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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

¹Note 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.

²Recent 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

³This 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.

⁴None 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 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 country. 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

⁵Not 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 through 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

⁶Description 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

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

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

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

¹⁰Letter 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.

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

¹²Letter 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."

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.

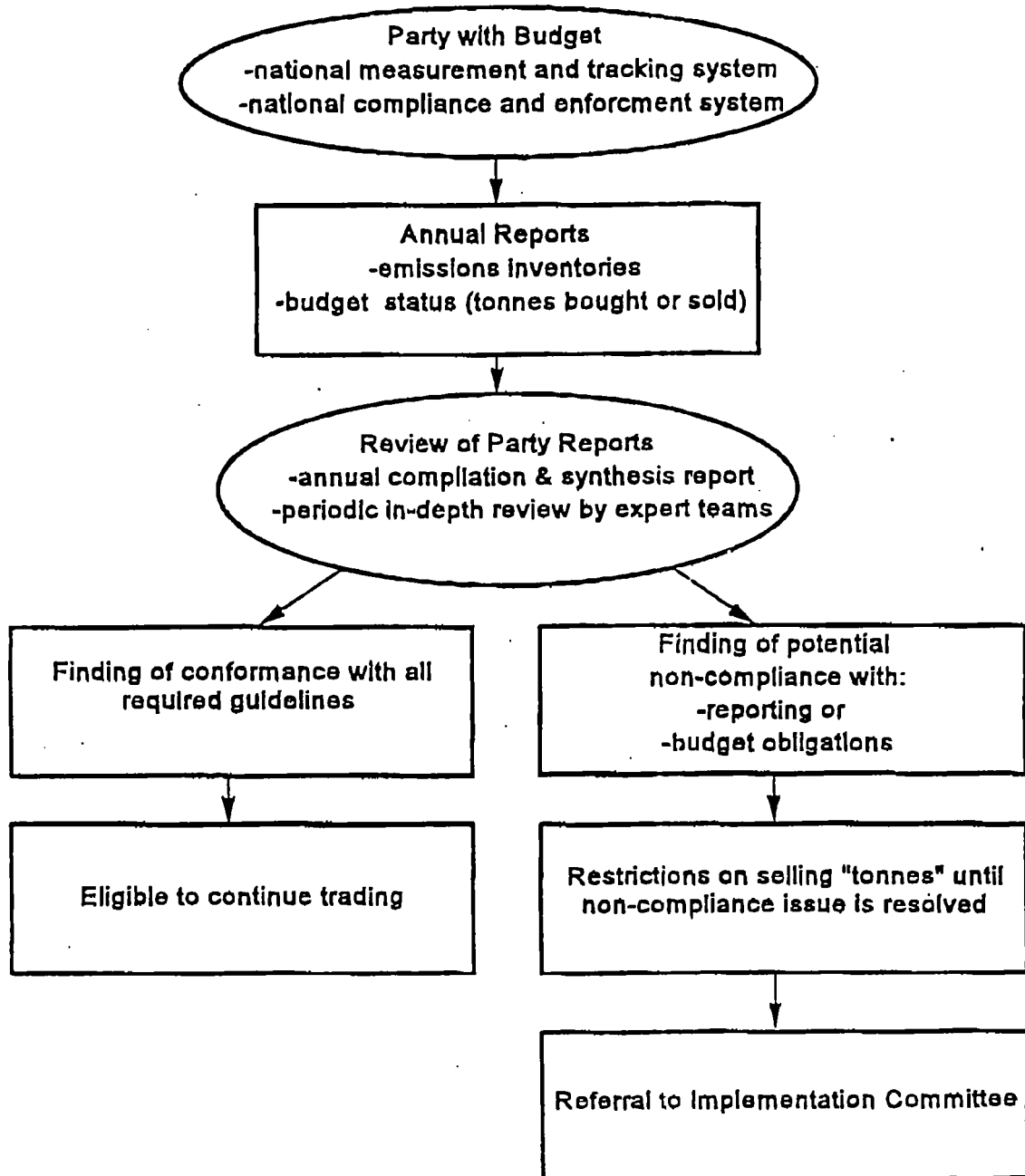
Parties with legally binding targets would not be required to have a domestic trading system to participate in the international greenhouse gas trading system. For example:

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 (SO₂) 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 SO₂ 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 SO₂ 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 SO₂ 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.

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

- o [OES to supply para on historical/future emissions]
- o 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.
- o 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).
- o 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;

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- 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.

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- o [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

- o 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.
- o 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.
- o 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).
- o 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."
- o 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.
- o 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

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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

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

- o 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:
 - o 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.
 - o 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.
 - o 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).

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- 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 compliance 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;

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- 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;

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- o seeking quantitative targets or other commitments from key countries through bilateral agreements with the U.S.;
 - o 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;
 - o 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;
 - o taking up elements relating to the OECD and IFIs within those fora;
 - o [other].
- o 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).
 - o 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.
 - o [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.]

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Next Steps

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

Office of Economic Policy

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

FAXDate: August 12, 1997Number of pages including cover sheet: 1*Copy to
Shogren
with*

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REMARKS:

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

Comments on
Additionality in the Context of Joint Implementation
 Office of Economic Policy

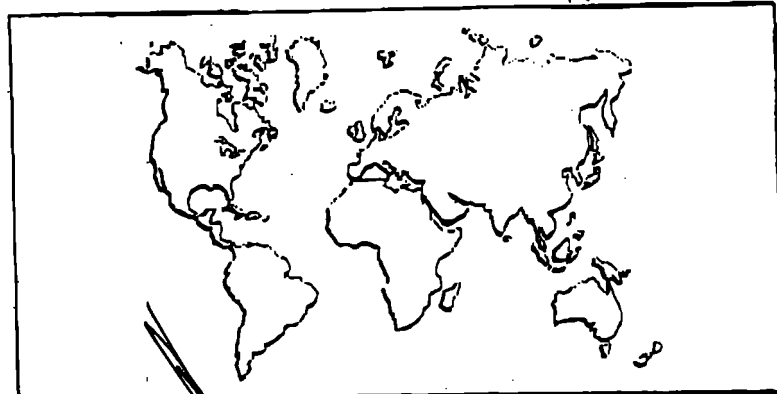
The paper would benefit from a much stronger presentation of the difficulties inherent in implementing the "benchmarking" approach to implementation of JI. Although the third paragraph on the first page refers to these difficulties, the overall tone of the paper leaves the reader with the feeling that this approach is fundamentally feasible, that reasonable people will be able to make it work at reasonable cost. We are not so sure.

One way to strengthen the paper in this regard would be to confront as thoroughly as possible some of the practicalities of implementing the "benchmarking" approach:

- Who exactly would determine the baseline technology for an xx-gigawatt electricity generating plant? Presumably this would have to be done by qualified engineers, who are experts in electricity generation. But no other country would allow the United States unilaterally to determine the benchmark technology. So are we really talking about a process of negotiation between engineering representatives of 160 nations? This sounds like a logistical nightmare in itself, and not one that is guaranteed to arrive at a sensible result from a purely scientific perspective. [We realize that there is some reference to this on the second half of page 2, but it is rather antiseptic, and doesn't sufficiently raise the alarm, in our view.]
- How does one deal with the fact that we may be unwilling to prescribe 100 percent penetration of technology for a given type of project. For example, you describe a case in the middle of page 3 in which "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." So suppose I come along and propose to do a wind installation. Am I going to be given *no* credit whatsoever? That doesn't seem right. On the other hand, it doesn't seem right either that I should be given full credit. How about *pro rata*? These are difficult questions without obvious answers, and might well lead to protracted disputes.
- How does one deal with the fact that every individual project will be claimed to be unique in some way, shape, or form? "I can't do biomass in this particular location because..."
- Isn't it a rather serious drawback is it that no project will be eligible for JI until a lengthy international process has been completed? Won't there be undesirable distortions induced by the fact that some projects have been evaluated for JI eligibility, and others not? It would be a peculiar outcome if the developing world found itself overwhelmed with, say, energy-efficient power plants, and no other modern infrastructure, simply because the power plant committee had been able to get its act together and no other committee had.
- Isn't the administrative burden further compounded by the fact that benchmark technologies would have to be determined anew prior to the start of each budget period

**CLIMATE POLICY & PROGRAMS
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LM

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Date: August 12, 1997
Pages including cover sheet:

Message:

See the attached draft of the additionality paper. I look forward to your comments by ~~COB~~ today so that we can get the paper to David Sandalow tomorrow.

Note that we would like your feedback on whether or not to include the attachments which speak to stakeholder positions on JI in general and to stakeholder positions on additionality, in particular. We are leaning toward deleting the attachments and inserting a paragraph on stakeholder positions in the introduction. Your comments on this subject would be appreciated.

Please call me if you have any questions.

Lisa Carter

229
 Randy + Joe

I agreed with
 Gruber that we would
 be responsible for
 comments to EPA
 by COB today

LF

Costs of assessing JI projects

Additionality in the Context of Joint Implementation

Issue:

The United States is calling for joint implementation (JI) with credit to be included in the 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.

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.

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 is 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

*Does the
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have to
show in
2010*

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*Does negotiation
of where #s
come from*

carbon reductions to reach 1990 levels by 2010. *but maintaining 1990 levels beyond 2010 will be very difficult given their likely development*

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

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Can a model all the CO2s - treat them as independent countries and not countries of common regional CO2.

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.

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.

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:

Should this be a ratio of some probability of failure (e.g., risk of fire or sequestration failure?)

Must be specific

1. *Defining additionality as overcoming project-specific barriers*

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*

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.

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 USJI project proposal USJI asks, regarding additionality, that project developers include a discussion of the following subjects in their project proposal:

- (1) How the existence of the USJI 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

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

(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 through JI).

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

Stakeholder Positions on Joint Implementation In General

Opposed to JI with credit in Kyoto

Sierra Club³

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 Responsibility⁴

In favor of JI with credit in Kyoto

International Climate Change Partnership⁵

Global Climate Coalition⁶

Edison Electric Institute⁷

³Comments 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.

⁴Letter 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

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

⁷Letter 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

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

⁹Facsimile 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 (USII) 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 costs (cents per KWH) than the project (after its completion).¹⁰"

Environmental Defense Fund

[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 than this collectively-defined BAT. The past twenty years of environmental policy in the United States,

¹⁰Letter 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 considered 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

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

¹²Letter 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."

¹³Letter 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.

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Draft #5

Predecisional Draft: Do Not Quote or Cite

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

- o [OES to supply para on historical/future emissions]
- o 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.
- o 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).
- o 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;

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- 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.

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- o [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

- o 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.
- o 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.
- o 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).
- o 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."
- o 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.
- o 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

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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 may be good environmental reasons why the large-emitting developing countries should be committed to targets in this round, critics have not focused on these.)

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Basic Scenarios

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

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Developing Country Commitments

"Whether"

- o 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:
 - o 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.
 - o 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.
 - o 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).

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- 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 compliance 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;

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- 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;

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-- [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;

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- o seeking quantitative targets or other commitments from key countries through bilateral agreements with the U.S.;
 - o 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;
 - o 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;
 - o taking up elements relating to the OECD and IFIs within those fora;
 - o [other].
- o 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).
 - o 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.
 - o [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.]

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Next Steps

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

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

JF
SP
QE

MEMORANDUM

TO: Bob Cumby, Treasury, 622-2633
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Victoria Greenfield, State, 647-5713
Jeff Seabright, AID, 216-3230
Clare Breidenich, EPA, 260-6405
Mark Mazur, DOE, 586-9626

FROM: Joe Aldy

DATE: November 16, 1998

RE: Technical paper for non-Annex I countries on setting emissions growth targets

Both Argentina and Kazakhstan have requested assistance from the United States in setting their emissions growth targets. The attached memo lists several sets of questions that could facilitate the development of a workplan on setting targets for these countries. This memo is a first draft, and would benefit from input from you and your colleagues. We will arrange a meeting for later this week to discuss this issue. If you have any comments on this memo that you would like to provide prior to this meeting, please feel free to fax or email them to me. My email is joseph_e._aldy@oa.eop.gov. Thanks.

**Questions to Consider Regarding Technical Issues
Associated with Setting an Emissions Growth Target**

Realistic targets for developing countries must accommodate their sustainable development and accommodate some emissions growth. However, the targets should also result in real abatement in emissions below the projected business as usual (BAU) level. Such a target, often referred to as a growth target, is set higher than the current emissions levels, but lower than the business as usual (BAU) projection. Emissions growth targets would provide for continued economic development but with a lower emission growth rate.

Determination of the appropriate level of a target requires assessment of key factors such as economic output, the size and structure of the energy sector, and the cost and benefits of emission abatement. It was clear in the negotiations of the Kyoto Protocol, that Annex I countries vary greatly in their national circumstances, and that these differences influenced the cost and availability of emission abatement opportunities. Ultimately, the differentiated targets in the Kyoto Protocol, and for some countries the EU burden-sharing agreement, reflect variations in countries' national circumstances. These same factors will be important for a developing country's consideration of an emissions growth target.

To facilitate an understanding of the technical issues associated with establishing an emissions growth target, provided below are a set of questions to frame many of the important economic, technological, and environmental issues. The process of addressing questions on such issues as the projected business as usual emissions, the costs of abating greenhouse gas emissions, and the benefits of emissions abatement can help inform decision-making. Considering these questions may also assist in identifying areas where further analysis and data collection may be necessary.

The first set of questions focus on identifying the business as usual emissions path. Many of these questions also influence consideration of the costs and benefits of abatement. The second set of questions addresses the issue of abatement costs. The third set describes the issue of the benefits of abatement. The last section identifies key issues to consider in designing policies to abate emissions.

Questions on Business as Usual Emissions Path

Identifying the business as usual greenhouse gas emissions path is important for evaluating the environmental gains from an emissions target. It also serves as the basis for estimating the costs and benefits of emissions abatement. Identifying the major sources of emissions growth can also illustrate the opportunities that are available to tailor policies to slow the rate of emissions growth for these sources. Finally, it is important to gain a sense of the possible range about emissions estimates from specific sources or sectors in order to understand the sensitivity of the estimates to specific assumptions.

1) Economic Growth Projection

Understanding economic growth is important for assessing growth in output and in emissions in the sectors that are the major sources of emissions. Projected output growth in these sectors should be consistent with the economy-wide output projection. Note, this does not imply that each sector growth rate should be the same as the economy-wide growth rate, because these should vary as the structure of the economy changes with continued development. However, the output growth of a sector should reflect the growth in the entire economy. Finally, at the macroeconomic level, economic output can also be used to describe carbon dioxide emissions, reflecting the relationship between output and emissions.

1.1) What is the estimated rate of growth in economic output between now and the end of the first commitment period?

1.2) Is there a "best" estimate, as well as estimates based on high growth and low growth assumptions?

1.3) What is the methodology for projecting the economic growth rate?

1.4) How do carbon dioxide emissions change with economic output?

1.5) How well does economic output, and other macroeconomic variables, explain carbon dioxide as well as greenhouse gas emissions?

2) Structure of Electricity Sector

2.1) What is the present composition of electricity generation by fuel type?

2.2) What is the projected growth in electricity demand domestically?

2.3) What is the projected growth in electricity demand from international consumers?

2.4) What electricity generating plants are projected to close over the next 15 years?

2.5) What are the technological efficiencies, share of electricity load, and greenhouse gas emissions for these closing plants?

2.6) What planned generating plants are projected to come on line over the next 15 years?

2.7) What are the technological efficiencies, share of electricity load, and greenhouse gas emissions for these new plants?

2.8) What are the projected changes in the distribution infrastructure, and how will these affect electricity losses associated with distribution inefficiencies?

2.9) What are the present and projected taxes and subsidies that affect the use of fossil fuels in electricity generation?

2.10) What are the present and projected taxes and subsidies on electricity consumption?

2.11) What is the nitrogen content of fuels used in electricity generation, and how does this affect electricity sector nitrous oxide emissions?

3) Characteristics of Transportation Sector

3.1) What is the current stock of passenger and commercial automobiles, rail transport, air transport, and water transport?

3.2) What are the present and projected fuel efficiencies of these classes of transportation?

3.3) What is the projected growth in demand for these classes of transportation?

3.4) What existing policies may affect the adoption of technologies or the use of these forms of transportation in the future that will affect fuel efficiencies?

3.5) What are the present and projected taxes and subsidies that affect transportation?

3.6) What are the present mass transit resources and the projected demand for them?

3.7) What are the present and projected shares of fuel types used in transportation?

3.8) What is the current and projected use of catalytic converter technology in automobiles, and how does this use affect nitrous oxide emissions?

4) Characteristics of Industrial Sectors

4.1) What are the sources of carbon dioxide emissions in industrial sectors unrelated to utility-generated electricity?

4.2) What is the present and future demand for fossil fuels in industrial processes?

4.3) What are the major energy-intensive industries?

4.4) What is the present stock of technologies that relate to greenhouse gas emissions in

these industries?

4.5) How is this stock of technologies expected to change over time, and how will this change affect emissions?

4.6) What is the present structure of industry in the economy, and how is the structure of the economy projected to change?

4.7) What are the primary sectors responsible for emissions of non-carbon dioxide greenhouse gases?

4.8) What is the current stock of technologies that affect the emissions of these non-CO₂ greenhouse gases in these sectors?

4.9) How is this stock of technologies projected to change, and how will this affect emissions?

5) Forestry and Agricultural Sectors

5.1) What is the current mix of forestry, agriculture, and other land uses that affect the sequestration and emission of greenhouse gases from land use change?

5.2) What is the current array of forestry and agricultural practices?

5.3) What is the projected mix of forestry and agriculture, and how will this affect net sequestration?

5.4) What is the present and future extent of livestock management systems, and how do these affect methane emissions?

5.5) What is the extent of nitrogen use in agriculture, both in the forms of chemical and manure applications, and how do the nitrogen applications affect nitrous oxide emissions?

6) Other sources of emissions

6.1) What is the extent of landfills in managing waste, and how do these affect methane emissions?

6.2) What is the current and the projected extent of HFC substitution for CFCs in the economy?

6.3) To what extent are HFCs used as chemical feedstocks, propellants, solvents, and for other purposes? Are these uses projected to increase over the next 15 years?

6.4) What, if any, aluminum smelting or semiconductor processing occurs, and how do these activities affect PFC and sulfur hexafluoride emissions?

6.5) To what extent is sulfur hexafluoride used as an insulator in electrical equipment? Are these applications projected to increase over the next 15 years?

Questions on the Costs of Abatement

To evaluate the effects of a percentage reduction below business as usual, it is important to understand the costs of the opportunities to abate emissions. This task involves identifying the technologies, processes, and fuel-switching options that can reduce emissions, the costs of switching to these climate-friendly options, and the policies necessary to stimulate their adoption.

7.1) What are the available technologies across all sectors that can abate emissions through improving energy efficiency, fuel switching, increasing process efficiency, or by promoting sequestration?

7.2) What are the technologies that are under development now that could be available for use during the commitment period?

7.3) What are the technologies that, under accelerated R&D, could be available for use during the commitment period?

7.4) What are the opportunities to increase sequestration through forestry activities?

7.5) What are the opportunities to increase sequestration through activities that might be added under Article 3.4 of the Kyoto Protocol?

7.6) What price premium is necessary to promote the adoption and implementation of technologies and processes that result in emissions abatement?

7.7) What are the elasticities of demand for electricity, gasoline and diesel, and natural gas for heating?

7.8) What is the capacity to construct technology-specific, sector-specific, and economy-wide abatement cost curves?

7.9) What modeling capacity is available to integrate information across sectors?

7.10) What economic modeling tools are available to assess the effect of efforts to abate emissions on the macroeconomy?

Questions on the Benefits of Abatement

In addition to the costs of abatement, it is important to evaluate the benefits of abatement when considering an emissions target. By reducing emissions of greenhouse gases, the climate benefits from lower global emissions. However, it is quite difficult to assess the long-term climate benefits associated with emissions reductions undertaken by one country. In addition to the climate benefits, reducing net greenhouse gas emissions can generate ancillary benefits, such as improved air quality and increased watershed protection. Further some policies that affect transportation sector emissions may also reduce congestion and traffic accidents.

8.1) What areas are and will experience air quality that adversely affects public health?

8.2) What are the emissions of air pollutants that affect air quality in these areas? What are the projected emissions of these pollutants (particulate matter, sulfur dioxide, nitrogen oxides)?

8.3) How will efforts to abate carbon dioxide emissions affect the combustion of fossil fuels?

8.4) How will the slower growth rate in the combustion of fossil fuels associated with emissions abatement policies affect the emission of particulate matter? Nitrogen oxides? Sulfur dioxide?

8.5) How will the change in emissions of these air pollutants affect air quality?

8.6) How will this relative improvement in air quality affect public health? What are the economic benefits of this change?

8.7) What is the current and projected extent of water pollution resulting from sediment and chemical loading from forestry and agriculture?

8.8) How will efforts to promote carbon sequestration affect forestry and agricultural practices in major watersheds?

8.9) How will the change in forestry and agricultural practices affect the sediment and chemical loading of waterways and waterbodies?

8.10) How will the change in water quality affect the use and consumption of water? What are the economic benefits of this change?

8.11) Do any policies to abate greenhouse gas emissions under consideration affect traffic congestion?

8.12) If so, what is the magnitude of the reduction in traffic congestion from what it would be otherwise?

8.13) What are the time-savings and cost-savings associated with reduced congestion?

8.14) What is the reduction in accidents associated with reduced congestion?

8.15) What are the economic benefits associated with a reduction in accidents from what they would have been otherwise?

Policy Mechanisms

The Kyoto Protocol stipulates that all Annex B countries have the discretion to implement their own policies and measures to comply with their targets. It is important to assess which policies and measures may be most appropriate given national circumstances. Possible policies include a domestic emissions cap and trade program, a carbon tax on energy, efficiency standards, tax incentives, removal of subsidies, investment in R&D, etc. Some policies could stimulate emissions abatement more efficiently than others. Assessing the cost-effectiveness as well as the ancillary benefits of these policies involves addressing the questions posed above on these issues to specific policies under consideration. Non-Annex I countries may find it informative to review the effectiveness of various policies implemented in Annex I countries and assess the applicability of these policies to their own circumstances.