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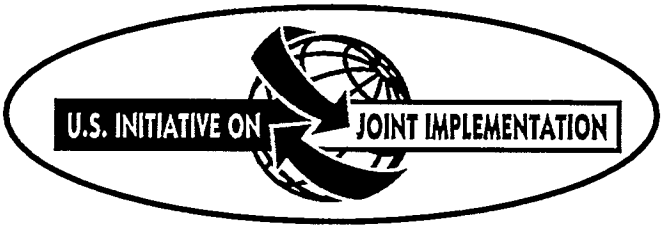
Activities Implemented Jointly: First Report to the Secretariat of the United Nations Framework Convention on Climate Change



Accomplishments and Descriptions of Projects Accepted Under the U.S. Initiative on Joint Implementation

Submitted by the
Government of the United States
July 1996

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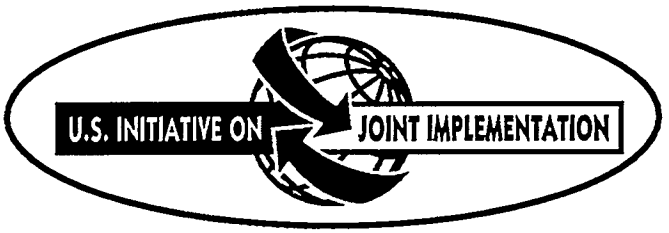

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Preface

Recognizing the need to address climate change at the global level, the United States has supported activities to avoid, sequester, or reduce emissions of greenhouse gases (GHG) both domestically and internationally. In the U.S. view, efforts between countries or entities within them to reduce net greenhouse gas emissions undertaken cooperatively – called joint implementation (JI) – hold particularly significant potential for combating the threat of climate change and promoting sustainable development.

Joint Implementation offers the potential to achieve greater emissions reductions than would be likely if each country pursued only domestic actions, and can achieve these reductions more cost effectively on a global basis. Joint Implementation can also spur technology cooperation, for example by increasing the spread of energy-efficient and renewable-energy technologies, including providing countries with additional training and capacity building, while stimulating export markets.

As with any actions to reduce net GHG emissions – whether implemented within one country or jointly among partners – it is important that the quantitative reductions claimed be verifiable. Claimed reductions need to be accompanied by transparent supporting analysis and by follow-up to evaluate the success of long-term projects in achieving real emissions reductions. With the goal of testing criteria for joint implementation the United States supported the inauguration of the international pilot phase, known as "Activities Implemented Jointly" (AIJ), adopted at the first Conference of the Parties in April 1995.

To help inform international discussion on this issue, the United States submits this first report on the accomplishments and lessons learned from the U.S. Initiative on Joint Implementation (USIJI) to the Secretariat of the U.N. Framework Convention on Climate Change (FCCC). This report follows the recommendations of the Conference of the Parties on the pilot phase for joint implementation as set forth in Decision 5/CP.1 of FCCC/CP/1995/7/Add.1, and as elaborated by the Subsidiary Body for Scientific and Technological Advice (SBSTA) in its "Initial Framework For Reporting Activities Implemented Jointly" (adopted during the SBSTA's second session, from February 27 to March 4, 1996, in coordination with the Subsidiary Body on Implementation).

Executive Summary

More than 150 countries are now Party to the United Nations Framework Convention on Climate Change (FCCC), which seeks, as its ultimate objective, to stabilize atmospheric concentrations of greenhouse gases at a level that would prevent dangerous human interference with the climate system. As a step toward this goal, all Parties are to take measures to mitigate climate change and to promote and cooperate in the development and diffusion of technologies and practices that control or reduce emissions and enhance sinks of greenhouse gases.

In the U.S. view, efforts between countries or entities within them to reduce net greenhouse gas emissions undertaken cooperatively – called joint implementation (JI) – holds significant potential both for combating the threat of global warming and for promoting sustainable development. To develop and operationalize the JI concept, the United States launched its Initiative on Joint Implementation (USIJI) in October 1993, and designed the program to attract private sector resources and to encourage the diffusion of innovative technologies to mitigate climate change.

The USIJI provides a mechanism for investments by U.S. entities in projects to reduce greenhouse gas emissions worldwide and has developed a set of criteria for evaluating proposed projects for their potential to reduce net GHG emissions. The criteria are designed to identify -- and allow the USIJI to "accept" -- projects that:

- Support the development goals of the host country while providing greenhouse gas and other environmental benefits.
- Produce measurable reductions in addition to reductions likely to result in the absence of the project.
- Can be monitored and tracked.
- Will not result in net greenhouse gas emissions elsewhere or otherwise have significant secondary environmental impacts.
- Have enduring impact.

To date, the USIJI has received 51 project proposals. Of these, 15 projects have been accepted (see Table 1). These projects represent a diverse set of innovative technologies and practices in six countries, and include projects developing renewable energy sources such as solar, biomass, and hydroelectric power, and land-use change projects leading to better forest management, reforestation and afforestation.

Aggregating preliminary estimates presented to the USIJI by project developers suggests that cumulative net emission reductions as a result of these projects are expected to be nearly 30 million metric tons of carbon (mt C) equivalent. While the USIJI does not certify project estimates prospectively, it does set forth provisions for monitoring and verifying emissions reductions as they occur. Furthermore, accepted

projects, when fully implemented, are expected to lead to significant financial and technical investments in host countries.

Additional proposals considered by the USIJI include submissions for projects in 12 countries and in such other technical areas as methane reduction from livestock and waste treatment. Eight of these proposals were withdrawn and another ten were not accepted. However, 18 of these proposals have been placed "In Development" and will receive limited technical support in order to assist them in fully meeting USIJI criteria for acceptance.

To test the USIJI criteria and to provide input into the international pilot phase, the United States intends to promote the development of other "acceptable" projects, and to seek additional information on the experience of individual developers during project implementation. As a supplemental effort, the USIJI seeks to assist countries in developing their national joint implementation programs and to this end has developed not only a domestic outreach effort, but also sponsors regular international workshops, produces a USIJI newsletter, and maintains a Home Page on the World Wide Web.

The following table and project descriptions provide an overview of USIJI projects that have been accepted as of April 1, 1996. While host governments have accepted or approved each such project, they have not in all cases had an opportunity to review or endorse the description contained in the detailed discussion provided in Part 3, "USIJI Projects," of this report.

Table 1: Projects Accepted into the United States Initiative on Joint Implementation as of April 1, 1996

Project Title	Sector[1]	U.S. Participants	Host Country Participants	Start Date[2]	Project Duration[3] (Years)	Cumulative Project GHG Emission Reductions[4] (mt C)	1995 Emissions Reductions[5]
Belize							
Rio Bravo Carbon Sequestration Pilot Project	Land Use and Forestry	a) The Nature Conservancy b) Wisconsin Electric Power Company c) Detroit Edison d) Pacificorp e) Cinergy	Programme for Belize	1995	40	1,300,000	Not yet determined
Costa Rica							
Aeroenergía S.A. Wind Facility	Energy	a) Power Systems, Inc. b) Bluefields, International c) EnergyWorks	Aeroenergía, SA	1997	20	9,800	N/A

[1] See the IPCC Guidelines for National Communication for Sector definition.
[2] The start date refers to the date the project will begin reducing GHGs.
[3] Project duration refers to the estimated functional lifetime of the project, not necessarily the period over which GHG reduction are estimated to occur.
[4] Metric Tons of Carbon Equivalent. Reduction estimates are estimates developed by USIJI project developers. The USIJI program does not accept these estimates per se, but will be monitoring and verifying emissions reductions as they are attained.
[5] Most projects will not begin reducing GHG emissions until after 1995. The USIJI has not yet finalized a process for monitoring and verifying emissions reductions from projects with 1995 emissions reductions.

Table 1: Projects Accepted into the United States Initiative on Joint Implementation as of April 1, 1996

Project Title	Sector[1]	U.S. Participants	Host Country Participants	Start Date[2]	Project Duration[3] (Years)	Cumulative Project GHG Emission Reductions[4] (mt C)	1995 Emissions Reductions[5]
BioDiversifix: Forest Restoration	Land Use and Forestry	The Nature Conservancy	a) Guanacaste Conservation Area b) National System of Conservation Areas c) National Institute of Biodiversity	1996	50	5,040,000	N/A
CARFIX: Sustainable Forest Management	Land Use and Forestry	Wachovia Timberland Investment Management	a) Foundation for the Development of the Central Volcanic Mountain Range b) MINAE	1996	25	5,939,000	N/A
Doña Julia Hydroelectric Project	Energy	New World Power Corporation	a) MINAE b) Compañía Hidroeléctrica Doña Julia	1996	15	57,400	N/A
ECOLAND: Esquinas National Park	Land Use and Forestry	a) Tenaska, Inc. b) Trexler and Associates, Inc. c) National Fish and Wildlife Foundation	a) COMBOS Foundation b) MINAE c) Council of the Osa Conservation Area	1996	15	345,500	N/A

Table 1: Projects Accepted into the United States Initiative on Joint Implementation as of April 1, 1996

Project Title	Sector[1]	U.S. Participants	Host Country Participants	Start Date[2]	Project Duration[3] (Years)	Cumulative Project GHG Emission Reductions[4] (mt C)	1995 Emissions Reductions[5]
Klinki Forestry Project	Land Use and Forestry	Reforest the Tropics, Inc.	Cantonal Agricultural Center of Turrialba	1997	40	1,968,000	N/A
Plantas Eólicas Wind Facility	Energy	a) Merrill International, Ltd. b) Charter Oak Energy, Inc. c) Northeast Utilities d) KENETECH Windpower, Inc.	Plantas Eólicas S.A	1996	15	71,800	N/A
Tierras Morenas Windfarm	Energy	New World Power Corporation	a) MINAE b) Energía del Nuevo Mundo S.A c) Molinos de Viento del Arenal S.A	1997	15	51,000	N/A
The Czech Republic							
City of Decin: Fuel-Switching for District Heating	Energy	a) Center for Clean Air Policy b) Wisconsin Electric Power Company c) Commonwealth Edison Company d) NIPSCO Development Company, Inc.	City of Decin	1996	25	165,600	N/A

Table 1: Projects Accepted into the United States Initiative on Joint Implementation as of April 1, 1996

Project Title	Sector[1]	U.S. Participants	Host Country Participants	Start Date[2]	Project Duration[3] (Years)	Cumulative Project GHG Emission Reductions[4] (mt C)	1995 Emissions Reductions[5]
Honduras							
Bio-Gen Biomass Power Generation Project	Energy	a) Nations Energy Corporation b) International Utility Efficiency Partnership c) Add-On Energy 1	Biomasa-Generacion	1998	20	647,400	N/A
Solar-Based Rural Electrification	Energy	Enersol Associates, Inc.	a) COMARCA b) AHDEJUMUR c) AHDE	1996	20	4,700	N/A
Nicaragua							
El Hoyo - Monte Galan Geothermal Project	Energy	Trans-Pacific Geothermal Corporation	C and R, Incorporated	1999	35	5,391,000	N/A

Table 1: Projects Accepted into the United States Initiative on Joint Implementation as of April 1, 1996

Project Title	Sector[1]	U.S. Participants	Host Country Participants	Start Date[2]	Project Duration[3] (Years)	Cumulative Project GHG Emission Reductions[4] (mt C)	1995 Emissions Reductions[5]
Russian Federation							
RUSAFOR: Saratov Afforestation Project	Land Use and Forestry	a) Oregon State University b) U.S. Environmental Protection Agency (EPA)	a) Saratov Forest Management District, Russian Federal Forest Service b) International Forestry Institute (Moscow and Volga Regional Branches)	1995	60	35,000	Not yet determined
RUSAGAS: Fugitive Gas Capture Project	Energy	a) Oregon State University b) U.S. EPA c) Sealweld Corporation d) Sustainable Development Technology Corporation	a) GAZPROM b) Center for Energy Efficiency	1997	25	8,182,000	N/A
Totals						**29,208,200**	

BELIZE

Rio Bravo Carbon Sequestration Pilot Project

This project combines land acquisition and a sustainable forestry program to achieve carbon reductions. The project has two components. Component A involves the purchase of a parcel of endangered forestland to expand existing protected areas. Component B involves the development of a sustainable forestry management program that would increase sequestration for a portion of the Rio Bravo Conservation Management Area (RBCMA) that includes the purchased parcel. In a later phase, this program will be expanded beyond the boundaries of the RBCMA. Several U.S. electric power utilities and a nongovernmental organization (NGO) are participating with a host country conservation organization.

COSTA RICA

Aeroenergía S.A. Wind Facility

This project will develop a 6.4-megawatt private power wind facility using 16 latest generation wind turbines. The facility is expected to generate 27 gigawatt-hours per year. This electricity will be sold to the national utility company and will displace electricity currently generated by burning fossil fuels. The U.S. partners in the project include a system integrator and trading company that is currently providing technical assistance in equipment procurement, and an international financial consulting and investment company with extensive experience in renewable energy and environmental project development. The host country partner is an energy development company. A Danish company that specializes in wind turbine technologies is also participating in the project. Participants currently anticipate financing the project with a combination of debt and equity.

BIODIVERSIFIX Forest Restoration Project

Originally submitted as two proposals (WETFIX and DRYFIX), this is a carbon sequestration project in northwest Costa Rica. This project will regenerate tropical wet and dry forest, expand the existing adjacent preserve, and implement sustainable forest management plans. Sustainable uses may include low-impact, controlled ecotourism and minor

regeneration of fine hardwoods. Income generated from carbon sequestration offsets and non-damaging biodiversity harvests will be used to cover project costs, as well as increase the endowment for future management projects. The project participants for the host country are a quasi-governmental organization with many years of experience managing biodiversity, an NGO created to gather information on, and develop sustainable uses for, the biodiversity resources of Costa Rica, and a government organization. The U.S. participant is an NGO devoted to land conservation and biodiversity.

CARFIX: Project to Stabilize Existing Forest and Expand Forest Cover

The purpose of this project is to stabilize the existing natural forest within a national park in central Costa Rica, and to provide additional forest cover in a buffer zone surrounding the park. The project will expand the existing forest cover in the buffer zone by instituting sustainable forest management, natural regeneration, and reforestation. Funding for buffer zone activities will support outreach activities as well as annual payments to private landowners for progressive forest management activities, including selective harvesting and low-impact logging techniques following individual forest management plans developed for each landowner's parcel. Funding will also be used to purchase private holdings in the park. The U.S. participant is a private timber investment company. Host country participants include a government ministry and an environmental NGO.

Doña Julia Hydroelectric Project

This project will construct a 16-megawatt hydroelectric plant in northern Costa Rica. Annual average generation is estimated to be approximately 90 GWh. This hydroelectric-generated power will be sold to the national utility company and will displace electricity that would have been generated by fossil fuel-burning thermal units. As a small-scale hydropower plant, the Doña Julia facility will also have less impact on the environment than would a large dam. The U.S. participant is an independent power producer and a global producer of electricity from renewable energy. Host country participants include a power generation company and a government ministry. The project will be financed with a combination of debt and equity.

ECOLAND: Esquinas National Park

The objective of this project is to permanently preserve the carbon sequestration capacity of forestland inside a National Park, located in southwestern Costa Rica. The land, which is under threat of conversion to agricultural use, will be purchased for management as a permanently protected tropical forest. In addition to providing a carbon sink, the project also will have other environmental benefits, including preservation of the region's biodiversity and habitats for endangered species, reduction of soil erosion, and maintenance of water quality. One of the U.S. partners is a limited partnership consisting of several energy service companies. Another U.S. partner is a recognized leader in the emerging field of identifying and implementing greenhouse gas emissions reduction and offset strategies, while a third is an environmental NGO. The Government of Costa Rica and a forest conservation foundation are the host country partners. An Austrian NGO is also participating.

Klinki Forestry Project

The proposed project would promote planting of Klinki pine intermixed with native and tree species on private farms. Klinki pine is a very fast-growing, high-quality tree species native to Papua New Guinea (PNG). The trees will be propagated in a forest nursery of the Costa Rican partner, a leader of on-farm tree planting in Costa Rica for more than three decades. Trials with Klinki in Costa Rica have shown excellent growth on a wide variety of sites. Long-term carbon storage in Klinki would occur in trees maintained onsite in some cases (Klinki is long-lived and attains immense size in PNG) and in treated utility poles and other durable forest products in other cases. The U.S. participant is a not-for-profit company speciãlizing in developing new, high-value agricultural and forest products in Costa Rica. The host country participant is a self-financed nonprofit organization that has been developing farm crops in Costa Rica for more than 25 years.

Plantas Eólicas S.A. Wind Facility

A 20-megawatt private wind powerplant currently under construction, this project is located in central Costa Rica. The wind electric plant will be the first and largest commercial-scale wind installation in Latin America. It was scheduled to begin commercial operation in spring 1996. Electricity generated by the project will be sold to a national utility company and will displace electricity currently generated by the burning of fossil fuel. The host country participant is an

organization created for the purpose of developing a wind project in Costa Rica. U.S. participants include a private power development subsidiary of a utility, a leading international private power developer, and a manufacturer of wind turbines.

Tierras Morenas Windfarm

The project will construct a 20-megawatt wind powerplant. The power generated from 40 wind turbines will be sold to the national utility company and will displace electricity that would have been generated using fossil fuel-fired thermal generating units. The facility will use the world's first direct drive wind turbines, which automatically adjust to changes in wind velocity for maximum efficiency. The U.S. participant is an independent power producer and a global producer of electricity from renewable energy. The host country partners are private companies and a government ministry. The project will be financed through private sources of capital, with a combination of equity and debt.

CZECH REPUBLIC

City of Decin: Fuel Switching for District Heating System

The objective of the Decin Project is to reduce greenhouse gas and other emissions through a combination of fuel-switching, cogeneration, and distribution system improvements. The City of Decin, one of the most polluted cities in Northern Bohemia, also anticipates substantial health benefits from accompanying reductions in sulfur dioxide and particulate emissions. A district heating plant that currently burns locally mined brown coal (lignite) will be converted to burn natural gas delivered by pipeline from Russia. The converted plant will provide both heat and potable hot water to local apartment blocks. A cogeneration facility for the production of steam and electricity also will be built, and improvements will be made to the distribution network to enhance the system's energy efficiency. U.S. partners include an NGO, electric power utilities, and a development company. The City of Decin is the host country partner.

HONDURAS

Solar-based Rural Electrification Project

The objective of this project is to reduce greenhouse gas emissions while generating a number of other economic and social benefits. The project will replace kerosene lamps with solar-powered electric lights in rural regions that do not have electricity service, reducing carbon emissions from the burning of kerosene combustion for lighting. Charging batteries with stand-alone photovoltaic modules also will displace the common practice of charging batteries on grid electricity, reducing emissions from fossil fuel combustion used to power the grid. The project is based on a model developed by the U.S. participant, a nonprofit organization, which has already successfully field-tested the model in the region. The host country participants include a coffee cooperative, NGOs, small businesses, and individual Honduran citizens.

Bio-Gen Biomass Power Generation Project

This project will develop a 15-megawatt biomass waste-to-energy plant in Honduras. Located near a region with a substantial forest products processing industry, the plant will use wood wastes as its fuel, consuming sawmill and logging residues that are currently disposed of through uncontrolled burning or dumped into rivers and other low-lying areas. The 15-megawatt plant represents the first of three planned phases; when complete, the facility will have a 45-megawatt capacity. The electricity will be sold to the main Honduran utility. U.S. participants include an affiliate of an electric utility, a trade association representing the inventor owned segment of the U.S. electric industry, and a biomass consulting firm. The host country participant is a limited partnership created to develop and implement the project. The project will be funded through a combination of equity and debt.

NICARAGUA

El Hoyo - Monte Galan Geothermal Project

This project will develop a privately owned and operated geothermal power project northwest of Managua. The project is planned as a staged development, with a 50-megawatt facility scheduled to be on-line in 1999 and upgraded to a 105-megawatt facility in 2001. The facility will use flashed steam technology, with hot water brought from the reservoir by

deep wells. The U.S. participant is a geothermal development firm. The host country participant is a Nicaraguan business developer.

RUSSIAN FEDERATION

RUSAFOR: Saratov Afforestation Project

This project was conceived as a Russian-American carbon offset forestry joint implementation demonstration project. Its objective is to evaluate the biological, operational, and institutional opportunities to manage a Russian forest plantation as a carbon sink in the context of joint implementation. The project has planted 450 hectares of native tree species in degraded steppe grasslands that do not naturally generate forest, and reforested 50 hectares of burned pine forest. Benefits include reduced soil erosion, enhanced soil nutrient content, and local employment. The U.S. partners are a university and a U.S. federal agency. The host country partners include a Russian forestry research institute and the Russian Federal Forest Service.

RUSAGAS: Fugitive Gas Capture Project

The project involves improvements to the natural gas transmission system. It is the first joint implementation fugitive natural gas emission capture project undertaken by the United States and the Russian Federation. The project will make improvements to the natural gas distribution system and evaluate the technological, operational, and institutional opportunities to reduce methane emissions in Russia's natural gas production and transmission system. U.S. participants include a university, a U.S. federal agency, a company with more than 25 years' experience in working with the gas and oil industry to reduce fugitive natural gas leaks from pipeline valves, and a firm that assists clients in identifying and implementing greenhouse gas reduction strategies. Host country participants include a joint stock company that provides more than half of Russia's domestic energy supply, two of its affiliates, and a Russian nonprofit NGO devoted to energy efficiency and environmental protection in Russia.

Part One: Background

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

At the 1992 Earth Summit in Rio de Janeiro, the United States joined more than 150 countries in signing the United Nations Framework Convention on Climate Change (FCCC). Parties to the Convention recognized that human activities have contributed substantially to increases in atmospheric concentrations of greenhouse gases, and that this trend poses a serious threat to the Earth's climate system. The ultimate objective of the FCCC, as called for in Article 2, is the "stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

JOINT IMPLEMENTATION

The concept of joint implementation (JI) was introduced early in the negotiations and was formally adopted in the Convention text. Article 4(2)(a) of the Convention explicitly provides for Parties to meet their obligation to reduce greenhouse gas emissions "jointly with other Parties," that is, through joint implementation activities. "Joint Implementation," or "JI," has been used to describe a wide range of possible arrangements between interests in two or more countries, leading to the implementation of cooperative development projects that seek to reduce, avoid, or sequester greenhouse gas emissions.

At the First Meeting of the Conference of the Parties (COP-1) in Berlin in March and April of 1995, the Parties addressed "decisions regarding criteria for joint implementation" (Article 4). At this meeting, the Parties determined that there would be an initial pilot phase of JI referred to as "Activities Implemented Jointly" (AIJ) and that during this phase of JI, "no credits shall accrue to any Party as a result of greenhouse gas emissions reduced or sequestered during the pilot phase...." The pilot phase ends no later than the year 2000.

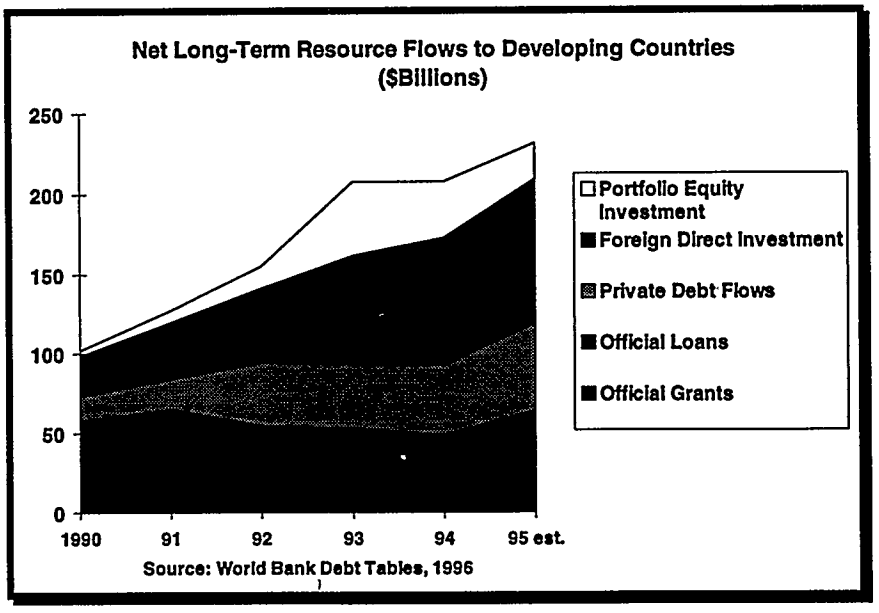
COP-1 further decided that the Subsidiary Body for Scientific and Technological Advice (SBSTA), coordinating with the Subsidiary Body on Implementation (SBI), would "establish a framework for reporting...the global benefits and the national economic, social, and environmental impacts as well as any practical experience gained or technical difficulties encountered in AIJ under the pilot phase." The SBSTA adopted a reporting framework at its second meeting in March and April 1996. SBSTA invited the Parties to report on AIJ through the FCCC Secretariat. SBSTA and SBI will produce a synthesis report from these submissions which will be considered by the Conference of Parties (COP) on an annual basis. These reports will also form the basis for "improving the reporting framework and for addressing methodological issues."

WHY JOINT IMPLEMENTATION?

Greenhouse gas emissions are rising rapidly. The most cost-effective options for addressing this problem often exist in developing countries, or countries with economies in transition, as they restructure or expand their infrastructure. Because costs of reducing or sequestering emissions of greenhouse gases vary among countries, and all such emissions have the same effect on global climate regardless of where they are emitted, joint implementation offers the opportunity to reduce emissions at a lower global cost than would be possible if each country acted alone. The Parties to the Convention recognized that "...policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost..."[6] As such, the FCCC stated that "[e]fforts to address climate change may be carried out cooperatively by interested Parties."[7]

Concerns have been raised by some countries that joint implementation is a means for industrialized countries to transfer their environmental problems to developing countries. However, the purpose of JI is not to provide a mechanism for industrialized countries to export emissions of greenhouse gases. Instead, the COP recognized that JI holds significant potential for lowering the cost of combating the threat of global warming, while also contributing to sustainable development. Furthermore, projects developed under JI can result in technology choices which meet the development objectives of host countries while also achieving the environmental objectives of the FCCC.

Figure 1: Net Resource Flows to Developing Countries



In addition, JI can influence technology choices in developing countries, and countries with economies in transition, as they build infrastructure. Net private and public capital flows to developing countries are approaching $250 billion per year (see Figure 1: Net Resource Flows to Developing Countries). The goal of Joint Implementation is to affect these already significant capital flows by increasing the number of environmentally-friendly

[6] Framework Convention on Climate Change, Article 3, Paragraph 3
[7] Ibid.

projects supported by these funds.

GOAL OF PILOT PHASE

The U.S. goal through the Pilot Phase of JI is to gain experience and knowledge which can be used as a basis for the post-pilot phase programs. This may best be accomplished by:

1. Encouraging rapid development and implementation of cooperative, mutually voluntary, cost-effective projects aimed at reducing or sequestering emissions of greenhouse gases, particularly projects promoting technology cooperation with and sustainable development in developing countries and countries with economies in transition to market economies.
2. Promoting a broad range of projects to test and evaluate methodologies for measuring, tracking, and verifying costs and benefits.
3. Establishing an empirical basis to contribute to the formulation of international criteria for joint implementation.
4. Encouraging private-sector investment and innovation in the development and dissemination of technologies for reducing or sequestering emissions of greenhouse gases.

BENEFITS OF JOINT IMPLEMENTATION

Joint Implementation activities provide benefits for partner country participants and for the global community as a whole. The benefits at the global level include reducing the overall global cost of greenhouse gas emissions reductions while promoting sustainable development.

Benefits accruing to participants within host countries include:

- ***Technology Transfer***. Encourages private sector diffusion of innovative technologies that can help meet host country development priorities while reducing or sequestering greenhouse gas emissions.
- ***Investments***. Expands investments in technologies and projects that reduce greenhouse gas emissions while contributing to overall host country development objectives.
- ***Local Environmental and Human Health Benefits***. Produces other local environmental and human health benefits by preventing or reducing air, water, or soil pollution, and/or by contributing to more sustainable use of natural resources.
- ***Local Economic Benefits***. Generates local economic benefits which may include training, construction of new or improved facilities, public participation in projects, provision of new energy services.
- ***Promote Sustainable Development***. Encourages additional private sector investment in the development and dissemination of technologies and practices that

contribute to sustainable development while reducing or sequestering greenhouse gas emissions.

- ***Influence Future of JI.*** Provides participants an opportunity to influence the direction and structure of JI beyond the pilot phase by demonstrating the potential for international collaboration to resolve environmental problems.

Benefits to participants outside the host countries include:

- ***Market Access.*** Provides entrée into energy and environmental markets in host countries. Participants may also be eligible for host country assistance in terms of relaxed permitting, reduced import restrictions, local content requirements, and/or tariffs.
- ***Lower the Cost of "Green" Technologies.*** Enhances the competitiveness of "green" technologies by accelerating application world-wide and further reducing the cost of production.
- ***Enhance Prospects for Financing.*** Expands partnership opportunities by providing greater visibility and credibility to the potential project which can, in turn, increase the depth of credit-worthiness associated with the project.
- ***Reduce Risk.*** Offers greater security of investment in foreign countries.
- ***Expand Knowledge of the JI Option.*** Provides participants an opportunity to influence the direction and structure of JI beyond the pilot phase by demonstrating the potential for international collaboration to resolve environmental problems.
- ***Recognition.*** Demonstrates participants' commitment to reduce the threat of climate change and contribute to sustainable development.
- ***Record of Reductions.*** Establishes a public record of emissions-reducing activities.
- ***International Credibility.*** Establishes a track record in international markets by working with governments, businesses, and organizations in foreign countries.

Part Two: The USIJI Program

Climate Change Action Plan

In October 1993, President Clinton announced the U.S. Climate Change Action Plan, which set forth a series of measures designed to return U.S. greenhouse gas emissions to 1990 levels by the year 2000. This plan relied on domestic actions alone. However, recognizing the enormous potential for cost-effective greenhouse gas emission reductions in other countries, the Administration also called for a pilot program to help establish an empirical basis for considering cooperative approaches such as joint implementation, and thus help realize the potential of domestic and international strategies to both combat the threat of global warming, and to promote sustainable development (see Table 2: Milestones

Table 2: Milestones in USIJI Program

1992	
Jun	Framework Convention on Climate Change (FCCC)
1993	
Oct	U.S. announces Climate Change Action Plan
Oct	U.S. announces USIJI to support Conference of the Parties
1994	
Jun 1	Final USIJI Groundrules published in *Federal Register*
Jun 10	First meeting of the USIJI Evaluation Panel
Sep 9	Announcement that proposals for the First Round of USIJI will be accepted beginning October 11, 1994
Sep 21	USIJI proposal preparation workshop, Washington, DC
Nov 4	Closing date for submission of First Round proposals
Dec 9	USIJI outreach workshop, Nairobi, Kenya
1995	
Jan 27-29	JI Southeast Asia Regional Workshop, Bangkok, Thailand
Feb 3	Announcement of First Round projects approved for inclusion in the USIJI program
Mar 6-7	JI Central and Eastern Europe Workshop, Prague, Czech Republic
Mar 7-8	JI South American Regional Workshop, Santiago, Chile
Mar 28-Apr 7	First Conference of the Parties (COP-1) to the FCCC, Berlin, Germany (AIJ Pilot decision is adopted)
May 2-3	Middle East Regional Workshop, Abu Dhabi, United Arab Emirates
May 31-Jun 1	USIJI Program Conference, Arlington, Virginia, USA
Jun 7-9	JI Workshop for the Americas, San Jose, Costa Rica
May	USIJI Secretariat convened several focus groups in Washington, DC, to discuss potential refinements to the proposal preparation guidance and evaluation process
May	Announcement that proposals for the Second Round of USIJI will be accepted beginning June 1995
Jul 28	Closing date for submission of Second Round proposals
Nov 30	Meeting of USIJI Evaluation Panel to determine which proposals will be approved for inclusion in USIJI Program
Dec 19	Announcement of Second Round projects approved for inclusion in the USIJI Program
1996	
Feb-Mar	UN FCCC Secretariat adopts international framework for reporting AIJ

in USIJI Program).

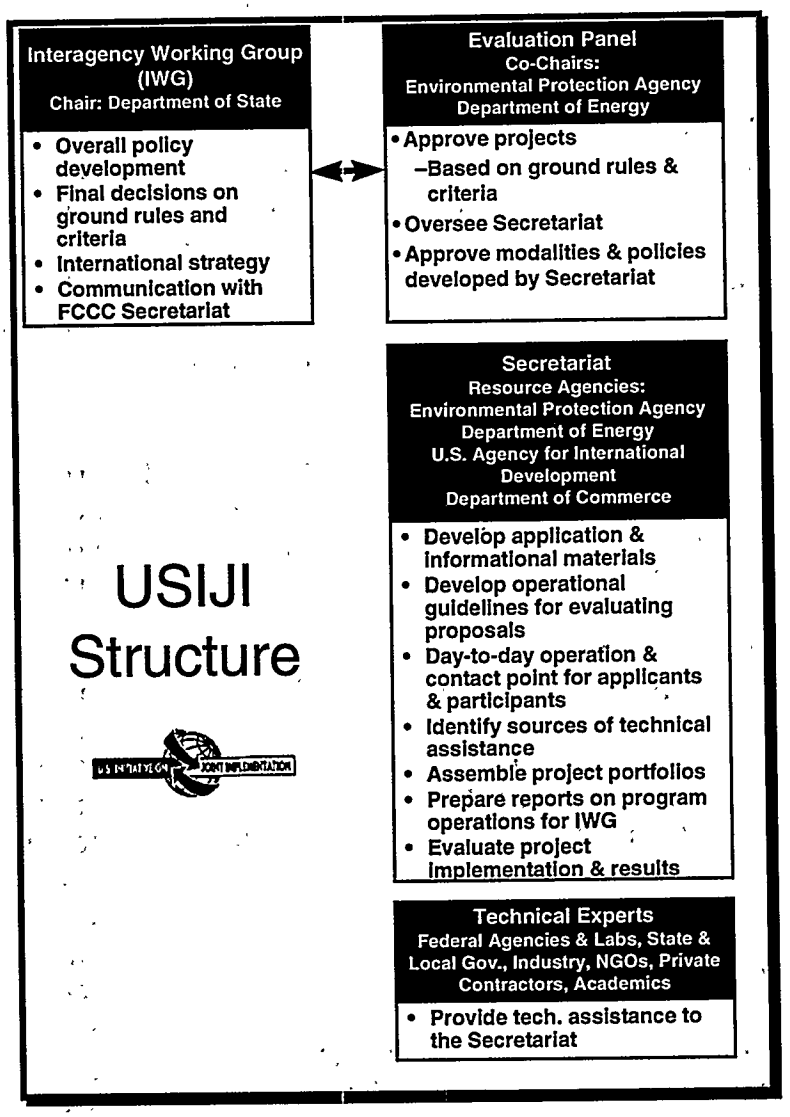
On December 17, 1993, draft Groundrules for the USIJI program were published in the Federal Register for public comment (see Appendix). The Final Groundrules, including a discussion of the specific comments received, were published by the Department of State in a Federal Register notice on June 1, 1994. They describe the purpose of the Pilot Program, outline the timeline for evaluation and reassessment of the program, define eligibility criteria for domestic and foreign participants, establish an Evaluation Panel to assess projects submitted for inclusion in the USIJI, and delineate the criteria for acceptance of a project submission into the USIJI portfolio.

USIJI is the first and currently most developed joint implementation pilot program worldwide. Its international outreach activities and workshops (attended by several hundred potential participants from approximately fifty countries) have positively influenced international understanding of joint implementation and its broad acceptance by Parties to the Framework Convention on Climate Change.

Structure

The USIJI is overseen by an Interagency Working Group (IWG) that has the primary responsibility for policy development and criteria used for project acceptance (see Figure 2: USIJI Structure). In turn, ultimate responsibility for project approval and the process for proposal identification, development and evaluation rest with the Evaluation Panel. The Panel has one member each from:

Figure 2: USIJI Structure



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

The Panel is co-chaired by the members from the Department of Energy and the Environmental Protection Agency. A Secretariat supports day-to-day operation of the USIJI program. Technical Experts are drawn from a wide variety of organizations to assist the Secretariat in the proposal review process and to provide technical assistance.

Approach

As indicated in the previous section, anthropogenic emissions of greenhouse gases are rising rapidly. The cost of mitigating these emissions will be substantial, and the potential magnitude of the problem is such that government funds and standard technologies alone are likely to be inadequate. Greater resources and innovative technologies need to be brought to bear on the problem. To this end, the private sector needs to be engaged as a major participant.

A key goal of the USIJI program is to influence the technological choices associated with the already substantial private capital flows to developing countries.

Acceptance into the USIJI program provides U.S. firms with both visibility and credibility. It is hoped that the USIJI program will result in an increasing number of projects that complement the development goals of the host country and promote the sustainable use of natural resources.

Key features of the USIJI program are presented in Figure 3. The overall program is designed to meet general concerns of the Parties, including

Figure 3: Key Features of USIJI

- Voluntary, market-based approach to facilitate partnerships between U.S. entities (largely private sector firms) and their foreign counterparts to engage in activities that reduce, avoid, or sequester greenhouse gases.
- An interagency Evaluation Panel to approve projects for inclusion in the program and to subsequently verify net emission reductions.
- Adherence to criteria for evaluating potential projects as to their ability to produce real, measurable greenhouse gas reductions.

whether projects:

1. Produce measurable reductions.

2. Are funded independent of or with resources in addition to the FCCC financial instrument or Official Development Assistance (ODA).
3. Measure and track net emission reductions achieved.
4. Ensure that reductions in one place do not give rise to increases in another.
5. Ensure that reductions will not be lost or reversed through time.

Central to the program is the establishment of criteria designed to meet these concerns and a project evaluation process where the criteria are applied. These aspects of the USIJI program are detailed in subsequent sections.

Project Criteria

Projects accepted into the USIJI program are evaluated against nine criteria and four other areas of consideration (see Appendix A: Groundrules and Project Criteria for USIJI). These criteria are intended to identify those projects that support the development goals of the host country while providing greenhouse gas benefits beyond those that would occur in the absence of the joint implementation activity. The criteria have been formulated to ensure that projects accepted into the program will produce real, measurable net emissions reductions.

The Evaluation Panel is responsible for approving or rejecting project submissions for inclusion in the USIJI program based on the specific criteria. The Panel considers how a project measures against all criteria, as well as how the project contributes to the purposes of the pilot program. While failure on any single criterion could keep a project from being approved, the Panel may find relatively poor performance on one criterion to be outweighed by excellent performance on another. Similarly, if a project's performance on all criteria is seen as only barely acceptable, it may not be approved by the Panel.

The application of criteria is also balanced by the goal of the USIJI project to promote a broad range of projects to test and evaluate methods to measure, track, and verify costs and benefits of accepted projects. In addition, the criteria are also being tested for appropriateness in selecting projects that will produce real, measurable results. As such, there has not been a single, rigid approach to the application of this criteria, but instead, the Evaluation Panel has remained flexible in the interpretation and application to each project. The development of criteria is seen as an evolving process, particularly during this pilot phase.

The criteria and other considerations used by USIJI to screen proposals are discussed below.

Acceptable to Host Country

Proposals must provide written notification from the designated ministry, or other entity of the host country national government, that the project is acceptable for inclusion in the USIJI program. Such certification is necessary to ensure that the host country is familiar with the project and that proposed activities are considered to be consistent with the national development objectives. In some countries, a single ministry has been designated to perform this function. Such is the case in Costa Rica, where the Minister of Natural Resources and Energy (MINAE) is the host government-approved signatory for proposed projects being considered by USIJI.[8] In other countries, an interagency commission has been established to review and approve USIJI proposals. An example is the Russian Federation, where the head of the Russian Federal Service for Hydrometeorology and Environmental Monitoring chairs an interagency commission and reviews and approves projects on behalf of the commission and host government.

Reductions Are Additional

It is important that projects accepted into the USIJI program do not simply constitute business as usual. The purpose of USIJI program is to create new or "additional" emissions reductions, not to provide certification to projects that would have occurred anyway. Therefore, in order to be accepted into the USIJI program, proposals should:

- Demonstrate that emissions will be reduced from what they would have been in the absence of the project. ***This constitutes emissions additionality.***
- Document that financing is in addition to normal Official Development Assistance and is being provided because of USIJI participation. ***This constitutes financial additionality.***
- Certify that the project was initiated as a result of, or in reasonable anticipation of, USIJI. ***This constitutes program additionality.***

In practice, this has been a particularly difficult criteria to apply. As noted above, three distinct manifestations of additionality have been identified. Further definition, and some examples of the application of these interpretations of additionality, are provided below.

Emissions Additionality

Proposals should identify specific measures to reduce or sequester greenhouse gas emissions. It must be shown that, as a result of the project, emissions will be reduced from what they otherwise would have been. To demonstrate this, proposals must present a "reference case," showing a baseline emissions scenario without the project, and a "project case," which shows emissions projections over the life of the project.

[8] Formerly the Ministry of Natural Resources, Energy and Mines (MIRENEM).

The difference between the project case and the reference case represents the emissions reduction.

The reference case has two important uses:

- It provides a reference point for historical greenhouse gas emissions and a projection of future emissions
- It is a "starting point," against which any future emissions will be compared.

Careful consideration is given to whether the reference case projections are consistent with

- Prevailing standards of environmental protection in the country involved
- Existing business practices within the particular sector of industry
- Trends and changes in these standards and practices.

The reference case should not only provide information and data on greenhouse gas emissions, but also on other related environmental non-greenhouse gas effects.

In developing the project case, proposals should show how the specific measures identified in the proposal will reduce or sequester greenhouse gas emissions above and beyond those referred to in the reference case. Proposers are also encouraged to consider, as appropriate, off-site effects such as:

- Activity shifting. Moving processes within an operation.
- Outsourcing. Purchasing services or commodities formerly produced internal to the project boundaries.
- Market effects. Offset to achievements caused by residual demand.
- Lifecycle emissions reductions. Upstream and downstream changes in process materials used.

For both the reference case and the project case, considerable importance is placed on documentation of all resources, methods, emission factors, and assumptions. Enough information needs to be provided in a proposal for an independent third party to understand all the assumptions that are made and be able to reproduce the emissions estimates and project effects. Various methods have been employed in proposal submissions. No single approach is endorsed by USIJI, nor does the use of a particular method imply acceptance. Instead, emphasis is placed on the adequacy of documented approaches to allow for third party validation.

Financial Additionality

Project funding should be independent of, or in addition to, the Framework Convention on Climate Change financial instrument, multilateral development bank or U.S. Government Official Development Assistance, or, in the case of U.S. federal funds, be in excess of levels provided in 1993. Project developers should demonstrate that in

developing their specific USIJI proposal, they were able to receive financing that they otherwise would not have received. USIJI wants to be certain that the financial aspects of the project have been adequately considered, and that simple repackaging of federally or multilaterally funded projects does not occur.

Program Additionality

Proposals should not only demonstrate that the proposed technology or practice reduces emissions, but that the technology or practice would not have been introduced but for USIJI. For example, if a technology or practice proposed in the project is required by an already established law or anticipated regulation, then the greenhouse gas emission reductions would have occurred anyway. If, however, the proposal shows that the emission reductions exceed what is required by law or international agreement, then the reductions may be considered additional, but only by the amount estimated that exceeds the legal requirement. Another situation might be one where the project proposes to employ a "new" technology or method. In such cases, the net reductions would be considered additional, but only to the extent that it can be shown that the new technology was introduced as a result of USIJI. In other words, to be accepted, a project proposal should be able to show that the emission project for which emissions reductions are being claimed would not have occurred if not for USIJI, or in anticipation of a similar program.

Proposals can meet this criteria by showing that projects were formulated specifically for the USIJI program. Projects can document that proposals were developed in response to workshops, or other outreach efforts of USIJI. Normally, a minimum requirement would be that project planning began after the inception of USIJI. However, in some cases, such as the Doña Julia Hydroelectric Project in Costa Rica, the project was actually conceived several years prior to the announcement of USIJI, but languished for a number of reasons. In these cases, it should be shown that USIJI was instrumental in overcoming barriers that would, otherwise, have prevented the implementation of the project.

Reductions Are Verifiable

Both verification and monitoring are important to assure the international community that real, measurable reductions are taking place. Monitoring and verification plans are required in proposals to make the process of measuring emissions transparent. Proposals must contain at least preliminary monitoring and verification plans. Where the proposed plans are less than adequate, the Secretariat will seek a commitment to improve these.

The plans should include adequate provisions for tracking the greenhouse gas emissions reduced or sequestered as a result of the project. Project developers are required to use the results of the monitoring process to periodically update estimates of

emissions reductions and carbon sequestration. The monitoring and verification plans should address activity shifting or other actions that may result in "leakage" of emissions outside the project site. For instance, if a project is presumed to result in reduced logging in one area as a basis for greenhouse gas reductions, the monitoring and verification plans should be designed to assure that logging does not increase elsewhere to compensate for the lost supply.

Proposers must also agree to a future process which may include verification of emissions reductions by third party organizations.

Reductions Will Not Be Reversed

Proposals should provide adequate assurance that greenhouse gas emissions reduced or sequestered will not be lost or reversed over time. For instance, a project proposal may estimate that it will sequester 100 metric tons of carbon (mt C) over the project duration of 40 years. However, if during years 41 through 45, the 100 mt C are released and this represents the end of the project, those reductions are not permanent.

The problem of reversal of effects is of less concern in energy projects where emissions reductions are generally considered irreversible. For example, if an energy project reduces emissions of a particular source from 20 mt C per year to 15 mt C per year for a period of 10 years, the project has achieved 50 mt C reductions. This is true even if the emissions level rises back to 20 mt C per year at the end of the 10^{th} year.

Other Environmental Benefits

Proposals should identify any associated non-greenhouse gas environmental impacts/benefits. For instance, a hydroelectric project may displace electricity generated by fossil fuel combustion, and as a result reduce emissions of other air pollutants. However, the hydroelectric project may have negative environmental impact on fisheries, water quality, or biodiversity. In reforestation and afforestation projects, planting trees in pastures and abandoned agricultural fields might provide positive secondary environmental benefits by stabilizing soil, restoring soil organic matter, and promoting the establishment of an understory of native species brought in as seed by roosting birds. However, questions arise about the impact on biological diversity of planting when non-native, exotic tree species are used. The Evaluation Panel needs to be able to weigh the benefit of potential GHG emission reductions or carbon sequestration with any other positive or negative environmental impacts that the project might produce.

Annual Reports

Participants must agree to provide annual reports to the Evaluation Panel on the emissions reduced or carbon sequestered, and on the share of such emissions attributed to each of the participants, domestic and foreign, pursuant to the terms of voluntary agreements among project participants.

Other Considerations

In determining whether to include projects under the USIJI, the Evaluation Panel also considers several other issues. The first of these is leakage. This is the potential for the project to lead to changes in greenhouse gas emissions outside the boundaries of the project. The Panel also considers whether there are potential positive and negative effects of the project apart from its effect on greenhouse gas emissions. These include local employment and health impacts. A third area of consideration is whether U.S. participants are emitting greenhouse gases within the United States and, if so, whether they are taking measures to reduce or sequester these emissions. Finally, the Evaluation Panel takes into consideration whether efforts are underway within the host country to ratify or accede to the FCCC, to develop a national inventory and/or baseline of greenhouse gas emissions and sinks, and take measures to reduce its emissions and enhance its sinks and reservoirs of greenhouse gases.

Proposal Solicitation Process

Following the publication of the final Groundrules and Criteria in the Federal Register of June 1, 1994, the USIJI Secretariat developed a set of guidelines for preparation of proposals and announced that proposals under the first round of USIJI would be accepted until November 4, 1994. Following evaluation in accordance with the process described below, those projects that were determined by the Evaluation Panel to comply with the USIJI criteria were announced on February 3, 1995. A second round of proposals was solicited in May, 1995, with a due date of July 28, 1995. Round 2 projects accepted in the USIJI program were announced on December 19, 1995.

Prior to and during these solicitations, a number of outreach efforts were made to increase awareness of USIJI. These included regional workshops, publications, and other information services. These are discussed in more detail in a subsequent section.

Evaluation Process

The Evaluation Process follows the general steps defined in Figure 4. Proposals are not only reviewed from a purely technical standpoint, but also for the appropriateness of a particular project for the host country. While not a criterion, the Evaluation Panel also

examines the likelihood that projects will receive funding, as it is the goal to not just approve good proposals, but to establish projects.

Using input from a team of technical reviewers, the USIJI Secretariat prepares a series of recommendations, or decision memoranda, for the Evaluation Panel. After careful consideration, the Evaluation Panel places proposals in one of three categories: Accepted, Placed in Development, and Not Accepted.

Figure 4: Steps in the Evaluation Process

- Projects are assigned to proposal managers.
- Proposal managers screen proposals for completeness.
- Proposal managers contact project developers for additional information, clarification, consultation.
- Technical reviewers return written evaluations to proposal managers.
  - Land-use projects are evaluated individually and discussed in a group meeting of forestry and biomass experts; energy-related projects are evaluated individually and discussed in a meeting of energy experts.
- Proposal managers draft decision memoranda for disposition of each proposal, including how well each criterion is addressed.
- The USIJI Secretariat convenes to review decision memoranda drafted by proposal managers.
- Evaluation Panel members review recommendations of USIJI Secretariat.
- Project developers are notified of status of their proposals.

Accepted

These proposals meet the criteria for acceptance into USIJI. Acceptance by the panel does not constitute certification of emission reduction estimates included in the proposal. Emissions reductions will be recorded by USIJI as they are achieved, monitored and verified.

Placed in Development

These proposals are not acceptable due to one or more serious issues. Failure to gain host country approval is one reason to be placed into development. However, these projects show innovation and could expand USIJI to additional sectors and/or activities. The USIJI Secretariat may provide technical assistance to promote rapid development of these proposals.

Not Accepted

Proposals placed in this category clearly do not meet USIJI criteria and are not developed well enough to merit additional attention from USIJI without significant independent effort on the part of the applicant.

Withdrawn

While not a formal category, proposals may be withdrawn from consideration at the request of the applicant. These proposals may continue to have promise and may merit assistance from other sources.

Outreach

The USIJI program performs a number of outreach activities. Outreach efforts are designed both to provide technical support and to identify project opportunities and partners. They are also mechanisms to relay general background information and program status.

The outreach effort is accomplished through bilateral and multilateral agreements, workshops, and print and electronic media. A summary of these activities is included below.

Bilateral and Multilateral Agreements on Joint Implementation

The U.S. government has entered into bilateral and multilateral agreements with countries in various regions of the world in order to facilitate cooperation on joint implementation agreements. These "Statements of Intent for Sustainable Development Cooperation and Joint Implementation of Measures to Reduce Emissions of Greenhouse Gases (SOI) are designed to provide a framework for governments to cooperate on promoting private sector investments in projects which fuel economic growth and benefit the environment. Key provisions in the SOIs include:

- Designation of a government contact on joint implementation with responsibility for creating program criteria, and identifying, supporting, and evaluating potential joint implementation projects.
- Information exchange on methodologies and mechanisms to establish procedures for monitoring and external verification of greenhouse gas emissions.
- Outreach and promotion of joint implementation and other sustainable development.
- Support of the international pilot phase at international fora.

As of April 15, 1996 bilateral SOIs have been signed with Bolivia, Chile, Costa Rica, and Pakistan. A multilateral SOI was also signed between the U.S. and Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. Most recently the Government of Costa Rica and the U.S. signed an Annex to their bilateral agreement to facilitate a cooperative assessment of baselines and certifiable and transferable GHG offsets.

Workshops

Two domestic workshops have been sponsored by the USIJI Evaluation Panel: the first in 1994, the second in 1995. The first workshop focused on proposal preparation. In

the second conference, attendees had the opportunity to learn more about the concept of joint implementation as a cost-effective element of a global strategy for addressing climate change and about the benefits of participating in the USIJI program.

USIJI also co-sponsors regional conferences in other parts of the world. The first workshop in Nairobi, Kenya, provided an opportunity to explore both the potential benefits and the challenges of managing a joint implementation regime. A Southeast Asia Regional Workshop in Bangkok, Thailand, provided an informal setting in which representatives of the various countries could begin an open and interactive dialogue on joint implementation. Presentations and discussions addressed technical issues, potential projects, and motivations of host countries and U.S. partners for developing JI projects.

A workshop was held in the Czech Republic in 1995 to present and discuss ongoing and potential pilot JI projects for the Central and Eastern Europe region. Two workshops were held in Latin America in 1995 focusing on the JI concept, regional views, the USIJI, case studies from the first round of the USIJI, potential projects for the future, and panel discussions on technical and financing issues.

Information Services

Fax-on-demand service

Many documents pertaining to the USIJI process are available for delivery by facsimile. The USIJI Secretariat provides an automated fax-on-demand service at (+1) 202-260-8677.[9] Categories of documents available include:

- General background documents (e.g., A description of USIJI, the text of the final USIJI Groundrules, submission procedures).
- Framework Convention on Climate Change (e.g., Text of the April 6, 1995, Decision of the Conference of the Parties).
- Documentation from conferences and workshops (e.g., Conference agendas, text of sections from conference notebooks).
- Results of USIJI submissions (e.g., List of projects, participants, and contacts for projects accepted).

Callers may select the documents they wish through a menu-driven query process, or if they have a hard copy menu (included with each fax delivery), they may skip directly to ordering. Up to three documents may be ordered with one phone call. (Callers without access to a touch-tone phone may contact the Secretariat at (+1) 202-426-0072.)

Newsletter

The USIJI Secretariat publishes a periodic newsletter entitled ***International***

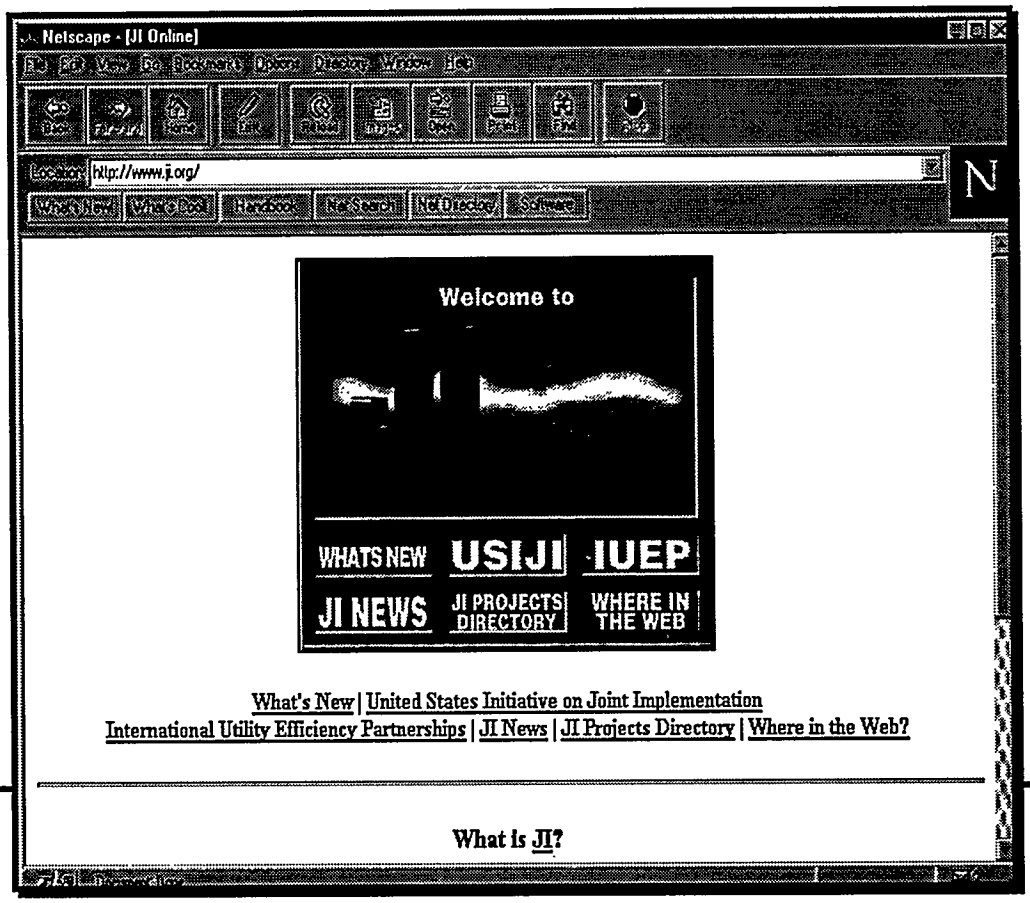
[9] This feature may not be accessible by all countries.

Partnerships Report, intended to provide updates on cooperative efforts to reduce greenhouse gas emissions. Issues to date have contained articles on the origins of USIJI, the signing of bilateral JI-related agreements, domestic and international USIJI workshops, the Evaluation Panel's selections from the first and second rounds of submissions, and the JI activities of other countries.

JI Online

Under the sponsorship of the USIJI Secretariat, the Edison Electric Institute (EEI) International Utility Efficiency Partnerships Program (IUEP) administers JI Online; accessible through the World Wide Web at HTTP://WWW.JI.ORG (see Figure 5: JI On-line). This computer bulletin board system is intended to enhance communications among people, institutions, and agencies working in JI, energy efficiency, and greenhouse gas mitigation projects around the world. JI Online provides a database of JI-related information from both government and private sources. Core libraries contain Secretariat publications, including project proposal guidelines, submission procedures, and contact information. Special areas can be set aside for materials from nongovernmental organizations that wish to post information to the system. JI Online invites posting of any materials that might be of value to other people working on JI-related activities. Also included is a listing of potential USIJI projects which interested parties can review.

Figure 5: JI On-line



USIJI PROPOSALS

Accepted Projects

A total of 51 proposals, in two rounds, have been reviewed for inclusion in the USIJI program.[10] Of these, 15 projects were accepted. One proposal, which was placed "in development" after Round 1, was subsequently accepted in Round 2.

Later sections provide information on projects that were either placed in development, not accepted, or withdrawn. A detailed overview of each of the accepted projects appears in Part 3 "USIJI Projects."

Proposals Placed in Development

A total of 18 proposals have been placed in development. These proposals did not meet all the USIJI criteria, but are candidates for technical and other assistance in order to further develop the proposals. Reasons for placing these in development include:

- Lack of host country acceptance.
- Financing and emissions additionality questions.
- Missing monitoring and verification information.

These proposals are of interest to USIJI because they would increase both the technical and regional experience of the program. USIJI is continuing to seek a more diversified base of projects to include in the program. The proposals placed in development include the areas of:

- Coal-bed methane recovery and utilization
- District heating improvements
- Gas pipeline replacement - methane recovery
- Industrial energy efficiency
- Reduced impact logging
- Biomass to electricity
- Biomass for cement manufacturing
- Afforestation

A number of regions are represented by these proposals. While some of these regions are already represented in accepted projects, USIJI seeks to gain more experience in countries which are not well represented by the current portfolio of accepted projects. Regions which are covered by the proposals placed in development include:

- Eastern Europe

[10] Two proposals were later combined and were accepted as one project.

- Asia
- South Pacific
- Former Soviet Union
- Latin America
- Africa

Proposals Not Accepted

A total of 10 proposals were not accepted while another 8 were subsequently withdrawn by their developers. Typically, these proposals failed to meet a substantial number of criteria or were otherwise not sufficiently developed to merit additional attention from the program without significant independent effort on the part of the applicant.

FUTURE GOALS

The USIJI program has several overall future goals involving expanding the number of projects, as well as the depth and scope of experience, and providing technical support to project proposals at various stages of development. Individual goals include:

- Continue to test and develop criteria which demonstrate effectiveness in selecting projects that will produce real, measurable results.
- Increase the number of accepted projects and expand to new sectors and geographic regions.
- Implement a technical assistance program for affiliated projects.
- Sponsor technical assistance workshops on emissions accounting, monitoring and verification, and financing of USIJI projects.
- Issue a technical handbook for project developers and a technical guidance document.
- Expand the USIJI public recognition program.
- Assist countries in developing their national joint implementation programs.
- Assist participants in obtaining project financing.
- Contribute to the better understanding of JI through analyzing USIJI projects.
- Work with existing USIJI projects to confirm that estimates of GHG emission reductions, avoidance, and sequestration are consistent and credible.
- Review, augment, and develop, as necessary, monitoring protocols for existing USIJI projects.
- Develop a verification process or processes for application to USIJI projects.

Part Three: USIJI Projects

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Rio Bravo Carbon Sequestration Pilot Project 26
Costa Rica 35
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BIODIVERSIFIX Forest Restoration 43
CARFIX: Sustainable Forest Management 51
Doña Julia Hydroelectric 57
ECOLAND: Esquinas National Park 62
Klinki Forestry Project 68
Plantas Eólicas S.A. Wind Facility 75
Tierras Morenas Windfarm 82
Czech Republic 89
City of Decin: Fuel Switching for District Heating System 90
Honduras 97
Bio-Gen Biomass Power Generation Project 98
Solar Based Rural Electrification 104
Nicaragua 110
El Hoyo-Monte Galan Geothermal Project 111
Russian Federation 117
RUSAFOR: Saratov Afforestation Project 118
RUSAGAS: Fugitive Gas Capture Project 126

PROJECT STATUS

Each of the projects accepted into the USIJI program has received host country government acceptance. However, time constraints have precluded an opportunity for host country government officials to review and concur with the specific details contained in the project descriptions in this part of the report. Table 3 presents the status of host country concurrence with these project descriptions. This table will be updated and provided to the UN FCCC upon receipt of additional concurrence.

Table 3: Host Country Concurrence

Project Title	Host Country Concurrence (Y or N)
Belize	
Rio Bravo Carbon Sequestration Pilot Project	Y
Costa Rica	
Aeroenergía S.A. Wind Facility	Y
BioDiversifix: Forest Restoration	Y
CARFIX: Project to Stabilize Existing Forest and Expand Forest Cover	Y
Doña Julia Hydroelectric Project	Y
ECOLAND: Esquinas National Park	Y
Klinki Forestry Project	Y
Plantas Eolicas Wind Facility	Y
Tierras Morenas Windfarm	Y
The Czech Republic	
City of Decin: Fuel-Switching for District Heating	N
Honduras	
Bio-Gen Biomass Power Generation Project	Y
Solar-Based Rural Electrification	Y
Nicaragua	
El Hoyo - Monte Galan Geothermal Project	Y
Russian Federation	
RUSAFOR: Saratov Afforestation Project	N
RUSAGAS: Fugitive Gas Capture Project	N

PROJECT DETAIL

The project summaries below are based on input from project developers and represent, in most cases, updates and revisions to original project proposals. The reduction estimates and other information contained in these summaries have been provided by project participants and developers. This information should be considered preliminary and is being reported as is. Inclusion in this report does not signify validation by the USIJI program.

The USIJI program has not yet finalized a process for validating emissions reductions. When developed, USIJI will be monitoring progress and verifying emissions reductions as they are attained. A number of approaches are used by project developers in their monitoring and validation plans. No single approach is endorsed by USIJI. Instead, USIJI will be assessing the various approaches used by project developers in monitoring emissions reductions.

It should also be noted that, although the USIJI requested participants to provide estimates of project costs, this is not one of the criteria. As such, cost figures presented in this section are those supplied by the participants and should be considered preliminary. Further, there has been no attempt on the part of USIJI to validate these cost estimates or even assess whether they have been reported on a consistent basis. Therefore, inter-project comparisons on the basis of cost would be meaningless at this time.

Project start date refers to the date the project will begin reducing GHGs. Also, the project duration refers to the estimated functional lifetime of the project, not necessarily the period over which GHG reduction are estimated to occur.

Additional information on individual projects is available from the USIJI Secretariat.

BELIZE

Rio Bravo Carbon Sequestration Pilot Project

A) Description	The Rio Bravo Carbon Sequestration Pilot Project is located in northwest Belize, adjacent to the Rio Bravo Conservation and Management Area (RBCMA). The project combines land acquisition and a sustainable forestry program to achieve carbon mitigation. The objective of the project is to demonstrate an optimal balance between cost-effective carbon dioxide sequestration, economically sustainable forest yield, and environmental protection. Project implementation has begun. Participants signed a Comprehensive Agreement in November 1995, and the land purchase was completed the following month. Project Type | Land-Use: Mixed Components Participants | TNC, a U.S. participant, is a nonprofit international organization dedicated to identifying, protecting and maintaining best examples of communities, ecosystems, and endangered species in the natural world. Wisconsin Electric Power Company (WEPCO), another U.S. participant, is a wholly-owned subsidiary of Wisconsin Energy, an investor-owned utility. WEPCO has long been a leader in exploring market-based approaches to environmental problems and has worked with TNC's Wisconsin Chapter in the past. Since the project was accepted into the USIJI portfolio, three U.S. companies – Detroit Edison, Pacificorp, and Cinergy – have joined as financial participants. The Programme for Belize (PfB), the host country participant, is a Belizean NGO established in 1988. PfB holds the RBCMA and has a memorandum of understanding with the Government of Belize committing PfB to the design of models of sustainable development

	that can be applied elsewhere in Belize.
Institutional Arrangements	All participants have signed a Comprehensive Agreement governing their respective responsibilities and project structure. The project is operated as a partnership: the power companies are financial partners, TNC serves as fund manager and provides technical support as needed, and PfB is the executant body and project manager.
Cost	Preliminary cost estimate for the project is US$2.6 million.
Technical Data	The project has two components: A) purchase of a parcel of endangered forest land, and B) development of a sustainable forestry management program. A 6,014-hectare parcel of endangered forest land has been purchased to protect it from conversion to farmland. An economically sustainable forest management plan will be implemented on the purchased land and the eastern portion of the RBCMA (a total of more than 50,500 hectares) to increase the level and rate of carbon sequestration on these lands. This program will include sustainable logging and pine stocking enhancement. The program will provide active protection against incursion and uncontrolled fire, substituting controlled burns for annual wild fire. The remaining RBCMA lands will be left undisturbed for conservation and research purposes. These lands will be managed as protected forest, as will those portions of land under Component B for which this is the appropriate management regime.
Long-Term Viability	The project is designed to ensure that carbon benefits are maintained on a long-term basis. The principal objective of Component B is to

	ensure continuing viability. The project is expected to become self-supporting within 10 years.
Location	Belize
Term	40 years
Project Assessment Procedures	A detailed preliminary monitoring and verification protocol was included with the USIJI proposal. A refined protocol has been developed in collaboration with Winrock International. The procedures are now being refined as part of the baseline assessment to estimate carbon benefits accruing from completion of the Component A land purchase. Participants expect to report to the USIJI in mid-1996. An independent advisory panel will provide internal verification annually.

B) Government Acceptance, Approval or Endorsement

The project received formal acceptance from the Government of Belize. The Foreign Minister of Belize sent a letter, dated October 28, 1994, to the U.S. Department of State "to express our support" for the project, noting that "the Government of Belize also supports the formal registration of that pilot project under" the USIJI.

On August 26, 1995, following open debate and the passage of resolutions by the House of Representatives and the Senate of Belize, the Government issued a formal statement under the signature of the Prime Minister known as "Commitments of the Government of Belize in Support of the Rio Bravo Carbon Sequestration Pilot Project." These commitments include and expand upon the content of the letter from the Foreign Minister.

C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	In his letter to the U.S. Department of State, the Foreign Minister of Belize noted that the Belizean Government considers the project to be "a significant step in [the] direction" of the Government's environmental and economic development goals.
D) Benefits Derived from the AIJ Project	The project is expected to sequester a total of approximately 1,300,000 mt C over 40 years. The project was designed to have positive impacts on the area's biodiversity, wildlife habitat, water quality, soil stability, and employment and economy.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project. The 6,014-hectare parcel of land purchased under Component A will be placed under the sustainable forestry management regime established as part of Component B. As a result, this parcel will accrue carbon benefits from both the preservation (Component A) and sustainable forestry (Component B) aspects of the project. In order to simplify overall calculations, carbon benefits associated with both the purchase of the land and the subsequent implementation of the sustainable forestry management regime on this parcel are calculated as Component A carbon benefits. Benefits associated with the implementation of Component B on the remaining 44,529 ha (= 50,543 ha - 6,014 ha) of the project area are calculated as Component B carbon benefits and are discussed later in this section. The project developer has indicated that all Component A land

was purchased by December 1995. Because a forestry protection regime had been established on the land prior to the purchase date and had been in effect throughout 1995, reference case and project case emissions and net project carbon benefits are calculated for the full year in 1995.

The project developer assumed that in the Component A reference case, 5,909 ha of forest area within the 6,012 ha of land purchased under Component A of the project (the remaining 105 ha is herbaceous swamp and open water) would be deforested and converted to agricultural lands within five years. The proposal further assumed that a 1,181.8 ha parcel (= 5,909 ha/5 yrs) of forest land would be deforested and converted each year. Annual Component A carbon stock estimates in the reference case accounted for:

- the loss of initial carbon stocks on the parcel of land deforested in that year
- the loss of any additional carbon accumulated on that parcel as a result of biomass growth prior to deforestation
- the accumulation of new carbon stocks from biomass growth on parcels not yet deforested
- the accumulation of carbon stocks in crops grown on deforested parcels.

Estimates for each of these components are explained below.

Average annual estimates for these changes over the first five years of the project were calculated based on cumulative changes over these five years. These stock estimates have been slightly modified to approximate annual changes on each parcel, rather than average annual numbers. This change more accurately estimates stocks and results in slightly different estimates than originally presented by the developer.

The initial carbon stock of Component A forest land was estimated to be 768,480 mt C. Thus, the deforestation of each parcel resulted in the loss of 153,696 mt C/yr (= 768,480 mt C/5 yrs). The proposal also estimated that 5,749 mt C/yr would have been sequestered through biomass growth on the total forested area over five years. Thus, the average annual amount of carbon sequestered by biomass growth per parcel of land not yet deforested was 1,150 mt C/parcel/yr (= 5,749 mt

C/yr/5 parcels). Finally, if the area protected by Component A of the project were converted to cropland, 5,909 mt C/yr (= 1,181.8 ha * 5 mt C/ha sequestered by cropland) would have been *stored* in planted crops.

In each year from 1995 through 1999, the Component A carbon stock in the reference case equals the total stock of carbon present at the start of the year, minus the carbon lost due to deforestation on a parcel equaling one-fifth of the land (which includes the initial carbon stocks on the parcel – 153,696 mt C – plus any additional growth prior to deforestation), plus the carbon stored in crops on the converted area (5,909 mt C), plus the carbon sequestered by new growth in the current year on the area not deforested (1,150 mt C/yr/parcel). Carbon stocks after 1999 remain constant because it was assumed that deforestation would have been completed in that year. Calculations of Component A reference case carbon stocks are as follows:

1995	768,480 - 153,696 + 5,909 + 4(1,150)
1996	1995 stock - (153,696 + 1,150) + 5,909 + 3(1,150)
1997	1996 stock - (153,696 + 2(1,150)) + 5,909 + 2(1,150)
1998	1997 stock - (153,696 + 3(1,150)) + 5,909 + 1,150
1999	1998 stock - (153,696 + 4(1,150)) + 5,909
2000-34	carbon stock stabilizes at 1999 level

Annual Component A carbon emissions in the reference case were calculated by subtracting the carbon stock in the year considered from the carbon stock in the previous year.

Annual Component A carbon stocks in the project case are equal to the initial Component A carbon stock, plus the additional carbon sequestered each year as biomass growth occurs on the area protected by Component A of the project. As discussed above, the initial carbon stock of Component A forest land was estimated at 768,480 mt C. The proposal indicates that with the project, 28,746 mt C would be sequestered over a five-year period due to biomass growth. Thus, on average, 5,749 mt C (= 28,746 mt C/5 years) would be sequestered from biomass growth each year. Average annual carbon stocks in the first five years of the project were determined by adding the average annual biomass growth (5,749 mt C) to the carbon stock in the previous year. Carbon

stocks remain constant after 2000 because biomass growth on Component A forest was expected to cease in that year. Calculations of project case carbon stocks are as follows:

1995	768,480 + 5,749
1996	1995 stock + 5,749
1997	1996 stock + 5,749
1998	1997 stock + 5,749
1999	1998 stock + 5,749
2000-2034	carbon stock stabilizes at 1999 level

Annual Component A carbon sequestration in the project case is calculated by subtracting the carbon stock in a given year from the carbon stock in the previous year. Annual estimates of net carbon benefits for Component A were derived by subtracting the average annual Component A project case carbon estimates from the annual Component A reference case carbon estimates, as calculated above. In each year, Component A benefits equal the carbon stored in biomass on the parcel that would have been deforested (including growth), minus the carbon that would have been stored if the land had been converted to crops. Although this effect is not quantified in the proposal, additional benefits would also accrue after five years if biomass continued to accumulate on protected lands.

As discussed previously, Component B of the project involves the implementation of a sustainable forestry management regime on 50,543 ha of forest area, which includes the 6,014 ha parcel purchased under Component A of the project. In order to simplify overall carbon benefits calculations, carbon benefits associated with both the purchase of the parcel and the implementation of the Component B sustainable forestry management regime on this parcel were included as Component A carbon benefits. Component B carbon benefits are calculated below as the benefits accrued from the implementation of the sustainable forestry management regime on the remaining 44,529 ha (= 50,543 ha - 6,014 ha).

Component B reference case carbon stocks are estimated based on anticipated changes in the carbon stock without the project. The proposal estimates that the initial carbon stock on the area under Component B is 4,191,708 mt C. Without the project, the current carbon stock was expected to remain

constant. Thus, the average annual reference case carbon stock from 1995 through 2034 was estimated to be 4,191,708 mt C.

Average annual carbon emissions in the Component B reference case are calculated by subtracting the carbon stock in the year considered from the carbon stock in the previous year, and are equal to zero in every year.

The proposal anticipates that in the project case, the Component B carbon stock will increase from 4,191,708 mt C to 4,733,522 mt C over 40 years, leading to a total stock increase of 541,814 mt C (estimates are considered conservative). Thus, on average, the carbon stock will increase by 13,545 mt C/yr (= 541,814 mt C/40 years). Component B project case stocks in any given year were calculated by adding 13,545 mt C to the stock level in the previous year.

1995	4,191,708 + 13,545
1996	1995 stock + 13,545
1997	1996 stock + 13,545
etc.	

Average annual carbon sequestration in the Component B project case is calculated by subtracting the carbon stock in the year considered from the carbon stock in the previous year.

Annual estimates of net carbon benefits for Component B of the project were derived by subtracting the average annual Component B project case carbon estimates from the average annual Component B reference case carbon estimates, as calculated above. Using this approach, total net carbon sequestered over the life of the project is approximately 1,300,000 mt C.

F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	No U.S. Government, Government of Belize, or other bilateral or multilateral development funds have been obligated to the Rio Bravo Carbon Sequestration Pilot Project or to the specific activities to be implemented by this project.

G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project supports the institutional development of a Belizean NGO. It also directly addresses the issue of developing innovative financing mechanisms for conservation management in Belize, perhaps the most important strategic aspect of the project in national terms. If the model developed in the RBCMA Pilot Project proves successful, the participants plan to extend the project beyond the RBCMA boundaries. In his letter to the U.S. Department of State communicating the Belizean Government's acceptance of the project, the Foreign Minister stated, "It is, indeed, our hope that the project would serve as a model to be applied elsewhere."
H) Additional Comments	

Aeroenergía S.A. Wind Facility Project

A) Description	The Aeroenergía S.A. Wind Facility Project will develop a 6.4-megawatt power facility consisting of 16 wind turbines. The plant will be located in an area of Costa Rica where previous studies have identified a very strong wind resource sufficient to support economical wind energy. The electricity generated by the powerplant will be sold to the Costa Rican Institute of Electricity (ICE) and will displace electricity that would have been generated using thermal fossil fuel-burning facilities.	
	Project Type	Renewables: Wind
	Participants	Power Systems, Inc., one of the U.S. partners, is a system integrator and trading company. Bluefields International, another U.S. partner, is a financial consulting and investment company with long experience in renewable energy and environmental project development. EnergyWorks, another U.S partner, is a global company that delivers energy services using small, renewable energy technologies for utility, industrial, and rural electrification projects around the world. EnergyWorks is a PacifiCorp-Bechtel Company. Aeroenergía S.A. is the host country partner. This Central American wind energy development company is recognized as an expert in structuring clean energy projects in the region. Micon A/S is providing the turbine technology. This Danish company is one of the largest manufacturers of wind energy turbines in the world.
	Institutional Arrangements	Aeroenergía and Bluefields International, in cooperation with Micon A/S, will develop the windfarm. Power Systems, Inc., is currently

	providing technical assistance in equipment procurement for the project. Aeroenergía will operate and maintain the wind farm for the duration of the ICE power contract. Technical support for this activity would be supplied by Power Systems, Inc., and Micon A/S, subject to related contracts. Anticipated carbon offsets will be distributed among the project equity participants based on equity share, the U.S. companies, and an unidentified Costa Rican entity(ies).
Cost	The total estimated capital cost is approximately US$8.85 million. Participants currently anticipate financing the project with approximately 70% debt and 30% equity.
Technical Data	The 6.4-megawatt power wind facility will use 16 Micon M75-400/100 kW latest generation wind turbines. Initial projections indicate that the project can generate 27 gigawatt-hours per year, displacing electricity from thermal units that burn fossil fuels. Costa Rica is a particularly strong candidate for substituting wind power for fossil fuel electricity generation because the country's wind resource is at its strongest during the time when reservoirs are lowest, January through August, and weakest when water flow exceeds storage capacity in September and October. Adding wind power to its power source portfolio would allow ICE to maximize use of its wind and hydroelectric resources by reducing water flow over the dams when the wind is strong and the water is low, storing the water to be spilled when the wind strength falls off. This potential made Costa Rica a good choice for developing a wind electric project specifically intended to achieve carbon emissions reductions.

	Long-Term Viability	Site-specific geological studies indicate the terrain is very stable. Windfarm operations are consistent with current land uses, primarily cattle-grazing.
	Location	Costa Rica
	Term	The term of the power purchase agreement with ICE is 20 years, with the possibility of an extension. The useful life of the equipment is expected to exceed 20 years.
	Project Assessment Procedures	Monitoring will take place on a regular and consistent basis in accordance with the power purchasing agreement. The Costa Rican Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM) and ICE will provide data and technical assistance in development of offset information. All participants agree to external verification.
B) Government Acceptance, Approval or Endorsement		A letter to the USIJI Evaluation Panel from the Costa Rican Minister of Natural Resources, Energy, and Mines dated July 26, 1995, indicates that "Costa Rica strongly supports" the project's application for USIJI acceptance.
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies		The ICE anticipates shortfalls in its ability to meet the demand for electricity as early as 1996. Because wind facilities can be constructed quickly, the project could be on line in time to help meet these shortfalls.
D) Benefits Derived from the AIJ Project		This project will provide cumulative greenhouse gas (GHG) reductions estimated at 9,800 mt C. These reductions will be achieved by displacing the emissions associated with fossil fuel capacity that would otherwise be called into service to meet the demand that the wind facility will satisfy. Although the project developer estimates that the wind facility will be operational in

May 1997 and will function for over 20 years, GHG reductions are projected only from inception through the year 2000. As explained in more detail below, this approach was adopted to be consistent with the Costa Rican Government's goal of phasing out fossil fuels by the year 2001.

The project also will reduce emissions of other air pollutants associated with fossil fuel combustion. The construction, operation, and maintenance of the facility will create jobs for Costa Ricans. The local economy will also benefit from improved roads and electricity transmission facilities.

E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change

To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project.

In order to establish credible reference and project cases, the project developer had to take into consideration current and planned electricity supply in Costa Rica, as well as any known regulatory influences, over the life of the project. Although fossil units in Costa Rica were originally designed to meet only peak demand, with hydroelectric systems meeting baseload demand, decreased reliability of hydroelectric plants resulting from El Niño drought conditions has forced ICE to rely more heavily on thermal units to meet baseload demand. At the same time, energy demand in Costa Rica is growing at a rate of between 7 and 9% annually. This rapid growth has put pressure on ICE to continue to expand its current capacity. In September 1994, the Minister of Natural Resources, Energy and Mines announced the goal to meet all electricity needs in Costa Rica with renewable energy sources by 2001. While this goal is intended to fulfill commitments under the Framework Convention on Climate Change (FCCC), the Biodiversity Convention, and Agenda 21, current energy demand and supply conditions suggest that such a phase-out may be delayed.

In light of ambiguities created by the drought and potential conflicts between policy goals and actual utility expansion plans,

the project developer considered two sets of reference case projections: one developed by ICE and USAID in 1992, and an "alternative" projection incorporating 1994 fossil fuel consumption data and the September 1994 official goal to phase out fossil fuels. Although neither approach was considered unreasonable, the "alternative" reference case discussed below provides a more conservative estimate of greenhouse gas reduction.

Using 1994 fossil fuel consumption data as a benchmark and the fossil fuel phase-out plan, the developer established annual "alternative" reference case projections in which emissions fall to zero over the period from 1997 to 2001. Reference case emissions were based on annual consumption of diesel and bunker fuel oil at Costa Rica's fossil fuel-fired generating plants, which are currently operating almost full-time. According to data provided to the developer by MINAE, during 1994, these fossil fuel plants generated 829.8 GWh, and emitted 235,048 mt C. From this can be derived a 1994 national emissions factor for fossil fuel plants of 283.2586 mt C/GWh (235,048 mt C/829.8 GWh).

To establish annual reference case GHG emissions estimates, the developer assumed that consumption of diesel and fuel oil would remain at 1994 levels until 1997. Thus, in the absence of this project, annual emissions from fossil plants would remain at 235,048 mt C in 1997. This is fully consistent with the Government's announced goal to phase out fossil fuel by 2001, according to which fossil fuel consumption is expected to decline beginning in 1998 until it is totally eliminated by 2001. Specifically, under the phase-out plan, emissions from fossil fuel consumption are expected to be reduced 44% by 1998, 86% by 1999, 99% by 2000, and 100% by 2001. Thus, in 1998, even without the project, emissions would be expected to decline to 131,627 mt C [235,048 mt C * (1–0.44)]. Similarly, reference case GHG emissions from fossil plants were assumed to continue their decline in accordance with the phase-out plan until they reached zero in 2001. For example, 1999 reference case emissions are 32,907 mt C [235,048 mt C * (1–0.86)],declining in 2000 to 2,350 mt C [235,048 mt C * (1–0.99)].

Because there are no emissions associated with wind energy

	electricity generation, emissions in the project case represent Costa Rican fossil fuel electricity generation that is *not* displaced by the project's generation. Thus, if it is assumed that the 6.4 MW wind facility will annually generate 27 Gwh of electricity, the project case emissions for 1997 would be 227,400 mt C [(829.8 GWh – 27 GWh) * 283.2586 mt C/GWh]. In 1998 project case emissions would be 127,344 mt C [(829.8 GWh – 27 GWh) * (283.2586 mt C/GWh * 0.56)] to reflect the fossil phase–out requirement for a 44% reduction in fossil emissions for that year. Similar calculations were done for 1999 and 2000. From 2001 through the balance of the project duration, both project case and reference case emissions were assumed to be zero. Reductions (net project benefits) for any given year are calculated by subtracting the project case emissions for that year from the reference case emissions for that year. For example, based upon the information given above, reductions for 1997 were estimated to be 4,461 mt C [(235,048 mt C - 227,400 mt C) * 7/12]. Since the project is not expected to be fully operational until May 1997, reductions were only estimated for seven months (7/12) of 1997. For 1998, reductions were estimated to be 4,283 mt C (131,627 mt C - 127,344 mt C). Similar calculations were done for 1999 and 2000. The sum of these annual reductions yields a total estimated net carbon benefit of approximately 9,800 mt C over the life of the project. By calculating annual reductions in net project carbon benefits based on the phase-out of fossil fuels, the project attempts to avoid double-counting emission reductions that may be claimed by other wind energy or hydroelectric projects in Costa Rica.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	The project will be financed entirely through private sources of capital. No U.S. federal funding is involved in this project. Aeroenergía has received eligibility for up to 70% financing from the Central American Economic Integration Bank (CABEI). The other 30% of the financing will be supplied as equity by Aeroenergía partners. Aeroenergía S.A. and Power Systems, Inc. have invested US$250,000 to initiate the project thus far.

G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	This project will contribute to the development goals of Costa Rica by expanding the application of renewable energy technologies, thereby reducing reliance on fossil fuels.
H) Additional Comments	

BIODIVERSIFIX Project

A) Description	The BIODIVERSIFIX Project will regenerate tropical wet forest and tropical dry forest in the Guanacaste Conservation Area in Costa Rica, forest conserved for sustainable, non-damaging use of wild-land biodiversity. Possible activities include low-impact controlled ecotourism, biological education programs, biodiversity prospecting, research programs, water generation, and regeneration of fine hardwoods. The project combines two subprojects, WETFIX and DRYFIX, that will promote reforestation and restoration of degraded forest and pasture tracts. Project Type | Land Use: Forest Restoration Participants | The Nature Conservancy (TNC) is a U.S. partner in this project. It is a nonprofit international membership organization, dedicated to identifying, protecting, and maintaining the best examples of communities, ecosystems, and endangered species in the natural world. The Guanacaste Conservation Area (GCA) is the host country partner. The GCA is a quasi-governmental organization with nine years' experience managing the biodiversity within the 120,000-hectare state-owned GCA. It is administered under the oversight of the Costa Rican Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM). The National System of Conservation Areas (SINAC), the rural manifestation of MINAE, is another aspect of the host country partnership, since the GCA is one of the eight conservation areas of SINAC. The National Institute of Biodiversity (INBio), another host country partner, is a nongovernmental organization created in 1989

	to gather information on and develop sustainable uses for the biodiversity resources of Costa Rica.
Institutional Arrangements	The GCA was established for the express purpose of restoring an entire dry forest and its adjacent wet forest, cloud forests, and marine habitats; and to ensure the survival of its biodiversity into the indefinite future. All carbon sequestration will be available for allocation to financing entities.
Cost	Project activity will be determined by carbon price, rather than budget: the price that the GCA secures for the project's carbon fixation and the associated payment schedule will determine the level of activity conducted. However, participants estimate overall project minimums are US$29,675,795 for Project WETFIX and US$35,098,000 for Project DRYFIX.
Technical Data	Carbon sequestration in Project WETFIX will be accomplished by restoring 13,500 hectares of abandoned or marginal pasture interspersed throughout a 40,000-hectare mosaic of middle-aged to primary wet forest. Some 6,100 hectares of natural and semi-natural forest would be regenerated within the current boundaries of the GCA; 7,400 hectares of marginal pasture would be purchased and added to the GCA. Project DRYFIX will consolidate the dry side of the GCA into a single forest unit. Income generated from carbon sequestration carbon credits and non-damaging biodiversity harvests will be used to cover project costs, as well as increase the GCA endowment for future management projects. Carbon sequestration will be accomplished by restoring 45,000 hectares of abandoned or marginal pasture

	interspersed throughout an 80,000-hectare mosaic of middle-aged to primary dry forest. Approximately 36,000 hectares of natural and semi-natural dry forest within the GCA would be restored, using facilitated natural regeneration. Another 9,000 hectares of marginal pasture would be purchased, added to the GCA, and planted with very valuable, slow-growing native hardwood species, with potential for sustainable harvest late in the project.
Long-Term Viability	Carbon benefits could be lost or reversed through timber poaching or fire. Successful fire surveillance and repression are already in place for the parent project. Current removal of wood is minimal, so the potential for leakage from displaced harvest is minimal. The project promises to use any harvested wood for long-term products. Reversion to cattle pasture is very unlikely, given: a) the strength of Costa Rica's land laws and conservation area designation, and b) long-depressed markets for beef and cattle pasture.
Location	Costa Rica
Term	Project lifetime is 50 years. However, the GCA is responsible for ensuring the survival of the biodiversity of the lands it holds in perpetuity, meaning carbon benefits will continue to accrue beyond the project lifespan.
Project Assessment Procedures	The monitoring plan includes annual visual inspection, aerial and satellite imagery, permanent measurement plots, and GIS data analysis. It builds on existing facilities and qualified staff of INBio, the GCA, and the Horizontes Forest Experiment Station within the GCA. Participants agree that all information gathered

	through this project will be publicly available in their offices, as well as on the Internet. Participants also agree to adhere to "green seal" audit by organizations such as Rainforest Alliance or Green Cross.
B) Government Acceptance, Approval or Endorsement	The USIJI Evaluation Panel has received letters dated July 26, 1995, from the Minister of Natural Resources, Energy and Mines confirming that the Costa Rican Government "strongly supports" Projects WETFIX and DRYFIX.
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The letters from Costa Rica's official joint implementation approval office note that Projects WETFIX and DRYFIX will serve as "an integral part of the overall management and non-damaging use plan" for the Guanacaste Conservation Area.
D) Benefits Derived from the AIJ Project	This project will produce carbon sequestration benefits equivalent to an estimated 5,040,000 mt C over the project's 50-year lifespan. One of the key non-greenhouse gas environmental benefits is biodiversity protection. Other positive impacts include the contribution to Guanacaste province's economic trend from marginal cattle ranching to tree crops, conservation management, and tourism; and creation of secure jobs for marginally employed ranchers as paraprofessional personnel for the GCA.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project.

In the development of the reference case for both the WETFIX (13,500 ha) and DRYFIX (45,000 ha) components of the project, the developer begins with marginal cropland, abandoned pasture, or otherwise unused lands, from which forests had been cleared over the last 100-400 years. Carbon stocks are constant, and annual emissions were therefore zero. Carbon stocks were estimated by the developer to range from 1-10 mt C/ha, based on decades of experience in the project area and published studies from the same kinds of habitat elsewhere. To be conservative in subsequently deriving net project benefits, the value of 10 mt C/ha was used to estimate reference case stocks. Based upon this value, the total carbon stock would equal 585,000 mt C (= 58,500 ha * 10 mt C/ha) of which the DRYFIX component accounts for 450,000 mt C, and WETFIX for 135,000 mt C.

To develop the annual stocks and flows for the project case, the following types of information were used: (1) estimated carbon stored per hectare in wet and dry tropical forests after 100 years; (2) assumptions about the rate at which carbon is accumulated in each decade of the project case, based on academic studies of carbon accumulation in regenerating forest; and (3) decadal carbon accumulations, based on the first two assumptions and the (conservative) reference case assumption. The specific information used is summarized in the following table.

		DRYFIX		WETFIX	
Decade	Percent Accumulation (%)	Decadal Increment (mt C/ha/dec.)	Annual Increment (mt C/ha/yr)	Decadal Increment (mt C/ha/dec.)	Annual Increment (mt C/ha/yr)
1	10	10	1.0	20	2.0
2	15	15	1.5	30	3.0
3	20	20	2.0	40	4.0
4	15	15	1.5	30	3.0
5	10	10	1.0	20	2.0
6-10	6	6	0.6	12	1.2

(The results presented for Decades 6-10 are for each decade in the 50-year period. Note that the data in this row are not used in deriving project case estimates or net project benefits.)

Assuming the land was purchased by April 1996, with sequestration beginning in September 1996, the first full year of

sequestration in the project case was assumed to be 1997 for purposes of developing annual estimates. The project currently estimates carbon sequestration benefits for only the first 50 years of the project (i.e., through the end of August 2046). This results in a conservative underestimate of the emissions sequestration by only accounting for approximately 70% of total incremental carbon storage that will be present on the site at equilibrium, reached in 100 years (i.e., 70% of the 100 year accumulation occurs within the first 50 years).

For the DRYFIX component of the project, the dry forest, the 100 year carbon density is assumed to be 110 mt C/ha. The incremental carbon accumulation over 100 years in the project case was therefore calculated as 100 mt C/ha (= 110 mt C/ha - 10 mt C/ha). (Incremental accumulation in the project case is calculated by subtracting the 10 mt C/ha initially present on pasture and marginal cropland from the final carbon stock of 110 mt C/ha.) The incremental carbon accumulation over each decade (see "Decadal Increment" column in the table above) was then estimated as the percent accumulation for that decade multiplied by the 100 year increment. For example, the decadal increment in the first decade of the project is 10 mt C/decade (= 100 mt C * 10%). Given these estimates of *decadal* uptake, *average annual* uptake estimates were derived by dividing the decadal values by 10 (see "Annual Increment" column). These annual average uptake estimates (per hectare), as provided by the developer, were used to derive annual stocks and flows.

Thus, for example, in the first 10 years (September 1996 - August 2006) of the project, annual uptake in the project case for DRYFIX was estimated to be 45,000 mt C/yr (= 1.0 mt C/ha/yr * 45,000 ha). Similarly, over the second 10 years (September 2007 - August 2016) of the project, annual uptake was estimated to be 67,500 mt C/yr (= 1.5 mt C/ha/yr * 45,000 ha). (In "transition" years between two decades, i.e., 1996, 2006, etc., the carbon accumulation for that calendar year spans two different project decades. Thus, it is estimated as 8 months of the previous decade's annual rate, and 4 months of the following decade's annual rate. For example, sequestration in 2006 is 52,500 mt C (= (8/12 * 45,000 mt C) + (4/12 * 67,500 mt C).) The carbon stock at the start of any year was derived by adding the initial carbon stock, 450,000 mt C (= 10 mt C/ha * 45,000 ha), to the carbon accumulated in all previous years.

	The same methodology was used for the WETFIX component of the project, the wet forest, except that the 100 year carbon density was assumed by the developer to be 210 mt C/ha, again based on studies done elsewhere in similar habitats. Subtracting from this value the 10 mt C/ha initially present on pasture and marginal cropland gives the incremental carbon accumulation over 100 years of the project case as 200 mt C/ha. Thus, annual sequestration for the WETFIX component during the first decade of the project (September 1996 through August 2006) was projected to be 27,000 mt C/yr (= 2 mt C/ha/yr * 13,500 ha). Similarly, annual sequestration during the second decade(September 2006 through August 2016) was projected to be 40,500 mt C (= 3 mt C/ha * 13,500 ha). Using the methodology described above, the project case cumulative carbon sequestration for BIODIVERSIFIX was estimated to be 5,040,000 mt C by 2046 {= 70% * [(100 mt C/ha * 45,000 ha) + (200 mt C/ha * 13,500 ha)]}. To determine the net carbon benefits of the project, the cumulative carbon sequestration estimated for the reference case is subtracted from the cumulative sequestration associated with the project case. Since, as noted above, there were zero emissions or sequestration assumed in the reference case, the net project benefits are the same as the project case 5,040,000 mt C by 2046.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	U.S. federal funds are not a source of funding for the specific measures to reduce or sequester greenhouse gas emissions in this project.

G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project will make a strong contribution to scientific and technical knowledge and strengthen the conservation area network in Costa Rica. Additionally, Costa Rica is a pilot project for the entire developing tropics, and projects undertaken there are under scrutiny from around the world.
H) Additional Comments	

CARFIX: Sustainable Forest Management

A) Description	The purpose of this project is to stabilize the existing natural forest and to create additional forest cover in the Central Volcanic Conservation Area (ACCVC) in Costa Rica. The ACCVC is a 290,187-hectare buffer zone surrounding the World Biosphere Reserve of Braulio Carrillo National Park.	
	Project Type	Land-Use: Multicomponent Forestry
	Participants	Wachovia Timberland Investment Management, a U.S.-based private timber investment company, is a possible U.S. participant. Wachovia has expressed a definite interest in investing in future harvests from the project. The Foundation for the Development of the Central Volcanic Mountain Range (FUNDECOR), a host country participant, is an endowed nonprofit organization whose goal is to maintain and enhance biodiversity in Costa Rica by building and conserving reserves, while at the same time utilizing forested and other lands for socioeconomic development. The Costa Rican Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM), another host country partner, has primary responsibility for Costa Rica's conservation activities and park management. Agencies in its portfolio include the Forest Service; the National Park Service; the Office of Geology, Mines, and Hydrocarbons; and the National Zoo and Botanical Garden. Two of its agencies are involved in the project: the National Park Service and Central Volcanic Conservation Area.
	Institutional Arrangements	Project CARFIX will expand an existing pilot project instituting sustainable forest management in the park and a buffer zone.

	The project will be managed by FUNDECOR. Founded in 1991 with funding provided by the U.S. Agency for International Development, FUNDECOR has been given responsibility for nearly 300 square kilometers of conservation area in the ACCVC. In addition, 75 landowners have entrusted FUNDECOR with technical management of close to 11,000 hectares of natural forest. All carbon offsets will be allocated to utility companies that invest in the project.
Cost	Preliminary cost estimates are US$21.4 million.
Technical Data	The project will involve approximately 72,000 hectares of land in national parks, 21,000 hectares of natural forest, 6,000 hectares of reforestation, and 11,000 hectares of natural forest regeneration in the privately-held buffer zone. Reforestation, sustainable management of the existing natural forest, and natural forest regeneration will conserve and enhance the carbon sequestration capacity of the ACCVC. The project also will undertake activities to guarantee continued total protection of national park lands within the project area. The project adopts a two-prong strategy to achieve its goals. Strong technical direction will be provided to ensure complete adherence to sustainable forestry practices. Funds will be used to purchase privately held land within the park areas, to improve the policing of the parks, and to provide training and assistance to farmers. At the same time, annual payments will be made to the private landowners for progressive forest management. These payments will be based on the value of the carbon sink preserved and the carbon sequestration added. Combined with incentives from the Costa Rican government

		and income from future forestry yields, the funds from carbon fixation will ensure that farmers and private landholders have sufficient annual income to provide a competitive alternative to land uses that lead to deforestation.
	Long-Term Viability	The project is an attempt to address one of the major obstacles to sustainable forestry in the area: the inability to realize an adequate yearly income. By providing a stable income, the project would reduce the incentives to clear-cut forests for conversion to pasture. To the extent it is successful in its goals, landowners will be motivated to preserve the forests, and thus the carbon sequestration capacity of the area.
	Location	Costa Rica
	Term	25 years
	Project Assessment Procedures	FUNDECOR will be responsible for triennial monitoring of deforestation using remote sensing imagery, annual measurements of forest growth, and two inspections per year of private lands in the project area. External audits will also be conducted by independent bodies.
B) Government Acceptance, Approval or Endorsement		The USIJI Evaluation Panel has received a letter dated Nov. 3, 1994, from the Minister of Natural Resources, Energy and Mines stating that "Costa Rica strongly supports" the project's application to the USIJI.

C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The project supports sustainable forestry, a major goal of the Costa Rican Government.
D) Benefits Derived from the AIJ Project	This project will sequester an estimated 5,939,000 mt C over its 25-year duration. In addition to sequestering carbon, Project CARFIX will help reduce soil and water degradation and loss of biodiversity. The project will also provide a source of income to landowners in the region and will help develop Costa Rica's ecotourism and wood products industries.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project cases are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project. The project area comprises natural forests in the National Parks (NPARK), and natural forests (NFMGT), deforested lands used for cattle production (REFOR), and abandoned pastures (SFREG) in the buffer zone. Emissions in the reference case arise from deforestation both in NPARK and in NFMGT, assuming deforestation continues at the rates observed from a remote sensing study of the project area. For 1996, it was estimated that emissions resulting from the deforestation of 4.14% of forests in NPARK would total 294,243 mt C (= 71,551 ha * 4.14% of deforestation * 99.4 mt C/ha), and that emissions from deforestation of 6% of forests in NFMGT would total 122,273 mt C (= 20,502 ha * 6% deforestation * 99.4 mt C/ha). In the reference case in SFREG and in REFOR, the *net* growth of biomass, and therefore *net* carbon store, are assumed to be

zero.

In the project case, carbon sequestration arises from avoided deforestation in NPARK, and from tree growth and reduced deforestation in the buffer zone. In the project case in NPARK, deforestation is expected to be averted by increased monitoring to prevent illegal logging and land use and by transfer of land ownership from private citizens to the government. NPARK comprises mature forests; therefore, there is *no* net biomass growth, so the annual incremental carbon sequestration estimate was zero.

In the project case in the buffer zone, under sustainable forestry practices, the natural forest in NFMGT was assumed to grow 1 m^3/ha/yr. Of the total area of NFMGT, 30% of the forest area will be totally protected, and the rest will be harvested three times during the life of the project. The carbon emissions in NFMGT in 1996 were estimated at 94,863 mt C (= 95,470 mt C of emissions from deforestation - 607 mt C sequestered by net growth). In the project case, carbon sequestration arises from tree growth due to natural regeneration in SFREG and from tree growth due to reforestation in REFOR. During the life of the project, SFREG will be harvested once and REFOR will be harvested twice. There will be no carbon sequestration in these two sites until 1998.

The net project benefits in NPARK and in NFMGT in the buffer zone arise from avoided carbon loss by protecting it from deforestation. In the buffer zone, net project benefits also arise from carbon sequestered by tree growth. The 1996 net project benefits in NPARK were estimated to be 294,243 mt C. The 1996 net project benefits in NFMGT were estimated to be 27,441 mt C (= 26,804 mt C sequestered by avoided deforestation + 607 mt C sequestered by net biomass growth). The total net carbon benefits over the life of the project were estimated to be 5,939,113 mt C (= 5,355,295 mt C sequestered by avoided deforestation in NPARK and in NFMGT + 583,818 mt C sequestered by tree growth in NFMGT, SFREG, and REFOR in the buffer zone).

F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	Financial support for the project is being sought from the Global Environmental Fund to support biodiversity monitoring studies and to determine carbon offset values attributable to the parks, but not for project implementation. FUNDECOR will provide in-kind support through provision of infrastructure and indirect overhead costs. Participants anticipate the bulk of project funding will come from JI-motivated U.S. utilities.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	Because the project involves education and outreach activities, information about proper silviculture techniques will be passed on to as many as 1,878 individual farmers and community organizations. The techniques employed here can be applied to other regions around the country.
H) Additional Comments	

Doña Julia Hydroelectric Project

A) Description	The project involves construction of a 16-megawatt hydroelectric plant in northern Costa Rica. The plant will use the waters of the Puerto Viejo River and the Quebradón Creek. The electricity generated will be sold to the Costa Rican Institute of Electricity (ICE) and will displace electricity that would have been generated using thermal fossil fuel-burning facilities.	
	Project Type	Renewables: Hydroelectric
	Participants	New World Power Corporation, the U.S. participant, is an independent power producer that develops, owns, and operates facilities that produce and sell electric power generated from water, wind, and sun. New World Power also assembles and sells renewable power generating systems. The Costa Rican Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM), one of the host country partners, has primary responsibility for Costa Rica's conservation activities and park management. Agencies in its portfolio include the Forest Service; the National Park Service; the Office of Geology, Mines, and Hydrocarbons; and the National Zoo and Botanical Garden. Compañía Hidroeléctrica Doña Julia is the other host country participant.
	Institutional Arrangements	The project will be the property of Compañía Hidroeléctrica Doña Julia. It is expected that carbon offsets will be distributed among the project equity participants based on equity share. However, if the Costa Rican entity cannot use the offsets and equitable agreement is reached on transferring the offsets, New World Power Corp. will accept all offsets associated with the

	project.
Cost	The estimated total project is US$28 million. The project would be financed with a combination of debt (70%) and equity (30%).
Technical Data	The plant's annual average generation is estimated to approach 90 gigawatt-hours (GWh) during peak energy demand. This hydroelectric-generated power will displace electricity that would have been generated using thermal units that burn primarily high-sulfur diesel fuels, bunker oils, and IFO 180 fuels.
Long-Term Viability	Given the level of capital investment associated with the project and the existence of a power purchase agreement, there is a strong incentive for the project participants to maintain the operation of the facility and the associated greenhouse gas (GHG) reductions.
Location	Costa Rica
Term	The initial project lifetime is 15 years, with possible 5-year extensions. However, reductions are projected only through the year 2000, on the assumption that Costa Rica will meet its goal of discontinuing all fossil-fuel generating capacity by that time.
Project Assessment Procedures	Monitoring will take place on a regular and consistent basis in accordance with the power purchase agreement. MINAE and ICE will provide data and technical assistance in development of offset information. All participants agree to external verification.

B) Government Acceptance, Approval or Endorsement	The USIJI Evaluation Panel has received a letter dated July 26, 1995, from the Costa Rican Minister of Natural Resources, Energy, and Mines indicating that "Costa Rica strongly supports" the project's application for USIJI acceptance.
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The ICE anticipates shortfalls in its ability to meet the demand for electricity as early as 1996. In his letter to the USIJI Evaluation Panel, the Minister of Natural Resources, Energy, and Mines notes that the Doña Julia Project will help the country achieve its sustainable development goals by diversifying its energy resource portfolio. MINAE, whose standards are consistent with or exceed World Bank Environmental Standards, has reviewed the entire design and construction program for this project. An Environmental Impact Study for the project received final approval in April 1994. The study concluded that there would be no serious ecological impact or environmental alterations which would significantly affect the flora and fauna of the area; and that, due to the low population density of the surrounding area, the impact on the inhabitants would be minimal.
D) Benefits Derived from the AIJ Project	This project will provide GHG reductions equivalent to 57,400 mt C from 1996 to 2001. Although the lifetime of the project is anticipated to be 15 years, project benefits are only claimed by the developer through the year 2000 because of the government's fossil fuel phase-out plan. The displacement of fossil fuel-burning will have a number of environmental benefits, including reduction of other air pollutants. The project will also generate jobs during construction and, once on-line, in operations and maintenance. The economy as a whole will benefit from increased stability in the power supply.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project.

To establish the reference case, the developer used historic and projected CO_2 emissions from consumption of diesel and bunker fuel oil powering Costa Rica's generating plants. The developer assumed that the consumption of diesel and oil fuels would remain at 1994 levels through 1997. This is fully consistent with the Government's announced goal to phase out fossil fuel by 2001, according to which fossil fuel consumption is expected to decline beginning in 1998 until it is totally eliminated by 2001. Based on Cost Rica's fossil fuel phase-out plan, emissions from fossil fuel consumption are expected to be reduced by approximately 33% by 1998, 66% by 1999, 99% by 2000, and 100% by 2001, relative to 1994 levels.

To estimate the emissions for the reference case, the developer calculated emissions for both diesel fuel and fuel oil using 1994 consumption data. Emissions from diesel fuel were derived by multiplying the amount of fuel consumed by the heat content of diesel fuel and by a diesel fuel CO_2 emissions factor. For diesel fuel, emissions were estimated to be 751,696 mt CO_2 (= 71,430,126 gal. * 0.145 10^6 Btu/gal * 0.072 mt $CO_2/10^6$ Btu). Emissions from fuel oil were calculated using the same method, but with a heat content of 0.15 Btu/gal. and a CO_2 emissions factor of 0.76 mt $CO_2/10^6$ Btu. Emissions from fuel oil were estimated to be 110,146 mt CO_2 (= 9,636,099 gal. * 0.150,000 10^6 Btu/gal * 0.076 mt $CO_2/10^6$ Btu). The sum of these emissions was used for the years 1996 and 1997. Annual emissions from 1998 to 2001 were estimated following the phase-out plan.

Because there are no emissions associated with hydroelectric energy electricity generation, emissions in the project case represent Costa Rican fossil fuel electricity generation that is *not* displaced by the project's generation. Annual project case emissions are calculated by subtracting annual net project benefits from annual reference case emissions.

To determine net project benefits, the estimated reductions for each year were computed as the ratio of the hydroelectric plant's projected maximum electricity generation (approximately 90 GWh) to total Costa Rican fossil fuel electricity generation in 1994 (829.8 GWh), multiplied by reference case CO_2 emissions in that year. Emissions reductions for 1996 were prorated by

	3/12 to reflect the date at which the facility was anticipated to come on-line (October, 1996). Because of the anticipated phase-out of fossil fuel plants, emission reductions decline annually until they reach zero in 2001. Cumulative GHG reductions from the project were estimated to be 210,567 mt CO_2 or 57,400 mt C (210,567 mt CO_2 * 12/44 C/CO_2). By calculating an annual reduction in net project carbon benefits based on the phase-out of fossil fuels, the project attempts to avoid double-counting emission reductions that may be claimed by other hydroelectric and wind projects in Costa Rica.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	The project will be financed entirely through private sources of capital. No U.S. federal funds have been used in this project.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	This project will contribute to the development goals of Costa Rica by further displacing fossil fuels and adding clean energy capacity.
H) Additional Comments	

ECOLAND: ESQUINAS NATIONAL PARK

A) Description

The ECOLAND Project will preserve tropical forest through the purchase of approximately 2,400 privately-owned hectares in the Esquinas National Park in southwestern Costa Rica. The purchased land will be conveyed to the Costa Rican Park Service for permanent protection.

Project Type | Land-Use: Forest Preservation

Participants | Tenaska Washington Partners, Ltd., is one of the U.S. participants. It is a partnership of four companies: Tenaska, Inc., the managing partner; Continental Energy Services, a subsidiary of the Montana Power Company; Illinova Generating Company, a wholly-owned subsidiary of Illinova Corporation; and KU Capital Corporation, a wholly-owned subsidiary of KU Energy Corporation. Tenaska owns and operates powerplants.

Trexler and Associates, Inc., another U.S. participant, assists companies in the identification and implementation of greenhouse gas emissions reduction and offset strategies. It represents Tenaska in the ECOLAND Project.

The National Fish and Wildlife Foundation (NFWF), another U.S. participant, is a nonprofit organization that provides matching funds to a wide variety of conservation efforts.

COMBOS Foundation (COMBOS), a host country participant, is a nonprofit Costa Rican association that promotes conservation and management of tropical forests through private action.

The Costa Rican Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM), another host country partner, has primary

	responsibility for Costa Rica's conservation activities and park management. Agencies in its portfolio include the Forest Service; the National Park Service; the Office of Geology, Mines, and Hydrocarbons; and the National Zoo and Botanical Garden. The Council of the Osa Conservation Area (ACOSA), another host country participant, is an inter-institutional body established by MIRENEM to administer the protected areas of the Osa Peninsula. ACOSA coordinates the activities of agencies having jurisdiction over the peninsula's national resources. Regenwald der Österreicher (Rainforests of the Austrians) an Austrian nongovernmental organization, was founded in 1991 to preserve biodiversity in the rainforests of Costa Rica. It already has an established in-country presence, providing support for an ecotourism project on land it has purchased bordering on the park.
Institutional Arrangements	Funded by Tenaska, Rainforests of the Austrians, and NFWF, COMBOS and ACOSA will purchase approximately 2,400 hectares of privately-owned land in the Esquinas National Park. The title to the land will be conveyed to MINAE. Under the direction of MINAE, the Costa Rican National Park Service will manage the land as a permanently protected tropical forest. Tenaska will be allocated the first 250,000 tons of carbon offsets. The Government of Costa Rica will be able to claim the balance if it so chooses.
Cost	Purchase of the entire park is estimated to cost approximately US$5 million.
Technical	The 12,500-hectare Esquinas Forest was

	Data	declared a national park by the Government of Costa Rica in 1993, but almost all of the land within the park is in private hands. Some landowners hold logging concessions, a number of which are active, and many owners face economic pressures that encourage deforestation. However, under Costa Rican law, the Government cannot restrict land-use decisions of private landowners, meaning the Government must purchase lands it wishes to protect. The ECOLAND Project will bring nearly 20% of the park's land under protection.
	Long-Term Viability	Long-term land-use management plans have been developed to ensure continued viability of the project. In addition, an endowment fund will provide for long-term park protection and monitoring.
	Location	Costa Rica
	Term	In perpetuity
	Project Assessment Procedures	MINAE and the Costa Rican Park Service will ensure that deforestation does not occur. They will receive assistance in this from international NGOs.
B) Government Acceptance, Approval or Endorsement	The Costa Rican government was fully involved in the development of the ECOLAND proposal. In fact, the Government specifically asked Tenaska to submit the project for USIJI approval, so that the project could become a model for joint implementation projects in that country. In a letter to the USIJI Evaluation Panel dated December 7, 1994, the Minister of Natural Resources, Energy and Mines wrote, "the Government of Costa Rica strongly supports the ECOLAND Project."	

C) Comparability with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	In his letter to the Evaluation Panel, the Minister of Natural Resources, Energy and Mines noted that the project "may be one of the last hopes for protecting lands within the Esquinas Park."
D) Benefits Derived from the AIJ Project	The net carbon benefits from the project's forest regeneration and protection activities will be approximately 345,500 metric tons of carbon over the 15-year project lifespan. Purchasing the land from private owners will save hundreds of species from the threat of extinction, will help maintain water quality, and will greatly reduce the soil erosion that results when plant cover is removed.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project. According to the developer, a total of 2,340 ha will be purchased, of which all but 304 hectares are currently forested. If not protected by this project, this land is projected to be deforested over the next 15 years at an average rate of 135.73 ha/yr (= 2,036 ha/15 yrs). Based on general soil and vegetation carbon content literature, the developer estimated the total amount of carbon sequestered on the project area to be 235 mt C/ha, of which 125 mt C/ha was assumed to be sequestered by soils, and 110 mt C/ha by vegetation. In addition, based on general forest carbon literature, the developer estimated that deforestation would result in a 60% loss in soil carbon, or 75 mt C/ha (125 mt C/ha * .60), and an 80% loss of carbon stored in vegetation, or 88 mt

C/ha (110 mt C/ha * .80). Based on the estimates of carbon loss from deforestation, the developer estimates that 163 mt C/ha would be released through deforestation. Thus, annual reference case carbon emissions would be 22,125 mt C/yr (= 135.73 ha/yr * 163 mt C/ha).

The project will protect 2,036 ha of forested land, thus preventing carbon emissions from deforestation that would have occurred otherwise. In addition, the project will allow forest regeneration to occur on the remaining 304 ha of project land that are currently not forested.

The developer estimated initial carbon stock on the forestland to be 331,868 mt C (163 mt C/ha * 2,036 ha). The developer has indicated that, while the forest protected by the project is considered to be in equilibrium, recent biomass removal suggests that biomass growth may occur over the lifetime of the project. However, to be conservative, annual carbon stocks for the forested area were held constant for estimating the project case, and annual sequestration on the forested area was estimated at zero throughout the lifetime of the project.

According to information provided by the developer, carbon stocks on the 304 ha that are no longer forested are expected to increase as the area regenerates its natural forest cover under the protection of the project. The developer estimated that 3 mt C/ha would be sequestered annually through biomass growth as the forest regenerates, resulting in an annual total of 912 mt C (3 mt C/ha * 304 ha).

Estimated annual carbon stocks for the project equal to the carbon stocks on the currently forested area, 331,868 mt C, plus the additional 912 mt C sequestered through forest regeneration on the 304 ha of the unforested land each year.

Annual carbon sequestration in the project case is calculated by subtracting the carbon stock in a given year from the carbon stock in the previous year. Since annual sequestration on the 2,036 ha of forest is equal to zero, annual sequestration is simply equal to the carbon sequestered each year through forest regeneration on the 304 ha of the project area that are currently not forested. Adding the initial carbon stock (331,868 mt C) and the amount of carbon sequestered on the 304 ha

	over 15 years, 13,680 mt C (= 912 mt C/yr * 15 years) gives an estimated total project net carbon benefit of 345,548 metric tons of carbon.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	No multilateral funding sources are involved in the project.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The Costa Rican Government has stated that the ECOLAND Project can serve as a model for subsequent Costa Rica-USIJI efforts. The project will provide Costa Rican institutions with valuable experience in protecting endangered rainforests.
H) Additional Comments	

Klinki Forestry Project

A) Description	The Klinki Forestry Project is located on the Atlantic slope of Costa Rica. The project will convert pastures to commercial tree plantations by promoting the planting of up to 6,000 hectares of private farms with mixtures of selected fast-growing tree species in a matrix, with the Klinki tree as a major component. The trees will be harvested for use in long-lived lumber products or left standing. The project will include small, medium, and large farms, educational pilot projects, and investor farms. Farmer groups will be paid fees for the carbon sequestration. The objective of the project is to develop a demonstration of the involvement of the farmer in carbon sequestration as an economic activity using the latest tree farming technology while providing carbon sequestration, wood production, and conservation benefits.
Project Type	Land-Use: Reforestation
Participants	Reforest the Tropics, Inc., a not-for-profit, non-stock organization, has a professional staff with a long history of forestry and agriculture development, technical assistance, and marketing. Its two tropical foresters have many years of experience implementing tree plantings in Costa Rica and elsewhere. The Cantonal Agricultural Center of Turrialba (CACTU), the host country partner, is a self-financed nonprofit nongovernmental organization that has been developing farm crops in Costa Rica for more than 25 years. Its board of directors is made up mainly of farmers and local representatives of banks and cooperatives whose goals are to further forestry and agricultural crops of interest to their region, with application to Costa Rica in general. Its technical director has 23 years of experience managing farms and tree crops. CACTU has been a leader of on-farm tree planting in Costa Rica for more than 25 years.

	Other collaborators are include the Yale School of Forestry and Environmental Studies, The Forest Products Laboratory of the U.S. Department of Agriculture, and The Tropical Agriculture Research and Higher Education Center (CATIE).
Institutional Arrangements	The project will be managed by the joint staff of the Reforest the Tropics, Inc., and CACTU, with advisory services from the other collaborators. It is expected that, at the end of the six-year project, CACTU will assume responsibility for ongoing monitoring and plantings. In a recent brief survey, 40 farmers indicated their willingness to participate in the initial stages of planting up to 2,750 hectares as soon as the project begins and trees become available. The linkage of U.S. industries to groups of farmers sequestering carbon, developed by this project, is expected to start at low levels of payments, since the newly planted trees will sequester relatively small amounts of carbon early in the project. However, if the industries and farmers are comfortable with the relationships and results, expansion to larger plantings and longer contracts is foreseen. The assignment of carbon offsets will be negotiated with the farmers or investors and financing industries.
Cost	Development costs are US$3.8 million.
Technical Data	The project focuses on four types of land ownership. The small-farm component (less than 10 hectares) will be used to determine what kind of carbon sequestration involvement is feasible for small farmers. The medium-sized farms (10-99 hectares) are likely to be found in cooperatives, with which carbon

	sequestering contracts may be appropriate. The large farms (100 hectares or more) will participate in joint projects with potentially large contracts. Educational projects (150 - 300 hectares) will be conducted in cooperation with research and teaching institutions, including CATIE. The private investor farm, a pilot project, will be financed by a combination of local and outside capital. Farmers will plant mixtures of native and non-native tree species with the Klinki tree as a matrix. The species combination has been specially selected to promote the conversion of low-productivity pastures with native or exotic grasses to productive forests. Forest stands created under this Klinki Matrix System (KMS) will produce multipurpose, high-grade industrial wood suitable for treated utility poles and other durable forest products for long-term storage of carbon in use. Trees left as living stands will sequester and store appreciable amounts of carbon. Carbon sequestered in this manner could become a new crop for farmers, providing motivation for converting old pastures into permanent and productive forest cover. KMS is based on 40 years of experience in Central America and elsewhere. Klinki is a fast-growing, tropical conifer, native to Papua New Guinea (PNG). Trials have shown excellent growth on a variety of sites over the past 29 years. In the past, the principal barriers to wider use of this species have been the lack of information and of seed supplies, previously available only from PNG. Now locally produced seed is available in limited quantities, with couriered seed from PNG and vegetative propagation supplying the rest.
Long-Term Viability	CACTU operates the only wood treatment plant in Costa Rica. The focus of the project on producing trees for an established market

		treated utility poles gives a high level of assurance that a large portion of the carbon would remain sequestered after harvest. The types of land where Klinki would be planted have a use-capability that makes forest production the most economically productive sustainable use.
	Location	Costa Rica
	Term	Project implementation phase is 6 years; the project and initial carbon accounting period is 40 years.
	Project Assessment Procedures	Monitoring of the initial site carbon and the carbon sequestered in trees will be an integral part of forest management, with systems developed by the project and carried out by CACTU. Following the six-year funded implementation period, carbon monitoring of KMS stands will be carried out by CACTU foresters, funded either by farmers receiving carbon payments or by the entity that finances the plantings in return for carbon offsets. Participants agree to external verification by the USIJI or another party.
B) Government Acceptance, Approval or Endorsement	The USIJI Evaluation Panel has received a letter of acceptance from the Government of Costa Rica's Ministry of Natural Resources and Energy (MINAE, formerly MIRENEM).	
C) Comparability with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The Government of Costa Rica is making a significant effort to play a leading role in the development of carbon sequestering in forests and forest plantings. The Klinki Forestry Project complements these efforts.	

D) Benefits Derived from the AIJ Project	This project will sequester the equivalent of an estimated 1,968,00 mt C over 40-years. Since Klinki trees live for several hundred years in their native setting, some level of sequestration likely will continue beyond the 40-year accounting period. Significant plantings by parties not involved in the project are anticipated as seedlings become readily available and the viability of the market for the superior Klinki wood is demonstrated. These stands would sequester substantial additional carbon. The project will have positive secondary environmental impacts, including soil stabilization, restoration of soil organic matter, and promotion of understory growth of native species through natural seed dispersion. Although KMS introduces non-native species, developers believe that native species will fare better in the KMS tree plantings than in the African grass pastures the plantings will replace. The project is also expected to have positive rural economic development impacts, promoting diversification of farm economies.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project. As noted above, the project area is pasture and depleted farmland cleared from the original forest by ranchers or migrating farmers. For the purpose of developing the reference case, it was assumed that in the absence of this project, the current land use patterns would continue, along with a decline in carbon stocks primarily as a result of ongoing soil carbon loss. These losses have not yet been quantified and are therefore not included in the calculation of reference case emissions or net project benefits. Thus, for the reference case, it is assumed that carbon stocks are constant and that emissions are zero, resulting in conservative estimates of net project benefits.

As currently planned, the developer will plant mixed stands of Klinki and other species as successive parcels of land are added to the project in each of the first 6 years. Net uptake will occur as the Klinki grows, accumulating carbon in above- and below-ground biomass. Thus, for the project case, the developer estimated that average annual net uptake would be 8.2 mt C/ha/yr, based on 26 years of growth and yield data gathered from Klinki stands planted in the Turrialba. The mixed stands planned for this project are expected to result in higher carbon accumulation rates than those for pure Klinki – according to the developer, the rates could be as much as 15% higher. However, due to the absence of sufficient empirical data, the developer chose not to factor this into the project case estimate, but instead used the lower rates for pure Klinki.

The project case sequestration for a given year was calculated by multiplying the cumulative number of hectares enrolled in the project in that year by the annual uptake estimate of 8.2 mt C/ha/yr. Thus, project case uptake in 1997 for the first 100 ha parcel of land added to the project was estimated to be 820 mt C (= 8.2 mt C/ha * 100 ha). (Because the sequestration estimates are based on average annual data, rather than actual annual estimates, project case uptake is likely overestimated in early years of the project and underestimated during later periods of more rapid growth.) Similarly, the project case uptake in 1998 was estimated as 4,920 mt C [(= 8.2 mt C/ha/yr * (100 ha + 500 ha)]. Beginning in 2002, when all six parcels were assumed to have been added to the project, the total acreage was 6,000 ha and annual uptake was 49,200 mt C/yr (= 8.2 mt C/ha/yr * 6,000 ha). It was assumed that uptake remained constant from 2002 through 2036, after which the claimed benefits for the project phased out on each of the six enrollment areas (i.e., after 40 years of uptake on each parcel). Thus, the cumulative carbon sequestration for the project case (over the period 1997 through 2041) was estimated to be 1,968,000 mt C (= 8.2 mt C/ha/yr * 6,000 ha * 40 years).

To determine the net carbon benefits of the project, the cumulative carbon sequestration estimated for the reference case is subtracted from the cumulative sequestration associated with the project case. Since, as noted above, there were zero emissions or sequestration assumed in the reference case, the net project benefits are the same as the project case,

	1,968,000 mt C.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	Under its economic plan, the Government of Costa Rica has agreed with the IMF that it will eliminate its forestry bond incentives for tree planting. The development of Klinki as a potential major species for carbon-fixing and timber production was initiated directly as a result of a request by a legal representative of an independent power producer for a carbon sequestration project with tropical trees. Financing for this pilot project is expected to come from U.S. industries interested in carbon offsets and from foundation grants.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	If KMS proves successful in this pilot project, the activities can be expanded both within Costa Rica and in Central and South America.
H) Additional Comments	

Plantas Eólicas S.A. Wind Facility

A) Description	The Plantas Eólicas Project, currently under construction, is a 20-megawatt power facility consisting of 55 wind turbines. Privately-owned and operated, it will be the first and largest commercial-scale wind installation in Latin America. The plant will be located in an area of Costa Rica where previous studies have identified a very strong wind resource sufficient to support economical wind energy. The electricity generated by the powerplant will be sold to the Costa Rican Institute of Electricity (ICE) and will displace electricity that would have been generated using thermal fossil fuel-burning facilities. Commercial operation is expected in the spring of this year.	
	Project Type	Renewables: Wind
	Participants	Charter Oak Energy, Inc., another U.S. participant, is an unregulated, private power development subsidiary of Northeast Utilities that provides financing and strategic input for private power projects. Merrill International, Ltd., a U.S. participant, is a leading international private power developer utilizing gas-fired projects and state-of-the-art high-efficiency wind turbines. Northeast Utilities, the parent company of Charter Oak Energy, is the largest electric utility in New England. KENETECH Windpower, Inc., another U.S. participant, is the world's leading manufacturer of wind turbines. Plantas Eólicas S.A., the host country participant, is a company created for the purpose of developing this wind project.
	Institutional Arrangements	Plantas Eólicas was formed with the aim of developing a 20-megawatt wind facility in Costa Rica. A power purchase agreement was

	signed in January 1995. KENETECH is expected to operate and maintain the plant for the duration of the ICE power contract. Carbon reductions were originally to be distributed among the project equity participants, Charter Oak Energy and an unidentified Costa Rican entity, based on equity share. However, since the Costa Rican entity cannot use the offsets, an equitable agreement has been reached which transfers all offsets to Charter Oak Energy. On behalf of Charter Oak Energy, Northeast Utilities will incorporate the offsets as part of its voluntary greenhouse gas emissions reduction initiatives in the United States.
Cost	Approximately US$30 million.
Technical Data	The 20-megawatt powerplant will consist of 55 KENETECH Model 33M-VS third generation variable speed wind turbines. Initial projections indicate that that the project can generate between 76 and 98 gigawatt-hours per year, displacing thermal units that burn primarily high-sulfur diesel fuels, bunker oils, and IFO 180 fuels. Costa Rica is a particularly strong candidate for substituting wind power for fossil fuel electricity generation because the country's wind resource is at its strongest during the time when reservoirs are lowest, which coincides with Costa Rica's peak energy use season – January through August – and weakest when water flow exceeds storage capacity in September and October. Adding wind to its power source portfolio would allow ICE to maximize use of its wind and hydroelectric resources by reducing water flow over the dams when the wind is strong and the water is

		low, storing the water to be spilled when the wind strength falls off. This potential made Costa Rica a good choice for developing a wind electric project specifically intended to achieve carbon emissions reductions.
	Long-Term Viability	Operation of the facility will not interfere with current land use, which is predominantly cattle grazing.
	Location	Costa Rica
	Term	The project has a contract for the sale of electricity with ICE for 15 years, with the possibility of an extension. The useful life of the equipment is expected to exceed 20 years.
	Project Assessment Procedures	Project participants have agreed to allow independent, external verification of emissions reductions. An internationally recognized environmental advocacy organization may be used to periodically verify the accuracy of all data related to greenhouse gas reductions.
B) Government Acceptance, Approval or Endorsement	The USIJI Evaluation Panel received a letter from the Minister of Natural Resources, Energy, and Mines dated Nov. 3, 1994, strongly supporting the project's application to the USIJI.	
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	In his letter to the Evaluation Panel, the Minister noted that the project will help reduce the country's growing reliance on fossil fuels and will also help reduce local and regional air pollution.	
D) Benefits Derived from the AIJ Project	This project will reduce the equivalent of an estimated 71,800 mt C over its 15-year lifespan. These reductions will be achieved by displacing the emissions associated with fossil fuel	

capacity that would otherwise be called into service to meet the demand that the wind facility will satisfy. However, GHG reductions are projected only from inception through the year 2000. As explained in more detail below, this approach was adopted to be consistent with the Costa Rican Government's goal of phasing out fossil fuels by the year 2001.

The displacement of fossil fuel-burning will have a number of environmental benefits, including reduction of other air pollutants. Positive development impacts will include increased employment and stimulation of local commerce.

E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change

To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project.

In order to establish credible reference and project cases, the project developer had to take into consideration current and planned electricity supply in Costa Rica, as well as any known regulatory influences, over the life of the project. Although fossil units in Costa Rica were originally designed to meet only peak demand, with hydroelectric systems meeting baseload demand, decreased reliability of hydroelectric plants resulting from El Niño drought conditions has forced ICE to rely more heavily on thermal units to meet baseload demand. At the same time, energy demand in Costa Rica is growing at a rate of between 7 and 9% annually. This rapid growth has put pressure on ICE to continue to expand its current capacity. In September 1994, the Minister of Natural Resources, Energy and Mines announced the goal to meet all electricity needs in Costa Rica with renewable energy sources by 2001. While this goal is intended to fulfill commitments under the Framework Convention on Climate Change (FCCC), the Biodiversity Convention, and Agenda 21, current energy demand and supply conditions suggest that such a phase-out may be delayed.

In light of ambiguities created by the drought and potential conflicts between policy goals and actual utility expansion plans,

the project developer considered two sets of reference case projections: one developed by ICE and USAID in 1992, and an "alternative" projection incorporating 1993 fossil fuel consumption data and the September 1994 official goal to phase out fossil fuels. Although neither approach was considered unreasonable, the "alternative" reference case discussed below provides a more conservative estimate of greenhouse gas reduction.

Using 1993 fossil fuel consumption data as a benchmark and the fossil fuel phase-out plan, the developer established annual "alternative" reference case projections in which emissions fall to zero over the period from 1996 to 2001. Reference case emissions were based on annual consumption of diesel and bunker fuel oil at Costa Rica's fossil fuel-fired generating plants, which are currently operating almost full-time. In 1993, these plants generated 422.8 GWh and emitted 114,307 mt C. From this information, a 1993 national emissions factor for fossil fuel plants was derived: 270.35714 mt C/GWh (114,307 mt C/422.8 GWh).

To establish annual reference case GHG emissions estimates, the developer assumed that consumption of diesel and fuel oil would remain at 1993 levels until 1997. Thus, annual emissions from fossil plants would remain at 114,307 mt C in 1996 and 1997. This is fully consistent with the Government's announced goal to phase out fossil fuel by 2001, according to which fossil fuel consumption is expected to decline beginning in 1998 until it is totally eliminated by 2001. Specifically, under the phase-out plan, emissions from fossil fuel consumption are expected to be reduced by approximately 44% by 1998, 86% by 1999, 99% by 2000, and 100% by 2001. Thus, in 1998, even without the project, emissions would be expected to decline to 63,586 mt C [114,307 mt C * (1– 0.44)]. Similarly, reference case emissions were assumed to continue to decline in accordance with the phase-out plan until they reached zero in 2001.

Because there are no emissions associated with wind energy electricity generation, emissions in the project case represent Costa Rican fossil fuel electricity generation that is *not* displaced by the project's generation. Thus, assuming that the 20 MW wind facility will generate 98 GWh of electricity annually, the project case emissions for 1996 would be 87,812 mt C

	[(422.8 GWh – 98 GWh) * 270.35714 mt C/GWh]. Assuming also that emissions remain constant through 1997 (consistent with the phase-out plan), the project case emissions for 1997 would also be 87,812 mt C. In 1998, project case emissions would be approximately 48,848 mt C [(422.8 GWh - 98 GWh) * (270.35714 mt C/GWh * 0.56)] to reflect the expected 44% reduction in fossil emissions for that year. Similar calculations were done for 1999 and 2000. From 2001 through the balance of the project duration, both project case and reference case emissions were assumed to be zero. Reductions (net project benefits) for any given year are calculated by subtracting the project case emissions for that year from the reference case emissions for that year. For example, based on the information given above, reductions for 1996 were estimated to be 26,495 mt C (114,307 mt C - 87,812 mt C). Similar calculations were done for each year through 2000. The sum of these annual reductions was 71,732 mt C. By calculating annual reductions in net project carbon benefits based on the phase-out of fossil fuels, the project attempts to avoid double-counting emission reductions that may be claimed by other wind energy or hydroelectric projects in Costa Rica.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	The project will be funded with approximately 65% debt from multilateral lending organizations or commercial banks. The balance will be funded through equity, the majority of which will be contributed by Charter Oak Energy.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	Being the first commercial-scale wind project in Latin America and the largest private power project in Costa Rica, the project has laid the groundwork for future wind projects and private power projects in Costa Rica.

H) Additional Comments	Project development has progressed relatively smoothly with full cooperation of ICE, the Ministry of Natural Resources and Energy (MINAE – formerly MIRENEM), and other Costa Rican government agencies.

Tierras Morenas Windfarm Project

A) Description

The Tierras Morenas Windfarm Project involves construction of a 20-megawatt powerplant consisting of 40 wind turbine generators. The plant will be located in an area of Costa Rica where previous studies have identified a very strong wind resource sufficient to support economical wind energy. The electricity generated by the powerplant will be sold to the Costa Rican Institute of Electricity (ICE) and will displace electricity that would have been generated using thermal fossil fuel-burning facilities.

Project Type	Renewables: Wind
Participants	New World Power Corporation, the U.S. participant, is an independent power producer that develops, owns, and operates facilities that produce and sell electric power generated from water, wind, and sun. New World Power also assembles and sells renewable power generating systems. The Costa Rican Ministry of Natural Resources and Energy (MINAE - formerly MIRENEM), one of the host country partners, has primary responsibility for Costa Rica's conservation activities and park management. Agencies in its portfolio include the Forest Service; the National Park Service; the Office of Geology, Mines, and Hydrocarbons; and the National Zoo and Botanical Garden. Energía del Nuevo Mundo S.A., (ENM) another host country participant, is a private company. Molinos de Viento del Arenal S.A., another host country participant, is a private company.
Institutional Arrangements	The project will be the property of Molinos de Viento del Arenal S.A. New World Power Corp. and ENM will provide equity investment. Participants are expected to conclude a power

	purchase agreement in 1995. It is expected that carbon offsets will be distributed among the project equity participants based on equity share. However, if the Costa Rican entity cannot use the offsets and equitable agreement is reached on transferring the offsets, New World Power Corp. will accept all offsets associated with the project.
Cost	The estimated total project is US$27 million. The project would be financed with a combination of debt (70%) and equity (30%).
Technical Data	The 20-megawatt powerplant will consist of 40 Enercon E-40 500-kilowatt Wind Turbine Generators, which are variable speed turbines. Initial projections indicate that that the project can generate 98 gigawatt-hours per year, displacing 30-megawatt thermal units that burn primarily high-sulfur diesel fuels, bunker oils, and IFO 180 fuels. Costa Rica is a particularly strong candidate for substituting wind power for fossil fuel electricity generation because the country's wind resource is at its strongest during the time when reservoirs are lowest, January through August, and weakest when water flow exceeds storage capacity in September and October. Adding wind power to its power source portfolio would allow ICE to maximize use of its wind and hydroelectric resources by reducing water flow over the dams when the wind is strong and the water is low, storing the water to be spilled when the wind strength falls off. This potential made Costa Rica a good choice for developing a wind electric project specifically intended to achieve carbon emissions reductions.
Long-Term Viability	Participants indicate that there is little chance that emissions reductions could be lost or

		reversed except through natural disasters, such as, earthquake, hurricane, or volcanic eruption.
	Location	Costa Rica
	Term	The initial project lifetime is 15 years, with possible five-year extensions. However, reductions are projected only through the year 2000, on the assumption that Costa Rica will meet its goal of discontinuing all fossil-fuel generating capacity by that time.
	Project Assessment Procedures	Monitoring will take place on a regular and consistent basis in accordance with the power purchase agreement. MINAE and ICE will provide data and technical assistance in the development of offset information. All participants agree to external verification.
B) Government Acceptance, Approval or Endorsement		The USIJI Evaluation Panel has received a letter dated July 26, 1995, from the Costa Rican Minister of Natural Resources, Energy, and Mines indicating that "Costa Rica strongly supports" the project's application for USIJI acceptance.
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies		The ICE anticipates shortfalls in its ability to meet the demand for electricity as early as 1996. Because wind facilities can be constructed quickly, the project could be on line in time to help meet these shortfalls. In his letter to the USIJI Evaluation Panel, the Minister noted that the Tierras Morenas Project will help the country achieve its sustainable development goals by diversifying its energy resource portfolio. MINAE, whose standards are consistent with or exceed World Bank Environmental Standards, has reviewed the entire design and construction program for this project. An Environmental Impact Report for the project has received final approval from the Costa Rican Government.
D) Benefits Derived from the AIJ Project		This project will provide cumulative greenhouse gas (GHG) reductions estimated at 51,000 mt C. These reductions will be achieved by displacing the emissions associated with fossil fuel capacity that would otherwise be called into service to meet the

demand that the wind facility will satisfy. Although the project developer estimates that the wind facility will be operational in 1997 and will function for more than 15 years, GHG reductions are projected only from inception through the year 2000. As explained in more detail below, this approach was adopted to be consistent with the Costa Rican Government's goal of phasing out fossil fuels by the year 2001.

The displacement of fossil fuel-burning will have a number of environmental benefits, including reduction of other air pollutants. Positive development impacts will include increased employment and stimulation of local commerce.

E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change

To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project.

In order to establish credible reference and project cases, the project developer had to take into consideration current and planned electricity supply in Costa Rica, as well as any known regulatory influences, over the life of the project. Although fossil units in Costa Rica were originally designed to meet only peak demand, with hydroelectric systems meeting baseload demand, decreased reliability of hydroelectric plants resulting from El Niño drought conditions has forced ICE to rely more heavily on thermal units to meet baseload demand. At the same time, energy demand in Costa Rica is growing at a rate of between 7 and 9% annually. This rapid growth has put pressure on ICE to continue to expand its current capacity. In September 1994, the Minister of Natural Resources, Energy and Mines announced the goal to meet all electricity needs in Costa Rica with renewable energy sources by 2001. While this goal is intended to fulfill commitments under the Framework Convention on Climate Change (FCCC), the Biodiversity Convention, and Agenda 21, current energy demand and supply conditions suggest that such a phase-out may be delayed.

In light of ambiguities created by the drought and potential

conflicts between policy goals and actual utility expansion plans, the project developer considered two sets of reference case projections: one developed by ICE and USAID in 1992, and an "alternative" projection incorporating 1994 fossil fuel consumption data and the September 1994 official goal to phase out fossil fuels. Although neither approach was considered unreasonable, the "alternative" reference case discussed below provides a more conservative estimate of greenhouse gas reduction.

Using 1994 fossil fuel consumption data as a benchmark and the fossil fuel phase-out plan, the developer established annual "alternative" reference case projections in which emissions fall to zero over the period from 1997 to 2001. Reference case emissions were based on annual consumption of diesel and bunker fuel oil at Costa Rica's fossil fuel-fired generating plants, which are currently operating almost full time. According to data provided to the developer by MINAE, during 1994, these fossil fuel plants generated 829.8 GWh, and emitted 235,048 mt C. From this can be derived a 1994 national emissions factor for fossil fuel plants of 283.2586 mt C/GWh (235,048 mt C/829.8 GWh).

To establish annual reference case GHG emissions estimates, the developer assumed that consumption of diesel and fuel oil would remain at 1994 levels until 1997. Thus, in the absence of this project, annual emissions from fossil plants would remain at 235,048 mt C in 1997. This is fully consistent with the Government's announced goal to phase out fossil fuel by 2001, according to which fossil fuel consumption is expected to decline beginning in 1998 until it is totally eliminated by 2001. Specifically, under the phase-out plan, emissions from fossil fuel consumption are expected to be reduced 33% by 1998, 66.5% by 1999, 99.8% by 2000, and 100% by 2001. Thus, in 1998, even without the project, emissions would be expected to decline to 131,627 mt C [235,048 mt C * (1 - 0.44)]. Similarly, reference case GHG emissions from fossil plants were assumed to continue their decline in accordance with the phase-out plan until they reached zero in 2001. For example, 1999 reference case emissions are 78,471 mt C [235,048 mt C * (1- 0.665)], declining in 2000 to 470 mt C [235,048 mt C * (1 - 0.998)].

	Because there are no emissions associated with wind energy electricity generation, emissions in the project case represent Costa Rican fossil fuel electricity generation that is *not* displaced by the project's generation. Thus, if it is assumed that the 20 MW wind facility will annual generate 90 Gwh of electricity, the project case emissions for 1997 would be 209,5550 mt C [(829.8 GWh - 90 GWh) * 283.2586 mt C/GWh]. In 1998, project case emissions would be 140,402 mt C [(829.8 GWh – 90 GWh) * (283.2586 mt C/GWh * 0.67)] to reflect the assumption that there will be a 33% reduction in fossil emissions for that year. Similar calculations were done for 1999 and 2000. From 2001 through the balance of the project duration, both project case and reference case emissions were assumed to be zero. Reductions (net project benefits) for any given year are calculated by subtracting the project case emissions for that year from the reference case emissions for that year. For example, based upon the information given above, reductions for 1997 were estimated to be 25,493 mt C (235,048 mt C - 209,555 mt C). For 1998, reductions were estimated to be 17,080 mt C (157,482 mt C - 140,402 mt C). Similar calculations were done for 1999 and 2000. The sum of these annual reductions yields a total estimated net carbon benefit of approximately 51,000 mt C over the life of the project. By calculating annual reductions in net project carbon benefits based on the phase-out of fossil fuels, the project attempts to avoid double-counting emission reductions that may be claimed by other wind energy or hydroelectric projects in Costa Rica.
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	The project will be financed entirely through private sources of capital.

G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	This project complements the host country's developmental objectives by displacing fossil capacity with state-of-the-art renewable technology.
H) Additional Comments	

City of Decin: Fuel-Switching for District Heating

A) Description	The project will implement fuel-switching, cogeneration, and efficiency improvements in the Bynov District Heating Plant, located in the City of Decin in the Czech Republic. The project will convert the plant from burning coal (lignite) to burning natural gas. The converted plant will provide both heat and potable hot water to local apartment blocks. A cogeneration facility for the production of steam and electricity also will be built, and improvements made to the distribution network to improve the system's energy efficiency. On-site greenhouse gas (GHG) emission reductions occur as a result of the fuel switch from lignite coal to natural gas and energy efficiency improvements. Off-site GHG emission reductions occur because the new Bynov plant will be a cogeneration facility with the ability to produce both electricity and heat. Thus, the new on-site generating capacity will reduce electricity consumption from the national utility (CEZ) grid, thereby reducing off-site GHG emissions. Although the plant was expected to be operational by October 1995, the project developer has advised that construction delays have postponed start-up until August 1996. Project Type: Energy: Fuel Switching/Cogeneration/Energy Efficiency Participants: The Center for Clean Air Policy, a U.S. participant, is a not-for-profit, nongovernmental research organization that develops and promotes innovative policy approaches to major state, federal, and international energy and environment-related issues. Wisconsin Electric Power Company (WEPCO), another U.S. participant, is a wholly-owned subsidiary of Wisconsin Energy, an investor-owned utility. Commonwealth Edison Company, also a U.S. participant, is an investor-owned utility.

	NIPSCO Development Company, Inc., also a U.S. participant, is an energy-focused holding company and an affiliate of Northern Indiana Public Service Company, an American electric and gas utility. The City of Decin, the host country participant, is a heavily industrialized city in northern Bohemia with a population of approximately 55,000.
Institutional Arrangements	In late 1994, the Czech Privatization Ministry began efforts to privatize the Decin District Heating Enterprise and turn it into a joint stock company. The company, to be called Termo, was designed to be a joint stock company, owning and managing the assets of the district heating system, including the Bynov plant. The U.S. utility investment provided the funding necessary to finance the US$1.5 million fuel-switch. Such a significant hard currency investment attracted the interest of local banks and gave the City of Decin the leverage needed to finance the much larger project – the US$8 million cogeneration option. In addition, the City was able to obtain a grant from the Government of Denmark to match the U.S. utility investment. This combination of U.S. and Danish funding made it possible for the City to obtain a grant and no-interest loan for the project from the Czech State Environment Fund. As the City was the recipient of this in-country financing, it was required to maintain ownership of the Bynov plant instead of transferring the assets to the Termo Company, thus precluding a stock purchase agreement originally negotiated with the U.S. utilities. As a result, the U.S. utilities provided a no-interest loan to the City in return for 100% of the on-site GHG reductions.
Cost	Preliminary cost estimates are US$8 million.

Technical Data	The project will involve construction of a new facility next to the existing Bynov District Heating Plant. This facility will house two gas engines generating a total of 10.6 megawatts with a 90% combustion efficiency, plus a peaking gas boiler. Water cooling of the engines will supply apartment blocks with hot water for heating and drinking. The engines will also generate 25 gigawatt-hours of electricity per year. Natural gas for the facility will be supplied by a pipeline from Russia. The existing steam distribution system will be replaced with a new, more efficient hot water delivery system, improving the network's overall efficiency. The City of Decin also plans to install meters in each building to measure heat and hot water delivery. In the future, controls will be installed in each apartment to provide efficient regulation of service delivery. These conversion and efficiency improvements will allow the Bynov facility to continue to provide 107,000 gigajoules of heat while reducing energy consumption from 170,000 gigajoules to 117,000 gigajoules.
Long-Term Viability	The construction of the new facilities and connection to the gas pipeline represent a substantial capital investment. The project also has significant local and federal political support. Therefore, the project's GHG reductions will likely be continued well into the future. Even if the project were abandoned at some point, the reductions achieved up to that point would not be reversed. Nevertheless, the U.S. participants plan to include in their final agreement with the City of Decin a provision that will prevent such a loss in the future.
Location	City of Decin, Czech Republic
Term	25 years

	Project Assessment Procedures	The Czech Ministry of the Environment will certify annual carbon dioxide emissions estimates. The U.S.-based World Resources Institute will also conduct a monitoring and verification program that will begin in the pre-construction phase and continue through the first year of the facility's operation.
B) Government Acceptance, Approval or Endorsement		The Director of the Cabinet of the Minister of Environment of the Czech Republic has issued his endorsement of the Decin Project as a pilot joint implementation project.
I. Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies		The Decin project is consistent with national goals to both reduce air pollution and enhance energy efficiency.
D) Benefits Derived from the AIJ Project		Over the 25-year lifespan of the project, GHG emissions will be reduced by an estimated 165,600 mt C. The reduction of other emissions, especially sulfur dioxide and particulate matter, will have significant public health benefits in what is one of the most polluted cities in Northern Bohemia.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change		To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project. On-site emissions for the reference case and project case were estimated based on projections that energy demand decreases by 13% at the Bynov plant by the end of 2001 and remains

steady thereafter. This explains the initial decrease in emission estimates for the on-site reference case and project case. The projected decline results from a combination of three assumptions:

1) heat demanded by existing households will decline by 20% over the next 5 years as a result of the installation of thermostats and other energy efficiency improvements;
2) demand for heat will increase by 8,000 GJ (7%), as additional one- and two-family houses are connected to the system;
3) heat demand will remain steady after 2001 because Decin is located in a small valley; therefore, it is unlikely that housing will increase or that new commercial facilities will locate there.

Since on-site GHG emission reductions occur as a result of the fuel switch from lignite coal to natural gas and energy efficiency improvements at the Bynov plant, on-site reference case annual emissions were estimated by multiplying the coal consumption (mt) of the old Bynov plant for a given year by the carbon content of lignite coal (41.8%). This amount was then converted to CO_2. For example, in 1997 the on-site reference case emissions are 19,177 mt CO_2 (= 12,535 mt of coal * 41.8% C * 3.66 CO_2/C).

Since off-site GHG emission reductions occur because the new Bynov cogeneration facility will offset electricity from the CEZ national grid, off-site reference case annual emissions were calculated by multiplying the estimated electricity production (MWh) of the new Bynov plant in a given year by the CO_2 emissions factor for the CEZ grid system, 0.79 mt CO_2/MWh. For example, in 1997 the off-site reference case emissions are 20,362 mt CO_2 (= 25,775 MWh * .79 mt CO_2/MWh).

The CO_2 emissions factor for the entire CEZ system of 0.79 mt CO_2/MWh, applied above, is the weighted average of the emission factors of the two types of coal used by the CEZ system. Thus, it is derived in four steps:

1) multiply the amount of *lignite coal* used by CEZ by its carbon content of 32.9%;

2) multiply the amount of *hard coal* used by CEZ by its carbon content of 67.4%;
3) add the results from the first two steps to derive total CEZ emissions;
4) divide this sum by the total CEZ electricity production. This amount is then converted from mt C/MWh to mt CO_2/MWh.

$$\frac{(mt\ lignite\ coal * 32.9\%\ C + mt\ hard\ coal * 67.4\%\ C) * 3.66\ CO_2 / C}{CEZ\ total\ electricity\ production} = CEZ\ CO_2\ emissions\ factor$$

$$\frac{(29\ mill.\ mt * 32.9\%\ C + 0.6\ mill.\ mt * 67.4\%\ C) * 3.66\ CO_2 / C}{46,300\ GWh} = 0.00079\ mill.\ mt\ CO_2 / GWh$$
$$= 0.79\ mt\ CO_2 / MWh$$

On-site project case annual emissions were calculated by multiplying the new Bynov plant natural gas consumption (mcf) for a given year by the carbon content of natural gas (lbs. C/mcf). The estimate was converted to mt CO_2 by dividing by 2,200 lbs per metric ton and multiplying by the CO_2 conversion factor. For example, in 1997 on-site project case emissions are 13,309 mt CO_2 (= (248 mcf natural gas * 33,000 lbs. C/mcf) / 2,200 lbs./mt * 3.66 CO_2/C).

On-site annual project net carbon benefits were calculated by subtracting the annual reference case emissions from the annual project case emissions. The on-site benefits represent the annual emissions avoided by switching from lignite coal to natural gas. The off-site annual project net carbon benefits are equal to the avoided reference case emissions because there are no off-site project emissions. The off-site benefits represent the annual emissions avoided at the national utility (CEZ) grid by the electricity production of the new cogeneration Bynov plant.

As noted above, the estimated GHG reductions for each year were determined by subtracting the project case emissions from the reference case emissions. Therefore, for 1997, emission

	reductions were determined as follows: Reference case 1997 on-site emissions without the project + 1997 off-site emissions without the project 19,177 mt CO_2 + 20,362 mt CO_2 = 39,539 mt CO_2 Project case 1997 on-site emissions with the project + 1997 off-site emissions with the project 13,309 mt CO_2 + 0 mt CO_2 = 13,309 mt CO_2 Reference case emissions - Project case emissions = Net Reduction for 1997 39,539 mt CO_2 -13,309 mt CO_2 = 26,230 mt CO_2 Using this approach, annual reductions were computed. By summing these annual reductions, cumulative reductions over the life of the project were 607,162 mt CO_2 or 165,000 mt C (607,162 mt CO_2 * 12/44 C/CO_2).
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	There are no U.S. government funds involved in the financing of the Decin Project.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The Decin Project has laid the groundwork for future JI project development by building the capacity of the local and federal government officials to identify, develop, and finance similar projects with GHG reductions. Further, the project can serve as a model to demonstrate how other inefficient and environmentally damaging district heating plants may be upgraded with both economic and environmental benefits.
H) Additional Comments	

HONDURAS

Bio-Gen Biomass Power Generation Project

A) Description	The Bio-Gen Biomass Power Generation Project will develop a 15-megawatt biomass waste-to-energy plant in Honduras. Located near a region with a substantial forest products processing industry, the plant will use wood wastes as its fuel, consuming sawmill and logging residues that are currently disposed of through uncontrolled burning or dumped into rivers and other low-lying areas. Long-term contracts for the supply of wood wastes will ensure both adequate supply and stable costs for fuel. Construction of the 15-megawatt plant is Phase One of a planned three-phase development that, when finished, is expected to have a capacity of 45 megawatts. As presently configured, all power produced by the plant would be sold to the Empresa Nacional de Energia Electrica (ENEE), the primary utility responsible for the generation, transmission, and distribution of electricity in Honduras. Project Type | Renewables: Biomass Energy Participants | Nations Energy Corporation, the lead U.S. partner, is a wholly-owned affiliate of Tucson Electric Power Company. It is currently exploring independent power prospects in both foreign and domestic energy markets. The International Utility Efficiency Partnership (IUEP) program at Edison Electric Institute, is also a U.S. participant. IUEP was established to coordinate the involvement of investor-owned electric utilities in joint implementation and other greenhouse gas (GHG) reduction projects. The program specializes in energy efficiency and renewable energy projects in the less industrialized countries. Add-On Energy 1, another U.S. participant, is an investor in the plant. It is a wholly-owned affiliate of Add-On Energy, a group of independent investors who take minority equity

	partnerships in projects that meet specific investment criteria. Biomasa-Generacion is a limited partnership organized under Honduran laws to develop and implement the project.
Institutional Arrangements	Biomasa-Generacion will own and operate the biomass generating plant. Nations Energy Corporation is the lead investor in the plant. Nations Energy has begun negotiations for a power purchase agreement with ENEE. A letter of intent to purchase all power produced has been signed by ENEE. Carbon offsets will be assigned to investors based on equity share. Investors may reassign, transfer, or sell their reductions.
Cost	The estimated total project cost is US$24 million, with $6 million as equity and $18 million as debt.
Technical Data	The project will reduce GHG emissions through displacement of fuel oil currently used in the country, more efficient combustion of waste, and reduction of the amount of waste left to decay. The electricity supplied by the Bio-Gen plant will displace a portion of ENEE's future needs, which ENEE expected to meet primarily through fuel oil-fired thermoelectric plants. The fuel source is sawmill and logging residues that are currently burned in an uncontrolled manner or left to decompose on the forest floor. Use of tree plantations as a source of fuel feedstock was found to be unnecessary and not cost-effective.
Long-Term Viability	The results of a biomass resource assessment by two external organizations indicate the existence of an adequate fuel supply for the

		project. The assessment concluded that more than 1,100 tons per day of waste material from the project area can be delivered at economic cost, enough fuel to supply up to a 25- to 30-megawatt plant on a sustainable basis. Given the level of capital investment associated with the project and the role of a power purchase agreement, there is a strong incentive for the project participants to maintain the operation of the facility and the associated GHG reductions.
	Location	Honduras
	Term	Project lifespan is 20 years.
	Project Assessment Procedures	Independent testing firms will monitor the project, using U.S. Environmental Protection Agency (EPA) emission test protocols and quality assurance procedures for stack gas emissions. The participants also have agreed to monitor the sources of all feedstocks. Participants agree to external verification based on "mutually agreed terms and criteria," in accordance with established EPA criteria and industry practice. Participants indicate they would select the external verifier unless USIJI does so.
B) Government Acceptance, Approval or Endorsement		The Honduran Minister of Planning has written a letter of support for the project and for joint implementation in general. Additionally, a letter approving the project and a memorandum acknowledging it as a joint implementation project have been provided by the Minister of the Environment.

C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	Honduras has faced a crisis in electricity generation. In the past, ENEE has been forced to implement up to 12 hours of power reductions daily, many of which were unannounced. Because of the random nature of the power reductions, sawmill owners cannot operate in an efficient manner. Since lumber and secondary wood products are a major export for the country, the electricity shortages have significant impacts across the entire Honduran economy. The Government of Honduras has championed the Bio-Gen Biomass Project as a cornerstone of its plan to integrate a portfolio of private sector renewable energy projects into the country's electricity grid to help the country meet its current and future energy needs in a fiscally and environmentally sustainable manner.
D) Benefits Derived from the AIJ Project	This project will provide net carbon benefits estimated at approximately 647,400 metric tons of carbon equivalent over its 20-year life by offsetting the emissions associated with a 15-megawatt fossil plant. The project will reduce air and water pollution caused by uncontrolled burning and dumping of wood waste. The facility will use a mechanical fly ash collector with 85% collection efficiency to reduce air pollution and a water-cooled condensing system to prevent the creation of a thermal plume upon discharge into the nearby river. COHDEFOR, the Honduran forest service, has strict regulations and is expected to monitor the project and the long-term waste fuel utilization and delivery protocols. The project is also responsive to laws passed by the Government of Honduras to stimulate more private investment in the power sector. Further, the private investment will help the Government meet demand for rural electrification.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to

arrive at the cumulative reductions over the life of the project.

Without the project, waste-wood would be disposed of through either uncontrolled burning or dumping into rivers and low-lying areas, where it would eventually decompose. Because data on the rate and magnitude of emissions from 1) uncontrolled burning and decomposition of wood-waste in Honduras, and 2) the controlled combustion of waste-wood at a facility similar to that planned for this project are not currently available, net changes in GHG emissions from controlled combustion have not been calculated at this time.

According to the developer, the project also will use forest wood residue as fuel to generate electricity. Such biomass would otherwise accumulate and rot on the forest floor. While clearing wood residue from the forest could enhance forest regrowth, potential carbon benefits associated with this aspect of the project have not been calculated at this time.

Reference case emissions estimates were based on emissions from new fossil generation capacity that could potentially be constructed in the absence of the 15 MW Bio-Gen facility. As noted above, such emissions were not included in the reference case at this time owing to a lack of data.

To estimate the emission from the fossil capacity that would be built in the absence of this project, the developer assumed that approximately 260,423 lb/hr of dry gas would be emitted from a 15 MW fossil fuel plant under optimum operating conditions. This assumption does not take into consideration the stress placed on the electricity generation system by the decreased availability of hydroelectric capacity owing to low rainfall in Honduras. Thus, it might understate the reference case emissions, rendering the estimate of net carbon benefits more conservative. The developer also assumed that 13.4% of the dry gas emitted from the fossil plant is in the form of carbon dioxide (CO_2), resulting in estimated CO_2 emissions of 34,897 lb/hr (260,423 lb/hr dry gas * 0.134 lb CO2/lb dry gas). Assuming the fossil plant would operate a minimum of 7,500 hr/yr, the annual reference case emissions were estimated at 118,697 mt CO_2 [(34,897 lb/hr CO_2 * 7,500 hr/yr) / 2205 lb/mt]. Converting this estimate to carbon equivalent provides 32,372 mt C/yr (118,697 mt CO_2/yr * 12/44 C/CO_2).

	Although a more comprehensive project case emissions projection could reflect annual emissions resulting from burning wood-waste and forest wood residue at the Bio-Gen plant, calculations of these expected emissions have not yet been completed by the project developers. However, as the developer has documented, wood-waste is currently either burned or left to decompose. Therefore, burning such wood-waste at the Bio-Gen facility in the project case will not, in aggregate, increase GHG emissions over their current level. Thus, for the purpose of establishing an initial estimate of the net carbon benefits from this project, the developer estimated that annual project case emissions would be zero over the lifetime of the project. Using the assumption, the annual net carbon benefits for this project are the avoided emissions from the 15 MW fossil plant that would be constructed under the reference case: 32,372 mt C. Therefore, the estimated cumulative reductions associated with the project are 647,400 mt C (32,372 mt C/yr * 20 yr).
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	IFREE supported the initial prefeasibility study in 1994. The project is in negotiations with the IFC. The equity portion of the project would be invested by project participants, with no further federal funding.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project will transfer U.S. biomass technology and give momentum to other biomass projects. Emission control technology would also be transferred. The project will model environmentally friendly construction techniques, particularly those involved in soil erosion control.
H) Additional Comments	

Solar-Based Rural Electrification

A) Description	The objective of the Solar-Based Rural Electrification Project in Honduras is to replace kerosene lamps with solar-powered electric lights in homes in rural regions that do not have electricity service. This technology-switching will eliminate carbon emissions from kerosene combustion for lighting. Charging batteries with stand-alone photovoltaic modules also will displace the practice of charging batteries on grid electricity.	
	Project Type	Renewables: Solar
	Participants	Enersol Associates, Inc., the U.S. participant, is a nonprofit international development organization based in Massachusetts that promotes the use of solar energy for rural electrification. The COMARCA coffee cooperative, a host country participant, is incorporated under Honduran law. AHDEJUMUR, another host country participant, is a development nongovernmental organization (NGO) incorporated in Honduras. AHDE, a third host country participant, is a private, nonprofit NGO founded in 1986 to implement sustainable development models. Additional host country participants will include NGOs, small businesses, and individual citizens.
	Institutional Arrangements	The Honduras Solar Project will use funding from JI-motivated sponsors to provide training and business development assistance to expand the workforce of local technicians as well as the market for solar electric systems in rural Honduras. Operating under a loan guarantee agreement

	signed by Enersol's executive director, COMARCA provides its members with credit to finance their purchases of solar-electric systems for their homes. AHDEJUMUR and AHDE also have a loan guarantee agreement with Enersol that it uses to make consumer credit available for the purchase of photovoltaic systems.
Cost	Participants intend to establish US$300,000 to $600,000 in revolving credit to finance approximately 2,000 to 5,000 solar-electric systems over five years. In addition, participants will require approximately US$150,000 to US$250,000 to conduct training and technical assistance activities.
Technical Data	The project is based on a model developed by Enersol Associates, Inc. and successfully field tested in the Dominican Republic. The project has two components: the establishment of local solar-electric service enterprises and the establishment of end-user credit programs. Training and technical assistance will be provided to Honduran individuals to help them set up solar-electric supply micro-enterprises, making the technology an available and sustainable option for rural Hondurans. The technician/entrepreneurs will combine imported components from the United States with locally manufactured components, assemble them into solar-electric systems, then sell, install and maintain the systems in rural communities. The development of local consumer credit mechanisms, managed by the Honduran NGO partners, will provide end-users with financing in the form of one- to three-year loans, making the systems affordable.
Long-Term Viability	The training component of the project puts in place the human infrastructure needed to

		ensure the durability of the technology switch. The project's focus on training local individuals ensures that technicians who are capable of not only installing, but also maintaining the solar-electric equipment will be readily available to the end users, thus reducing the likelihood that users will switch back to kerosene due to equipment breakdown. Enersol has also indicated that it plans to monitor system maintenance carefully.
	Location	Honduras
	Term	Approximately 20 years, the lifespan of the solar equipment.
	Project Assessment Procedures	Participants have a detailed monitoring plan for both the technical and the financial aspects of the project. Participants also agree to external verification of the project's greenhouse gas (GHG) emissions reductions by a third party.
B) Government Acceptance, Approval or Endorsement		In a letter to the USIJI Evaluation Panel (dated October 19, 1994), the Honduran Environmental Minister stated, "... the proposal to bring solar electricity to rural Hondurans is an appropriate and timely effort that not only addresses the pressing issue of global climate change, but also offers development opportunities to rural people."
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies		This project will bring electrification at low cost to many poor rural households, helping Honduras accomplish an important development goal. The project is compatible with the Honduran objective of meeting its national energy needs, adopting renewable technologies, and providing employment opportunities in rural areas.
D) Benefits Derived from the AIJ Project		If fully implemented, the project will reduce GHG emissions by an estimated 4,700 mt C over its 20-year lifespan. By replacing lamps with photovoltaic systems, the project will reduce GHG emissions associated with the combustion of kerosene in lamps

	in rural households. There are no GHG emissions associated with the photovoltaic systems. Adopting stand-alone photovoltaic technology will generate a number of other economic and social benefits, while providing a highly cost-effective means of expanding rural electrification. The switch away from kerosene will help reduce health and safety problems associated with the indoor combustion of kerosene. The project will also reduce the use of dry cell batteries and hence improper disposal of such batteries.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). On-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project. The reference case was based on emissions that would occur from the combustion of kerosene in lamps of participating households. The project developer anticipates that between 2,000 and 5,000 photovoltaic systems will be installed over a 5-year period beginning in 1996. The total number of installations for the project is estimated by taking the average of 2,000 and 5,000, which equals 3,500 photovoltaic systems. Thus, reference case emissions in any given year are calculated by multiplying the number of currently participating households by the estimated annual emissions per household. The average annual installation rate of photovoltaic systems over the 5-year enrollment period is estimated by dividing 3,500 (i.e., the total number of targeted households) by 5 years, which equals 700 installations per year. The actual installation rate will vary. It is estimated that a typical household in Honduras burns 24 gallons of kerosene for lighting annually. Approximately 0.0028 mt C are emitted per gallon of kerosene burned. This results in 0.2456 mt CO_2 or 0.067 mt C emitted from kerosene burned for lighting per rural household per year (= 24 gal./household * 0.0028 mt C/gal.). Thus, reference case emissions for the first 5 years of the project are calculated as follows:

1996	(700 * 1) * .2456 mt CO_2
1997	(700 * 2) * .2456 mt CO_2
1998	(700 * 3) * .2456 mt CO_2
1999	(700 * 4) * .2456 mt CO_2
2000	(700 * 5) * .2456 mt CO_2

Between 2000 and 2015, the reference case emissions remain constant at 860 mt CO_2 (= 3,500 * 0.2456 mt CO_2), because all 3,500 targeted households are using photovoltaic systems. Because the developer does not claim benefits beyond the estimated service life of each system, 700 participating households are removed from the calculations each year between 2016 and 2019. Thus, the reference case emissions decrease between 2016 and 2019, and fall to zero in 2020.

There are no GHG emissions associated with the photovoltaic systems, therefore the project case emissions are equal to zero. The project case emissions remain constant throughout the life of the project.

To determine the net GHG reductions estimated to result annually from households that have converted from kerosene to photovoltaic systems, annual project case emissions are subtracted from the annual reference case emissions. To arrive at the estimated GHG reductions over the duration of the project, annual reductions for the project lifetime are added, yielding an estimate of 17,194 mt CO_2 or 4,700 mt C (17,194 mt CO_2 * 12/44 C/CO_2).

F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	Sponsorship for developing the model and an earlier pilot project in Honduras has come from various sources, including private philanthropic foundations, U.S. government agencies (which have provided financial and, from the Peace Corps, in-kind support), and private corporations. Enersol expects to involve Peace Corps volunteers in the scaled-up project. Participants anticipate that the incremental expansion of the project will result from new sources of local and international private and public funding. Multilateral support could also significantly contribute to the project's scale-up.

	Multilateral development bank loans have also been identified as a potentially important source of debt financing to scale up the level of consumer credit used in programs for solar electric system purchases.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project will transfer energy-efficient solar electric technologies to Honduras. It will also provide training opportunities for Honduran citizens who will work as technicians, entrepreneurs, and loan officers.
H) Additional Comments	

El Hoyo-Monte Galan Geothermal Project

A) Description	This project will develop a privately owned and operated geothermal power project at El Hoyo-Monte Galan in Nicaragua. When the multi-phase project is completed, a 105-megawatt facility will be on-line. The facility will use flashed steam technology, with hot water brought from the reservoir by deep wells. The project will achieve greenhouse gas (GHG) reductions by generating electricity to meet future demand that would otherwise have been met by diesel-based generation capacity.	
	Project Type	Renewables: Geothermal
	Participants	The U.S. participant in the project is Trans-Pacific Geothermal Corporation (TGC), a U.S. geothermal development firm located in Nevada. The host country participant is C and R, Incorporated, a Nicaraguan business developer.
	Institutional Arrangements	The Government of Nicaragua and TGC have signed an Agreement in Principle for the development of a 105-megawatt facility. No assignment of carbon reductions had been made at the time the project was proposed to the USIJI.
	Cost	Not currently available.
	Technical Data	The project is planned as a staged development, with an exploration (feasibility) stage beginning in October 1995 and completed by January 1997. Construction of a 50-megawatt development will begin January 1997, bringing the facility on-line by mid-1999. Construction for the final stage, a 55-megawatt plant, is scheduled to begin in mid-1999. The

		El Hoyo-Monte Galan facility is expected to have a total capacity of 105 megawatts on-line by mid-2001. The project is entering the feasibility phase, which involves conducting detailed geoscientific studies and drilling a limited number of deep wells.
	Long-Term Viability	Uncertainties that may affect the project's ability to reduce GHGs include potential declines in the fluid flow from the project owing to exhaustion of the geothermal reservoir, volcanological uncertainties (the project is sited along the volcanic belt of Nicaragua), regulatory risk, and political uncertainties. However, the companies involved believe the project is viable and have invested considerable time and money in its development to date.
	Location	Nicaragua
	Term	Project lifetime is expected to be approximately 35 years.
	Project Assessment Procedures	The monitoring protocol submitted with the proposal envisions only the monitoring of GHGs emitted at the geothermal site. However, conversations between the proposal manager and the project developers indicate TGC is aware that it is responsible for monitoring net GHG emissions from the entire project, not just the emissions of the geothermal facility itself. The participants agree to independent, external verification.
B) Government Acceptance, Approval or Endorsement	A letter from Nicaragua's Minister of Energy indicates his Government's acceptance of the project.	

C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	Nicaragua currently experiences regular electricity blackouts of up to nine hours per day because of drought conditions. Nicaragua has abundant geothermal resources, probably the largest in Central America. Development of these resources would increase the stability of the country's baseload power while reducing dependence on imported fuels, a goal of the Nicaraguan government. Project developers indicate an environmental impact statement will be completed and submitted for review and approval by the Nicaraguan Government once the project moves beyond the exploration stage.
D) Benefits Derived from the AIJ Project	This project will provide GHG reductions equivalent to an estimated 5,391,000 mt C over its 35-year expected lifetime. The project will also stabilize baseload power, reducing blackouts and thus increasing economic productivity. TGC will inform community leaders in nearby towns of project plans and seek their input on ways to maximize the economic benefits to the area resulting from the construction and operation of the facility.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). Off-site and on-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project. To establish the reference case, the developer assumed that in the absence of the geothermal project, diesel-fueled units would have been used to meet increased electricity demand. The reference case, therefore, was based on GHG emissions from diesel-fueled units with generation capacity equal to that of the geothermal units in the project case; a 50 MW unit coming on line in 1999 and a 55 MW unit coming on line in 2001. For the years 1999 and 2000, GHG emissions were estimated for only the 50 MW unit. Starting in 2001, emissions from the 55 MW unit were included. Generating capacity was assumed to

remain constant over the 35-year lifetime of each of the diesel units. Based on this assumption, emissions for the reference case were assumed to remain constant between 2001 and 2033, when 105 MW of diesel capacity would be operating in the absence of the two geothermal units. For the final two years of the project, 2034 and 2035, the reference case emissions are assumed to be constant at a level equivalent to that associated with 55 MW of diesel capacity.

To estimate emissions for the reference case, it was necessary to determine the electricity generation of the diesel units that would be functioning in the absence of the geothermal units. Annual electricity generation (MWh) was calculated by multiplying plant capacity by the number of hours in a year and by a load factor of 85%. Load factor is defined as the ratio of the average to peak loads. For example, in 1999, when only 50 MW of capacity would be in operation, electricity generation would be 372,300 MWh (= 50 MW * 8,760 hours * 85% load factor). Annual generation estimates were developed for each year over the life of the project based on the assumed capacity during that year.

Annual GHG emissions were calculated by multiplying annual electricity generation (MWh) by a diesel fuel CO_2 emission factor of approximately 0.72 mt CO_2/MWh. (The developer obtained this emissions factor from Public Service Commission of Nevada Ruling, SB 497, Docket No. 89-752.) For example, emissions in 1999 were estimated to be 269,253 mt CO_2 (= 372,300 MWh * 0.72 mt CO_2/MWh).

Because the geothermal project fully displaces diesel fuel generation capacity, the only emissions in the project case are those associated with flash-steam geothermal electricity generation. To establish the project case emissions, the developer accounted for the emission of small amounts of CO_2 that are produced when the steam phase separates from boiling water.

The project developer estimates that the geothermal plant will begin operating in 1999 with 50 MW capacity and increase to 105 MW beginning in 2001. It is assumed that both the 50 and 55 MW units have a 35-year lifetime and that each unit will be able to maintain its full capacity throughout that period.

	Emissions in the project case, therefore, are constant between 2001 and 2033. In 2034 and 2035, the project case only includes emissions from the 55 MW geothermal unit. To establish project case emissions, annual flash-steam geothermal electricity generation (MWh) was computed as for the reference case; i.e., multiplying plant capacity by the number of hours in a year and by a load factor of 85%. For 1999, it is assumed that the 50 MW geothermal unit would generate 372,300 MWh of electricity (= 50 MW * 8,760 hours * 85% load factor). Using the annual generation estimates, annual emissions from the flash-steam geothermal plant were calculated by applying a geothermal CO_2 emission factor of approximately 0.0009 mt CO_2/MWh. (The developer used a geothermal plant CO_2 emission factor from a Public Service Commission of Nevada Ruling, SB 497, Docket No. 89-752.) For example, emissions in 1999 were estimated to be 333 mt CO_2 (= 372,300 MWh * 0.0009 mt CO_2/MWh). Annual generation estimates were developed for each year over the life of the project based on the assumed capacity in that year. To determine net project benefits, the estimated CO_2 reductions for each year were computed by subtracting the annual project case emissions from the annual reference case emissions. For example, in 1999, there was a projected reduction of 268,920 mt CO_2 (= 269,253 mt CO_2 - 333 mt CO_2) associated with displacing the expected diesel-fired capacity with comparable geothermal capacity. The annual estimated reductions are summed to arrive at the estimated cumulative GHG reductions over the duration of the project. Cumulative GHG reductions from the project are estimated to be equivalent to 19,765,628 mt CO_2 which is equivalent to 5,391,000 mt C (19,765,628 mt CO_2 * 12/44 C/CO_2).
F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	Currently, the project has no funding for the feasibility or later stages of the project. However, the IFC and Trade Development Agency have expressed an interest in participating in the project, and three major private corporations in the United States have expressed interest in being the major equity partner in the project. Preliminary discussions to this effect are underway.

	As part of the feasibility stage, TGC is negotiating the concession and a detailed power purchase agreement. It is expected that these agreements will be finalized within the next several months. Conclusive financing will only be negotiated after these agreements are finalized.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	TGC will provide training to Nicaraguan personnel in the operation and maintenance of the project, upgrading existing skilled labor and training inexperienced personnel.
H) Additional Comments	

RUSSIAN FEDERATION

RUSAFOR: Saratov Afforestation Project

A) Description	The Russia/USA Forestry and Climate Change Project - Saratov Afforestation Project (RUSAFOR-SAP) was conceived as a Russian-American carbon offset forestry joint implementation demonstration project. The purpose of the project is to evaluate the biological, operational, and institutional opportunities to manage a Russian forest plantation as a carbon sink. The project has established plantations on three sites, totaling 500 hectares on marginal agricultural land or burned forest stands in Russia.
	Project Type: Land-Use: Afforestation/Reforestation
	Participants: Oregon State University (OSU) is a state-funded university with a Civil Engineering department that has become a center of expertise on Arctic and Russia environmental engineering. OSU is working under a Cooperative Agreement with the U.S. Environmental Protection Agency (EPA). The U.S. Environmental Protection Agency, Climate Change Division, another U.S. participant, analyzes the potential impacts of, adaptation to, and policy options for, global climate change. The Saratov Forest Management District, Russian Federal Forest Service (SFMD(RFFS)), is a host country participant. It has direct responsibility for managing the forests in the project area. The International Forestry Institute (IFI) is another host country participant. A nonprofit research center headquartered in Moscow, it focuses on Russian forest science, management, and policy. The IFI Moscow Branch has institutional links to the Saratov forestry activities through the larger

	RUSAFOR Project, of which RUSAFOR-SAP is one component. The IFI Volga Regional Branch also has institutional links to the RUSAFOR-SAP. The town of Saratov is located in the Volga Region.
Institutional Arrangements	Under the terms of the agreement signed between OSU and its Russian forestry agency partners, three sites will be developed as plantations. When the plantations reach maturity, timber may be harvested for long-term use. Non-commercial and slash debris may be substituted for fossil fuels in energy or heating systems. OSU and SFMD(RFFS) will divide the carbon offsets equally between them. Either party may independently assign, sell or otherwise transfer their share of the offsets to a third party.
Cost	The project cost is estimated to be US$250K.
Technical Data	This project involves a total of 500 hectares at three sites. Sites I and II, 450 hectares of marginal agricultural and pasture lands, will be afforested with native broadleaf seedlings (i.e., green ash, maple, and elm). Site III is a 50-hectare parcel of former pine plantation that was burned by wildfire that was neither slated for replanting nor expected to naturally regenerate; it will be reforested with native pine seedlings. These sites will be developed as plantations. When the plantations reach maturity, their timber may be harvested for applications wherein the timber will be preserved for 100 years or more. Non-commercial and slash debris may be used as a biomass fuel substitute for fossil fuels in energy or heating systems.

		The agreement between the participants details responsibilities for activities, including seedling protection; plantation maintenance; replanting and re-establishment in the event of loss to fire, disease, or insects; and carbon sequestration projection. The plantation maintenance and preservation plan will be finalized and approved in the third year of the project.
	Long-Term Viability	The project participants are taking measures to reduce risk from drought, frost, weeds, and disease, and have agreed to replant in the event of loss or destruction of seedlings. At the conclusion of the project, when the period of carbon accumulation ends, the timber may be harvested but must be used for durable construction only. The participants have also found that, regardless of whether the site had an economic impact on the surrounding area or not, the project has become a source of pride for nearby communities. The commitment of the communities in and around the sites to the project provides another level of stewardship, enhancing formal monitoring and risk reduction activities conducted as part of the project plan.
	Location	Russia
	Term	Project lifetime for Site I & II is 40 years; for Site III it is 60 years.
	Project Assessment Procedures	The project will be monitored with field surveys. Project participants have also agreed to external verification to ensure emissions reductions.
B) Government Acceptance, Approval or Endorsement		The USIJI Evaluation Panel has received letters from a Board Member of the Ministry of Environmental Protection (October 24, 1994) and Nature and the First Deputy Director of the RFFS (October 21, 1994) indicating that the RUSAFOR-SAP is acceptable to their respective organizations and strongly

	recommending its acceptance into the USIJI portfolio. The project has been approved for JI status by the Interagency Commission of the Russian Federation on Climate Change Problems.
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The RUSAFOR project is compatible with the Russian government's desire to enhance environmental quality.
D) Benefits Derived from the AIJ Project	This project will sequester approximately 35,000 metric tons of carbon equivalent over its 60-year lifespan. In addition to sequestering carbon dioxide, the project will also reduce soil erosion, enhance soil nutrient content, and provide habitat for vertebrate and insect species. There are no negative impacts associated with the project.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net carbon benefits associated with this type of project, it is first necessary to estimate how much carbon would be sequestered without the project (the "reference case") and with the project in place (the "project case"). Annual carbon stock accumulations for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case accumulations for each year are added together to arrive at the cumulative amount of carbon sequestered over the life of the project. Emissions in the reference case arise from the loss of soil carbon through erosion in Sites I and II and from the gradual decay of coarse woody debris (CWD) (i.e., burned tree stems and branches) in Site III. Carbon and grazing sequestration in the project case arises from biomass growth in all three sites, and from the use of stem CWD for long-term construction purposes in Site III (dead standing stems harvested at the start of the project before the planting of seedlings). Estimates of annual incremental flows and of annual stocks emissions, sequestration, and net project carbon benefits have been

performed, including information regarding the growth of the plantations during early stages. Several assumptions were made in generating these estimates:

- For Sites I and II, in the project case, the carbon sequestration estimates are based on the average of high and low estimates of growth rates.
- For all the three sites, in the reference case and project case, *annual* sequestration.
- estimates are derived from the cumulative estimates.
- For Site III, in the reference case, *annual average* estimates (calculated over the life-time of the project) of the total emissions from CWD are used, instead of the *annual* estimates.
- Emissions estimates from total CWD decomposition, in the reference case for Site III, are disaggregated into emissions estimates from stem CWD and from non-stem (branch, root) CWD, to provide details of forest carbon pool changes.

In establishing a reference case for Sites I and II, the developer considered three different scenarios. In Scenario 1, considered most probable by the developer, emissions arise from the loss of soil organic matter (i.e., carbon stores in soil) due to soil erosion. The average annual rate of carbon emissions was assumed to be 0.1 mt C/ha/yr. Therefore, in Sites I and II, the total annual emissions in the reference case would be 45 mt C (= 0.1 mt C/ha * 450 ha). Because this carbon loss estimate is the highest of those of the scenarios, adoption of Scenario 1 results in the most conservative estimate of net project benefits.

In Site III, emissions in the reference case arise from the decomposition of the previously burned pine plantations. The residual CWD plant mass (burned stems, etc.) left on-site after burning was estimated to be 71 mt/ha (of which 50 mt/ha is stem CWD), based on an evaluation of field conditions and other research studies on regional and local forests. Based on a scientific study, the carbon content of plant mass was assumed to be 50%. Thus, the total initial carbon stock (i.e., the carbon content of total residual plant biomass) was estimated to be 1,775 mt C (= 71 mt of plant biomass/ha * 0.5 mt of C per mt of plant biomass * 50 ha). The initial carbon stock of 1,775 mt C would be comprised of stem CWD stock of 1,250 mt C (= 50 mt of plant biomass/ha * 0.5 mt C per mt of

plant biomass * 50 ha) and non-stem CWD stock of 525 mt C (= 1,775 mt C - 1,250 mt C).

Based on field data, it was assumed that 90% of the residual plant biomass would decompose after 60 years under local climate conditions, leaving 10% of the residual plant biomass (and its carbon content). Therefore, the average annual rate of carbon emissions is estimated to be 0.53 mt C/ha/yr. This estimate was developed as follows: the carbon content of biomass/ha is 35.5 mt (= 71 mt of plant biomass * 0.5), 10% (= 3.55 mt C/ha) of which is assumed to remain even after 60 years. Therefore, over 60 years, 31.95 mt C/ha (= 35.5 - 3.55 mt C/ha) will be emitted into the atmosphere at an average annual rate of 0.53 mt C/ha/yr (= 31.95 mt C/60 years).

For consistency, the total emissions from CWD for the Site III reference case were estimated using the *annual average* estimate provided by the developer. Because annual emissions from CWD were assumed to decline over the project lifetime, using the *average* annual instead of annual emissions results in a more conservative estimate of the net project carbon benefits. The carbon sequestration estimates for Sites I and II in the project case were derived from cumulative estimates of carbon sequestered per hectare of vegetation growth. Because growth tables for the broadleaf trees in the project region are not available, the growth and biomass estimates for broadleaf were calculated based on growth data for different forest pine stands in that region and for other broadleaf trees. For example, the incremental carbon sequestration for Sites I and II in the project case in 1995 was estimated to be 65.4 mt C (= 0.145 mt C/ha * 450 ha).

Carbon sequestered by tree growth in the project case for Site III was estimated using growth tables for forest pine stands in Russia, provided by the developer. In all three sites, project activities commenced in 1993 and carbon sequestration began in 1994. Because the period included under the USIJI began in 1995, the project case estimate excluded sequestration from 1994 tree growth of 77.4 mt C [= 65.38 mt C in Sites I & II + 12 mt C in Site III (= 0.24 mt of C/ha * 50 ha)].

Site III carbon sequestration also results from delayed stem CWD decomposition, relative to the reference case. The

burned trees were harvested before seedlings were planted, and the salvaged timber was used for long-term construction purposes (as required in the project contract). The stem CWD is expected to decompose in 100 years, instead of 60 years, as in the reference case. The longer decomposition period reduces the average annual rate of carbon emissions to 0.25 mt C/yr (= 25 mt C / 100 years), compared with 0.53 mt C/ha/yr in the reference case. The estimates of carbon emissions from *stem CWD* in Site III in the project case (= 12.5 mt C/yr) are lower than that in the reference case (= 18.75 mt C/yr), due to the use of stem CWD for long-term construction purposes.

These estimates do not explicitly quantify the carbon emissions resulting from burning slash (i.e., non-stem CWD) on-site as part of the soil preparation for reforestation (in addition to stump removal and tillage), nor do they estimate the carbon benefits of the build-up of soil organic matter and charcoal from this burning. These carbon emissions occurred in 1993, prior to the commencement of the USIJI project period, and therefore are not included in the project case. These emissions have also been excluded from the calculation of net project carbon benefits.

For Sites I and II, net project carbon benefits are the sum of the amount of carbon sequestered by tree growth and the amount soil carbon loss avoided when water erosion is reduced by afforestation. For Site III, net project carbon benefits are the sum of the amount of carbon sequestered by tree growth and the additional carbon benefits arising from salvaging stem CWD for long-term construction use rather than leaving it to decompose on site. For example, of the estimated 18.25 mt C net project benefits for 1995 for Site III, 12 mt C was sequestered by new growth of trees and 6.25 mt C (= 18.75 mt C - 12.5 mt C, i.e., reference case, minus project case) was sequestered by long-term storage of stem CWD in construction products.

Adding up the annual net carbon benefits over the 60-year life of the project, the developer estimated that the project will sequester approximately 35,000 metric tons of carbon equivalent.

F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	The project was developed to serve as a demonstration of the potential for carbon offsets through the USIJI. Funding is being provided by RFFS and by OSU (on behalf of the State of Oregon), which is working under a Cooperative Agreement with the EPA. The EPA is providing federal funds, but the project was undertaken with funds in excess of those available for such activities in fiscal year 1993.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project will provide experience in the biological, operational, and institutional aspects of forest plantation management in Russia. These techniques can then be applied to other sites around the country.
H) Additional Comments	

RUSAGAS: Fugitive Gas Capture Project

A) Description	The Russian Federation/USA Natural Gas Climate Change Project - Fugitive Gas Capture (RUSAGAS-FGC) is the first joint implementation fugitive natural gas emission capture project between the United States and the Russian Federation. The project involves improvements to the natural gas distribution system. The project also will evaluate the technological, operational, and institutional opportunities to reduce methane emissions in Russia's natural gas production and transmission system.	
	Project Type	Methane Recovery: Natural Gas Transmission System Improvements
	Participants	Oregon State University (OSU), one of the U.S. participants, is a state-funded university with a Civil Engineering department that has become a center of expertise on Arctic and Russia environmental engineering. OSU is working under a Cooperative Agreement with the U.S. Environmental Protection Agency. The U.S. Environmental Protection Agency (EPA), Climate Change Division, another U.S. participant, analyzes the potential impacts of, adaptation to, and policy options for, global climate change. Sealweld Corporation, another U.S. participant, has been active worldwide for more than 25 years in working with the gas and oil industry to reduce fugitive natural gas leaks from pipeline valves. Sealweld provides all necessary hardware and lubricants to implement valve sealing programs, as well as the training to ensure that clients can continue the programs independently. Sustainable Development Technology Corporation (SDTC), another U.S. participant, assists clients in the identification and

	implementation of greenhouse gas (GHG) emissions reductions strategies. GAZPROM, a Russian Joint Stock Company, is a host country participant, along with its regional affiliates Volgogradtransgas and Yugtransgas. GAZPROM is the world's largest gas producer and one of the largest corporations in the world. It is responsible for more than half of Russia's domestic energy supply. The Center for Energy Efficiency, another host country participant, is a nonprofit independent Russian-American organization founded in 1992 to promote energy efficiency and environmental protection in Russia. Its activities include studies on environmental effects of energy conservation, greenhouse gas mitigation strategies, and development and promotion of joint implementation projects.
Institutional Arrangements	The project will be run under a partnership of the present participants plus a JI-motivated U.S. utility company (yet to be identified). Participants expect that GAZPROM and the utility company partner will agree to assign all GHG emission reductions to the utility company. The utility will be able to independently assign, sell or otherwise transfer its offsets to a third party.
Cost	The project cost is estimated to be US$300K.
Technical Data	The RUSAGAS Project calls for implementation of a technical program to seal the valves at the Pallasovskaya and Storozhovka compressor stations, seal the valves on the main pipelines contiguous to the compressor stations, and improve the operational efficiency of the compressor stations' prime movers. The sites are located in Saratov and Pallasovka, Russia.

	Long-Term Viability	There is some risk that inadequate maintenance will diminish the effectiveness of the valve sealing program over time. A monitoring and evaluation plan would be put into place to measure impact. Participants have also included provision for training in operations, maintenance and repair.
	Location	Russia
	Term	Project lifetime is associated with the life of the compressor station. Operating efficiency improvements will continue for as long as the maintenance program is conducted, assuming that the existing compressor prime movers are not replaced with more efficient units in the future.
	Project Assessment Procedures	The project will be monitored with field surveys. Participants agree to external verification. Southern California Gas Company has agreed to do the verification and has provided some preliminary information on their qualifications and their proposed approach.
B) Government Acceptance, Approval or Endorsement	The project has been approved for JI status by the Interagency Commission of the Russian Federation on Climate Change Problems.	
C) Compatibility with and Supportiveness of National Economic Development and Socioeconomic and Environmental Priorities and Strategies	The RUSAGAS project is compatible with the Russian government's desire to enhance environmental quality and improve energy sector efficiency.	
D) Benefits Derived from the AIJ Project	This project reduces GHGs by the equivalent of an estimated 8,182,000 mt C over its 25-year lifespan.	

	The project would increase station fuel efficiency, increase station safety, and reduce local air pollution. A direct cost savings will be accrued through the decrease in leakage of gas from the system.
E) Calculation of the Contribution of AIJ Projects to Mitigation of Climate Change	To calculate the net GHG reductions associated with this type of project, it is first necessary to estimate emissions without the project (the "reference case") and with the project in place (the "project case"). On-site emissions for both the reference and the project case are estimated for each year of the project's lifespan. The differences between reference and project case emissions for each year are added together to arrive at the cumulative reductions over the life of the project. The reference case was based on the current estimated emissions of methane from leaking valves at the two compressor stations (Pallasovka and Saratov) believed to be representative of the system. At the Pallasovka compressor station, it was estimated that there are 70 leaking valves that emit a total of approximately 0.01×10^9 m^3 CH_4/yr. This emissions estimate was based on measurements of 16 leaking valves. The minimum and maximum emissions measured were 15 m^3/hr and 1300 m^3/hr, respectively. To be conservative, the lowest emission level of 15 m^3/hr was used. Therefore, a leaky valve will produce annual fugitive gas emission of 131,400 m^3 CH_4/yr (= 15 m^3/hr * 24 hrs/day * 365 days/yr). Total annual emissions are 0.01×10^9 m^3 CH_4/yr (= 131,400 m^3 CH_4/yr * 70 valves). At the Saratov compressor station, it was estimated that there are 120 leaking valves, emitting approximately 0.09×10^9 m^3 CH_4/yr. To develop this estimate, the project participant used information provided by the Head Environmental Engineer for the Saratov station, who estimated that the fugitive gas emissions at the station were likely to be in the range of 0.5 to 0.6% of the maximum gas transmission capacity of the compressor station. This is equivalent to 0.09×10^9 m^3 CH_4/yr. Although this is somewhat higher than the result that would be obtained using the 15 m^3/hr leak rate for the Pallasovka plant, it is still conservatively low. Thus, the reference case emissions were estimated by: 1)

adding the emissions at both stations; 2) converting cubic meters of methane (CH_4) to metric tons of methane; and 3) converting from metric tons of methane to metric tons of CO_2.

Using this approach, reference case annual emissions were estimated to be 1,715,000 mt CO_2 (= (0.01 x 10^9 m^3 CH_4/yr + 0.09 x 10^9 m^3 CH_4/yr) * .0007 mt/m_3 * 24.5 CO_2/CH_4). This amount is equivalent to 467,700 mt C (= 1,715,000 mt CO_2 * 12/44 mt C/mt CO_2). According to the developer, an expert assessment has determined that without intervention, the emission levels could increase up to 5% per year. However, to be conservative, the developer did not factor such an increase into the estimated emissions in the absence of the project. Therefore, reference case emissions are assumed to remain constant throughout the 25 year life of the project.

To establish emissions under the project case, it was assumed that repairing valves reduces their methane emissions to zero. At Pallasovka, it was projected that all of the 70 valves would be sealed, resulting in zero project case emissions at that compressor station. At Saratov, it was estimated that 80 of the 120 valves would be sealed, resulting in emissions of .03 x10^9 m^3 CH_4/yr (= 40/120 * .09 x 10^9 m^3 CH_4/yr) from the 40 remaining leaking valves.

Given that Pallasovka project case emissions are assumed to be zero, annual project case emissions for the entire project are equal to the Saratov project case emissions. Project case annual emissions are equivalent to 514,500 mt CO_2 (= .03 x10^9 m^3 CH_4/yr * 0.0007 mt/m^3 * 24.5 CO_2/CH_4). The project case emissions are assumed to remain constant throughout the life of the project.

To determine the net GHG reductions estimated to result annually from sealing leaking valves at the two compressor stations, annual project case emissions are subtracted from the annual reference case emissions. Thus, net annual reduction are estimated to be 1,200,500 mt CO_2 (1,715,000 mt CO_2 - 514,500 mt CO_2): To arrive at the estimated GHG reductions over the duration of the project, annual reductions are multiplied by the project lifetime in years, yielding an estimate of 30,000,000 mt CO_2 (1,200,500 mt CO_2/yr * 25 years) or 8,182,000 mt C (30,000,000 mt CO_2 * 12/44 C/CO_2).

F) Additionality to Financial Obligations of Parties Included in Annex-II of the Convention and Current ODA Flows	To date, the project has been funded by the Sustainable Development Technology Corporation, Sealweld Corporation, GAZPROM, and OSU (working under a Cooperative Agreement with the U.S. EPA). SDTC, Sealweld and OSU will contribute in-kind services. Sealweld has invested in market development in Russia since 1993. OSU will provide $10,000 through a U.S. EPA Cooperative Agreement for transaction activities relating to the conduct of the project as a JI project. Participants do not envision using U.S. federal funds to support the Valve Sealing and Operation Efficiency Improvement Programs.
G) Contribution to Capacity Building, Transfer of Environmentally Sound Technologies, and Know-How to Other Parties	The project is intended to serve as a model for similar joint implementation projects.
H) Additional Comments	

Appendix

GROUNDRULES AND PROJECT CRITERIA FOR USIJI

Groundrules

The following describes the U.S. Initiative on Joint Implementation (USIJI), which shall be established as a pilot program.

Section I--Purpose

The purpose of the pilot program shall be to:

(1) Encourage the rapid development and implementation of cooperative, mutually voluntary, cost-effective projects between U.S. and foreign partners aimed at reducing or sequestering emissions of greenhouse gases, particularly projects promoting technology cooperation with and sustainable development in developing countries and countries with economies in transition to market economies;

(2) Promote a broad range of cooperative, mutually voluntary projects to test and evaluate methodologies for measuring, tracking and verifying costs and benefits;

(3) Establish an empirical basis to contribute to the formulation of international criteria for joint implementation;

(4) Encourage private sector investment and innovation in the development and dissemination of technologies for reducing or sequestering emissions of greenhouse gases; and

(5) Encourage participating countries to adopt more complete climate action programs, including national inventories, baselines, policies and measures, and appropriate specific commitments.

Section II--Evaluation and Reassessment of Pilot Program

The pilot program shall be evaluated and reassessed within two years of its inception or within six months of adoption of international criteria for joint implementation by the Conference of the Parties to the United Nations Framework Convention on Climate Change, whichever is earlier.

Section III--Eligible Participants

A. Domestic

(1) Any U.S. citizen or resident alien;

(2) Any company, organization or entity incorporated under or recognized by the laws of the United States, or group thereof; or

(3) Any U.S. federal, state or local government entity.

B. Foreign

(1) Any country that has signed, ratified or acceded to the United Nations Framework Convention on Climate Change;
(2) Any citizen or resident alien of a country identified in B(1) of this section;
(3) Any company, organization or entity incorporated under or recognized by the laws of a country identified in B(1) of this section, or group thereof; or
(4) Any national, provincial, state, or local government entity of a country identified in B(1) of this section.

Section IV--Evaluation Panel

A. An Evaluation Panel is hereby established.

B. The Evaluation Panel shall consist of eight members, of whom:
(1) One shall be an employee of the Department of Energy, who shall serve as Co-Chair;
(2) One shall be an employee of the Environmental Protection Agency, who shall serve as Co-Chair;
(3) One shall be an employee of the Agency for International Development;
(4) One shall be an employee of the Department of Agriculture;
(5) One shall be an employee of the Department of Commerce;
(6) One shall be an employee of the Department of the Interior;
(7) One shall be an employee of the Department of State; and
(8) One shall be an employee of the Department of the Treasury.

C. The Panel shall be responsible for:
(1) Advising and assisting prospective U.S. and foreign participants on the technical parameters (including with respect to baselines, measuring and tracking) of projects submitted for inclusion in the USIJI;
(2) Accepting project submissions from eligible U.S. participants and their foreign partners;
(3) Reviewing and evaluating project submissions, including baseline projections;
(4) Approving or rejecting project submissions for inclusion in the USIJI, based on criteria contained in section V;
(5) Providing written reasons for its decisions, which shall be made publicly available, within 90 days of receipt of a complete submission or resubmission;
(6) Certifying emissions reduced or sequestered estimated to result from projects;
(7) Developing operational modalities for the implementation of the Program; and
(8) Preparing an annual report of its activities, including a summary of approved projects.

Section V--Criteria

A. To be included in the USIJI, the Evaluation Panel must find that a project

submission:

(1) Is acceptable to the government of the host country;

(2) Involves specific measures to reduce or sequester greenhouse gas emissions initiated as the result of the U.S. Initiative on Joint Implementation, or in reasonable anticipation thereof;

(3) Provides data and methodological information sufficient to establish a baseline of current and future greenhouse gas emissions:

  (a) In the absence of the specific measures referred to in A.(2)-- of this section; and

  (b) As the result of the specific measures referred to in A.(2) of this section;

(4) Will reduce or sequester greenhouse gas emissions beyond those referred to in A.(3)(a) of this section, and if federally funded, is or will be undertaken with funds in excess of those available for such activities in fiscal year 1993;

(5) Contains adequate provisions for tracking the greenhouse gas emissions reduced or sequestered resulting from the project, and on a periodic basis, for modifying such estimates and for comparing actual results with those originally projected;

(6) Contains adequate provisions for external verification of the greenhouse gas emissions reduced or sequestered by the project;

(7) Identifies any associated non-greenhouse gas environmental impacts/benefits;

(8) Provides adequate assurance that greenhouse gas emissions reduced or sequestered over time will not be lost or reversed; and

(9) Provides for annual reports to the Evaluation Panel on the emissions reduced or sequestered, and on the share of such emissions attributed to each of the participants, domestic and foreign, pursuant to the terms of voluntary agreements among project participants.

B. In determining whether to include projects under the USIJI, the Evaluation Panel shall also consider:

(1) The potential for the project to lead to changes in greenhouse gas emissions elsewhere;

(2) The potential positive and negative effects of the project apart from its effect on greenhouse gas emissions reduced or sequestered;

(3) Whether the U.S. participants are emitters of greenhouse gases within the United States and, if so, whether they are taking measures to reduce or sequester such emissions; and

(4) Whether efforts are underway within the host country to ratify or accede to the United Nations Framework Convention on Climate Change, to develop a national inventory and/or baseline of greenhouse gas emissions by sources and removals by sinks, and whether the host country is taking measures to reduce its emissions and enhance its sinks and reservoirs of greenhouse gases.