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[Global Climate Change - Clean Development Mechanism and Joint Implementation] [loose]

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GCC and Developing Countries

ii

Enclosures filed in  
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NANA 18792

DEPARTMENT OF STATE  
 BUREAU OF ECONOMIC AND BUSINESS AFFAIRS  
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**FAX COVER SHEET**

TO: Bob Lumby et al Joe Alay et al	PHONE:
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DATE: 9/27/98	TIME: 6:10 pm

Number of pages including cover sheet: 3

Subject: CDM (Summary of position)

Messages: For discussion only, copy as necessary.

Bob Lumby / Ray Squitieri / Adele Morris (Wilcox)	622-2633
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## CLEAN DEVELOPMENT MECHANISM

### BACKGROUND

The Clean Development Mechanism (CDM), created prior to and during the third session of the Conference of the Parties to the Framework Convention on Climate Change was largely the result of a merger between the U.S. proposals for "joint implementation with credit" between developed and developing countries, and the Brazilian proposal to establish a fund to support actions in developing countries.

The CDM provides for the functional equivalent of joint implementation with developing countries, allowing Annex I Parties to be able to meet "part of" their targets from project activities in non-Annex I countries. It calls for:

- emission reductions to be certified by operational entities to be designated by the COP/moP;
- guidelines to include methods for determining that projects are additional, and generate real, measurable and long-term benefits;
- the establishment of an Executive Board (EB) to supervise the CDM;
- an unspecified "share of the proceeds" to be used both to cover administrative expenses, as well as assist particularly vulnerable developing country Parties (such as small island states) to adapt to climate change; and
- early credit for certified projects beginning in 2000.

The Protocol text does not in any way limit private sector participation. In fact, it specifically provides for the participation of "private entities." We anticipate that capital (e.g. from the private sector) will flow based on the availability of qualifying projects, the potential rate of return on investments, and the market value of certified emission reductions. In those cases where funding does not exist, the CDM can assist in arranging such funding (Article 12.6), for example by acting as a clearing-house and making widely known the nature of the proposed projects for which funding is necessary. However, the CDM itself will not provide funding.

Little guidance is given as to how the Parties are to elaborate the mechanism. We expect to establish a work plan in Buenos Aires to move the process forward.

### U.S. POSITION

The following are some of the key elements for which the U.S. has developed its position:

- "Part of." CDM project activities should not be capped; either in total or in the amount of CERs an Annex I Party can apply to its target. While Article 12.3(b) of the Protocol provides for a determination of the COP/moP regarding how Parties may use CERs resulting from projects to meet "part of" their targets, the COP should not seek to quantify "part of" because it would seriously reduce the benefits for both Annex I and non-Annex Parties derived from this flexibility mechanism.
- Sinks. Sink activities are allowed under the CDM. This will necessitate the development of better operational guidelines to allow a determination of "additionality" for sink projects. Such determinations should not be limited to projects in afforestation or reforestation -- for example, they should not preclude sustainable forest management.

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- **“Share of the Proceeds.”** The “share of the proceeds” should be defined in terms of emissions and be based on the total amount of the emissions reductions achieved by the specific project activities - not the value of the underlying project itself; the total percentage that should be allowed should be low.
  - ⇒ The list of countries eligible to receive adaptation funds should be limited, where possible confined to particularly vulnerable developing countries; mechanisms will need to be developed to administer the adaptation portion of the mechanism, although to avoid any conflict of interest, CDM “operational entities” that audit and verify reductions should not administer CDM adaptation funds.
- **Institutions.** A number of issues arise related to the organizational structure and its role in administering the CDM. For example:
  - ⇒ The constitution, character, and functions of the EB will depend in part on the various functions of the CDM as a whole. We believe the board members should be limited in number, have professional expertise in matters related to project development and project financing, with sufficient expertise in climate change mitigation efforts, and there should be a balance between Annex I and non-Annex I Parties.
  - ⇒ Existing organizations, both public and private, should be tapped to the extent possible to perform the various functions of the CDM including certifying emissions reductions, helping as necessary to arrange project funding, and administering adaptation funds.
- **Additionality.** We should seek to develop project guidelines/criteria that promote real, measurable and long-term benefits, and include mechanisms for auditing and verification. Generalizable rules or “benchmarks” should be developed that allow objective decisions regarding project acceptance. A benchmark is a standard of performance, which can be either historical or forward-looking. Projects which would not be eligible under the benchmark approach, or for which criteria had not or could not be developed could be considered separately on a case-by-case basis. (The Executive Board may have a role in the development of such guidelines/criteria.)
- **Certification, Auditing and Verification.** Operational entities can pre-certify projects as qualified CDM activities, but will certify emissions reductions after they occur. If modalities/procedures for the CDM are not in place by the year 2000, projects should be eligible for retroactive certification of emissions reductions, if they meet applicable criteria. To avoid any conflict of interest, entities involved in auditing and verification should not be the same as those involved in project development and promotion (see related comments above on administration of adaptation funds).

### OTHER ISSUES

In recent interagency meetings, some participants have raised the issue of “banking” in the context of CDM. More specifically, they have sought to identify ways to allow developing countries to bank CERs forward from one period (e.g. the pre-2008 period) to apply to targets in future periods (e.g. the 2008-2012 period). At issue is whether a developing country that agrees to take on a target in a particular period (e.g. the 2008-2012 period) can continue to participate in the CDM prior to the onset of that period. If a developing country must curtail its participation in the CDM, it may be less interested in taking on a target. (The legal considerations surrounding this issue will be addressed shortly.)

**DRAFT**

## MEMORANDUM TO DISTRIBUTION

FROM: David Gardiner

SUBJECT: CDM Papers

DATE: January 11, 1999

Attached are two papers on 1) CDM Design and Operation Policy Issues and 2) whole sector CDM. David Sandalow requested that I circulate these papers in advance of the White House Climate Change meeting that is scheduled for Wednesday, January 13, 1999.

Please note that the whole sector CDM paper is the product of a joint effort between EPA's Office of Policy and DOE's Office of Policy and International Affairs.

## DISTRIBUTION:

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**CDM Design and Operation Policy Issues**  
**Initial Draft**  
**January 12, 1998**

**General**

- What is the scope of the Clean Development Mechanism?
  - Individual projects only
  - Pooled projects
  - Targets for selected sectors
  - Project-specific reductions driven by policies and measures
  
- What activities should be included in the CDM?
  - Comprehensive: all project categories (reduction and sequestration) and all gases
  - Comprehensive, however, LUCF activities adhere to definitions in Article 3 of Kyoto Protocol
  - Determination of inclusion of project categories by host country
  - Staged approach to project inclusion (e.g., begin with categories of greatest certainty)
  - Are there any activities that should not be included in the CDM?
  
- Is there a linkage between certified emission reductions resulting from CDM and reductions subject to early-crediting?
  - Early crediting only for domestic actions
  - Early crediting can be for either domestic and international actions (with provisions to ensure that double counting of credits does not occur)
  - No linkage between CDM and early crediting
  
- Should there be any requirements to participate in CDM?
  - Submit national communications
  - Require national plan for total emission reductions
  - Schedule for adopting a target

**Baselines**

- How should "baselines" be established to determine additionality and certified emission reductions?
  - Bottom-up project baseline (e.g., project-by-project)
  - Top-down baseline (e.g., benchmark, performance standard, whole-sector, technology standard)
  - Allow different options for different sectors and situations

- How should top-down baselines be designed?
  - Based on historical data or projections?
  - Based on total existing capacity or new capacity additions (marginal capacity)?
  - Sector or sub-sector?
  - Country/regional or global?
- What are the key characteristics of any baseline?
  - Static or dynamic?
  - Straight line or declining slope?
  - Rate-based or absolute?

### **Additionality**

- What forms of additionality should be included in the CDM?
  - Programmatic
  - Financial
  - Emissions

### **Accounting**

- How should certified emission reductions (CERs) be measured and credited?
  - Absolute amount of GHG emission reductions (in "tonnes of CO<sub>2</sub> equivalent" bundled to appropriate project size – calculate using GWPs)
  - Rate-based approach (e.g., C/kWh)
  - Full credit for all CERs from all project activities
  - Discounted credits for CERs for certain activities (e.g., address leakage, baseline uncertainty, externalities)
  - Units fungible with emissions trading and JI units
- How should the share of proceeds and use of adaptation funds be determined?
  - Market value of the emissions reductions achieved
  - What percentage share is acceptable?
  - How should use of adaptation funds be determined?
  - How should "particularly vulnerable" countries be identified, and with what criteria?
  - Who should disburse/administer adaptation funds?

### **Process**

- Should the CDM have a "pre-certification" or "registration" stage?
  - Pre-certification of project activity to ensure project is voluntary, meets sustainable goals, additionality, but actual emissions reductions certified only after they occur
  - Pre-certification of claimed certified emission reductions

- No pre-certification stage
- What should be the relationship between projects under AIJ and CDM?
  - AIJ projects grandfathered into CDM as is
  - AIJ projects grandfathered into CDM with new baseline assessment
  - AIJ projects not incorporated into CDM
- What should the sequence be for certification and verification?
  - Operational entity certifies the CERs and then a "body" verifies these reductions
  - Operational entity verifies CERs then UNFCCC (or other body) certifies reductions

### **Compliance**

- How should compliance issues be addressed in relation to CDM?
  - Institutionally built into the operation/design at the domestic and international levels
  - Compliance with broader obligations under the Protocol or Convention
  - Compliance with terms of Article 12 of the Protocol (addressed by Executive Board, UNFCCC)
  - Private sector compliance/liability (e.g., contracts between private sector investors)
- How should "part of" be defined in the CDM?
  - Qualitative but no numerical "cap" ("part of" totality of Annex I Party reductions from the flexibility mechanisms and domestic actions)
  - Numerical "cap" for offsets achieved through all three mechanisms
  - Numerical cap only for CDM
  - No qualitative or quantitative caps imposed on the CDM

### **Sustainability and Equity:**

- How should sustainable development component of project activities be determined?
  - By host country
  - Formulaic approach
  - Internationally agreed upon standards
- What policy mechanisms are available to address equity concerns under the CDM
  - Adjusted baselines
  - Discounting credits
  - Special fund to ensure geographical distribution of projects
  - Project Bundling, Regional Projects, Clearing house function
  - No consideration for equity - CDM operates as a market-based mechanism

## Whole Sector CDM

### Concept

The Clean Development Mechanism (CDM) of the Kyoto Protocol allows for emission reduction credits for projects in non-Annex B countries. While CDM credits are expected to be project-based, the term 'project' is not defined. Under 'whole sector' CDM, credits would be generated from GHG emissions reductions for an entire sector (e.g., the electricity sector) relative to a preestablished baseline. Individual projects within this sector would not be credited.

### Qualifying Under the CDM

Credits to whole-sector emission reductions would have to meet the same conditions as all other CDM projects:

- Participation would be voluntary;
- The credited actions must assist the non-Annex I Party in achieving sustainable development objectives;
- The credited actions must result in reductions or removals that are real, measurable and long-term;
- The credited actions must result in emission reductions or removals that are additional to any that would occur in the absence of the certified project activity; and,
- A share of the proceeds from the sectoral (based on reductions) would be used to cover administrative and adaptation expenses.

### Process

#### *Setting the Baseline:*

An emissions baseline would have to be established for the identified sector for some future period.

- The first step would be to estimate the projected emissions for the sector in a business as usual scenario.
- The BAU projections could be based on absolute net emissions from a given sector over a period of time or a generic measure of emissions intensity (e.g., tonnes of carbon per megawatt hours of electricity generated) over a period of time.
- The baseline could be
  - the BAU projection itself (where any emissions below BAU would be credited),
  - or a designated amount under the BAU projection (where credits would be attainable only for reductions that are a given percent below what would have happened anyway).
- The baseline could be set for each budget period or for other designated periods.
- This baseline might be determined by an internationally agreed upon formula or by a country-specific negotiating process.

#### *Awarding Credits:*

Credits could be awarded to the host country government, ministry, or designated entity within the host country (e.g., an association or conglomeration). Credits would be awarded if emissions reductions for a whole sector were below a pre-established baseline for a given period.

Credits would be certified only after the emissions reductions had been achieved and verified. Individual projects within a whole-sector baseline would be ineligible for additional credits through other CDM processes. If emissions exceed the pre-established sectoral baseline, the participating country would not be penalized.

### **Implications / Assessment**

#### *Benefits of whole-sector credits over credits to individual projects:*

- Allows for the inclusion of amorphous emission reductions such as those resulting from domestic policies otherwise be difficult to quantify and reward.
- Total reduction potential could be greater since the entire sector is being addressed as opposed to attempting to affect total sector emissions through crediting individual projects.
- Sectoral crediting could reduce some of the additionality concerns associated with crediting individual projects.
- Could eliminate some types of leakage problems associated with individual projects (e.g., forestry projects where logging on one plot is displaced to another).
- Whole-sector CDM would be a largely risk-free way for a country to obtain many of the benefits of full participation in emissions trading, without the risks associated with accepting a binding emissions target.
- Whole-sector reductions may better advance "meaningful participation" from developing countries beyond project-by-project reductions.
- Could have lower transaction costs since only one baseline needs to be established and only one 'project' emissions needs to be calculated, certified, and verified. No need to verify and certify individual projects.

#### *Drawbacks of whole-sector credits over credits to individual projects:*

- No market until whole-sector emissions have been measured and verified. The time periods of measurement and verification would depend on the level of effort needed to measure emissions for a whole sector and the available data. Longer intervals between credit awards could make capital recovery for efficiency investments more difficult.
- Could substantially reduce the incentive to accept a binding target, especially if the sector baselines were comparable to (or higher than) the levels that would be considered acceptable binding targets.
- Most projections are extremely uncertain, often dependent on factors that are difficult to predict (e.g. economic conditions) and are therefore more likely to be influenced by political posturing.

- Can create distortions by shifting activities from a capped sector (e.g., electricity) to an uncapped one (e.g., industry self generation).
- Total incentive for private investment may be diluted because credits would not be directly allocated to individual projects, and individual private investors would have little or no control over whether the country meets its whole-sector target.
- All developing countries may not have the data and capacity to develop these targets so some may be advantaged over others.
- Developing countries may perceive this as a back-door target.

**Example:  
Whole-Sector Baseline for  
Electricity Generation in China**

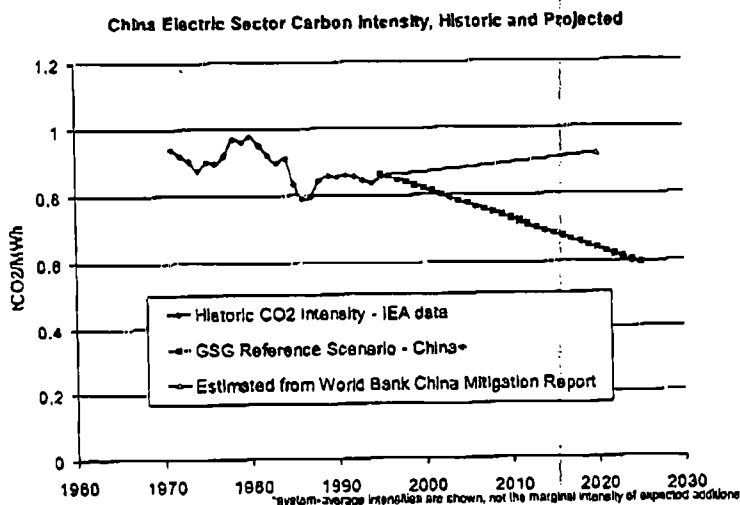
The following is a step-by-step description of how whole sector CDM would generate credits. The example sector used is the electricity sector in China.

**Step 1: Choose relevant sector (Host country and body designated by the Executive Board)**

China and a body designated by the Executive Board will approve a sector for Whole-sector CDM. Not every sector will be conducive to this approach, so the approved body would evaluate the proposal based on available data to create a baseline, capacity to gather data for measurement within project years, and the benefits of this approach over other approaches for this sector.

**Step 2: Develop a baseline (Host country and body designated by the Executive Board)**

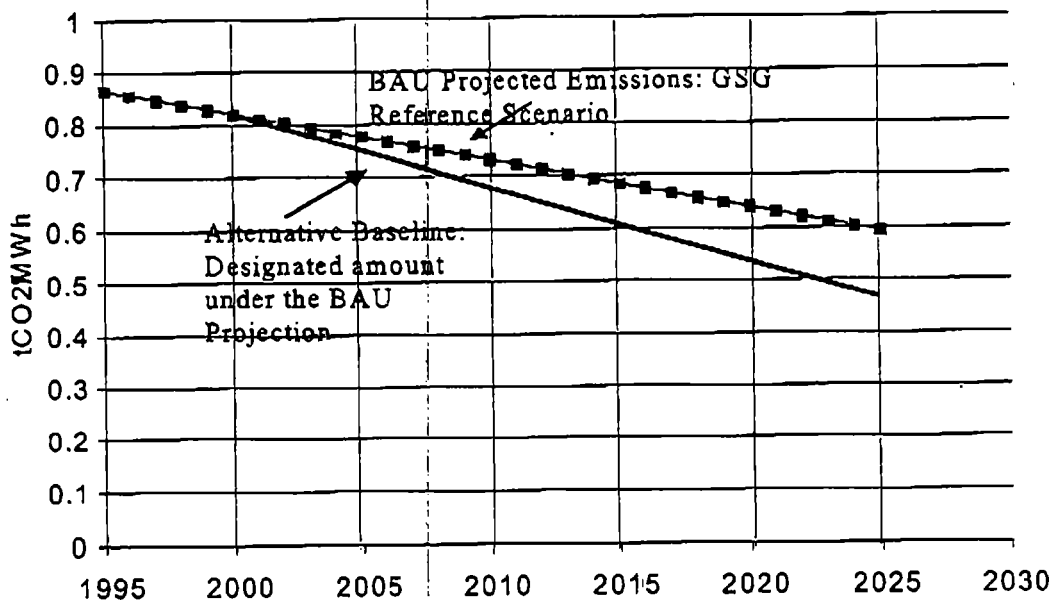
The first step in developing a baseline for the whole sector is to estimate projected emissions (either absolute or an emissions rate) for the given sector in a BAU scenario. Projections can often vary widely as shown in the example below of the projected efficiency rates (CO<sub>2</sub>/MWh) for the Chinese electricity sector.



In this example, the Global Scenario Group (GSG) Reference scenario (based largely on IPCC 92a with some added technical detail) shows the Chinese electricity sector becoming more efficient and the World Bank Mitigation Report estimates that the Chinese electricity sector will become less efficient.

The baseline would either be the BAU projection itself, or a designated amount under the projection (see figure below). The baseline would be either developed through a set formula for that sector or through a negotiating process between the China and designated body. The baseline would need to be set prior to the period for which credits would be considered. In this example, the BAU projection and the baseline are rate based, however they could be based on absolute emissions.

In the example below, the baseline is based upon the BAU Projections from the GSG Reference Scenario for the Chinese electricity sector. The BAU projection is the upper line, however the baseline to which reductions would be compared could be either line. Actual baselines would need to be revisited and updated periodically.



### Step 3: Determine method for calculating actual emissions from the whole sector.

Many developing countries may never have estimated emissions from an entire sector. Methodologies can be standardized across all developing countries or may be based upon IPCC guidelines for developed countries. The methodology would determine the boundary of the sector, the required data (including the source), coefficients and factors, time period and other information relevant to creating a sector emissions estimate. This methodology would need to be agreed upon before the first eligible year. A methodology for the Chinese electricity sector could be:

Boundary: On-Grid Electricity Production (no industrial or residential production)  
 Time Period: First budget period  
 Required Data: Fuel input by fuel type (coal must be designated by type of coal)  
 Factors: IPCC carbon factors for each type of fuel  
 Equation:  $\text{Total Emissions} = (\text{Fuel Input}_a * \text{C factor}_a) + (\text{Fuel Input}_b * \text{C Factor}_b) + (\text{Fuel Input}_c * \text{C factor}_c)$

### Step 4: Begin Emission Reduction Policies and Projects (Host country and Private Sector)

China would be responsible for creating incentives for emissions reductions. Incentives could be country-wide policies, incentives for regional policies, incentives for private investment etc. The policies themselves, GHG reduction projects or other measures taken to reduce emissions within the given sector would not be individually evaluated.

### Step 5: Emission Monitoring and Reporting (Host country)

Monitoring refers to the measurement of GHG reductions/sequestration and other related socio-economic and environmental effects of the sector. Monitoring does not involve the actual calculation or certification of GHG reductions nor does it involve comparisons with baseline measurements.

The Chinese government or designated ministry would monitor the electricity sector performance in accordance with guidelines set forth in step 3. Monitoring methods for GHG emissions for the China electricity sector could include engineering methods, statistical sampling (including multivariate statistical models), end-use metering, short-term monitoring and integrative methods.

The Chinese government or designated ministry would monitor socioeconomic and sustainability performance of the projects within the sector in accordance with guidelines set forth by the COP/MOP but based on objectives designated by China.

#### **Step 6: Emissions Reporting (Host country)**

At the end of the time interval set in Step 3, China will compare the actual emissions for the sector for the given period to the whole-sector baseline set forth as the beginning of the project. China will incorporate this information onto a standard reporting format that includes the environmental, social and economic status of the sector. There are two options for emissions reporting:

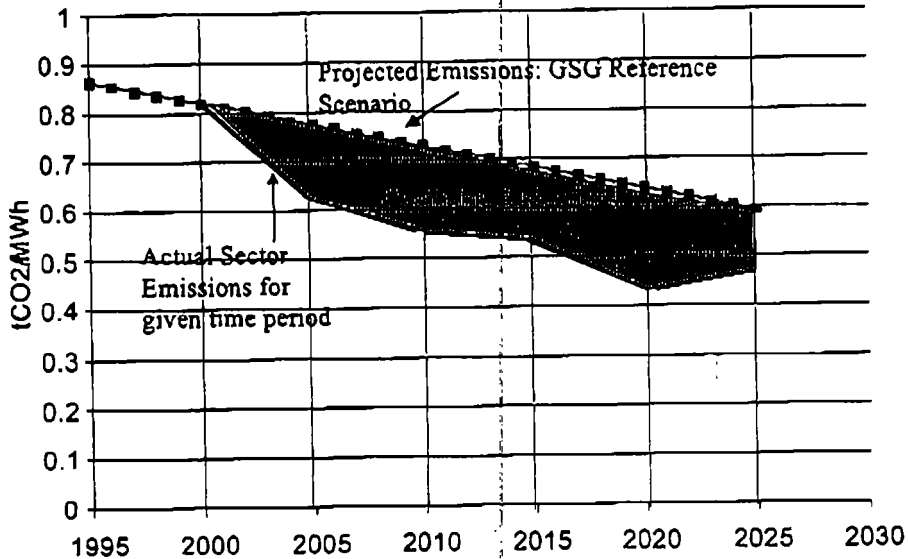
- (1) The Chinese government or designated ministry will report actual emissions to the [CDM, Operational Entity, third party verification] in accordance to the standard methodologies set forth in step 3. The benefit of this approach is that it incurs small transaction costs, however, confidence in the report may decrease since the operators have an incentive to inflate emission reduction estimates.
- (2) A third party [auditor] is hired by the Chinese government to check the operators monitoring data and to complete the report to the [CDM, Operational Entity, etc.]. The benefit of this approach is that gaming is less likely to occur, however, transaction costs increase as you include a third party.

#### **Step 7: Certification (Operational Entity)**

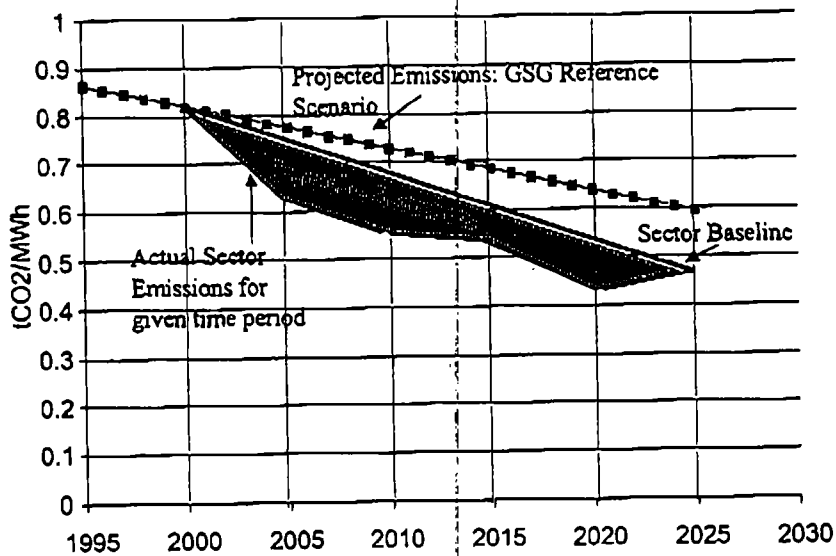
The calculation of project GHG reductions is conducted at this stage and would include GHG reductions, non-GHG impacts, determination of proper project performance baselines against the stated reference scenario, estimation of project leakage, etc.

The Operational Entity would review the reports submitted by the project operator/developer (which state the results of measuring, monitoring, and evaluating the project) and compare the actual emissions to the baseline. Actual credits would be awarded to reductions that fall under the baseline. As illustrated below, the baseline could be either the BAU projection itself, or a given level under the BAU projections.

### Option 1: Provide Credits to Any Reductions Under BAU Projection



### Option 2: Set Sector Baseline Under Projected Emissions



### Step 8: Audit and Verify Emission Reductions (Third Party Auditor)

Verification of whole sector emissions would occur in a similar fashion to other CDM systems. A third party auditor would review the Chinese electricity data for the whole sector and verify that the sector emissions are the same as are reported in Step 6. An operational entity would report the verified emissions to the COP/MOP.

CEA Comments on EPA/OP Benchmarking Paper

The benchmarking approach has appeal because it could lower the costs of the approval process for CDM projects, and thereby increase the number of projects that could be funded. However, there is a risk of a trade-off between this additional simplicity and achieving desired low-cost, real emissions reductions: if the benchmark is “too low”, then projects that are not truly additional would receive credit, and if the benchmark is “too high”, then some projects that would be additional do not receive credit and would not occur. This illustrates the critical importance of the task of developing benchmarks, and the need for analysis to evaluate this trade-off. For example, if the benchmark is too high, the transaction costs for each approved project may be lower than what they would be under an alternative form of the CDM, but the cost-savings to all participants of the CDM in total would be lower, because fewer projects are funded. If the benchmark is too low, then many non-additional projects would be funded. While the costs of “achieving” targets would be lower, the credibility of the CDM institution could be called into question.

The paper claims that “normative values are likely to create the most effective benchmark.” It is not clear what these normative values would be, or what would serve as the basis for them, if neither historical nor projected rates are appropriate. Benchmarks should be set such that they minimize the number of rejected projects that are truly additional and the number of accepted projects that would have been undertaken anyway. We do not believe that benchmarks should be set so high so that the project participants only receive a fraction of the emissions reductions that are truly additional. This is an area where we support continued analytic work.

The discussion on the level of aggregation for the sector is not clear. It would be helpful to have more background on what is meant by the “5-sector benchmark model”. The fourth sentence is especially unclear on this issue. We also note that while there is a risk of subjectivity with evaluating CDM projects on a case-by-case basis, there could also be a risk of subjectivity with developing a large set of benchmarks for many sectors and sub-sectors across many countries.

The paper includes several attached figures, but there are no references to them in the text. It would be useful to explain how these data can inform the discussion on benchmarks. We should note, however, that the first chart on average carbon intensity of existing capacity is not that useful, since we are interested in the carbon intensity of new capacity (this is the point made in the first bullet of the text). Also, the third chart is not clear given the two y-axes.

If benchmarks are established at levels (e.g., 1 kg/kWh) that are above the rates of some existing plants (e.g., 0.8 kg/kWh), there could be the potential for gaming. If an existing plant undertook a small modification, a.k.a. a “project”, would the plant then be eligible for CDM credit? This would not appear to be additional, but it might receive credits under this approach.

cc: JA  
QF

Clear to Jackie Krueger by 2pm Fri. 2604337

Gardiner, ELS

CDM Benchmarking  
January 13, 1998  
EPA/OP



**Concept:**

Benchmarks are a way to lower transaction costs and reduce subjectivity for crediting CDM projects. Benchmarks would create a rate-based baseline for an entire sector. Any project that is more efficient than that the benchmark would be considered additional and subject to credits based on the difference between the benchmark and the project performance.

**Policy Issues and Options:**

- Should the benchmark be based on total past emissions or new capacity? Some countries have remained fairly consistent over time, however other countries' new capacity is completely different than past trends. For example, Argentina electricity generation used to be largely oil based. However, recent trends are toward natural gas and large-scale hydro. Since the additionality criteria applies to what would have happened next, current trends (e.g., new capacity additions) are more applicable.
- Should the benchmark be based on historical average, projections, or normative values? A historical average benchmark would allow any project that has better than average carbon intensity to qualify for CDM credits. By definition, this would allow half of the existing production in any given sector to qualify as additional. Projections, while correct in intent, rely on many factors that are difficult to predict. Projections can vary not only in magnitude, but directionally as well. Normative values (e.g., percentile approach) are likely to create the most effective benchmark.
- Level of Aggregation for the sector. Benchmarks could be created at various levels of aggregation (e.g. industrial demand, pulp and paper, cardboard products). Dissaggregation leads to more precision, but more cost. The level of aggregation will vary between sectors, however, there is generally too much dispersion within individual sectors to create a 5-sector benchmark model. A 5-sector model likely to allow many non-additional projects from efficient subsectors, yet not create enough of an incentive for high carbon intensive processes. For example, in China the electricity generation is mostly coal and hydro. One benchmark would credit all the hydro (~25% of new capacity from 1992-1996), but be well below any possible efficiencies for the coal production. Industrial demand energy intensities also vary significantly between and within large sectors. An effective industrial demand benchmark may need to be specific not only to the 2 digit U.S. SIC code (e.g., pulp and paper), but to the 3 or 4 digit U.S. SIC code (e.g., tissue paper).
- Should the benchmark be global or regional? For the electricity sector, regional (e.g., country specific) benchmarks are likely to be more effective. Every country will have some electricity production and the available resources and existing infrastructure vary between countries. If a global benchmark were created for historical marginal capacity, all electricity production from some countries would be considered additional. Global benchmarks for the electricity sector could be effective if the benchmark is technology-fuel based (e.g. coal benchmark). In this case, incentives for lower-carbon fuels could be provided by looser benchmarks or by discounting credits for high carbon intensive fuels.

Commodity-based sectors (e.g. iron and steel), while also varying greatly between countries, have more tradeable products. It may therefore make more sense to have global commodity

benchmarks to encourage production in more energy efficient countries. Global commodity benchmarks would also allow more disaggregation without exorbitant costs.

- Updating the benchmark. The benchmark for any given year will provide the baseline for the lifetime of a project that qualifies in that year. Updated benchmarks for new projects, however, will be needed to account for new trends and technologies. The intervals in which benchmarks are updated will depend largely on the level of effort needed to create the benchmarks. If the cost is high, then the intervals between updates will be longer. It is possible to tighten the benchmarks using an automatic deflator to account for technology improvements. However, the trends in developing countries have not suggested that efficiencies historically improve over time. Decreasing the benchmark between updates, however could create the correct incentive for efficiency improvements.
- Which sectors are most conducive to Benchmarks? Sectors that are most conducive to benchmarks will have a homogenous output, quantifiable reductions, available data, and are likely to attract many CDM projects. Electricity, some industrial demand sectors, energy supply (e.g., natural gas pipelines or coal mining methane recapture), residential appliance may qualify for benchmarks. Forestry is a possibility that needs further investigation.

FIGURE 4X.2

# Carbon Intensity for Total Existing Capacity

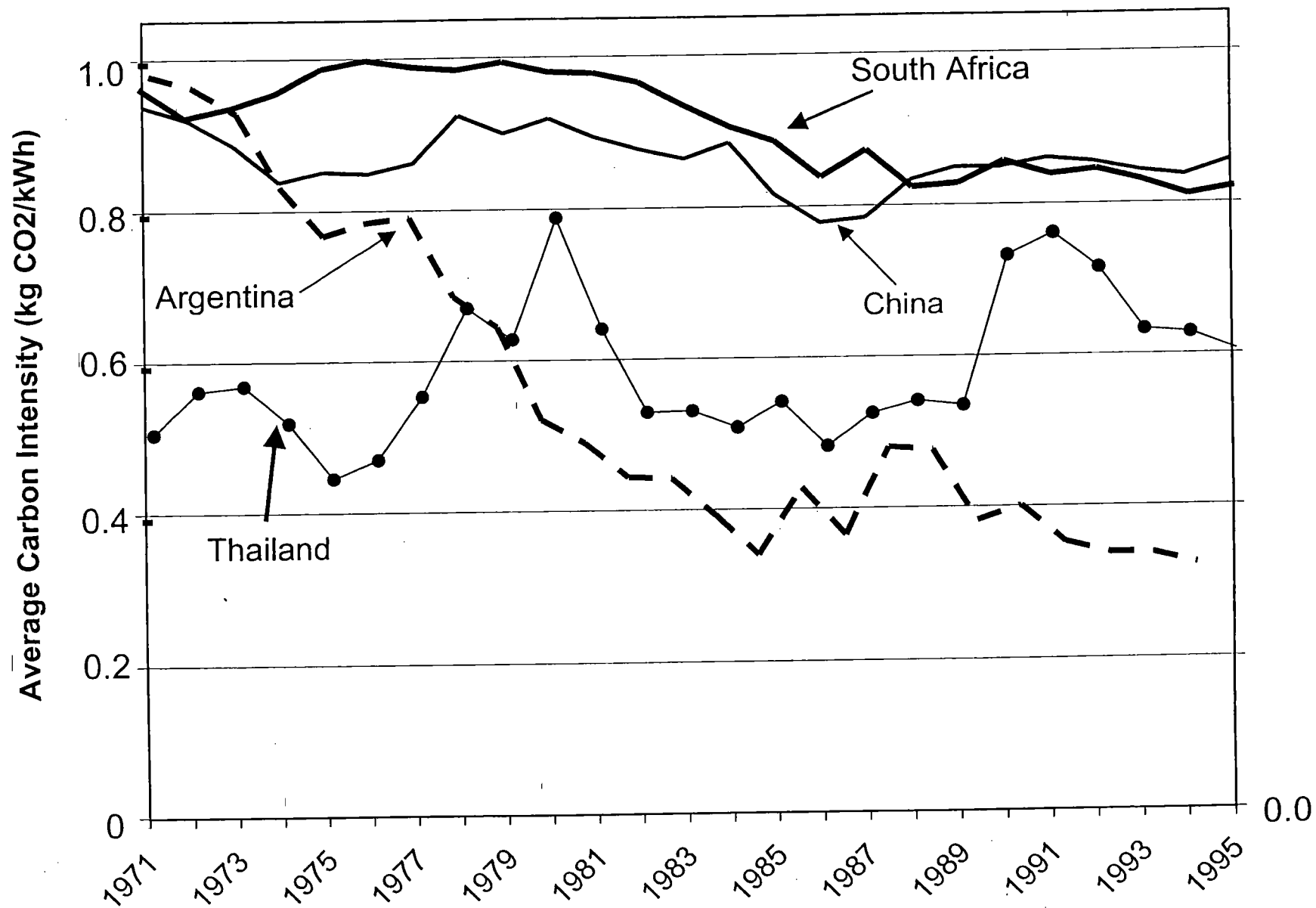


FIGURE 4X.3

# Carbon Efficiency for Total New Capacity Additions

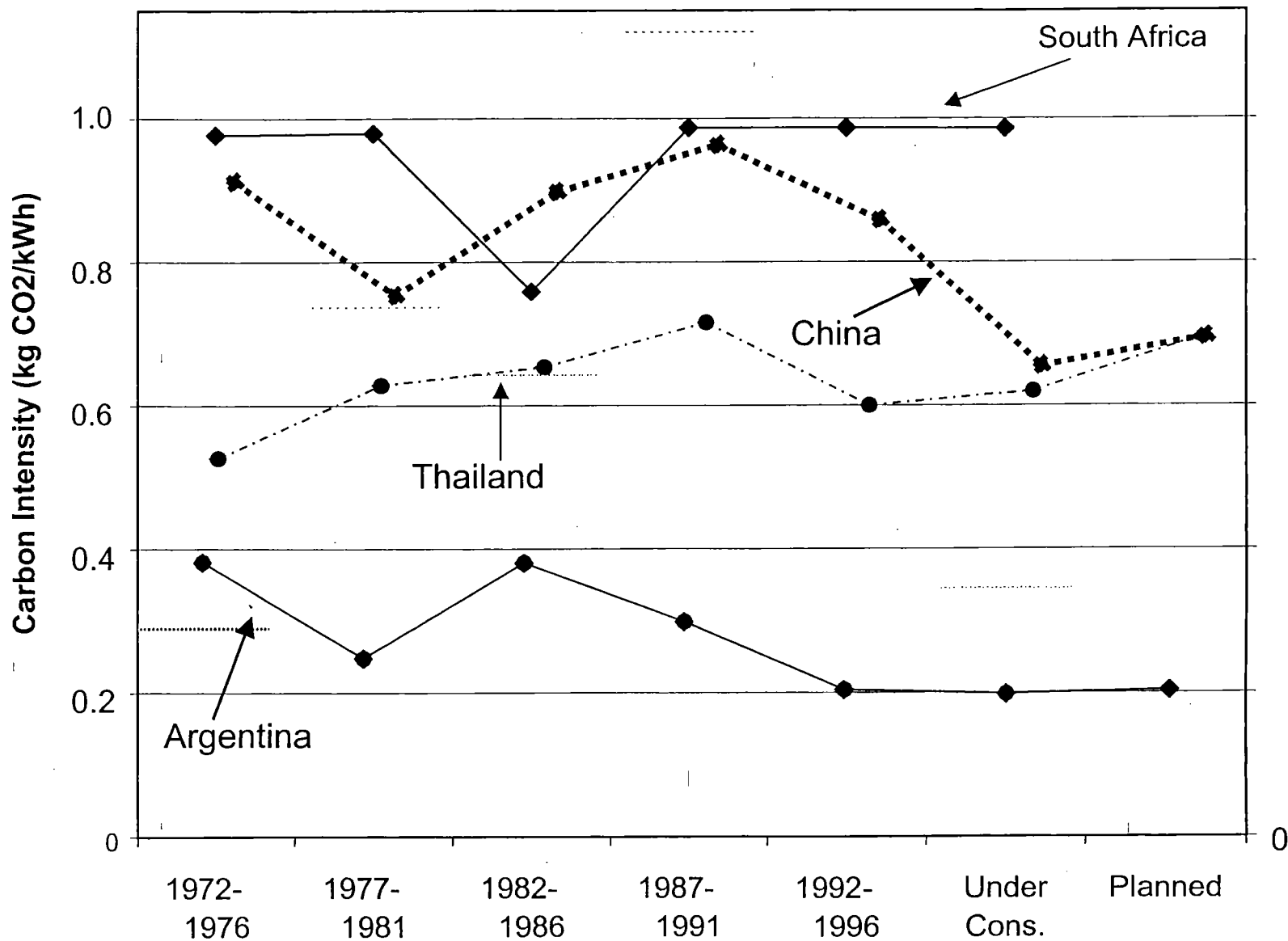


FIGURE 4X.4

# Carbon Intensity for New Capacity Additions-- Fossil Fuel Only

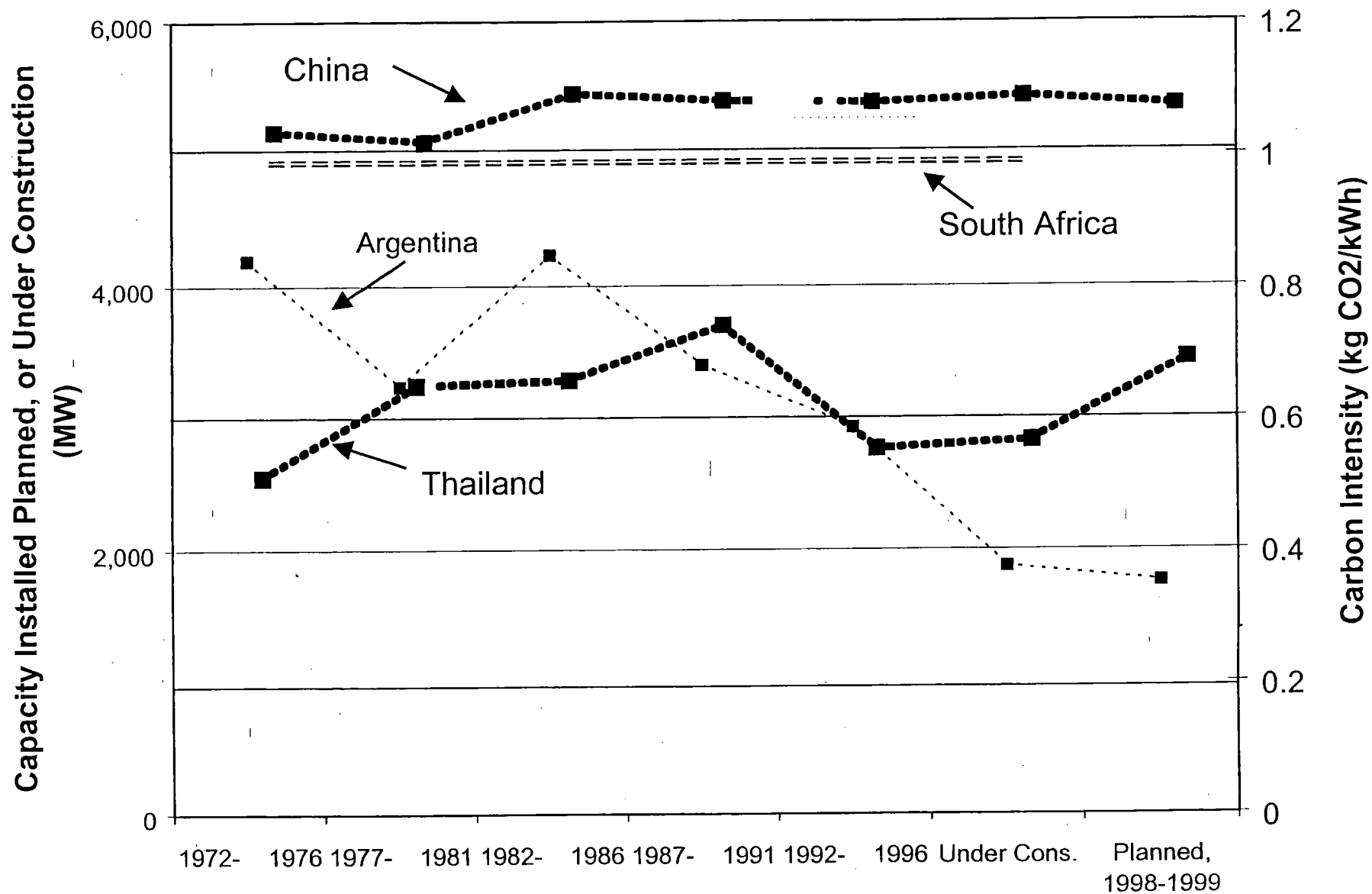
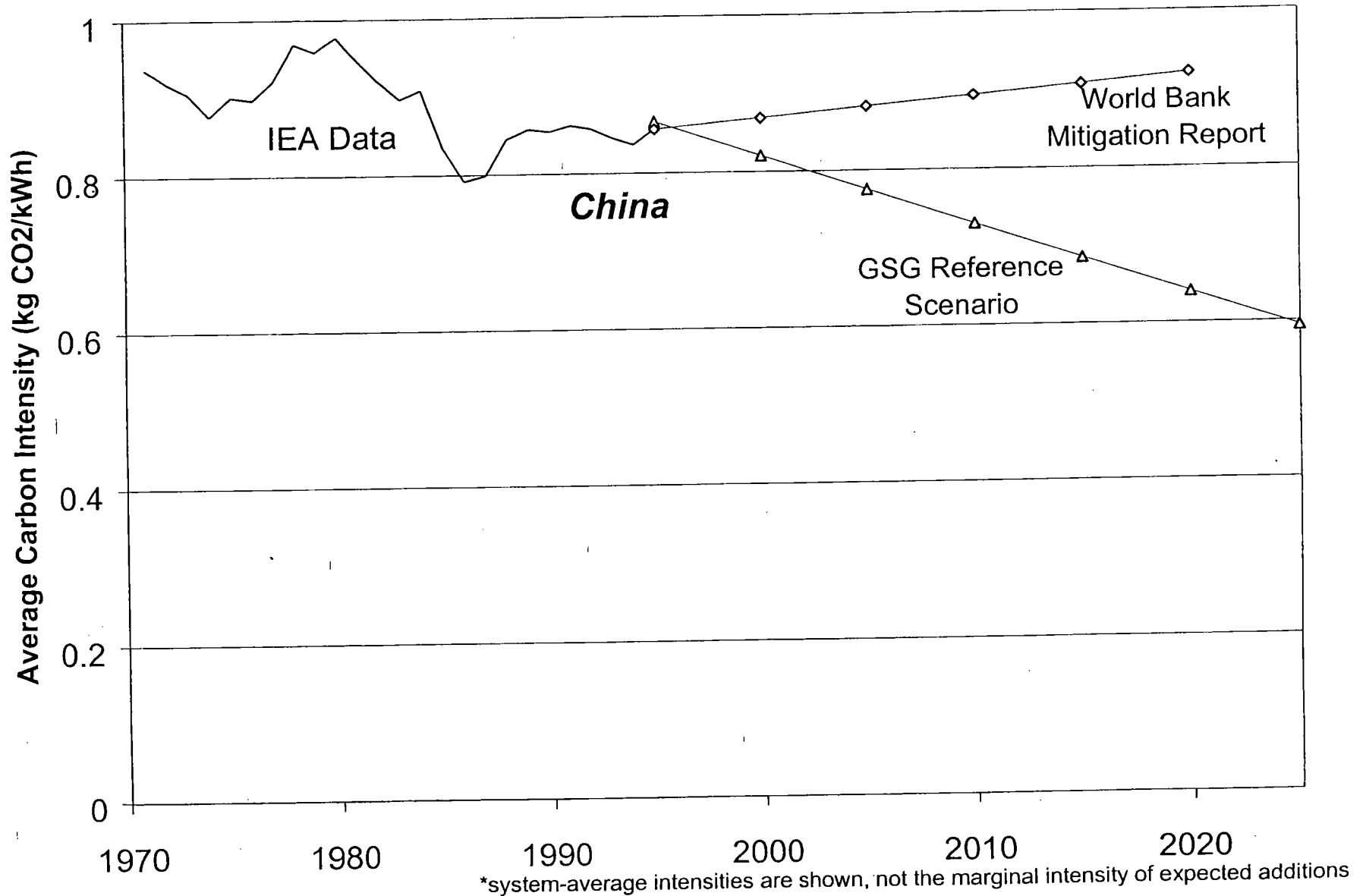


FIGURE 4X.1

# Historical and Projected Average CO<sub>2</sub> Intensities, Electric Sector - China



## Using a Benchmark to Award CDM Credits: An Example from the Electricity Sector

Project: Advanced Natural Gas Combined Cycle Unit

### ARGENTINA

Benchmark		Project			
		C Intensity	Credits		
Type	kgC/Kwh	NGCC	Credit/kwh	output (GWh)	Total credits
Average carbon intensity, all existing capacity (1995)	0.33	0.38	0	3,942	0
New Capacity Additions, historical (1986-96)	0.22	0.38	0	3,942	0
New Capacity Additions, historical (1992-96)	0.19	0.38	0	3,942	0
New Capacity Additions, under construction	0.19	0.38	0	3,942	0
New Capacity Additions, historical (1992-96)- fossil only	0.6	0.38	0.22	3,942	867240
New Capacity Additions, under construction- fossil only	0.43	0.38	0.05	3,942	197100

\*fossil only numbers are approximations based on graphical data

### UNITED STATES

Benchmark		Project			
		C Intensity	Credits		
Type	kgC/Kwh	NGCC	Credit/kwh	output (GWh)	Total credits
Average Generation, 1995	0.66	0.38	0.28	3,942	1103760
Median Capacity, 1995 (50th percentile by C int)	0.81				0
Top 25th percentile of capacity, 1995	0	0.38	0	3,942	0
New Capacity Additions, historical (1986-96)	0.39	0.38	0.01	3,942	39420
New Capacity Additions, historical (1992-96)	0.68	0.38	0.3	3,942	1182600
New Capacity Additions, under construction	0.7	0.38	0.32	3,942	1261440
New Capacity Additions, under construction- fossil only	0.92	0.38	0.54	3,942	2128680
Natural gas CC average	0.51	0.38	0.13	3,942	512460
Natural gas CC top 25%	0.46	0.38	0.08	3,942	315360
Natural gas CC top 10%	0.44	0.38	0.06	3,942	236520

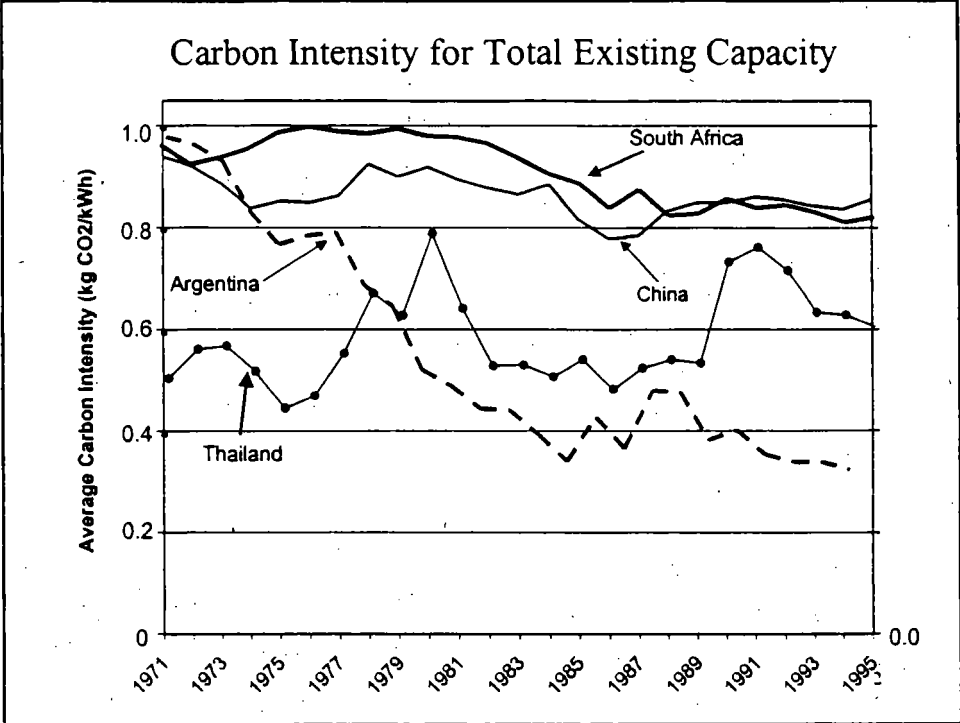
\* the carbon efficiency for the NGCC is based upon an advanced model

\* Plant generation is based on a 500 MW plant operating 8760 hrs/yr at 90% capacity factor.

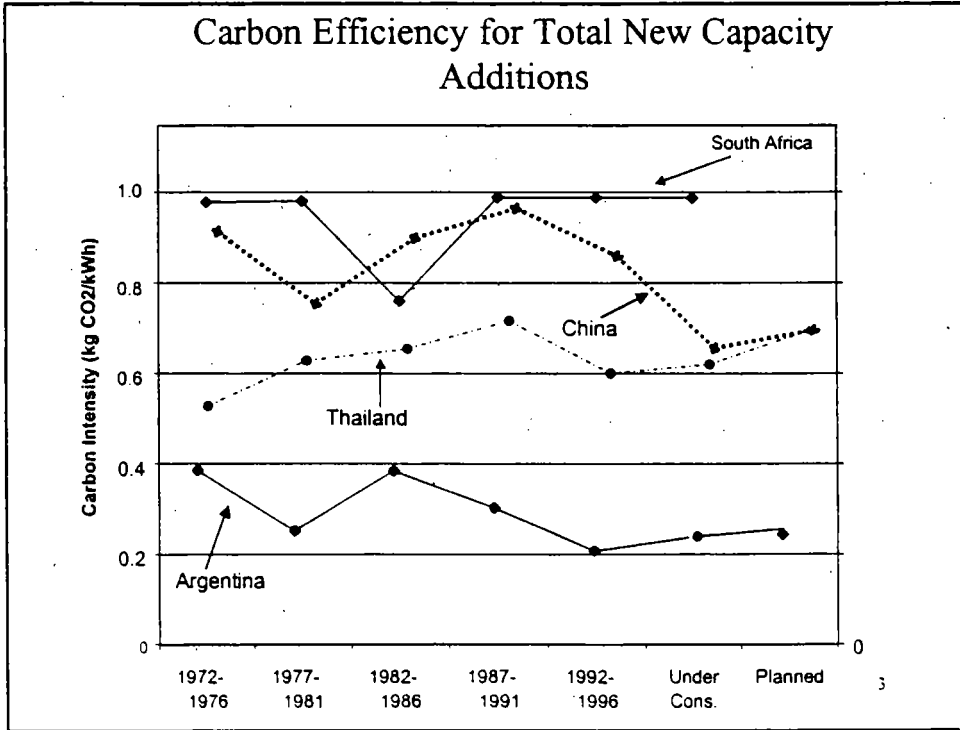
\*\* fossil only numbers are approximations based on graphical data

Benchmarking as a Measure for  
Certification and Additionality  
for CDM: Background Data

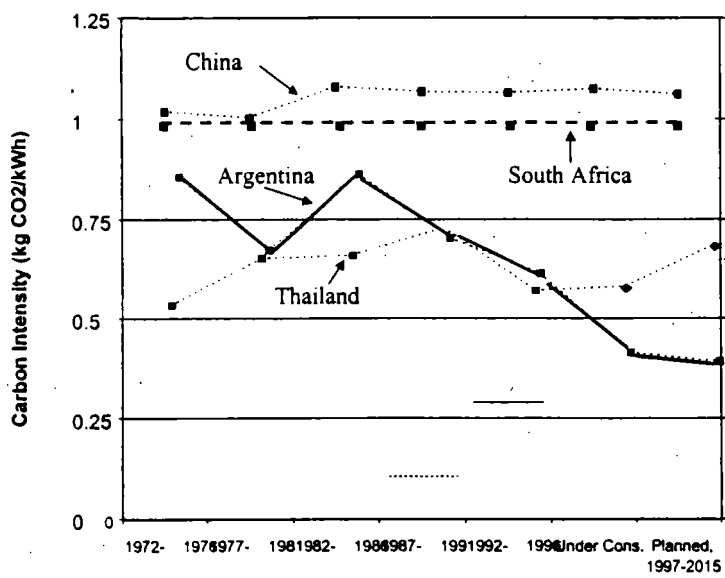
February 1999



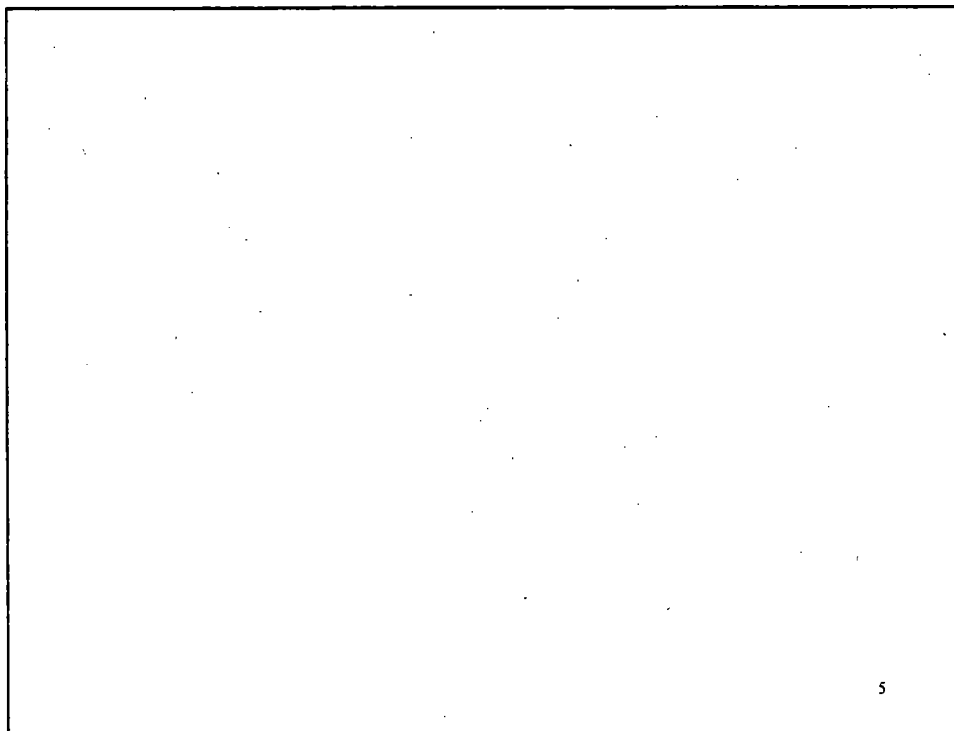
All electricity generation (on-grid)



### Carbon Efficiency for Fossil Only New Capacity Additions

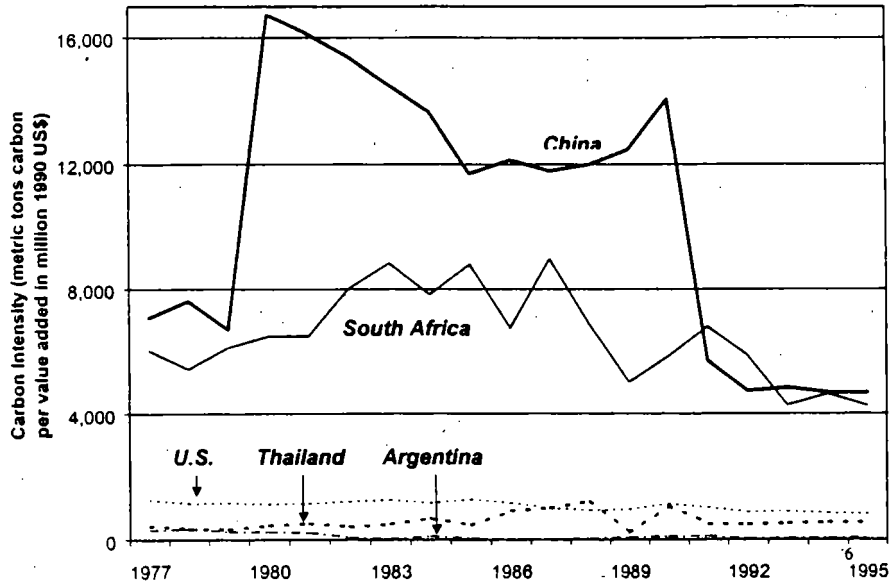


4

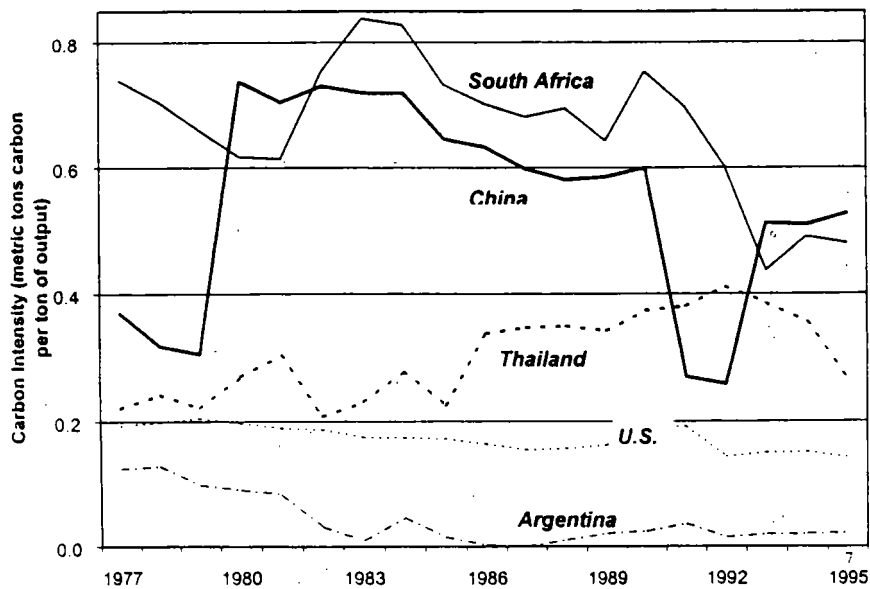


5

Carbon Intensity by value added in the iron and steel industry for study countries, 1977-1995



Carbon Intensity by weight of output in the iron and steel industry for study countries, 1977-1995



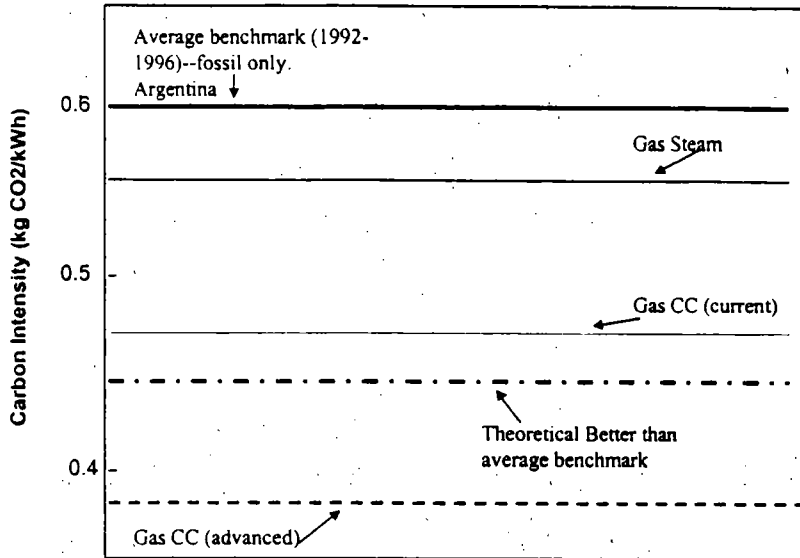
## Carbon Intensity Comparison: All existing Capacity and New Capacity Additions

Country	Carbon intensity of all existing capacity (1995)	Carbon intensity of capacity additions (last 5 year period)	Difference
Argentina	0.33	0.19	-42 %
China	0.86	0.84	- 2 %
South Africa	0.83	0.99	+ 19 %
Thailand	0.61	0.56	- 8 %
United States	0.57	0.68	+19 %

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### Benchmark Examples: Argentina



Argentina's 'fossil only' benchmark is an approximation based on graphical data.

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### Better-than-average Benchmarks: Percentile Approach

U.S.

	share	Carbon Intensities (Kg CO <sub>2</sub> /kWh)		
		Average	25th %ile	10th %ile
<b>All Generators</b>	<b>100%</b>	<b>0.81</b>	<b>0.0</b>	<b>0.0</b>
Coal, Steam	55.2%	0.95	0.84	0.80
Nuclear	22.5%	0.0	0.0	0.0
Hydro	10.0%	0.0	0.0	0.0
Gas, Steam	8.5%	0.62	0.60	0.60
Oil, Steam	1.8%	0.85	0.81	0.80
Gas, CC	1.2%	0.51	0.46	0.44
Gas, CT	0.4%	0.77	0.69	0.55

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## Allowable credits/kWh Under Given Historical Averages

Technology	Carbon Intensity	Marginal Historical Averages (Kg or CO2 Credit/kWh)	
		Argentina (0.20)	S. Africa (0.99)
zero carbon electricity production technologies	0	0.20	0.99

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## Demand Sector: Heterogeneity I

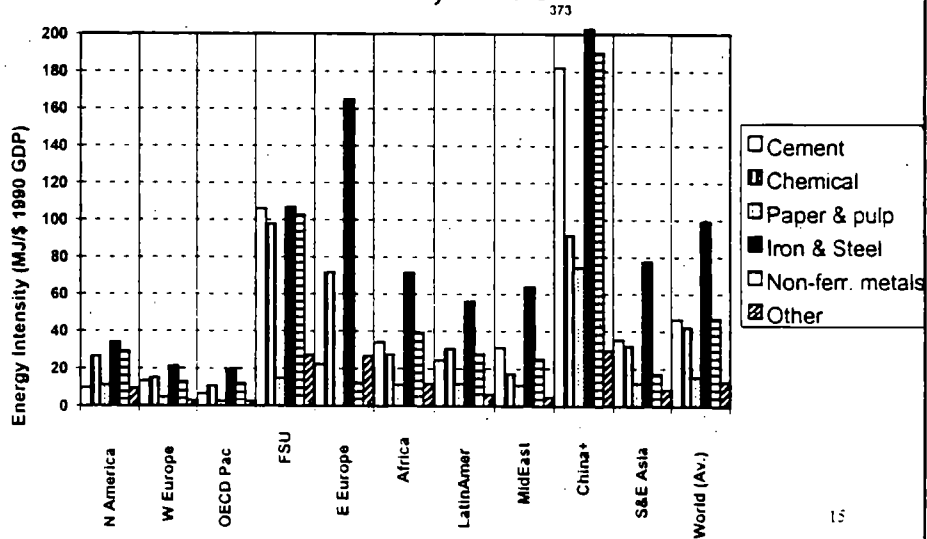
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**Total production & energy intensity of the Pulp & Paper Industry in So. Africa**

Product	production (tons)	steam (GJ/ton)	electricity (GJ/ton)	total (GJ/ton)
<b>Tissue</b>	<b>114,000</b>	<b>20</b>	<b>17</b>	<b>37</b>
Uncoated mechanical	61,000	19	10	29
Uncoated woodfree	238,000	19	9	28
Coated woodfree	53,000	24	11	35
<b>Newsprint</b>	<b>320,000</b>	<b>8</b>	<b>8</b>	<b>16</b>
Linerboard	550,000	12	8	20
Fluting	220,000	12	6	18
Paperboard	145,000	16	9	25
Other	108,000	19	9	28
Pulp exports	450,000	8	4	12

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## Industrial Energy Intensity By Sub-sector, 1990



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## IDEAS FOR IMPLEMENTATION

Luiz Gylvan Meira Filho  
President, Brazilian Space Agency  
Brasilia, Brazil

**Summary:** From his perspective as the Chairman of the Contact Group that negotiated the inclusion of the Clean Development Mechanism in the Kyoto Protocol, this author considers the historical evolution of the Clean Development Mechanism (CDM) and examines it in terms of the broader goals of the United Nations Framework Convention on Climate Change (UNFCCC). He then offers specific guidelines and practical steps for successfully implementing the CDM.

### HISTORICAL EVOLUTION

The idea of promoting cooperation between industrialised and developing countries to assist the latter grow along a "cleaner" or, to be more precise, a more carbon-free path, has early been recognised as a "win-win" exercise. This is based on the fact that avoiding emissions might be less costly in countries where the infrastructure in the greenhouse-gas-related sectors has yet to be built. It incorporates the notion of technological "leap-frogging" - that development of the energy-related infrastructure in developing countries should occur in such a way as to leap over emission-intensive steps that have been taken by industrialised countries. Much has been written on these concepts, in general finding no fault with them.

Early attempts to translate these ideas into practice fall into two major categories, with minor and, for the purposes of this note, negligible variations. The first is the concept of "incremental cost" adopted by the Global Environmental Facility, together with the provision of the Convention that non-Annex I Parties could voluntarily participate in the effort to mitigate climate change. The incremental cost of such actions would be covered by Annex I Parties through the financial mechanism of the United Nations Framework Convention on Climate Change.

The second was the experiment made with the so-called "joint implementation with credit," involving Annex I and non-Annex I Parties, and the associated interim solution of "Activities Implemented Jointly" (AIJ) and its pilot phase. The basis for those efforts was an extension of the provision of Article 4.2 of the Climate Change Conventions on specific commitments by Annex I Parties to reduce their net emissions in line with the general commitments of all Parties, included in Article 4.1.

The successful negotiation of the Kyoto Protocol introduced into the climate negotiations a regulatory element with legally binding, quantitative emission limitations and reductions by Annex I Parties. The basis for this is the agreement in the Climate Change Convention that industrialised countries must take the lead in decreasing their emissions, because the present concentrations of greenhouse gases are mostly due to their actions.

This transition to a regulatory approach in dealing with climate change naturally brought into the spotlight the fundamental question of how to share the burden of mitigating climate change among the countries.

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My personal view of the Climate Change Convention is that there are only two central issues to be negotiated regarding the mitigation of climate change. The first issue is the consensus decision, to be reviewed periodically, on how much the global emissions are to be reduced in the near future. This decision will depend on the perceived importance of avoiding or limiting climate change, weighed against the perceived burden on countries that will result from limiting or reducing emissions. The second issue is apportioning this burden among countries, within the principles agreed to in the Convention.

It is in within this new framework that the implementation of the Clean Development Mechanism (CDM) must be analysed. There seems to be an opportunity now to effectively change the trend of global warming in a manner that is consistent with the Climate Change Convention and in a way that will be advantageous to all Parties involved.

### GUIDELINES FOR THE IMPLEMENTATION OF THE CDM

The following are, in my personal view, conditions that must be fulfilled as necessary conditions for the successful implementation of the CDM.

The governance of the CDM, through the Executive Board, must be efficient. Therefore the Executive Board should be relatively small, while maintaining the necessary representativeness of the different interests at stake.

The categories of projects certifiable under the CDM must, by general consensus, result in real reduction of emissions. Since it is impossible to determine the baseline against which the emission reduction is to be counted on purely technical grounds, and there may be controversy as to whether a baseline is appropriate or not, it is the "representativeness" of the Executive Board that will guarantee that the credits for emission reductions under the CDM will be accepted towards compliance of the quantified emission limitation and reduction objectives (QELROs). *as steps with*

The selection of the subcategories of projects that will be accepted for submission to certification and the approval of individual projects must be left to individual non-Annex I countries. They can then adapt their decisions to national development priorities.

For the sake of efficiency, the actual certification of projects must be distributed among existing institutions working under the strict guidance and supervision of the Executive Board. The feedback only achievable through a regulatory and auditing process is an essential part of the guidance and supervision.

### OTHER ACTIONS RELEVANT TO THE SUCCESS OF THE CDM

It is often said that one of the reasons the concept of AIJ never produced satisfactory results was that there were no credits in its pilot phase. In my opinion, a similar argument applies for the CDM. Even though a credit is clearly associated with the CDM – to the extent emission reduction certificates will be accepted towards a demonstration of compliance with QELROs of Annex I Parties – there will be no real incentive for its use until the Annex I Parties clearly establish national regulations limiting their emissions. There will be a real incentive to acquire such emission reduction certificates only when Annex I governments and/or private entities – depending on their particular choice of economic management tools – are faced

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with the clear alternative of: (a) reducing their emissions; or (b) paying a carbon tax/penalty; or (c) acquiring a CDM emission reduction certificate.

In other words, I believe that the effective functioning of the CDM absolutely depends on the effective implementation by Annex I Parties of national laws and regulations regarding their own emission limitation and reduction objectives.

A second overall condition that must be fulfilled in order for the CDM to be successful is that recognition that there is a fundamental difference between the CDM and other so-called flexibility mechanisms.

The success of emissions trading in the case of other flexibility mechanisms is often cited to show the advantages of the market for emission reductions. It is important to notice, however, that this kind of emissions trading regime works because there is a limitation imposed. A limited number of emission permits are available in the market, and the only other alternative to reducing emissions or purchasing emission certificates is to pay a high price for a carbon tax/penalty.

In the case of the CDM, it is this important to establish strong national mechanisms so that Annex I Parties will be prompted either to realize CDM emission reductions voluntarily, or, if they prefer, to establish national regulations that would require them to do so. The governments would accept those certificates in demonstration of compliance with the domestic limits, and use them, in turn, to demonstrate international compliance.

Another important difference between the CDM and either the emission permits regime or the other so-called flexibility mechanisms under the Kyoto Protocol is that the CDM offers no emission entitlement or permit. Rather, Parties have an obligation to limit or reduce emissions. The difference may be non-existent from a mathematical point of view in the amount that the difference between a national baseline and a limitation or permit obligation is equal to the amount of the point of view of compliance with the Climate Change Convention. However, the difference is significant.

Moreover, both the emission trading regime and the permit-based approach allowed by the Kyoto Protocol have a clear focus on the national level. In my view, it is simply permission for QELROs conducted on behalf of and under the authority of Annex I Parties, a point that was agreed upon in the Convention. The Convention does not address the allocation of responsibility for non-compliance and the corresponding factors under the Convention. The question of the exchanges that take place among Parties is addressed in the Convention, but the convention provided that, with the agreement of the Parties involved, international inventories of emissions include additions and subtraction that add up to zero.

The CDM, on the other hand, is based on a global level of emissions. It is a global market, even though Annex I Parties will conduct the trading on a national level.

#### PRACTICAL STEPS FOR THE IMPLEMENTATION OF THE CDM

In my opinion, the implementation of the CDM will be successful only if it is done in accordance with the provision in the Kyoto Protocol that requires Parties to take the necessary steps in order to

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accomplish this, attention should be focused on the establishment of the Executive Board, the negotiation of its terms of reference, and the guidelines under which it is to operate.

The following are some preliminary ideas on relevant aspects of these tasks, based on a series of discussions with Professor José Goldemberg over the first half of 1998.

The Conference of the Parties to the Convention must establish the Executive Board of the Clean Development Mechanism - EB/CDM.

- The EB/CDM is to be composed of a group of ~~nine~~ <sup>X</sup> representatives of Parties to the Protocol, selected on the basis of parity among the regions of the world and representing an adequate balance of Annex I and non-Annex I Parties.
- The EB/CDM shall follow the guidelines established periodically by the COP and have the mandate suggested below.
- The EB/CDM shall be supported by the Secretary of the Convention/Protocol, which will act as the Secretariat of the CDM ~~and receive a fee for these services.~~
- The EB/CDM shall meet three times a year and report annually to the COP.

The following are suggested initial guidelines for the CDM.

- The reduction of emissions obtained in specific projects to be certified under the CDM shall be computed against a baseline that takes into account the projection, on a sector-by-sector basis, of the emissions for each country.
- The International Standard Organisation (ISO) will be requested to establish the detailed methodology for the definition of certifiable baselines and reductions and to use its system of accreditation of certifying organisations, for the purposes of issuing the emissions reduction certificates.
- Certificates of emissions reductions may be presented by non-Annex I Parties (see next item on the procedure) to the Secretariat of the CDM, for placement in the market.
- Each non-Annex I Party shall establish national mechanisms to regulate the submission of requests by any Party for certification for projects in its territory, which may vary from a requirement that each request be processed and submitted by the government itself to a general authorisation for the Secretariat to receive project proposals and to inform the government.
- The total credit for each Annex I Party that may be obtained through CDM certificates shall be limited in such a way that their national emissions do not exceed the 1990 level plus 2.5%.
- The emission reduction certificates shall state the number of tons of carbon to which it refers. The

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corresponding value shall be determined by market mechanisms, avoiding the concept of incremental costs.

- The share of the proceeds of the CDM devoted to adaptation projects shall not exceed three per cent of the total.
- The share of the proceeds of the CDM devoted to administrative costs shall not exceed three per cent of the total.

The following are suggested terms of reference of the Executive Board of the CDM.

- To accredit organisations - governmental or otherwise - to systematically offer to the highest bidder the certificates of emissions reductions available at the Secretariat, without prejudice to an open negotiation by anyone else.
- To accredit, through the ISO, organisations - governmental or otherwise - to pre-certify the emissions reductions as requested by non-Annex I Parties.
- To verify periodically, through accredited organisations, the correspondence between the pre-certified and the realised emissions reductions, and to issue the corresponding certificates of emission reductions.
- To establish and periodically review the list of project activities for which emission reduction certificates may be issued. This global list should take into account exclusively the aspects related to the establishment of a credible baseline, leaving to governments the authority to establish their own list of eligible projects, taken from the former list. The national list will take into account, additionally, the sustainable development priorities.

In defining baselines on a sector-by-sector basis, the Executive Board shall consider, among other factors, the introduction of new technologies that will create new baselines. The technological impacts should be incorporated into the respective sectors, with a consequent review of the baselines.

In addition, the emission reductions to be certified must be agreed upon by both the donor and host governments.

The key to the successful implementation of the CDM lies with the establishment of baselines for certifiable emission reductions on a sector-by-sector basis for individual countries. It is essential that this process occur in such a manner that the emission reductions are comparable, according to the best available technical knowledge and to the political agreement of parties, through the Executive Board.

The roster of certifiable projects must be dynamic, starting with those for which there is more certainty about the emission reductions and less controversy about their inclusion. Such a list is to be progressively expanded to include other types of projects as they meet the above criteria.

U.S. Agency for International Development  
Washington, D.C. 20523



**FACSIMILE TRANSMITTAL COVER SHEET**

369  
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**DATE:** AUGUST 18, 1998

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**SUBJECT:** CLEAN DEVELOPMENT MECHANISM

**NUMBER OF PAGES** *(including this cover sheet):* 7

**COMMENTS:**



U. S. AGENCY FOR  
INTERNATIONAL  
DEVELOPMENT

AUG 18 1998

TO: Dan Reifsnyder, State  
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Jane Leggett, EPA  
Jeffrey Frankel, CEA

FROM: Jeff Seabright, G/ENV/EET

Attached is a revised draft issues paper on a possible Clean Development Mechanism (CDM) registry proposal for COP-4, as discussed at the CDM meeting at EPA on July 30. Please share comments by COB Friday, August 21st and I will circulate a revised draft for the next CDM inter-agency meeting.

cc: DHales, DAA/G/ENV  
Ckoppell, G/ENV/EET

## The CDM Registry: Jump Starting the Clean Development Mechanism

**Issue:** The US should press for a non-binding resolution at COP-4 which would state the political intent of the Parties to retroactively credit valid Clean Development Mechanism projects from the year 2000 if such projects meet the criteria eventually established by the COP/MOP or CDM Executive Board. To help operationalize this intent, should a "Registry" be created at the UNFCCC Secretariat to document candidate CDM projects and opportunities?

### Introduction and Background

The Clean Development Mechanism, defined in Article 12 of the Kyoto Protocol, allows certified emission reductions from project activities to accrue beginning in the year 2000. However, the necessary institutional infrastructure, rules and guidelines to govern a CDM crediting system will not be in place by 2000 and it could be several years beyond then before the COP/MOP decides on the mechanics of the system. Adopting a non-binding resolution at COP-4 and establishing a CDM Registry is one way of encourage early action.

The Registry is based on the premise that *early action* generates economic and environmental benefits. Early action enables a smoother, and less costly, transition to lower national emissions levels commensurate with Kyoto commitments. However, because of future regulatory uncertainty the current market will not promote strong early action. In order to act, the private sector needs reasonable expectations of investment returns. The Registry could overcome this barrier and promote CDM projects by boosting expectations that projects will be retroactively credited.

The US has experience with registries in other, analogous regulatory contexts in which there is a similar intent to document and recognize early action. Section 1605(b) of the Energy Policy Act of 1992, administered by the Energy Information Administration (EIA/DOE), establishes a means for US firms to voluntarily report greenhouse gas emissions reductions. The program allows firms to (1) report annual GHG emissions, for the purposes of recording a baseline from which to measure future actions, and (2) record specific GHG emissions-reducing and carbon sequestering projects, at both the domestic and international levels.

Documenting action under Section 1605(b) is simple and straightforward. Guidelines and forms are provided for a wide range of project activities that include, inter alia, electricity generation, cogeneration, energy end use, transportation and carbon sequestration. Several measures exist to ensure the accuracy of reported emissions including a third party certification requirement, self-assessments, clear guidelines and procedures, and a review process.

Climate Wise, USIJI, and other government programs are vehicles for early action and voluntary reporting. A condition of participating in Climate Wise is annual reporting of GHG emissions through Section 1605(b). One driver of participation in the Climate Wise program and documenting GHG emissions through Section 1605(b) is to help insure fair treatment under future climate policies, such as a domestic emissions trading system. By documenting early action, companies can strategically position themselves and reasonably anticipate reduction

credit. The same rationale exists for creating a CDM Registry. Once COP/MOP decisions have been made enabling the CDM to become operational, information about what projects have already taken place will help insure that appropriate emissions reduction activities are recognized (beginning in 2000), in the form of certified emission reductions (CER).

### **The CDM Registry**

A CDM Registry would document and facilitate early CDM action, as well as serve as a "bulletin board" -- a clearinghouse of potential CDM projects that matches host country needs and investor specializations. The Registry would be UNFCCC Secretariat-based and include information on project proposals and investments that expect to be credited by the CDM, once the mechanism becomes operational. The Registry would complement and help actualize a non-binding resolution or statement of intent to retroactively certify acceptable projects.

The Registry is intended to be value free and non-prejudicial -- in no way will projects posted on the Registry be guaranteed retroactive credit. The only "guarantee" is that the CDM Executive Board will eventually review projects that are operationalized through the Registry (i.e. projects registered will be *considered* for crediting). Whether the project generates certified emission reductions (CERs) is a decision of the Executive Board or other UNFCCC body, and a function of the relevant baselines, monitoring provisions, additionality criteria, etc. that the COP/MOP eventually agrees to. This is analogous to Section 1605(b) in the US, where the review process is undertaken by the US government. Whether credit is eventually retroactively granted under 1605(b) will depend on, inter alia, the nature of the regulatory system adopted and the magnitude, robustness and credibility of emissions reported.

CDM Registry would add value for investors, hosts and the process itself:

*Investors.* Candidate CDM projects that have already been agreed to between investor and host country could be posted on the Registry for documentation and information sharing purposes. In addition, Annex I private sector entities could use the Registry to post projects that they are interested in financing. For example, a company specializing in photovoltaics or combined-cycle gas turbines could "advertise" their services in a CDM context.

*Hosts.* Non-Annex I entities (government agencies or private sector) could use the Registry to solicit sponsors for a project, or set of projects, that the host has identified as potentially CDM eligible and consistent with national sustainable development objectives. Thus, the Registry would be an enabling mechanism for Article 12.4 of the Convention, which states that "Developing country Parties may, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and incremental removal of greenhouse gases, as well as an estimate of the consequent benefits."

*Process.* By detailing projects that expect to earn credit, a CDM Registry would contribute to the growing body of experience on many of the difficult methodological issues -- such as baseline construction, additionality, leakage, monitoring, etc. -- which CDM rules and

procedures will address. If methodologies used by project developers are subsequently deemed unacceptable by the COP/MOP or Executive Board, emission reductions could be recalculated and verified *ex post*, for crediting purposes, using agreed upon methods.

The information posted on the Registry would be chosen at the discretion of the Parties or entities posting. Unlike Section 1605(b), there would not be required categories of information that project proponents or hosts would need to provide. The Registry would employ an easy-to-use interface (perhaps with a web-based option) and be accessible and available to any Party or domestic entity.

**Pro:**

*Cultivate private sector interest.* The private sector is showing strong interest in emissions reduction projects overseas. This interest is largely motivated by a return on investments that includes CERs -- an asset useful in demonstrating compliance in a domestic and/or international regulatory system. If COP-4 fails to make any progress on the CDM, the US business constituency's interest and support for the Kyoto Protocol could wane. A disillusioned private sector may lead to negative repercussions in the domestic political arena and discourage project initiation. In short, the private sector is ready, but international politics are not. The Registry may help balance this disjunction, and maintain some "Kyoto momentum."

*Engage Developing Countries.* In addition to Annex 1 private sector entities, constituencies in some developing countries already support early action. Gylvan Meira (at the Aspen CDM workshop in Sao Paulo) proposed a non-binding COP-4 resolution for retroactive crediting. Other developing country delegations could also be amenable to such a proposal, and should be engaged as early as possible to preclude concerted G77/China opposition. Because it is broad in scope, treating the needs and interests of all Parties, the Registry should garner considerable support from developing countries. Countries wary of unbridled CDM investment within their borders should be comforted, rather than intimidated, by an approach that gives them discretion and oversight over projects. Similarly, for countries fearing that the CDM -- like AIJ -- will overlook them, the Registry gives them an opportunity use the CDM as a vehicle to proactively promote their investment and development needs.

*Kyoto Compliance.* CERs generated by US entities between 2000 and 2012 will be added to the US assigned amount. An effective CDM, which generates CERs throughout the pre-budget period, will reduce compliance costs and domestic actions needed to comply with Article 3/Annex B commitments. The Registry would facilitate the crediting of emission reductions during the years before the CDM becomes officially operational (in 2000 and 2001, for example).

*Environmental Benefits.* Because of long atmospheric residency lives, GHGs emitted today will contribute to higher atmospheric concentrations in future decades. Without crediting provisions, or reasonable expectations of crediting, it is unlikely that GHG-reducing projects will be initiated en masse. The Registry would boost investor confidence and expectations in the system and therefore stimulate CDM investments. In addition, because the Registry facilitates the actual *initiation* of projects, helping to match project hosts and investors, transaction costs will be

lowered and more potential CDM flows will be generated.

*Incremental Learning.* This is one of the explicit functions of the CDM Registry. The Registry would contribute to the growing body of experience on yet to be determined methodological issues -- such as baseline construction, additionality, leakage, monitoring, etc.

*Maintain the Kyoto momentum.* Unlike Article 6 JI or Article 17 emissions trading, CDM negotiations entail some degree of urgency. The banking provision (Article 12.10) requires the CDM to be operational before the first budget period begins. Unless measures are taken at COP-4, the Parties will not be able to express their views on CDM crediting until COP-5, which will take place just a few months before the Protocol allows credits to be obtained.

Con:

*Designing the Registry.* Problems designing the Registry will be a function of the detail and information requested. If the Registry consists of a detailed set of questions, analogous to Section 1605(b), the issue of *who* designs the Registry, and *what* exactly the Registry consists of, will become highly contentious and politicized.

Therefore, design if the Registry should not presuppose a certain institutional structure or other CDM rules and modalities. To prevent design of the Registry from becoming a *de facto* design of the CDM itself, proponents should insist that specific information (such as additionality, monitoring, sustainable development benefits, etc.) not be *required* in the Registry. *The information offered is provided at the discretion of the registrant.*

*Overstating Reductions.* Section 1605(b) utilizes several measures that help ensure accurate reporting. These include standardized reports; a report review and assistance process; certification of data accuracy; criminal penalties for falsifying data; and a self-assessment of data accuracy conducted by the reporter. Agreement among Parties on similar measures for the Registry may not be possible at COP-4, nor are they necessarily appropriate or desirable. Without such measures however, CDM project developers and hosts may attempt to use unsanctioned methodologies to inflate emissions reduction estimates for the purposes of obtaining credit. The Registry would be unable to exclude certain methodologies and practices, which may become standard practice.

This potential problem can be eased by clearly stipulating that the "auditing" and "review process" (analogous to 1605(b)) are the functions of the yet to be formed Executive Board or other COP/ Secretariat-related body. If project developers anticipate a rigorous review process for obtaining CERs, the incentive should actually be to report as accurately as possible, because sloppy projects with weak monitoring and reporting may be denied CERs. *Thus, ideally, forward-thinking project developers will self-initiate third party verification, conservative estimation methodologies, etc. to strengthen their case for generating CERs retroactively.*

*Developing country opposition.* If not presented carefully, the Registry could become a "straw man" for some developing country delegations and harm the negotiating environment for the CDM and other issues at COP-4. In terms of operationalizing the CDM, developing countries' main priority is that CDM rules "should be determined on the basis of equity, sustainable

development and the other principles of the Convention" (FCCC/SB/1998/MISC.1/ Add.3). A G77/China position paper also states that studying methodological issues should be a first step (FCCC/SB/1998/MISC.1/Add.5), and this should take place under the full authority of the COP or other official bodies. Some developing countries may feel that the Registry -- which is geared toward documentation for the purpose of retroactive crediting -- runs counter to stated G77/China priorities. Registry "design" and the potential to overstate reductions, both discussed above, could also elicit developing country reticence.

*These problems can be mitigated by enlisting the support of key developing countries before COP-4 and proposing the Registry as a joint initiative between several Annex 1 and non-Annex 1 Parties that cut across negotiating blocs.* In addition, some countries may simply wish to retard the development of the CDM in any way possible. General anti-CDM sentiment does not constitute a legitimate argument against a Registry, and is not consistent with what has already been agreed to in the Kyoto Protocol.

### Conclusion

A CDM Registry offers numerous benefits, as discussed above. The three drawbacks discussed -- designing the Registry, overstating reductions and developing country opposition -- are tractable problems which a carefully proposed Registry will overcome.

Overall, the Registry performs three important functions:

"Registering" projects, thereby insuring they will be *reviewed* by the Executive Board and *considered* (although not guaranteed) for CERs. This will also serve as a key "signal of intent" from regulators, boosting private sector confidence in the CDM and bringing domestic political benefits.

Serving as a "bulletin board," or clearinghouse, to match the project needs of hosts and investment desires of project developers. Thus, the Registry lowers transaction costs, thereby promoting CDM projects that transfer technology and reducing GHGs.

Providing a formal "space" for information gathering and learning for estimation methodologies, additionality criteria, verification, monitoring, baseline formulation, etc.

Insuring that the statement of intent and the CDM Registry are agreeable to all Parties at COP-4 will depend on enlisting the support of key developing countries before COP-4 and packaging the Registry as a non-confrontational and non-institutional entity that will not pre-judge future COP/MOP/EB decisions.

Office of Economic Policy

Department of the Treasury  
Washington, D.C. 20220

FAX

Date: 8/2/98  
Number of pages including cover sheet: 7

Name	Fax Number	Phone Number
To: <u>Joe Ably</u>	<u>(395-<del>0600</del> 6870</u>	
From: <u>Bob Cumby</u>	<u>202-622-2633</u>	<u>202-622-</u>

Remarks:  **URGENT**  For your review  Reply ASAP  Please comment

Joe :

This is the EPA benchmarking paper that they prepared for a CDM discussion. They are requesting comments.

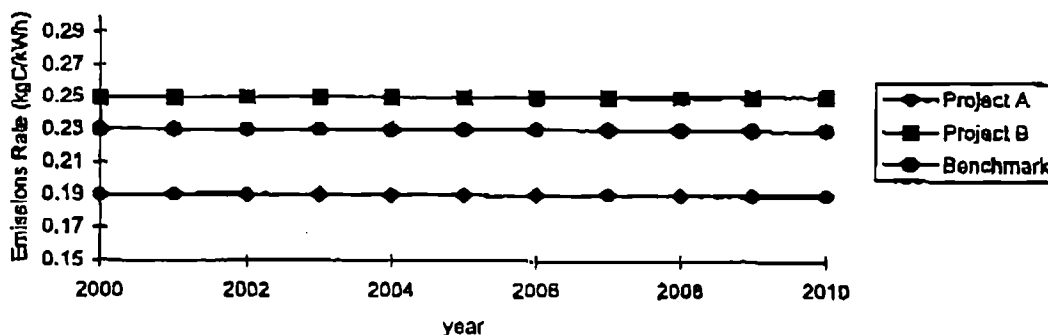
BJL

## The Role of Benchmarks in Assessing Additionality and Emission Reductions under the CDM

### INTRODUCTION

A key concern in the debate over project level activities under CDM is the assurance that the GHG emission reductions represent credible and quantifiable reductions in global emissions, which would not have occurred in the absence of the given project.

A benchmark approach to determine additionality and/or assessing emission credits under the CDM would use performance standards based on historical or projected practices to create standard baselines for project evaluation. Under this framework, activities that generate reductions in excess of baseline reductions would receive credits under the CDM. This concept is illustrated in its most basic form in the graph below. Project A (with a low emissions rate of 0.19 kgC/kWh) falls well below the benchmark emissions rate set at 0.23 kgC/kWh. Using this same benchmark, project B (with a high emissions rate of 0.25 kgC/kWh) would not pass the additionality criteria in this example.



These benchmarks would be specific to project categories, location, and represented by the average or marginal performance by project category (with a possible requirement that projects meet a minimum standard of improvement over the benchmark). In addition, it is possible for benchmarks to be recalculated periodically to reflect technology and efficiency changes.

This paper explores methodological issues surrounding the development and implementation of benchmarks, as well as some of the significant policy issues raised with this approach.

### METHODOLOGICAL ISSUES

A number of important methodological questions concerning benchmarks still need to be resolved. These issues will greatly influence the reliability of benchmarks and directly impact the transaction costs for project development, implementation and assessment.

- **Data Availability** -The development of any benchmark is dependent upon accurate existing data or reliable forecasts of energy production, fuel mix, and efficiencies within differing sectors. In many developing nations, the lack of existing data may make historical benchmarks both time consuming and costly. At the same time, accurate forward-looking benchmarks which rely on forecasts for specific sectors may prove difficult to produce in certain countries due to a lack of technical expertise or a clear set of national plans for energy development.
- **Sample Size** - The sample size has a large impact on the effectiveness of the benchmark. A small sample can create a target technology that could inadvertently bias the qualifying projects. A larger sample has the advantage of being more flexible in that it might be used to create benchmarks for a

variety of project types and may be more accurate; however, the larger the sample, the larger the data requirement and the greater lag between the emerging technological baseline and the benchmark.

- **Sector Targeted** - The sector, subsector, or project type for which the benchmark is being calculated largely determines the design and measurement units of the benchmark. Reasonable benchmarks may not be possible for all project types because some sectors or subsectors do not lend themselves to quantitative analysis at such an early stage in project development or the data required are not available. In this case, an alternative method to determine additionality must be flexible enough to account for projects which can only be assessed through non-benchmark means.
- **Certification and Verification of Reductions** - Benchmarks could be used either for measuring additionality alone, or for determining the amount of emission reductions. In this first case, the benchmark system would only assess whether the project meets the additionality criteria and thus is accepted as a CDM project. Certification and verification of emission reductions earned annually would be based on actual project performance. In the second scenario, benchmarking would be used not only to assess additionality, but to determine the amount of credits that would be awarded up front to the project based on projected performance. Although transaction costs for the second option are much lower, the credibility of the system may be called into question.

*general equilibrium effects  
life-cycle accounting of intensity of production*

**BENCHMARK OPTIONS**

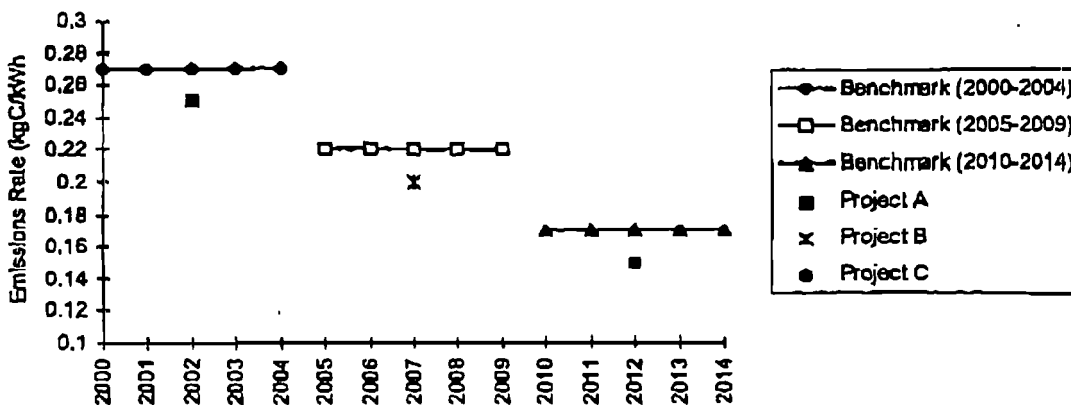
A number of benchmark options exist. The effectiveness and accuracy of each option depends in large part on the availability of data on past, current and future energy generation and efficiencies within the country. This section outlines six potential benchmark options (3 historical, 3 forward-looking).

**Historical**

A historical benchmark relies upon existing data for energy resources and generation in the selected country. Unlike forward-looking benchmarks which rely upon projections to determine emissions rates, historical benchmarks rely on established information for existing energy generation, fuel mix data, and rates of technological change. A critical weakness of this approach is that a static historical benchmark can quickly become outdated if not periodically revised, and therefore will not reflect the current situation.

- **Select Year Emissions Rate** - This option chooses an average emissions rate for a given year or set of years and assesses the project over its projected lifetime against this static marker. The strength of this benchmark is that it is relatively easy to develop. However, this benchmark does not account for changes in efficiency or fuel mix over time and may prove a lenient standard over the longer term. As with any historical benchmark, the size of the cross-sectional sample (e.g., types of fossil fuel facilities included) will greatly influence the average emissions rate that is selected to serve as the benchmark. Moreover, if older plants are included in the development of the benchmark (for example including all plants built over the last ten years as compared to the last five), your benchmark will be less stringent.
- **Updated Static Benchmark** - The utility of static historical benchmarks can be improved by updating them over time. The advantage of this option is that it can more accurately account for changes in efficiency or fuel mix over time. An updated benchmark requires quick turnaround of previous year's emissions data, and may potentially prove difficult and more costly to develop, particularly in large, less developed nations. In nations where gains in efficiency may occur more slowly, or data is more difficult to collect, a timetable for updating benchmarks could be set at five year increments. In this scenario, the static benchmark would be updated every five years to reflect changes in the national fuel mix, advances in technologies and fuel efficiencies, and other factors. This concept is graphed below:

*endogeneity  
problem  
→ uncertainty  
re: emis  
reductions  
& i: value  
of project*



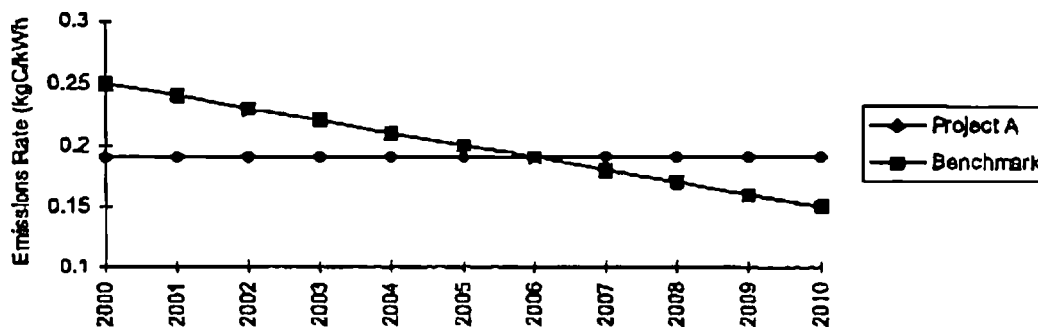
During the first benchmark period (2000-2004) Project A would be considered as additional and would earn emission reductions for the first five years. As the static benchmark is upgraded in 2005, all new projects would have to have emission rates below the new, more stringent, benchmark. Now, Project A would no longer qualify if assessed as a new project. By the year 2010, only new projects with emission rates below 0.17 kgC/kWh would be considered additional. If Project B were introduced in 2000, it would earn emission reductions through the year 2010. Project C would provide reductions under this scheme through the year 2014.

Alternatively, an updated static benchmark could incorporate a modest "deflator" which would anticipate new technologies and gains in efficiencies over the five year period. This example would be a hybrid of historical and forward-looking methodologies and be represented by a downward sloping benchmark over the five year increment, rather than a straight line.

**Forward-Looking**

A forward-looking benchmark relies upon forecasts for energy resources and generation in the selected country. Projections for emissions rates by sector or technology are averaged on the basis of planned development of energy generation, fuel mix data, and technological change.

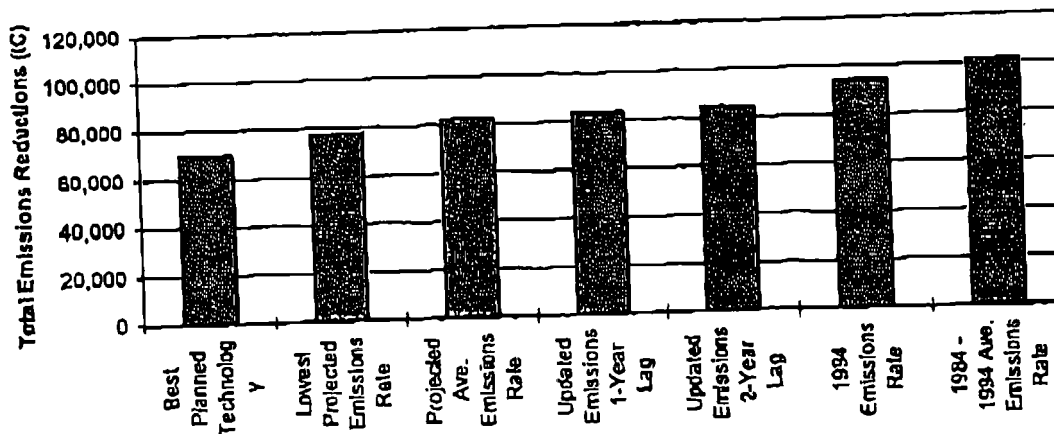
- Projected Average Emissions Rate - A dynamic benchmark, which would rise and fall along with the projected average emissions rates, can be constructed using the annual emissions rates themselves. Since the realized fuel mix may not match the actual fuel mix in a given year, this benchmark may tend to over- or under-estimate the actual annual average emissions rate. As this is a downward sloping curve, some projects evaluated under this benchmark may be considered additional, even though they do not necessarily earn emission reductions in the later stages of the projects lifetime. This case is graphed below:



In this scenario, project A would not be earning emission reductions after 2006 under the dynamic benchmark.

- **Lowest Projected Emissions Rate** - Of the projected annual average emission rates, this option uses the lowest average of the data set as a static benchmark for the duration of the project's lifetime. This type of benchmark assumes that the lowest rate represents the best achievable combination of clean fossil fuel mix and efficient technology over the period, thus encouraging project developers to better the optimal average in terms of efficiency.
- **Best Planned Technology** - This benchmark is based on the best (i.e., lowest-emitting) planned generation technology. This benchmark may be optimal if the planned project will displace generation in a country where large gains in efficiency are expected in the short term. This benchmark is the most progressive and would establish the most difficult benchmark to be achieved (as well as providing the least earned credits to a project developer).

The benchmark type chosen will result in a wide range of total emission reductions earned over the lifetime of the project. The following bar chart highlights projected emission reductions earned under different benchmark scenarios for a wind power project in Costa Rica.

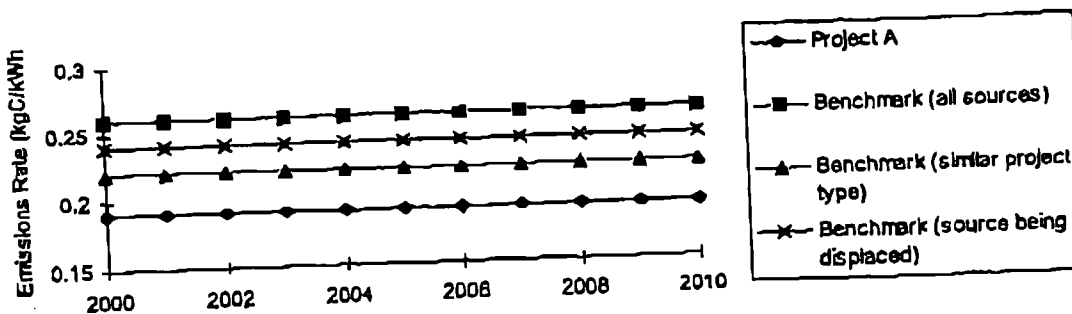


Note that all the forward-looking benchmarks (first three bars) tend to be more conservative. The most lenient benchmark is that of a static emission rate benchmark based on emission rate averages for plants built over the last ten years.

### POLICY ISSUES

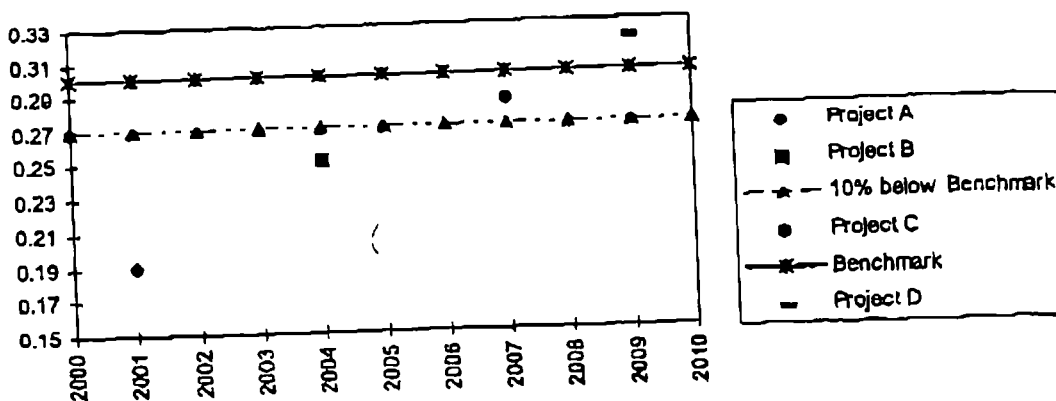
Benchmarking schemes used to assess additionality or to measure emission reductions earned will directly affect the effectiveness, cost, and speed at which the CDM is developed and projects implemented. These policy considerations must take into account the trade-offs inherent in each benchmarking option.

- **Benchmark Selection** - When choosing which benchmark (whether historical or forward) to use for project comparison, various policy options exist. A new project can be evaluated against: (1) the average emissions rate for all generation sources in country; (2) the rate within a sector or project type similar to the project at hand; or, (3) the rate for that sector which will be displaced by the new project. These options are displayed graphically, illustrating the potentially large differences in amount of credits which can be earned over a projects lifetime depending on the type of benchmark selected.



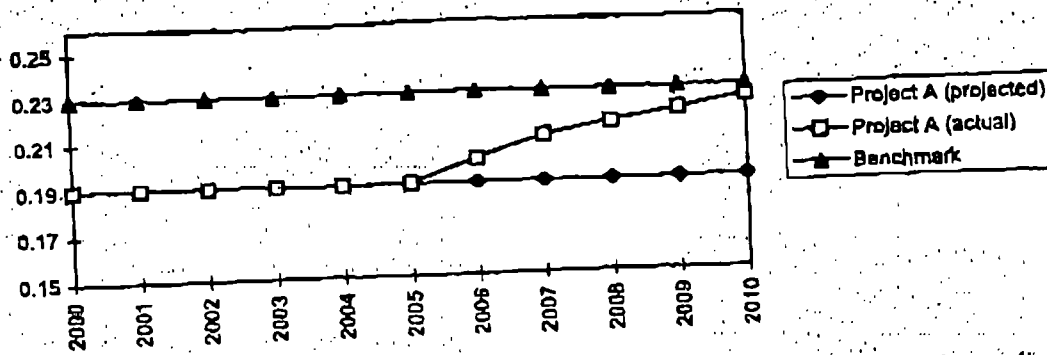
Although considered additional under any of the above benchmarks, Project A's total value (in terms of emission reductions) would differ substantially depending upon which benchmark is used. In this case, the benchmark chosen for project evaluation may be determined by the availability of data. When the source being displaced is clearly identified, that benchmark could be utilized. If the project is just adding power to the grid in general, the "all sources" benchmark may need to be used.

- **Need for Minimum Standards** - In cases where the policy objective is to promote projects which advance the pace of technological change or gains in efficiency, minimum standards may need to be applied. In this case, projects would be additional only if they "beat" a given benchmark (in this case an average rate for all sectors) by a predetermined percentage. Some projects may be more efficient than the existing average, but may still not be considered additional because they do not better the average by a certain percentage (Project C in the graph below).



In this example, Project A and B both fall within the minimum standard of 10% below the benchmark. While Project D does not qualify by any standard, Project C may prove more efficient than the average facility in the country, but would still not qualify under this scenario of a minimum standard of 10% below the existing benchmark.

- **Benchmark Accuracy** - A number of erroneous assumptions may lead to overestimating or underestimating projected emission reductions under a benchmark system. These assumptions include: the amount of power generated by the project; the source(s) and amount of power displaced; the duty cycle of the project; estimated growth in energy demand in the host country; and the impact of current or future energy policies. The graph below illustrates how changes in these variables may affect the "actual" versus the "projected" project emission rate of the project lifetime as compared to the benchmark.



Although these types of uncertainties are often encountered in any evaluation mechanism, policy should balance the need to simplify project assessment and reduce transaction costs with the desire to maintain a relatively high standard for benchmark accuracy.

- **Discounting**  
In those sectors where data is difficult to gather or greater uncertainty exists on future rates for efficiency gains, a benchmark mechanism could still be used with the addition of a discounting scheme for credits earned. In this case, the discount would help to correct for these uncertainties. The greater the level of uncertainty, the higher the rate at which the credit earned would be discounted.
- **Cost-Effectiveness** - The cost and level of effort for developing forward-looking benchmarks will be relatively high due to the need for an unbiased forecast of system resources and generation. On the other hand, historical benchmarks rely on data which may be readily available. If a shorter lag time for updating the benchmark is facted, then the cost of gathering the data on a timely basis may raise costs. The Costa Rican case study showed that it took the same or less effort to develop historical benchmarks as to develop project specific baselines.
- **Gaming** - Under any benchmarking system, a potential for gaming exists. Varying benchmarks among countries will affect their relative competitiveness in attracting CDM investment. This creates an incentive for developing nations to have a higher benchmark (less efficient) in order to attract CDM investment and generate more credits. Policy must address the possibility that the primary interest of the developing nation partner may be investment and access to technology, not necessarily GHG mitigation. As a result, the host nation or the developer may time the implementation of a project to maximize additional emission reductions under a given benchmark scheme. At the same time, set benchmarks which are upgraded at specified times may be advantageous environmentally as they can promote early action on the part of investors.
- **Longer-term Objectives** - Flexibility to refine and update a benchmark may prove critical to the success of the CDM. At the same time, any benchmark mechanism should recognize that the longer term objective of U.S. policy is to move these nations from CDM toward a JI type system, and eventually to Emissions Trading. The characteristics of the benchmark chosen may either facilitate or impede this process. For example, a less stringent benchmarking system (which provides easily earned credits and promotes large scale investment) may make developing nations reluctant to move forward from the CDM framework. In another example, a forward-looking benchmark system may serve to strengthen a nation's own capacity for developing accurate emission projections and data gathering, thus enabling the country to more easily adopt binding targets in future.

## Clean Development Mechanism and Buenos Aires

**Issue:** What CDM issues can be decided at COP-4 in Buenos Aires?

**Background:** The Clean Development Mechanism is addressed in Article 12 and in Article 3.12 of the Kyoto Protocol. The purpose of the CDM is to assist non-Annex I Parties in achieving sustainable development and contributing to the ultimate objective of the Convention. CDM also provides for the transfer and acquisition of certified emission reductions from non-Annex I Parties to Annex I Parties to assist Annex I Parties to achieve their reduction commitments under Article 3.

Article 12.10 of the Kyoto Protocol provides that certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used by Annex I Parties to assist in achieving compliance in the first commitment period. It is clear, however, that the necessary institutional and rule making infrastructure for the CDM will not be in place by the year 2000 and could take several years beyond then to become fully operational. Progress can nevertheless be made at COP-4 in order to implement the CDM as close to the year 2000 as possible.

In order to make the progress that is necessary, several options may be proposed:

**Option 1.** Prepare a work program for essential methodological and technical elements of Article 12, with a specific timetable for completing activities, and an indication of the entity responsible for completing each element of the work program. Priority elements include: 1) additionality criteria; 2) criteria for establishing that reductions are real, measurable and long-term; 3) certification of emission reductions; and, 4) modalities for independent auditing and verification of project activities. This would provide the foundation for the COP/MOP to reach agreement on these aspects of the CDM by COP5.

**Option 2.** At COP-4, pursue the following decisions:

A) That Parties agree that certifying, monitoring, and verifying emission reductions are essential elements of a credible CDM program and agree to draft guidelines for these elements to be completed as near to the year 2000 as possible. These guidelines would build on progress already made under the AIJ pilot phase and would provide necessary guidance for project developers and Parties to be able to determine potential reductions from CDM project activities. (EPA is currently drafting a paper that outlines this proposal in greater detail).

B) That Parties agree to establish a mechanism to retroactively credit valid CDM projects from the year 2000 on if such projects meet criteria eventually established by the CDM Executive Board. This mechanism could take the form of a CDM "registry" which: 1) would allow for the registration of candidate projects that meet appropriate rules for baseline measurement (incl. additionality), monitoring, certification, verification, and reporting; and 2) would be compatible with any

*? Institutional Issues*

national registry systems established for emissions trading. (AID is currently drafting a paper that outlines this proposal in greater detail).

**Option 3.** Prepare a decision with selected developed and developing country Parties to establish an interim set of guidelines and institutional and operational modalities for CDM at COP4. This would allow projects to begin in 2000 under these interim guidelines, with a clear timetable for finalizing a full set of rules and guidelines for full implementation of the CDM, as near to the year 2000 as possible. This option would also identify terms by which existing AIJ (or other) projects could be "grandfathered" into the CDM..

**Recommendation:**

Option 2 because it: 1) permits forward movement on the key methodological issues for which we have already gained enough experience to begin to draft international rules and guidelines (through the international AIJ pilot phase); and 2) would generate international support for CDM by engaging vested interests in developing as well as Annex I countries.

We also need to define a strategy -- using key international fora -- to advance our position on CDM between now and November:

- follow-up to BNC meeting in Mexico - mid August
- CDM consultations and workshops in Argentina and Chile - August-September
- Canadian ministerial - September 24-25
- Umbrella Group meeting - September 7-8
- IEA CDM workshop in Africa - SEptember



# U.S. Initiative on Joint Implementation

USIJI  
PO-6, Room GP-196  
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Washington, DC 20585 USA

## FAX COVER

DATE: 4/29/98  
Number of pages, including cover sheet 20

TO: Joe Aldy FROM: Jette Findsen  
Council of Economic Advisors EMR for USIJI

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FAX: 202-395-6870 FAX: \_\_\_\_\_

REMARKS:  
*Attached, please find a copy of the  
USIJI project fact sheet.*

# USJI PROJECT

## FACT SHEET

### USJI PROJECTS

THE U.S. INITIATIVE ON JOINT IMPLEMENTATION (USJI) IS PROUD TO PROFILE 32 ACCEPTED PROJECTS THAT OFFER INNOVATIVE APPROACHES TO COMBAT THE THREAT OF CLIMATE CHANGE AND PROMOTE SUSTAINABLE DEVELOPMENT. THESE PROJECTS TAKE PLACE IN TWELVE COUNTRIES ON THREE CONTINENTS AND APPLY A VARIETY OF TECHNOLOGIES AND PRACTICES, INCLUDING WIND, GEOTHERMAL, HYDROELECTRIC, AND SOLAR ENERGY; COAL TO NATURAL GAS FUEL SWITCHING; METHANE GAS CAPTURE; BIOMASS WASTE-TO-ENERGY GENERATION; FOREST CONSERVATION; REFORESTATION AND SUSTAINABLE LAND MANAGEMENT; REDUCED IMPACT LOGGING; AND ENERGY-EFFICIENCY IMPROVEMENTS TO DISTRICT HEATING SYSTEMS. IF ALL PROJECTS ARE FULLY IMPLEMENTED, MORE THAN 189 MILLION METRIC TONNES OF CO<sub>2</sub> WILL BE SEQUESTERED OR OFFSET. USJI LOOKS FORWARD TO ESTABLISHING EVEN MORE PARTNERSHIPS THAT WILL RESULT IN THE REDUCTION OF GREENHOUSE GAS (GHG) EMISSIONS.

### PROJECT ABSTRACTS

#### FOREST MANAGEMENT

#### PROJECT CARFIX: Sustainable Forest Management

**Country—Costa Rica:** The project plans to expand a pilot project instituting sustainable forest management in a major national park (71,000 hectares) and a buffer zone (20,000 hectares) in central Costa Rica. Funding for buffer zone activities would support annual payments to private landowners for progressive forest management. Funding for park activities would police illegal logging and purchase private inholdings. If the

project is fully funded, the carbon benefits are estimated to be 21.6 million tonnes of CO<sub>2</sub> over 25 years. The Costa Rican government recently committed to provide new project funding, and additional hectares of new forest land are being added to the project area.

Accepted February 3, 1995.

Participants: *Costa Rican Ministry of Environment and Energy; FUNDECOR; Wachovia Bank of Georgia.*

Project Contact: *Franz Tattenbach, Fundecor, 011-506-297-1065.*

FOR FURTHER INFORMATION,  
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Washington, DC 20585 USA

Telephone: 1-202-586-3268

Information Line: 1-202-586-3467

Fax: 1-202-586-3485 or 3486

Internet Site:

<http://www.jointimplementation.org>

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**FOREST PRESERVATION**


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**ECOLAND: Piedras Blancas National Park**

**Country—Costa Rica:** The project preserves tropical forest through purchase of 2,500 hectares (depending on prices) in a "paper park," the Piedras Blancas National Park in southwestern Costa Rica. The land was under threat of deforestation from private landowners who were awaiting a delayed buyout by the government. ECOLAND has acquired all of the land, and as of mid-1997, the land was

in the process of being conveyed to the National Park Service. Projected GHG benefits are estimated at 1.3 million tonnes of CO<sub>2</sub> over 16 years. Accepted February 3, 1995.

**Participants:** COMBOS; Costa Rican Ministry of Environment and Energy; Rainforests of Austria; Tenaska Washington II Partners, Ltd.; Trexler and Associates, Inc.

**Project Contact:** Dr. Mark Trexler, Trexler and Associates, Inc., 1-503-786-0559.

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**FUEL SWITCHING**


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**Fuel Switching and Cogeneration for Decin District Heating System**

**Country—Czech Republic:** The project has replaced part of a lignite coal-fired district heating system in the City of Decin located in Northern Bohemia. Domestic participants will assist in converting the Bynov District Heating Plant from coal-fired boilers to natural gas, internal-combustion engines, and associated exhaust gas/hot water heat exchange equipment, in addition to assisting in improving the efficiency of the hot water distribution network.

The project will reduce GHG emissions and dramatically improve local air quality. A groundbreaking ceremony on September 18, 1995, attracted Czech, U.S., and other foreign dignitaries. Accepted February 3, 1995.

**Participants:** Center for Clean Air Policy; City of Decin, Czech Republic; Commonwealth Edison Company; NIPSCO Development Company; Wisconsin Electric Power Company.

**Project Contact:** Mary Bixle Kotnick, Center for Clean Air Policy, 1-202-408-9260.

Department of State  
 Department of Energy  
 Environmental Protection Agency  
 Agency for International  
 Development  
 Department of Agriculture  
 Department of Commerce  
 Department of the Interior  
 Department of the Treasury

The USJI Project Factsheet  
 is edited by Sarah Sowell,  
 EMR Inc.

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**WIND POWER GENERATION**


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**Plantas Eólicas, S.A. Wind Facility**

*Country—Costa Rica:* The project, a 20-megawatt, privately owned and operated wind electric plant near the town of Tejona, became fully operational in 1996. The project consists of 55 KENETECH Model 33M-VS third-generation, variable-speed wind turbines. It is the first commercial-scale wind project in Latin America and the largest private power project in Costa Rica. Electricity

generated by the project is sold to the national utility company of Costa Rica and displaces electricity currently generated by the burning of fossil fuel. The estimated GHG benefits are 223,000 metric tonnes of CO<sub>2</sub>.

Accepted February 3, 1995.

Participants: *Charter Oak Energy, Inc.; Plantas Eólicas, S.A.*

Project Contact: *John R. Morissette, Charter Oak Energy, Inc., 1-860-665-5605.*

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**LAND CONSERVATION AND MANAGEMENT**


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**Río Bravo Carbon Sequestration Pilot Project**

*Country—Belize:* The project has two components: the purchase of land to add to existing protected areas and the implementation of sustainable forest management practices on the larger conservation area to produce economic benefits to the neighboring population. The project will purchase a 6000-hectare parcel of endangered forest land to protect two adjacent tracts from

conversion to farmland. It also will sustainably manage 44,000 hectares of forest. It is estimated to sequester 4.8 million metric tonnes of CO<sub>2</sub>. Accepted February 3, 1995.

Participants: *CINergy; Detroit Edison Company; PacifiCorp; Programme for Belize; The Nature Conservancy (TNC); Utilitree; Wisconsin Electric Power Company.*

Project Contact: *Tia Nelson, TNC; 1-703-841-5372.*

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**LAND MANAGEMENT**


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**RUSAFOR: Saratov Afforestation Project**

*Country—Russian Federation:*

Originally proposed to plant seedlings on 500 hectares of marginal agricultural land or burned forest stands, RUSAFOR has planted 900 hectares, with an initial seedling survival rate of 65 percent; additional replanting occurred in 1996. The project is designed to evaluate the biological, operational, and institutional opportunities for managing a Russian forest plantation as a carbon sink. It will sequester 293,000

tonnes of CO<sub>2</sub> over its 60-year lifetime, prevent soil erosion, and foster public participation in joint implementation activities. Accepted February 3, 1995.  
*Participants: International Forestry Institute; Oregon State University; Russian Federal Forest Service; Sustainable Development Technology Corporation; U.S. Environmental Protection Agency.*  
*Project Contact: Ted S. Vinson, Ph.D., P.E., Oregon State University, 1-541-737-3494.*

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**SOLAR ELECTRIFICATION**


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**Solar-Based Rural Electrification in Honduras**

*Country—Honduras:* The project plans to increase the penetration of solar panels in rural Honduras. Building on pilot-scale solar electrification activities underway since 1992, CO<sub>2</sub> would be displaced by replacing kerosene lamps with solar-based electric lights in rural homes. Project participants set up a solar-electric system financing program

in May 1995, and the number and technical capacity of Honduran solar technicians has grown since the project's acceptance. Accepted February 3, 1995.

*Participants: ADESOL-Honduras; AHDE; AHDEJUMUR; COMARCA; Enersol Associates, Inc.*  
*Project Contact: Julie Smith, Enersol Associates, Inc., 1-978-251-1829.*

## WIND POWER GENERATION

**Aeroenergía Wind Facility Project**

**Country—Costa Rica:** The project will develop a 6.4-megawatt private power wind facility using 16 Micon Model 750-400-100-kilowatt latest generation wind turbines. Electricity generated by the facility will be sold to the Costa Rican Institute of Electricity (ICE) and will displace electricity currently generated by burning fossil fuels.

The project is expected to reduce CO<sub>2</sub> emissions by more than 33,000 metric tonnes over a four-year period.

Accepted December 19, 1995.

**Participants:** *Aeroenergía, S.A., EnergyWorks; Power Systems, Inc.*

**Project Contacts:** *Joseph Viroslav, Power Systems, Inc., 1-214-879-6555;*

*Salomon Lichtman, Aeroenergía, S.A., 011-506-227-4555.*

## FOREST REGENERATION

**BIODIVERSIFIX: Forest Restoration**

**Country—Costa Rica:** Composed of two complimentary subprojects, WETFIX and DRYFIX, the BIODIVERSIFIX project plans to regenerate tropical dry forest and tropical wet forest for sustainable use without damaging biodiversity. Generation of carbon offset benefits will occur as the forest regenerates, producing a standing crop of 70–140 metric tons per hectares stored in 50 years. Sustainable uses of these forests—such as water purification and generation, ecotourism, biodiversity conservation, biodiversity prospecting for genes and chemicals, and production of fine hardwoods—

constitute a biodiversity industry that can help guarantee the permanent storage of this carbon. Over its 50-year lifetime, if fully funded, BIODIVERSIFIX is projected to sequester 18.3 million metric tonnes of CO<sub>2</sub> by restoring 58,500 hectares of abandoned or marginal pasture interspersed through a 120,000-hectare mosaic of middle-aged to primary dry and wet forest. In addition, 16,000 hectares will be purchased and planted.

Accepted December 19, 1995.

**Participants:** *Guanacaste Conservation Area; National Institute of Biodiversity; The Nature Conservancy (TNC).*

**Project Contact:** *Randall Curtis, TNC, 1-703-841-4864.*

TWENTY-FOUR

OF THIRTY-TWO USIJI

PROJECTS ARE PARTIALLY

OR FULLY FUNDED.

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**BIOMASS POWER GENERATION**


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**Bio-Gen Biomass Power Generation Project**

**Country—Honduras:** The project will develop a 10- to 15-megawatt biomass power generation plant in Guaimaca, Honduras. Sawmill and logging residues, currently burned in an uncontrolled manner and left to decompose on the forest floor, will serve as the fuel source, making the use of trees from plantations as a fuel source unnecessary and not cost-effective. All power produced by the plant will be sold to the Empresa Nacional de

Energía Eléctrica, the utility responsible for generating, transmitting, and distributing most electricity in Honduras. Accepted December 19, 1995.

**Participants:** *Add-On-Energy 1; Biomasa-Generación; International Utility Efficiency Partnerships (Edison Electric Institute); Nations Energy Corporation.*

**Project Contact:** *Ronald Shiftett, International Utility Efficiency Partnerships, 1-202-508-5507.*

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**HYDROELECTRIC POWER GENERATION**


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**Doña Julia Hydroelectric Project**

**Country—Costa Rica:** The project involves the construction and operation of a 16-megawatt hydroelectric plant using the Puerto Viejo River and Quebradón Creek in northern Costa Rica. Estimated average annual electricity generation is expected to be 83–87.8 gigawarhours during peak energy demand, displacing electricity and GHG emissions currently produced by thermal fossil fuel-burning facilities. The project facility became operational in October

1996, and the power generated is being sold to the Costa Rican Institute of Electricity. During its first five years of operation, the hydroelectric plant is estimated to produce a net reduction of 210,000 metric tonnes in CO<sub>2</sub> emissions. Accepted December 19, 1995.

**Participants:** *Compañía Hidroeléctrica Doña Julia; Costa Rican Ministry of Environment and Energy.*

**Project Contact:** *Carlos Corrales, Compañía Hidroeléctrica Doña Julia, 011-506-260-2433.*

USJI PROJECTS COUPLE

CLEAN ENERGY ACTIVITIES WITH  
ENVIRONMENTAL PROTECTION TO

PRODUCE EFFICIENT,

SUSTAINABLE BENEFITS.

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**GEOHERMAL POWER GENERATION**


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**El Hoyo-Monta Galan Geothermal Project**

*Country—Nicaragua:* The project will develop a privately owned and operated geothermal powerplant. A 70-megawatt plant will be constructed and is expected to come on line by 2001. A final-stage upgrade of the plant to 105 megawatts may be constructed in 2004. The facility is designed to meet

the demand for increased electricity supply in Nicaragua, and will use flashed steam technology with hot water brought from a reservoir by deep wells. Accepted December 19, 1995.  
*Participants: C and R, Inc.; Trans-Pacific Geothermal Corporation.*  
*Project Contact: Ellen Margron, Trans-Pacific Geothermal Corporation, 1-510-763-7812.*

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**REFORESTATION**


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**The Klinki Forestry Project**

*Country—Costa Rica:* The project analyzes the carbon emissions of homeowners, small organizations, and businesses in the U.S., and establishes specialized tree plantings in Costa Rica to offset those emissions. Cooperating farmers provide land and long-term management in return for financial incentives provided by emitters to establish Greenhouse Gas Mitigation Certificates, issued and guaranteed by the Costa Rican Government, documenting the actual carbon sequestered. A 40-year contract with farmers allows them to thin their forests to maintain the health and productivity of the stand, while the carbon sequestered is registered in the name of the U.S. entity.

The Klinki Carbon-Offset Forest is a mixture of native and naturalized species, a fast-growing stand which produces high-grade industrial wood. Products made from thinnings, such as

utility poles and plywood, continue the storage of sequestered carbon in use.

The project also works with schools in Connecticut, educating students about global warming and raising funds to offset school emissions through establishing Klinki Carbon-Offset Forests. Students strive towards establishing a "Carbon-Balanced Community."

This 40-year demonstration project is designed to offset 7.2 million metric tonnes of CO<sub>2</sub> on 6,000 hectares, involving hundreds of small U.S. emitters and C.R. farmers. Accepted December 19, 1995.

*Participants: Farmers in Costa Rica, The Cantonal Agricultural Center of Turrialba, Yale School of Forestry and Environmental Studies, USDA Forest Products Laboratory, Schools, emitters, and other donors in the U.S.*

*Project Contact: Dr. Hester Barres, Reforest The Tropics, Inc. (A nonprofit organization), 1-860-572-8199.*

**ACTIVITIES IMPLEMENTED**

Join...

NINE OF THE TEN HOTTEST YEARS  
SINCE THE MEASUREMENTS BEGAN  
HAVE COME IN THE LAST TEN YEARS.  
THE TREND IS CLEAR. THE HUMAN  
CONSEQUENCES—AND THE ECONOMIC  
COSTS—OF FAILING TO ACT ARE  
UNTHINKABLE."

VICE PRESIDENT AL GORE  
THE UNITED NATIONS COMMITTEE ON  
CLIMATE CHANGE  
CONFERENCE OF THE PARTIES  
DECEMBER 8, 1997  
KYOTO, JAPAN

## METHANE GAS CAPTURE

### RUSAGAS: Fugitive Gas Capture Project

*Country—Russian Federation:* The project plans to reduce fugitive methane emissions, improve operational efficiency, and seal valves on the main pipelines that are contiguous to the Storozhovskaya and Pallasovskaya compressor stations, Saratov and Volgograd oblasts, Russia. The GHG benefits of the project can be directly measurable and will reduce methane emissions equivalent to 31 million tonnes of CO<sub>2</sub> over the 25-year life of the project, if fully funded. The project will evaluate technological, operational,

and institutional opportunities for reducing methane emissions in the natural gas production and transmission system of Russia. Accepted December 19, 1995. Participants: *GAZPROM; Oregon State University; Sealweld Corporation; Southern California Gas Co.; Sustainable Development Technology Corporation; The Center for Energy Efficiency; U.S. Environmental Protection Agency; VOLGOTRANS GAS; YUGTRANS GAS.* Project Contact: *Ted S. Vinson, Ph.D., P.E., Oregon State University, 1-541-737-3494.*

## WIND POWER GENERATION

### Tierras Morenas Windfarm Project

*Country—Costa Rica:* The project will construct a 20-megawatt powerplant consisting of 40 Enercon E-40 500-kilowatt wind turbine generators. Studies indicate the site has a very strong wind resource sufficient to support economical wind energy. The project is estimated to generate 98 gigawatt-hours annually, displacing 30-megawatt thermal units that burn high-sulfur diesel fuels, bunker oils, and IFO 180 fuels. The project is

projected to reduce CO<sub>2</sub> emissions by over 108,000 metric tonnes. Electricity generated will be sold to the Costa Rican Institute of Electricity (ICE). The facility will be operational in June 1998. Accepted December 19, 1995. Participants: *Costa Rican Ministry of Environment and Energy; Energia del Nuevo Mundo, S.A.; Energy Works; Molinas de Viento del Arenal, S.A.* Project Contact: *William Moore, Energy Works, 1-301-918-7381.*

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**BIOMASS POWER GENERATION**


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**The BEL/Maya Biomass Power Generation Project**

**Country—Belize:** The project involves the installation and operation of an 18-megawatt waste-to-energy powerplant adjacent to a sugar mill in the community of Orange Walk in northern Belize to be fueled by sugarcane bagasse, orange processing wastes, and wood waste from sawmills and other nearby sources. Circulating fluidized bed combustion technology will be used at the plant. By displacing diesel oil-fired power generation with waste biomass fuel (that would revert eventually to CO<sub>2</sub> in any case), the project would reduce utility CO<sub>2</sub> emissions by as much as 3.4 million

metric tonnes over its projected 30-year life.

The project will help reduce the power supply deficit in Belize, increase the economic efficiency of one of the country's principal export industries, and use biomass wastes that are often incinerated in open piles or disposed of improperly. Accepted December 6, 1996.

**Partners:** *e-prime, Inc., a subsidiary of Public Service Company of Colorado; e-prime (Belize), Ltd.; the International Utility Efficiency Partnerships, Inc. (IUEP).*

**Project Contact:** *Ronald Shiflett, Jr., IUEP 1-202-508-5507.*

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**BIOMASS POWER GENERATION**


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**The Bio-Gen Biomass Power Generation Project Phase II, Saba Site**

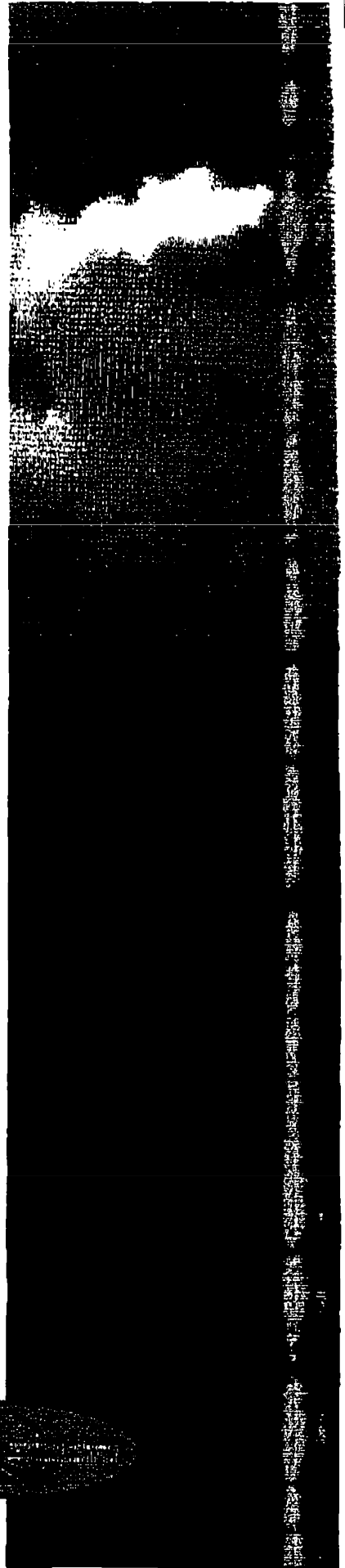
**Country—Honduras:** The project will locate a 15-megawatt biomass-fueled steam powerplant 15 kilometers west/northwest of the city of Saba, Honduras. The plant will be owned and operated by Biomasa-Generacion for the purpose of generating electrical power for sale to ENEE (Empresa Nacional de Energia Electrica), the primary utility responsible for the generation, transmission, and distribution of electricity in Honduras. By displacing diesel-fired power generation with biomass fuel obtained from waste from the forest products and palm oil industries, the project

participants estimate it will reduce CO<sub>2</sub> by as much as 2.3 million metric tonnes over its projected 20-year life.

The collection and controlled burning of biomass for the project will also eliminate current disposal methods of palm and wood wastes that contaminate local air and water resources and increase the threat of forest fires. Accepted December 6, 1996.

**Partners:** *Biomasa-Generación, S. de R.L.; International Utility Efficiency Partnerships, Inc. (IUEP); Nations Energy Corporation, a subsidiary of Tucson Electric Power Company.*

**Project Contact:** *Ronald Shiflett, Jr., IUEP 1-202-508-5507.*



DISTRICT HEATING IMPROVEMENTS

**District Heating Improvements  
In Zelenograd**

*Country—Russian Federation:* This project will upgrade a portion of the district heating system for the city of Zelenograd to provide more reliable, higher quality service with less consumption of natural gas. If fully implemented, the project has the potential to reduce GHG emissions by over 1.5 million metric tonnes of CO<sub>2</sub> over the estimated 30-year life of the project. The reduction would result from the installation of heat exchangers, pumps, control valves, and related

instrumentation and control circuitry at 28 substations within the city's district heating system. Accepted December 6, 1996.

*Partners:* City of Zelenograd; Johnson Controls, Inc.; Russia Energy Savings Fund; Consortium for Integrated Resource Planning at the University of Wisconsin; Leonardo Academy, Inc.

*Project Contact:* Patrick Cronin, Johnson Controls International, Inc., 1-414-274-4148; Michael Army, Leonardo Academy, Inc., 1-608-250-0400.

THE "UNITED STATES INITIATIVE  
ON JOINT IMPLEMENTATION"

(USIJI) IS A PILOT PROGRAM THAT

ENCOURAGES ORGANIZATIONS IN

THE U.S. AND OTHER COUNTRIES

TO IMPLEMENT PROJECTS THAT

REDUCE, AVOID, OR SEQUESTER

GHGs. THE UNITED STATES

ANNOUNCED THE USIJI IN

OCTOBER 1993 AS PART OF ITS

NATIONAL CLIMATE CHANGE

ACTION PLAN.

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**SUSTAINABLE LAND USE**

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**The Noel Kempff M. Climate Action Project**

**Country—Bolivia:** This land-use project is located in the province of Velasco, Department of Santa Cruz, Bolivia, and stretches to the border of Brazil. It combines elements of park expansion, protection, regeneration, and development of sustainable forest product enterprises. Component A involves the cessation of logging activities on 639,057 hectares and expansion of an existing park to encompass these and other adjoining lands totaling 842,095 hectares. Component B will establish income-generating activities that will be used to preserve and protect the entire 1,523,446 hectares of park land. The income-generating activities include an endowment fund, commercialization of orchids and other products, and an ecotourism program. Component C

will extend mitigation activities beyond the boundaries of the park by establishing environmentally sustainable economic opportunities for local populations. The project developers estimate that Components A and B will sequester approximately 53 million metric tonnes of CO<sub>2</sub> over the 30-year project lifetime.

The project is located in an environmentally sensitive area. The environmental benefits of the project are substantial and include protection of biodiversity and habitat, water and air quality improvements, and soil conservation. Accepted December 6, 1996.

**Partners:** *American Electric Power Company, Inc. (AEP); Fundación Amigos de la Naturaleza (FAN); The Nature Conservancy (TNC).*

**Project Contact:** *Tia Nelson, TNC, 1-703-841-5372.*

## REFORESTATION

**Reforestation of Chiriqui Province**

*Country—Republic of Panama:* The project involves the reforestation of degraded pasture land in the Chiriqui Province in western Panama. The project plans to plant 500 hectares with teak (*Tectona grandis*) with an estimated net sequestration of 212,000 metric tonnes of CO<sub>2</sub> over the 25-year lifetime of the project, if fully funded and implemented. The sustainably managed teak plantation is expected to

yield a stream of high-quality hardwood for furniture production, providing a substitute for unsustainably harvested natural forest hardwoods.

The plantation is also expected to reduce soil erosion from grazing and cropping and will increase wildlife habitat. Accepted December 6, 1996.

*Partners: CAOBO, Inc.; Center for Clean Air Policy.*

*Project Contact: Guillermo Suarez, CAOBO, Inc., 1-212-684-4064.*

## REFORESTATION

**Reforestation in Vologda**

*Country—Russian Federation:* This project plans to convert 2,000 hectares of active hayfield to natural forests in a location adjacent to the Russky Sever National Park in the Vologda region. Approximately 1,100 hectares are located within the borders of the national park, but they are not considered part of the park. These hayfields would be taken out of production and the area allowed to

regenerate. The estimate of above- and below-ground carbon sequestration is approximately 878,000 metric tonnes of CO<sub>2</sub> over the 60-year life of the project. Accepted December 6, 1996.

*Partners: Center for Environmental Economics, Moscow; Environmental and Economic Consulting; Vologda Region Department of Natural Resources.*

*Project Contact: Alice LeBlanc, Environmental and Economic Consulting, 1-212-799-3045.*

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**BIOMASS CULTIVATION**


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**Project *Salicornia*:  
Halophyte Cultivation  
in Sonora**

*Country—Mexico:* This is a demonstration project on 12 hectares of land (in Phase I) to cultivate a native halophyte (a salt-tolerant euphorb plant, *Salicornia bigelovii*) in a coastal desert region of northwest Mexico. The crop could provide a valuable source of biomass material, food, and income from land unsuited to other human purposes. The developers estimate the project will sequester 440 metric

tonnes of carbon by increasing soil organic matter and long-term storage of CO<sub>2</sub> in the low-carbon desert soils. A greatly expanded Phase II of the project is in the planning stages but has not yet been submitted to the USIJI.

Accepted December 6, 1996.

*Partners: Econergy International Corporation (EIC); Genesis, S.A. de C.V.; Halophyte Enterprises, Inc. (HEI); Salt River Project (SRP).*

*Project Contact: Michael Ashford, EIC, 1-202-822-4980.*

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**FOREST CONSERVATION**


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**Forest Conservation—Bilaa Reserve**

*Country—Ecuador:* World Parks Endowment, Inc., will implement a forest preservation project with the second largest Ecuadorian environmental NGO, Fundación Jatun Sacha, which has successfully managed forest reserves in the Ecuadorian Amazon and the highlands. The project will add 2,000 hectares of tropical forest to the already established 2,000 hectares comprising the Bilaa Reserve in the Montanas de Mache in the Esmeraldas province of northwest Ecuador. The developers estimate that the project site will store approximately 1,170,000 metric

tonnes of CO<sub>2</sub> that would otherwise be lost because of land conversion. The Pacific coast wet forest where the reserve is located has suffered extremely high deforestation rates. The project will protect a forest area that is extremely rich in biodiversity and is under imminent threat of deforestation.

Jatun Sacha will manage the reserve for ecotourism and research purposes. Accepted February 26, 1997.

*Partners: Fundación Jatun Sacha; World Parks Endowment, Inc.*

*Project Contact: Byron Swift, World Parks Endowment, Inc., 1-202-939-3808.*

## SUSTAINABLE FORESTRY

### Scolec Té—Sustainable Land Management and Carbon Sequestration, Chiapas

*Country—Mexico*

The Scolec Té project is a demonstration of sustainable forestry and agroforestry (tree/crop system) management practices in nine Mayan indigenous communities, in the humid lowland and drier hill forest-cropland mosaics of northeast Chiapas. About 2,400 hectares of farmers' and communal lands have been identified by the villagers as suitable for improved practices chosen by farmers through their rural agricultural credit union. Plans call for a 3-year start-up phase, then 27 years of social, economic, environmental, and carbon benefits, totaling 842,000 metric tonnes of CO<sub>2</sub>, if fully funded and implemented. Scolec Té seeks to develop a model for delivering technical assistance from the project coalition and for delivering income from investors seeking potential

GHG reduction benefits to farmers who increase carbon sequestration on their lands. It also is developing protocols for the administration, monitoring, and evaluation of larger-scale land use sequestration programs for low-productivity lands in southern Mexico, through its strong research and monitoring components. Project activities should help conserve biodiversity, and reduce human migration to the critical Lacandon forest frontier undergoing deforestation. Accepted February 26, 1997.

*Partners: American Forests; Econergy International Corporation (EIC); El Colegio de la Frontera Sur; IEA Greenhouse Gas R&D Programme; International Carbon Sequestration Federation; Unión de Crédito Pajal; University of Edinburgh.*

*Project Contact: John Paul Moscarella, EIC, 1-202-822-4980; Gerry Gray, American Forests, 1-202-955-4500.*

"TECHNOLOGY COOPERATION"  
MAKES AVAILABLE ENERGY  
EFFICIENT TECHNOLOGIES AND  
PROCESSES DEVELOPED BY  
INDUSTRIALIZED NATIONS TO LESS  
INDUSTRIALIZED NATIONS. THIS  
COOPERATION MAY BE CONDUCTED  
THROUGH THE EFFORTS OF  
PRIVATE ORGANIZATIONS OR MAY  
INVOLVE GOVERNMENTS AND  
INTERNATIONAL INSTITUTIONS.

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**REDUCED IMPACT LOGGING**


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**Carbon Sequestration Through  
Reduced Impact Logging**

*Country—Indonesia:* The project will implement reduced impact logging (RIL) techniques to reduce GHG emissions associated with logging practices in East Kalimantan, Indonesia. RIL will be introduced on 600 hectares of forest land within the Kiani Lestari and Inhutani private logging concessions in East Kalimantan, on the island of Borneo. The forests are lowland dipterocarp rain forest, have not been previously harvested, and are not densely populated. The project will include developing guidelines and procedures for implementation of RIL techniques, providing on-site training, and implementing the techniques on the 600 hectares. Some logging operations in the tropics damage a much higher proportion of the forest than the trees that are harvested. However, it is estimated that logging damage to the remaining biomass can be reduced by as much as 50 percent through precutting vines, directional felling, and planned extraction of timber on properly constructed and utilized skid trails. Project developers estimate that

this project will generate cumulative savings of over 130,000 metric tonnes of CO<sub>2</sub> over the 40-year life of the project.

As heavily damaged residual forests yield little timber and, therefore, are at high risk of conversion to other uses, RIL techniques help preserve existing biodiversity. RIL techniques also reduce the susceptibility of the forest to weed infestations that reduce biomass recovery rates and reduce the susceptibility to destructive fires. Furthermore, by reducing the amount of forest canopy that is opened up, there are fewer ill effects on understory plants and animals because of changes in temperature, light intensity, wind speed, and moisture. Accepted March 24, 1997.

*Partners: American Forests; the Association of Indonesian Forest Concession Holders (APHI); the Center for International Forestry Research (CIFOR); COPEC, a joint implementation project developer; the Kiani Lestari and Inhutani II concessionaires.*

*Project Contact: Don Justin Jones, COPEC, 1-626-799-9059.*

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**DISTRICT HEATING IMPROVEMENTS**


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**District Heating Efficiency Improvements, Metallurgichesky District of Cheliabinsk**

*Country—Russian Federation:* This project will upgrade the central heating system of the Metallurgichesky District of Cheliabinsk, Russia, which serves a human population of 144,500. Energy efficiency improvements will be made to the heat distribution system, public buildings, residential housing stock, and boiler houses. Potential GHG benefits of the project are

estimated at 828,000 metric tonnes of CO<sub>2</sub> over the 10-year life of the project. Accepted March 19, 1998.

*Partners:* Administration of Oblast and Metallurgichesky District of Cheliabinsk (the municipal government); Battelle Memorial Institute/Pacific Northwest National Laboratory (PNNL), the Center for Energy Efficiency (CENEf) in Moscow.

*Project Contact:* Susan Legro, Battelle Memorial Institute/PNNL, 1-202-646-7861.

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**DISTRICT HEATING IMPROVEMENTS**


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**District Heating Renovation, Lytkarino**

*Country—Russian Federation:* The project will employ energy efficiency technologies to rehabilitate and modernize the central heating system of Lytkarino, Russia. The system, which serves a human population of 53,000, will undergo improvements to the boiler house and central heating points, municipal and public service buildings, and the housing stock. If fully funded and implemented, the total GHG benefits of the project are estimated at

486,000 metric tonnes of CO<sub>2</sub> over the 10-year project lifetime. Accepted March 19, 1998.

*Partners:* Administration of the City of Lytkarino (the municipal government); Battelle Memorial Institute/Pacific Northwest National Laboratory (PNNL); the Center for Energy Efficiency (CENEf) in Moscow.

*Project Contact:* Susan Legro, Battelle Memorial Institute/PNNL, 1-202-646-7861.

"SUSTAINABLE DEVELOPMENT REFERS TO THE NEED TO BALANCE THE SATISFACTION OF NEAR-TERM INTERESTS WITH THE PROTECTION OF THE INTERESTS OF FUTURE GENERATIONS, INCLUDING THEIR NEED FOR A SAFE AND HEALTHY ENVIRONMENT. AS EXPRESSED BY THE 1987 U.N. WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT (THE "BRUNDTLAND COMMISSION"), SUSTAINABLE DEVELOPMENT "MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR NEEDS."

## RENEWABLE POWER GENERATION

**APS/CFE Renewable Energy Mini-Grid Project**

*Country—Mexico:* The project involves the development of a hybrid power supply system that will use solar, wind, and diesel capacity to replace a 205-kilowatt diesel generator in the town of San Juanico, Baja California Sur State, Mexico. The hybrid system will extend the availability of electrical service from the current 3–4 hours per day to 24 hours per day. The project has the potential to reduce GHG emissions by

more than 4,000 metric tonnes of CO<sub>2</sub> over the 30-year project lifetime.

Accepted March 19, 1998.

*Partners:* Arizona Public Service Company (APS) of Phoenix, Arizona; Comisión Federal de Electricidad (CFE), the Mexican national utility; Niagara Mohawk Power Corporation (NMPC) of Syracuse, New York.

*Project Contact:* Dr. C.V. Mathai, Arizona Public Service Company, 1-602-250-3569.

## LAND CONSERVATION AND MANAGEMENT

**Community Silviculture in Sierra Norte, Oaxaca**

*Country—Mexico:* This project will improve existing silviculture and forest protection activities in six communities in rural southern Mexico through forest restoration and improved forest management, increased agricultural efficiency, and increased wood use efficiency over 49,027 hectares of land. The project will build on and support local community-based efforts to expand and utilize forests in a sustainable manner over the 30-year life of the project. If fully funded and implemented, an estimated 3,065,000

metric tonnes of CO<sub>2</sub> will be sequestered. Accepted March 19, 1998.

*Partners:* Consejo Civil Mexicano para la Silvicultura Sostenible, A.C. (CCMSS); Econergy International Corporation (EIC); Estudios Rurales y Asesoría Campesina, A.C. (ERA); Fideicomiso de Recursos Naturales de la Sierra Norte de Oaxaca; Secretaría del Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP); Unión de Comunidades Islán-Esla, Oaxaca (IXETO); Unión de Comunidades Zapoteco-Chinantecas (UZACHI).

*Project Contact:* Edward Hoyt, EIC, 011-525-563-4280.

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**SOLAR ELECTRIFICATION**


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**Rural Solar Electrification Project**

**Country—Bolivia:** This project intends to finance and install photovoltaic units of 48–55 watts in 400 households in the two Departments of Bolivia, Oruro and Chuquisaca, which are not serviced by the national electricity grid system. The photovoltaic units will be used for residential lighting and will reduce CO<sub>2</sub> emissions by replacing diesel wick lanterns. The project is intended to test the commercial feasibility of photovoltaic technology in rural areas of Bolivia. If successful, this project could lead to a second, much larger project. Accepted October 15, 1997.

**Partners:** *Center for Sustainable Development in the Americas (CSDA); Empresa Eléctrica Guaracachi S.A. (EGSA—an affiliate of GPUI, Inc.); General Public Utility International, (GPUI) Inc. (An independent power provider); National Rural Electric Cooperative Association (NRECA International, Ltd.); the Prefectures of Oruro and Chuquisaca.*  
**Project Contact:** *James Torpey, GPUI, Inc., 1-973-263-6376; Anne Hambleton, CSDA, 1-202-588-0155.*

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**RURAL ELECTRIFICATION**


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**SELCO—Rural Electrification Project**

**Country—Sri Lanka:** This project will market and install 812,000 solar home systems in Sri Lanka as an alternative to the use of kerosene lamps for lighting and the use of diesel-electric charging of lead-acid batteries for powering small home appliances. The project will build on successful pilot efforts in Sri Lanka to demonstrate and install solar home systems, obtain consumer financing, and provide technical assistance to rural homeowners who lack access to the electricity grid. Each solar system will

consist of a 12-volt photovoltaic panel, battery, and charge controller as well as compact fluorescent lamps and hardware. The systems will provide electricity for lighting, radio, and television services. Accepted October 15, 1997.

**Partners:** *Renewable Energy Services Company of Asia, Ltd.; Solar Electric Light Company (SELCO); Trexler and Associates, Inc.*  
**Project Contact:** *Dr. Mark Trexler, Trexler and Associates, Inc., 1-503-786-0559.*

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**FOREST CONSERVATION**


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**The Carbon Sequestration Through  
Costa Rican Territorial and Financial  
Consolidation of Biological Reserves  
Project**

**Country—Costa Rica:** This project intends to purchase threatened park lands from private owners and nongovernment organizations and transfer ownership to the government for management and conservation. If fully funded, the project would sequester an estimated 57 million metric tonnes of CO<sub>2</sub> through avoidance of tropical deforestation and regeneration of secondary forests and pasture lands on 530,000 hectares of land newly converted to full protection status. Funds to purchase these lands are proposed to be generated from the sale of "Certifiable Tradable Offsets" (CTOs).

CTOs represent the creation of the first tradable commodity for mitigating global climate change. Each CTO will represent a third party certification of 1,000 tonnes of carbon the project sequestered the previous year. Monitoring and verification of the project's increased carbon sequestration and original baseline will be conducted by an experienced commodity trade monitoring firm. The Costa Rican government will guarantee the CTOs for 20 years. Accepted July 28, 1997.  
**Partners:** *Costa Rican Ministry of Environment and Energy (MINAE); Costa Rican National Parks Foundation; Earth Council Foundation—Costa Rica; Earth Council Foundation—U.S.*  
**Project Contact:** *Adalberto Gorbitz, OCIC for MINAE, 011-506-220-0036.*

"GREENHOUSE GASES" (GHGs) ARE CONSTITUENTS OF THE ATMOSPHERE WHICH HAVE A MAJOR EFFECT ON THE EARTH'S RADIATIVE HEAT BALANCE—BY IMPEDING OUTGOING LONGWAVE RADIATION, THEY WARM THE EARTH'S SURFACE. GHGs INCLUDE CARBON DIOXIDE (CO<sub>2</sub>), METHANE (CH<sub>4</sub>), NITROUS OXIDE (N<sub>2</sub>O), AND CHLOROFLUOROCARBONS (CFCs). WATER VAPOR IS ALSO A GHG.

OBSERVED INCREASES IN THE ATMOSPHERIC CONCENTRATIONS OF THESE GHGs OVER THE PAST CENTURY HAVE RESULTED FROM LAND-USE CHANGE, THE RELEASE OF CFCs FROM REFRIGERATORS AND AIR CONDITIONERS, AND THE BURNING OF FOSSIL FUELS SUCH AS GASOLINE, OIL, COAL, AND NATURAL GAS.

## **CDM vs. Target and Trade**

Inspired by comments that CDM is equivalent to target and trade, this analysis seeks to provide information about how CDM should be designed and its merit relative to a target and trade approach. This note presents an illustrative calculation suggesting that CDM, by focusing on “large” emissions reductions opportunities on a case-by-case basis, would likely generate fewer emissions reductions than the target and trade approach. Thus a target and trade approach should continue to receive priority over CDM in U.S. diplomatic strategy. For the purposes of this calculation, we address the CDM in the context of new investment in Chinese electricity generation, the sector where it might be most successful.

### **Electricity Generation in China**

In 1996, China generated 925 billion kilowatt-hours of electricity, of which about 3/4 came from coal-fired power plants. Electricity consumption in China is projected to increase 5.8% annually between now and 2010. To generate this increase in consumption, EIA projects more than \$300 billion of electric power investments over 1995-2010 in China, with about 72% going to new coal-fired plants and 22% for renewable (primarily hydroelectric). New gas-fired plants account for less than 1% of investments. Over this period, an annual average of 73 billion kilowatt-hours of generation would come on-line.

### **Carbon-Lean and Carbon-Free CDM Projects in China's Electricity Sector**

Suppose that through the CDM, 10% of all new electricity generation in China is natural gas-based instead of coal-based. In 2001, this would be about 7 of the 70 billion kilowatt-hours, and in 2012, 13 of the 130 billion kilowatt-hours of new generation. Using the differential in carbon emissions per kilowatt-hour between natural gas-fired plants and coal-fired plants in the U.S. of 0.106 MMTCE/billion kilowatt-hours, CDM projects resulting in this 10% shift to natural gas over 2000-2012 would yield total annual emissions reductions of 15 MMTCE during 2008-2012. This shift to natural gas would reflect investments 34 times greater than the projected natural gas investment in China.

If the CDM projects stimulated a shift of 10% of all new electricity generation in China to nuclear instead of natural gas, then the nuclear investments would yield total annual emissions reductions of 39 MMTCE during the first commitment period. This shift to nuclear would result in more than 2 ½ times the projected BAU investment in nuclear in China.

The emissions reductions under both fuel switching scenarios are less than the SGM estimate that with international trade in permits priced in world markets at \$26/ton, and a target at BAU, China reduces 275 MMTCE annually during the first commitment period. Only if 97% of all coal investments is diverted to nuclear, would CDM projects conducted through the electricity sector achieve the same level of emissions reductions.

The following chart illustrates the carbon emissions credits generated if CDM projects divert investments from coal-based power to natural gas or nuclear. It should be recognized that these

calculations ignore offsetting increases in emissions that may result as more CDM projects lower coal prices and raise natural gas prices.

Electric Power Investments by Fuel in China, 1995-2010

Scenario	Coal	Natural Gas	Nuclear	Renewable	Emissions Credits during the Commitment Period (MMTCE)
EIA BAU (IEO98)	72%	0.3%	6%	22%	0
10% to Natural Gas	62%	10.3%	6%	22%	15/yr
10% to Nuclear	62%	0.3%	16%	22%	39/yr
70% to Natural Gas	2%	70.3%	6%	22%	108/yr
70% to Nuclear	2%	0.3%	76%	22%	270/yr

### Implications for CDM

1) While present joint implementation rules assess emissions reductions on a year-by-year basis, awarding emissions credits by summing the entire stream of emissions reductions relative to the baseline at the time the project goes on-line could improve the attractiveness of CDM. Assuming that power plant projects have a life of 40 years and all 40 years of emissions reductions are credited on day one of the project, a shift to natural gas equal to 92 times the projected investment in natural gas would be necessary for CDM emissions credits to equal emissions allowances sold to developed countries under the target and trade approach. Under the same line of reasoning, nuclear power investments would need to nearly triple for CDM to equal target and trade. It is not clear that a tripling of nuclear power would be reasonable for a well-run CDM program.

More importantly, this approach raises three issues. First, since an effective CDM will require such large changes that calculating the baseline becomes critically important, especially since the CDM will result in changes in relative fuel prices that would offset some of the emissions reductions. Second, this approach creates a moral hazard problem. Since emissions credits are awarded on the first day of the project, an operator may shut down the plant prior to the end of its scheduled 40-year lifetime. Third, this approach is essentially emissions borrowing and so may draw a negative diplomatic response, since borrowing was rejected in Kyoto.

2) To achieve emissions credits in excess of these, efforts will need to focus on other sectors. However, the diverse nature of those sectors may present difficulties in developing a standardized approach to projects to minimize transaction costs.

Target and trade deserves continued high diplomatic priority because CDM is apparently significantly inferior to target and trade approaches in terms of potential carbon reductions.

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## **U.S. POSITION PAPER CLEAN DEVELOPMENT MECHANISM**

### **BACKGROUND:**

The Clean Development Mechanism, created prior to and during the third session of the Conference of the Parties to the Framework Convention on Climate Change was largely the result of a merger between the U.S. proposals for "joint implementation" between developed and developing countries, and the Brazilian proposal to establish a fund to support actions in developing countries.

The CDM provides for the functional equivalent of joint implementation with developing countries, allowing Annex I Parties to be able to meet part of their target from project activities in non-Annex I countries. It calls for:

- emission reductions to be certified by operational entities to be designated by the COP/MOP;
- guidelines to include methods for determining that projects are additional, and generate real, measurable and long-term benefits;
- the establishment of an executive board to supervise the CDM;
- an unspecified "share of the proceeds" to be used both to cover administrative expenses, as well as assist particularly vulnerable developing country Parties (such as small island states) to adapt to climate change; and
- it provides for early credit in that pre-2008 period.

In addition, the Protocol text does not does not in any way limit private sector participation.

However, little guidance is given as to how the Parties are to proceed to elaborate the mechanism. The June 1998 agenda for both subsidiary bodies includes an item on the CDM, and we anticipate a more thorough discussion than one limited to pre-budget period project certification (as referred to in Article 12.10).

### **U.S. POSITION**

Given the opportunity provided in the text to begin CDM activities in 2000, developing the operational rules and modalities is urgent. The U.S. should continue to strongly promote action to develop agreed rules, and to allow CDM actions to proceed as soon as possible. The following are some of the key elements on which the U.S. should take a clear stand in Bonn, in intersessional meetings, and in Buenos Aires:

- There should be no limits on the extent to which reductions from CDM project activities may count against targets as long as these activities result from legitimate projects.
- Sink activities - including on any aspect of sustainable forest management - should be allowed under the CDM (noting that this will necessitate the development of better operational guidelines to allow a determination of "additionality" for sink projects).

-2-

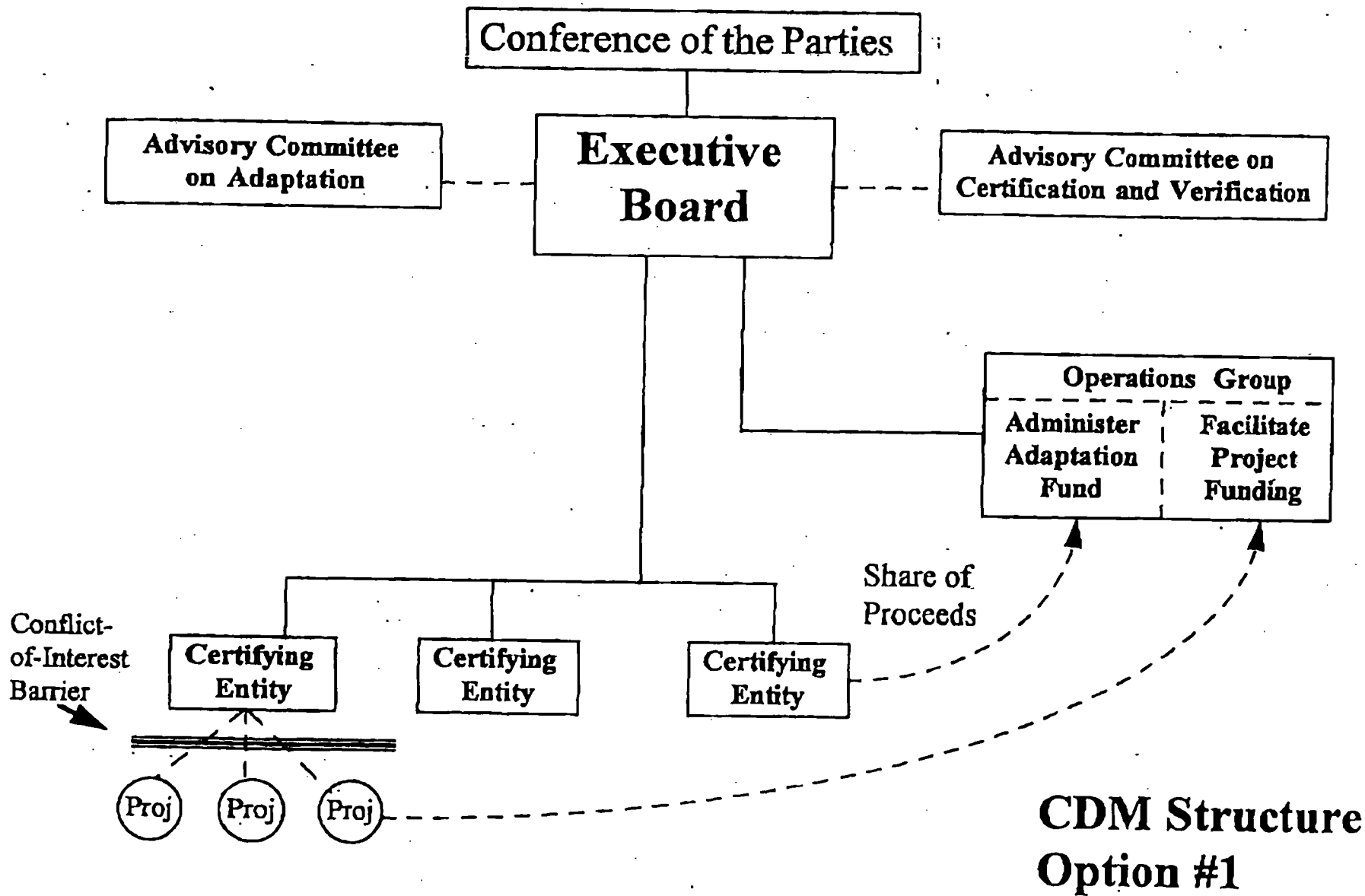
- The "share of the proceeds" should be defined in terms of emissions and be based on the value of the emissions reductions achieved by the specific project activities – not the value of the underlying project itself; the total percentage that should be allowed should be low – perhaps in the range of 2-3 percent.
  - The list of countries eligible to receive adaptation funds should be limited, where possible confined to particularly vulnerable developing countries; mechanisms will need to be developed to administer the adaptation portion of the mechanism, although to avoid any conflict of interest, CDM "operating entities" that verify reductions should not administer CDM adaptation funds.
- A number of issues arise related to the organizational structure and its role in administering the CDM. These are described in a separate paper and organizational graphic.
- Inasmuch as it can be applied, decisions on project criteria (including for additionality, for assurance of real, measurable and long-term benefits, and for auditing and verification) should be drawn from the experience of the AIJ pilot phase.
  - Simplified reference cases should be developed so that project developers have clear guidance on what kinds of projects will be accepted, and can plan accordingly. However, the absence of generalized rules should not be grounds for excluding a specific project; projects falling outside of agreed criteria may be subject to certification on an individual basis by the operating entities or under the supervision of the Executive Board.

### PROCESS ISSUES

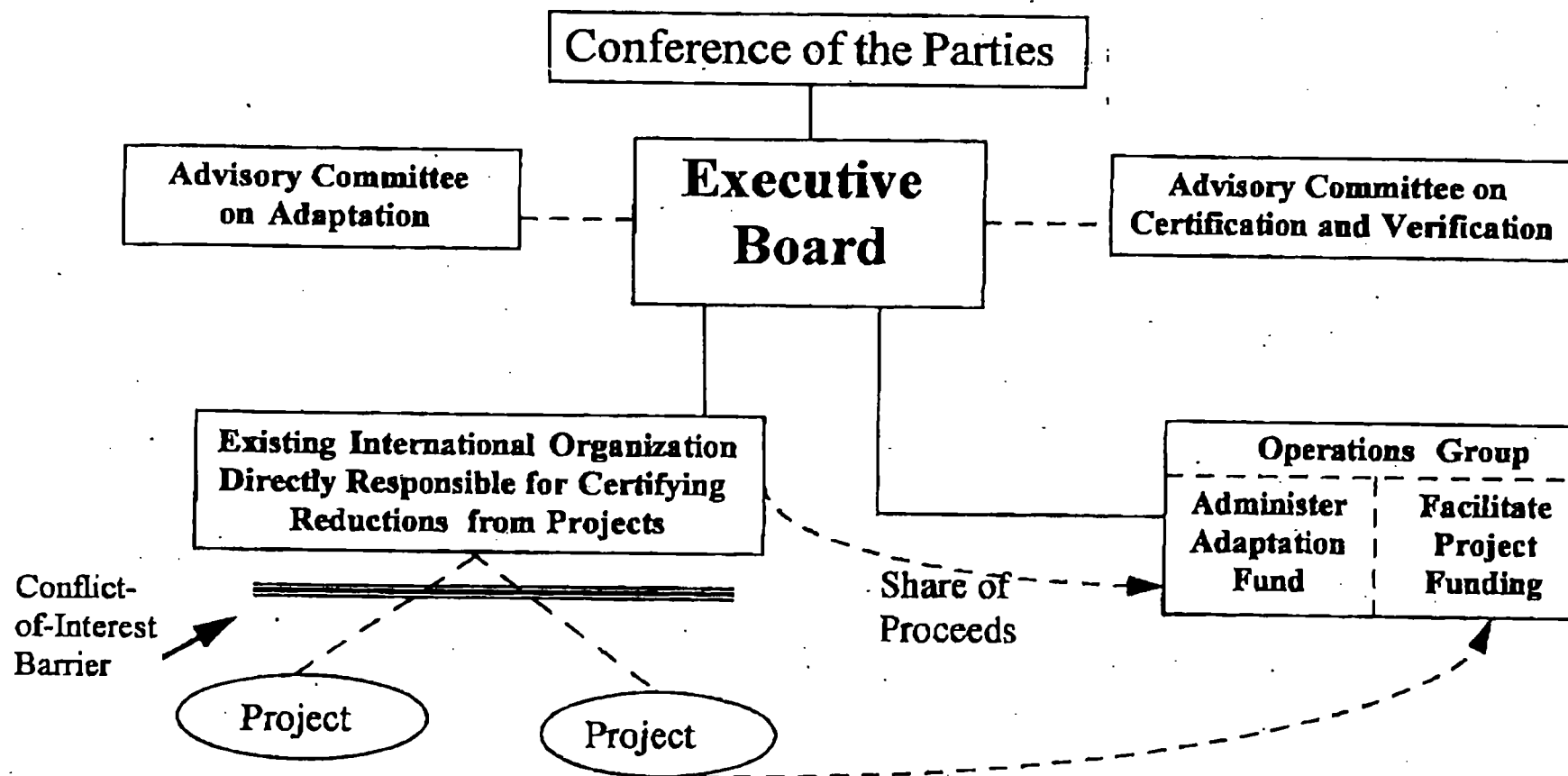
A number of forthcoming meetings present opportunities to raise CDM issues. These include the April 28-29 IEA Workshop in Rio de Janeiro, the May 12-13 IEA workshop in New Delhi, the May 12-13 UNEP workshop in Lima, the May 18 IEA workshop in Beijing, the September 21-22 IEA workshop in Accra, and the final IEA wrap-up session in Paris in October. In addition, multilateral meetings (such as the OECD ministerial session, ASEAN and the G-8 present opportunities, as do bilateral sessions with key developing countries (e.g., Secretary Albright's trip to China).

The U.S. effort at these sessions should focus on adopting guidelines that will allow specific projects to move forward, largely drawing on existing agreement within the international community on elements of the AIJ process. At this time, the USG has not yet agreed on specific, simple project criteria that we are prepared to accept as an international basis for the CDM. The USII should be tasked with developing a set of such recommendations, based on its experience with agreed projects. Draft recommendations should be completed by mid May for consideration by the IWG and the A/S group in late May.

# Multiple Certifying Entities Authorized by Executive Board



# Existing International Organization Responsible for Certifying Emissions Reductions



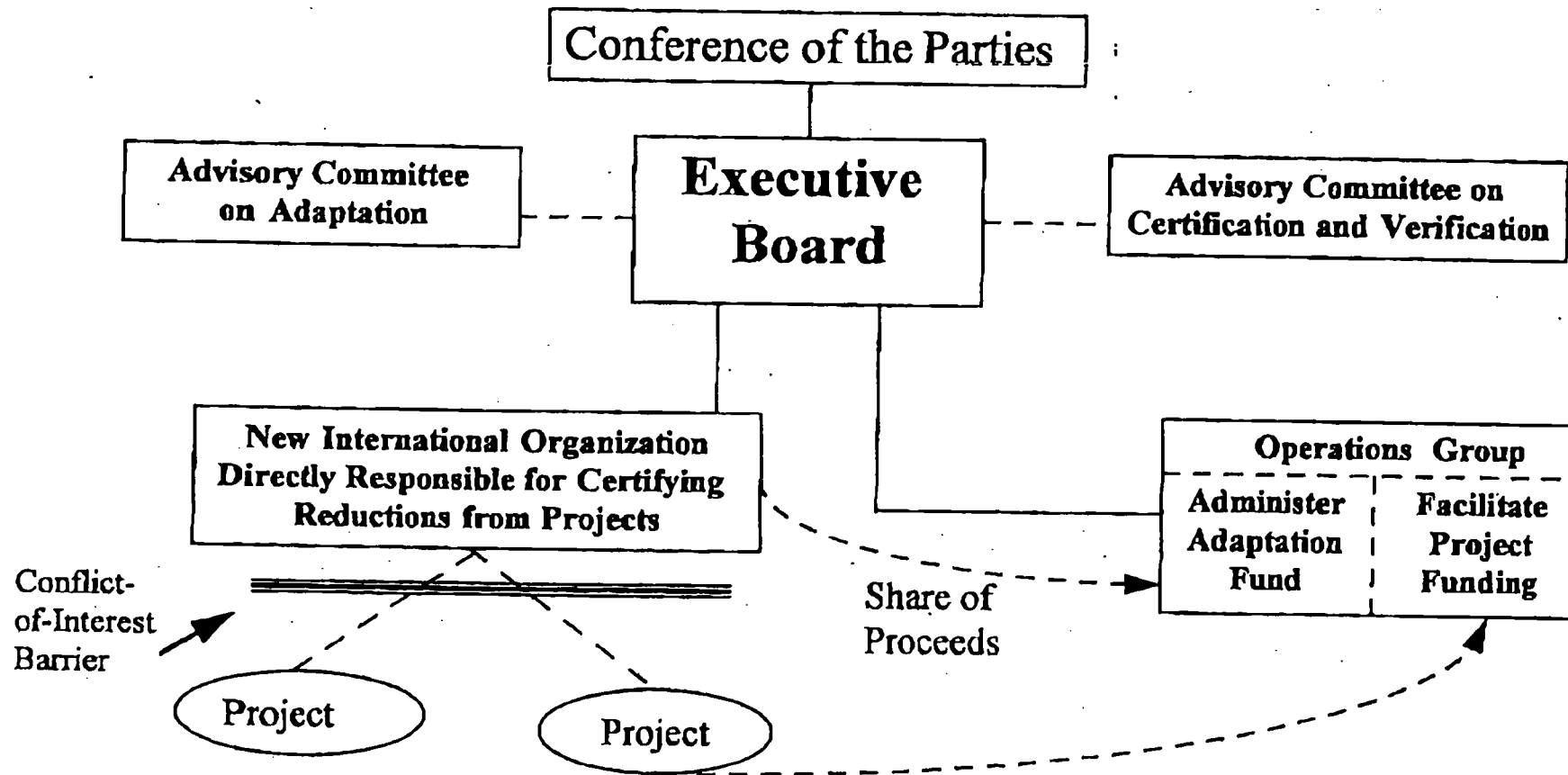
**CDM Structure  
Option #2**

2000

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# New International Organization Responsible for Certifying Emissions Reductions



**CDM Structure  
Option #3**



## Alternative CDM Structures

- Option 1: Multiple Operating Entities Authorized by an Executive Board to Certify Reductions.
- Option 2: Utilize Existing Single International Organization (e.g., World Bank, UNEP) as the operating entity.
- Option 3: Establish New International Organization Exclusively Devoted to Administering the CDM
- Option 4: Establish New International Organization with the Authority to License External Certifying Entities, conducting random audits as necessary to preserve the integrity of the system.

**Executive Board of the Clean Development Mechanism** - as prescribed by Article 12.5, the cdm shall be "supervised" by an executive board (Ex-Board). The Ex-Board receives guidance, direction, and approval from the COP on matters such as: 1). which group(s) will be "designated" "operational entities," capable of certifying emission reductions (Art. 12.5); and 2). what will be the rules under which the cdm will function to ensure credibility and accountability (Art. 12.8).

Under Option 1, the Ex-Board takes a more direct role in the authorization of certifying entities within the guidance provided by the COP. In the case of Option 2 and 3, it is assumed that the COP would have "designated" an international organization and, as such, it would certify the reduction directly from the projects. Under Option 4, the Ex-Board would create a Certifications Group directly reporting to it that would be responsible for the licensing and auditing of entities that it had determined complied with the standards established by the COP.

The Ex-Board should be limited to 9-15 members, representing Parties, and to the extent possible, with professional expertise in matters related to project development and project funding, as well as in climate change mitigation. Board members should serve for single terms of 3 to 5 years, as established by the COP.

**Advisory Committee on Certification and Verification** - Because of the relatively small size of the Ex-Board, there will understandably not be resident experts in all areas. Therefore, this Advisory Committee will assist the Ex-Board in developing standards for certification and verification, which in turn the Ex-Board would present to the COP for approval. Further, this Advisory Committee would be available to the Ex-Board for consultation and to assist the Ex-Board in making recommendations to the COP for subsequent revisions and/or additions to the guidance and modalities, based upon changed circumstances and/or experience.

**Advisory Committee on Adaptation** - This Advisory Committee will augment the depth of technical and country-specific experience not necessarily represented on the Ex-Board at all times when recommendations need to be presented to the COP regarding providing funding assistance to a developing country Party that may be particularly vulnerable to the adverse effects of climate change.

**Operations Group** - Reporting directly to the Ex-Board, the Operations Group would have the following functions:

1. Facilitate Funding for Projects, as called for under Article 12.6, including project "bundling", as appropriate.
2. Collect Share of Proceeds from Projects
3. Administer Adaption Fund, in accordance with Article 12.8.

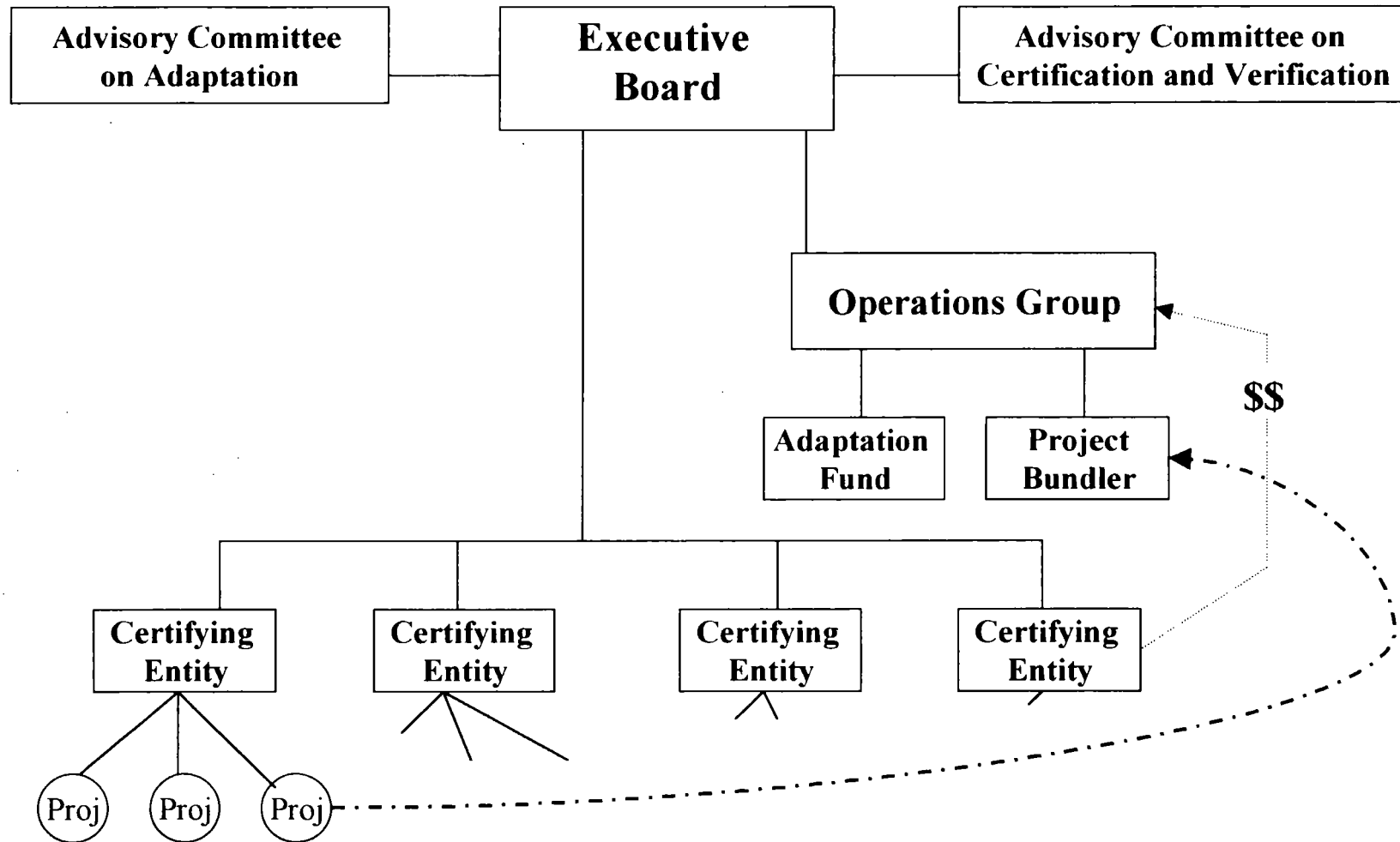
**Certifying Entity (CE)** - As provided by Article 12.5, guidance will be provided by the COP regarding the designations of entities and their associated credentials necessary to become qualified to certify emission reductions. One or more such operating entities can be designated. Subject to such guidance, and prior to being able to represent itself as an official certifying entity affiliated with the CDM, each CE would have to demonstrate to the Ex-Board that it possessed the technical competency and capacity required. Further, such CEs would be subject to periodic, random audits by the Ex-Board or its agent (e.g., the Certifications Group of Option 4) to ensure that the CE was conducting its certification processes as required and that the personnel performing such certification functions possessed the requisite skills and training. Some form of "qualifying" and/or "re-qualifying exam" might be used to ensure that CE staff were maintaining their skills consistent with current technology, etc.

**Remedies Following Audit Deficiency -**

**Option A:** Require each CE to maintain the equivalent of a performance bond through a recognized/approved surety which could be looked to in the event an audit discovered that the CE had not performed certifications as required and thus made all, or a portion of, such reductions invalid. To correct the matter, the surety would purchase on the open market reductions equal to those determined to be invalid. The amount of the performance bond required would be established by the Ex-Board on the basis of the volume of emission reductions being certified by a given CE.

**Option B:** Should an irregularity be discovered that raises questions concerning the validity of the reductions from a given project, previously certified reductions would be unaffected, but any pending/future reductions would be placed in suspension until the issues raised had been resolved and the project successfully recertified. If it is not recertified, suspended reductions from the time an irregularity is discovered would be invalid.

# A CDM Structure



DRAFT, 15APR98

**U.S. POSITION PAPER  
CLEAN DEVELOPMENT MECHANISM**

**ISSUE:** What actions must be taken in Bonn and in Buenos Aires to operationalize the Clean Development Mechanism?

**BACKGROUND:**

The Clean Development Mechanism was created in a burst of creative energy immediately prior to and during the third session of the Conference of the Parties to the Framework Convention on Climate Change. It was largely the result of a merger between the U.S. proposals for "joint implementation" between developed and developing countries, and the Brazilian proposal to establish a fund to support actions in developing countries.

As incorporated into the Kyoto Protocol, Article 12:

- Provides for the functional equivalent of joint implementation with developing countries.
- Provides for Annex I Parties to be able to meet part of the target (to be defined by the COP/MOP) for emissions reductions from project activities in non-Annex I countries.
- Calls for emission reductions to be certified by operational entities to be designated by the COP/MOP, based on:
  - voluntary participation by each involved Party;
  - real, measurable and long-term benefits related to mitigation of climate change (which would include sinks projects);
  - reductions in emissions that are additional to any that would occur in the absence of the activity (note that this standard apparently differs from that in Article 6 of the Protocol on Joint Implementation).
- Calls for the establishment of an executive board to supervise the CDM.
- Calls for the COP/MOP to ensure that a share of the proceeds from certified activities is used to cover administrative expenses, as well as assist particularly vulnerable developing country Parties (such as small island states) to adapt to climate change.
- Makes clear, as with the provisions in Article 6 on joint implementation, that the private sector may participate; participation may either involve investing in project activities that yield emissions reductions or acquiring certified emissions reductions without such investment.
- Significantly, provides for early credit in that certified reductions obtained from 2000 up to 2008 can be used to meet the target.

While a significant number of operational issues are raised by the text of the Protocol, little guidance is given as to how the Parties are to proceed to elaborate the mechanism. In spite of U.S. requests for consideration of issues related to the CDM at COP-4, the decision taken at COP-3 on next steps only provided for:

-2-

"... the Chairman of the Subsidiary Body for Scientific and Technological Advice and the Chairman of the Subsidiary Body for Implementation . . . to give guidance to the secretariat on the preparatory work needed for consideration by the Conference of the Parties, at its fourth session on the following matters. . . : (e) Analysis of the implication of Article 12, paragraph 10, of the Protocol."

However, we understand that the June 1998 agenda for both Subsidiary Bodies includes an item on the CDM, and we anticipate a more thorough discussion than one limited to pre-budget period project certification (as referred to in Article 12.10).

### U.S. POSITION

While questions remain on operational issues for the CDM, consensus has been reached on large number of CDM elements. Given that the Protocol allows credits from projects to be counted after 2000, there is considerable urgency to developing the operational rules and modalities for the CDM. Thus, even though certification of individual projects is required by the COP/MOP (or perhaps by entities it designates), and no actual credit can be received until after the agreement enters into force, the private sector may still plan for, and bank for later credit, any projects begun after the year 2000 that ultimately meet applicable criteria. The following are some of the key elements on which the U.S. should take a clear stand in Bonn, in intersessional meetings, and in Buenos Aires:

- It should be noted that other ACAP countries have suggested an alternative interpretation of the relevant provisions of the text, namely that the COP/MOP is not authorized to set a limit on CDM; rather the COP/MOP more generally, is to determine how Annex I Parties may use certified emissions to satisfy Article 3 commitments. It is premature to recommend any limits on CDM activities now. For the time being, the focus should be on encouraging CDM activities, not creating a chilling effect by imposing a limit.
- Sink activities should be allowed under the CDM. Thus, we need to create operational guidelines to allow a determination of "additionality" for sink projects. Such a determination should not be limited to projects in afforestation or reforestation - but should not preclude any aspects of sustainable forest management.
- The "share of the proceeds" should be defined to apply to the value of the emissions reductions achieved by the project - not the value of the underlying project itself.
  - The total percentage that should be allowed should be low - perhaps in the range of 2-3 percent.
  - We may wish to consider a "sliding scale" so that the larger the magnitude of emissions reduced the lower the percentage that might apply.
  - It has also been suggested that the percentage be calculated in terms of emissions credits, and not of US dollars or other national currency.
- The list of countries eligible to receive adaptation funds from the CDM should be limited. Where possible, it should be confined to countries "particularly vulnerable to the adverse effects of climate change" (largely the small island states, or perhaps countries facing significant desertification threats).

*how do we know who is vulnerable?*

*how will these countries use B? should we require that they have plans?*

- There will be a need to develop appropriate mechanisms to administer the adaptation portion of the mechanism; preferably the administration should be by an existing international entity with a track record in project development, disbursement and oversight.
- In order to avoid any conflict of interest, CDM "operating entities" that verify reductions should not administer CDM adaptation funds.
- The Montreal Protocol Executive Committee structure, with weighted voting for donors, may be used as a model for the CDM Executive Board. Alternatively, a GEF-like structure, while much larger, may be considered as a model. In any event, the Board should not be an open-ended body if it is to be effective in its supervisory role.
  - The Board should be limited to 10-15 members, representing Parties, and if possible, with professional expertise in matters related to project development and project funding, as well as in climate change mitigation. Board members should serve terms of 3-5 years with no renewals.
  - Parties should be asked to nominate candidates with appropriate expertise. Ideally there would be an equal number from developed and developing countries - but we should seek to avoid strict "regional representation" and instead focus on competence.
  - Additional thought must still be given to the specific tasks to be undertaken by the Executive Board. However, we would anticipate it would perform a regular assessment of the operation of the CDM, and report on progress - and possible modifications to CDM procedures - to the COP/MOP for action. We would not anticipate that the Board would have any role in project selection or project review or verification - such responsibilities would be left to the operational entities.
- CDM operational entities should make use of multiple existing institutions. Entities should be selected on the basis of their expertise in dealing with project development financing.
  - While stock exchanges may have the financial expertise, it is not clear they have adequate project experience; we may instead choose to focus our attention on the regional development banks, UNDP or other development institutions for this function.
  - Operational entities would also be responsible for project verification and monitoring, although on an individual basis, this task could be delegated to private contractors.
- Inasmuch as it can be applied, decisions on project criteria (including for additionality, for assurance of real, measurable and long-term benefits, and for auditing and verification) should be drawn from the experience of the AIJ pilot phase.
  - Simplified reference cases should be developed so that project developers have clear guidance on what kinds of projects will be accepted, and can plan accordingly. However, the absence of generalized rules should not be grounds for excluding a specific project; projects falling outside of agreed criteria may be subject to certification on an individual basis by the operating entities or under the supervision of the Executive Board.

Simplified reference cases is a difficult approach because projects are not independent in terms of their effects on emissions

## STRATEGIC ISSUES

-4-

Notwithstanding the desirability of operationalizing the CDM, there is some concern that the mechanism will ultimately detract from the more desirable goal of engaging developing countries in taking legally binding targets – and, as an incentive, becoming part of the emissions trading regime. However, in the near term, it seems unlikely that countries such as China will accept targets, and the advantage of engaging them (and others) in meaningful emissions reductions is well worth the effort invested in the CDM.

Recognizing its potential to generate project related financing, developing countries are likely to be extremely interested in the CDM. As a consequence, it may be possible to leverage this interest into support for other aspects of the U.S. position. However, a decision will need to be made about trade-offs between this element and other aspects of the U.S. position – and what priorities we assign to the use of this leverage.

## IMPLEMENTATION STRATEGY

Unlike other flexibility mechanisms, the CDM is likely to have a relatively high level of developing country support. While significantly different than the original Brazilian proposal (which had also been incorporated into the G-77 text), the current structure of the CDM benefits from having elements of this initial concept. In addition, there will be strong proponents for the key elements of a U.S. proposal.

With respect to the issue of what part of a budget may be offset by CDM credits, we can expect countries which anticipate benefits from projects to support either no limit at all, or at least a very non-restrictive level. Such benefits accrue not only to those where investments are likely (e.g., big developing countries, as well as countries in Central America such as Costa Rica), but also countries in AOSIS that are likely to benefit from the CDM funds set aside to pay for adaptation. Early diplomatic efforts should stress this advantage in seeking allies.

We anticipate that the EU will have a number of concerns about the CDM effort. They have suggested that no Party may meet more than 50 percent of their commitment through flexibility mechanisms, and have also argued for extremely limiting rules and guidelines in discussion of AIJ projects criteria. They may be most readily persuaded through a combination of (1) finding themselves isolated on this issue, with other JUSCANZ and developing countries supportive of our proposals and procedures, and (2) arguing that without meaningful participation of developing countries we will not ratify – and that the CDM may provide some component of such meaningful participation. Even with these arguments, we may anticipate a significant level of opposition to the CDM from the EU, and their insistence on too rigorous rules to enable the ready flow of capital and technology to developing countries.

The FSU and Eastern European countries may fear that the CDM will divert funds away from their projects to less expensive offsets in the developing world. For this group, it would be appropriate to indicate that the added expense of project administration could be prohibitive – and that most funding could still be expected to go to emissions trading. We may also indicate to this group (as with those in the EU), that the mechanism provides an initial basis for participation by developing countries, essential for US participation in the CDM and in JI or trading.

We may also anticipate a number of international institutions seeking to become the operational entities of the CDM. Already, we have seen proposals from the World Bank (with its Carbon Initiative) and from the GEF, as well as informal indications that UNEP is seeking to become the entity to perform monitoring and assessments of projects. Each of these organizations will have proponents in the international community – and many may have substantial funds to devote to such an effort. The U.S. will need to decide on their role, and perhaps use them in building coalitions for our own view of the CDM.

cc: JAF  
RL  
JA

Discussion Paper  
Clean Development Mechanism: Answers  
(1/15/98)

Timing

**How much needs to be decided by COP-4?**

We need to have as much as possible decided by COP-4, under either of two assumptions. If the Administration decides not to sign the Kyoto Protocol until after COP-4 (to influence the adoption of various important decisions in Buenos Aires), we will need to specify clearly what we want well before COP-4 and use COP-4 to get as much of it as we can. Only if we are satisfied with the outcome at COP-4 would we then move to sign – and any leverage we get from withholding signature runs out after COP-4, because Convention subsidiary bodies are not likely to meet again (and the COP clearly will not meet again) before March 1999 when the signature period lapses. Thereafter, the U.S. would need to accede.

If we decide to sign the Protocol in March or in any event before COP-4, we will still need to get most of what we need quickly. If we do not, it will be difficult to send the Protocol to the Senate for advice and consent because we will be giving opponents another target to shoot at.

In addition, we want to move on the CDM as quickly as possible because certified project activities can count against emissions reductions commitments in the 2008-12 budget period as early as 2000. The private sector will need to know how the CDM will work as early as possible before the year 2000 in order to begin structuring their investments in project activities in developing countries appropriately. }

If we delay getting what we need on the CDM until after COP-4, our next opportunity to get it would be COP-5, presumably in late 1999 (but the COP could decide not to meet until sometime in the year 2000). That will be rather late for the U.S. private sector in terms of planning their investment strategies. In effect, the more time that goes by without having what we need, the more people will begin to question whether the CDM will prove workable – with the many other issues that we face, we do not want to be on the defensive with this one.

This said, some issues with respect to the CDM are more important to resolve at COP-4 than others (more fully discussed herein). We can, and perhaps should, take more time to deal with the less immediate items because we will have more and better information later on which to make some decisions.

activities are a “loophole” in the targets imposed by Article 3 – and they may advocate closing this loophole as much as possible.

Those with concerns about (or opposed to) “flexibility” may seek to argue that developed country Parties should not be allowed to use any of the flexibility provisions in the protocol (joint implementation, emissions trading and/or Clean Development Mechanism project activities), alone or in combination, to account for more than 49 percent of their reduction commitments. Some may even seek to limit these flexibility provisions to a lower percentage.

Advocates of such restrictions will have difficulty making their case with respect to joint implementation and emissions trading because the protocol does not define “supplemental” and does not ask the Parties to take a decision in this regard. However, they will have an opportunity to push restrictions on how much will count under the CDM because of the need under Article 12.3(b) for a COP/mop decision.

Those anxious to see CDM project activities go forward (many developing countries, generally) and those anxious to ensure that the CDM generates funds for adaptation (particularly AoSIS) may resist an overly restrictive approach. Still, we are likely to have a difficult time pushing a high percentage for CDM project activities to count against emissions reductions commitments, while perhaps simultaneously defending against efforts to restrict emissions trading and joint implementation.

The resolution of this issue in the context of all three “flexibility mechanisms” will be one of the biggest issues we face in Buenos Aires, surpassed only, perhaps, by the broader issues of “meaningful participation of developing countries.”

Imposing a ceiling at any level on CDM project activities will create a number of problems – how will a country know, much less an individual company, whether a given project activity will “count” against a country’s reduction target, particularly as a country approaches its ceiling? If a project activity exceeds any ceiling imposed in one budget period, can the reductions be “banked” against subsequent budget periods?

Countries may need to develop implementation strategies that include specific projections or targets of how much they plan to accomplish domestically, how much through joint implementation, how much through emissions trading, and how much through the CDM– and these projections will not be easy to make because it is unclear, and will likely remain unclear for some time, what the real opportunities are or will be in the areas of joint implementation, emissions trading and the CDM.

In addition, we face the issue of how a Party will make up the difference should its projection with respect to CDM reductions not be realized in practice. The fact that CDM project activities from the year 2000 until the beginning of the 2008-12 commitment period can be used to assist in achieving compliance in the first commitment period should help in making projections, however. Since these activities are likely to

**What share of the proceeds from certified projects should be collected by the CDM for administrative expenses and adaptation?**

*Administrative fees  
- Political refs*

In the case of either administrative expenses or adaptation, the answer to this question will likely depend on projections of the volume of traffic under the CDM. In its original proposal for a Clean Development Fund – which was supported by the G-77 and China -- Brazil indicated that 10 percent of the funds collected could be used for adaptation projects. Similarly, in Kyoto, a key representative of the Alliance of Small Island States (AoSIS) suggested that about 10 percent should go to adaptation under the Clean Development Mechanism; however, this same AoSIS representative acknowledged that much would depend on the volume and value of project activities under the CDM. He said that if there is substantial volume, perhaps 10 percent would be too high; if volume were lower, perhaps 10 percent would be about right. In any event, it is reasonable to assume that even AoSIS countries (likely to be the primary beneficiaries of the adaptation feature of Article 16-bis) do not anticipate that more than 10 percent would go to adaptation projects. It is also possible that the Parties should consider a sliding scale – the larger the project activity, the smaller the percentage.

A key question arises, however, concerning a percentage of what? Article 12, paragraph 7, talks about “a share of the proceeds from certified project activities” will be used to cover administrative expenses and adaptation costs – but is this a share of the value of a project, or simply a share of the value of the emissions reductions achieved in the project?

In the interest of preserving the CDM as a workable “flexibility mechanism” we clearly and forcefully support the second interpretation. It is inconceivable that the private sector in any country would take the CDM seriously if “proceeds” were defined to mean proceeds from the underlying activity, not proceeds from the value of the emissions reductions achieved as the result of the underlying activity. However, achieving such an understanding may be difficult because resolution of this question has huge financial implications and some (unrealistic) colleagues may be difficult to persuade.

Fortunately, because we were able to beat back a last minute effort by OPEC to open up use of these “adaptation funds” to a broader range of developing countries, AoSIS is likely to be the chief (and perhaps only) interlocutor on this issue. And fortunately, too, AoSIS representatives are sensible – they understand that setting too high a percentage will discourage participation in the CDM, and they also understand that a small percentage of a large volume may be worth far more than a large percentage of a small volume. They may also support a sliding scale.

Some representatives of the U.S. private sector seemed to indicate in Kyoto that 2-3 percent might be reasonable. Presumably this level would include both administrative and adaptation costs.

Notwithstanding the importance of resolving this question, the immediate need for doing so would seem less pressing than with respect to the other questions here. Also, the operating entities of the CDM may have some important thoughts in this regard -- they will be responsible for scoring projects and will want to ensure the accuracy and reliability of their determinations.

More important, in the near term, will be the instructions, guidance or charter given by the COP to the operating entities it selects. Those entities will want to know with some precision exactly what they are being asked to do, how they should go about it, what criteria should be applied in scoring project activities, etc. We could, and perhaps should, interpret the issue of "modalities/procedures for ensuring transparency, efficiency and accountability" as a way of beginning to deal with the broader issue of what instructions, guidance or charter should be given by the COP to the operating entities selected.

**Other (for example, should there be guidance to the operational entities on what constitutes "real, measurable, and long-term benefits related to the mitigation of climate change" or "additionality"?)**

Answering this question raises the issue of the relationship between the CDM and the Pilot Phase for Activities Implemented Jointly. In the AIJ Pilot Phase, Convention Parties are seeking to develop approaches to the kinds of questions asked here. We should seek to use information and approaches developed in the pilot phase and build on them in providing such guidance to the operational entities.

The answer to the specific question is "yes -- there should be operational guidance on these issues" -- at least broad operational guidance that will give the operating entities enough to work with. Ultimately, there is a need for an iterative process -- the operational entities will need to operate (much as the Global Environmental Facility does) under broad operational guidance from the COP -- but there will also be a need for reporting back to the COP by the operational entities and for refining approaches as the CDM becomes operational.

Again, however, the need to resolve this question is not as immediate as the need to resolve other questions here. We may have more time with this one and may not need to resolve it by Buenos Aires in November.


### **Institutional Issues**

#### **What form should the CDM executive board take?**

It has been impossible thus far under the Convention to constitute any body with limited membership (recall the painful process with respect to Technical Assessment Panels -- which still have not been established). However, if we want the executive board to work and be effective, it will be vital that it not be open-ended. There would seem to

conflicts of interest. It would also seem desirable to keep these functions distinct because, particularly if stock exchanges or the like serve as operational entities, it is not clear they have any expertise in project development and financing or could take on the additional task of serving as a financial institution. Representatives of the European Union, many of whom have long experience with the GEF and Multilateral Development Banks, were particularly concerned that we not confuse these two functions and that responsibility for disbursing money to adaptation projects be given to an entity or entities with experience in project development and financing. Many also urged that this particular role be given to the GEF itself.

In the interest of building support among our European allies for the Clean Development Mechanism (and perhaps ensuring that we develop reasonable approaches in other areas under it), we should work closely with them on this particular question. In this sense, we should agree that the two functions be clearly separated.

cc: Am  
JA  
PL  


Office of Economic Policy

Department of the Treasury  
Washington, D.C. 20220

**FAX**

Date: 11/12/97  
Number of pages including cover sheet: 3

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Bill White	260-0275	260-4332
From: Jon Gruber	<b>202-622-2633</b>	622-0563

REMARKS:  Urgent  For your review  Reply ASAP  Please comment

Attached is the suggested language on US JI position.

Jon Gruber

## From Joint Implementation to Technology Transfer Credits

**The Current U.S. Position on JI.** The U.S. has proposed that Annex I countries be given credit for emissions reductions in other nations which, by some metric, are additional to the existing path of emissions. While this position has substantial business support in the U.S. it has, perhaps surprisingly, been met with strong opposition from the developing world. This appears to be largely based on the fact that the developing countries see little advantage to themselves from a JI system, despite the implied valuable technology transfer, since U.S. firms get all the credit

**An Alternative: Technology Transfer Credits.** Under this system, developing countries would directly reap the benefits from carbon-reducing investments made within their borders. More specifically:

- The World Bank, or some other multilateral institution, would be authorized to issue Technology Transfer Credits (TTCs) for investments that offer incremental reductions from business-as-usual emissions in developing countries. Incrementality would be assessed by independent engineers, either through a comparison to existing average emissions for an investment of that type, or through estimates of how this project deviates from the minimum cost project that ignores carbon reduction. One credit would be issued for each ton of incremental carbon reduction.
- The credits would be issued directly to the country in which the investment takes place. These credits could be used in a number of ways:
  - They could be traded into the Annex I international trading scheme, with the developing country receiving the current market clearing price as a cash transfer
  - They could be directly used to pay down existing debt to the World Bank or other multilateral institutions
  - Some share of the credits could be given to the investing companies as an inducement to place their investment in that country, and as an incentive to attract the most incrementally beneficial project. For example, companies could offer to bid a power plant contract, with the winner receiving a share of the credits for the incremental reduction in emissions.
- The bottom line is that, with the TTC system, developing countries *win in two ways*: they get a cutting edge technology transfer, and they get a cash transfer.
- For U.S. companies, this alternative is much better than the absence of JI, which is currently strongly opposed by the developing world. They will undoubtedly share in the credits received by developing countries, providing an extra return to environment-friendly investments abroad.
- This approach can also be molded to be responsive to the Brazil plan supported by

4/13 GCC mtg - Sinks + CDM

Wahage paper - CDM/JI/  
trading

intl trading - new paper w/in a day

developing country - new paper - Anna Pence coordinating

- multiple developing countries papers - sherpa

sons sherpa

Sinks

IPCC work

how could methodology in sinks be written into rules on trading?

→ EPA wants uniform guidelines

- concerned that lack of uniformity could complicate  
compliance, enforcement, trading

→ est. U.S. rules that we could/world only buy  
sink tons generated under U.S. guidelines

use IPCC process by 1999 (if possible) to do guidelines/  
methodologies

next mtg: Wed 3pm

4/15/98 GCC mtg - State

RFF conference: 6/19-6/20 "Annex I Trading: Understanding Different Views"

Look over January U.S. protocol position language on intl trading

## CDM

Montreal Protocol as a template for CDM

see CDM structure handout from Abe

Grardiner - could get 1/3 of US commitment thru CDM prior to 2008 - call Al McFarland about this analysis

see AII rules - may serve as basis for CDM rules

Wed, 4-6pm next week, WH Conf. Ctr. (perhaps 2 mtgs - 1 prior to Wed)

next mtg: Compliance  
process

CDM Deputies Mtg 8/3/98

Define "part of" - umbrella only countries opposed to defining  
Italy has tied definition of "part of" w/ other flex mech  
restrictions

Sinks won't be resolved @ B.A. bc of IPCC sink process

Canadian ministerial - perhaps have 3 co-chairs present a  
paper on CDM analogous to umbrella trading paper

Draw from G-77 Qs + As

Restrictions on Trading paper (CEA-Treasury paper)  
call JP

Doniger @ EU ideas on how to make it work

Option 2

- buyer beware / buyer liability

just by registering does not generate credits, still need retroactive approval

Focus on benchmarking paper

Decision Memos on 3,3, liability

Wed mtg on liability