person as the "authorizing official") for budget adjustments. Further guidelines must be developed to specify these minimum standards, including evaluation requirements for in-depth review teams.

Elements of the International GHG Trading System

Tradeable Units. The tradeable unit would be established as a "tonne of carbon equivalent emissions allowed" (tonne-allowed). The FCCC Secretariat would record the initial budget of tonnes-allowed for each Party (the Secretariat would likely use an electronic database, with an "account" for each Party), together with the identifying information necessary to track trades of specific tonnes-allowed, including country-of-origin and budget period of issuance.

Standardized Reporting by Parties. All Parties must provide annual emissions reports to the FCCC Secretariat. To facilitate the accounting process, the Secretariat would likely use a standard electronic reporting format which Parties would be required to use in order to minimize administrative costs and reduce errors. In addition to the annual reports on emissions to be required of all Parties, those Parties participating in an international trading system would have to report annually on the status of their budget. Specifically, the Party would identify any tonnes-allowed traded and would identify sufficient tonnes-allowed to account for its annual emissions. The Secretariat would likely use a simple form to capture the needed tracking information.

Centralized Recordkeeping and Accounting. The FCCC Secretariat already records, tracks, and publishes emissions inventory reports based on the data submitted by each Party in its national communications. Under the proposed protocol, the Secretariat would be authorized to administer budget transactions for Parties which meet the monitoring, reporting, verification, and compliance requirements established by the Parties. At least annually, the Secretariat would record any transfers of tonnes-allowed. The Secretariat would officially record a transfer by deducting the specified number of tonnes-allowed from the selling Party's account and adding that quantity to the buying Party's account. After all the transfers have been officially recorded by the end of each year, the Secretariat would retire enough tonnes-allowed from each Party to account for its annual emissions, as specified by each Party's annual report.

At the end of the budget period: The FCCC Secretariat would complete a final accounting of each Party's emissions and budget adjustments. If a Party held more than enough tonnes-allowed to match its actual emissions, the Secretariat would automatically transfer the unused tonnes-allowed into that Party's account for use during the next budget period. If a Party did not have sufficient tonnes-allowed to cover all of its emissions during the budget period, the Party would be permitted to buy tonnes-allowed from other Parties to make up the difference. A Party could also have a limited number of tonnes-allowed automatically deducted from its subsequent budget in order to remain in compliance. A predetermined penalty would be associated with this type of "borrowing." For example, the Party would have its subsequent budget reduced by 12 tonnes-allowed in order to transfer 10 tonnes-allowed into the current budget period. (The two "penalty" tonnes would be immediately retired by the Secretariat.)

Emissions Trading Restrictions for Parties Not in Compliance. Parties must meet initial and ongoing minimum measurement, verification, and reporting requirements in order to maintain eligibility to participate in trading. In-depth review teams would periodically assess a Party's compliance according to minimum standards established by the Parties. The trading system is designed to foster and facilitate compliance with Parties' emissions budget by providing a mechanism which encourages low cost emission reductions but requires significant, automatic consequences for failure to achieve the required budget levels. Specifically, the FCCC Secretariat would be authorized to implement any emissions trading restrictions established by the Parties. Emissions trading restrictions would include preventing a non-complying Party from selling tonnes-allowed, or allowing the sale of such tonnes-allowed, but restricting their use by another Party until the question of

compliance is resolved. In addition, Parties will have the discretion to take any further action deemed necessary to address non-compliance.

Party Authorization Required for Trades Initiated by Domestic Entities. Although any Party could permit private entities to take actions that would lead to international trades of tonnes-allowed, the Party would have to provide official authorization before the tonnes-allowed could be transferred to the purchaser (or acquired by the buyer). Such verification would be necessary because the Party is legally responsible for meeting its commitments, and transfers modify a Party's compliance obligation.

National Mechanisms for Meeting Budget Requirements.

Parties with legally binding targets would not be required to have a domestic trading system to participate in the international greenhouse gas trading system. For example:

1. Party "A" could adopt a policies and measures approach (e.g carbon taxes, efficiency standards) to reduce greenhouse gas emissions, while also trading tonnes-allowed internationally in order to reduce the cost of meeting its obligations.

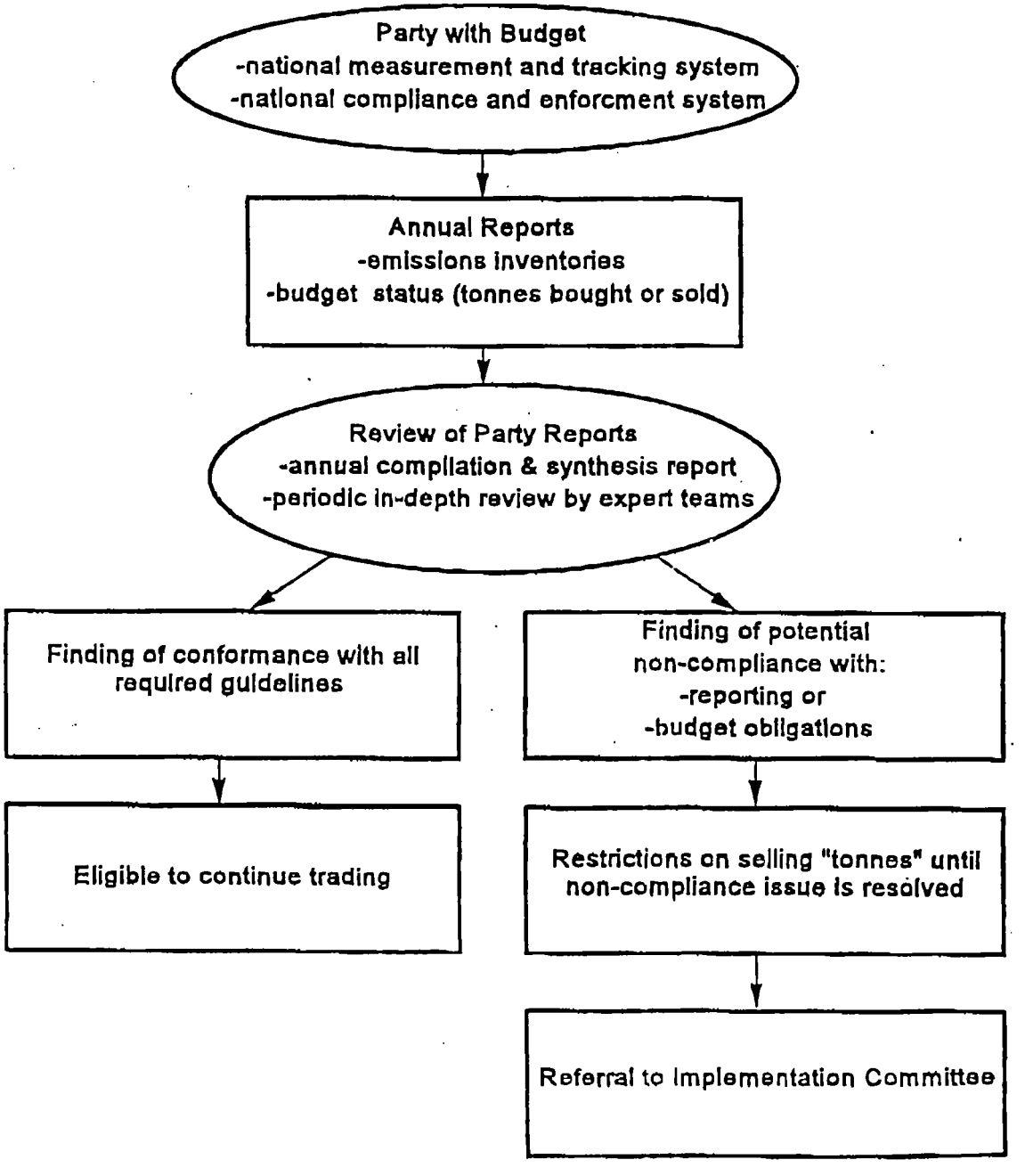
2. Party "B" could adopt a domestic emissions trading program to control its emissions. It might allocate its entire budget of tonnes-allowed to an appropriate set of private entities which are responsible for greenhouse gas emissions. These private entities would monitor and report their emissions to the Party, and the Party would have domestic enforcement mechanisms to hold each source accountable for its emissions. Then, a domestic entity could choose its own compliance strategy. For example, a domestic entity could reduce its own emissions and sell its "extra" tonnes-allowed on the domestic market or internationally, with approval from its own Party. Another domestic entity could choose to purchase tonnes-allowed from the international market (with approval from the appropriate Parties).

3. Party "C" could adopt a combination of approaches to reduce its emissions. For example, it could use policies and measures for some sectors and an emissions trading system for other sectors. Under this approach, domestic entities in those sectors which are assigned tonnes-allowed in a domestic emissions trading system could participate as described above for Party B. At the same time, the government could choose to purchase or sell tonnes-allowed to account for emissions from those sectors being addressed by policies and measures.

Conclusion

If the Agreement establishes a clear environmental goal with legally binding targets, Parties must meet certain minimum standards for monitoring, verification, compliance, and reporting in order to demonstrate compliance. These minimum standards are also necessary for an international greenhouse gas emissions trading system. Such a trading system will be an extremely valuable tool, providing Parties with the flexibility to achieve their commitments at the lowest possible cost.

International Trading Reporting & Verification Process



*Legally binding budgets established in the International Agreement

International Emissions Trading: Commonly Asked Questions

1. **Why does the U.S. believe that emissions trading programs are cost effective tools to achieve emissions reductions?**

   The U.S. view is based on the experience with the U.S. sulfur dioxide (SO_2) trading program to reduce the emissions from electric utilities which cause acid rain. When the authorizing legislation was developed in 1990, a typical policies and measures program (which would have required each electric utility boiler to install standard pollution control technology) was estimated to cost about $5 billion annually. To achieve the same level of emissions reductions using an emissions trading program (which would allow electric utilities to choose the most cost effective approach for each boiler) was estimated in 1990 to cost about $4 billion annually. Once the program actually became effective, pollution control costs dropped dramatically, and with trading, the U.S. Government Accounting Office has since estimated that the SO_2 program is costing about $2 billion annually. The U.S. has already experienced significant emission reductions under the first phase of the control program: by 1995, the U.S. experienced a 30% drop in national SO_2 emissions from 1980 (and the monitoring results show that the 263 Phase 1 units reduced their emissions by 3 million tons from 1994 to 1995 - a 40% reduction attributed to the first year of the SO_2 trading program).

2. **Why is the cost of compliance with the U.S. SO2 trading program so much lower than anticipated when the program was first designed?**

   The cost of reducing a ton of SO2 from the utility sector has dropped dramatically from the initial estimates. Recent studies have highlighted the innovation and efficiency improvements in pollution controls which have developed since the SO2 trading program was implemented. In the past, policies and measures in the United States prescribed the specific scrubber technology required to meet a required removal efficiency. Scrubber costs have dropped significantly in the last six years, and their sulfur removal efficiencies have improved. In addition, there have been innovations in the blending of high-sulfur and low-sulfur coals, while expected increases in cost associated with the increased use of low sulfur coal have not materialized. The market mechanism provides an incentive to spur the efficiency and innovation which lowers costs.

3. **How would Party "A", using policies and measures, participate in an international emissions trading system?**

   Party "A" has imposed various policies and measures on its domestic entities in various emission sectors. Assume that by the last year of the budget period, its national policies and measures have been extremely effective, and Party "A" will have 50 million "tonnes-allowed" left over after deducting all of its emissions. If Party "B" has estimated that it will need an additional 30 million "tonnes-allowed" to meet its budget, then Party "A" could sell 30 million tonnes-allowed to Party "B" at a negotiated price that would be acceptable to both Parties (presumably, at a total price less than the cost for Party B to reduce 30 million tonnes domestically).

4. **How would a Party "B" using a domestic trading system, participate in an international emissions trading system?**

Party "B" could develop a domestic trading system which is designed to transparently delegate its tonnes-allowed to its domestic entities. Domestic entities would then try to make emission reduction choices based on both domestic and international costs of compliance. Because Party B would presumably have a compliance system which requires its domestic entities to retain enough "tonnes-allowed" to account for their emission reductions, Party B may be willing to approve its domestic entities' request to purchase or sell tonnes-allowed with fairly minimal government involvement in the details leading to the transaction. Nevertheless, the official transfer of tonnes-allowed cannot take place without official review and authorization of the transaction by Party B.

Detailed example of a Trade Initiated by a Private Company:

Party B allocates tonnes-allowed to Company X, requiring Company X to hold enough tonnes-allowed to account for its emissions. Company X installs energy efficient technology which reduces its emissions. Company X determines that it now has extra tonnes-allowed, which it could choose to sell either domestically or on the international market. Company X could choose to sell its extra tonnes-allowed to Party A (at a mutually agreeable price). However, Party B would have to authorize the transaction before the FCCC Secretariat could officially record the transfer, deducting the specified number of tonnes-allowed from Party B's account and adding that quantity to Party A's account.

Summary of Scenarios:

Government to Government trades
(domestic trading system is not necessary for either country)

Company X request, approved by its Government, trades with another Government
(Government of Company X has delegated tonnes-allowed to its company in a transparent domestic trading system; trading system is not necessary for the other government)

Company X request, approved by X's Government, trades with Company Y, approved by Y's Government
(Assumes domestic trading systems in both countries)

5. What is the Accounting Role of the FCCC Secretariat?

The FCCC Secretariat serves as the "bookkeeper" for tracking emissions inventories and budget adjustments. The FCCC Secretariat would create a simple computerized database and with the approval of the SBSTA/SBI develop standardized forms to make tracking easier to implement. The Secretariat would set up an account for each Party containing the initial allocations set in the Agreement. The Secretariat would then record emissions and budgets based on the annual reports submitted by Parties in their national communications. After determining that all necessary information was properly included, the Secretariat would implement budget transfers reported by the Parties by adjusting each Party's account to add any "tonnes-allowed" purchased and subtract any "tonnes-allowed" sold by the Party. The Secretariat would then permanently deduct (retire) enough "tonnes-allowed" to account for each Party's annual emissions. At the end of the budget period, the Secretariat would automatically record any budget adjustments required by banking and borrowing provisions.

6. What is the Role of the Private Sector?

Although a trade does not officially take place until the Secretariat records the transfer at the end of the year based on each Party's annual submission, there is a role for the private sector to facilitate the private transactions which lead to the official transfer. Indeed, private brokers may negotiate trades among Parties at any time during the year. "Tonnes-allowed" might be informally exchanged several times through various Parties during the year, with only certain transfers being officially recorded by the Secretariat. The Secretariat might facilitate the role of brokers by creating a "market account" (separate from the accounts created for each Party) where parties could transfer their tonnes-allowed to be held until the broker eventually finds another Party to purchase those tonnes-allowed for compliance. It might be possible to allow brokers and other various nongovernmental organizations to participate directly in official transfers recorded by the Secretariat, although there is some concern about the level of resources which would be required.

7. What happens at the end of the budget, if a Party does not have enough tonnes allowed to account for all of its emissions?

If there are cases where a Party does not have enough tonnes-allowed to cover all of its emissions during the budget period, the Party would be permitted to buy enough tonnes-allowed from other Parties to make up the difference. However, if the Party still does not have enough tonnes-allowed to account for its emissions, then the Secretariat would automatically transfer a sufficient quantity of "borrowed" tonnes-allowed from the Party's subsequent budget period into the Party's current account. The Secretariat would simultaneously deduct the appropriate number of "penalty" tonnes-allowed from the Party's subsequent budget period and immediately transfer those tonnes-allowed into a permanent "retirement" account. In addition, a Party would be restricted from selling any additional tonnes-allowed until the question of compliance was resolved.

Burden Sharing

Emissions in 2050 – SGM output

No LDC Part.	World	US	US/World (%)	
Peaks	10448	1350	12.93	no ramp in
1990–2010	10439	1350	12.93	
-10%	10031	1215	12.11	
1995–2010	10161	1480	14.56	

2030 Levels

1990–2010	8688	1350	15.54	ramp in
Peaks	8687	1350	15.54	

2030–2050 Per Capita

1990–2010	10072	1350	~~10072~~ 13.4	ramp in
Peaks	10071	1350	13.4	

BAU

	11988	2245	18.73

1990	5583	1350	24.18

Population

	US[1]	World[2]	US/world (%)	
1990	249,913,000	5,281,551,305	4.73	1: 1996 Stat Abstract
2050	393,931,000	9,355,700,376	4.21	2: http://www.census.gov/ipc/www/worldpop.html

United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

August 27, 1997

TO: *Distribution

FROM: OES/EGC - Daniel A. Reifsnyder

SUBJECT: Climate Change: Developing Countries

Attached is a copy of a draft paper on "Developing Countries: An Overview of the Options" that will serve as a basis for discussion at our meeting tomorrow morning, August 28, at 10:00 a.m. in Room 6245 of the State Department. The paper follows from the earlier discussion paper (version #5) entitled "Climate Change: Developing Countries." We plan, at the meeting, to consider both procedural and substantive options.

We look forward to seeing you tomorrow.

Attachment:
As stated.

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Rev:8/27/97

DRAFT

Developing Countries: An Overview of the Options

The issue of developing country commitments has emerged as one of the most contentious in the current policy debate. Domestically, Congress (through the Senate's Byrd Resolution) and industry (through numerous letters and personal comments from associations, CEOs and lobbyists) have insisted that developing countries assume obligations in the same time frame as developed countries.

The most rapid emissions growth comes from the developing world, and that because of the rates of new investment in capital stock, enormous potential exists for reducing the growth trend in emissions as new equipment is added. Furthermore, ultimately, it is clear that global GHG concentrations could not be stabilized absent emissions limitations at a global level.

Even if developing countries do not participate, however, most economic analysis suggests that the U.S. economy will maintain its competitive edge, in aggregate. While some sectors and regions may experience disproportionate effects relative to the average national "impact," there is little aggregate competitive impact on developed countries if each unilaterally assumes the commitments proposed: developing countries, on average, have less than half the per capita emissions of developed countries; it is expected to be more than 30 years before aggregate developing country emissions equal those from the developed world; and developing countries have less than one third of the per capita income of developed countries. Notwithstanding these counterweights, congressional and industry concerns remain.

A number of alternatives have emerged with respect to the U.S. position regarding developing countries in the agreement or package of agreements to be adopted to address the problem of climate change. These options are described below, and an Appendix is attached which explains a possible structure for including developing countries in a new instrument which might be agreed under either option 2 or 3.

Option 1: Existing proposal with extensive public outreach to build support.

The current U.S. draft protocol proposal contains three elements that involve developing countries:

1) "Advancing the implementation of Article 4.1 commitments, which includes an array of policy and measures obligations to annually inventory and report on emissions, to take actions to increase energy efficiency and remove subsidies that impede market behavior (and thus inappropriate energy prices), etc.

2) Establishing a new category of countries (Annex B), which would establish legally binding emissions limitation commitments for advanced developing countries (such as Mexico and Korea) which voluntarily assume them. Recognizing the differences between these countries and other Annex I Parties, such commitments might enter into force on a different time-frame or at a different level than those of Annex I.

3) Establish, as part of the protocol, a date certain (e.g., 2005) by which a new agreement would have to be negotiated, which would obligate all Parties, including developing country Parties, to assume specific emissions limitation obligations. As part of this agreement, there would be an automatic graduation mechanism so that commitments could, for example, be tied to a level of economic growth.

The United States has argued that each of these proposals are within the ambit of the Berlin Mandate. The first poses no problem; the second, which establishes new commitments, allows voluntary accession; and the third, while calling for new commitments, does not specify them – only requiring that some the date for concluding such commitments be set. In spite of these arguments, most other countries have indicated their belief that actions (2) and (3) are beyond the scope of the mandate – and have proposed they be dropped from consideration as part of any agreement adopted in Kyoto.

To further complicate this proposal, the Senate has clearly indicated its objection to the Berlin Mandate and view that the current U.S. proposal would not adequately strengthen developing country participation. To increase confidence that the Senate would give its advice and consent to the ratification of such a proposal (presuming it were internationally agreed), significant efforts would need to be made to develop public consensus around the appropriateness of the approach.

Given these concerns, even the successful negotiation of the existing U.S. proposals will be an uphill task, and one that might not be accomplished prior to Kyoto. Furthermore, given the overwhelmingly negative reception in the Senate to date, ratification might take years beyond that time.

Options for Redefinitions of Success in Kyoto

Option 2. Redefine success – establish a new negotiating mandate in Kyoto

Under this scenario, the United States would acknowledge the importance of involving developing countries in any next step, and publicly recognize that the current mandate does not properly set the course for such negotiations. The Kyoto meeting would become the session for agreeing on a new mandate for future negotiations – a Kyoto Mandate to replace the Berlin Mandate. Such an agreement might include elements of the existing U.S. proposal (e.g., those on flexibility, and strict monitoring and compliance mechanisms) as well as the requirement that any future commitments be global in nature, and involve both developing and developed countries.

Some significant advantages accrue to such an option. It would be possible to extend the period for negotiation of the difficult – but critical – details to allow operationalization of emissions trading and joint implementation. Further, it might be possible to develop one, possibly differentiated regime in which all countries participated, removing the arbitrary separation between "developed" and "developing" countries. Furthermore, such an approach would send a clear signal of U.S. unwillingness to

negotiate under the current mandate, and would silence any criticisms that our proposals ran counter to negotiating guidelines. Domestic critics of the current approach (most of whom have argued that the Berlin Mandate was a significant mistake) would applaud such an approach.

However, both domestic and international difficulties could also follow from taking such a position. The U.S. could be accused of "negotiating in bad faith" given that since March of 1995, when we accepted the Berlin Mandate at the first session of the Conference of the Parties , we have not sought to object to its terms. Even as recently as the just concluded August session of the Ad Hoc Group on the Berlin Mandate (established to negotiate the Kyoto agreement), we did not indicate a desire to renege on our agreement to continue to work under its direction. It is also not clear that it would be an easy matter to turn Kyoto from a session at which we might adopt a new legal instrument to one at which Parties would be content to adopt only new negotiating directions. The outcome of the Berlin meeting was predicated on an insistent rejection by developing countries that they take on new commitments unless and until developed country Parties had done so. None of these arguments have diminished in force – and would probably preclude a successful effort to set a new mandate in Kyoto. A U.S. statement of this nature might be perceived as a rejection of the entire negotiating process to date – which could lead to a contrary reaction rejecting the other more desirable elements of the U.S. position such as our flexibility proposals. Finally, as an extreme possibility, such a statement could dampen the likelihood that a future negotiation could proceed at all for several years – a circumstance which could significantly set back global efforts to address the climate change problem, and a failure which would almost certainly be laid at the U.S. door.

To achieve this goal, an aggressive and high level diplomatic effort would need to be mounted. To be successful, we would need to indicate our own willingness to take on a significant limitation target prior to (or at least concurrently) with any such announcement. Key negotiating partners, such as Japan (host of the Kyoto meeting, and with enormous prestige invested in a successful meeting), and the EU would need to be informed and mollified. Domestic environmental constituencies would need to be consulted and convinced of the appropriateness of such an approach. However, allies could be found. Were the Administration to take such a stand, both Congress and many industry representatives might be willing to work with us to support the U.S. adoption of an agreement under such terms (contingent, of course, on accepting the target itself). A number of developed countries (including Canada, Australia and possibly some in the FSU) might support such a proposal. Finally, given the difficulty in bringing China and other developing countries to support our existing proposals, this option might provide more time to engage them in a diplomatic effort to convince them of the need to participate in the new regime.

Option 3. A two-step approach – multiple agreements.

A merger of these two proposals might be a third alternative. Under such a scenario, we could conclude (or at least complete the principal effort to negotiate) an agreement in Kyoto that incorporated those elements consistent with the Berlin Mandate (e.g.,

dropping our proposals for Annex B and evolution), and set a new mandate for the negotiation of developing country commitments at the same time. The United States could explicitly link the two agreements, refusing to either sign or submit for ratification either agreement until both were complete.

Such a proposal might bring advantages from both option 1 and 2. It would maintain the momentum of the current negotiations, allow a positive outcome in Kyoto (satisfying both the Japanese and other countries keen to see an agreement concluded in December, as well as members of U.S. environmental constituencies), and set the stage for a negotiation of a second linked agreement containing the substantive obligations for developing countries called for by Congress and others. This option would also allow for the continuation – and possible completion in Kyoto – of negotiations on issues central to the current U.S. position, including on flexibility elements, reporting, monitoring and compliance structures, and the kinds of general policies and measures proposed under the existing Article 4.1.

A number of decisions would need to be taken regarding the structure and content of the second, linked agreement. Ideally, it would be a part of the same instrument, or have similar standing (e.g., both could be amendments to the convention). It will also be necessary to consider how to insure that developing countries are Party to both agreements – and not only to the instrument completed in Kyoto. The Convention itself provides some guidance on how developing country commitments might be set – it calls for a "second review of the adequacy of Article 4.2" no later than the end of 1998, and it requires a review of the Annexes by the same date. The first requirement would enable a conclusion that absent developing country participation the existing convention obligations are inadequate; the second would allow for including all countries, perhaps on a graduated basis, in commitments to limit or reduce emissions.

There may be both domestic and international support for this alternative. Many OECD countries, while rejecting the U.S. proposal for "evolution" as part of the Kyoto agreement, have indicated their willingness to consider a separate Kyoto mandate that would establish a new follow-on negotiation. The AGBM chairman has also indicated his view that the U.S. "Annex B" and the EU "Annex X" should be taken up in the context of the review and possible amendment of the Annexes under the Convention. While difficult to negotiate substantively, the existence of procedures for such negotiations could significantly facilitate the process.

This option also has drawbacks. Negotiating the mandate to agree on future steps might be extremely difficult. The rationale for rejecting developing country commitments elucidated above would still apply – and could derail the second negotiation. However, in such a case, the failure might be laid at the door of developing countries rather than at our own – as we would have been operating within the negotiating terms established both in the Convention itself and in Berlin at the first meeting of the Conference of the Parties. In addition, the lengthy period during which negotiations would proceed may see little if any action by any country to reduce emissions – leading to a continued build-up of atmospheric concentrations. Finally, Congress may not be satisfied with any statement regarding the linkage between the two

agreements if one is completed in Kyoto which does not mandate developing country commitments.

As with option 2, to successfully achieve this goal would require a concerted effort between now and Kyoto – both on the diplomatic front to insure U.S. proposals are endorsed by others, and on the domestic front, to develop a proposal for a Kyoto mandate or to table a proposal for an amendment to the Convention for discussion.

Appendix: A Proposal for Engaging Developing Countries (Under Options 2 and 3)

A proposal to engage developing countries could be built on the existing provisions in the Convention as well as those in the U.S. draft protocol proposal, particularly including those that relate to the review of Annexes. Specifically, the United States could recommend:

1) Amending the Convention to include all countries in a binding target.
2) Setting a threshold at which the target would automatically enter into force using a formula based on (a) the per capita income of the Party and/or (b) the percentage of the global total that the party's national emissions represent. Both variables could be set so as to insure including the major emitters (e.g., China and India) and to insure that the wealthy developing countries would take on commitments (e.g., Singapore, Israel, the wealthy oil exporting countries and others).*
3) Take the U.S. provision on "evolution" and modify it to call for a regular review of the overall target, with a possibility of ratcheting the obligation of each party appropriate to any new developments in the science.

These obligations could be in addition to existing provisions (either adopted as part of the U.S. proposals or in any new instrument) that Parties develop and make public the domestic programs they intend to use to meet their targets; and that strict compliance and enforcement regimes be established.

* 31 countries have emissions that are greater than ½ percent of the global total (according to WRI numbers). Those not currently included in Annex I are (in size order): China, India, Mexico, Kazakhstan, South Korea, North Korea, Iran, Saudi Arabia, Brazil, Indonesia, , Uzbekistan, Argentina, Venezuela and Thailand.

  According to the same data tables, seven countries have per capita incomes exceeding the minimum in the OECD (Greece, at $8,877): Singapore, UAE, Israel, Libya, Trinidad and Tobago, South Korea, and Saudi Arabia. Of these, only Singapore exceeds the OECD average, and only Singapore and the UEA exceed the Annex I average. More than 90 countries exceed the Annex I minimum (Romania, at $2,100).

Drafted: OES/EGC - JCPershing

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Country	Purchasing Power Parity Per Capita ($1995)
India	**1400**
China	**2920**
Mexico	**6400**
Argentina	8310
Malaysia	9020
St. Kitts and Nevis	9410
Chile	9520
Barbados	10620
South Korea	**11450**
Mauritis	13210
Bahrain	13400
Bahamas	14710
Israel	16400
Qatar	17690
Singapore	**22770**

ɔuntry	GNP, US$ millions 1995	GNP per capita US$ 1995	PPP international $ 1995	CO2 emissions for 1994 (thousand metric tons of C)
Afghanistan				342
Albania	2199	670		446
Algeria	44609	1600	5300	23100
American Samoa				77
Andorra				
Angola	4422	410	1310	1366
Antarctic Fisheries				4
Antigua and Barbuda				85
Argentina	278431	8030	8310	35077
Armenia	2752	730	2260	951
Aruba				460
Australia	337909	18720	18940	75912
Austria	216547	26890	21250	15586
Azerbaijan	3601	480	1460	12694
Bahamas	3297	11940	14710	472
Bahrain	4525	7840	13400	3933
Bangladesh	28599	240	1380	5043
Barbados	1745	6560	10620	269
?elarus	21356	2070	4220	18164
ɔelgium	250710	24710	21660	27974
Belize	568	2630	5400	68
ɜnin	2034	370	1760	177
ɜermuda				125
Bhutan	295	420	1260	41
Bolivia	5905	800	2540	2454
Bosnia and Herzegovinia				642
Botswana	4381	3020	5580	668
Brazil	579787	3640	5400	64417
British Virgin Islands				14
Brunei				2588
Bulgaria	11225	1330	4480	14408
Burkina Faso	2417	230	780	260
Burundi	984	160	630	58
Cambodia	2718	270		133
Cameroon	8615	650	2110	937
Canada	573695	19380	21130	121712
Cape Verde	366	960	1870	32
Cayman Islands				77
Central African Republic	1123	340	1070	64
Chad	1144	180	700	26
Channel Islands				
?hile	59151	4160	9520	11319
:hina	744890	620	2920	828436
hristmas Island				22
Colombia	70263	1910	6130	18062
Comoros	237	470	1320	18

ountry	GNP, US$ millions 1995	GNP per capita US$ 1995	PPP international $ 1995	CO2 emissions (Thousand metric tons of C 1994)
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Cayman Islands				77
Central African Republic	1123	340	1070	64
Chad	1144	180	700	26
Channel Islands				
Chile	59151	4160	9520	11319
hina	744890	620	2920	828436
hristmas Island				22
Colombia	70263	1910	6130	18062
Comoros	237	470	1320	18

Congo	1784	680	2050	493
Cook Islands				6
Costa Rica	8884	2610	5850	1349
Cote d'Ivoire	9248	660	1580	2812
roatia	15508	3250		3706
Cuba				7673
Cyprus				1433
Czech Republic	39990	3870	9770	31105
Czechoslovakia				52226
Denmark	156027	29890	21230	17007
Djibouti				100
Dominica	218	2990		19
Dominican Republic	11390	1460	3870	3093
Ecuador	15997	1390	4220	3960
Egypt	45507	790	3820	24651
El Salvador	9057	1610	2610	1256
Equatorial Guinea	152	380		34
Eritrea				
Estonia	4252	2860	4220	4736
Ethiopia	5722	100	450	1555
Faeroe Islands				159
Falkland Islands				10
Fiji	1895	2440	5780	196
Finland	105174	20580	17760	14571
France	1451051	24990	21030	88196
French Guiana				236
ench Polynesia				149
Gabon	3759	3490		2086
Gambia	354	320	930	57
Georgia	2358	440	1470	1931
Germany	2252343	27510	20070	219612
Ghana	6719	390	1990	1113
Gibraltar				55
Greece	85885	8210	11710	20804
Greenland				137
Grenada	271	2980		44
Guadeloupe				405
Guam				400
Guatemala	14255	1340	3340	1897
Guinea	3593	550		287
Guinea-Bissau	265	250	790	62
Guyana	493	590	2420	287
Haiti	1777	250	910	146
Hondurus	3566	600	1900	883
Hong Kong	142332	22990	22950	7930
Hungary	42129	4120	6410	14646
Iceland	6686	24950	20460	549
dia	319660	340	1400	236448
ndonesia	190105	980	3800	66964
Iran			5470	69573
Iraq				25268

Ireland	52765	14710	15680	9001
Isle of Man				
Israel	87875	15920	16490	12468
Italy	1088085	19020	19870	106947
Jamaica	3803	1510	3540	2369
Japan	4963587	39640	22110	303267
Jordan	6354	1510	4060	3135
Kazakstan	22143	1330	3010	66547
Kenya	7583	280	1380	1787
Kiribati	73	920		6
N. Korea				71079
S. Korea	435137	9700	11450	91853
Kuwait	28941	17390	23790	11526
Kyrgyz Republic	3158	700	1800	2024
Lao	1694	350		80
Latvia	5708	2270	3370	2987
Lebanon	10673	2660		3143
Lesotho	1519	770	1780	
Liberia				85
Libya				10843
Liechtenstein				
Lithuania	7070	1900	4120	4277
Luxembourg	16876	41210	37930	2765
Macao				339
Macedonia	1813	860		2776
Madagascar	3178	230	640	295
Malawi	1623	170	750	196
Malaysia	78321	3890	9020	26339
Maldives	251	990	3080	29
Mali	2410	250	550	125
Malta				455
Marshall Islands				
Martinique				556
Mauritania	1049	460	1540	885
Mauritis	3815	3380	13210	370
Mayotte				
Mexico	304596	3320	6400	97694
Micronesia	215			
Moldova	3996	920		3676
Monaco				
Mongolia	767	310	1950	2535
Montserrat				10
Morocco	29545	1110	3340	8376
Mozambique	1353	80	810	257
Myanmar				1797
Namibia	3098	2000	4150	
Nauru				37
Nepal	4391	200	1170	413
Netherlands	371039	24000	19950	36900
Netherlands Antilles				1685
New Caledonia				468

New Zealand	51655	14340	16360	7360
Nicaragua	1659	380	2000	529
Niger	1961	220	750	302
Nigeria	28411	260	1220	29792
liue				1
Northern Mariana Islands				
Norway	136077	31250	21940	11712
Oman	10578	4820	8140	5193
Other Far East				44465
Pacific Islands (Palau)				63
Pakistan	59991	460	2230	23105
Panama	7235	2750	5980	1389
Papua New Guinea	4976	1160	2420	645
Paraguay	8158	1690	3650	859
Peru	55019	2310	3770	5672
Philippines	71865	1050	2850	13429
Poland	107829	2790	5400	92416
Portugal	96689	9740	12670	12723
Puerto Rico				4686
Qatar	7448	11600	17690	7819
Reunion				421
Romania	33488	1480	4360	31458
Russian Federation	331948	2240	4480	440979
Rwanda	1128	180	540	118
Saint Helena				2
Samoa				33
ao Tome and Principe	45	350		20
Saudi Arabia	133540	7040		61804
Senegal	5070	600	1780	838
Seychelles	487	6620		46
Sierra Leone	762	180	580	189
Singapore	79831	26730	22770	21699
Slovak Republic	15848	2950	3610	
Slovenia	16328	8200		2505
Solomon Islands	341	910	2190	42
Somalia				9
South Africa	130918	3160	5030	85488
Spain	532347	13580	14520	59371
Sri Lanka	12616	700	3250	1538
St. Kitts and Nevis	212	5170	9410	27
St. Lucia	532	3370		51
St. Pierre & Miquelon				19
St. Vincent and Grenadine	253	2280		33
Sudan				946
Suriname	360	880	2250	578
Swaziland	1051	1170	2880	133
Sweden	209720	23750	18540	13668
witzerland	286014	40630	25860	11201
yrian Arab Republic	15780	1120	5320	12619
Tajikistan	1976	340	920	759
Tanzania	3703	120	640	620

Thailand	159630	2740	7540	39535
Togo	1266	310	1130	194
Tonga	170	1630		28
Trinidad and Tobago	4851	3770	8610	4607
Tunisia	16369	1820	5000	323
Turkey	169452	2780	5580	44752
Turkmenistan	4125	920		7852
Uganda	4668	240	1470	261
Ukraine	84084	1630	2400	111644
United Arab Emirates	42806	17400	16470	17423
United Kingdom	1094734	18700	19260	149741
United States	7100007	26980	26980	1387256
Uruguay	16458	5170	6630	1140
Uzbekistan	21979	970	2370	28550
Vanautu	202	1200	2290	17
Venezuala	65382	3020	7900	49577
Vietnam	17634	240	2345	8086
Virgin Islands				3421
Wake Island				17
West Bank and Gaza				
Western Samoa	184	1120	2030	
Yemen	4044	260		
Yugoslavia (Serbia)				779
Zaire	5313	120	490	967
Zambia	3605	400	930	672
Zimbabwe	5933	540	2030	5108

Level comparisons of GDP

The level comparisons of GDP per capita and per employed person in this report are labeled "real" because they are based on purchasing power parities (PPPs). A PPP for a given country is the number of national currency units required to buy goods and services in that country equivalent to what can be bought with one unit of a base country's currency in the base country (in this report, the base country is the United States). Thus, PPPs are currency conversion rates that allow output in different currency units to be compared among countries.

PPPs are interspatial indexes constructed for the purpose of comparing currencies and volumes across countries. They are somewhat analogous to intertemporal price indexes used within a country to compare changes in prices and volumes over time, such as a consumer price index. Just as a consumer price index measures the cost of a basket of goods and services over time, PPPs can be used to measure the cost of a particular basket of goods and services across countries. The procedures are similar: to compare prices (or amounts of each country's currency) for each of a set of goods and services and then to construct a weighted average of the price (or units of currency) ratios to arrive at an overall index.

While the comparison of prices in different currencies across countries (*i.e.*, the development of PPPs) is comparable in concept and methodology to the comparison of prices within a country over time, some aspects of cross-country comparisons are more complicated. For example, it is more difficult to find goods and services for pricing that are representative of many different countries than to select representative goods and services within a country for pricing over time; and there is no consensus on the best method for aggregating the PPPs for commodity groups to arrive at a single PPP for total GDP.

Inter-country comparisons of output levels are sometimes based on market exchange rates rather than PPPs. However, market exchange rates seldom reflect the relative purchasing powers of different currencies. At best, even freely fluctuating market exchange rates represent only the relative values of currencies for goods and services that are traded internationally, not the relative value of total domestic output, which also consists of goods, and particularly services, that are not traded internationally or which are isolated from the effects of foreign trade. Market exchange rates are also affected by influences entirely unrelated to the relative values of currencies for purchases of any goods or services. These influences include currency traders' views of the stability of governments in various countries, relative interest rates among countries, and other incentives for holding financial assets in one country rather than another.

International trade, patterns of specialization, and relative prices

The scenario's growth, trade liberalization, and transport cost assumptions yield a projection of world trade volume growth averaging near 5.5 percent a year in 1992–2020, not much below the 6 percent rate averaged since the mid-1980s. The high-income OECD countries' share of world exports and imports falls in constant dollar terms from 65–70 percent in 1992 to 40–45 percent in 2020, while that of developing countries roughly doubles to 45–50 percent (table 1-8). Among the Big 5, India achieves the highest growth in exports and imports (11–12 percent a year), reflecting the removal of anti-export bias as protection is reduced from high levels and as international barriers to apparel trade are removed. China is expected to continue its vigorous export growth of 10 percent a year.

The focus of industrial country trade shifts substantially toward the developing countries in the baseline scenario. The proportion of industrial country exports shipped to other industrial countries is expected to fall in value terms from 65 percent in 1992 to 45 percent in 2020, while that to developing countries rises from 25 to 40 percent, the Big 5 accounting for about 10 percentage points of the increase. About 50 cents in every dollar's worth of OECD export growth in the period to 2020 would be exports to developing countries. And developing countries will be the fastest growing markets across all twelve of the broad industrial sectors analyzed, ranging from primary agriculture through various kinds of manufactures to services.

Big reductions in trade barriers and transport costs and the sharp rise in developing countries' share in world income envisaged by the scenario generate significant changes in international specialization. Indexes of revealed comparative advantage provide one measure of international specialization (table 1-9).[17] For high-income OECD countries the most dramatic feature of the scenario is a sharp increase in their specialization in services exports ("other services"), including key categories such as telecommunications

Developing countries' share of world GDP will nearly double by 2020

Table 1-7 World growth, 1974–2020, and shares in world GDP, 1992 and 2020
(Percent)

	Annual average growth							
	Real GDP[a]				*Capital stock*	*Total factor productivity*	*Share of world real GDP*[a]	
Country or group	*1974–82*	*1982–92*	*1992–95*	*1992–2020*	*1992–2020*	*1992–2020*	*1992*	*2020*
World	2.6	3.0	2.4	2.9	3.6	0.5	100.0	100.0
High-income economies	2.3	3.1	2.2	2.5	3.3	0.3	84.2	70.9
OECD	2.2	2.9	2.0	2.4	3.1	0.3	81.5	66.7
Newly industrialized economies[b]	8.0	8.7	7.4	4.9	6.0	1.3	2.3	3.8
Hong Kong (China)	7.7	9.3	7.8	4.0	4.0	1.1	0.3	0.4
Developing countries	3.7	2.6	3.1	5.4	6.0	1.3	15.7	29.1
Big 5	4.4	2.7	3.3	5.8	7.2	1.7	7.8	16.1
China	6.5	10.3	12.5	7.0	9.5	2.2	1.4	3.9
India	4.4	5.4	5.5	5.8	6.7	1.9	1.0	2.1
Brazil	4.3	1.8	4.8	4.6	4.6	1.1	1.7	2.5
Indonesia	6.8	7.1	7.6	6.9	6.9	1.9	0.6	1.5
Economies in transition[c]	3.8	–0.7	–5.4	5.5	7.0	1.7	3.2	6.0
ASEAN 3[d]	6.3	5.6	7.7	7.1	6.7	2.0	0.8	2.4
Rest of South Asia	5.3	5.2	4.0	5.2	5.7	1.4	0.3	0.6
Rest of Latin America and the Caribbean	3.0	2.0	2.2	4.2	4.0	0.9	2.1	2.9
Sub-Saharan Africa	2.2	2.0	2.1	4.2	3.4	0.8	1.2	1.7
Middle East and North Africa	2.2	2.0	2.1	4.2	4.1	0.3	2.3	3.1
Rest of world	3.3	2.4	2.6	5.6	5.8	1.4	1.2	2.3

a. Constant 1992 U.S. dollars using market exchange rates.
b. Republic of Korea, Singapore, and Taiwan (China).
c. Because of data limitations economies in transition are modeled as a group.
d. Malaysia, Philippines, and Thailand.
Source: Global Trade Analysis Project; World Bank data and staff estimates.

.ieet 1 - Individual co emissions reductions under stabilization									
Reg/Co		Chng in	C cnt of	Energ cnt	Coal Res	C/GDP	C/POP	GDP/POP	C 1990
		C/GDP	fossil fuel	fsl ful exp	in 1990	tons/ 87 $	tons/cap	87 $/cap	mm tons
		90 - 2010	exprts,"90	quads,'90		in 1990	in 1990	in 1990	
		Ti	Ui	Vi	Wi	Xi	Yi	Zi	
OECD-NA									
US		-5.6E-05	77.47946	3.105419	265173	0.000273	5.349926	19596.25	1337
Canada		-2.9E-05	71.40494	3.70513	7677	0.000308	5.116629	16620.05	136
Mexico			0						
OECD-EUR		2.44E-05	162.952	8.592849	123031	0.000184	2.363351	12857.57	1023
Austria									
Belgium									
Denmark									
France									
Germany									
Greece									
Ireland									
Italy									
Netherlands									
Norway									
Portugal									
Spain									
Sweden									
Switzerland									
Turkey									
UK									
other									
OECD-PAC									
Australia*		-3.8E-05	81.32532	3.27538	100216	0.000277	3.634232	13111.96	62
Japan		6.5E-05	1.20696	0.047	962	0.00011	2.510528	22787.12	310
New Zealand									
EE/FSU									
FSU		-0.00089	166.2948	9.077674	265582	0.001418	3.564288	2512.82	1034
East. Eur		-0.00024	20.77667	0.820728	59465	0.001678	3.423695	2040.673	341
E.Asia									
So. Korea									
Average		-0.00017	72.68002	4.089169	117443.7	0.000285	3.422906	11999.33	606.1429
Total									4243

Annex A allowable emissions based on 3 metric tons per capita (millions metric tons)

Reg/Co	1990	1995	2000	2005	2010	2025
OECD-NA						
US	**750**	**789**	**828**	**861**	**897**	**993**
Canada	**84**	**87**	**96**	**99**	**105**	**114**
Mexico						
OECD-EUR	**1287**	**1317**	**1344**	**1368**	**1383**	**1395**
Austria	24	24	24	24	24	24
Belgium	30	30	30	30	30	30
Denmark	15	15	15	15	15	15
France	171	174	180	183	186	183
Germany	237	246	237	240	237	228
Greece	30	30	33	33	33	30
Ireland	12	12	12	12	12	12
Italy	171	171	174	171	168	156
Netherlands	45	48	48	48	48	48
Norway	12	12	12	12	12	15
Portugal	30	30	30	30	30	30
Spain	117	120	120	120	120	114
Sweden	27	27	27	27	27	30
Switzerland	21	21	21	24	24	24
Turkey	171	183	201	219	234	273
UK	174	174	180	180	183	183
other						
OECD-PAC						
Australia	**51**	**54**	**57**	**60**	**63**	**75**
Japan	**372**	**375**	**381**	**387**	**390**	**366**
New Zealand	**12**	**12**	**12**	**12**	**12**	**12**
EE/FSU						
FSU	**864**	**879**	**882**	**891**	**900**	**951**
Belarus,Rep	30	30	30	30	30	30
Estonia,Rep	6	6	6	6	6	3
Latvia, Rep	9	9	9	9	9	6
Lithuania,Rep	12	12	12	12	12	12
Moldova, Rep	12	12	12	12	12	15
Russian Fed	444	441	438	432	429	417
Ukraine	156	153	153	153	153	147
Armenia	9	12	12	12	12	15
Azerbaijan	21	24	24	24	24	30
Georgia, Rep	15	15	15	15	15	18
Kazakhstan, Rep	51	51	51	54	54	66
Kyrgyz Rep	12	15	15	15	18	21
Tajikistan, Rep	15	18	18	21	24	36
Turkmenistan,Rep	12	12	12	15	15	21
Uzbekistan,Rep	60	69	75	81	87	114

Sources: IEA, WRI

Annex A allowable emissions based on 3 metric tons per capita (millions metric tons)

Reg/Co	1990	1995	2000	2005	2010	2025
East. Eur	**324**	**324**	**324**	**327**	**327**	**342**
Albania	9	9	9	9	12	15
Bulgaria	27	27	27	27	24	24
Czech Rep	30	30	30	30	30	33
Hungary	30	30	30	30	30	27
Poland Rep	114	114	114	117	117	126
Romania	69	69	69	69	69	66
Slovak Rep	15	15	15	15	15	18
Yugoslavia, FR	30	30	30	30	30	33
E.Asia						
So. Korea						
Total	**3744**	**3837**	**3924**	**4005**	**4077**	**4248**

Sources: IEA, WRI

Annex A Populations 1990-2025 (millions)

Reg/Co	Historical	Projected				
	1990	1995	2000	2005	2010	2025
OECD-NA						
US	**250**	**263**	**276**	**287**	**299**	**331**
Canada	**28**	**29**	**32**	**33**	**35**	**38**
Mexico						
OECD-EUR	**429**	**439**	**448**	**456**	**461**	**465**
Austria	8	8	8	8	8	8
Belgium	10	10	10	10	10	10
Denmark	5	5	5	5	5	5
France	57	58	60	61	62	61
Germany	79	82	79	80	79	76
Greece	10	10	11	11	11	10
Ireland	4	4	4	4	4	4
Italy	57	57	58	57	56	52
Netherlands	15	16	16	16	16	16
Norway	4	4	4	4	4	5
Portugal	10	10	10	10	10	10
Spain	39	40	40	40	40	38
Sweden	9	9	9	9	9	10
Switzerland	7	7	7	8	8	8
Turkey	57	61	67	73	78	91
UK	58	58	60	60	61	61
other						
OECD-PAC						
Australia	**17**	**18**	**19**	**20**	**21**	**25**
Japan	**124**	**125**	**127**	**129**	**130**	**122**
New Zealand	**4**	**4**	**4**	**4**	**4**	**4**
EE/FSU						
FSU	**288**	**293**	**294**	**297**	**300**	**317**
Belarus,Rep	10	10	10	10	10	10
Estonia,Rep	2	2	2	2	2	1
Latvia, Rep	3	3	3	3	3	2
Lithuania,Rep	4	4	4	4	4	4
Moldova, Rep	4	4	4	4	4	5
Russian Fed	148	147	146	144	143	139
Ukraine	52	51	51	51	51	49
Armenia	3	4	4	4	4	5
Azerbaijan	7	8	8	8	8	10
Georgia, Rep	5	5	5	5	5	6
Kazakhstan, Rep	17	17	17	18	18	22
Kyrgyz Rep	4	5	5	5	6	7
Tajikistan, Rep	5	6	6	7	8	12
Turkmenistan,Rep	4	4	4	5	5	7
Uzbekistan,Rep	20	23	25	27	29	38

Sources: IEA, WRI

Annex A Populations 1990-2025 (millions)

Reg/Co	Historical	Projected				
	1990	1995	2000	2005	2010	2025
East. Eur	**108**	**108**	**108**	**109**	**109**	**114**
Albania	3	3	3	3	4	5
Bulgaria	9	9	9	9	8	8
Czech Rep	10	10	10	10	10	11
Hungary	10	10	10	10	10	9
Poland Rep	38	38	38	39	39	42
Romania	23	23	23	23	23	22
Slovak Rep	5	5	5	5	5	6
Yugoslavia, FR	10	10	10	10	10	11
E.Asia						
So. Korea						
Total	**1248**	**1279**	**1308**	**1335**	**1359**	**1416**

Sources

IEA- Energy Policies of IEA Countries - 1996 Review
World Resources 96-97 pp. 190-1 WRI

Notes
1 - Other OECD-EUR are Finland, Iceland, Luxembourg
2 - E. Eur includes Albania, Bulgaria, Czech Rep., Slovakia
Hungary, Poland, Romania, Former Yugoslavia
3 - FSU includes Russian Federation, Eur Rpblcs(Belarus,
Moldova, Ukraine); Cen. Asian Rpblcs(Kazakstan,
Kyrgyz Rep., Tajikistan, Turmenistan, Uzbekistan);
Transcaucasus (Armenia,
Azerbaijan, Georgia); and Baltic Sts(Estonia, Lativia, Lithuania)
4 - No data included for Greenland, Guam and Virgin Islands
5 - FSU and EE interpolated for 2000, 2005, 2010

Sources: IEA, WRI

GDP, Carbon Emissions, and Population Projections through 2050

GDP in billions of 1990 US$ (ppp)

	1	2	3	4	5	6	7	8
	Canada	FSU	Japan	USA	W. Europe	Australia	China	India
1985	475	1,614	2,040	4,635	5,345	232	1,207	821
1990	520	1,810	2,221	5,501	6,046	278	1,824	983
1995	588	946	2,461	6,038	6,760	320	2,758	1,232
2000	673	1,238	2,736	6,759	7,560	367	4,066	1,536
2005	770	1,567	3,025	7,517	8,549	422	5,954	1,888
2010	861	1,946	3,248	8,230	9,671	482	8,391	2,255
2015	927	2,390	3,391	8,852	10,921	551	11,369	2,664
2020	971	2,941	3,551	9,490	12,317	627	14,769	3,144
2025	999	3,504	3,750	10,173	13,883	709	18,964	3,668
2030	1,018	4,152	3,954	10,905	15,644	799	23,789	4,217
2035	1,051	4,817	4,141	11,690	17,629	905	29,153	4,777
2040	1,096	5,480	4,269	12,532	19,877	1,009	35,500	5,294
2045	1,150	6,198	4,451	13,434	22,409	1,132	43,827	5,828
2050	1,207	6,944	4,697	14,401	25,267	1,269	54,266	6,514

Carbon Emissions (bold numbers indicate **emissions base**: 90 or 95 for An I, but for non An I year at which begin to limit emissions = 5yr after income factor >0)

	1	2	3	4	5	6	7	8
	Canada	FSU	Japan	USA	W. Europe	Australia	China	India
1985	106	945	242	1227	820	55	509	132
1990	117	**1050**	272	1350	835	62	648	198
1995	**135**	664	**311**	**1480**	**887**	**69**	808	252
2000	146	710	337	1550	937	75	979	300
2005	158	760	356	1637	1008	82	1173	345
2010	169	836	368	1729	1074	88	1379	373
2015	176	886	370	1808	1112	92	**1610**	432
2020	180	933	373	1871	1146	96	1829	503
2025	181	960	380	1922	1172	98	2068	573
2030	180	963	386	1972	1179	99	2316	632
2035	180	982	390	2029	1172	99	2607	657
2040	181	1023	389	2093	1174	99	2887	676
2045	185	1050	394	2166	1170	99	3153	732
2050	189	1050	406	2245	1160	100	3443	816

Population (millions)

	Canada	FSU	Japan	USA	W. Europe	Australia	China	India
	Region 2	Region 4	Region 6	Region 1	Region 1	Region 1	Region 3	Region 5
1985	24.721	279.208	120.751	239.28	420.54	15.944	1051.672	744.884
1990	26.524	289.514	123.532	250.3	432.681	17.064	1133.687	810.709
1995	28.423	295.497	125.213	263.301	444.44	18.241	1199.332	883.401
2000	29.842	302.106	126.84	275.603	452.87	19.291	1255.054	967.133
2005	31.052	309.267	127.749	287.102	457.323	20.19	1301.519	1058.659
2010	32.168	317.056	127.947	298.897	461.356	20.972	1347.517	1147.597
2015	33.158	324.709	127.295	311.2	464.781	21.616	1392.235	1229.515

Source: SGM

Population (millions) (cont.)

	Canada	FSU	Japan	USA	W. Europe	Australia	China	India
	Region 2	Region 4	Region 6	Region 1	Region 1	Region 1	Region 3	Region 5
2020	34.022	331.335	126.027	322.742	467.469	22.115	1434.385	1306.26
2025	34.659	337.583	124.292	335.046	469.292	22.525	1471.284	1381.008
2030	34.999	342.812	122.152	346.9	469.616	22.824	1500.61	1456.898
2035	35.14	347.215	120.118	358.459	468.465	23.023	1521.626	1533.732
2040	35.085	350.787	118.297	369.981	465.065	23.118	1535.192	1607.294
2045	34.991	353.898	116.507	381.709	461.665	23.137	1542.178	1673.931
2050	34.89	359.034	114.677	393.934	458.265	23.178	1555.809	1732.87

Source: SGM

GDP in billions of 1990 US$ (ppp)

	9	10	11	12	13
	Korea	Mexico	ROW	E. Europe	Mideast
1985	265	507	1,258	246	510
1990	336	597	1,497	279	607
1995	420	721	1,782	144	712
2000	548	883	2,129	178	841
2005	727	1,086	2,530	219	967
2010	973	1,309	2,981	269	1,111
2015	1,242	1,548	3,475	333	1,274
2020	1,497	1,796	4,005	411	1,499
2025	1,713	2,043	4,563	507	1,767
2030	1,912	2,283	5,141	625	2,080
2035	2,101	2,513	5,740	771	2,441
2040	2,316	2,726	6,351	953	2,830
2045	2,550	2,939	6,956	1,098	3,226
2050	2,801	3,149	7,580	1,264	3,608

Carbon Emissions (bold numbers indicate **emissions base**: 90 or 95 for An I, but for non An I year at which begin to limit emissions = 5yr after income factor >0)

	9	10	11	12	13
	Korea	Mexico	ROW	E. Europe	Mideast
1985	36	69	412	379	130
1990	50	86	499	**417**	172
1995	57	111	601	276	214
2000	65	131	673	299	246
2005	74	152	746	317	274
2010	**90**	**175**	836	339	304
2015	107	199	936	361	336
2020	120	221	1039	382	382
2025	130	242	1141	401	420
2030	139	259	1242	422	**468**
2035	143	272	1342	444	533
2040	148	281	1440	468	600
2045	157	289	1532	482	661
2050	162	296	1622	499	695

Population (millions)

	Korea	Mexico	ROW	E. Europe	Mideast
	Region 7	Region 8	Region 1	Region 13	Region 9
1985	40.42	73.171	1564.955	122.455	127.933
1990	42.872	81.723	1763.484	124.182	141.48
1995	44.825	90.464	1970.463	124.561	157.466
2000	46.721	98.784	2186.477	125.704	175.678
2005	48.396	106.718	2411.628	127.172	196.377
2010	49.874	114.021	2644.263	128.772	218.926
2015	51.076	121.173	2875.197	130.119	241.617

Source: SGM

Population (millions) (cont.)

	Korea	Mexico	ROW	E. Europe	Mideast
	Region 7	Region 8	Region 1	Region 13	Region 9
2020	52.071	128.455	3104.766	131.149	263.685
2025	52.947	135.611	3330.54	131.981	285.132
2030	53.681	142.334	3548.174	132.701	306.591
2035	54.143	148.314	3752.314	133.202	328.69
2040	54.129	153.562	3939.744	133.463	350.986
2045	54.114	158.028	4107.266	133.488	372.848
2050	54.1	162.356	4285.822	134.234	393.323

Source: SGM

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

MEMBER

August 26, 1997

MEMORANDUM FOR RAFE POMERANCE, STATE DEPARTMENT

FROM: JEFF FRANKEL

SUBJECT: Developing Countries Paper (Comments are on Draft #5)

Page 3: The major reasons why we want developing countries participating is not the "competitiveness" issue (which, as you say, is the one that has been articulated by critics), but rather that, without the developing countries, our sacrifices will have been largely in vain, with regard to global emissions and concentrations. This is for two reasons: "free riding" (even if the LDCs don't alter behavior, their emissions will grow rapidly) and "leakage" (efforts by Annex I countries to reduce use of fossil fuels will end up raising fossil fuel use in non-included countries, e.g., via a lower world price of oil). I think you agree with these points. But I would suggest that they be included explicitly.

Page 5: Should the list of middle scenarios include two obvious ones: a moderate path, and a clause making US/Annex I action conditional on developing country agreement to participate?

Page 7: Under "Who:" the last bullet listing triggers should perhaps include in the list emissions per capita.

Page 8: I certainly do not think that common legally binding performance standards would be a good idea.

How to include developing countries?

I've seen some interesting proposals for mathematical formulas to guide the accession of developing countries to a treaty, as their incomes grow. Some proposals are probably too academic to constitute practical treaty language. My own tentative thoughts as to the sort of formulation that might work are as follows.

Middle-income countries could be defined, e.g., as those with per-capita incomes above $3,000/year (or $7,000 on a PPP basis). They would be asked at Kyoto to commit (1) to begin reducing emissions growth by some specific date in the future, (2) to agree to a future conference, at which they would be expected to agree on a (still-later) decade for eliminating emissions growth entirely and (3) to agree that the future conference would also set their longer-run emission paths (as some not-yet-specified functions of their populations, incomes, and 1990 emission levels), in such a way that they are treated more and more analogously to the Annex I countries as they grow.

Poor countries would also be asked at Kyoto to agree that if and when they cross the income threshold (e.g., $3,000/yr.), they too will adopt commitment paths analogous to those of the Annex I and middle-income countries.

This leaves out China and India for the time being. Figuring out what we are going to do about them is beyond me.

August 19, 1997

Comments on Developing Country Commitments paper
Office of Economic Policy, Treasury Department

1) Page 4: A potential political problem with developing country committments is that realistic levels of committments might involve, in the short run at least, large flows from the U.S. to the developing countries. That is, since the targets are likely to bind much more tightly here than in developing countries, we would be a substantial net buyer of permits from those countries. This would result in very large flows from the U.S. to, for example, China. These flows are likely to raise political problems domestically, regardless of their label, given concerns over either government transfers to developing countries or trade deficits with developing countries.

2) Page 6 ("Whether"): This section is much too negative on developing country committments. The discussion makes it seem as if the only constituency that we need to satisfy is other nations. In particular, there is no discussion of the possibility that the rest of the world is more flexible than our domestic constituencies. In that case, from the perspective of having a deal as soon as possible, it may be most efficient to insist on strong developing country committments now. This may sink the Kyoto round internationally, but it will at least lay down a marker which must be satisfied domestically, and move us as quickly as possible to the only realistic world, one with serious developing country committments. Otherwise, we may spend years stuck between our domestic and international constituencies.

3) Page 8: In discussing incentives, it is important to point out that restricting JI to countries with committments has the key advantage of ensuring "additionality", which is very hard to do with any other proposed mechanism.

THE WHITE HOUSE

WASHINGTON

August 15, 1997

cc: JS
JA

NOTE FOR CLIMATE CHANGE POLICY OVERSIGHT GROUP

FROM: PETER ORSZAG
DAVID SANDALOW

Subject: Summer Reading

Attached is a summary of workgroup activity underway.

Also attached are papers on:

1. Joint Implementation "Additionality"

2. International Emissions Trading, and

3. Developing country commitments.

Climate Change: Developing Countries

Issue

How to respond to domestic criticism of the current U.S. approach to developing countries in the climate change negotiations.

Background

- [OES to supply para on historical/future emissions]

- The 1992 UN Framework Convention on Climate Change (the "Convention"), in light of differing contributions to climate change and differing capacities to respond, recognizes that Parties have "common but differentiated responsibilities." Thus, while all Parties must take measures to address climate change and to report on such measures, as well as on their greenhouse gas emissions, developed countries are to "take the lead." As such, so-called "Annex I" countries (currently including OECD member states as of 1992 plus Russia/Eastern Europe) are to report with more specificity and with the non-binding "aim" of returning their emissions to their 1990 levels by the year 2000.

- The Convention calls for periodic reviews of the adequacy of commitments. At their first meeting in 1995, the Parties concluded that the existing developed country commitment was not adequate because it did not contain any quantitative objectives beyond 2000. The resulting "Berlin Mandate" calls upon Annex I countries to agree upon quantified emissions limitation and reduction objectives; with respect to "non-Annex I" countries (hereinafter referred to as "developing countries"), it states that the process will introduce "no new commitments," but rather will "continue to advance the implementation" of Article 4.1 of the Convention (the provision containing qualitative measures for all Parties).

- The U.S. agreed to a Mandate providing for no new developing country commitments because:

  -- the Mandate left completely open the level of the Annex I commitment;

  -- there was a certain legitimacy to the argument that developed countries had not yet really "taken the lead," given that only two years had passed since entry into force of the Convention and, further, that developed countries (with two exceptions) were nowhere close to meeting the non-binding "aim" in the Convention;

-- the Mandate leaves developed countries free to press for new developing country commitments in the very next round of negotiations (not, for example, until developed countries have met their next target);

-- U.S. insistence that developing countries take on new commitments in this round (a position not even supported by the EU) would have resulted in all likelihood in no negotiating process -- a result that would have been awkward for an Administration committed to making environmental progress on this issue; and

-- it was considered that the Mandate's call for the process to continue to advance implementation of Article 4.1 of the Convention provided substantial scope for elaborating important developing country elements.

o In the Berlin Mandate process, which is scheduled to culminate in agreement in December in Kyoto, the U.S. has been seeking, as a matter of content ("what"):

-- an additional category, so-called "Annex B," which would include countries that voluntarily agree to take on binding quantitative targets; (initially, the U.S. has been focusing on Korea and Mexico, as States that joined the OECD after the Convention was adopted);

-- an elaboration of Article 4.1 of the Convention containing various qualitative requirements, including an obligation to "take actions to address climate change that are justified economically in their own right and can also help in solving other environmental problems" (so-called "no regrets" measures), as well as a more rigorous report and review process for developing countries; and

-- a so-called "evolution" provision, calling for the adoption, by 2005, of binding quantitative emissions obligations for all Parties (i.e., including developing countries) and a mechanism for automatic application of progressive obligations, based on agreed criteria; the U.S. has not specified what kind of criteria might be appropriate.

o In terms of placement and timing ("where" and "when"), the U.S. has been seeking, as a minimum requirement, inclusion of all of the above elements in the protocol or other legal instrument to be adopted in Kyoto in December.

- [OES fill in current negotiating situation -- reaction to our proposals -- complicated by fact that we don't yet have proposed U.S. target -- what we are likely to get/not get]

Domestic Concerns

- The Senate recently voted overwhelmingly to pass the non-binding Byrd Resolution, which expresses, among other things, the view that the U.S. should only sign a new agreement that also mandates "new specific scheduled commitments to limit or reduce greenhouse gas emissions" for developing country parties "within the same compliance period" as for developed countries.

- In addition, certain segments of industry (such as...) have made clear their view that the current U.S. approach to developing countries is not adequate.

- Reasons for considering that our approach to developing countries is not adequate can vary from group to group or even Senator to Senator (as is clear from the floor statements regarding the Byrd Resolution).

- Articulated reasons are essentially two:

  -- Competitiveness. The concern here is that certain segments of U.S. industry could suffer commercial disadvantage if they are subject to climate change-related regulation and their competitors in developing countries are not.

  -- Fairness. The concern here is that it is simply "unfair" for an agreement to subject the United States to stringent requirements while letting developing countries (in particular the larger or wealthier ones) "off the hook."

- An unarticulated reason of some is opposition to any U.S. action on climate change and use of the developing country issue to create a "poison pill" in the negotiations.

- Each of these underlying reasons is difficult to address:

  -- Regarding competitiveness, the evidence contained in the economic literature and climate change economic analyses about international competitive impacts is quite thin. Overall impacts on the economy will be quite small -- many goods and services are not traded

and, of those that are, many are traded primarily with other Annex I countries. On the other hand, the effect on the major energy-intensive industries is less clear; little analysis has looked at the level of energy price differentials ($50-100/ton) that might result, but large energy price differentials internationally already exist. In any event, it is not clear that even the Byrd Resolution's call for developing country commitments within the same compliance period but which could be different from Annex I commitments would necessarily address the concern. What is clear is that relevant industries care passionately about this issue.

- o Complicating this issue is that not all those raising "competitiveness" issues are concerned with trade competitiveness; coal producers and oil companies, for example, are concerned about adverse impacts on their assets and the prices they command for the fossil fuel they produce relative to other fuels and to energy conservation.

-- Regarding fairness, the counterargument that would be faced internationally is that "fairness" cuts in the other direction, namely that it is equitable to ask the U.S., which contributes X% of global emissions, has a per capita energy consumption rate X times greater than..., and is highly developed, to take on a target commitment before asking less developed countries to do so. Nonetheless, the fairness concern has resonance among the U.S. public.

-- Concerning the unspoken reason ("poison pill"), even the most forthcoming developing country package would not satisfy this concern; indeed, once the Administration had achieved a particular package, the "moving target" would move again.

o Further complicating the issue is the fact that, while the Byrd Resolution makes clear what kind of an agreement would not be acceptable, it does not indicate what would be acceptable.

o (It should be noted that, while there many be good environmental reasons why the large-emitting developing countries should be committed to targets in this round, critics have not focused on these.)

Basic Scenarios

- From both an environmental and political point of view, it is assumed that the optimum scenario is one that results in an agreement that can be ratified by the United States.

- It is easy to sketch out the scenarios at either end of the spectrum, namely scenarios that result either in no agreement (with the U.S. blamed for "killing" the agreement) or an agreement that could not be ratified by the U.S. (at least not now):

  -- At one end, the U.S. agrees to a target with substantial economic implications, seeks no further developing country commitments, and does not address domestic competitiveness/fairness concerns (either by rebutting or accommodating).

  -- At the other end, the U.S. insists that key developing countries, including China, take on the Annex 1 target in the December agreement.

- It is more difficult to develop scenarios that walk the line between domestic unacceptability and international unacceptability.

- Middle scenarios might involve:

  -- Staying the course internationally and addressing competitiveness issues, to the extent they exist, through a domestic mechanism, e.g., a border tax solution for the dozen most energy intensive goods, compensation to affected industry, import relief if U.S. imports rise too quickly in a short period).

  -- Addressing concerns through the U.S. target, namely minimizing competitiveness and fairness concerns by adopting a very modest U.S. target (e.g., one that implies a permit price of about $X/ton).

  -- Seeking additional developing country commitments that are within the realm of the achievable.

  -- A combination of the above.

- A further consideration in determining whether a particular agreement would be ratifiable by the U.S. is whether the Administration should be seeking an agreement that is acceptable to the current Senate or some future Senate.

Developing Country Commitments

"Whether"

- In deciding whether all or part of the U.S. response to domestic concerns should be to seek additional developing country commitments, decisionmakers should take into account the following:

  -- Additional commitments will be difficult to achieve. In addition to the "equity" arguments above:

     - Many developing countries (and indeed some developed Parties, such as the EU) already view the existing U.S. proposals as unacceptable and, in part, as exceeding the Berlin Mandate.

     - Many will view a new U.S. demand as an attempt by one country to dictate the terms of the agreement, a country which is overwhelmingly the largest contributor to greenhouse gas emissions and which has not even come forward with its own proposed target.

     - The U.S. does not have particular leverage vis-a-vis developing countries in this negotiation. Unlike the usual negotiation, where obligations are reciprocally sought, many developing countries are indifferent (or even hostile) to our agreeing to take on a target.

  -- Seeking substantial additional commitments, particularly ones exceeding the Berlin Mandate, could be viewed by some as a means of ensuring that the negotiations do not succeed, thereby appearing to undercut professed U.S. interest in addressing the climate change problem.

  -- A U.S. demand for further commitments would likely trigger counterdemands for a more stringent target commitment from developed countries, including the United States.

  -- A U.S. demand for further commitments, even if accepted by developing countries, would undoubtedly also trigger counterdemands for more funding. We would not likely be in a position to agree to more funding, given the two-thirds reduction in U.S. contributions to the Global Environment Facility (the financial mechanism for the Convention).

-- Seeking additional commitments may also be criticized by environmental NGOs as the Administration's caving in to industry groups rather than taking them on.

"Who"

o In terms of additional commitments that might be sought, it is critical to determine which countries we are concerned about. While the Byrd Resolution technically seeks commitments from all developing countries for the same complianc period as Annex I countries, it is likely that inclusion of certain key countries would go a long way toward mitigating domestic concerns (and also be easier to negotiate).

o It appears that the countries that matter most from a domestic political point of view are the ones that have reached a certain level of economic development and those that will be large emitters. This would argue for the inclusion of:

-- all OECD member States (which would mean the inclusion of Korea and Mexico today and whoever else joined in the future);

-- rapidly industrializing countries (such as Malaysia and Argentina); and

-- China and possibly India.

o Triggers might be: GDP, per capita income, or share of global emissions.

"What"

o Another issue is what would be asked of countries in terms of commitments.

o Options are grouped into targets, policies/measures, and incentives:

o In terms of targets, options could include:

-- requiring the same target as Annex 1 countries;

-- requiring a quantitative target, but the target could be less stringent (in terms of percentage/timing) than that of Annex 1 countries and could vary depending upon the country;

o a target could involve a percentage of a past baseyear, a limitation on the rate of future emissions growth, or a formula that adjusts the target automatically to the country's economic growth rate;

-- requiring a non-legally binding "aim;"

-- requiring agreement on a date certain when targets would have to be taken on (e.g., with common targets but differentiated timetables);

-- setting up the Annex 1 target so that it is contingent (either in its entirety or for the second budget period) upon quantitative commitments' being taken on by all or certain developing countries by X date;

o In terms of policies and measures, options might include:

-- requiring certain policies/measures to reduce emissions (e.g., elimination of fossil fuel subsidies; removal of obstacles to alternative fuels);

-- requiring common, legally binding performance standards (e.g., for all sources in industries that are both energy-intensive and capable of relocating or on certain utility and industrial equipment);

-- requiring an even more rigorous reporting and review process than we are currently seeking in our Article 4.1 proposal;

o In terms of incentives (which, in general, would not affirmatively require developing country commitments), options could include:

-- only allowing JI with countries that have quantitative targets;

-- agreeing among OECD countries that a precondition for membership is taking on the Annex 1 commitment;

-- agreeing among OECD countries that export financing/insurance will be limited, based on climate change-friendly projects or other conditions;

-- agreeing that IFI and bilateral assistance is to be made conditional upon adoption by recipients of suitable quantitative commitments or other conditions (e.g., "cleanliness" of project);

-- development of a longer-term technology/export strategy designed to make future infrastructure of developing countries climate-friendly;

-- [other].

"Where/When"

o In terms of "where/when," the U.S. does not necessarily need to seek all developing country-related elements in the Kyoto agreement itself:

-- An advantage of seeking "new" developing country commitments outside the Kyoto agreement is that, technically speaking, the Berlin Mandate would not be exceeded.

-- It is also critical to note that any U.S. proposal to include something in the Kyoto agreement that goes materially beyond existing proposals would be vulnerable to the charge that it violates the Convention's six-month rule, namely that notice of a proposed protocol/amendment must be given six months before its adoption. (Note that this would not necessarily be an issue if adoption of the agreement took place later than December.)

-- As noted above, a commitment to future negotiations (such as our current "evolution" proposal) could take the form of a decision of the Parties in Kyoto rather than be in the agreement itself.

-- Further, the U.S. could agree to adoption of a less-than-complete Kyoto agreement in December and make clear that it will not sign [note: the Byrd Resolution says don't "sign," not don't "adopt"] the agreement or transmit it to the Senate until a number of other elements are in place.

-- Outside-Kyoto elements might include, for example:

o getting key countries to take on the Annex 1 target by joining Annex 1 under the Convention (through the Convention's "review of annexes" procedure, to begin at COP 3 and finish at COP 4) rather than including them in the Kyoto agreement;

o amending the Convention to add an Annex B, rather than including an Annex B in the Kyoto agreement;

o including an Annex B in the Kyoto agreement, but getting key countries to take on an Annex B target after the Kyoto agreement is adopted;

- seeking quantitative targets or other commitments from key countries through bilateral agreements with the U.S.;

- seeking quantitative targets or other commitments from key countries through regional groups (e.g., the Japanese proposal for a pledge and review process under APEC auspices;

- elaborating certain processes under the Convention (such as related to developing country reporting and review); these would then apply to all Parties to the Convention, not just Parties to the Kyoto agreement;

- taking up elements relating to the OECD and IFIs within those fora;

- [other].

- If certain key elements are to be sought outside the Kyoto agreement and if the Kyoto agreement is to be adopted in December, before the other elements are in place, it needs to be decided what is the minimum that must emerge from Kyoto to be politically acceptable (e.g., it might not be viable to include only a developed country target in the agreement and seek all other elements elsewhere).

- Alternatively, the U.S. might seek to postpone the adoption of any Kyoto agreement until COP 4 in 1998, at which point certain other elements could be available, such as the addition of new countries to Annex 1 and the amendment of the Convention to include a new "Annex B." The Kyoto agreement and the new elements could be combined into one amendment package or legally linked in some other way.

- [Note that it is not just developing country elements of the U.S. position that could be deferred past Kyoto. For example, regarding JI with credit, some argue that the decision whether to allow JI with credit should only be made after the pilot phase is over; the Kyoto agreement could provide that Parties with targets can use JI, "in accordance with the decision taken the Parties to the Convention in [date]." The U.S. could make clear that a decision to allow JI with credit is a precondition for our joining the Kyoto agreement.]

Next Steps

- Time is of the essence with respect to any option that requires international negotiation.

- If it is also decided to seek additional developing country elements outside (and later than) the Kyoto agreement:

  -- it would be advisable to reach out to domestic constituencies to start changing expectations about what is to emerge from Kyoto itself; and

  -- it will be necessary to figure out the means for achieving the post-Kyoto objectives.

Different Approaches to a Safety Valve

There are essentially two different approaches to setting the safety valve:

- A permit price ceiling - if the price of permits rose about P, the government would sell as many permits as demanded at that price P

- An "insurance policy" based on economic conditions - if there is a recession, or if growth is slow, the government would somehow relax the emissions quantity constraint. E.g., by selling additional permits at some price or even by suspending participation altogether.

Your economic advisors strongly prefer the first approach, for three reasons:

- This price ceiling approach is the most appropriate given the enormous uncertainty about the ability of emerging technologies, international trading, and JI to lower the cost of meeting our emissions targets. This uncertainty is not insured by policies that focus on economic conditions, but it is by policies that focus on permit price, since if the optimistic forecasts of the gains from these factors prove to be wrong the permit price will rise.

- A safety valve based on economic conditions does not take into account the "but for" case - e.g. "but for our policy, growth would have been even faster". Suppose that there is an enormous negative effect of this policy which lowers GDP growth by 1 percentage point in each year. If the economy is otherwise booming, so that growth in the absence of this policy would have been 3.5%, then the result of the policy will still be a reasonable 2.5% growth rate. In this case, focusing on the growth rate (or some other cyclical indicator) will miss the enormous negative implications for the economy of our climate change policy.

  This problem cannot be remedied through analysis to try to separate the "but for" path of growth. Given the enormous uncertainties, even ex post, about the effect of environmental regulation on the economy, it is impossible to separate out the role of policy to obtain the counter factual economic performance.

- The price ceiling approach automatically dictates the response of the government to the safety valve being triggered: it releases more permits until their value drops to the trigger level. But an economic conditions-based trigger provides no guidance for either how many more permits should be issued, or at what price they should be issued.

On the other hand, an obvious attraction of basing the safety valve on economic

Draft. Close hold. JF 10/15/97

ADVANTAGES / DISADVANTAGES OF VARIOUS POSSIBLE ECONOMIC TRIGGERS

Desirable characteristics of a trigger:
-- related to cost of limiting emissions
-- built-in stabilizer for macro-economy
-- simplicity/conducive to public salesmanship

Yet to be discussed:
(i) Would this go in the treaty?
(ii) What is it that would be "triggered on"? If the response is to be the sale of additional emission permits, what would be the quantity and price?

First-best trigger:

- **Price of Carbon Permit**

Advantages:
(1) Specifically addresses the possibility that emissions reductions would result in high costs, and thus insures against uncertainty in an economically desirable way;
(2) Once the price level of the trigger is set, then the answer to item (ii) above is clear.

Disadvantage:
The price of carbon emission permits may not be a widely understood concept.

(The possibilities that follow are economic triggers *other* than the price of carbon.
Ranking is preliminary; principals may not agree.)

Second-best trigger:

- **Permit price*Quantity-of-permits/GDP**

Advantage: The formula contains the carbon price, and thereby responds to the onerousness of emission limitations per se.

Disadvantage: it is more complicated than some of the other possibilities, and does not allow the President to say "I promise that if X [an easily-understood bad thing] happens, the constraint will be loosened."

Third-best trigger

- **growth below 2%**

Advantages: (1) Acts as an automatic stabilizer (as do the others).
(2) Encompasses both the possibility of slowdown in long-term growth and the possibility of cyclical downturns. Both are relevant: (i) slow growth of either sort could be the result of onerous emissions restrictions, (ii) slow growth of either sort, even if the result of standard macroeconomic factors, might still lead one to choose less aggressive emissions reductions (assuming environmental benefits are a "normal" good).

Disadvantages: (1) a measure of GDP will not fully reflect the economic costs of the policy because declines in consumption will be masked by some increases in investment, (2) the trigger does not address situations where climate policy negatively impacts high economic growth years (e.g., imagine that under climate policy, GDP grows at 2.2%, but under the counterfactual, GDP would have grown at 3%), (3) the shadow price of the quantitative emissions constraint is lower if growth falls, not higher.

Fourth-best triggers:

- **recession**

Advantage: Very easily explained and understood.

Disadvantages: (1) Doesn't get at slow long-term growth. (2) Unlikely to be triggered often.
(3) In the year following a recession, output gap is usually still high.

- **output gap above 1%**

Advantage: May address short-term cyclical conditions better than a recession trigger.

Disadvantages: (1) Doesn't get at long-term growth. (2) Not explainable to public.
(3) Partly subjective even within economists' paradigm.

- **unemployment above 7%**

Advantage: easily explained and understood

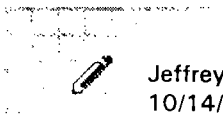
Disadvantages: (1) Unrelated to long-term growth. (2) An imperfect measure even of short-term cyclical conditions: the natural rate of unemployment moves around.
(3) Probably bears the least connection to emissions of any of the measures.

- **a committee** (Sec.Treas, Chair Fed. Res., etc.) **judges "economic distress"**

Disadvantage: very subjective/political/ad hoc.

- **some attempt to judge whether economic slowdown is attributable to climate change policy**

Disadvantage: even more subjective/political/ad hoc.



Jeffrey A. Frankel
10/14/97 04:12:21 PM

Record Type: Record

To: Lisa D. Branch/CEA/EOP

cc: See the distribution list at the bottom of this message
Subject: mtg. on non-p "econ.distress" triggers for GCC safety valve

I'd like to call a working group meeting for Wednesday. Let's try for 9:15, after the breakfast meeting, in my office. (Otherwise, 2:00 is a possibility for me.) Lisa, could you see if most people are free?

The President wants us to consider what possibilities there might be for a safety valve triggered by adverse economic developments, that would not involve price. Unthought-through suggestions so far include P*Quantity-of-permits/GDP, recession, growth below 2%, unemployment above 7%, output gap above 1% 9:30 or 2:00, and a committee (Sec.Treas, Chair Fed. Res., etc.) judging "economic distress."

We would be pursuing this on the assumption that the President has now basically already made the fundamental decision about targets and timetables. So that should be taken as given, for this exercise.

JF

Message Copied To:

Adele C. Morris/CEA/EOP
Joseph E. Aldy/CEA/EOP
Randall W. Lutter/CEA/EOP
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10/15 GCC mtg on safety values

non-price trigger

does not tell us how much to sell in extra permits

does not tell us the price to sell extra permits

6/15

Possible economic triggers (other than price of carbon P)

Desirable characteristics:
related to climate change policy?
built-in stabilizer for economy?
simplicity

- P*Quantity-of-permits/GDP
- recession
- growth below 2%
- unemployment above 7%
- output gap above 1%
- a committee (Sec.Treas, Chair Fed. Res., etc.) judging "economic distress"
- some attempt to judge whether economic slowdown is attributable to climate change policy

10/15

Economic trigger not related to price of permits

- aggregate demand shocks
- trend growth
- technology shocks (innovation)

	Pure Price	growth rate	recession	P·Q / gdp
aggregate demand – business cycle	yes	↓	(1/2) yes	maybe
trend growth	No	↓ (maybe 2% → 1%)	No	yes
technology (be more inclusive of climate & policy)	yes	↓	No	yes

10/7 deputies mtg - Safety Valves

Hunker - concerned that SV provides cover for an even tighter T+T, and then later, we lose SV in negotiations

Gruber - response to SV f(SV price level)

~~Orszag~~ Prinze - concerned e credibility of SV w/ low ~~cost~~ price + a tight T+T

~~Orszag~~

Orszag - want distributions about permit price estimates
→ charge to CEA, Treas, EPA - look at one next day or 2

Romevance - Brazilian proposal - SV to ⊕ in multi-lateral agency

ESCAPE CLAUSE: INTERNATIONAL ASPECTS

Multilateral version:

- A supranational authority, presumably the same one that is to monitor countries' emission levels under any sort of agreement, stands ready to sell permits (beyond the basic agreed-to target levels) to whatever *national governments* wish to purchase them at a pre-determined price P.

- In the basic agreement, countries agree to emission targets, but reserve the right to whatever manner of domestic implementation they desire (as in current US position against "common policies and measures").

- Parties would have to agree in advance how to divide up the revenue.

- International trade in permits is superfluous in this case, but would do no harm.

Why couldn't individual firms also buy permits from the supra-national authority? In the multilateral version, it is suggested that only national governments be allowed to buy permits from the supra-national authority. Only they can be held internationally responsible for meeting their countries' aggregate emissions commitment. If permits could be purchased by individual firms, the government might be able to explain away any excedence of its target by claiming that domestic firms might have paid for the extra permits in private transactions.. (This is also an argument why, aside from escape clauses, international trading probably needs to be done via national governments.) It might work for governments to act as the agents for individual firms in making international purchases.

National version:

- National governments stand ready to sell additional permits *to their own citizens* at a predetermined price P.

- In the basic agreement, countries agree to a common plan for domestic implementation: a scheme of tradable permits.

- It does not matter whether the initial allocation of permits in a particular country is done by auction or arbitrary allocation, insofar as the workability of the escape clause is concerned. All that matters is that the initial allocation is the quantity agreed to in the treaty.

- Each government would get to keep the revenue raised.

- International trade in permits is again superfluous in this case. Indeed, it might be necessary to rule it out. Otherwise an irresponsible government (think "transition

economies") could flood the market with permits, which it prints at the cost of the paper while receiving real money for them. (Of course such a country would be grossly out of compliance with the international treaty. But one does not wish to structure a treaty in such a way that a single irresponsible government can result in the breaching of intended emission limits, not just by its own economy, but worldwide.)

Why couldn't countries retain their own domestic implementation schemes? If some countries implemented their emission limits by means other than tradable permits, whether taxes or regulation, then it would be difficult to enforce the principle that the country's total emissions are to be limited by their initial allocation plus those demanded at the marginal cost P. The "marginality" becomes suspect. There would be nothing to stop a country from abolishing its existing energy taxes and regulations (or even adding energy subsidies!) and selling a lot of permits to its citizens because the true marginal cost of emission overruns would be far below P.

Wimp versions

The two versions described above pre-suppose a desire for an honest and workable system. It is possilbe that the multilateral version would be viewed as unacceptable because of aversion to supra-national authorities, and the national version as unacceptable because of aversion to insistence on a common domestic implementation measures. Is there some other way that the U.S. could tell its businesses they will be protected against a price higher than P?

(1) The U.S. could insist that the U.S. government be the only one with the right to sell additional permits at price P. If this were accepted, it would have the desirable efficiency properties, while simultaneously transferring potentially huge amounts of money from other countries to the U.S. It is hard to see why any other country would be willing to consider this.

(2) The U.S. (and other countries if they wished) could assure its citizens that if the price were to rise above P, with scope for buying emission permits internationally already having been exploited, then *the country would borrow, as agreed to internationally, however many permits were necessary* to keep the domestic (and world) price from rising above P. This is perfectly workable institutionally. But it is hard to see why it would be any easier to attain quantity targets in 2015, and simultaneously pay back past borrowings, if the 2010 targets have turned out to be prohibitively expensive to meet.

ESCAPE CLAUSE **9/17/97**

- ***"Price-trigger" escape clause*** would focus on the price of energy per ton of carbon: If the price rises to level P, then government(s) are prepared to sell at P however many emission permits are demanded (beyond the shares already allocated to countries, and to citizens by their governments). The effect would be to convert the quantity limit into a price instrument under circumstances when the burden would otherwise be too burdensome.

- ***Analogies from trade policy:***
  - Safeguards: GATT Article 19 (seems to work, despite its admitted vagueness)
  - Tariff-Rate Quotas: imports free up to a pre-assigned quota; additional imports allowed under a pre-set penalty rate.

- ***Insurance version:*** P would be set at "best-guess," say $100/ton. Or perhaps "best guess plus one standard deviation," e.g., $150. The intent is to safeguard against unexpectedly large economic costs of emissions reductions -- costs that could turn out to be unexpectedly large if the economic growth rate turned out higher than expected, or if unrealistic estimates regarding the ease of reducing emissions were built into treaty targets

- ***Political version:*** The price could be set low, e.g., $25. The effect would be to assure constituents that the program will not be too costly. Such a price could be justified:

(I) if one believes claims of the wishful-thinking free-lunch technology optimists
(ii) conditioned on the U.S. obtaining international agreement on all our demands, including not only international trading but also some serious participation by developing countries, or
(iii) even knowing that conditions (I) and (ii) are unlikely to be met. Then the escape clause could be explicitly acknowledged as probably converting a quantity target into a price target.

- ***Technical points:***
- Who would sell permits? Could be:

(i) national governments (in countries with domestic emissions-trading schemes) or
(ii) a supra-national authority (in which case would have to decide how to split the proceeds).

- What is time path? Would have to pre-set one price for 2010 and another for 2020.

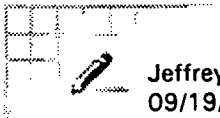
(Could also interpolate more points along the path; but banking and borrowing should have the same effect.)

- ***Scholarly references***: Nordhaus (1997), McKibbin and Wilcoxen (1997) and Pizer (1996) have proposed plans under which there is a cap on how much the price of carbon can rise and argued that it has a number of desirable properties.

McKibbin, Warwick, and Peter Wilcoxen, 1997, "A Better Way to Slow Global Climate Change," The Brookings Institution, Washington, DC, March.

Nordhaus, Bill, 1997, "Climate Allowances Protocol (CAP): Comparison of Alternative Global Tradable Emissions Regimes," Yale University, June 17.

Pizer, William A, 1996, "Optimal Choice of Policy Instrument and Stringency Under Uncertainty: The Case of Climate Change," Resources for the Future, Discussion Paper 97-17, Dec.



Jeffrey A. Frankel
09/19/97 01:06:00 PM

Record Type: Record

To: Janet L. Yellen/CEA/EOP, Adele C. Morris/CEA/EOP, Randall W. Lutter/CEA/EOP, Joseph E. Aldy/CEA/EOP

cc:
Subject: escape clause and McKibbin-Wilcoxen

You have heard me mention several scholarly references in connection with the Escape Clause proosal (tho I don't think any use that phrase or have in mind exactly what we want). Billy Pizer, who presented at the lunch seminar recently is quite relevant, regarding the uncertainty of prices vs. quantities. But I particularly recommend that people also look at a March paper by McKibbin-Wilcoxen. I am sending you all copies. I think it makes clear that what we would be contemplating in the Escape Clause is a potentially radical change in the proposed nature of the system -- but a change that has many desirable properties (given the mess otherwise).

JF

THE BROOKINGS INSTITUTION

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Economic Studies Program

19 March 1997

Much more modest proposal (which is the point)

Professor Jeffrey Frankel
Council of Economic Advisors
(fax 202 395 6947)

Dear Jeff,

Negotiations leading up to the next round of climate change negotiations seem to be converging on using an international system of tradable permits to stabilize greenhouse gas emissions at 1990 levels. We believe this is a serious mistake. Although the theoretical advantages of a permit system are well known, there are serious practical problems that would make an international trading scheme unworkable. In addition, stabilization is a more stringent target than can be justified on the basis of current knowledge of the costs and benefits of controlling climate change. As a result, a treaty focused on using international permits to achieve stabilization seems unlikely to ever be ratified and implemented. In the enclosed paper we discuss the problems arising from an international permit scheme and describe an alternative policy, a combination of national permits and emissions fees, which solves these problems.

In short our argument goes as follows. The attraction of a tradeable emission permit system is that it minimizes total abatement costs by equating marginal abatement costs across countries. However, it would also involve large international transfers of wealth. Some studies have estimated that emissions permits might sell for hundreds of dollars per ton by 2010. If much international trading occurs there could be transfers of hundreds of billions of dollars each year. This would cause a serious deterioration in the balance of trade for countries importing permits. Moreover, our research suggests that countries exporting permits would end up with bad case of the "Dutch Disease" problem: a booming export business in permits causing appreciation of the real exchange rate and crowding out conventional exports.

A better approach would be a system combining emissions permits and fees at the national level. Each country would be allowed to distribute emission permits within its borders equal to its 1990 emissions. Each government would also agree to sell additional permits for a specified fee, say $10. This approach would achieve a modest but significant step toward reducing emissions without large international transfers. Like the tradable permit system, global abatement costs would be minimized since marginal abatement costs would be equalized throughout the world. Unlike the stabilization policy, it could be justified on the basis of current economic information. Also unlike the international permit scheme, this policy contains a strong incentive for enforcement by individual governments because the fee provides a source of government revenue.

A permit/fee system would also provide valuable information about the extent to which emissions can be reduced at low cost. It is flexible as well: the fee can be adjusted as needed when better information becomes available on the seriousness of climate change and on the cost of reducing emissions. The international permit scheme is less flexible because it would require international negotiation to change the number and allocation of permits.

Despite its theoretical attractions, an international permit trading scheme is fatally flawed as a practical policy. A treaty based on the idea will have little effect on emissions because it will never be implemented. A national permit/fee system, on the other hand, is politically viable and would begin to reduce emissions. More importantly it puts in place a mechanism to respond to information as it becomes available.

Please let us know if you would like more details.

Best Regards

Yours Sincerely,

Warwick McKibbin
Non Resident Senior Fellow

Peter Wilcoxen
Non Resident Senior Fellow
(Phone 512-475-8531)

A BETTER WAY TO SLOW GLOBAL CLIMATE CHANGE

Warwick J. McKibbin
The Australian National University and
The Brookings Institution

and

Peter J. Wilcoxen
The University of Texas at Austin and
The Brookings Institution

March 1997

A BETTER WAY TO SLOW GLOBAL CLIMATE CHANGE

Executive Summary

International concern about climate change has lead to a series of negotiations aimed at producing a binding treaty to control worldwide emissions of carbon dioxide. The next two rounds of talks, intended to produce a final agreement, will be held later this year in Kyoto. Negotiations have focused on measures to roll back emissions to 1990 levels and hold them there.

A preliminary proposal advanced by the United States would achieve this by creating a system of internationally tradable emissions permits. The total number of permits would be limited to the amount of emissions in 1990 and they would be distributed among countries by treaty, possibly according to each country's population or to its actual 1990 emissions. It would be up to individual governments to decide how to distribute their country's allocation. Once distributed, the permits could be bought and sold without restriction on an international market. The system would initially apply to developed countries and would later be extended to developing countries as well.

Although this proposal has attractive features and has been endorsed by a number of prominent economists, it has several serious flaws that ensure the treaty would never be ratified and implemented. First, it focuses exclusively on stabilizing emissions even though a much stronger case can be made for reducing the growth of emissions instead of outright stabilization. A better policy would focus on a more modest, and also more politically viable, goal. A second problem is that it would also be very difficult and expensive to monitor and enforce. Third, it would generate huge transfers of wealth between countries. These transfers are large enough that it is unlikely the treaty would be ratified by the countries generating most of the world's emissions. More importantly these wealth transfers could cause dramatic changes in exchange rates, trade balances and international capital flows and would put enormous stress on the world trade system.

A better alternative would be to set up a system of national permits and emissions fees. Each country would be allowed to distribute tradable emissions permits equal to its 1990 emissions. Each government would also agree to sell additional permits at fee specified in the treaty, say $10 US dollars per ton of carbon emitted. The effect of the policy would be to encourage firms to reduce emissions whenever they could do so at a cost of $10 per ton or less. Since the policy does not focus on stabilization and instead aims at the more modest goal of reducing emissions where it can be done at low cost, and since it includes an allowance for 1990 emissions, it is far more likely to be ratified and implemented. It would give firms an incentive to reduce emissions without causing huge international transfers of wealth and would avoid causing havoc in the system of world trade. Because the fee would be uniform throughout the world, the emissions reductions would be accomplished at minimum cost. Finally, the revenue raised by emissions fee provides an incentive for the policy to be enforced by individual governments.

What if govts just substituted this tax for other energy taxes? Then no effect.

Equalizes marginal effort ([illegible] substitute [illegible] for other taxes)

But marginal price of emissions would not be equalized

Key is that each country distributes free permits equal to 1990 e levels, which already reflect existing energy taxes & subsidies.

Introduction

International concern about climate change has lead to a series of negotiations aimed at producing a binding treaty to control worldwide emissions of carbon dioxide. The next major round of talks, intended to produce a final agreement, will be held in December in Kyoto. Negotiations have focused on measures to roll back emissions to 1990 levels and hold them there. A preliminary proposal advanced by the United States would achieve this by creating a system of internationally tradable emissions permits. The total number of permits would be limited to the amount of emissions in 1990 and they would be distributed among countries by treaty, possibly according to each country's population or to its actual 1990 emissions. It would be up to individual governments to decide how to distribute their country's allocation. Once distributed, the permits could be bought and sold without restriction on an international market. The system would initially apply to developed countries and would later be extended to developing countries as well.

The U.S. proposal has generally received favorable reviews from economists and was featured in a widely circulated petition regarding climate change written by five leading economists and signed by thousands of others. (The authors were Kenneth Arrow, Dale Jorgenson, Robert Solow, Paul Krugman and William Nordhaus.) However, much of the enthusiasm for international permit trading has been based on purely theoretical arguments. Few economists or policy makers seem to be aware that it would create such serious practical problems that a treaty based on international trading would never be ratified and implemented.

If the remaining rounds of negotiations are to produce a useful agreement, it is essential that the focus be shifted to a more pragmatic policy. We propose a system of national permits

and emissions fees that would be a significant step toward controlling climate change and would be practical and politically viable. In the remainder of this paper we discuss the practical problems with an international permit system and explain how our alternative policy would work.

Why Do Permits Look Good in Theory?

To understand the problems that would arise under the U.S. proposal it is necessary to understand how a tradable permit system would work. The basic idea is simple: any firm emitting the carbon dioxide would be required to own a quantity of permits equal to the amount of carbon in the carbon dioxide it produces. A firm emitting 100 tons of carbon would have to own 100 permits; one emitting 200 tons would have to own 200 permits; and so on. The permits would be allocated among countries by treaty, and would be issued within each country by that country's government. It would be up to each government to decide how to distribute its permits (we will return to this point below). Once distributed, the permits could be bought and sold without restriction on a world market. It would be illegal to burn fossil fuels without having purchased a permit, and it would be up to each government to enforce the treaty within its own borders.

Permit systems have three key features as a method of pollution control. First, they guarantee that the quantity of pollution will not exceed a particular absolute level. In this case, if the number of permits issued were equal to 1990 emissions, then emissions would be capped at that value. This feature of permits makes them attractive to those who believe that firm action needs to be taken on climate change.

A second key feature is that the government can control the distributional impact of the policy by the way it distributes the permits. It can give out the permits for free, auction them, or

sell them for a fixed price. This can allow the government to reduce the overall financial impact of the policy on the firms most heavily affected. It could use this flexibility to grandfather existing firms or to shift the burden of the policy around in other ways.

Third, the tradability of the permits guarantees that pollution abatement will be done at the minimum possible cost to the economy. Firms that can clean up cheaply will end up doing the abatement: they will be able to make a profit by cutting their emissions and selling their extra permits. These will be bought by firms that find it very expensive to reduce emissions.

To make this concrete, consider the following example. Imagine two companies, A and B, are each emitting 50 tons of carbon annually for a total of 100 tons. Suppose the government wants to reduce total emissions to 80 tons. One approach would be to require each firm to reduce its emissions by 10 tons. That would achieve the 80 ton target and on the surface it seems like a reasonable policy: both firms contribute equally to the problem so it seems reasonable for them to contribute equally to the solution.

Beneath the surface, however, the policy could end up wasting a lot of money. It fails to take into account that it might be much more difficult for one firm to reduce emissions than for the other. Suppose firm A can reduce its emissions at a cost of $100 per ton and that it costs firm B $200 per ton. If each firm eliminates 10 tons of carbon the total cost will be $3000. However, it is possible to get the same amount of abatement at far less cost: if firm A cleans up all 20 tons the cost would only be $2000. The equal reduction policy, in other words, would waste $1000.

To avoid this problem one might imagine a different policy in which firm A was not required to do anything and firm B was required to reduce its emissions by 20 tons. This would get the cleanup at minimum cost, but it would clearly not be regarded as fair by firm B. Firm B

would have to pay $2000 -- the total cost of the cleanup -- while firm A paid nothing, even though both firms are responsible for the problem.

The attraction of a tradable permit system is that it would allow the costs of cleanup to be shared among firms while simultaneously ensuring that the cleanup is achieved at minimum cost. In this example the government could print up 80 permits, each allowing the its owner to emit one ton of carbon, and then prohibit each firm from emitting more carbon than the number of permits it owns. The government could give the permits to the firms and allow them to trade. It could distribute the permits to achieve whatever equity goal it desired. For example, it could give 43 of the permits to firm A and 37 to firm B. Firm A would want to buy up to 7 permits at up to $200 each; as long as the price is $200 or less it will be better off buying the permits than doing the abatement itself at $200 a ton. Firm B would be happy to sell permits at a price of $100 or more; it would gain because each permit it sells would bring in more revenue than the $100 in extra abatement cost it would have to pay. If the two firms agree to a price of $150, the overall cost of the policy to A would be $1050 (the amount it spends on permits) and to B, $950 ($2000 spent on abatement less $1050 received from selling permits). By handing out the permits this way the cost of abatement could be shared between the firms and minimized at the same time.

What Would Go Wrong In Practice?

Permit systems have worked well in practice when used to control domestic problems. The most well-known example is the sulfur emissions trading scheme introduced by the 1990 amendments to the Clean Air Act. It has been a tremendous success: electric utilities, the principal industry affected by the program, have been able to reduce the cost of controlling sulfur

emissions to one tenth of the minimum cost projected when the Act was adopted. In an international context, however, several practical problems arise that ensure that a treaty based on the U.S. proposal would never be ratified and implemented.

The first problem is that the proposal focuses exclusively on stabilizing emissions even though too little is known about the costs and benefits to make a clear case for stabilization. Much uncertainty remains but most studies to date suggest that the costs of stabilizing emissions could be substantially higher than the damages caused by a warmer climate. Given this evidence, it seems unlikely that the U.S. Congress would accept a policy of stabilization. There is, however, enough evidence to make a clear case for taking steps to slow the growth of emissions. A better policy would focus on a more modest, and also more politically viable, goal.

A second problem with the U.S. proposal is that it would generate large transfers of wealth between countries. Supporters of a permit system regard this as an advantage because it would allow developed countries to compensate developing countries for reducing their emissions. However, the size of the transfers make it unlikely the treaty would be ratified. To see this, consider the following rough calculation. In 1990 the United States emitted about 1340 million tons of carbon in the form of carbon dioxide. Carbon emissions are expected to grow over time and suppose that by 2010 the U.S. ended up needing to import permits equal to about 20 percent of 1990 emissions, or about 238 million tons. There is enormous uncertainty about what the price of an international carbon permit might be but $100 per ton is well within the range of estimates and some studies have projected prices of $200 or more. In this scenario, the permit system would add $24 billion to $48 billion dollars to the U.S. trade deficit every year.

To put this in context, the entire U.S. trade deficit in 1995 was about $95 billion so adding

permits could increase it by 25 to 50 percent. Where will the money go? If advocates of the policy are correct that emissions reductions will be cheapest in developing countries, developing countries could be large sellers of permits on the international market. The value of permits would dwarf the often controversial U.S. foreign aid budget, which is now about $17 billion. Transfers of wealth of this magnitude guarantee the treaty would never be implemented regardless of its economic merits.

A third problem with the plan is that it would put enormous stress on the world trade system. A developed country importing permits would see its balance of trade deteriorate substantially. This would lead to substantial volatility in exchange rates and would create distortions in the world trade system. Equally serious problems would be created for developing countries. Massive exports of permits would lead to exchange rate appreciation and a decline or collapse in traditional exports. Also, the permit revenue comes with strings attached -- much of it would have to be invested in improved energy technology in order to reduce emissions and free up the permits in the first place. This is unlikely to be an optimal strategy for long-term economic development and would make the policy unattractive to developing countries.

In fact, because developing countries have been unenthusiastic about the policy the current proposal actually stops short of setting up a worldwide system of permits. Instead it would set up a system of trading among developed countries only. This is a peculiar approach because developed countries are fairly homogeneous and there may not be much to be gained by international trading. Moreover, the proposal would have little effect on overall emissions because several developed countries, including Britain, Germany and Russia, are actually below their 1990 emission levels. Under a trading system with permits allocated on the basis of 1990

emissions, these countries could sell their unused permits abroad. In that case the permit system is really nothing more than an accounting trick. If the U.S. were to buy permits from Russia, all that would happen would be that U.S. emissions would be counted against Russian's allocation. There would be little or no real reduction.

Moreover, one thing that has not been widely understood is that if Russian economic growth begins to recover, the demand for permits within Russia would increase, driving up the world price of permits. In fact, if Russia were to grow quickly, the U.S. could soon become the developed world's low-cost emissions abater. In that case the U.S. would end up selling permits rather than buying them. This would raise energy prices in the U.S. beyond what they would be if the U.S. were to stabilize emissions on its own. Higher energy prices would lead to a redistribution of wealth from energy consumers to the owners of emissions permits.

Finally, one further problem with the U.S. proposal, already acknowledged even by its supporters, is that no individual government would have any incentive to police the agreement. It is easy to see why this is so: monitoring polluters is expensive and punishing violators imposes costs on domestic residents in exchange for benefits that will accrue largely to foreigners. An elaborate and expensive international mechanism for monitoring and enforcement would be required.

All in all, an international permit system aimed at stabilizing emissions is not politically viable in developed countries, would distort or compromise the world trade system, would be unattractive to developing countries, and would be difficult to monitor and enforce.

A Better Approach: National Permits and Emissions Fees

The international permit system is an impractical policy focused on achieving the unrealistic goal of stabilizing emissions. A better approach would be an international agreement setting up a system combining emissions permits and fees at the national level. Each country would be allowed to distribute emissions permits equal to its 1990 emissions. The permits could be given away, auctioned, or distributed in any other way the government of each country saw fit. Each government would also agree to sell additional permits for a specified fee, say $10 U.S. dollars. Firms within a country would have to have emissions permits equal to the amount of emissions they produce. They could buy the permits from other firms or from the government for the stated fee.

Under this system firms would have an incentive to reduce emissions whenever they could do so for less than $10 per ton. Because the total supply of permits is not fixed, the policy does not guarantee precisely how much abatement will be done. However, it does insure that whatever abatement is done will be done at minimum cost. Moreover, firms always have an incentive to reduce further, either to avoid having to pay the fee or in order to be able to sell excess permits. Finally, the base block of 1990 permits can be distributed by the government in whatever pattern is necessary to make the policy politically palatable.

A national permit/fee policy would be a modest but concrete step forward in protecting the environment from excessive climate change. It is unlikely to stabilize world carbon emissions but it will certainly reduce them below where they would be in the absence of any policy, or in the presence of a stronger but un-implemented policy.

This approach would provide valuable information about how much abatement can be

done at low cost and how expensive it would really be to stabilize emissions. There is much debate about how easily emissions might be reduced: many economists believe that it will be quite costly but others argue that emissions can be reduced substantially at low cost. A modest emissions fee would do a lot to show which group is right.

The permit/fee policy also contains a strong incentive for enforcement. Among the serious problems of an international permit scheme are monitoring and enforcement of the treaty. For such a treaty to be viable, each participating country would need to be confident that all of the other participants are enforcing it. However, countries would have little incentive to enforce the treaty within their own borders -- there would be a strong temptation to look the other way when firms were exceeding their emissions permits. A permit/fee scheme reduces this problem because the fee gives governments a built-in incentive to monitor and enforce the treaty. The revenue raised through fees would be available for a variety of purposes: to reduce budget deficits, lower personal income taxes or shore up social insurance programs. This would give governments enough incentive to enforce the policy that little or no international monitoring would be needed.

Finally, the permit/fee system is flexible. The fee can be adjusted as needed when better information becomes available on the seriousness of climate change and the cost of reducing emissions. The international permit scheme is much less flexible because it would require international negotiation to change the number of permits outstanding. It would also be difficult to ever increase the number of permits because that would cause large losses for holders of existing permits as the new permits flooded the market.

Conclusion

The U.S. proposal to stabilize carbon dioxide emissions using an international permit trading system is attractive in theory but fatally flawed in practice. A treaty based on it will have little effect on carbon emissions because it will never be implemented. A combined permit/fee system such as we propose, on the other hand, is politically viable and would reduce emissions. Some environmentalists may oppose the permit/fee policy because it does not guarantee a sharp reduction in emissions. They should keep in mind, however, that it would be better to get modest reductions with high probability than huge reductions with zero probability.

United States Department of State

Washington, D.C. 20520

BUREAU OF ECONOMIC AND BUSINESS AFFAIRS

FACSIMILE COVER SHEET

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Date Sent: 8/15/97 Number of Pages: 11 (Including Cover Sheet)

Time Sent: 6:30 pm

EB FAX #: 202-647-5713 Verification #: 202-647-5973

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TO:	NAME	AGENCY	PHONE #	FAX #
	Jonathan Gruber	Treasury	622-0563	622-2633
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	Randy Lutter	CEA	395-3142	395-6947
	Peter Nagelhout	EPA	260-7015	260-6405
	Jay Shogren	CEA	395-5012	395-6947

FROM: Victoria (Vicky) Greenfield Phone #: 647-6985

SUBJECT: Climate Change

COMMENTS: 2 Papers:

1. Climate Change: Escape Clause
2. Climate Change: Permit Prices

Comments welcome - I will be away from the office (in Oslo) 8/16 - 8/24. W/ immediate questions etc, call Rafe Pomerance @ 647-2232

Pre-Decisional Draft -- Do Not Quote or Cite

Draft #2A

August 15, 1997

Climate Change: Permit Prices "Too High"

ISSUE

How to deal with the concern that Congress is unlikely to enact implementing legislation that binds the U.S. to a particular target without the possibility of exceeding the target in the event that permit prices are "too high."

LEGAL BACKGROUND

- The current U.S. position is to seek a legally binding target in the treaty.
- If the treaty were to contain a legally binding target, the U.S. would need to be able to ensure fulfilment of the international target as a matter of domestic law before the U.S. could ratify the treaty.
- In order to be able to ensure fulfilment, our domestic law could not be less stringent than the international obligation.
- Any elements of flexibility that we want to be able to rely upon domestically in terms of fulfilling the target:
  - -- must be provided for in the treaty; and
  - -- must be within the sole power of the United States to implement.
- Thus, while the U.S. could ultimately take advantage of treaty elements such as JI with credit and international emissions trading, we could not rely on their availability for purposes of ratifying the treaty, because they require the consent of another country.

IS THERE A REAL PROBLEM?

- The first issue is whether there actually is a real problem that needs to be addressed.
- From an economic point of view:
  - -- [economists to fill in analysis -- see attachment]
- From a political point of view:

-- [to be filled in after economic analysis, noting that there may be a political problem even if there is not an economic problem]

OPTIONS

o Assuming there is an economic or political problem that needs to be addressed, there are numerous ways in which this particular problem could be mitigated. They are not necessarily mutually exclusive.

Non-Binding Target

o One way of addressing the concern would be to agree to a non-binding, rather than binding, target.

o A non-binding target would have the advantages of:

-- not requiring implementing legislation (although other elements of the treaty might); and

-- not putting the U.S. in legal breach of the treaty is it were to exceed the target.

o On the other hand, a non-binding target:

-- would require a change in the U.S. position (with the accompanying domestic and international fallout); and

-- might not be effective in addressing the underlying climate change problem (which was a reason for the U.S. position in the first place).

Modest Target

o There might be a legally binding target, but at a level sufficiently modest that the risk of exceeding it was so slight as to not really pose the concern noted above.

o Arguably, a very modest target level would not be inconsistent with the current U.S. position, which seeks a target that is "realistic" and "achievable."

o At the same time, there is obviously an inverse relationship between the comfort level that a modest target affords and the likelihood that such a level could be negotiated. Moreover, a modest target might not be effective in addressing the underlying/motivating environmental issue.

Combination

- It might be possible to combine the two options above so that the treaty contained a very modest legally binding commitment coupled with a more ambitious non-binding target.
- This option would be easier to negotiate than either of the individual options and would only require implementing legislation for the binding piece.

Multi-Year Budget Periods

- Extending the target over a several-year period reduces the possibility that a surge in economic growth or other temporary phenomenon would render achievement of the target problematic.
- Multi-year budget periods are already part of the U.S. position.
- A multi-year budget period might be more difficult to monitor and enforce.

"Borrowing"

- The ability of a Party to "borrow" a certain amount of tons from a future budget period would provide a "safety valve" were a surge in economic growth or other temporary phenomena, particularly at the end of a budget period, to render achievement of the target problematic.
- In order for the U.S. to be able to rely upon borrowing as a means of ensuring U.S. fulfilment of its treaty obligation for purposes of U.S. ratification:
  - -- the right to borrow would have to be absolute (and not, for example, subject to conditions not under the control of the U.S.); and
  - -- borrowing would have to be legal, i.e., it could not be set up in the treaty so that it was possible to borrow but a borrowing Party would technically be in non-compliance.
- Legal borrowing is part of the current U.S. position.
- A borrowing provision could increase the difficulty of monitoring and enforcement.

Policies and Measures

- Another option is for the treaty to mandate particular policies and measures (i.e. legally-binding ones) without mandating a target.

- The U.S.-Canada Air Quality Agreement, for example, which needed to reflect the 1990 Clean Air Act Amendments, contains legally-binding mobile source standards rather than a binding NOx target. (The target is aspirational.)

- While implementing legislation would be necessary to enshrine the mandated policies/measures into domestic law, such legislation would not have to set a cap on emissions.

- At the same time, such an approach:

  -- would require a rather dramatic reversal of the U.S. position; and

  -- would be difficult to negotiate.

"Escape Clause"

- Another option would be to include in the treaty provision for discharging a party from its legal obligation to meet an emissions target where a particular condition related to its economy existed.

- A separate paper discusses some of the legal issues that would come into play in deciding whether the U.S. should seek an "escape clause" in case of harm to competitiveness/ national security. Similar issues arise here.

- Such a provision would need to identify the substantive condition under which exceeding the target would not be a violation of the treaty. It could be vague and subjective (e.g., where economic growth would render fulfillment of the obligation seriously harmful to the national economy) or more quantitative and objective (e.g., where a Party's economic growth during X period has exceeded Y by Z% or the price of permits reaches a certain predetermined level of $X/ton).

- It would also need to be clear whether the condition for discharge was "self-judging" (i.e., by the party in question) or subject to a decision by other Parties to the agreement or a third party.

- Another question would be whether the Party invoking the provision would be entirely "off the hook" or would be allowed to exceed the target only by a particular amount or for a limited period of time. For example, we could pre-commit to make additional permits available at a pre-set price, e.g., if the price of permits reaches a certain predetermined level of $X/ton. (In this case, we would need to decide whether the additional permits would be sold by national or supra-national authorities.) Potentially we could look to the SO2 program for other options.

- What would the temporal aspects be: in the case of a multi-year target, when could a Party invoke the clause? in the case of more than one budget period, what would the Party's obligation be with respect to subsequent budget periods?

- U.S. implementing legislation could incorporate whatever "escape" were accorded by the provision (although it could not be more flexible).

- At the same time, securing such a provision could be difficult. In addition to other predictable reactions, there might be opposition (given our position on mandatory policies/measures) to allowing a discharge where the target itself is not necessarily the cause of the economic hardship, but the particular Party's chosen method(s) of implementation.

- In addition, seeking such an "escape clause" would likely result in such clauses being demanded by other countries (for example, by developing countries seeking to subject their environmental obligations to their need for economic development and/or the receipt of financial and technical assistance).

- From an economic point of view, providing such an escape clause in domestic legislation would [economists to fill in economic implications, e.g., market distortion]

Drafted:L/OES:SBiniaz

Pre-Decisional Draft: Do Not Cite or Quote
August 15, 1997

Is There a "Real" Problem? (From an Economic Point of View)

There are a number of scenarios under which permit prices could be higher than expected. For example, the economy could grow more rapidly than expected, so that "excessive" demand for carbon pushes up the price of permits. This could pose an economic "problem" to the extent that the higher price of permits leads to inflation and/or chokes off growth. If permit prices rise "sufficiently," U.S. GDP could fall "unacceptably" relative to its higher-than-expected potential. It is also possible that our estimate of the baseline trajectory of technical progress is too optimistic, in which case the price of permits would also be higher than expected.

Consider two potential kinds of concern. One relates to short-term phenomena, e.g. "economic overheating," wherein the U.S. economy experiences a brief period of high growth, or an exogenous demand shock, perhaps caused by inclement weather. In such instances, the price of permits would rise temporarily. Another relates to long-term phenomena, e.g. a sustained rise in aggregate productivity or a sustained decline in technical progress, so that carbon reductions are costlier than anticipated. In such instances, the price of permits would rise permanently. (In effect, we would have miscalculated the baseline and underestimated the cost of compliance.)

- **Permit prices rise temporarily**. A temporary increase in the price of permits would increase the cost of compliance, relative to our projections, but several existing provisions in the U.S. position could provide safety valves, e.g. multi-year budget periods, banking and borrowing, international trading, and JI with credit. (Such safety valves would smooth the effects of short-term phenomena -- but would not offset the effects entirely.) With regard to economic overheating, a budget period of x or more years would cover an "ordinary" surge. (Banking and borrowing would cover the possibility of an end-of-period surge.) Historical data show that rates of economic growth have fluctuated over the past three decades, averaging 3.2% per year from 1960 to 1994. During that period, the U.S. experienced only two intervals in which the rate of economic growth exceeded 4% per year for three or more consecutive years, one spanning 1962 to 1966, and another spanning 1976 to 1978. The average rate of growth for the period 1984 to 1994 was 2.4%.

- **Permit prices rise permanently**. A permanent increase in the price of permits could be viewed as an economic problem, depending on several factors, including the effect of higher-than-expected permit prices on U.S. GDP. (In the IAT analysis, a permit price of $100/ton would result in a loss of GDP of no more than 1%.) If the rise were precipitated by sustained higher-than-expected productivity, then potentially higher-than-expected investment could provide a counterweight. (New capital tends to be more energy-efficient than old capital.) Moreover, with higher-than-expected productivity, we might be able to "afford" the additional cost. If, however, the rise in the price of permits were precipitated by an overly optimistic long-term projection of technical progress, there would be more cause for concern. International trading and JI with credit could relieve some of the pressure, but budgets, banking, and borrowing would be less helpful. Other policy options, including an "escape clause," are discussed below.

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

MEMBER

August 26, 1997

MEMORANDUM FOR VICTORIA GREENFIELD, STATE

FROM: JEFF FRANKEL

SUBJECT: Comments on Escape Clause papers

Overall, I think that the escape clause idea might turn out to be very important (notwithstanding that the U.S. has not yet brought it up in the international negotiations, if I am not mistaken). I am glad that you are working on the escape clause, and I look forward to continuing to exchange thoughts on it.

First, comments on the paper **"Climate Change: "Escape Clause"**

I think that the focus on the examples of "competitiveness and national security" in paragraph 2 of page 1, and also pages 2 and 3, is misplaced. Most importantly, serious concerns about "competitiveness" per se properly apply only to a small number of (energy-intensive) industries that may be adversely affected in international competition. This point came out clearly in an interagency paper reviewing the literature on competitiveness written and circulated by Peter Orszag, drawing on Janet Yellen's remarks at a Principals meeting on developing country participation. (The point is somewhat related to Paul Krugman's "Competitiveness: A Dangerous Obsession.") Rather than saying "competitiveness", I think what you want to say is "adverse effects on the economy." These are effects on the entire economy of higher energy prices (or, if a more inefficient means of implementation is chosen, the effects of regulation) that would be virtually as worrisome regardless which foreign countries participated and regardless whether international trade existed.

A less important point is that I am not sure why national security is mentioned so many times. The major implication of climate change policy for national security that I can think of is that reducing US use of fossil fuels would mean reducing dependence on Mideast oil, and would thereby *enhance* national security.

As I have mentioned to you by telephone, I also think it might be useful to consider adding some other escape clauses, in addition to the principal one triggered by unexpectedly severe adverse economic effects or energy price increases. My guess is that this paper is the place to enter these ideas (rather than the other paper, for example). Three possibilities:

- An escape clause that would be triggered in the future if continued **scientific research** determined that the dangers from GHG concentrations and climate change were much less than feared. (Presumably the treaty would be renegotiated in such a case anyway. But the arguments for putting this language in now are three: (1) to facilitate the change, should this come to pass, (2) so that we don't look foolish in the eyes of history if this should come to pass, and most importantly, (3) to help allay the fears of today's skeptics.)

- An escape clause that would be triggered in the future if **developing country accession** turned out to be less than we expect after Kyoto.

- An escape clause that would be triggered if other Annex I countries fail to abide by their commitments.

Each of these might be important.

Comments on the paper **Climate Change: Permit Prices "Too High"**

I have seen Treasury's comments. I agree with all six of them, and would have liked to make most of the same points myself. So consider that two votes for their suggestions.

A note under their item 5: your words on the possibility of an international mandate for common policies and measures runs against good economics if common "standards" is the sort of thing contemplated. But those words would instead be consistent with good economics if the proposal by Treasury regarding a possible U.S. implementation (measures to raise the price of carbon directly) were interpreted as the common policy/measure.

I approve the focus in the paper on "permit prices too high" even if, as Treasury suggests, you were to change the title. I think the triggering condition, permit prices above some level "+x%", needs to be clarified in the longest paragraph on page 4. Also, in the preceding bullet, I don't like the phrase "competitiveness /national security" for the reasons indicated toward the beginning of this memo.

August 18, 1997

Comments - Escape Clause Economic Analysis
Office of Economic Policy, Treasury Department

1) It is important in this paper to draw a distinction between the symptoms (a high permit price) and the cause (fast economic growth, etc.). The paper bounces between these two concepts throughout. The paper should be retitled "Escape Clauses for Economic Circumstances". Rewrite the opening paragraph as:

How to deal with the concern that Congress is unlikely to enact implementing legislation that binds the U.S. to a particular target without the possibility of exceeding that target in the event that it becomes extremely costly for the U.S. economy.

2) Retitle the third section "What is the problem" (Not "Is there a real problem"), since there is certainly a problem in theory, even if it is small in reality.

3) Rewrite the economics section as follows:

- The source of the problem is that restrictions on the amount of emissions can serve as a very costly brake on economic activity under particular circumstances, for example very rapid economic growth. This can lead to extreme costs, both economically and politically.

- This problem will manifest itself through the permit price: when the emissions cap binds strongly on economic activity, there will be very high demand for permits, and as a result a very high permit price.

- High permit prices could pose an economic problem to the extent that the higher prices of permits leads to inflation and/or chokes off growth.

- This scenario could arise for two types of reasons:

    - Faster than expected economic growth

    - Slower than expected technological progress

- In the former case, it is important to draw the distinction between short run "economic overheating", which would raise the prices of permits temporarily, and longer run factors such as changes in aggregate productivity, which would permanantly shift raise the demand for permits and their price; the latter case, slow technological progress, is clearly a permanent shift.

    - **Temporary rise in permit prices:** A temporary increase in the price of permits would increase the cost of compliance, relative to our projections. There is

substantial variation in the growth rate of the U.S. economy in the recent past, leading to these types of overheating concerns. For example, since 1960, the real growth rate in the U.S. has exceeded the average (3.2%) by more than 2 percentage points in 7 years.

- The increased costs of this scenario could be eased, although not necessarily erased, through several policy mechanisms:
  - multi-year budget periods
  - banking and borrowing
  - international trading
  - JI with credit

- **Permanent rise in permit prices:** A permanent increase in the price of permits could be a more important economic problem. International trading or JI with credit could relieve some of the pressure, but budgets, banking, and borrowing would be less helpful. To guard against this case, specific escape clause language may be required.

4) Under the borrowing section, it is important to draw a distinction between borrowing by individual firms, and aggregate borrowing by the U.S. I know that the former is part of the U.S. position; is the latter? This is an important distinction because the former raises a number of difficult issues with respect to bankruptcy, etc., while the latter simply provides an aggregate escape mechanism.

Also, with borrowing, there is an important issue of how to set the appropriate interest rate at which the parties must repay the "loan".

5) The section on policies and measures is somewhat confusing and should be deleted. Any standard has the same problems as a cap on emissions - it becomes overly restrictive if the economy overheats.

This section should be replaced with a section on carbon taxation:

- Another option is for the U.S. to replace its emissions cap system with a carbon tax.

- The tax rate could be set so that, at anticipated energy consumption, we achieve the same level of GHG as under a cap-and-trade system

- But the advantage of a tax in this context is that it allows for a natural escape mechanism: by fixing the price of emissions, rather than the level, it allows for more emissions if there is an overheated economy or slow technological progress.

- At the same time, explicit tax approaches run into domestic political problems, as witnessed by the BTU tax experience.

6) Some changes to the section on escape clauses:

a) The third bullet should be rewritten as:

- Such a provision would need to identify the substantive condition under which exceeding the target would not be a violation. This condition should be specified in terms of the price of a permit.

    - The appropriate price level should be chosen to not disproportionately constrain economic growth, e.g. the price level that would arise with economic growth rates that are 50% higher than expected.

    - The escape clause target price should be flexible, as future information about permit pricing may adjust the appropriate level at which escape is needed

b) The fifth bullet should also point out some mechanisms:

- we could fix the price at some level - if it rises above $x per ton, we will sell as many permits at $x as are demanded.

- we might allow for a certain number of new permits to be "released" depending on the price: e.g. if the price rises to $X, we increase the number of permits by 10%, if it rises to $1.5*X, we increase the number of permits by 20%, etc.

c) There is no need for the last bullet. In fact, economists should like this escape clause - it solves an important problem with a cap and trade system.

United States Department of State

Washington, D.C. 20520

BUREAU OF ECONOMIC AND BUSINESS AFFAIRS

FACSIMILE COVER SHEET

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TO:	NAME	AGENCY	PHONE #	FAX #
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	Peter Nagelhout	EPA	260-7015	260-6405
	Jay Shogren	CEA	395-5012	395-6947

FROM: Victoria (Vicki) Greenfield Phone #: 647-6985

SUBJECT: Climate Change

COMMENTS: 2 Papers:

1. Climate Change: Escape Clause
2. Climate Change: Permit Prices

Comments welcome - I will be away from the office (in Oslo) 8/16 - 8/24. W/ immediate questions etc, call Rafe Pomerance @ 647-2232

Pre-Decisional Draft -- Do Not Quote or Cite

August 15, 1997

Climate Change: "Escape Clause"

Issue

Whether, in the current negotiations on a follow-on protocol/other legal instrument, the United States should press for an "escape clause" whereby a Party would be discharged from its legal obligation to meet an emissions target if certain conditions existed.

Background

- Concerns have been raised concerning a future scenario under which the United States would be legally bound to a particular emissions limitation/reduction target even if achievement of the target would cause harm to U.S. competitiveness or national security.

- There appear to be a number of ways in which such a scenario could potentially be addressed, not all of which are mutually exclusive, e.g.,

  -- Agreeing to a non-legally binding, rather than legally binding, target.

  -- Agreeing to a binding target at a level that is not likely to result in the above scenario.

  -- Agreeing to a binding target, with substantial flexibility in terms of implementation (through, for example, multi-year targets, emissions trading, legal "borrowing" of emissions allowances from future budget periods).

  -- Ensuring that the agreement allows for withdrawal upon reasonably short notice. The Climate Change Convention requires three years' notice; an amendment to the Convention would be covered by this requirement. A protocol could vary the notice requirement, for example, by allowing withdrawal upon one year's notice.

  -- Having the agreement provide for discharge of the legal obligation to meet a target upon certain conditions; unlike withdrawal, such a clause would allow a country to remain a Party to the agreement.

This paper focuses on the last approach.

Discussion

- Apart from policy issues (see below), devising a clause providing for the discharge of the legal obligation to meet a target raises a number of legal questions:

  -- What would the substantive condition(s) be that would trigger the discharge of obligation (for example, harm to national security)? Would the substantive condition(s) be vague and subjective or more quantitative and objective.

     - Given the U.S. position that the agreement should dictate the target but not the policies/ measures to achieve it, how would one deal with the situation in which the target itself is not necessarily the cause of the condition, but the particular Party's chosen method(s) of implementation?

  -- Who would decide whether the substantive condition(s) had been met, i.e., would it be self-judging (by the Party in question) or would it be the subject of a decision by other Parties to the agreement or a third party? If the latter, what kind of institution would decide?

  -- What would the temporal aspects be: in the case of a multi-year target, when could a Party invoke the clause? in the case of more than one budget period, what would the Party's obligation be with respect to subsequent budget periods?

  -- What would be the relationship between the international "escape" clause and the domestic legislation necessary to implement the target (e.g., how would the domestic regime reflect the international clause)?

- Policy considerations in connection with a possible "escape" clause include, e.g.,

  -- likely domestic reaction (Senate, industry, environmental NGOs);

  -- likely international reaction;

  -- likelihood of being able to negotiate such a clause;

-- likelihood of "escape" clauses being demanded by other countries (for example, by developing countries seeking to subject their environmental obligations to their need for economic development and/or the receipt of financial and technical assistance);

-- in the case of a clause excusing environmental performance based on harm to the economy, extent of its consistency with the U.S. conception of and worldwide goals regarding "sustainable development."

o Examples of types of agreements that provide for non-performance of obligations under conditions related to national security/economic impacts include:

-- Investment: The typical Bilateral Investment Treaty provides that it does not preclude the application of measures necessary, inter alia, "for the protection of its own essential security interests."

-- Trade: Certain trade agreements provide for suspension of certain obligations (e.g., tariff concessions) in response to qualifying import surges. Further, in the GATT, for example, there is a clause providing that nothing in the agreement prevents a Party from "taking any action which it considers necessary for the protection of its essential security interests relating to [three defined areas, including the traffic in arms]...."

-- FCN: The model bilateral Friendship, Commerce, and Navigation Treaty provides that it does not preclude the application of measures necessary to protect a Party's "essential security interests." Note that the International Court of Justice, with respect to the U.S.-Nicaragua FCN Treaty, found that this clause was not self-judging.

-- Arms Control/Nonproliferation:- These agreements generally contain a withdrawal clause along the following lines: "Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme national interests of its country." A Party must give three months' notice, along with a statement of the extraordinary events. Note, however, that this type of "escape" clause does not provide a Party with an additional basis for non-performance; on the contrary, it is written as a limitation on a Party's ability to withdraw from the Treaty.

- Note that the above examples appear to involve a Party's ability to take certain measures vis-a-vis another Party that would otherwise violate the agreement, rather than a total discharge of the agreement's core obligation vis-a-vis all other Parties. (The arms control provision does discharge the totality of obligations, but only in the context of withdrawal.)

Drafted:L/OES:SBiniaz