Development of an International Electric Cooperative Initiative on Energy Efficiency

FINAL REPORT

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submitted by:

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LIST OF ACRONYMS

ADB/PSOD – Asian Development Bank/Private Sector Operations Department
CAS – Corporate Advisory Service (*World Bank Group)*
CDE – **Compania Dominicana de Electricidad *(Dominican Republic)***
CDM – Clean Development Mechanism
CFC – National Rural Utilities Cooperative Finance Corporation *(U.S.)*
CONELECTRICAS – **Consorcio de Cooperativas Electricas Costariccensas *(Costa Rica)***
GHG – Greenhouse gases
G&T – Generation and Transmission Cooperative
ICE – Instituto Costarricense de Electricidad (*Costa Rica)*
IDB – Inter-American Development Bank
IFC/CAS - Corporate Advisory Services Department, International Finance Corporation
IPP – Independent power producer
IUEP – International Utility Efficiency Partnerships *(U.S.)*
MIF – Multilateral Investment Fund (*IDB*)
NRECA – National Rural Electric Cooperative Association *(U.S.)*
NRECA International – NRECA International, Ltd.
SHS – Solar home system
USIJI – U.S. Initiative on Joint Implementation

I. EXECUTIVE SUMMARY

1.1 NRECA conceived of the *International Electric Cooperative Initiative on Energy Efficiency* (IECIEE) in order to provide an ongoing means of contributing voluntary actions on greenhouse gas emissions mitigation as an integral component of its international programs and projects. This required designing the IECIEE to be integrated directly with the core interests and attributes of participating cooperatives in the U.S. and Latin America, which was the initial focus area selected for the IECIEE. In the case of NRECA International, the core interests related to promoting and strengthening the electric cooperative model, which has proved highly successful in maximizing operational efficiencies in electric power generation, distribution and retailing, as compared to government-owned entities. As power sector reform continues to evolve in the region, power authorities in a growing number of countries are considering the advantage of adopting this model, and also to support the further development of existing electric cooperative industries.

1.2 The approach involved three basic components: *(i)* establishing the IECIEE mechanism, which involved setting up a functioning organizational vehicle providing for investment, management, and emissions credit accounting; *(ii)* developing a portfolio of projects in countries where NRECA International could effectively implement the broader mandate of cooperative development as energy efficient suppliers and distributors of electrical energy; and *(iii)* conducting outreach to obtain the commitment of participants and resources from U.S. and Latin American cooperatives and partnering agencies in the development financing community. The institutional arrangement would need to be adequate to carry out commercial-grade investments and activities as well as provide for technical assistance and for influencing policies and related arrangements with the appropriate in-country authorities. Therefore at the national level, the program would require the recruitment and/or creation of suitable associations of cooperatives capable of playing a role similar to NRECA and other apex agencies of U.S. electric cooperatives. This would facilitate program scale and aggregation of projects and contributed resources to a manageable level, which was considered necessary in order to interest partners such as the Inter-American Development bank in participating with funding.

1.3 The activities carried out under this formative stage of the IECIEE were as follows:

- Research was conducted on the emerging Kyoto accord operating systems to determine options for structuring programs and projects to efficiently accrue emissions reductions credits.

- NRECA International's program was oriented to accommodate interests voiced by NRECA members following an outreach program to discuss opportunities and options for GHG emissions reduction projects and activities.

- An institutional model was formulated in collaboration with the Multilateral Investment Fund of the Inter-American Development Bank to provide a formal basis for aggregating projects and resources and manage the development and accounting for emissions reduction credits.

- A portfolio of projects was developed in four countries: Bolivia, Costa Rica, Guatemala, and Bolivia.

1.4 The Costa Rica program was selected for the initial IECIEE undertaking and several key measures were accomplished, including the development of an investment consortium arrangement under the national electric co-op association, CONELECTRICAS; hydro and wind-power project studies; a related rainforest watershed protection program; and passage of a landmark law by the Costa Rican government that grants the co-ops direct authority to develop, own and operate power facilities for their own use.

1.5 Looking to the future, the IECIEE is expected to be formally initiated later this year under an alliance between NRECA and its member cooperatives, the IDB/MIF, and counterpart cooperatives in Latin America starting with CONELECTRICAS. NRECA expects to expand this successful pattern to cooperative partnerships in other countries in Asia and Africa.

II. PROJECT AIMS AND STRATEGY

Background

2.1 The impetus for IECIEE was an interest on the part of NRECA International to create a permanent capability for assisting NRECA member electric cooperatives in accessing emissions reduction credit options in the international "market" by taking advantage of existing NRECA International program infrastructure and relationships. By integrating climate change-related activities with NRECA International's existing programs, moreover, the additional benefit of enhancing the "quality" of carbon emissions offsets that could be obtained through NRECA International's core programs overseas. These programs are dedicated to establishing efficient and effective means of expanding modern energy supplies and services to enable rural populations worldwide to enjoy the long-term benefits of greater economic growth and new opportunity. "Efficient" means creating and delivering energy supplies on a cost-efficient and operationally sustainable basis, so the opportunity to incorporate incremental efficiency enhancements under the impetus of a climate change initiative is a natural, value-adding accompaniment.

2.2 NRECA was asked to focus the IECIEE initially in the Americas, where some 2,000 electric cooperatives and community-based electric associations have been formed, starting in the 1920s and stretching from the lower reaches of the Southern Cone region of South America to northernmost Alaska. More broadly, NRECA's overall strategy was

to set up a common resource and networking base for projects and programs combining U.S. electric co-op expertise and resources together with needs and resources of electric cooperatives worldwide.

2.3 The program goal will be accomplished through transfers of energy-efficient technology, contributions of capital, and technical assistance and training assistance from north to south, where participants will work collaboratively to obtain and share carbon credit rights, or perhaps alternative recognition of the impacts of jointly implemented activities to address global climate change through emissions avoidance, reduction and/or carbon sequestration (in contrast to the emissions trading model).

2.4 The initiative was oriented in a way so that such actions could be directly incorporated within NRECA International's program activities, as opposed to setting up a unique climate change-specific program activity for its community. The rationale for this approach was twofold:

- The impact in terms of NRECA membership participation would be greater if climate change mitigation was embedded in an international activity more directly aligned with NRECA International's core mission.[1]

- Such a program would be more successful and sustainable if it were part of a formal organizational initiative having the purpose and outlook of a long-term venture with independent funding and resources.

2.5 In addition to giving NRECA greater opportunity to contribute to climate change mitigation, the intended outcomes of the initiative are compatible with NRECA International's core program objectives, which are to –

- increase access to electricity by rendering electrification more cost-efficient and commercially sustainable;
- mobilize funding support for electric cooperative development overseas; and
- develop markets for US electrification methods and technologies.

2.6 To better understand how the IECIEE concept would be carried forward in this manner, it was necessary to consider the rural electrification policy environment in which NRECA's International program has been operating. NRECA International's program was started in 1962 with the idea of "exporting" the U.S. electric cooperative pattern, through a public-private partnership approach. In fact, NRECA International has had to compete with national para-statal utilities whose mandate included rural electrification as a simple extension of their responsibilities to generate power and deliver it to urban areas and industrial centers. Unfortunately, these governmental agencies are most often marked by bureaucracy, inefficiency and corruption and their rural electric construction and operational patterns have in fact been – improperly – mere extensions of urban-area

[1] NRECA's mission is to promote and support international cooperative electrification development to help people escape rural poverty and enjoy more productive, dignified and healthy lives.

systems. This resulted in overbuilt systems with an unrecoverable capital base, poorly maintained distribution systems, and in particular gross inefficiencies in management and execution of vital commercial functions – metering, billing and collecting revenues. Apart from the commercial losses, technical losses arising from poorly designed, built and maintained systems could reach as much as 30% or more, or up to five times the typical standard of U.S. electric utilities. In some developing countries, electric utilities have transmission and distribution losses of 70% and loss rates (technical and administrative combined) in the range of 50% are commonplace.[2] These circumstances result in enormous waste of generating capacity and fuel. In India alone, the annual energy loss from poorly designed and maintained electric distribution networks is on the order of one hundred billion kilowatt-hours.[3]

2.7 Competing with these agencies involved working patiently with their senior management and other governmental authorities to help them modify their rural electrification philosophies and approaches. Most often NRECA International's program has barely dented the entrenched superstructure of these agencies and consequently our significant successes have occurred in cases where we have been provided with the opportunity to build the national rural electrification program from the ground up. Moving forward to the present day, a seismic change has occurred in NRECA International's program "market." The global policy wave of power-sector liberalization and the privatization of government electric power have created new openings for cooperative development, particularly since the sale of rural-area concessions has proved problematic and service expansion to rural areas by private companies has not materialized.

2.8 The IECIEE concept occurred at a time of basic change in the electric power business overseas, which also has changed how cooperatives are viewed by power sector policy-makers and reformers. Currently, the major theme is "sustainability," not only environmental, but also economic and financial in electric utility markets that are undergoing fundamental change. Rural service territories have traditionally been viewed as an unwanted financial burden on under-performing state-owned enterprises due to their inherent economic disadvantages of low consumer density and low energy use, combined with persistent conditions of ultra-high energy loss rates and faulty billing and collection. Unfortunately, utility privatization has not solved the operational realities of rural electrification. With this growing consensus, coupled with the rejection of governmental control of utility services, a new opening for the electric cooperative model is now gradually emerging from the privatization debate.

2.9 Electric cooperative performance in most countries has compared very well with state-owned enterprises. A recent evaluation of two representative cooperatives done by NRECA International – one in Bolivia and one in Brazil – showed that bill collection and energy loss rates, key financial ratios and customer satisfaction to be generally on a par

[2] NRECA (2000); Bangladesh project papers.
[3] Government of India (2001); Infrastructure Development Finance Corporation (IDFC) policy paper on non-urban electric distribution.

with US electric co-ops and much better than those neighboring local utilities.[4] A clear illustration of the cooperative model's relative efficiencies was evident in the case of a cooperative serving an area near Bangladesh's capital city of Dhaka, who under a government-mandated utility improvement program absorbed 220 km of distribution line from the state-owned utility company and within six months from the point of take-over, technical and non-technical line losses had been reduced from nearly 60% to 17%. Moreover, consumer-side energy waste from theft, under-billing and under-collection were dramatically reduced.

2.10 Utilizing the co-op approach as a vehicle for obtaining efficiencies is a logical strategy. A significant cost factor in virtually every market relating to electric sector development is the perceived risk of financing electric distribution or power supply investments, particularly the former . Many countries who engaged aggressively in open-market power supply and electric sector private investment during the 1990s are now coming to understand that the underlying risk can be found not in setting the policies and mechanisms in the wholesale power market but rather in the way electricity is distributed and retailed. Wholesale power suppliers depend on the efficiency and effectiveness of local distributors to recover energy and power costs from consumers. When distributors fail, a chain reaction occurs all the way back to the wholesale markets, which respond by raising risk premiums that are built into power project financing. Unit costs increase, and so does the difficulty in payment collections along with greater incidence of power theft. Distributors fail to maintain systems, also due to inadequate bill collection, leading over time to reduced electricity service quality. Service reliability also becomes a problem as the distributors default on their wholesale power contracts and, in the absence of enforceable regulations or effective regulators, consumers feel less obligated to pay. This circumstance is well entrenched in many developing countries, including those that have attempted privatization as a solution. On the other hand, when consumers work together, power theft takes a noticeable drop. As has been found to be true in many NRECA International cooperative electrification projects around the world, neighbors tend not to steal from each other, and they collectively ensure that service quality is maximized.

2.11 A recent example of this as relates to the IECIEE is plainly seen in the case of the Dominican Republic, where NRECA is currently installing a new cooperative brand of electric distribution system owner-operators. DR was one of the first countries in the Caribbean Basin to adopt the concept of independent power producers (IPPs), initially in the 1980s, which led to investments in a series of thermal power plants by several strategic investors. One of these was AES, Inc. a U.S. based private power investment company. At the time of AES' initial investment, the distribution system was owned and operated by the state-owned power company, Compania Dominicana de Electricidad (CDE). CDE's distribution operations had long been characterized by a combination of inadequate tariffs, poor billing and collection practices, chronic financial losses and underinvestment. Many connected users were not even metered and the system was rife with power theft. As a consequence, CDE was unable to meet its contract obligations with the IPPs. This led to power supply interruptions when the IPPs refused to serve

[4] *Cooperative Development Program Case Studies: Cooperativa Rural de Electrificacion, Bolivia and Comilla I Palli Bidyut Samity, Bangladesh;* NRECA International, Ltd.; August 2003.

CDE and a political crisis which eventually led to a decision by the government to invite private investors to purchase three national distribution concessions. AES and Union Fenosa, a Spanish firm, won the distribution concessions and commenced operations in 1998. Unfortunately, the two strategic investors struggled to correct the commercial deficiencies in the distribution and retail of electricity, which inhibited their appetite to invest in distribution improvements. This eventually led to two subsequent events: the collapse of the Union Fenosa concession contracts in 2003-04 and a subsequent decision by the government to enforce a provision in the new power sector law to open the distribution market to other entrants, including the possibility of user associations. NRECA took advantage of this opportunity to propose the development of two pilot electric cooperatives, starting in 2003, in the former Union Fenosa concession areas. NRECA also negotiated with AES to carve out a distribution enclave in its service territory to apply a similar strategy where a user co-op would be created to purchase power in bulk from AES and then manage its own distribution system.

2.12 This initiative is providing an opportunity to demonstrate the implicit market efficiencies of the cooperative model to inhibit electricity theft. It also forces the distribution operator to make the necessary investment to improve quality of service and eliminate distribution losses in a user-supplier "compact" fundamentally based on the proven principle that consumers that are organized into a cooperative will not steal from each other. Not only will technical losses be reduced, but also the losses arising from un-metered use and theft will be eliminated altogether – CDE's loss rates run between 30-50% of electricity entering the grid. The are multiple benefits to this approach, including savings to the Dominican economy from the prevention of lost energy production in the millions of kWhs, reductions in carbon dioxide emissions associated with losses improvements in technical operation of the distribution system, and more economic energy consumption arising from improved enforcement of the commercial system.

IECIEE Objectives and Planned Activities

2.13 The implementation strategy had three basic components: (1) establish the mechanism for participation in GHG mitigation projects; (2) develop a portfolio of high-yielding project activities; and (3) conduct outreach to obtain the participation of U.S. electric cooperatives. The primary output was to be a document that could serve as the basis for implementing the IECIEE, together with organizing the core partners for the program in preparing for a pilot project. The IECIEE project description and scope of work is annexed to this report (Annex E).

Component #1: Establish the mechanism

2.14 The task of creating the IECIEE "mechanism" entailed accomplishing two objectives considered necessary for the initiative to be successful. The first objective was to create a suitable programmatic vehicle that would allow for implementation and sustainability of activities on an on-going basis. Most of the activities envisioned for the IECIEE involve investments with long-term maturities: investments in line loss reduction technologies, fuel-substituting distributed generation facilities, watershed

protection/restoration, etc. This reflects the preferred "carbon strategy" orienting the initiative more to an invest-and-harvest model than a credit trading approach. The former model is more in line with the basic strategy that the IECIEE be designed to align closely with NRECA International's overall program approach. This approach also provides opportunities to bring about actual reductions in atmospheric carbon-dioxide unlike some of the prevailing carbon trading systems. The long-term financial characteristics of these types of activities, as well as the on-going support and monitoring functions including verification purposes relating to carbon credits, implies a sophisticated organizational structure with core financing, professional management and rigorous accounting capacities.

2.15 Second, the mechanism's approach for obtaining valid emissions reduction credits had to assure effective participation of US electric co-ops and other carbon "investors." For this reason, research into alternative methods for accruing carbon credits was to be carried out early on in the process as a resource to be used by NRECA in developing the mechanism (Annex A). This paper was to describe alternative mechanisms including the Prototype Carbon Fund of the World Bank and the Clean Development Mechanism under the Kyoto agreement.

Component #2: Develop a portfolio

2.16 The second general task was to identify target countries and begin to develop a portfolio of projects, including pilot projects in one or more countries for program launch. As noted, the primary focus area was in projects that increased efficiency of electricity generation, distribution and use. NRECA International's program provides a rich environment for developing an attractive portfolio of projects of this kind, as illustrated by the following:

- In Costa Rica, NRECA International assisted in the establishment of a consortium of electric cooperatives, CONELECTRICAS, to develop small, distributed power projects including wind and hydro. As an initial project the consortium obtained the development rights to a 17 MW hydropower site that was commissioned in 1997. As part of this project, NRECA International later introduced the idea of a watershed protection program to improve the plant's dry-season production capacity that would help to offset Costa Rica's dependency on thermal power generation.

- In the Dominican Republic, NRECA International developed a plan with the CDE to acquire segments of the rural distribution network with high technical and commercial losses for the purpose of installing improved metering and other measures aimed at eliminating energy waste. NRECA International subsequently implemented this strategy in several defined service area "enclaves" of the two private investor-owned utility companies that purchased CDE's distribution concessions.

- In Bolivia, NRECA International established a program to assist local communities in remote rural areas to increase electricity access while reducing dependency on diesel power generators. In one province, NRECA International developed a program for converting diesel to gas-fueled systems; in three other provinces NRECA establish programs to finance and install SHS. In the Beni province, NRECA designed and built a 1 MW biomass power plant to displace and augment an existing diesel power generating plant.

- In Guatemala, NRECA International set up the Solar Foundation in 1992, and subsequently, a special rural electrification revolving fund with BANRURAL in 1999. The Fund finances small rural electrification projects including grid supply, SHS installations and other off-grid electrification systems, and end-use investments including, potentially, demand-side energy efficiency investments.

2.17 These and other NRECA programs in Latin America constituted, and continue to provide, a solid project portfolio base for implementing the IECIEE.

Component # 3: Conduct outreach

2.18 The outreach task involved recruiting US participants for the initiative and also working to establish a stronger basis for expanding and strengthening the electric cooperative industry in the Latin American region. Again, this component was to take advantage of existing NRECA International program structures, including the NRECA International Foundation, which maintains an extensive set of contacts with NRECA member cooperatives, affiliates and associated firms. The Foundation was established in 1985 as a complementary international channel specifically to raise support from NRECA members for overseas activities and therefore is an obvious choice for accessing support for IECIEE.

III. APPROACH

3.1 A defining factor in developing the IECIEE was to assure that the resources required to accomplish the type of project portfolio envisioned would be available to IECIEE participants. This included assurance that the policy environment would be conducive for cooperative-led rural electrification development (e.g., concessions, licensing, regulatory approvals, etc.) and that capital financing suitable for long-maturing electrification-related investments would be available. It was also assumed that a network of electric cooperatives organized and motivated to engage in activities to mitigate global climate change would have the political strength to obtain government support and approvals of its projects under a uniform accreditation and accounting system.

3.2 The critical task, therefore, was to create a meaningful network, which meant creating a formal organization in which Latin American cooperatives and their North American electric counterparts could jointly participate, including contributing capital

and other resources. The role of IECIEE was to incorporate measures targeting carbon avoidance and sequestration investments and activities, among other development objectives, along with a management system for obtaining and accounting for emissions reduction credits. After consultations with both parties it became clear that a common implementation vehicle with a financial and investment core would be required, in order to implement a series of long-term investments involving energy efficiency and fuel substitution on electric distribution systems. This vehicle would also be required to manage the process of monitoring and recording carbon benefits.

3.3 The major task in carrying the IECIEE forward was to create a dynamic and expandable network in which Latin America's 850 electric cooperatives and their North American counterparts could jointly participate. Several attempts have been made over the years to create a working association of cooperatives in the region. For example, NRECA International assisted in the creation of an electric cooperative conference as part of the Latin American Rural Electrification Conference (Conferencia Latinoamericana de Electrificacion Rural, CLER) in 1975, which is now an on-going biennial event. Another opportunity was presented by the International Cooperative Alliance, which proposed an energy committee be created in 1993. However, both of these attempts struggled to attract electric cooperative membership. A compelling agenda and necessary financial resources were lacking, however, reflecting the fact that electric cooperatives represent a small fraction of Latin America's electric utility industry.[5]

3.4 As noted above, the utility privatization trend, and the potential role of the electric cooperative model, has presented a significant new opportunity. Thanks in large part to the work of NRECA International in pursuing the IECIEE concept with various financial intermediaries, in particular the World Bank and the Inter-American Development Bank, this trend has given the cooperative model a new level of attention with rural electrification policy makers. For example, in the Dominican Republic, NRECA International and the Superintendencia de Electricidad, the governmental authority directing regulatory reforms in the power sector, adopted an explicit program to coordinate the development of electric distribution cooperatives in a rural sector near the Haitian border and a peri-urban area of the capital city of Santo Domingo, respectively. More recently, the energy committees of the Dominican legislature have begun working with NRECA International to evaluate specific legal and regulatory enabling environment to assure the success of this demonstration initiative.

3.5 In order to tackle the issue of financial resources, NRECA International's proposal to DOE/EERE identified the potential to set up a regional rural electrification initiative in partnership with one or more the multilateral development banks. In terms of achieving the aims of IECIEE, this strategy is intended to provide for access to financing and policy influence and would also provide for linkages to NRECA's parallel effort to

[5] The 983 electric cooperatives in the U.S. account for 10% of total national electricity sales and are by far the largest network in the Western Hemisphere. Of countries that have national cooperative electrification industries, in Brazil there are some 200 electric cooperatives; in Argentina there are some 600; in Costa Rica there are five and in Bolivia there are 100, including the world's largest electric cooperative, serving the provincial capital and surrounding rural areas of the Department of Santa Cruz.

organize the participation of NRECA member co-ops to assist in rebuilding high-loss distribution systems and to implant cooperative structures to attack deficiencies in the commercial aspects of CDE's former concessions.[6]

3.6 A second major determining factor was to ensure that the IECIEE was able to deliver emissions credits to participants that would be sufficient to attract investment by both the host-country cooperatives and their overseas partners. Basing the program in a formal consortium format, and providing both technical assistance as well as investment resources, facilitates the development of carbon benefits on a shared basis; credits are allocated according to the contributions by various consortium members to an aggregated pool of programs and projects.

Methodology

3.7 The methodology used to develop the IECIEE strategy involved the following measures and activities:

- Research of trends and potential enabling measures for developing and obtaining valid GHG emissions credits.
- Consultation with NRECA members and membership interests to ascertain the ways and means of their participation in IECIEE.
- Orientation of the on-going NRECA International programs and projects to the international climate change intervention environment and formulation of IECIEE project models.
- Identification of high-value "investment" opportunities for climate change interventions.
- Integration of IECIEE objectives and activities with NRECA mainstream international activities in the region under an appropriate organizational format, in cooperation with partnering financial intermediaries.
- Creation of a workable GHG emissions credit accounting and apportioning model.
- Initiation of one or more trial programs/projects.

IV. ACTIVITIES AND RESULTS

Review of GHG Emissions Crediting Options and Membership Consultation

4.1 When the development of IECIEE got underway, there were no regulatory requirements mandating electric utilities to control carbon dioxide emissions. The U.S. policy has continued to encourage voluntary action on GHG remissions control under the

[6] As of the date of this report, NRECA has begun the process of recruiting NRECA co-op partners to engage in a long-term "sister co-op" relationships with the two nascent co-op demonstration projects in the Dominican Republic. This followed a successful undertaking in 2002 in which NRECA brought 16 volunteer linemen to assist in building an electric distribution system in one of the AES "enclaves" that NRECA and AES co-financed as part of a hurricane reconstruction project financed by USAID.

voluntary reporting system established in the Section 1605(b) of the 1992 Energy Policy Act and continued in several initiatives under the current Administration aimed at addressing emissions reduction crediting, new power technology development, and tropical forest conservation enhancement, among others. Some U.S. electric utilities have pursued activities to obtain "early action crediting" for investments in this field and during this period, NRECA member G&Ts (generation and transmission cooperatives) initiated a variety of GHG emissions mitigation projects.

In the international realm, the key to obtaining U.S. utility participation in emissions reduction activities, as opposed to carbon trading, has been to understand how GHG programs and projects could be validated under as-yet undefined procedures, for without having assurance of being able to offer officially sanctioned and transferable credits, the opportunities of securing investment and other contributed resources from U.S. utilities in overseas efforts were restricted. It also became clear that for purposes of the IECIEE, the issue would be particularly challenging since, with the exception of Costa Rica and a handful of other developing countries, most countries have been slow to develop formal GHG emissions reduction crediting systems and programs.

4.2 In the process of consulting with NRECA member power supply cooperatives, there was evident interest in participating in international projects and in particular in gaining understanding of how activities could be formally sanctioned to result in valid credits. To begin to address this issue, a consultant was retained to prepare a background paper examining the state of the carbon credit "market" and means for accruing GHG emissions avoidance credits (herein attached as Annex A), which was used by NRECA International staff as background in a series of discussions with NRECA member co-ops during the IECIEE development process. The issue of certification, particularly in the case of international programs and investments, was determined to be important to NRECA member participants, leading to the decision to focus on the evolving development of the Clean Development Mechanism as a preferred model for pursuing GHG emissions avoidance crediting. It was also confirmed that the IECIEE was an attractive model given its design to implant the pursuit of creditable GHG mitigation within a program of broader aims and benefits, based on NRECA International's traditional mission interest of promoting cooperative electrification development around the globe.

NRECA's Climate Change Policy

4.3 NRECA's policy on climate change, while still evolving, has for many years encouraged voluntary programs and measures by its cooperative membership. In 1999, NRECA adopted a resolution calling for voluntary participation by NRECA member electric cooperatives in international climate change initiatives and in 2000 a similar resolution was adopted. The IECIEE provided the impetus for including international activities as a formal component of this policy.

4.4 In January 2003, NRECA outlined its approach to climate change mitigation in a letter to DOE Secretary Spencer Abraham, featuring its participation in the Electric

Power Industry Climate Initiative (EPICI) and the EPICI-DOE partnership with DOE, Power Partners (Annex B). The outlined approach included as one of its four primary components the international initiative, aimed at fostering efforts to reduce energy loss on electric cooperative distribution lines worldwide, increasing fuel substitution by replacing thermal fossil fuel-based generation with renewable energy power systems, developing energy conservation programs and supporting carbon sequestration in forest protection efforts. This statement fulfilled the view of the membership of the need for an association-wide commitment to the purpose of the IECIEE. It also reflected the IECIEE strategy to imbed climate change initiatives within a broader framework for implementing NRECA International's overarching international mission and goal of promoting consumer-driven rural electrification development.

Regional Cooperative Development Alliance

4.5 The basic purpose of the IECIEE cooperative agreement was to facilitate the development of a formal international network of electric cooperatives that would provide resources and technical assistance for the development of effective GHG mitigation programs, among other purposes. The strategy of working with the international financial institutions led to the initiation of several negotiations including one with the Multilateral Investment Fund of the Inter-American Development Bank. This partnership ("Alliance"), which is described in the document exhibited in Annex C, will be the basis for pursuing the aims of the IECIEE in the future.

4.6 The Alliance consists of four central participants: NRECA International Ltd., which implements NRECA's major international initiatives; MIF, which provides grants funding and equity to support new initiatives in the Latin American region to support small-scale private initiatives in areas traditionally controlled by government management; the NRECA International Foundation, which mobilizes U.S. private sector support for NRECA International's programs and projects, primarily through NRECA-member cooperatives; and counterpart organizations representing Latin American electric cooperatives. The basic mission of the Alliance is to promote rural electrification expansion through the development and growth of the electric cooperative industry in the region as an example of small, local private initiative where governmental and other private sector efforts have failed. The participants will share in the cost of programs and in the benefits, including GHG emissions reduction benefits from activities eligible for formally sanctioned crediting.

4.7 NRECA member cooperatives have been supporting Latin American cooperatives for many years through "sister cooperatives" programs and other projects sponsored by the NRECA International Foundation. Under the Alliance they will be invited to participate in sponsoring projects that are developed by the core management team; some will involve carbon creditable activities but not others. Activities that earn GHG emissions reduction credits will accrue to the participants of those project activities according to the financial and in-kind contributions of the participants including investments and accompanying technical assistance. The core team will set up collaboration agreements with partnering local co-op agencies in the countries where the

Alliance works; in some countries such agencies already exist and in others the Alliance will develop such agencies as part of electric cooperative development programs.

4.8 The job of the Alliance is to design and develop electric cooperative projects; foment policy changes as needed to allow projects to be implemented; arrange for capital financing; and create project-level implementation alliances: sister co-op arrangements, etc. Illustrative projects are described in section 4.11 below including the program in Costa Rica, which is the most advanced project to date and will be the trial program for implementing the GHG emissions reduction crediting system.

4.9 Crediting will be managed by the Alliance core team in collaboration with the partnering local co-op agencies in the host countries according to the rules and procedures established in each country for participating in CDM and potentially other sanctioned mechanisms such as the USIJI. Accruing credits may be accumulated and held in account by the alliance on behalf of participating co-op partners or distributed at the time that they are officially declared. NRECA International will be supported by the National Rural Electric Cooperative Utilities Finance Corporation (CFC), which has entered into an agreement with NRECA to assist in setting up investment programs and structures with international electric co-op agencies.

4.10 NRECA also developed a similar partnership with the World Bank Group in partnership with the Corporate Advisory Services department (CAS) of the International Finance Corporation. This particular alliance is focusing initially on projects in Asia and Africa, but could interface with the Alliance in the future.

Project Portfolio Development

4.11 Three general models were formulated to be integrated with the projects developed and directed by the Alliance.

1. *Adopt-a-project:* The NRECA International Foundation development strategy is based on a new approach for creating sister co-op relationships, wherein NRECA member co-ops or groups of co-ops already associated through Statewide Associations and/or G&Ts, are invited to sponsor electric cooperative development initiatives overseas. Currently, adopt-a-project initiatives are underway or planned in Philippines, Haiti, Guatemala, Costa Rica and the Dominican Republic. GHG offset crediting components are particularly appropriate in cases where existing electric service territories are taken over and reconstituted as electric cooperatives aimed at reducing commercial losses and improving the distribution infrastructure, both of which can yield carbon benefits. In the Dominican Republic, nearly all of the country's new power capacity will generate power using thermal fossil fuels and in Guatemala, coal-fired plants are being built to provide new baseload generating capacity. As part of the investment and development of these initiatives, participating co-op associations from the U.S. will provide a combination of funds, equipment and contributed technical assistance and

training which will be reflected in the Alliance's project capital development budgets which in turn will allow the U.S. participants to obtain the carbon credits associated with these projects.

2. *Renewable energy electrification and fuel substitution:* Power plants based on renewable energy achieve the greatest economic value when connected to local or national grids served by higher-cost thermal plants. This is so as to obtain the maximum use of energy production since most renewable energy facilities are variable-output plants with little or no power capacity value. In the LAC region, NRECA International has been involved in power generation projects in Central America, Chile and Bolivia. In Central America, this work has involved primarily hydropower facilities in Guatemala and Costa Rica and to a lesser degree wind-power. NRECA International is currently assisting a consortium of electric cooperatives in Costa Rica, CONELECTRICAS, to develop and finance a 34 MW hydro project and has been invited to assist in the development of a new 70 MW hydro project in Guatemala that has a local community electrification component, both of which are expected to be considered for the Alliance portfolio. NRECA International and its partners are also currently assessing the feasibility of wind power projects in both countries. All of these would be connected to the national grids, and to the extent that these and similar projects are qualified under CDM for carbon accreditation, they would allow Alliance participants to claim GHG emissions reduction equivalent to the energy displacement from thermal power facilities serving the grids.

3. *Watershed conservation:* Related to hydropower project development, NRECA International also initiated projects in Costa Rica aimed at restoring upstream watersheds, typically in semi-protected and unprotected rainforest areas above the intake weirs. These projects are sanctioned for GHG emissions offset credits by the Costa Rican government. NRECA International's analysis showed that sequestration effects of restoring forest cover, combined with improved hydrologic regimes in the watersheds feeding the hydropower facilities and consequent increased energy and power outputs, would yield significant results in terms of creditable GHG emissions reduction impacts.

V. COSTA RICA – AN ILLUSTRATIVE CASE

5.1 The Costa Rican program under IECIEE centers on the establishment of a new capital financing program by a consortium of four electric cooperative to provide for investments in small hydro and other renewable energy projects as well as electric distribution needs among other potential investments. Costa Rica was selected as a primary target for the IECIEE for several reasons:

- An association of four electric cooperatives (the Consortium of Costa Rican Electric Cooperatives – CONELECTRICAS) was formed to facilitate the Alliance's engagement with local cooperatives. This association has proved very effective not only as a basis for mounting a common investment framework in hydropower and other fields, but also in terms of carrying out political interactions with the government and other parties, such as arranging for officially sanctioned GHG offset programs.

- CONELECTRICAS had already successfully undertaken a small hydroelectric project, the 17 MW San Lorenzo project, setting a workable template for carrying out additional investments. This investment was carried out under Law 7200 which permitted private development of power generation for sale to the national utility, ICE. The project has allowed the cooperatives to create a $10 million equity base from the project's profits, hence forming a solid counterpart funding capability to develop a larger second-stage investment program.

NRECA International assisted in forming CONELECTRICAS starting in the late 1980s, so the relationship was already well established. NRECA International has also fostered a number of "sister" relationships between U.S. and Costa Rican electric co-ops.

5.2 NRECA International and CONELECTRICAS agreed to carry out a long-range partnership covering a variety of needs and interests including the pursuit of collaborative activities relating to climate change. The partnership will focus on the development of additional power projects that would be implemented by CONELECTRICAS, whereby power purchase agreements would be executed with the four distribution co-ops and thus providing the contractual and economic basis for developing the necessary project financing. NRECA and CONELECTRICAS reached a specific agreement on a joint activity relating to watershed protection and also agreed to consider the establishment of a common financing entity for the Costa Rican cooperatives, as envisioned in the Alliance initiative.

5.3 NRECA International presented a concept paper to CONELECTRICAS (Annex D) outlining a strategy and format for creating a formal financing entity, "FINANCIERA CONELECTRICAS," that would change the modality of investment financing by CONELECTRICAS and its individual co-op members from project financing to more of an institutional system using the assets of the agencies as opposed to project assets to back credit risk. The entity would finance large and small investment requirements of CONELECTRICAS and its members, including distribution upgrades, short-term procurement needs, power projects primarily hydro and wind, and potentially other non-electric business interests such as telecommunications services, water, etc. The paper provided a financial plan and established an implementation process and schedule, to be undertaken by the Alliance once formally established with CONELECTRICAS' participation.

5.4 NRECA International retained a local engineering company, BEL Ingenieria, to conduct a general survey of potential hydropower project investments and to carry out a

pre-feasibility study on the best candidate site, the 34 MW "Pocosol" project located in the same area as the San Lorenzo project. The BEL study (Annex D) recommended selection of Pocosol, and also recommended legislative action by CONELECTRICAS to obtain special legal authority for co-op development and ownership of power projects, a right that was granted exclusively to ICE. This law was successfully obtained in 2003. CONELECTRICAS financed a full feasibility study of Pocosol, which provided IECIEE counterpart funding of $360,000. The feasibility study put the plant investment cost at $49 million with energy production potential exceeding 200 GWH annually and an internal rate of return of approximately 12%. This cost did not include the financial burden of wheeling agreements with ICE to deliver energy to CONELECTRICAS member co-ops. The Pocosol project's design also provided for a pumped storage capability which would be particularly valuable in offsetting peaking energy from ICE, whose dry-season peak loads are largely served from thermal power stations.

5.5 NRECA International also studied the potential for wind-power projects in the FINANCIERA CONELECTRICAS pipeline, including projects in Guanacaste, Tilaran, and the San Marcos region south of the capital city of San Jose. The commercial viability of these projects, however, is generally weaker than alternative hydropower investments.

5.6 NRECA International and CONELECTRICAS also executed an agreement in two stages to implement watershed improvement programs as part of hydropower investments, starting with a project in the watershed formed by the San Lorenzo and Jamaical rivers above the San Lorenzo hydro facility (see Annex D). The agreement provided for equal cost sharing by the parties, with NRECA International's portion coming from a trust fund that was established with donations from some 500 NRECA members and individuals. CONELECTRICAS contracted with the University of Costa Rica to establish a monitoring station in the watershed, which was subsequently built, and with the joint NRECA-CONELECTRICAS watershed project trust fund, began to purchase land along the river watercourses above the dam. Related to the watershed initiative, NRECA also developed plans to engage school-aged children in the communities of U.S. electric cooperatives to participate in fundraising activities to support the project. An information folder on Costa Rican rainforest protection was developed for distribution to local schools in the service territories of sponsoring U.S. co-ops (Annex F).

5.7 CONELECTRICAS, on behalf of the Alliance and its participants, is responsible for presenting project proposals through the Costa Rican government for carbon credit approval under its official program including power projects, energy conservation programs, watershed restoration, etc. Credits will accrue to the participants in proportion to their contributions to the project investment requirements. Investment by U.S. co-op participants would come through the NRECA International Foundation and the Alliance. The Alliance, working with CONELECTRICAS FINANCIERA, will establish the funding requirements in project capital expenditure budgets, which U.S. contributors may satisfy in any of several forms: direct cash contributions, in-kind contributions of equipment or labor required to implement the projects, and/or discounted debt financing.

NRECA International will be responsible for recruiting participants by disseminating information on the projects including estimated GHG emissions reduction credits and assisting in setting up project partnerships and sister co-op relationships. The Alliance management team and CONELECTRICAS FINANCIERA will be responsible for the project investment planning, management, and accounting system including GHG emissions credit accounting which, as in the case of the Alliance's financial earnings may be retained ("banked") for future distribution to the individual participants, or alternatively, put up for sale by the Alliance to third parties as a capitalization strategy, as the Alliance Board determines.

5.8 An important feature of the Alliance investment management model is that capital inflows are fungible in terms of allocating GHG emissions credits. Capital budgets covering a number of projects will be managed on a consolidated basis, allowing for an internal trading system across multiple projects and project sponsors. For example, a U.S. cooperative participant may provide resources that are contributed toward the execution of a planned electrification project and in return may obtain the GHG emissions credits earned by the Alliance in a separate project funded by other capital. In this way, electric cooperatives from the state of Georgia who are contributing cash funds, labor, and equipment for the development of an electrification project in the northern frontier area served by one of the CONELECTRICAS member cooperatives and could negotiate to receive a share of the GHG emissions reduction credits obtained by that CONELECTRICAS member co-op from its contribution to the Pocosol hydroelectric project.

VI. GOING FORWARD WITH THE IECIEE

6.1 As noted, NRECA International's strategy in conceiving and developing the IECIEE, ultimately, was to embed climate change activities into a larger international initiative that could be successful in drawing interest and resources to meet NRECA's traditional mission aims and objectives. NRECA International has developed an aggressive program for involving U.S. electric cooperatives in its overseas programs, and under the impetus of the IECIEE program with DOE's support, has included voluntary action on climate change as a specific component.

6.2 There were various delays in implementing the IECIEE, and while having achieved most of the objectives, its full implementation is not complete. In particular there were delays associated with the development of a workable arrangement with MIF regarding the form and implementation strategy of the international electric cooperative partnership entity. In 2005 NRECA and MIF intend to continue work on its design, set-up and capitalization with the probability of initially focusing the Alliance on the IDB region encompassing Central America, Mexico and the Dominican Republic. There were also delays in the developing the groundwork for the "test" program in Costa Rica, particularly in obtaining legal and licensing authority for developing power projects, which eventually necessitated passage of a separate piece of legislation by the Costa Rican national assembly, whose approval was an important result of the IECIEE

partnership in Costa Rica. NRECA International has involved electric cooperatives from the state of Pennsylvania, Georgia and North Carolina in supporting the Costa Rican program and co-ops from other states to support planning projects in Guatemala (Minnesota) and Dominican Republic (Illinois).

6.3 The IECIEE in Latin America will also provide a template for similar work in other parts of the world where NRECA International is operating. In the Philippines, where NRECA International has involved the support of cooperatives from the state of Kentucky, a financing agency similar to FINANCIERA CONELECTRICAS has already been established and is currently financing projects in electric distribution system efficiency. In India, NRECA International is preparing to work through its partnership with IFC/CAS to develop market mechanisms for establishing new electric cooperatives in tandem with private sector investment aimed at taking over poorly administered distribution systems from the state electric power utilities. And in Africa, NRECA International is involved in discussions with the World Bank for the set up of regional entities similar to what is planned with MIF to develop and support local electrification programs that will improve on current electric distribution practices in both urban and rural settings.

ANNEX A

ENERGY RESOURCES
INTERNATIONAL, INC.

ERI- 3096-0002

NRECA International Cooperative Initiative on Energy Efficiency: Mechanisms to Accrue GHG Benefits

Synthesis Paper

ENERGY RESOURCES
INTERNATIONAL, INC.

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NRECA International Cooperative Initiative on Energy Efficiency: Mechanisms to Accrue GHG Benefits

Synthesis Paper

Prepared for:

National Rural Electric Cooperative Association (NRECA)

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Purpose of Paper

NRECA International, Ltd. is actively engaged in global programs to improve the overall efficiency of existing and planned rural electrification through improved technology choices, construction, operation and management. One of the beneficial "environmental externalities" associated with such efficiency improvements is reduced or avoided emissions of greenhouse gases (GHG)--e.g., carbon dioxide (C02) and methane (CH_4).

While no regulatory requirement to control GHG emissions currently exists-either in the United States or internationally there are ongoing discussions to implement an international regime to mitigate global climate change.' Due to the pervasive and significant impact that such a potential regime would have on energy-based investments, many forward-looking entities[2] are voluntarily determining and banking GHG credits that arise from current energy investment projects.

This paper discusses alternative mechanisms to accrue GHG credits (or other financial benefits) from international NRECA energy efficiency investments. The emphasis is on those mechanisms available *today* for voluntary, early action crediting.

Motivation to Accrue GHG Credits

While NRECA energy efficiency investments in developing countries would generate many local and national "sustainable development" benefits, such investments would also create positive international environmental effects through avoided (or reduced) GHG emissions. Since a regime to control GHG emissions is likely in the future, it is not financially prudent to forego accruing emission credits (or other financial benefits) that currently arise from these projects.

These credits could be used to enhance the project revenue stream, banked for use in the future for compliance with domestic obligations or to offset project development emissions (by NRECA cooperatives), or used as barter to 1) reduce the cost of capital or 2) as equity investment compensation. However, once a project is completed, the ability to capture the environmental benefits from avoided emissions is foregone. Thus, unless the transaction cost associated with credit documentation is greater than their expected value, such credits should be accrued as a compliance or financial risk hedge (insurance policy).

' Meetings of the Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) on *Procedures and Mechanisms Related to Compliance Under the Kyoto Protocol* (FCCC/SB/2000/1) and *Mechanisms Pursuant to Articles 6, 12, and 17 of the Kyoto Protocol* (FCCCISB/2000/3), in advance of meetings by the Conference of the Parties (COP-6) in November 2000.

2 For example, BP Amoco, Shell and Enron have voluntarily established internal emissions trading systems among their business units; PEMEX (Mexico) recently announced it would establish such a system. Many U.S. power generators and technology vendors have voluntarily reported GHG reduction projects under Section 1605(b) of the Energy Policy Act of 1992 (see below).

In a DOE-funded activity, *International Cooperative Initiative on Energy Efficiency,* NRECA International, Ltd. is establishing a program to channel resources from the U.S. electricity cooperative community into feasible and attractive electric-energy efficiency improvement projects in Latin America. In this program NRECA will create specially-directed capital instruments to channel privately-sourced capital to support these projects

The GHG mechanism would 1) provide an additional source of capital to expand

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coordinating resources among participating'beneticiariess to obtain and bank emission However, to accrue credit for voluntary actions necessitates that the method employed to derive the avoided (reduced) emissions be "sanctionable" -i.e., a verifiable procedure consistent with that being discussed by the SBSTA and SBI, and subsequently approved by the Conference of Parties (COP), for use in certifying joint implementation (JI) and clean development mechanism (CDM) projects. Only particular GHG programs currently have procedures that would likely be "sanctionable" in the future, so that any credits created (reported) would be valid. In addition to credits, some voluntary GHG programs provide financial assistance in the form of 1) feasibility study funding, 2) grants, 3) lower-cost loans, and 4) "additionality" funds.[3]

Voluntary Actions-Domestic Programs

The primary U.S. program to promote voluntary mitigation of GHG emissions is Climate Challenge. Climate Challenge is a joint program between the U.S. electric power industry and the U.S. Department of Energy to reduce, avoid or sequester greenhouse gases. Climate Challenge was developed as the U.S. response to the voluntary reduction in GHG emissions (by 2000 from 1990 levels) stipulated in the U.N. Framework Convention on Climate Change (UNFCCC).

Under the Climate Challenge program, participating utilities commit to reduce, finance and/or contribute to emissions reductions, and report their reductions under the Section 1605(b) voluntary program. The Climate Challenge program consists of a portfolio of electric industry-wide initiatives designed to increase market share of clean technologies, provide project funding, or initiate carbon sequestration projects. About half of the programs in the portfolio are targeted at increased deployment of clean technologies in the U.S. market, while the remainder are designed to find U.S. partners to help finance projects hosted by another country. For instance, the International Utility Efficiency Partnerships

[3] **"Additionality" funds are those that cover the marginal (incremental) cost associated with adopting a GHG-beneficial project investment. Funds available from the Global Environmental Facility (GEF) are an example of this type of funding source.**

(IUEP) program provides pre-feasibility funding and advice for potential joint implementation (JI) programs (see discussion below).

Participants in the Climate Challenge Program do not receive credit for their emissions reductions, but are encouraged to file annually with the Energy Information Administration (EIA) under Section 1605(b) of the 1992 Energy Policy Act. While participants have no guarantee, there is an assumption that credits for these emission reduction actions will have some value, should the U.S. assume a binding GHG emissions reductions commitment in the future.

Some proactive companies are assuming this risk and have undertaken bilateral GHG reduction trades. For example, during the last week of October, 1999, Ontario Power purchased credits equivalent to reductions of 2.5 million tonnes of CO_2 from U.S.-based Zahren Alternative Power Corporation, which develops landfill gas capture projects and uses the methane for electricity generation. This trade is believed to be the largest to date in this unofficial market. Credits will be certified by Ontario's Pilot Emission Reduction Trading Program, which should allow for their eventual trade on international markets (ENS, 1999).

Other trades of this type have included energy efficiency, fuel switching, and renewable energy projects. Carbon reduction credit prices in these types of trades have ranged from US$ 0.16 to $17.00 per tonne of CO_2 (Mendis and Lee, 2000). However, there are no guarantees that the credits developed in these types of transactions will eventually be validated and certified for trade on international markets.

Voluntary Actions-International Programs

A number of programs exist in the international arena to initiate and develop GHG mitigation projects. Table 1 delineates the primary multinational programs, and the type of support they offer-project identification, feasibility funding, technical assistance and project investment funds.[4] Of these programs, only the following permit the creation or transfer of emissions credits:[5]

- Activities Implemented Jointly (AIJ)
- Prototype Carbon Fund (PCF)
- U.S. Initiative on Joint Implementation (USIJI)
- International Utility Efficiency Partnerships (IUEP)

[4] There are also regional technical support programs. However, these programs tend to focus on technical/financial assistance and do not (yet) address credit creation.

[5] There is considerable experience-primarily in the U.S, but also in New Zealand-with credit trading. Appendix C highlights this experience and provides a summary of "lessons learned" for use in evaluating a country's potential to support granting GHG reduction credits.

Table 1 Voluntary GHG Mitigation Support Programs

SPONSOR	PROGRAM				
World Bank	Activities Implemented Jointly (AIJ)	,/	.J	V	V
	Carbon Investment Fund	J	J	J	V
	Prototype Carbon Funds	~(			
	Energy Sector Management Assistance Program (ESMAP)			~/	
IFC	Technical Assistance Trust Funds			d	
	Project Finance				V
	Small- and Medium-Size Enterprise Program				
IFC/GEF/World Bank	Renewable Energy and Energy Efficiency Fund (REEF)	J		V	~I
World Bank/UNDP/UNEP	Global Environment Facility (GEF)	~/	,/	,f	V
DOE/EPA/AID	U.S. Initiative on Joint Implementation				
	U.S. Country Studies Program			V	
Export-Import Bank	Environmental Exports and other programs				~/
AID	Development Credit Authority and other grants	J	J	J	J
USEA/AID	International Utility Efficiency Partnerships, Inc. (IUEP)	~I	V	V	
	Global Environment Fund				,/

In the **AIJ Program,** a bilateral contract is established to develop a GHG reduction project. Since the AIJ Program was designated as a "pilot" program, at the first Conference of the Parties (COP-1), the intent was to identify (and resolve) issues in GHG project development and not create (and transfer) credits. So, any credit transfer under the AIJ program is purely voluntary between the parties to the contract.

As of September 1999, there were 133 AIJ projects worldwide. The future of the AIJ program is uncertain due to programmatic uncertainties and the JI investment criteria defined in the Kyoto Protocol. See Appendix A for a further discussion of the AIJ Program.

The **Prototype Carbon Fund (PCF)** is scheduled to open this fall with receipt of its initial tranche, $150 million; discussions are underway to propose a second tranche. The PCF has three stated objectives:

- To illustrate how project-based emissions reductions can promote sustainable development in developing countries and economies in transition;
- To provide an opportunity to "learn by doing" while guidelines for these types of projects are negotiated; and
- To demonstrate how the World Bank can mobilize new resources to assist developing countries or economies in transition while pursuing environmental goals.

Credits generated by the projects financed would revert back to the PCF for distribution to the contributors in proportion to their funding contribution. The PCF is structured as a mutual fund, where contributors receive a risk-adjusted allocation of emission credits based

on their initial contribution and the project success rate. See Appendix B for a further discussion of the PCF.

The U.S. **Initiative on Joint Implementation (USIJI)** was established to

- Encourage the development and implementation of voluntary, cost-effective projects between U.S. and non-U.S. partners
- Reduce or sequester GHG emissions
- Contribute to the formulation and implementation of the UNFCCC AIJ pilot phase.

The guiding principles of USIJI projects are: credible, efficient/flexible, transparent, verifiable and to promote energy & emissions security. To date, more than 300 million metric tons of CO2 have been reduced or avoided from 44 projects in 21 countries. To be certified as a USIJI project, three "additionality" criteria must be met:

- Emissions: GHG reductions above and beyond those likely to occur without the project
- Financial: funding independent of or in addition to the UNFCCC financial instrument, multilateral development bank or U.S. Government Official Development Assistance
- Programmatic: measures initiated as a result of or in reasonable anticipation of the USIJI Program.

Credits can be generated under the USIJI program and transferred between parties based on bilateral negotiation. Most USIJI projects have the option to transfer credits, but details on the distribution among the parties are either confidential or are not yet defined.

The **International Utility Efficiency Partnerships (IUEP)** program is an initiative within Climate Challenge, which is part of the U.S. Climate Change Action Plan to reduce GHG emissions. IUEP, an affiliate of the Edison Electric Institute (EEI), was formed in 1995 to

- identify international energy project development opportunities,
- work with host country government personnel to facilitate project investment, and
- demonstrate U.S. utility commitment to voluntary approaches to global climate change issues.

Participation is open to EEI investor-owned electric companies, EEI International Affiliates, EEI Associates, and energy product manufacturers and service providers.

The goal of IUEP is to identify and support international activities, sponsored by U.S. utilities, which reduce, limit or avoid GHG emissions. To date, IUEP has developed 12 projects; 6 projects have received USIJI approval. At present, IUEP is negotiating the transfer of credits under the Argentina and Bolivia projects.

Table 2a IUEP Projects Approved by USIJI

Country	Name	**Type**	Date Approved	**CO_2 Offset (MMT)**	**Benchmarks**
Honduras	The Bio-Gen Biomass Power Generation Project, Phase I	Biomass (Wood Chip)	December 1995	3.4	Fossil Fuel
Honduras	The Bio-Gen Biomass Power Generation Project, Phase II	Biomass (African Palm Waste)	December 1996	3.4	Fossil Fuel
Belize	The Bel/Maya Biomass Power Generation Project	Biomass (Wood Chip)	December 1996	3.0	Fossil Fuel
Argentina	The Capex, S.A. Project	Natural Gas Combined Cycle	March 1999	30.0	Natural Gas Simple Cycle
Bolivia	Taquesi River Hydroelectric Project	Hydropower	February 2000	10.02	Fossil Fuel

Table 2b IUEP Projects "Under Development" in USIJI Process

Country	Name	Type	Date Approved	CO_2 Offset (Million MT)	Benchmarks
Czech Republic	The ECKG Project	Fluidized Bed Combustion	October 1996	3.76	Pulverized Coal Combustion
Guatemala	Bio-Gen Power Generation Guatemala	Biomass	June 1997	3.4	Fuel Oil
Nicaragua	Bio-Gen Power Generation Nicaragua	Biomass	June 1997	3.4	Fuel Oil
Paraguay	The Carlos Casado S.A. Laguna Tigre I Mariscal Estigarribia Project	Carbon Sequestration	June 1997	0.5	-
Philippines	Philippines Bioten Biomass Project	Biomass	June 1997	3.0	Fuel Oil

Source: IUEP

Credit for Voluntary Actions

Under the Energy Policy Act of 1992, Section 1605(b) permits the voluntary reporting of actions taken to reduce GHG emissions, either domestically or internationally. While filing a GHG emission reduction project under Section 1605(b) does not guarantee that credit will be received if/when a GHG requirement is implemented, it does provide a historical record of actions taken to reduce GHG emissions according to an established procedure, which would likely be "sanctionable" in the future.

Participants in the Section 1605(b) program report emissions and emissions reductions of greenhouse gases as well as some criteria air pollutants. A completed standard form is submitted on the anniversary of their Action Plan submission to DOE/EIA that provides corporate information on the entity, project- and entity-level emissions and reductions (direct and indirect), and the planned actions and progress in each project in the entity's action plan.

The six categories of data required for emissions reductions from 1991-1999 include:

1. Define the boundary of the entity or project
2. Estimate actual emissions within entity or project boundary 3.
Estimate the reference case emissions or sequestration 4.
Calculate emissions reduction or sequestration
5. Report emissions reductions associated with energy end use, and
6. Use a modified reference case to normalize for changes in production output.

In 1998, 1507 GHG reduction projects were reported, equal to 212 million metric tons of carbon dioxide equivalent (MtC02E). Figure 1 depicts that 75% of the GHG emissions reduced came from electric power actions. Of the 1507 projects, approximately 6% (83) were international-primarily forestry reported programs (56), but also fuel switching, cogeneration, wind, hydroelectric, etc. (EIA, 1999). These international projects contributed approximately 5.6% (12.2 MtC02E) to the 1998 total reported.

There are several proposals that would institutionalize the creation of credits from proactive, voluntary actions (Nordhaus and Fotis, 1998). These include:

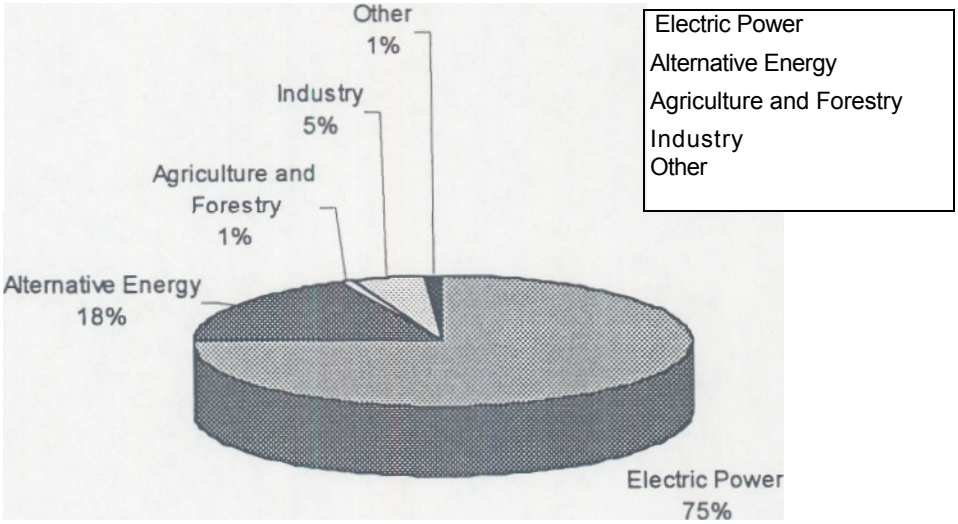
- **Environmental Defense Fund** (EDF) developed a proposal that would provide credit for early GHG reductions achieved through voluntary actions for the years 1999 through 2007. Ton-for-ton credit would be provided for each ton of GHG reduced or sequestered through actions taken either domestically or abroad.
- **Coalition to Advance Sustainable Technology (CAST)** proposed establishing a baseline rate expressed in terms of GHG emissions per unit of revenue (e.g., lbs of C02 equivalent/dollar of company sales). First, the company would use emissions and revenue levels for the baseline year in calculating its initial baseline rate, expressed in terms of lbs of C02 equivalent/dollar of company sales. Second, the baseline rate is adjusted downward by 1 percent per year to reflect BAU improvement in efficiency.

Credit would be received under either a "Meet Kyoto" or a "Beat Kyoto" option (likely reductions would be slightly discounted under the Meet Kyoto scenario).

- **Center for Clean Air Policy (CCAP)** outlined an economy-wide, early-action crediting program for the period 1998 to 2007. Companies would report on a comprehensive, company-wide basis rather than facility by facility. Credits would not be awarded for shutdowns or sale of existing facilities, but they would be allocated for "replacements." A cap would be put on the total number of credits that could be awarded for early action.
- **Resources for the Future (RFF)** authorized developed countries to receive internationally recognized credits for domestic reductions achieved prior to the year 2008. Early reduction credits would be added to each nation's first budget allocation--that would require establishment of an internationally recognized baseline for measuring the early reductions. This could be best achieved by providing a binding GHG limitation and a corresponding budget allocation for each developed nation. Reductions below the budget allocations could be banked and used to offset future treaty obligations beginning in the year 2008.

In addition, there have been several legislative proposals regarding early action crediting, including "Credit for Voluntary Early Reductions Act", introduced in the US Congress (March, 1999), which would retroactively grant credits to 1990.[6]

Figure 1 Voluntary GHG Emissions Reductions: 1998 Share by Sector



[6] Senate Bill 547 would allow entities to receive a credit for reducing emissions or sequestering carbon (including J1 projects). The credits could be traded and used to offset any obligations under future mitigation programs. A parallel piece of legislation, House Bill 2520, would also grant credits to companies that voluntarily reduce greenhouse gas emissions (Mendis and Lee, 2000).

Carbon Market Development

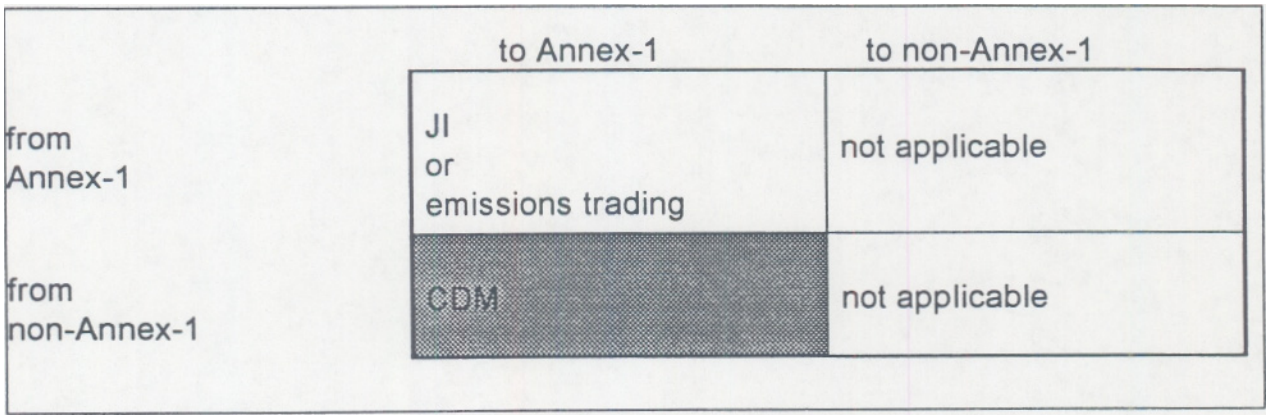
While programs that promote voluntary actions, and provide associated crediting, are a mechanism to initiate recognition (and value) of the GHG component of energy investment projects, a viable carbon trading market will not be created until there is a national/global mandate to reduce GHG emissions.

Under the Kyoto Protocol, industrialized countries and economies in transition (EITs) are required to reduce overall greenhouse gas emissions by an average of 5% under 1990 levels during the period 2008 to 2012 (Hahn and Stavins, 1999). While the Kyoto Protocol may not-in the end be ratified, another protocol, with more politically acceptable provisions, may be developed. Regardless of the protocol vehicle, the commitments still be partially met by three possible flexible mechanisms:

- Joint Implementation (JI),
- Clean Development Mechanisms (CDM), and
- International Emissions Trading (IET).

Appendix D provides a more detailed description of these mechanisms, as defined in the Kyoto Protocol. These mechanisms are expected to reduce the costs of achieving future, domestic emissions reduction targets. Also, these mechanisms represent substantial opportunities to offset domestic GHG emissions, or create a revenue stream to subsidize international NRECA energy efficiency investments.

However, not each of these mechanisms can be applied in all countries as shown below. Only the CDM vehicle can be used between the US (Annex 1 country) and a non-Annex 1 country. The advantages of CDM are that it 1) permits creation of certified emission reduction (CER) credits as early as 2000 (or upon ratification of the Protocol), which can be banked and used during the first budget period (2008-2012) and 2) is "supplemental" to the domestic emissions budget.



Carbon reduction credits from JI and CDM projects may be generated through investments in energy efficiency, renewable technologies, fuel switching, and the implementation of methane or CO2 capture techniques both domestically and in other countries. These credits may then be banked or traded on both domestic and international credit markets, once they are established.

Estimates indicate that the market for carbon reduction credits could be quite substantial in size (World Bank, 1999). The World Bank Prototype Carbon Fund (PCF) estimates that trades in carbon reduction credits could reach $150 billion per year by 2020, while the Sidney Futures Exchange estimates an even higher volume of approximately $700 billion (Inter Press Service, 1999). With estimates of carbon emissions exceedance of over 25% relative to targeted carbon reduction levels for just Non-EU Annex I countries, the aggregate potential demand for greenhouse gas offsets (credit-gaining opportunities) is expected to be 620.6 MtC equivalent in 2010 with a range of 328 to 1312 MtC (Zhang, 1999).

And estimates of carbon reduction credit prices on international markets range from a low of US $3.5 per tonne of carbon equivalent[8] to $50 (Mendis and Lee, 2000). The lower range estimates assume that there are limits on the levels of a country's commitment that can be met by the purchase of credits, while the upper ranges assume that all of a country's commitment may be met by credits.

Since energy producers and energy service providers are already engaged in projects where carbon reducing activities could be implemented, the generation of carbon reduction credits from such activities could decrease the financing cost (or increase the profitability) of a project. Additional project revenues from these carbon credits could be used in the NRECA Initiative to 1) package with equity returns (to increase the future rate of return), 2) banked for use in domestic compliance by NRECA cooperatives, 3) sold, with revenues used to underwrite the interest costs on debt instruments, or 4) other innovative approaches.

Potential carbon reduction credit generating projects, however, have a substantial degree of risk associated with them. With the Kyoto Protocol still undergoing the ratification process, there is no means of enforcement for non-compliance with its provisions. In addition, various key elements with respect to the identification of credit-gaining projects, the monitoring of emissions, the verification of reductions, and the certification of carbon reduction credits are still under negotiation (see Appendix E).

Even upon agreement of these key provisions, the terms of governance will be the responsibility of a host country. This can create the potential for differences in the quality of credits obtained from a project, and their price on international credit markets. As a result, NRECA needs to be aware of country-specific differences when developing a credit-gaining project, and the

' See Appendix E for a discussion of the issues under negotiation regarding the rules, procedures and modalities associated with flexible mechanisms in the Kyoto Protocol.

s Care needs to be taken when examining prices of carbon reduction units. Prices have been reported in terms of both tonnes of carbon and tonnes of CO2. Prices for a tonne of CO_2 can be converted to the price of a tonne of carbon by multiplying by a factor of 6.3333. This is based on the contribution by molecular weight of carbon (12) and oxygen (32) to a molecule of CO2 (76).

implications of current international negotiations on the implementation of flexible mechanisms and the development of markets for the resulting credits.

Findings

As outlined above, there are several mechanisms currently available that could provide the basis upon which to develop a crediting scheme for voluntary actions under the NRECA *Initiative on Energy Efficiency Investments*. Whatever mechanism that is developed and launched today via voluntary action, must be capable of being sanctioned in the future under whatever international climate change regime is established. The crediting mechanisms currently operational employ methods that appear to be "sanctionable".

Four principal criteria should be used by NRECA to determine eligibility of its investment in energy efficiency projects:

1. non-Annex I host countries must benefit from the project activities which generate the carbon activities;

2. the projects must assist non-Annex I countries in achieving sustainable development and contributing to the ultimate objective of the UNFCCC;

3. projects must result in real, measurable and long-term benefits related to the mitigation of climate change; and

4. projects must result in reductions in emissions that are additional (Hassing and Mendis, 1999).

Project financing for these types of projects will require demonstration of these criteria along with protocols for measurement, reporting and verification of the resulting credits, development of the baseline, etc. that are still the subject of negotiation among the subsidiary bodies to the Kyoto Protocol.

Appendix A: Activities Implemented Jointly (AIJ)

Early efforts at the development of GHG offsets in other countries have been administered through the AIJ program. Starting with 15 registered ('accepted, approved and endorsed by designated authorities for AIJ') in 1997, the program had 133 projects in September, 1999 with others planned (Joint Implementation Quarterly, 1999). Example AIJ projects include:

- **Chile:** a gas distribution network using a nylon gas pipe technology that will reduce the leakage of gas which is currently estimated at 6% of all produced gas. In addition, the project includes a fuel switching component and the promotion of cogeneration opportunities.

- **Mauritius:** an energy efficiency project will improve the efficiency of generating electricity from oil by placing a fuel catalyst in a power station. Another project in the same country will result in a switch from oil to solar energy in a power plant.

- **Indonesia:** methane will be captured from major landfill projects in the Ajung Pandang region and used as a fuel for electricity generation. A second project will install hydrosolar-wind electricity generation capacity. Finally, a third project will install a power system that will combine solar energy with diesel power.

- **Solomon Islands:** two micro-hydroelectric power schemes will be installed in rural villages and replace the use of kerosene and timber from the rainforest.

- **Slovakia:** conversion of two industrial boiler systems from fossil fuels to biomass is underway in the towns of Jochy and Lucenec.

- **India:** implementation and evaluation of a number of integrated agricultural DSM and energy efficiency improvements on a pilot scale are under way in the state of Andhra Pradesh. These improvements include converting from low voltage feeders to high voltage feeders and installing small capacity amorphous core single-phase transformers on the distribution system, reductions in system load and line losses through the use of automated load control, the provision of customer meters, and the replacement of low efficiency irrigation pumps.

- **South Africa:** low-cost energy-efficient homes are being built, which not only address greenhouse gas emissions (i.e., a shift from traditional fuels such as dung), but also address social and economic needs.

One of the shortcomings, however, of the current AIJ program is the lack of clear focus and the promulgation of success criteria (World Bank, 1999). Other impediments to the expansion of this program include: (1) lack of climate-specific regulations in most countries; (2) levels of complexity (e.g., determination of additionality); and (3) the skeptical attitude of most developing country governments. These have created uncertainty and served as disincentives for private firms to invest in these types of projects, since it is not clear that carbon reduction credits will be granted for participation in the program. Therefore, a major condition for large scale

private participation in JI projects will be an environment in the host country, which supports the credit certification process with relatively low risk.

Appendix B: Prototype Carbon Fund (PCF)

As a risk moderating mechanism, several international donor organizations have developed financial mechanisms, which use a portfolio approach to investment in JI and CDM projects. The first, the World Bank Prototype Carbon Fund (PCF), is a "mutual fund" working on behalf of a group of national governments and private firms.[9] The fund invests in JI and CDM projects, which produce "certified" emission credits under Articles 6 and 12 of the Kyoto Protocol. In other words, emissions reductions from PCF funded projects must be unequivocally additional (environmentally and financially) in nature and fully verifiable.

As of the March 20000, the fund had reached its maximum cap of $150 million (US), and there is a proposal to expand the cap to be considered at the first meeting of the PCF board in June 2000. Contributors to the fund will receive emissions credits in proportion to their investment.

The PCF has three stated objectives:

- To illustrate how project-based emissions reductions can promote sustainable development in developing countries and economies in transition;
- To provide an opportunity to "learn by doing" while guidelines for these types of projects are negotiated; and
- To demonstrate how the World Bank can mobilize new resources to assist developing countries or economies in transition while pursuing environmental goals.

The first activity for the PCF a methane capture project from a municipal solid waste project in Latvia-fulfilled all of these objectives. However, this project illustrated the difficulties associated with the development of baselines and the determination of additionality, and ultimately the valuation of carbon reduction credits.

Original estimates of the potential revenues from sales of carbon reduction credits from the project did not include pending environmental regulation and international negotiations associated with ascension to the European Union. Further evaluation of this issue required that the baseline would need to be recalculated in 2008 as a condition of this transaction. As a result, one of the Latvian project demonstrated the sensitivity of baseline development to international and local legal and political conditions, and to interpretation of those conditions. The experience in Latvia illustrated that other environmental policies and regulations can impact the potential revenues from JI/CDM projects.

Since the advent of the PCF, several other international donor organizations have initiated similar activities. In conjunction with the European Bank for reconstruction and Development, the Franco-Belgian banking group, Dexia, is launching an equity investment fund aimed at reducing carbon emissions. The fund expects to raise 150 million euros to invest in energy

[9] More than eighteen private sector companies are participating, including British Petroleum, Chevron, Ontario Hydro and Tokyo Electric Power. In addition, the governments of Finland, the Netherlands, Norway, and Sweden have pledged funds. (Thatcher, 1999).

saving projects in central and eastern Europe. As with the PCF, the fund will offer investors the chance to earn carbon emission credits in addition to normal equity returns (Reuters, 2000b). Also the Asian Development Bank is expected to initiate a similar undertaking before the end of this year.

Appendix C. Previous Experience with Credit and Allowance Trading Programs

Two different forms of emission trading programs-credit trading and allowance trading-have been used previously to address environmental issues (Tietenberg, et al., 1999). Credits are earned or certified as tradeable when emissions reductions are greater than pre-specified legal requirements for specific sources of pollutants. On the other hand, allowances result from the definition of an emissions cap, and the "right-to-emit" under the cap is allocated to eligible legal entities.

Past experience with both types of programs indicate that allowance trading has led to improvements in economic efficiency, environmental effectiveness, and compliance. However, in comparison, credit trading has not resulted in these types of gains, and has resulted in higher transaction costs with greater uncertainty and risk. [10] Examples of the previous implementation of both credit and allowance programs include:

- The **Acid Rain Program** in the US, which is an emissions cap and allowance trading program, was instituted in 1990 to reduce industrial (including electricity generation) emissions of SO2. The program requires high-quality continuous monitoring of all emissions, high penalties for non-compliance (e.g., fines and forfeiture of allowances), and self-reporting of both emissions and allowance trades to a public database. As a result of the program, in 1999 US electric utilities emitted 25% fewer tons of SO2 in comparison with 1980, while generating 41% more electricity. According to the General Accounting Office, the program saves utilities $3 billion a year over previous command and control regulation through innovation in control technologies, and reduced litigation and transaction costs.

- The **Regional Clean Air Incentives Market (RECLAIM)** program, which established an emissions cap covering most stationary sources of nitrogen oxides and sulphur oxides in the Los Angeles area in 1993, has also achieved significant reductions in the costs of compliance. Before the program began, marginal costs of NO,, control in the Los Angeles area were estimated at $25,000 per ton for major point sources (e.g., electric generation facilities), while under the program those costs have been reduced to approximately $2000 per ton. A 42% annual savings in compliance costs over command and control regulation have been attributed to the program.

- The **New Zealand Fisheries License Trading** program uses a cap-and-trade system to manage the majority of its commercial fisheries. Since 1986, the Government of New Zealand has issued total allowable commercial catch limits and individual transferable quotas. As a result of this program, commercial harvesting of the nation's fisheries have stabilized at sustainable levels. The program is distinctive because allowance "banking" is allowed, and borrowing may occur against future years.

10 A synopsis of alternative credit and allowance trading programs, and their merits, can be found in Kosobud, 2000.

• Emissions **credit trading for "criteria pollutants" (carbon monoxide, lead, nitrogen oxides, sulphur oxides, particulate matter and volatile organic) in the** US have been in effect since 1977. This program includes such features as bubbles, netting, offsets and discrete emission reduction credits. Firms may trade credits below permitted or historical levels, but trades are essentially rule-making events and subject to high uncertainty, high transaction costs and high regulatory risk. As a result, the volume of trades has been less than expected and the program has not had significant economic or environmental benefits or flexibility. Further, since the trades are project-specific, complex liability rules have developed and reduced the tradeable commodity nature of the credits (South, et al., 1990).

- The **lead phasedown program** in the US was established in 1982 to reduce levels of lead in gasoline and expanded in 1985, but terminated in 1987. The program paired efficiency gains for the refining industry with lead reductions for the environment, which were largely paid for by the cost savings from trading. This program was more effective than other programs, because government approval was not required for trades and "banking" was allowed. Both of these characteristics reduced transaction costs, and had economic and environmental benefits, however, cheating resulted until the US EPA increased oversight (Loeb, 1998).

- **A pilot program for activities implemented jointly (AIJ)** that reduce or sequester greenhouse gases was established under Article 4.2(a) of the United Nations Framework Convention on Climate Change (UNFCCC) at the first Congress of Parties (COP) in 1995. This program was intended to test various design issues which surround carbon reduction and sequestration projects. Unlike other credit granting programs, the pilot phase of AIJ explicitly excludes crediting, but rather concentrates on implementation procedures for "additionality" (or measurement of incremental levels of reductions beyond what would have occurred without a project) and the creation of baselines. These components are required under Articles 6 and 12 of the Kyoto Protocol. As a result of the lack of formal crediting or similar incentives for investment, and the high transaction costs associated with baseline development and additionality, only a limited number of projects have been approved.

These programs have provided a number of lessons which are relevant to the expanded implementation of carbon reduction credit trading under the Kyoto Protocol (Tietenberg, et al., 1999). Since national sovereignty is guaranteed under the Protocol for the implementation of flexible mechanisms, private investors need to evaluate each country's potential for carbon reduction credit-granting opportunities in terms of the characteristics of the specific country's credit programs. These lessons can offer guidance in terms of which countries provide the most favorable environment for the development of JI or CDM projects.

From previous credit and allowance programs, the following characteristics are significant for the evaluation of a country's potential to successfully support carbon reduction credit granting programs:

- Credit granting programs have higher transaction costs, because they are project-based which requires complete analysis of all the associated issues and certification of each trade. Each credit granting project must establish an emissions baseline, permitted levels

of future emissions, a reduction plan, a monitoring, verification and reporting plan, and an enforcement mechanism. This requires a much greater level of government involvement in individual projects, and if the capacity is not available to administer the credit granting program, obtaining high-quality credits in some countries may be more costly than in others, if not impossible.

- An essential benefit to credit and allowance programs is the flexibility of compliance including technology choices and other means of compliance. For carbon reduction efforts, those projects, which gain the greatest levels of credits, will have the least amount of other regulatory interference (e.g., other environmental, financial, occupational, or similar types of regulations). As a result, investors in carbon reduction projects need to evaluate the entire regulatory framework in a country.

- Banking or saving of credits or allowances results in early reductions and substantially lower overall costs of compliance. Programs that have an established accounting framework for this function will have lower transaction costs and lower costs of compliance than program without an established accounting system.

- The legal ownership of allowances or credits substantially determines the economic efficiency and environmental effectiveness of a program. Legal ownership and the property rights structure within a country will determine the ease with which credits are transferred, i.e., government ownership as opposed to private ownership. This will have a bearing on the level of transaction costs and the liability that buyers will face.

- Levels of transaction costs for a program determine levels of participation, i.e., high transaction costs mean lower levels of participation. Further, low transaction costs substantially lower costs of compliance. These costs are composed of the costs for documentation, verification and procedural requirements, costs of delay, costs created by the uncertainty of regulatory approval and national sanctioning, and costs of accounting for credit development and trades. Countries without a framework for facilitating the certification of credit-gaining opportunities will have higher transaction costs, and the potential for producing only low-quality carbon reduction credits.

- Sufficient numbers of allowances or credits need to be provided or produced to reduce the risk of market power. Market power on the supply side could suppress prices for credits and reduce the revenues from that source for a project, as well as increase the difficulty of entrance into the market. Similarly, such power on the purchasing side could also result in reduced prices for credits.

- Availability of price information reduces uncertainty and ensures the smooth operation of credit or allowance markets. For investors, trades on public exchanges will reduce the uncertainty or risk of an investment in a carbon-reducing project. Until carbon reduction credit markets are smoothly operating on public exchanges, additional emphasis needs to be placed on risk management techniques, including investing in only countries whose programs have a reporting mechanism of all trades with the prices paid.

- Effective compliance mechanisms ensure the integrity and fairness of the systems and ensure relatively low transaction costs. The compliance system will normally include monitoring and reporting requirements and enforcement mechanisms. Institutional capacity in terms of compliance varies across countries and will determine whether credits are considered to be high- or low-quality.

Appendix D: Flexible Mechanisms in Kyoto Protocol

In December 1997, the governments of 150 countries adopted the Kyoto Protocol as an amendment to the UN Framework on Climate Change (UNFCCC). The Kyoto Protocol provided the foundation for the accreditation of projects generating carbon reduction credits and for markets for carbon reduction credit trading.

Under the Protocol three different vehicles are specified for development and acquisition of carbon emission reduction credits. But all three mechanisms are required to be supplemental to reduction activities undertaken domestically. However, flexible mechanisms do provide several different routes of compliance with the targets and timetables set under the Kyoto Protocol. Table D.1 provides a summary of key characteristics for each of the mechanisms-"Joint Implementation (JI)," "Clean Development Mechanisms (CDM)," and "International Emissions Trading (lET)."

Under Article 6, as referred to in paragraphs 10 and 11 of Article 3, of the Kyoto Protocol, Joint Implementation (JI) opportunities have been defined (Conference of Parties, 1997; The World Bank, 1999). JI opportunities are negotiated between Annex I countries (see box below) and can be developed between governments and their designated entities (private firms). These opportunities must be additional in nature (i.e., result in incremental decreases in carbon emissions beyond forecasted declines of greenhouse gas (GHG) emissions from other activities) and must be fully verifiable in accordance with Articles 5 and 7 of the Kyoto Protocol. Under JI, carbon emissions reduction credits are obtainable for both carbon reduction and sequestration (e.g., reforestation) projects. Credits are useable after 2008, but are not bankable. And acquisition of credits can only occur upon actual production of the decrease in carbon.

Clean Development Mechanisms (CDM) are defined under Article 12, as referenced in paragraph 12 of Article 3, of the Protocol (Conference of Parties, 1997). CDM investments are similar to JI projects, but provide for investments in carbon reduction efforts by Annex I countries in non-Annex I countries. Entities in Annex I countries may use the certified emission reductions (CER) accruing from a carbon reduction project to contribute to their reduction obligations under Article 3 of the Protocol.

Annex I Countries Under the Kyoto Protocol

Argentina*, Australia, Austria, Belarus*, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, European Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan*, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey*, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America.

*Status under discussion.
Source: Janssen, 1998a.

Table D.1 Flexible Mechanisms in the Kyoto Protocol

International Emissions Trading (IET)	**Joint Implementation** (JI)	**Clean Development Mechanism (CDM)**
Type of trade: International *trade of* GHG emission credits.	Type of trade: Bilateral investments in GHG emission reduction projects.	Type of trade: Bilateral investments in GHG emission reduction projects.
Market structure: Any legal entity on organized markets (i.e., one of three exchanges).	Market structure: Annex I to Annex I countries on non-exchange markets, e.g., electronic markets over the internet.	Market **structure:** Annex I to Non-Annex I countries on non exchange markets, e.g., electronic markets over the internet.
Temporal structure of trading **arrangement:** Acquisition of emission credits prior to their production is allowed.	Temporal structure of trading arrangement: Acquisition *of* emission credits only after their actual production.	**Temporal structure of trading arrangement:** Acquisition *of* emission credits only after their actual production.
Time frame: Useable from 2008 onwards or earlier (subject *of* current discussions).	Time frame: Useable from 2008 onwards or earlier (subject of current discussions).	**Time frame:** Useable from 2000 onwards and banking of credits permitted.
Level of participation: Governments and private firms.	**Level of participation:** Governments and private firms.	**Level** of **participation:** Governments and private firms.
Under the Kyoto Protocol: No specific language.	Under the Kyoto Protocol: Projects aimed at reducing anthropogenic GHG emissions or enhancing anthropogenic Removals (carbon sequestration).	Under the Kyoto Protocol: Projects aimed at reducing anthropogenic GHG emissions.
Examples of **types** of **transactions:** U.S. public utility selling future emission credits to Japanese electricity producers as an option on a public exchange.	Examples of types of **transactions:** (1) Public utility investing in energy efficiency enhancement projects in Eastern Europe. (2) Public utility investing in reforestation project in Costa Rica.	**Examples of types of** transactions: U.S. public utility investing in reduction of venting and flaring of natural gas associated with oil or coal production in China.

After Janssen, 1998a.

CDM projects are subject to much higher standards of certification and verification than JI projects. Also, carbon sequestration activities, which are considered to be JI activities, are not (currently) included in this category.

One of the major issues for a CDM project is the development of the baseline and the identification of the portion of the project, which is both economically and environmentally incremental to other actions (i.e., additional). However, unlike JI projects, credits from CDM projects are useable in the near term (from 2000 forward) and are bankable against future emissions targets.

Provisions for trading carbon units have been loosely defined under Article 17, as referred to in paragraph 12 of Article 3, of the Protocol (Conference of Parties, 1997). As a result of this loose definition, extreme uncertainty exists for the development of these markets. But even with this uncertainty, three public exchanges are currently supporting or have announced plans to support trades in carbon emissions reduction credits. Those exchanges include: the International Petroleum Exchange (IPE) in London; the Chicago Board of Trade (CBOT); and, the Sydney Futures Exchange. Other exchanges are also in the initial stages of supporting trades, but with no announced plans as of this point in time.

Until a number of key issues concerning the certification of carbon reduction credits are resolved through international negotiation, market development will continue to be sporadic. Public exchanges provide a form of guarantee for the validity of the securities being traded, and with the current lack of definition of various characteristics which would define carbon reduction credits, there are substantial risks to supporting trades.

Because of uncertainties in carbon market development, business opportunities currently exist for those entities that invest in energy efficiency measures and measures to reduce carbon emissions. However, these transactions will be at least initially subject to high levels of political risk resulting from the allocation of emissions caps and the ability of individual governments to influence credit development, in addition to the normal sources of systematic and non-systematic project risk (Baron, 1999a).

As a result, participants in carbon reduction credit markets need to consider a "portfolio approach", which includes

- trading on international exchanges,
- trading in domestic and informal (e.g., electronic markets on the internet) credit markets, and
- development of individual carbon-granting opportunities, both domestically and internationally.

Appendix E: Flexible Mechanism Issues Under Negotiation

Since the Kyoto Protocol Agreement was signed, negotiations have occurred to further define the original form of the flexible mechanisms outlined in the Protocol. However, even in these discussions, a critical component for market development has not been addressed. Enforcement measures for non-compliance with other Articles of the Protocol, such as failure to meet targeted emission reduction levels by individual countries, have not been addressed.

The following topics have been discussed relative to those negotiations over flexible mechanisms (The World Bank, 1999; Goldstein, et al., 2000):

- **Supplementarity:** How will the use of flexible mechanisms go beyond domestic actions in meeting emissions reduction targets under the Kyoto Protocol?

- **Baselines:** What are the actual levels of greenhouse gas emissions that would occur without a JI/CDM project?

- **Additionality:** What are the incremental costs (economic additionality) for the project components that result in greenhouse emission reductions and what are the incremental emission reductions (environmental additionality)?

- **Monitoring, verification, and certification:** How will the credit granting process be organized to assure credibility and consistency of credits in the market place?

- **Fungibility:** Will credits from different flexible mechanisms be interchangeable and can they be combined into a single account?

- **Liability:** How should the liability be assigned in the event that carbon reduction credits from a J ICDM project cannot be traded or used to offset emissions reduction obligations?

- **Role of "legal entities":** What constitutes a legal entity in the carbon emissions trading market and how should non-governmental entities be treated?

- **Transaction fees:** How should the "share of proceeds" from a JI/CDM project to be used for administration of the credit trading process and strategies for carbon emissions reductions be determined?

- **Funds for adaptation:** How much of the proceeds from a CDM project should be allocated to climate change adaptation projects?

- **Geographical distribution:** How should different regions of the world be assured a "fair share" of JI/CDM projects? And should those regions adversely affected by climate policy (e.g., the OPEC countries suffering from a decline in the demand for oil) be compensated?

These topics are currently and will continue to be a matter of international discussions (Center for Clean Air Policy, 1999). How these issues are resolved will certainly shape the structure and operation of future carbon reduction credit markets.

The issues of supplementarity, development of baselines, additionality of a project, monitoring, verification, and certification of credits from a project, the fungibility of credits, liability, and the role of "legal entities" are of importance to private sector investors in those markets. Although the three remaining issues, transaction fees, funds for adaptation, and geographical distribution, impact private sector participation in carbon reduction credit markets, these are more political or institutional issues specific to a participating country.

Perhaps the single most important issue to determining the future of carbon reduction credit markets is the issue of supplementarity (Zhang, 1999). Under the Kyoto Protocol, use of each of the flexible mechanisms is required to be supplemental (or in addition) to domestic actions to reduce greenhouse gas emissions. This requirement has produced the greatest controversy in the negotiations. Two extreme views exist with variations in between:

- domestic actions should provide the primary means of meeting the reduction commitments of Annex I countries under Article 3 under the Kyoto Protocol so that any action abroad would be additional; and

- any action abroad will be supplemental to whatever domestic actions are taken.

Under the second view, an Annex I country could satisfy all of its commitment through the development of lower cost JI or CDM projects, or the purchase of carbon reduction credits on international markets. As a result, numerous proposals" have been put forward for the imposition of ceilings on levels of contributions that flexible mechanisms may make towards a country's commitment. The definition of this ceiling will determine both the demand for carbon reduction credits and the supply available, and ultimately the price that a seller can obtain for them on international markets. A too stringent ceiling will depress demand and reduce the price, while a less stringent ceiling (i.e., one that includes "hot air" [12)] will not result in true reductions in carbon emissions.

11 The EU proposal is the most representative of all of the proposals tabled so far, and calls for limits on both buying and selling countries. For a buying country, the maximum purchase of carbon reduction credits from JI, CDM, or IET sources can not exceed the higher of two alternatives: (1) 5% of {(its base year emissions multiplied by 5 + its assigned amount)/2}; or (2) 50% of the difference between its annual actual emissions in any year between 1994 and 2002, multiplied by 5, and its assigned amount. Similarly, for sellers, the EU proposal specifies a maximum allowed sale for carbon reduction credits from all three sources by the rule stated in alternative 1 for buyers (Zhang, 1999).

12 Some countries are allocated assigned amounts under the Kyoto Protocol that exceed their anticipated emissions requirements even in the absence of any limitation. These excess emission allowances may be traded to other countries and are referred to as "hot air." These emission allowances are not real reductions in carbon emissions.

In the development of JI and CDM projects, three issues are of paramount importance:

- development of baselines,
- determination of additionality, and
- implementation of monitoring, verification, and certification protocols

Each will be the responsibility of a JI or CDM project developer and are crucial to the valuation of the carbon reduction credits (Janssen, 1999, Meyers, 2000).

Probably the greatest problem in carbon reduction credit valuation is determination of the baseline. This is the point in current or future levels of emissions against which greenhouse gas emissions reductions are measured. (Heister, 1997). For a baseline, a scenario is assumed where no changes in current activities or planned activities occurs.

To determine the number of credits gained by from a JI or CDM project, an alternative scenario is generated with project implemented. The difference in emission levels between the two scenarios determines the number of the carbon reduction credits generated. For the purposes of ensuring the integrity of the resulting carbon reduction credits, methods used in the generation of baselines need to be transparent, simple, and inexpensive to implement (OECD and IEA, 1999).

Baseline methods may be "project-specific," "multi-project," or a hybrid of these two. In any case, in the determination of a baseline these two issues are relevant: (1) the length of time emission credits can accrue, and (2) whether or not the baseline is fixed at the start of the project (static) or revised during the project operation (dynamic). As a result of these issues, baseline development can be crucial to the development of carbon reduction credit markets.

An overly lax baseline will threaten the system's credibility and usefulness, and increase the percentage of low quality credits available, thus creating a fungibility and liability problem. An overly stringent baseline will discourage valid projects and drive up costs. Therefore, baseline development depends on not just the methods used, but also on the set of institutions (i.e., governmental) that keep the method's application reasonable and honest (Chomitz, 1998; Repetto, 2000).

To receive "emission reduction units (ERUs)" under Article 6 of the Protocol for JI projects or "certified emission reductions" under Article 12 for CDM projects, project developers must demonstrate environmental and economic "additionality." That is, that additional expenditures above and beyond those required for the normal implementation of the project have been made, and that those expenditures result in additional reductions in greenhouse gas emissions (Chomitz, 1998).

Additionality may be determined through the use of comparison groups or through simulation of project investment decision making (i.e., an engineering or cash flow model combined with a normative decision model and a set of key parameters such as capital costs, expected future fuel prices, and pollution charges, etc.). The number of carbon reduction credits from a project are determined by the difference between the baseline estimates of emissions without the project and the levels of emissions with the project over a specified time horizon.

As a result, additionality criteria determine the available supply of carbon reduction credits and ultimately the price on international and domestic markets. Investors in JI or CDM projects need to be aware of planned or future changes in environmental regulations or policies in a specific country which may alter the additionality criteria used to grant credits. For example, although not mandated now for a municipal landfill project, methane capture may be required at some future date by planned changes in the current regulations. Therefore, a project, where methane capture has been voluntarily implemented now as a credit-gaining mechanism, may loose that capacity at some future point in time.

Monitoring of emissions from a project, verification of the reductions in carbon emissions, and certification of the resulting credits are crucial to maintaining the quality of credits. Methods of GHG emission monitoring are imperfect for the most part, and thus there is a substantial degree of uncertainty connected with the process (Tietenberg, et al., 1999). At this time there is no international standard or method for monitoring GHGs and this represents a substantial barrier to the development of credit markets (i.e., guarantees of the quality of carbon reduction credits are lacking). The major issue in this process is the quality of the data, which very often suffers from errors, uncertainties, omissions, inconsistencies or lack of transparency (Williams, 1999). Therefore, the institutional context, which varies by country, will largely determine whether credits can be certified and fungible in international markets. This represents a project-specific risk for private investors in JI or CDM projects, which may be mitigated through investing in countries with existing institutional capacity for monitoring of environmental emissions.

The issues of fungibility, liability, and the "role of legal entities" in the credit market are intertwined. In order for a secondary market (i.e., IET) in carbon reduction credits to develop, credits must be standardized (Larson and Parks, 1998). Unless this process occurs, investors will want to distinguish among credits based on the time, host-country, and project characteristics of the credits.

In other words, on international credit markets not all carbon reduction credits may be considered equal in value. This disparity will be even greater for domestic markets in different countries, since governments will regulate definitions of additionality and validation, and set the rules for use of the credits. This heterogeneity will create high levels of risk and potential liabilities for those investors entering these markets. The liability will arise from the enforcement of contracts in the international arena (i.e., contracts between entities in two different jurisdictions) and the potential for a seller (or Party) to be in non-compliance with targeted emission reduction limits (Janssen, 1999; Baron, 1999b).

Credits from non-compliant sellers sold on international markets would be valueless, and the buyer would have no recourse. This issue is further complicated by the differences between countries in the definition of what constitutes a "legal entity," and the role that entity plays in the development of carbon reduction credit granting opportunities, and the certification of those credits (Heller, 2000).

In countries where entities both develop projects and certify credits, questions will arise concerning the unbiased nature of the certification process and result in reductions in quality of

the credits. Investors in both JI and CDM projects, therefore, need to be fully aware of the legal and institutional context for credit certification in the specific country for which a carbon reduction project is planned.

The three remaining issues geographic distribution, transaction fees, and funds for adaptation-are political and institutional issues (Heller, 2000). However, resolution of these issues will impact credit market development. A requirement of equitable geographic distribution, as with the supplementarity restrictions, may possibly place constraints on the supply of quality credits (i.e., some regions of the world may have a lower quality credit producing opportunities). This would increase prices on international markets for higher quality credits.

As previously noted, transaction costs will reduce the economic efficiency and environmental benefits of a program, as well as affect the quality of the projects available. Transaction fees accessed to support the administration of carbon reduction credit programs are considered to be transaction costs. Therefore, the level of transaction fees for administration of carbon reduction credit programs will impact the price of the resulting credits.

Similarly, depending on the means of assessment (e.g., a tax on a project), funds for adaptation may also be considered to be a transaction cost. Therefore, depending on the resolution of these issues, supplies of high-quality carbon reduction credit gaining opportunities could be constrained, and project costs increased.

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NRECA Business Casual Standards for Arlington Office

I. Definition of Business Casual for Women

Features two-piece outfits, dresses, or layers. A sweater or jacket is optional.

Pants:	Microfiber, khaki, twill, linen, silk blends, wool, wool blends, or corduroy
Skirts:	Appropriate length and style for a professional environment
Sweaters:	Crew, v-neck, cardigan, or turtleneck
Tops:	Blouse or knit
Dresses:	Appropriate length and style for a professional environment
Shoes:	Leather or leather-look in flat, low-stacked or platform heels

II. Definition of Business Casual for Men

Features two-piece outfits with collared shirt, or layers. A sweater, jacket, or tie is optional.

Pants:	Khaki, twill, linen, wool, wool blends, or corduroy
Sweaters:	Crew, v-neck, or turtleneck
Shirts:	Long- or short-sleeved with collar, polo
Shoes:	Oxfords, loafers, or dress boots

III. Inappropriate Attire

The following items should not be worn by employees or contractors while working on NRECA premises: Blue jeans, tight-fitting shirts, shorts, t-shirts, athletic shoes/clothing, and excessively short skirts or other provocative clothing.

IV. Coverage

EI These standards apply to employees working in the Arlington headquarters. Lincoln staff are guided by local policies.

V. Exceptions

I1 Employees will be expected to exercise good judgment when meeting with those with whom they have a business relationship. Normally, they will wear traditional business attire when visiting or meeting with members, and when representing the association outside NRECA's office.

E On special occasions, such as Spring Clean-Up days announced by a work unit, the dress standards may be relaxed as appropriate; e.g., jeans and sneakers may be allowed.

ANNEX **B**

National Rural Electric Cooperative Association

A Touchstone Ene y'
Cooperativ 1-Y

4301 Wilson Boulevard
Arlington, Virginia 22203-
1860 Telephone: (703) 907-
5500 Tr (703) 907-5957
www.nreca.org

January 10, 2003

The Honorable Spencer Abraham
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Secretary Abraham:

Last year President Bush announced a new approach to the challenge of climate change-an approach that is long-term, emphasizes economic growth, and takes advantage of American technology, innovation, and efficiency. The President set an environmental goal for economic growth, to reduce the ratio of U.S. greenhouse gas emissions to economic output by 18 percent over the next 1.0 years. As part of his plan for meeting that goal, the President challenged American businesses to reduce the greenhouse gas intensity of their operations and emissions.

The National Rural Electric Cooperative Association (NRECA), representing more than 900 electric cooperatives serving 36 million people in 47 states, supports the President's climate policies and the call *for voluntary* actions to slow the growth of greenhouse gas emissions. As a vital part of the electricity sector, cooperatives deliver 9 percent of the total kilowatt-hours sold in the U.S. and generate 5 percent of the electricity produced each year. Cooperatives, as part of the electricity sector, can contribute to the President's goal by increasing the greenhouse gas efficiency of their operations.

First, in order to formulate a sector-wide approach to President Bush's Global Climate Change Initiative, NRECA participates in the Electric Power Industry Climate Initiative (EPICI), a coalition of seven electric power groups. EPICI has developed a voluntary climate partnership with the U.S. Department of Energy (DOE) called *Power Partners. Power Partners* includes a range of actions for the short, medium and long terms including *a Power Partners Resource Guide* to enhance the efficiency and reduce emissions of electricity generation, transmission and distribution, several carbon sequestration initiatives and long-term research and development. All generation and transmission cooperatives participate in *Power Partners.*

Looking toward the future, electric cooperatives are also investing in the development of clean coal technologies. While half of the nation's overall electric generation is coal-based, more than two-thirds of the electric cooperatives' generation is from coal. Since

fossil fuels will remain essential to electricity generation for the foreseeable future, new "near-zero emission" technologies are needed. Electric cooperatives recognize the importance of accelerating the development of affordable technologies and are working with *Power Partners* and the Electric Power Research Institute (EPRI) to evaluate carbon capture and sequestration.

Power Partners will help to focus the electric sector's efforts to increase emissions efficiency as its contribution to the President's goal. As part of EPICI, NRECA will pursue a Memorandum of Understanding with DOE for *Power Partners* over the next several months to formalize this public-private partnership.

Second, in addition to *Power Partners,* NRECA is developing a Memorandum of Understanding with the U.S. Department of Agriculture (USDA) during 2003 to identify opportunities to reduce greenhouse gas emissions. Potential areas for cooperation include the development of renewable electricity, e.g., wind, solar, biomass (cofiring with coal and waste-to-energy including landfill methane, use of methane digesters for manure, etc.), continued development and testing of new technologies such as fuel cells and microturbines, and the use of biofuels (bioethanol and biodiesel) and other bioproducts. NRECA and USDA will look for ways to remove technical and market barriers to the use of renewables for electricity generation in rural areas and commercialize other emission-efficient technologies.

Third, electric cooperatives are also committed to expanding their research and development of new electric technologies. They have recently produced *Electric Technology Cooperative Solutions,* a strategic vision and roadmap for cooperatives and consumer-members. Electric cooperatives spend more than $15 million annually on the research and development of new technologies that produce, deliver, or more efficiently use energy at rural electric consumers' homes and businesses. For example, through the work of the Cooperative Research Network, a consortium of electric cooperatives dedicated to research, and the commitments by cooperatives to EPRI, cooperatives have been successful in developing tools and technologies that have resulted in the following successes:

- **Distribution System Line Losses.** Resistance to the flow of electrical current in the distribution and transmission system causes a portion of energy, typically 7 percent, to be lost in the form of heat, resulting in higher emissions for the same amount of delivered electricity. Data from the USDA's Rural Utilities Service (RUS), show that cooperative distribution system line losses were consistently around 6% from 1994 to 2000, well below the industry norm. In fact, RUS reported cooperative line losses at 4.96% during 2001. While electric cooperatives serve 12% of all electric consumers, they maintain nearly half (2.3 million miles) of the nation's distribution miles of line. With their consumers widely dispersed (6.6 consumers per mile compared to 34 for investor-owned

utilities and 44 for municipals), cooperatives have maintained a high degree of distribution efficiency under very challenging conditions.

- **Load Management.** Load management technologies allow generation companies to better manage the timing of their customers' energy use, and thus help reduce the large discrepancy between peak and off-peak demand. Although this approach does not reduce the overall consumption of electricity, it can reduce the need to build new power plants simply to serve customers during periods of peak demand and reduces emissions associated with using fossil fuels to meet those peak electrical demands. The nation's electric cooperatives have a strong commitment to load management devices and control infrastructure. Energy Information Administration (EIA) data for 2000 show that cooperatives have more than 2,500 MW under control. That represents more than 25% of all actual peak reduction MW for the U.S. Because 60% of cooperative sales are to residential consumers, much of their load management activity has been targeted to residential load reduction. There the cooperative contribution has been even more dramatic, with more than 1,500 megawatts under control, more than 40% of all residential actual peak reduction MW for the nation.

- **Renewable Energy.** Nearly a quarter of all distribution cooperatives currently offer Green Power from wind and biomass to their consumer-members. This number has grown dramatically due to consumer demand. Because cooperatives are owned by the consumers they serve and are part of their local communities, they will continue to respond promptly to consumer demands for renewable energy.

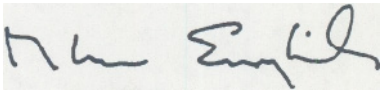
Lastly, in addition to the commitments with DOE through *Power Partners,* the Memorandum of Understanding with USDA and the continued expenditure of research and development dollars for electricity efficiency technologies, electric cooperatives are uniquely positioned to pair U.S. electric cooperatives with cooperatives around the world to increase energy efficiency. NRECA International-a non-profit international program that provides technical assistance to developing countries for clean, efficient electrification-is investigating ways to reduce greenhouse gas emissions overseas.

The International Program teams U.S. electric cooperatives with electric cooperatives in countries such as the Philippines, India, Costa Rica, and Bolivia to identify and implement opportunities for creditable projects that reduce or avoid greenhouse gas emissions. The most promising efforts involve energy loss reduction and efficiency improvements on cooperative distribution systems; fuel substitution projects such as hydropower plants, wind, solar and other renewables to reduce cooperative dependency on thermal power; carbon sequestration in tropical areas; and energy conservation.

NRECA believes that credible, voluntary actions can increase the economic efficiency of business operations, strengthen U.S energy independence, and enhance our environment. The President's plan to provide incentives for investments in clean technologies, increased conservation and energy efficiency can help electric cooperatives maintain affordable and reliable electric service for our consumers. Policies that provide incentive for *all* electricity generators to develop clean energy will move America toward cleaner, more efficient electricity generation.

NRECA looks forward to working with you on this important energy and environment issue.

Sincerely,



Glenn English
Chief Executive Officer

cc: The Honorable Ann Veneman
Secretary, U.S. Department of Agriculture

The Honorable James Connaughton
Chairman, White House Council on Environmental Quality

T

Memorandum of Understanding Between
The National Rural Electric Cooperative Association
and The U.S. Department of Agriculture

This Memorandum of Understanding (MOU) is a voluntary agreement between National Rural Electric Cooperative Association (NRECA) and the U.S. Department of Agriculture (USDA) to identify and advance jointly cost-effective, voluntary opportunities for electric cooperatives to help achieve the President's goal to reduce the greenhouse gas intensity of the United States economy by 18 percent by 2012. This agreement establishes a public-private partnership between NRECA and USDA under the President's Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities *Now).*

This MOU builds on the substantial actions that the Parties have taken to ensure the availability of clean, efficient electricity generation to the nation's rural electric consumers and expands that commitment to new, clean energy technologies, actions, and activities that will reduce the economy's greenhouse gas intensity and sustain economic growth.

I. PURPOSE AND SCOPE

The purpose of this MOU is to explore new areas for cooperation on the identification, development, and deployment of greenhouse gas emissionefficient actions, activities, and technologies suitable for electric cooperatives. Each Party may contribute to this effort through appropriate means, including, but not limited to, research, joint projects, program coordination, information sharing, sharing of relevant expertise, and coordinated education and outreach.

The scope of the actions, activities, or technologies covered by this MOU includes all sectors of the economy that reduce, avoid or sequester greenhouse gases, thereby slowing the growth of these emissions. Potential areas of cooperation may include, but are not limited to, efficient use of energy, renewable technologies for energy generation, continued development and demonstration of new, emission-efficient technologies such as fuel cells and microturbines, identification of options for reducing technical and market barriers to the use of renewable energy, and biobased energy and products.

II. GENERAL PRINCIPLES

A. The Parties recognize that the primary responsibility of NRECA is to support and assist consumer-owned not-for-profit electric utilities in achieving access to reliable, affordable and safe electric power.

B. The Parties recognize that the competitive situations of electric cooperatives are changing with regard to electric utility restructuring and energy and environmental regulation at the Federal, State, and local level. Cooperativespecific circumstances such as fuel mix and resources, customers served per mile of line, geography, growth, and financial resources are important considerations in evaluating emission-efficient options and opportunities.

C. Electric cooperatives promote economic growth and business development in the communities they *serve. Actions and* activities under consideration to slow the growth of greenhouse gas emissions must also sustain economic growth in rural communities. All other things being equal, opportunities that supply cost-effective and scientifically demonstrable environmental and economic benefits to rural communities and cooperative members should receive emphasis.

111. NRECA ACTIONS

A. NRECA will establish a coordinating committee to facilitate implementation of the MOU and designate a chair to be the liaison to USDA. Committee activities shall include identifying and reviewing potential collaborative efforts, coordinating those efforts with USDA, and disseminating information to electric cooperatives.

B. NRECA will assist member cooperatives toward a goal of increased use of renewable technologies for electricity generation. Such technologies include biomass co-fired power plants, biornass gasification power plants, animal waste-to-electricity using anaerobic digesters and gasification, landfill methane power plants, and increased use of wind and solar energy.

C. NRECA will continue research, development, and demonstration of new, more efficient, lower emission technologies, such as fuel cell microturbines, and hydrogen production from bio syngas, and will seek ways to cooperate with USDA. Potential areas of collaboration with USDA include:

1. Demonstration of fuel-flexible generators, and waste products, including ethanol, at cooperative sites.

2. Demonstration of low-Btu microturbines (Flex-Microturbine) on a variety of biomass feedstocks (pecan nutshells and/or wood waste).

3. Application of biopower decision tools, which provide a "turbo-tax" approach to developing a biopower business plan, to additional case studies and support of their dissemination via Internet and other means.

4. Development of business cases for generic cooperatives based on field-test models to be obtained from animal-waste-to-electricity studies.

5. Investigation of the microgrid concept for rural utility operation of clusters of biomass-based distributed power sources and storage, either independently or in parallel with the grid.

6. Investigation of the impact of large numbers of biomass-based distributed power sources in rural utility settings.

D. NRECA will continue to support the development of industry standards for the interconnection of distributed generation to the electricity grid and innovative approaches to the integration of renewable energy sources. In addition, NRECA will evaluate options for reducing technical and market barriers to the use of renewable energy and distributed generation.

E. NRECA will research, develop, promote and encourage greater cooperative use of biobased products such as biodiesel, ethanol, lubricants, and solvents.

VI. **USDA ACTIONS**

A. USDA will designate an individual as the representative of the Secretary to coordinate with NRECA on the implementation of the MOU.

B. USDA will work with NRECA and other agencies of the Federal government to identify researchable needs, to develop technology that meets those needs and reduces greenhouse gas emissions, including promising new emission-efficient and renewable energy hydrogen and fuel cell technologies for rural communities and agricultural producers, and to identify and remove technical and market barriers to adoption of these new technologies.

C. USDA will cooperate with NRECA to develop education and outreach materials, workshops, and programs that will provide technical and economic information on renewable technologies, distributed generation and interconnection issues, emerging low emission technologies, and biobased product information, such as content, environmental performance, and other performance standards.

D. USDA will seek to make available technical support, and other assistance and incentives, to the electric cooperatives and farmers for reducing, avoiding, and sequestering greenhouse gas emissions, consistent with USDA authorities and appropriations.

V. **GENERAL PROVISIONS**

A. Participation in this MOU does not constitute NRECA endorsement of any particular policies with respect to energy or environment.

B. This MOU can be modified only by means of a document signed by both Parties.

C. Either Party may terminate this MOU at any time, for any reason, with no penalty.

D. This is a voluntary agreement that expresses the good-faith intentions of the Parties and is not intended to establish any legal obligations for the Parties.

As representatives of the USDA and the N'RECA, we, the undersigned, do hereby execute this Memorandum of Understanding.

For the U. S. Department of Agriculture:

Signature: _____ Date: October 22, 2003

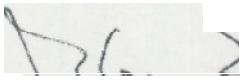
Name: Ann M. Veneman

Title: Secretary

For the National Rural Electric Cooperative Association

Name: Glenn English

Title: Chief Executive Officer



October 22, 2003

ANNEX C

Proposal to the Multilateral Investment Fund

NRECA Initiative in Consumer-Based Rural Electric Utility Development'

1. Project Rationale

Conventional privatization strategies have not been successful in addressing hard-toserve markets such as rural areas of national and regional electric utility concessions. The underlying economic incentive basis for investors is weak. The skill set needed to overcome frequently encountered deficiencies in utility concessions attempting to serve such areas is generally not found among the strategic investors responding to privatization tenders. These challenges include low customer density, low energy use and uneconomic capacity utilization, low billing and collection rates, un-funded consumer subsidy mandates, and challenging legal environments. As a consequence, 75 percent of rural dwellers in Latin America remain without electricity service.

Cooperatives and other community-based electrification models often exhibit characteristics distinct from private investor owned power systems -- higher penetration rates in service localities, emphasis on promoting economic energy use, and better discipline in billing and collections. While cooperatives and similar consumer-based service enterprises face legal and commercial obstacles, NRECA experience around the world indicates that they can participate effectively under reform and privatization schemes in a variety of private-sector implementation mechanisms. Policy reforms and financing strategies currently being promoted by multilateral finance institutions and borrowing member countries for rural electrification development can promote this process. Lacking, however, are competent agents with a strong track record of success to help implement such policy initiatives and to mobilize capital investment into operationally sound cooperatives and similar community-based, user-based corporations.

The record reflects that where well-run cooperatives exist, private sector resources can be mobilized to invest in new projects that expand service capability. However, great care must be taken to ensure not only that the projects are bankable and that the sponsoring entity has the capacity to meet the challenge of a significantly increased level of debt and other financial complexities that accompany significantly increased financing for new projects. One of the most compelling reasons for establishing this mechanism is that is will be designed to provide a sustainable resource for long-term electric cooperative development and strengthening in Latin America and the Caribbean, drawing expertise and resources not only from the U.S. electric cooperative community but also so that

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1 cc NRECA" represents a group of international assistance programs and agencies of the National Rural Electric Cooperative Association (NRECA International, Ltd.; its subsidiary NRECA Electricity for Progress, LLC; and the NRECA International Foundation), and by association also representing NRECA's membership of U.S. electric cooperatives including the National Rural Utilities Cooperative Finance Corporation (CFC).

Latin American cooperatives may ally interdependently for learning transfer, resource mobilization, policy influence and other means of mutual support. Another key objective of the proposal is to create a permanent resource base for rural electrification support in the region. Previous efforts to promote electric cooperative development have been pursued in a halting and haphazard pattern, owing to the cyclical nature of bi-lateral project funding. Projects typically lasted three to five years, often followed by a decline and ultimate demise of the cooperatives in various instances. This project would lay the foundation for an on-going support and service program, eventually to be structured as an independent technical/management resource-plus-financing entity providing membership and fee-based support to participating beneficiary co-ops and other rural electric associations.

2. The Requesting Institution

The core mission of NRECA is to promote sustainable, usually consumer-based electrification programs worldwide. New opportunities to advance these efforts result from the global trend toward privatization. NRECA has a unique understanding and track record of successfully mobilizing local communities in all parts of the globe to organize and promote their own interests in electrification. NRECA's experience in Latin America and the Caribbean is particularly deep, spanning 42 years. During this time, NRECA has worked with the 1DB, USATD, and the U.S. Departments of Agriculture and Energy, in coordination with other multilateral and bi-lateral agencies to promote policy reforms, develop strategies, and implement projects for the provision of rural electricity. NRECA is a transaction-oriented organization with a strong international reputation. In recent years, NRECA has collaborated with CFC to develop capacity among cooperatives to access financing from private capital markets.

NRECA has complementary skills and a shared purpose with 1DB electricity sector programs to build successful markets and sustainable enterprises in electricity supply and distribution. NRECA currently has teams working on the ground in several countries in Latin America and the Caribbean on funded projects toward these goals. Over its years of working internationally, NRECA has developed systems for procurement and management of funds that meet the rigorous and challenging standards of various international assistance agencies. It should not be a complex undertaking to adapt these to the requirements of the MIF. The operations of NRECA are subject to annual audit and there is a strong tradition of governance by an active Board. NRECA's experience and relationships among host country officials, bilateral and multilateral funding agencies, and the local beneficiaries will make it possible to "hit the ground running" in terms of project implementation.

3. Project Objectives, Activities, and Direct Beneficiaries

The general objective is to employ the cooperative model, where appropriate, with the goal of accelerating the pace of rural electricity market development to match the need and pace of urban and industrial sector power reform employing the cooperative model where appropriate. In a case where electric cooperatives have not yet been established, the project would focus on local communities to provide assistance in negotiations with

exiting utilities and regulators for cooperative projects in defined service territories of underserved areas.

A central activity of the initiative will be to facilitate technical assistance coupled with local capacity-building to support the successful creation and development of electric cooperatives. Such support will strengthen existing cooperatives from the business side by providing advice on business operations (billing, collections, etc.) and governance (Board of Directors training, etc.), which in turn will give confidence to potential lenders in the capacity of cooperative borrowers to manage investments effectively. In this context, a specific, innovative objective of the program is to develop sustainable mechanisms for the sharing of best practices among cooperatives and community-based entities in Latin America and the Caribbean. Successful cooperatives from throughout the Americas would be recruited to provide peer-to-peer assistance to counterparts, including through long-term twinning relationships, in need of technical assistance and/or where partnering cooperatives seek common interests such as in executing joint programs in carbon dioxide emissions reduction.

In certain cases the objective will be to catalyze national-scale programs similar to efforts in countries such as Argentina, Bangladesh, Costa Rica, Philippines, China, and parts of Brazil, all of which relied extensively on local community initiative, investment, and organization to promote successful rural electrification efforts. This is consistent with NRECA's current mission to renew this process with the benefit of lessons learned and a wider, more diverse and flexible network of partnerships and funds leveraging, while taking advantage of the region's current search for appropriate rural electrification policies and implementation mechanisms.

It is anticipated that modest investments would be made in a majority of the projects as part of an effort to mobilize debt and equity for capital expansion in qualifying projects of well-run cooperatives. In this area, considerable attention will be paid to ensuring the capacity of the cooperative to undertake successful expansions and accompanying financial obligations. NRECA would be able to rely on the assistance of CFC building on the successful experience of cooperatives in Costa Rica and the Southern Cone region.

The direct beneficiaries of these efforts would not only be the consumers of electricity in currently underserved areas as member/shareholders of the cooperatives but, also, the small businesses, farmers, micro-enterprises, and a wide range of individuals and entities that would benefit from more dependable, less expensive electricity. Projects will include development of grass-roots support in areas of demand development, microlending, and program capitalization.

The initiative will be designed to respond flexibly to different policy, institutional, and market conditions. While the cooperative and consumer owned utility format will be the primary model, the project will be prepared to address a variety of circumstances and approaches, especially where the structure of market is in transition. Candidate projects would be among the following countries, Argentina, Bolivia, Brazil, Colombia, Costa

Rica, Dominican Republic, Guatemala, Guyana, Haiti, Honduras, Nicaragua and Peru. Typical project scenarios for accomplishing this mission fall into three categories:

1. Restructuring/reforming national or sub-national electric utility systems where reforms have been limited, rural utility performance and service penetration remain at low levels, and cooperatives do not exist (Honduras, Peru, and Guyana).
2. Creating new rural utility markets and market aggregators in countries where power sector refoiin/privatization has occurred but rural areas remain underserved (Dominican Republic, Guatemala, Nicaragua, Panama, Bolivia).
3. Strengthening institutional and market-aggregating capacities where consumer-based rural utility markets exist with the goal of facilitating market based financing for new builds or expansion. (Brazil, Costa Rica, Argentina).[2]

The program would work with local counterparts, including host government electrification agencies and others involved in policy reform in the electric sector of the target country to devise and implement plans for consumer based expansion of energy services. Significantly, in terms of the broader Bank Group's interest in this initiative, coordination will take place with the Bank's public sector and private sector units in order to organize and schedule initiatives in countries where Bank rural energy financing would benefit from private-sector institutional development, management assistance and local capacity-building, which is the core objective of this project. Similarly, a major purpose is to develop and support investment-ready regulatory/institutional and investment programs including teaming with expert private-sector group(s) in the field of consumer-oriented electric supply and marketing enterprises.

Among essential activities would be crafting remedies for inadequate or faulty legal, institutional, organizational patterns for the expansion of consumer based energy services. Certain countries may require legislative remedies, particularly related to cooperative enterprise laws governing energy services. Depending on the country, support for the cooperative approach will require providing information and organizing support from key members of government, utility sector leaders, and, most important, local communities. Another key area of activity would be developing and implementing the appropriate contracting mechanisms for private-cooperative partnerships in coordination with governments, regulatory, and financial institutions. Finally, the goal would be to work with those cooperatives that have the capacity to mobilize investment in projects that increase the capacity of the cooperative to serve and expand its membership. Small, carefully targeted investments would be made in these entities.

4. Estimated Cost, Proposed Financing Composition and Operational Sustainability

-Counterpart funding is available from a range of sources. NRECA will share in the program budget cost, and will jointly solicit funds from other sources to complete the

[2] Summaries of potential country activities are listed in the Addendum.

budget requirement. Partial funding is in place for programs in several countries from bilateral sources and from resources that NRECA will provide. The proposed facility would be a regional partnership among a core group who are committed to developing, supporting, and assuring the long-term business success of local-community, cooperative infrastructure service business entities around the Latin American and Caribbean region.

The founding partners would consist of NRECA International, Ltd., which would be responsible for building a team of experts drawn from its project teams around the region and from electric co-ops and from U.S. electric cooperatives and in other countries. NRECA would also involve its International Foundation in the initiative, to be responsible for orchestrating resource mobilization for counterpart funds among U.S. electric cooperatives. Both NRECA agencies would also undertake to raise funds and inkind support from donor and private-sector sources to cover the cost of the program including modest strategic investments in most cases. The financial underpinning of the program over the longer-run is to be based on the success achieved by its interventionsspecifically, the successful provision of services to members for which they would later be expected to pay a membership fee, and also with the development of investment programs, related financing fees included in financing packages.

Table 1. Illustrative funding allocation

Purpose	Estimated Cost	Sources and Shares
Program Development/Management Team (PMT)	± $3.85 million	NRECA - 40% MIF - 18% Counterpart contributors[3] -42%
Technical Assistance	$4.5 million	NRECA - 22% MIF - 0% Counterpart contributors[4] -78%
Local Capacity Building	$3.0 million	• NRECA - 25% • MIF - 50% • Counterpart contributors - 25%
Pilot projects	1 $25.65 million	• NRECA - 10% • MIF - 8% • Beneficiaries' - 6% • Counterpart[6] -76%

For illustrative purposes, the estimated total budget requirements for an initial regional effort with initial programs in six countries would be in the $35-$40 million range,

[3] Sources: U.S. foreign assistance agencies - USTDA, USAID etc.

[4] Sources: Government-sponsored rural electrification projects (Bank-financed projects and other sources). [5] Sources: Local co-op funds (membership fees and equity) for project implementation. [6] Sources: Government-funded rural electrification projects, trusts, or funds, supplemented by international development grants and loans including MCC.

including capital costs, with the MIF portion no more than $4,200,000 (see Table 1). Of the MIF contribution, it is anticipated that $700,000 would be channeled to project development and program administration, $1,500,000 to local capacity building and $2,000,000 to investment direct investment in projects, respectively 18, 50, and 8 percent of total amounts for each category.

NRECA will mobilize counterpart funding from the NRECA International Foundation and local cooperatives in the U.S., USAID, the U.S. Department of Agriculture, the U.S. Trade and Development Agency, the Millennium Challenge Corporation, and other nonU.S. bilateral aid programs and multilateral agencies that fund rural electrification and the development of cooperatives. NRECA_is experienced in mobilizing such resources and commitments for some of these contributions are already in place.

The project will be sustained in a second stage as a general support facility for electricity cooperatives through a combination of funding raised form public and private sources, membership fees and commissions related to resource mobilization for project finance. It is anticipated that once a successful regional entity is in place for cooperatives, additional bilateral and multilateral funding sources will be available.

5. Executing Agency and Execution Mechanism

A Program Management Team (PMT) organized and supported by NRECA will:

1. Prepare, process, supervise, and evaluate proposals for a group of initial projects from diverse countries (mentioned above);
2. Mobilize matching funds and monitor local in-kind contributions from partner cooperatives;
3. Contract specialized consultants to assist in project design, preparation, and supervision;
4. Organize intra-regional mechanisms for the sharing of best practices among cooperatives and other community based electrification entities; and
5_ Oversee day-to-day implementation of the program through a program management team that will be part of a permanent regional facility designed to provide sustainable support for cooperatives and other user based electrification systems as well as national supporting national entities.

MIF and NRECA would enter into an agreement for administration of the program establishing a PMT to execute day-to-day implementation of the program. The PMT would identify, develop, and supervise the initial projects, including the raising counterpart funds, the hiring of consultants, and making targeted investments in accordance with guidelines established by NRECA and approved by the MIF. NRECA would also contribute in-kind staffing support for the PMT as well as office space and

[7] This amount is based on an assumed amount of investment that is subject to various sponsors' approvals.

general support services at its headquarters in Arlington, Virginia. The agreement for administration of the program would include guidelines for the submission of projects to the MIF for no objection, procedures for the contracting of consultants, disbursement of funds, as well as project monitoring and supervision, and evaluation. A Trust Account or other suitable mechanism would be established to receive and disburse funds. It is anticipated that the initial stage of the project would last approximately four years from date of first disbursement from the MIF.

6. Project Implementation and Coordination

In the implementation of these programs, care will be taken to ensure that the efforts are complementary to existing Bank funded policy reforms and other programs. Indeed, inasmuch as the investment programs entail new rural electrification, the project team will engage directly and deliberately with the appropriate government agencies and multilateral advisors to assist in establishing administratively efficient means to link public rural electrification financing with the local privately funded institutional development, local capacity-building and project implementation that is the focus of this proposal. In addition, this coordination will help to guarantee that any operations of the MIF do not duplicate other multilateral efforts and that, where these operations are in place, that MIF/NRECA resources are utilized for private, consumer-based initiatives that are not otherwise funded. However, it is expected that the institutions put in place by this operation-- local cooperatives and national market aggregators --would be a valuable resource for supporting the implementation of Bank-funded rural electrification efforts.

7. Risk Issues and Success Factors

The difficulties anticipated with this initiative have to do with obtaining the needed funding, effectively aggregating demand for its services, and the administrative challenge of creating and operating a regional program, especially one as innovative and ambitious as envisioned here. In the longer run, the challenge will be assuring the formal entity's financial sustainability.

NRECA, which itself represents the general type of organization that is contemplated, has had experience with similar undertakings and will apply lessons learned and time-proven principles and techniques in overcoming these potential obstacles. In this sense, NRECA and its member co-ops recognize the critical role that similar common-services resource agencies have played in the U.S. rural electrification experience - such as NRECA and CFC and others at the national, regional and state levels - without which it is doubtful that the cooperatives could have achieved their current status as vibrant, successful corporations with nearly $70 billion in combined asset value, enjoying the fastest rate of growth of any segment of the U.S. electric utility sector.

In terms of the organizational dimension of the project, the task of creating a regional cooperative support agency, as with any type of regional agency, can be a complex undertaking. The primary difficulty is in creating such an agency in a single stroke - with the implicit challenge of assembling participants, funding, and activities from a cold start. In practice, potential constituents and participants, including funding agencies, can

be expected to want evidence first that it will be workable and successful, so gaining the needed foothold while working through many complicated tasks is the specific challenge. For this reason, NRECA's strategic design starts the process with first a developmental stage under a coherent, pre-set format including sponsorship group, roles, budget, work plan, schedule, and deliverables. The envisioned establishment agreement between the partners will make explicit provisions for each of these facets. This initial stage is intended as time to gain traction with an initial series of successes, which along with an outreach campaign, will allow for a formal "live birth" launching of the permanent entity as a specific product of the project.

Another specific outcome of the envisioned interventions is to formulate and establish national aggregating agencies to partner with the future entity, such as national cooperative associations or electrification development corporations that would become `member' institutions. This will greatly facilitate the flow of resources and services into many remote rural communities, while reducing management and administrative risks and burdens.

On a related theme, the skill of the PMT in assembling a compelling agenda for the envisioned entity including effective and valued services will make all the difference in whether this project attains its goal. This must be a demand-driven enterprise or it will fail. Therefore, a critical success factor will be in understanding the needs of the project's intended beneficiaries and other constituencies, including government agencies seeking assistance in implementing rural electrification programs. The demand for the envisioned program clearly exists, but the challenge will be to develop the products and services to be 'on-target' - appropriately priced, properly communicated, and effectively delivered. In this aspect, NRECA is uniquely capable given its knowledge and project experience as well as a unique reputation from over 40 years work in the LAC rural electrification community.

In terms of its financial dimension, the initiative must be able to attract the anticipated levels of funding support. In order to mitigate the risk of failure due to shortfall in resources, all substantial commitments will be obtained for the major funding elements as a condition for MIF disbursements.

Looking further downstream, the permanent agency's financial sustainability will derive from its performance in constituency development, including direct beneficiaries/ members as well as outside sponsors. It is not realistic to contemplate the entity having an adequate revenue base from dues and fees alone, during its early operation stage, so one of the on-going requirements of NRECA and the community that is being assembled in this project is to build long-term loyalty not just with its beneficiaries but also with a diverse number of sponsors and supporters including private foundations as well as other donors.

Addendum: Illustrative Country Summaries

Bolivia:

The Government of Bolivia has been planning a major rural electrification investment program for two years, however effective institutional capacity to manage project development, design and implementation is lacking. There are many scattered rural electric utilities around the Bolivian countryside, however they are generally weak and incapable of good management. That leaves the government with the option of reinstalling a government rural electrification program, which has not had a good record in the past. The opportunity is to establish a specialized private rural electrification corporation to work with the government, donors, local utilities and others, in partnership with the target communities, to assist in designing and implementing the national rural electrification program. The project would involve a modest investment for which NRECA's share is already in hand.

Costa Rica:

CONELECTRICAS, a national association of electric cooperatives, is interested in growing its financial and technical capacity to support an expansion of the electric cooperative industry's role in power supply, telecommunications, and potentially other services besides electrification. CONELECTRICAS and its members are capable of providing equity and obtaining local bank financing. The opportunity is to assist CONELECTRICAS in developing an institutional financing capacity and related organizational and technical skills, along with project development assistance and a modest capital investment.

Dominican Republic:

NRECA has carried out a national rural electrification market study and is working collaboratively with the government to create a national implementing agency for rural electric cooperative formation, financing and support. Several pilot projects are planned and the government has established a national electrification fund. Multilateral agency project loans to support reform and improvements in the electric distribution sector are also being contemplated by the Bank and/or World Bank. The opportunity is to join the process, build up NRECA's on-going project and develop a larger, nation-wide rural electrification reform and expansion program. NRECA has a modest amount of capital financing and technical assistance resources already in place to initiate this program.

Guatemala:

The government of Guatemala set up a rural electrification Trust which is due for reform and replenishment to expand electricity service. In particular, Guatemala needs to broaden the participation in the country's rural electrification development. The Trust is currently monopolized by Union Fenosa, which has proved unwilling to take initiative to

carry out rural electrification beyond its existing distribution system, which it inherited from INDE, the national power company that was privatized 5 years ago. NRECA has established a smaller, private-financed rural electrification trust fund that has successfully financed rural electrification and related economic investments working directly with small rural municipalities. The opportunity is to work with the government on an expanded municipal electrification program including both distribution and decentralized power investment and possibly including reform of existing municipal electric utilities into independent community-owned corporations.

Haiti:

Electricity service in the country is extremely underdeveloped. Most Haitian towns and virtually the entire rural population have no electricity service. The Bank has attempted to engineer power sector reform and investment in Haiti but there continues to be limited hope in any meaningful reform of EdH, the national power company, in the foreseeable future. NRECA has begun to develop cooperatives in rural towns to take on this job on a private decentralized basis. Haitian communities show that they have the motivation, capability and a surprising degree of access to expatriate funding to make this a reality.
A cooperative has been set up in the rural town of Pignon with the voluntary assistance of a group of U.S. electric cooperatives. The opportunity is to build on this success and establish a national network of similar cooperatives.

Peru:

Despite the partial success of power sector privatization in urban centers several years ago, provincial electric utility reform in Peru has stalled. Most rural towns currently receive poor-quality service and a majority of rural Peruvians remain without electricity service. Various donor agencies including 1DB are interested in re-starting electrification reform and investment, including USA-ED, which has recently shown an interest in funding rural electrification as part of its "alternative development" program. The opportunity is to work with the government to select a provincial utility on a modest rehabilitation and service expansion program as an example of a decentralized approach to rural utility reform, including the development of community ownership schemes.

ANNEX D

FINANCIERA CONELECTRICAS

Costa Rica Electric Co-op Investment and Finance Initiative

Project Background

Costa Rica's four electric cooperative utilities collectively serve over 90,000 consumers in four regions of the country covering roughly one-quarter of the total national electric utility service area outside the major cities. Representing about 15% of the national electricity market in kWh sales, they have a combined peak demand approaching 100 MW and purchase most of their power from ICE, the national para-statal electric power company. ICE had maintained a virtual monopoly on power generation and over the development of the country's hydroelectric resources. That changed with the passing of a new private power investment law in 1992 that was modeled on a similar U.S. initiative established under the Public Utilities Regulatory Policies Act (PURPA) in the late 1970s. The law required ICE to purchase power from independent power producers (IPPs) at tariffs calculated as ICE avoided long-run marginal cost. The law, which was the product of several years' effort to persuade ICE and the government to open the power markets to new players, explicitly provided that electric cooperatives could also participate as IPPs.

During this time, the electric cooperatives adopted a plan to develop their own organizational and financial means for generating power, and in 1989 they formed a consortium organized as a cooperative under Costa Rican law (CONELECTRICAS) to develop a 17-MW hydroelectric project as the first of a planned series of small power investments. The project, located at the confluence of the San Lorenzo and Jamaical rivers in the jurisdiction of San Ramon, was selected from a survey of about a dozen sites carried out by an NRECA small hydro assessment team under funding assistance from USAID. CONELECTRICAS acquired the site concession rights from the Servicio Nacional de Electricidad (SNE), and thereafter obtained eligibility from ICE to develop the project. This required them to sell the entire energy output to ICE and in 1994 the parties executed a 10-year power purchase agreement (PPA) for that purpose. Financing was completed in 1995, including $3.5 million in equity from CONELECTRICAS, $5 million in quasi-equity from a group of banks and two of the projects vendors, and $12 million in senior debt. The project proceeded rapidly from that point and began operating in 1997. The San Lorenzo investment has met all expectations and CONELECTRICAS has earned a profit in each year of operations.

CONELECTRICAS is now working to assist its members in undertaking a larger scale of investment financing, both in power supply and in other capital investment needs relating to their core functions in electric distribution and possibly other member services. With retail electric service competition on the horizon and rapidly growing demand (7% average annual growth rate), the cooperatives must secure their competitive position in the Costa Rican electric utility market. Relying on ICE small power projects to serve their own power supply needs instead of relying on ICE, currently a retail

competitor in rural areas. Small run-of-river hydro plants are relatively simple and cheap to build in Costa Rica, with average kWh costs well below ICE's long-run marginal cost. Over the next decade the co-ops are planning to build their competitive basis by adding the equivalent of 10 MW a year in small, low-cost distributed power plants and/or perhaps high-voltage substations to take better advantage of ICE's tiered pricing system. This will provide most of the baseload energy and allow them to compete with ICE for new industrial and commercial customers while keeping their existing members happy. The co-ops also have on-going investment requirements to maintain and expand their distribution networks including adding substation capacity to reduce system loss. Moreover, they will also need financing to respond to new business opportunities to become more effective providers in their rural communities covering a wider spectrum of service activities. To move this investment program forward, the co-ops must develop an organizational strategy to facilitate project financing in a more cost and time efficient manner, since the transaction costs of doing relatively small projects individually is expensive and time consuming. They also need to be independently capable of responding quickly when investment needs arise - i.e. expanding service to new industries, adding new services, etc.

There is a readily adaptable model available to the co-ops to meet this need, the National Rural Utilities Cooperative Finance Corporation (CFC), NRECA's affiliate. CFC aggregates equity from numerous small cooperative utilities in the U.S. under a successful leveraging system that allows CFC to acquire relatively low-cost debt in private capital markets and to deliver credit back to the individual participating utilities at a competitive "group rate" cost. In 1997, NRECA teamed up with CFC to help cooperatives worldwide to access private capital markets. CFC-type agencies are under consideration in several developing countries and in the Philippines one has already been formed. Together, NRECA and CFC are working with CONELECTRICAS to evaluate the merit and feasibility of establishing such a system in Costa Rica.

Concept

CONELECTRICAS is interested in establishing a permanent capital financing facility under a legally appropriate and professionally managed corporate format that is capable of supplying cost-efficient loan financing for its projects and to cover the capital financing needs of its four electric co-op members. The facility, FINANCIERA CONELECTRICAS ("FINANCIERA"), will be based on the CFC non-profit model of member/borrower equity and ownership. The co-ops' equity will be leveraged with debt financing of various types to obtain a dependable supply of competitively-priced debt funds. Initially, FINANCIERA's funds will be accumulated through the sale of capital term certificates and deeply subordinated debentures (DSDs), and will be used as the basis for drawing on a pool of debt funds administered under a trust agreement with a local Costa Rican bank. Debt funds will be raised from banks, multilateral agencies and special-purpose funds and would be committed incrementally as projects are readied.

CONELECTRICAS and its members are currently planning to invest in two new power generating plants, which is the initial impetus for creating FINANCIERA. Additional power investments are envisioned in the future. The co-ops also require a steady supply of capital for distribution improvements, replacements and additions, and potentially for new business undertakings in other service areas including energy service/conservation programs for their members. CONELECTRICAS has engaged an advisor to develop a strategic plan for expanding its common services.

CONELECTRICAS is preparing a detailed business plan for FINANCIERA, including the organizing a consortium of strategic partners ("SPONSOR") to assist CONELECTRICAS in implementing the program. This paper presents the basic FINANCIERA scheme as presently envisioned.

The main purpose of FINANCIERA is to provide long-term capital funds for financing projects. Initially, most of the financing will be for power generation facilities. Currently, a 30-MW hydropower facility and a 9 MW wind-power facility are being readied for financing. FINANCIERA will also provide short-to-long term financing for other capital investment needs: electric distribution facilities, efficiency improvements, bulk procurement, and new co-op business initiatives.

FINANCIERA will lend money only to CONELECTRICAS and its four member cooperatives. Loans would be based on mortgages made between FINANCIERA and the borrowing co-op. These mortgages would be used to secure medium term and long-term debt obligations between the consortium of lenders and FINANCIERA.

CONELECTRICAS and each of the four co-ops will provide capital in the form of paidin equity plus the purchase of Member Capital Term Certificates by the co-ops. The initial capitalization would involve a commitment of funds from the San Lorenzo project cash reserve. The MCTCs would cover a sufficiently long period of time in order to secure debt financing from the external parties and would be funded from a portion of the annual revenue from the San Lorenzo project. Other methods of raising member capital will also be considered in order to assure that FINANCIERA's capitalization maintains an adequate debt/equity ratio.

FINANCIERA would be launched under a partnering agreement with SPONSOR, representing the consortium of lending institutions. SPONSOR would provide management assistance to FINANCIERA for its organization and operation and development of projects in order to assure that its lending operations and portfolio meet lenders' standards for committing funds. This would include development of a debt funds management system in partnership with a local bank. SPONSOR would be responsible for obtaining pre-investment funds from various development agency sources, and also for obtaining special credits, including project financing, credit lines, funds associated with carbon credit programs and facilities, and the like. SPONSOR would also assist in arranging credit enhancements as may be possible in order to secure the external debt on favorable terms.

Rationale

I. CONELECTRICAS and its members, like co-ops in many countries, are facing an uncertain future and must equip themselves to deal effectively with increasing competition. The competitive forces include price competition, protecting their service territories from predatory tactics, expanding their services and improving customer services. All of these factors could involve significant capital financing requirements, in greater amounts than they can obtain as individual cooperatives. In particular, the co-ops must be in a position to finance an aggressive program of power generating capacity over the next 10-20 years. It is clear that they would be able to obtain lower-cost power by investing in small hydro and other power generation sources that are locally sited and relatively easy to construct. The co-ops are already feeling the "pinch" of price competition with ICE. Increasing their access to low-cost power generation under their own control and reducing their dependency on ICE is the most important challenge they face. Such investments in the future could include larger-scale plants along with transmission facilities to serve the co-ops' collective demand for power, including firm capacity, to obtain economies of scale, much like U.S. electric co-ops have achieved over the past 30 years.

2. Developing financing on a project-by-project basis is costly and time-consuming, as previous experience has shown. Delays in obtaining financing in the past have hampered the co-ops ability to take advantage of opportunities to acquire and develop hydro sites. Moreover, it is likely to be more difficult to obtain project financing for power investments without the security of a long-term power sales contract to ICE, as was the case for the San Lorenzo project. Establishing a permanent stand-by financing capability within the CONELECTRICAS community will greatly facilitate the co-ops' ability to act swiftly to address financing needs as opportunities arise.

3. A collective financing program will also facilitate joint procurement activities for the co-ops, in terms of setting up credit lines and allowing easier contracting arrangements with vendors. Part of this function includes establishing procurement credit lines with local banks, export and vendor credits, for routine purchasing of electric utility equipment and material components (transformers, meters, poles, conductor, etc.). Once established this program may be expandable to include similar needs of other purchasers of these materials in Costa Rica, as has been done in the U.S.

4. FINANCIERA will give the co-ops leveraging capabilities that they do not have, allowing them to re-leverage their assets, engage in re-financing where advantageous (San Lorenzo, for example), and optimize their equity-to-debt balance.

5. With SPONSOR's built-in support capability, FINANCIERA will provide the co-ops with ready access to international capital markets. This could include finding and accessing discounted-price credits in specialty funds, secondary markets and

arranging swaps, obtaining carbon-based financing, and other special financing sources.

6. FINANCIERA will enable the co-ops to obtain economies of scale in capital financing, reducing project transaction costs and the overall cost of funds. Cost savings should also result from more direct access to international sources.

7. FINANCIERA will provide the co-ops with a permanent "in-house" capability in areas of market intelligence, long-range strategic planning, investment and financial planning, and electric utility industry stature both in Costa Rica and internationally.

8. CONELECTRICAS, with its highly profitable San Lorenzo hydroelectric project, has amassed a significant amount of cash that provides the co-ops a unique, and perhaps their only, opportunity to provide for a significant and permanent resource of leveraged funds. Using this as equity to start up an institutionalized financing system to address their on-going financing needs makes vastly more strategic sense than applying it to one or two projects for the near-term alone.

Key **Features**

Mission

The mission of CONELECTRICAS FINANCIERA is to provide Costa Rica's electric cooperatives with a permanent, dependable, and affordable supply of investment financing so as to aid in their growth and modernization, maximize their operating efficiency and competitiveness, and assure the highest quality of service throughout their communities.

Corporate Structure and Organization

FINANCIERA's corporate orientation and financing activities would be conducted under the legal authority of CONELECTRICAS as a non-profit cooperative entity operating for the exclusive benefit of its members. Equity will be provided exclusively from funds committed to FINANCIERA from CONELECTRICAS and its members, to enable FINANCIERA's operations to enjoy the tax and other privileges granted to cooperatives. Additional risk capital will be provided in the form sub-debt from SPONSOR, sufficient to maintain an established equity-debt ratio. For its on-lending program, loans will be executed between FINANCIERA and its members secured by mortgages and by other collateral instruments such as power sales contracts. Debt financing will be provided under loans made between FINANCIERA and various lending agencies. These senior debt loans will be secured by collateral bonds backed by the pool of mortgages and other securities executed between FINANCIERA and its member/borrowers. The loans will also include financing for projects to be executed by CONELECTRICAS secured by similar collaterals.

FINANCIERA's organizational and operating structure would be formally executed under a contract between CONELECTRICAS and SPONSOR that would provide for risk capital, in the form of subordinated debentures arranged by SPONSOR between CONELECTRICAS and other strategic partners that it represents, along with financial management and technical services. The services provided by SPONSOR and its partners would focus on developing activities and projects to be financed by loans executed between CONELECTRICAS and its members. The contract would spell out the functions and responsibilities of each of the parties, and would also mandate the execution of the CTCs between CONELECTRICAS and its members.

SPONSOR would devise an agreement with a Costa Rican bank acting as trust administrator ("TRUST") to administer debt funds obtained from banks, investment funds, bonds, and other sources that will be arranged by TRUST on behalf of CONELECTRICAS. The trust agreement will establish a set of tasks and procedures including precedent conditions under which debt funds are to be obtained and disbursed. The agreement would also provide for the establishment of a credit committee made up of the representatives from TRUST and CONELECTRICAS to review and approve disbursement of debt funds. One of TRUST's responsibilities is to select and arrange crediting agreements with selected financial institutions.

Financing Requirements

An important assumption of the FINANCIERA concept is that CONELECTRICAS will have access to economically attractive power projects in order to increase their powersupply security incrementally. Assuming the goal of generating two-thirds of their total electric energy requirements by the end of 2012, the co-ops will need to invest in 80 MW of new power generating capacity. In addition, it is assumed that other demand (e.g., electric distribution facilities and CONELECTRICAS common-services initiatives) will require an average of $2 million in new medium and long-term financing annually.

Capitalization, Sources and Cost of Funds

The long-term financing demand of the co-ops (10 years) is estimated to be on the order of $150 million, of which 75% would be devoted to power and transmission. An initial capitalization of $55 million is proposed to cover the initial group of investments, to consist of 35% equity and subordinated debt, and 65% in debt. For this initial financing tranche, equity/sub-debt would therefore be roughly $20 million and senior debt $35 million. Of the $20 million amount, $4 million would be in cash, $4 million would come from redemption of CTCs over the ten-year period, and $12 million in the form of DSDs.

Financial Plan and Projections

The financial plan includes focuses on an initial 4-year phase covering an initial tranche of financing to be arranged for near-term financing needs of CONELECTRICAS and its members. The plan also estimates the expected financing requirements and results for the remaining years (through 2012). FINANCIERA's financial plan is summarized in the

attached table. The amounts and interest rates indicated in the forecast are illustrative. Actual terms will depend on subsequent negotiations with financial institutions.

Operating Procedures and Policies

FINANCIERA's operating policies are to be delineated in the contract between SPONSOR and CONELECTRICAS and duly approved under a resolution adopted by the CONELECTRICAS Board. The policies would cover the credit eligibility, credit review procedure, loan agreement terms, capitalization requirements for borrowing, *etc.,* and would be based on policies similar to those developed by CFC, modified to suit local conditions.

Implementation Plan

The FINANCIERA program was initiated with the assistance of NRECA by developing a conceptual framework and business plan. The next step involves the completion of a formal business plan, including legal analysis on the organizational and contractual structures, development of a more detailed long-range capital requirements forecast and financial projections, formalization of the proposed management scheme including operating procedures and policies, along with more detailed discussions with financial institutions regarding the terms and repayment conditions of their potential participation.

Feasibility studies for the two power projects that are currently planned are underway, which will provide important detail on the financing requirements for the initial lending tranche.

The pre-investment activities will be carried out with the assistance of SPONSOR for which an initial cooperative agreement will be required. The business plan will lead directly to formal negotiations with interested financial institutions, followed by completion of all agreements including the formal partnering agreement with SPONSOR. Funding for the remaining pre-investment requirements will be obtained by SPONSOR with counterpart funding from CONELECTRICAS.

Key Assumptions and Project Risks

FINANCIERA can limit its operational risks by good management, careful planning and by applying a disciplined system of project review procedures and credit analysis and loan collateralization. Since the value of FINANCIERA is in reducing their need for detailed review of individual projects and loans by these institutions, it is important that FINANCIERA's organizational and management system is sound. Lenders will consider the condition of the borrowers and their projects as the major determinant of FINANCIERA's success or failure, so an important function of FINANCIERA is to provide its members with assistance in planning their investment programs and borrowing.

Key assumptions on which the success of the FINANCIERA scheme depends include the following:

- Development of a legally sound organizational plan for FINANCIERA including authority to enter into financial contracts and financing activities including execution of trust agreement.

- Satisfactory arrangement of partnering agreements with SPONSOR and other stakeholders.

- Availability of affordable terms in FINANCIERA's borrowings, and willingness of financial institutions to participate with funds on affordable terms.

- Access to hydroelectric sites under acceptable legal terms and satisfactory completion of project implementation provisions including delivery of energy.

- Commitment of adequate resources to carry out pre-investment tasks (business plan, project preparation requisites, legal work and contracting, *etc.).*

FINANCIERA CONELECTRICAS - Proyección Ejemplo

ESTIMACIONES DEL ESCENARIO

Scenario:

Inversion de Cooperativas = $4 million +$1,500,000/ano

I. Prestamos a Cooperativas de Electricidad alcanza $138.9 millones (Anexo G, Linea 7) .
2. Inversiones de Cooperativas alcanza: Acciones comunes = $13.0 millones, y Utilidades acumuladas = $18.0 millones. 3. Limite mínima de (Utilidades Netas + Intereses pagados) / Intereses pagados = 1.2 4. Limite máxima de (Prestamos + Títulos) / (Capital + Deuda subordinado) = 2.5

Tasas de interes - Prestamos por cobrar	Proyeccion Tendencias		Anos de	Anos de	Pagos	Metodo
Prestamos, por plazo:	Principio	Fin	solo Interes	Pagos	por Ano	
Corto	***8,50%***	***10,00%***	***0***	***1***	*1*	Bullet
Intemiedio	***9,00%***	***11,00%***	***1***	**4**	4	Level
Largo	***9,50%***	***13,00%***	*1*	10	4	Principal
Gastos de prestamos	***1,00%***	***1,00%***				
Rendimiento de inversiones	***3,65%***	***5,00%***				

Tasas de interes - Prestamos bancarios	Proveccion Tendencia		Anos de	Anos de	Pagos	Metodo
	Principio	Fin	solo Interes	Pagos	por Ano	
Banco national # 1	***6,50%***	***10,50%***	***1***	***5***	***4***	***Level***
Banco national #2	***11,00%***	***14,00%***	***1***	***5***	***4***	***principal***
Banco intemacional # 1	***8,50%***	***12,00%***	***1***	***5***	***4***	"
Banco international #2	***8,50%***	***12,00%***	***1***	***5***	***4***	

Tasas de interes - Titulos	Proveccion Tendencia		Anos de	Anos de	Pagos	Metodo
	Principio	Fin	solo Interes	Pagos	por Ano	
Titulos - # 1	***8,75%***	***13,00%***	1	8	***4***	***Level***
Titulos - #2	***8,75%***	***13,00%***	**1**	8	***4***	***principal***
Titulos - #3	***8,75%***	***13,00%***	**1**	**8**	**4**	
Titulos - #4	***8,75%***	***13,00%***	**i**	**8**	4	

Tasas de interes - Deuda Subordinada	Proveccion Tendencia		Anos de	Anos de	Pagos	Metodo
	Principio	Fin	solo Interes	Pagos	por Ano	
Deuda subordinada - # 1	***10,00%***	***14,00%***	1	8	***4***	***Level***
Deuda subordinada - #2	***10,00%***	***14,00%***	1	8	***4***	***principal***
Deuda subordinada - #3	***10,00%***	***14,00%***	1	8	***4***	'1
Deuda subordinada - #4			1	8	***4***	"

Otras datos	
Impuesto sobre la renta Estimacion	*0,00%* (% Utilidad Neta antes Impuesto - Anexo E, Line 39) *3,00%*
para creditos dudosos Depreciation	(expensed in year of loan advance) 4,0 anos

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: *Inversion de Cooperativas = $4 million+$1,500,000/ano*

Anexo B

ESTADOS DE RESULTADOS, POR MES (EU$)

			Enero 2003	Febrero 2003	Marzo 2003	Abril 2003	Mayo 2003	Junio 2003	Julio 2003	Agosto 2003	Septiembre 2003	Octubre 2003	Noviembre 2003	Diciembre 2003	Total 2003
1	*Intereses ganados, por plazo:*														
2	Corto	@ 8,50%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.771	$ 3.542	$ 3.542	$ 3.542	$ 12.396
3	Intermedio	@ 9,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.500	$ 15.000	$ 15.000	$ 15.000	$ 52.500
4	Largo	@ 9,50%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5	Gastos de prestamos	@ 1,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 25.000	$ -	$ -	$ -	$ 25.000
6	Total		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34.271	$ 18.542	$ 18.542	$ 18.542	$ 89.896
7															
8	*Rendimiento de inversiones*	@ 3,65%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.121	$ 12.157	$ 4.560	$ 4.559	$ 4.557	$ 37.954
9															
10	*Intereses pagados:*														
11	Banco nacional #1	@ 6,50%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	Banco nacional #2	@ 11,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	Banco internacional #1	@ 8,50%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
14	Banco international #2	@ 8,50%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
15	Titulos - #1	@ 8,75%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
16	Titulos - #2	@ 8,75%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
17	Titulos - #3	@ 8,75%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Titulos - #4	@ 8,75%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19	Deuda subordinada - #1	@ 10,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20	Deuda subordinada - #2	@ 10,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21	Deuda subordinada - #3	@ 10,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	Deuda subordinada - #4	@ 10,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	Total intereses pagados		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	Otros		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25	Total gastos de fondos		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
26															
27	*Margen financiero*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.121	$ 46.428	$ 23.102	$ 23.100	$ 23.099	$ 127.850
28															
29	*Gastos generales y administrativos:*														
30	Del personal	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000	$ 4.000	$ 4.000	$ 4.000	$ 4.000	$ 20.000
31	Arrendamiento de oficina	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 500	$ 500	$ 500	$ 500	$ 500	$ 2.500
32	Comunicaciones	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50	$ 50	$ 45	$ 50	$ 70	$ 265
33	Auditoria externa y Abogados	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.000	$ -	$ -	$ -	$ 5.000	$ 10.000
34	Suministros, computadores, etc.	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 125	$ 125	$ 125	$ 125	$ 500
35	Depreciacion		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 313	$ 313	$ 313	$ 313	$ 313	$ 1.563
36	Otras	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 300	$ 300	$ 300	$ 300	$ 300	$ 1.500
37	Total gastos generales, etc.		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.163	$ 5.288	$ 5.283	$ 5.288	$ 10.308	$ 36.328
38	Estimacion para creditos dudosos		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75.000	$ -	$ -	$ -	$ 75.000
39	Impuesto sobre la renta	@ 0,00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40															
41	*Utilidad neta*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.959	$ (33.860)	$ 17.819	$ 17.813	$ 12.792	$ 16.522
42	(*) = Direct input.		19-Sep-02 09:25 p.m.												

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: *Inversion de Cooperativas = $4 million+$1,500,000/ano*

Anexo C

ESTADO DE FLUJOS DE EFECTIVO, POR MES (EU$)

			Enero 2003	Febrero 2003	Marzo 2003	Abril 2003	Mayo 2003	Junio 2003	Julio 2003	Agosto 2003	Septiembre 2003	Octubre 2003	Noviembre 2003	Diciembre 2003	Total 2003
1	***Actividades de operacion***														
2	Utilidad neta		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.959	$ (33.860)	$ 17.819	$ 17.813	$ 12.792	$ 16.522
3	Depreciacion		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 313	$ 313	$ 313	$ 313	$ 313	$ 1.563
4	Estimacion para creditos dudosos		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75.000	$ -	$ -	$ -	$ 75.000
5	Cambios en activos y pasivos de operacion		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.550	$ (39.146)	$ (18.547)	$ (18.537)	$ 20.749	$ (45.930)
6	Otras		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	Efectivo neto provisto por operacion		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11.821	$ 2.307	$ (415)	$ (411)	$ 33.853	$ 47.155
8	***Actividades de inversion***														
9	Prestamos - corto plazo	(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (500.000)	$ -	$ -	$ -	$ (500.000)
10		Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
11	Prestamos - intermedio plazo	(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (2.000.000)	$ -	$ -	$ -	$ (2.000.000)
12		Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	Prestamos - largo plazo	(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
14		Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
15	Activos fijos	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ (15.000)	$ -	$ -	$ -	$ -	$ -	$ (15.000)
16	Efectivo neto de inversion		$ -	$ -	$ -	$ -	$ -	$ -	$ (15.000)	$ -	$ (2.500.000)	$ -	$ -	$ -	$ (2.515.000)
17	***Actividades de financiamiento***														
18	Banco nacional #1	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20	Banco nacional #2	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	Banco internacional #1	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	Banco international #2	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Prestamos bancarios - neto		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
26	Titulos - #1	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
27		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
28	Titulos - #2	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
29		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	Titulos - #3	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
32	Titulos - #4	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
33		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Titulos - neto		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
34	Deuda subordinada - #1	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	Deuda subordinada - #2	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
37		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
38	Deuda subordinada - #3	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
39		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40	Deuda subordinada - #4	Ingresos (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
41		(Egresos) (*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deuda subordinada - neto		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	Efectivo neto de deuda		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
43	Certificados de Patrimonia: CONELECTRICAS														
44	y los Cooperativas de Electricidad	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$ -	$ -	$ -	$ -	$ -	$ 4.000.000
45	Dividendos pagados	(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
46	Efectivo neto por financiamiento		$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$ -	$ -	$ -	$ -	$ -	$ 4.000.000
47	***Disminucion (aumento) en efectivo***														
48	Efectivo al inicio del mes		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$3.985.000	$ 3.996.821	$ 1.499.128	$ 1.498.713	$ 1.498.301	$ -
49	Efectivo al final del mes		$ -	$ -	$ -	$ -	$ -	$ -	$ 3.985.000	$3.996.821	$ 1.499.128	$ 1.498.713	$ 1.498.301	$ 1.532.155	$ 1.532.155
50	(*) = Direct input.		19-Sep-02 09:25 p.m.												

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: *Inversion de Cooperativas = $4 million+$1,500,000/ano*

Anexo D

BALANCES GENERALES, POR MES (EU$)

		Enero 2003	Febrero 2003	Marzo 2003	Abril 2003	Mayo 2003	Junio 2003	Julio 2003	Agosto 2003	Septiembre 2003	Octubre 2003	Noviembre 2003	Diciembre 2003
1	*Activos:*												
2	Efectivo y equivalentes de efectivo	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.985.000	$3.996.821	$ 1.499.128	$ 1.498.713	$ 1.498.301	$ 1.532.155
3	Prestamos por cobrar:												
4	A corto plazo	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 500.000	$ 500.000	$ 500.000	$ 500.000
5	A intermedio plazo	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.000.000	$ 2.000.000	$ 2.000.000	$ 2.000.000
6	A largo plazo	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.500.000	$ 2.500.000	$ 2.500.000	$ 2.500.000
8	Intereses por cobrar	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34.271	$ 52.813	$ 71.354	$ 55.625
9	Estimacion para creditos dudosos	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (75.000)	$ (75.000)	$ (75.000)	$ (75.000)
10	Prestamos y intereses por cobrar, neto	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.459.271	$ 2.477.813	$ 2.496.354	$ 2.480.625
11	Activos fijos	$ -	$ -	$ -	$ -	$ -	$ -	$ 15.000	$ 15.000	$ 15.000	$ 15.000	$ 15.000	$ 15.000
12	Depreciacion acumulado	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (313)	$ (625)	$ (938)	$ (1.250)	$ (1.563)
13	Activos fijos, netos	$ -	$ -	$ -	$ -	$ -	$ -	$ 15.000	$ 14.688	$ 14.375	$ 14.063	$ 13.750	$ 13.438
14	*Total activos*	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$4.011.509	$ 3.972.774	$ 3.990.588	$ 4.008.406	$ 4.026.217
15													
16	*Pasivos y captial contable:*												
17	Intereses por pagar	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Otras pasivos corrientes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.550	$ 4.675	$ 4.670	$ 4.675	$ 9.695
19	Total pasivos corrientes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.550	$ 4.675	$ 4.670	$ 4.675	$ 9.695
20	Prestamos bancarios:												
21	Banco nacional #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	Banco nacional #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	Banco internacional #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	Banco international #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25	Total prestamos bancarios	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
26	Titulos:												
27	Titulos - #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
28	Titulos - #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
29	Titulos - #3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	Titulos - #4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31	Total titulos	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
32	Deuda Subordinada:												
33	Deuda subordinada - #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
34	Deuda subordinada - #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	Deuda subordinada - #3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	Deuda subordinada - #4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
37	Total deuda subordinada	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
38	Certificados de Patrimonia: CONELECTRICAS												
39	y los Cooperativas de Electricidad	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$4.000.000	$ 4.000.000	$ 4.000.000	$ 4.000.000	$ 4.000.000
40	Utilidades acumuladas	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.959	$ (31.901)	$ (14.082)	$ 3.731	$ 16.522
	Total capital	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$4.001.959	$ 3.968.099	$ 3.985.918	$ 4.003.731	$ 4.016.522
41													
42	*Total pasivos y capital*	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.000.000	$4.011.509	$ 3.972.774	$ 3.990.588	$ 4.008.406	$ 4.026.217
43													
44		19-Sep-02	09:25 p.m.										

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: *Inversion de Cooperativas = $4 million+$1,500,000/ano*

ESTADOS DE RESULTADOS, POR ANO (EU$,000)

Exhibit E

			Projection Trend Begin	End	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	Intereses ganados, por plazo:													
1	Intereses ganados, por plazo:													
2	Corto	@	8,50%	10,00%	$ 12.396	$ 43.333	$ 44.167	$ 45.000	$ 45.833	$ 46.667	$ 47.500	$ 48.333	$ 49.167	$ 50.000
3	Intermedio	@	9,00%	11,00%	$ 52.500	$ 245.926	$ 346.296	$ 386.667	$ 445.000	$ 539.259	$ 602.778	$ 686.111	$ 790.370	$ 861.667
4	Largo	@	9,50%	13,00%	$ -	$ 1.137.222	$ 3.054.784	$ 4.642.963	$ 6.347.731	$ 8.173.241	$ 10.209.537	$ 12.147.531	$ 13.952.793	$ 16.044.167
5	Gastos de prestamos	@	1,00%	1,00%	$ 25.000	$ 468.333	$ 296.111	$ 321.967	$ 341.111	$ 375.556	$ 416.667	$ 363.889	$ 402.778	$ 477.778
6	Total				$ 89.896	$ 1.894.815	$ 3.741.358	$ 5.396.596	$ 7.179.676	$ 9.134.722	$ 11.276.481	$ 13.245.864	$ 15.195.108	$ 17.433.611
7														
8	***Rendimiento de inversiones***	@	3,65%	5,00%	$ 37.954	$ 58.222	$ 16.500	$ 16.133	$ 15.765	$ 8.714	$ 1.868	$ 16.975	$ 15.418	$ 11.960
9														
10	***Intereses pagados:***													
11	Banco nacional #1	@	6,50%	10,50%	$ -	$ 34.722	$ 101.597	$ 195.833	$ 269.028	$ 316.181	$ 389.583	$ 492.569	$ 628.472	$ 735.000
12	Banco nacional #2	@	11,00%	14,00%	$ -	$ 56.667	$ 102.083	$ 75.000	$ 46.250	$ 15.833	$ -	$ -	$ -	$ -
13	Banco internacional #1	@	8,50%	12,00%	$ -	$ 44.444	$ 81.181	$ 60.417	$ 87.986	$ 104.444	$ 67.708	$ 98.194	$ 174.167	$ 240.000
14	Banco international #2	@	8,50%	12,00%	$ -	$ 44.444	$ 81.181	$ 60.417	$ 37.708	$ 13.056	$ -	$ -	$ -	$ -
15	Titulos - #1	@	8,75%	13,00%	$ -	$ 691.667	$ 1.350.298	$ 1.198.214	$ 1.025.893	$ 1.861.111	$ 2.610.387	$ 2.139.861	$ 1.624.137	$ 2.957.500
16	Titulos - #2	@	8,75%	13,00%	$ -	$ -	$ 581.667	$ 1.132.857	$ 1.003.095	$ 857.143	$ 1.940.208	$ 2.923.472	$ 2.438.442	$ 1.908.214
17	Titulos - #3	@	8,75%	13,00%	$ -	$ -	$ -	$ 660.833	$ 1.284.266	$ 1.134.921	$ 968.036	$ 1.989.167	$ 2.908.234	$ 2.405.000
18	Titulos - #4	@	8,75%	13,00%	$ -	$ -	$ -	$ -	$ 824.514	$ 1.599.206	$ 1.410.685	$ 1.201.250	$ 2.442.917	$ 3.556.429
19	Deuda subordinada - #1	@	10,00%	14,00%	$ -	$ 104.444	$ 202.222	$ 178.095	$ 151.429	$ 244.444	$ 325.714	$ 262.222	$ 193.651	$ 280.000
20	Deuda subordinada - #2	@	10,00%	14,00%	$ -	$ -	$ 108.889	$ 210.476	$ 185.079	$ 157.143	$ 253.333	$ 337.143	$ 271.111	$ 200.000
21	Deuda subordinada - #3	@	10,00%	14,00%	$ -	$ -	$ -	$ 113.333	$ 218.730	$ 192.063	$ 162.857	$ 262.222	$ 348.571	$ 280.000
22	Deuda subordinada - #4	@	10,00%	14,00%	$ -	$ -	$ -	$ -	$ 117.778	$ 226.984	$ 199.048	$ 168.571	$ 271.111	$ 360.000
23	Total intereses pagados				$ -	$ 976.389	$ 2.609.117	$ 3.885.476	$ 5.251.756	$ 6.722.530	$ 8.327.560	$ 9.874.673	$ 11.300.813	$ 12.922.143
24	Otros				$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
25	Total gastos de fondos				$ -	$ 976.439	$ 2.609.117	$ 3.885.476	$ 5.251.756	$ 6.722.530	$ 8.327.560	$ 9.874.673	$ 11.300.813	$ 12.922.193
26														
27	***Margen financiero***				$ 127.850	$ 976.598	$ 1.148.741	$ 1.527.253	$ 1.943.685	$ 2.420.907	$ 2.950.790	$ 3.388.166	$ 3.909.712	$ 4.523.379
28														
29	***Gastos generales y administrativos:***													
30	Del personal		(*)		$ 20.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000	$ 48.000
31	Arrendamiento de oficina		(*)		$ 2.500	$ 6.000	$ 6.000	$ 6.000	$ 6.000	$ 6.000	$ 6.000	$ 6.000	$ 6.000	$ 6.000
32	Comunicaciones		(*)		$ 265	$ 840	$ 840	$ 840	$ 840	$ 840	$ 840	$ 840	$ 840	$ 840
33	Auditoria externa y Abogados		(*)		$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000
34	Suministros, computadores, etc.		(*)		$ 500	$ 5.000	$ 5.000	$ 5.000	$ 5.000	$ 5.000	$ 5.000	$ 5.000	$ 5.000	$ 5.000
35	Depreciacion				$ 1.563	$ 3.750	$ 3.750	$ 3.750	$ 11.250	$ 11.250	$ 9.688	$ -	$ -	$ -
36	Otras		(*)		$ -	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000	$ 10.000
37	Total gastos generales, etc.				$ 36.328	$ 83.590	$ 83.590	$ 83.590	$ 91.090	$ 91.090	$ 89.528	$ 79.840	$ 79.840	$ 79.840
38	Estimacion para creditos dudosos				$ 75.000	$ 730.000	$ 423.333	$ 425.000	$ 438.333	$ 451.667	$ 470.000	$ 356.667	$ 368.333	$ 428.333
39	Impuesto sobre la renta				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40														
41	***Utilidad neta***				$ 16.522	$ 163.008	$ 641.818	$ 1.018.663	$ 1.414.262	$ 1.878.150	$ 2.391.263	$ 2.951.660	$ 3.461.539	$ 4.015.205

(*) = Direct input.

19-Sep-02 09:25 p.m.

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: ***Inversion de Cooperativas = $4 million+$1,500,000/ano***

ESTADO DE FLUJO DE EFECTIVO (EUS.000)

Anexo F

				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	*Actividades de operacion*												
2	Utilidad neta			$ 16.522	$ 163.008	$ 641.818	$ 1.018.663	$ 1.414.262	$ 1.878.150	$ 2.391.263	$ 2.951.660	$ 3.461.539	$ 4.015.205
3	Depreciacion			$ 1.563	$ 3.750	$ 3.750	$ 3.750	$ 11.250	$ 11.250	$ 9.688	$ -	$ -	$ -
4	Estimacion para creditos dudosos			$ 75.000	$ 730.000	$ 423.333	$ 425.000	$ 438.333	$ 451.667	$ 470.000	$ 356.667	$ 368.333	$ 428.333
5	Cambios en activos y pasivos de operacion			$ (45.930)	$ (177.856)	$ (53.454)	$ (94.720)	$ (104.200)	$ (121.068)	$ (134.182)	$ (105.567)	$ (130.776)	$ (154.293)
6	Otras			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	Total operating cash flow			$ 47.155	$ 718.901	$ 1.015.447	$ 1.352.693	$ 1.759.645	$ 2.219.998	$ 2.736.768	$ 3.202.759	$ 3.699.096	$ 4.289.245
8	*Actividades de inversion*												
9	Prestamos - corto plazo	(Egresos)	(*)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)	$ (500.000)
10		Ingresos		$ -	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000
11	Prestamos - intermedio plazo	(Egresos)	(*)	$ (2.000.000)	$ (2.000.000)	$ (2.000.000)	$ (2.000.000)	$ (3.000.000)	$ (3.000.000)	$ (3.000.000)	$ (4.000.000)	$ (4.000.000)	$ (4.000.000)
12		Ingresos		$ -	$ 666.667	$ 1.333.333	$ 2.000.000	$ 2.000.000	$ 2.333.333	$ 2.666.667	$ 3.000.000	$ 3.333.333	$ 3.666.667
13	Prestamos - largo plazo	(Egresos)	(*)	$ -	$ (23.000.000)	$ (16.000.000)	$ (18.500.000)	$ (20.000.000)	$ (23.000.000)	$ (26.500.000)	$ (25.000.000)	$ (28.500.000)	$ (34.000.000)
14		Ingresos		$ -	$ -	$ 2.555.556	$ 4.333.333	$ 6.388.889	$ 8.611.111	$ 11.166.667	$ 14.111.111	$ 16.888.889	$ 20.055.556
15	Activos fijos		(*)	$ (15.000)	$ -	$ -	$ (30.000)	$ -	$ -	$ -	$ -	$ -	$ -
16	Efectivo neto de inversion			$ (2.515.000)	$ (24.333.333)	$ (14.111.111)	$ (14.196.667)	$ (14.611.111)	$ (15.055.556)	$ (15.666.667)	$ (11.888.889)	$ (12.277.778)	$ (14.277.778)
17	*Actividades de financiamiento*												
18	Banco nacional #1	Ingresos	(*)	$ -	$ 1.000.000	$ 1.000.000	$ 2.000.000	$ 1.000.000	$ 2.000.000	$ 2.000.000	$ 3.000.000	$ 3.000.000	$ 3.000.000
19		(Egresos)		$ -	$ -	$ (250.000)	$ (500.000)	$ (1.000.000)	$ (1.250.000)	$ (1.500.000)	$ (1.750.000)	$ (2.000.000)	$ (2.500.000)
20	Banco nacional #2	Ingresos	(*)	$ -	$ 1.000.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21		(Egresos)		$ -	$ -	$ (250.000)	$ (250.000)	$ (250.000)	$ (250.000)	$ -	$ -	$ -	$ -
22	Banco internacional #1	Ingresos	(*)	$ -	$ 1.000.000	$ -	$ -	$ 1.000.000	$ -	$ -	$ 1.000.000	$ 1.000.000	$ 1.000.000
23		(Egresos)		$ -	$ -	$ (250.000)	$ (250.000)	$ (250.000)	$ (500.000)	$ (250.000)	$ (250.000)	$ (500.000)	$ (500.000)
24	Banco international #2	Ingresos	(*)	$ -	$ 1.000.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25		(Egresos)		$ -	$ -	$ (250.000)	$ (250.000)	$ (250.000)	$ (250.000)	$ -	$ -	$ -	$ -
26	Prestamos bancarios - neto			$ -	$ 4.000.000	$ -	$ 750.000	$ 250.000	$ (250.000)	$ 250.000	$ 2.000.000	$ 1.500.000	$ 1.000.000
27	Titulos - #1	Ingresos	(*)	$ -	$ 15.000.000	$ -	$ -	$ -	$ 18.500.000	$ -	$ -	$ -	$ 27.000.000
28		(Egresos)		$ -	$ -	$ (2.142.857)	$ (2.142.857)	$ (2.142.857)	$ (2.142.857)	$ (4.785.714)	$ (4.785.714)	$ (4.785.714)	$ (2.642.857)
29	Titulos - #2	Ingresos	(*)	$ -	$ -	$ 12.000.000	$ -	$ -	$ -	$ 21.500.000	$ -	$ -	$ -
30		(Egresos)		$ -	$ -	$ -	$ (1.714.286)	$ (1.714.286)	$ (1.714.286)	$ (1.714.286)	$ (4.785.714)	$ (4.785.714)	$ (4.785.714)
31	Titulos - #3	Ingresos	(*)	$ -	$ -	$ -	$ 13.000.000	$ -	$ -	$ -	$ 20.000.000	$ -	$ -
32		(Egresos)		$ -	$ -	$ -	$ -	$ (1.857.143)	$ (1.857.143)	$ (1.857.143)	$ (1.857.143)	$ (4.714.286)	$ (4.714.286)
33	Titulos - #4	Ingresos	(*)	$ -	$ -	$ -	$ -	$ 15.500.000	$ -	$ -	$ -	$ 23.500.000	$ -
34		(Egresos)		$ -	$ -	$ -	$ -	$ -	$ (2.214.286)	$ (2.214.286)	$ (2.214.286)	$ (2.214.286)	$ (5.571.429)
35	Titulos - neto			$ -	$ 15.000.000	$ 9.857.143	$ 9.142.857	$ 9.785.714	$ 10.571.429	$ 10.928.571	$ 6.357.143	$ 7.000.000	$ 9.285.714
36	Deuda subordinada - #1	Ingresos	(*)	$ -	$ 2.000.000	$ -	$ -	$ -	$ 2.000.000	$ -	$ -	$ -	$ 2.000.000
37		(Egresos)		$ -	$ -	$ (285.714)	$ (285.714)	$ (285.714)	$ (285.714)	$ (571.429)	$ (571.429)	$ (571.429)	$ (285.714)
38	Deuda subordinada - #2	Ingresos	(*)	$ -	$ -	$ 2.000.000	$ -	$ -	$ -	$ 2.000.000	$ -	$ -	$ -
39		(Egresos)		$ -	$ -	$ -	$ (285.714)	$ (285.714)	$ (285.714)	$ (285.714)	$ (571.429)	$ (571.429)	$ (571.429)
40	Deuda subordinada - #3	Ingresos	(*)	$ -	$ -	$ -	$ 2.000.000	$ -	$ -	$ -	$ 2.000.000	$ -	$ -
41		(Egresos)		$ -	$ -	$ -	$ -	$ (285.714)	$ (285.714)	$ (285.714)	$ (285.714)	$ (571.429)	$ (571.429)
42	Deuda subordinada - #4	Ingresos	(*)	$ -	$ -	$ -	$ -	$ 2.000.000	$ -	$ -	$ -	$ 2.000.000	$ -
43		(Egresos)		$ -	$ -	$ -	$ -	$ -	$ (285.714)	$ (285.714)	$ (285.714)	$ (285.714)	$ (571.429)
44	Deuda subordinada - neto			$ -	$ 2.000.000	$ 1.714.286	$ 1.428.571	$ 1.142.857	$ 857.143	$ 571.429	$ 285.714	$ -	$ -
45	Efectivo neto de deuda			$ -	$ 21.000.000	$ 11.571.429	$ 11.321.429	$ 11.178.571	$ 11.178.571	$ 11.750.000	$ 8.642.857	$ 8.500.000	$ 10.285.714
46	Certificados de Patrimonio: CONELECTRICAS												
47	y los Cooperativas de Electricidad		(*)	$ 4.000.000	$ 1.500.000	$ 1.500.000	$ 1.500.000	$ 1.500.000	$ 1.500.000	$ 1.500.000	$ -	$ -	$ -
48	Dividendos pagados		(*)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	Efectivo neto por financiamiento			$ 4.000.000	$ 22.500.000	$ 13.071.429	$ 12.821.429	$ 12.678.571	$ 12.678.571	$ 13.250.000	$ 8.642.857	$ 8.500.000	$ 10.285.714
50	***Disminucion (aumento) en efectivo***												
51	Efectivo al inicio del ano			$ -	$ 1.532.155	$ 417.723	$ 393.487	$ 370.943	$ 198.048	$ 41.062	$ 361.163	$ 317.891	$ 239.209
52	Efectivo al final del ano			$ 1.532.155	$ 417.723	$ 393.487	$ 370.943	$ 198.048	$ 41.062	$ 361.163	$ 317.891	$ 239.209	$ 536.391
53													
54	(Prestamos bancarios + Titulos) /												
55	(Total capital + Deuda subordinado)			0,00	2,47	2,50	2,50	2,50	2,49	2,49	2,50	2,49	2,50
56	(Utilidad Neta + Total Intereses Pagados) /												
57	Total Intereses Pagados			NA	1,17	1,25	1,26	1,27	1,28	1,29	1,30	1,31	1,31
58	(*) = Direct input. 19-Sep-02 09:25 p.m.												

FINANCIERA CONELECTRICAS - Proyeccion

Scenario: *Inversion de Cooperativas = $4 million+$1,500,000/ano*

BALANCES GENERALES, POR ANO (EU$,000)

Anexo G

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	*Activos:*										
2	Efectivo y equivalentes de efectivo	$ 1.532.155	$ 417.723	$ 393.487	$ 370.943	$ 198.048	$ 41.062	$ 361.163	$ 317.891	$ 239.209	$ 536.391
3	Prestamos por cobrar:										
4	A corto plazo	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000	$ 500.000
5	A intermedio plazo	$ 2.000.000	$ 3.333.333	$ 4.000.000	$ 4.000.000	$ 5.000.000	$ 5.666.667	$ 6.000.000	$ 7.000.000	$ 7.666.667	$ 8.000.000
6	A largo plazo	$ -	$23.000.000	$ 36.444.444	$ 50.611.111	$ 64.222.222	$ 78.611.111	$ 93.944.444	$ 104.833.333	$ 116.444.444	$ 130.388.889
7	Total	$ 2.500.000	$26.833.333	$ 40.944.444	$ 55.111.111	$ 69.722.222	$ 84.777.778	$ 100.444.444	$ 112.333.333	$ 124.611.111	$ 138.888.889
8	Intereses por cobrar	$ 55.625	$ 473.704	$ 935.340	$ 1.349.149	$ 1.794.919	$ 2.283.681	$ 2.819.120	$ 3.311.466	$ 3.798.777	$ 4.358.403
9	Estimacion para creditos dudosos	$ (75.000)	$ (805.000)	$ (1.228.333)	$ (1.653.333)	$ (2.091.667)	$ (2.543.333)	$ (3.013.333)	$ (3.370.000)	$ (3.738.333)	$ (4.166.667)
10	Prestamos y intereses por cobrar, neto	$ 2.480.625	$26.502.037	$ 40.651.451	$ 54.806.927	$ 69.425.475	$ 84.518.125	$ 100.250.231	$ 112.274.799	$ 124.671.555	$ 139.080.625
11	Activos fijos	$ 15.000	$ 15.000	$ 15.000	$ 45.000	$ 45.000	$ 45.000	$ 45.000	$ 45.000	$ 45.000	$ 45.000
12	Depreciacion acumulado	$ (1.563)	$ (5.313)	$ (9.063)	$ (12.813)	$ (24.063)	$ (35.313)	$ (45.000)	$ (45.000)	$ (45.000)	$ (45.000)
13	Activos fijos, netos	$ 13.438	$ 9.688	$ 5.938	$ 32.188	$ 20.938	$ 9.688	$ -	$ -	$ -	$ -
14	***Total activos***	$ 4.026.217	$26.929.447	$ 41.050.875	$ 55.210.057	$ 69.644.460	$ 84.568.875	$ 100.611.395	$ 112.592.690	$ 124.910.764	$ 139.617.016
15											
16	***Pasivos y captial contable:***										
17	Intereses por pagar	$ -	$ 244.097	$ 652.279	$ 971.369	$ 1.312.939	$ 1.680.632	$ 2.081.890	$ 2.468.668	$ 2.825.203	$ 3.230.536
18	Otras pasivos corrientes	$ 9.695	$ 5.820	$ 5.820	$ 5.820	$ 5.820	$ 5.820	$ 5.820	$ 5.820	$ 5.820	$ 5.820
19	Total pasivos corrientes	$ 9.695	$ 249.917	$ 658.099	$ 977.189	$ 1.318.759	$ 1.686.452	$ 2.087.710	$ 2.474.488	$ 2.831.023	$ 3.236.356
20	Prestamos bancarios:										
21	Banco nacional #1	$ -	$ 1.000.000	$ 1.750.000	$ 3.250.000	$ 3.250.000	$ 4.000.000	$ 4.500.000	$ 5.750.000	$ 6.750.000	$ 7.250.000
22	Banco nacional #2	$ -	$ 1.000.000	$ 750.000	$ 500.000	$ 250.000	$ -	$ -	$ -	$ -	$ -
23	Banco internacional #1	$ -	$ 1.000.000	$ 750.000	$ 500.000	$ 1.250.000	$ 750.000	$ 500.000	$ 1.250.000	$ 1.750.000	$ 2.250.000
24	Banco international #2	$ -	$ 1.000.000	$ 750.000	$ 500.000	$ 250.000	$ -	$ -	$ -	$ -	$ -
25	Total prestamos bancarios	$ -	$ 4.000.000	$ 4.000.000	$ 4.750.000	$ 5.000.000	$ 4.750.000	$ 5.000.000	$ 7.000.000	$ 8.500.000	$ 9.500.000
26	Titulos:										
27	Titulos - #1	$ -	$15.000.000	$ 12.857.143	$ 10.714.286	$ 8.571.429	$ 24.928.571	$ 20.142.857	$ 15.357.143	$ 10.571.429	$ 34.928.571
28	Titulos - #2	$ -	$ -	$ 12.000.000	$ 10.285.714	$ 8.571.429	$ 6.857.143	$ 26.642.857	$ 21.857.143	$ 17.071.429	$ 12.285.714
29	Titulos - #3	$ -	$ -	$ -	$ 13.000.000	$ 11.142.857	$ 9.285.714	$ 7.428.571	$ 25.571.429	$ 20.857.143	$ 16.142.857
30	Titulos - #4	$ -	$ -	$ -	$ -	$ 15.500.000	$ 13.285.714	$ 11.071.429	$ 8.857.143	$ 30.142.857	$ 24.571.429
31	Total titulos	$ -	$15.000.000	$ 24.857.143	$ 34.000.000	$ 43.785.714	$ 54.357.143	$ 65.285.714	$ 71.642.857	$ 78.642.857	$ 87.928.571
32	Deuda Subordinada:										
33	Deuda subordinada - #1	$ -	$ 2.000.000	$ 1.714.286	$ 1.428.571	$ 1.142.857	$ 2.857.143	$ 2.285.714	$ 1.714.286	$ 1.142.857	$ 2.857.143
34	Deuda subordinada - #2	$ -	$ -	$ 2.000.000	$ 1.714.286	$ 1.428.571	$ 1.142.857	$ 2.857.143	$ 2.285.714	$ 1.714.286	$ 1.142.857
35	Deuda subordinada - #3	$ -	$ -	$ -	$ 2.000.000	$ 1.714.286	$ 1.428.571	$ 1.142.857	$ 2.857.143	$ 2.285.714	$ 1.714.286
36	Deuda subordinada - #4	$ -	$ -	$ -	$ -	$ 2.000.000	$ 1.714.286	$ 1.428.571	$ 1.142.857	$ 2.857.143	$ 2.285.714
37	Total deuda subordinada	$ -	$ 2.000.000	$ 3.714.286	$ 5.142.857	$ 6.285.714	$ 7.142.857	$ 7.714.286	$ 8.000.000	$ 8.000.000	$ 8.000.000
38	Certificados de Patrimonia: CONELECTRICAS										
39	y los Cooperativas de Electricidad	$ 4.000.000	$ 5.500.000	$ 7.000.000	$ 8.500.000	$ 10.000.000	$ 11.500.000	$ 13.000.000	$ 13.000.000	$ 13.000.000	$ 13.000.000
40	Utilidades acumuladas	$ 16.522	$ 179.530	$ 821.348	$ 1.840.011	$ 3.254.272	$ 5.132.422	$ 7.523.685	$ 10.475.345	$ 13.936.884	$ 17.952.089
	Total capital	$ 4.016.522	$ 5.679.530	$ 7.821.348	$ 10.340.011	$ 13.254.272	$ 16.632.422	$ 20.523.685	$ 23.475.345	$ 26.936.884	$ 30.952.089
41											
42	***Total pasivos y capital***	$ 4.026.217	$26.929.447	$ 41.050.875	$ 55.210.057	$ 69.644.460	$ 84.568.875	$ 100.611.395	$ 112.592.690	$ 124.910.764	$ 139.617.016
43											

19-Sep-02 09:25 p.m.

NRECA

REPORT
August, 2001

Elaborated by:
BEL INGENIERIA S.A.

Consulting Engineering

San Jose, Costa Rica

CONTENIDO

ANEXOS

APENDECIS

NRECA REPORT

1. Demanda de Energia Electrica en Costa Rica

1.1 El Sistema Nacional Interconectado

Existen en el pais aproximadamente 80 proyectos hidroelectricos mayores de 20 Mw que representan 8.000 Mw. La Ley 7200 que autoriza al ICE a la compra a generadores privados, a la fecha existen 18 proyectos con un total de 181.2 Mw con elegibilidad - CUADRO N° 1.1- ; 28 proyectos 5/2001 con solicitud de elegibilidad con 225.3 Mw - CUADRO 1.2 -, y 28 proyectos con una capacidad de 173.8 Mw ya instalados - CUADRO 1.3 -.Ademas hay alrededor de 300 Mw en microproyectos (menores de 1 Mw) potencialmente desarrollables. En resumen en Costa Rica podemos estimar en alrededor de 9.000 Mw aprovechables.

Al ano 2000 la capacidad mstalada es de 1796.80 Mw y en el ano 2020 segun el plan de expansion del ICE, incluido en el ANEXO N° 1.1, el CUADRO 1.8 muestra el cambio de la capacidad mstalada entre los anos 2000 y 2020 para tener a esa fecha 4441.20 Mw.

Año	Hidro y otros renovables	%	Eolicos	%	Térmicos y no renovables	%	Totales	%
2000	1516.8	84.4	46	2.6	234	13.0	1796.80	100.0
2020	2382.2	73.96	66	1.5	1093	24.6	4441.20	100.0

CUADRO 1.8

Capacidad Instalada en Mw con recursos renovables, eolieos y no renovables para los

El cuadro anterior sugiere que conviene hacer un esfuerzo en los proximos 20 anos en incrementar los renglones en recursos hidro y otros renovables ya que segue la informacion anterior la generacion con energia no renovable practicamente se esta duplicando segun el plan de expansion del ICE para el ano 2020.

1.2 **Aspectos tarifarios**

En el ANEXO N° 1-2 se adjunta copia de las tarifas que rigen a partir del 13 de marzo.

Exposition de motivos del ICE para tarifas 13-3-01

El ICE justifica el incremento de tarifas afirmando que para el promedio de las ventas en los ultimos 5 aiios; en terminos de colones constantes de 1995, los precios se han mantenido en todos los sectores de consumo (Industrial, Comercial y Residencial) invariables. En los ultimos meses del ano 2000 el ICE presento a la ARESEP una solicitud de ajuste de tarifas para el presente ano. El Regulador General, resolvio la petitoria del ICE responsablemente y los ajustes entraron a regir a partir del 13 de marzo del ano 2001, ver ANEXO 1.1.

Dicha resolution se sustento en la necesidad de obtener mgresos suficientes para invertir en la expansion del sistema electrico, asi como hacer frente a los costos de mantenimiento y operac16n, transmision y distribution de tal forma que el ICE garantice el abastecimiento electrico nacional y se evite una crisis energetica que seria catastrofico para el pais como ha sucedido en Brasil, California y Chile.

La demanda crece a razon de 6% anual y el sistema debe de adecuarse a esa proportion.

Un analisis de los incrementos tarifarios de los ultimos 5 aiios demuestra que los precios reales de la electricidad para el conjunto de todos los sectores de consumo han dismmuido en el 3%.

A continuation los comentarios del periodico de mayor circulation de Costa Rica, La Nacion, en relation con este aumento de tarifas:

"Evidentemente, el reciente aumento decretado por la Autoridad Reguladora de Servicios Ptiblicos (Aresep) fue abrupto y significativo. Sin embargo, a la luz de la evolution de las tarifas electricas nacionales, no parece desmesurado. Desde 1995, las tarifas electricas, tanto para el sector industrial como para el residential, venian disminuyendo en terminos reales. El Gobierno anterior y actual prefirieron dejar que la infacion redujera el precio de la electricidad antes que tomar la decision de mantenerlo constante con aumentos periodicos. Los precios reales de la electricidad para los industriales cayeron continuamente en cada uno de los ultimos seis anos. No fue hasta el ano pasado cuando el precio de la energia residential empieza a recuperar su valor anterior y, hasta hate tres meses, cuando ocurre para el sector industrial. Sin embargo, las tarifas electricas aun permanecen por debajo del nivel real de mediados de la decada pasada. Los grupos interesados han ocultado esta verdad.

La fijacion de las nuevas tarifas electricas por la Autoridad Reguladora de los Servicios Ptiblicos (Aresep) han enfrentado, en estos dias, dos situaciones o dos tipos de mentalidad ante los problemas del pals: el politico y el tecnico; el interes personal o gremial, y el nacional; el hoy y el ahora y la vision del futuro; la popularidad y la impopularidad, en fin, la vision del estadista y el oportunismo. En este conflicto de visiones e intereses se ha movido el pais, por varios anos, frente a sus problemas estructurales, asi como ante los desafios y signos de tiempos.

El diologo y la controversia son los elementos consustanciales del sistema democrdtico, de donde se sigue que, en este proceso dialectico, se impone tambien ceder para encontrar puntos de encuentro rationales y convenientes para el pais. Esta bzisqueda se toma, sin embargo, dificil cuando se introducen elementos contaminantes como los enunciados anteriormente o cuando se adoptan posiciones contradictorias. En el caso del establecimiento de las tarifas electricas, cada uno de los actores interesados ha dejado de lado aspectos esenciales. La Union de Comaras, aliada a otros grupos, algunos de los cuales han recurrido anteriormente a medidas de fuerza para lograr sus propositos, no ha destacado en forma transparente dos hechos basicos: el rezago de Las tarifas por cuanto, entre 1995 y el aho 2000, estas aumentaron por debajo de la infacion y, como consecuencia, el entorpecimiento de la inversion, que, al afectar un servicio estrategico a corto plaza, perjudicarb gravemente el desarrollo de las empresas y de la economia nacional. La Union de Comaras ha carecido asi de una vision de totalidad, en el orden tecnico y economico, que, por su propia naturaleza, no deberia serle ajena ".

Todo lo anterior explica las contradicciones y desinformacion de algunos "grupos de presion" en relacion con los precios de compra de energia electrica por el ICE a generadores privados que de acuerdo con la Ley 7200, que rige esta compra, establece que es por el costo marginal a largo plazo y con ajustes periodicos para contemplar inflacion y otros no previstos mediante una formula automatica de reajuste.

"Como quiera que evoluciones el debate nacional en relacion con las participaciones del Estado y el sector privado en la generacion eletrica, dentro de un contexto mundial caracterizado por una ineludible obligation de obtener provecho de las ventajas competitivas de cada pais, es claro que la estrategia de explotar el potencial hidroelectrico de Costa Rica tiene cada dia mas vigencia ".

ICE, Estudio de Factibilidad
P.H. Penas Blancas

Al momento de escribir este documento el ICE solicito una rebaja a las tarifas acordadas por Aresep el 13 de marzo del 2001.

La solicitud el ICE es la siguiente: Rebajar el 4% a todos sus clientes directos que representan 440.000 abonados y 2'/ % de rebaja a restos de los distribuidores cooperativos, CNFL, ESPH y JASEC que representan 605.000 abonados.

1.3 El CUADRO 1.7 muestra la proyeccion de la demanda del Sistema Cooperativo. El Capitulo 4 muestra una lista de los proyectos que podrian estar a cargo del sistema de Cooperativas Electricas; estos que representa 2/3 la demanda del Sistema Cooperativo.

Estudios futuros permitiran fijar el "back up" que deben tener las cooperativas para su interconexion con el sistema nacional_ El ICE no considera viable por el monto un aporte regional de energia.

PROYECTOS CON ELEGIBILIDAD A MAYO DEL 2001

NOMBRE DEL PROYECTO	NOMBRE LA EMPRESA	CAPAC. KW	UBICACIb N bEL PROYECTO	PRES EN T. ELE GIB.	DECLARAT. ELE GIB.	VENCIM. ELEGIB.			
LOS NEGROS	INVERSIONES NERJA DE SAN	17,0	AGUAS CLARAS,	28-Jun-	07-Dic-99	07-Dic-00			
LAS JUNTAS DE ABANGARES	PROYECTOS RUME, S.A.		LA SIERRA, ABANGARES, GUANACASTE	13-Ago-99	01 - Jun-00	01-Jur-01			
PIEDRAS NEGRAS	PIEDRAS NEGRAS S.A.		PURISCAL, SAN JOSE	02-Nov'99	07 - Jun-00	07-Jun-01			
SAN VICENTE	ASOC. HOGAR DE ANCIANOS SN VICENTE DE PAUL		75.0	SAN CARLOS, CIUDAD QUESADA	36-Oct-97	27-Jul-99	27-Jul-01		
SAN MIGUEL	MIGUEL RAMIREZ STELLER		17 000.0	COTO BRUS, PUNTARENAS	24-May-99	06-Oct-99	06-Qct-01		
PIEDRA PINTADA	LAGUNA DE LOS VOLCANES SA.		19,550.0	COTO BRUS, PUNTARENAS.	.03-Jun-99	26-Oct-99	26-Oct-01		
EL PORVENIR	DAGOBERTO BARBOZA NUNEZ		5,000.0	QUESADA, SAN CARLOS, ALAJUELA	19-Jui-89	26-Oct-99	28-Oct-01		
ATIRRO	D. ELECTRICOS VEREH S.A.		9,300.0	ATIRRQ Y LA ESPERANZA DE TURRIALBA	11-Jun-99	23-Ene-01	23-Ene-02		
DESTIERRO	HIDROELECTRICA DEL CARIBE SA,		2 604.0	GUACIMO POCORA LIMON	29-Jun-99	23-Ene-01	23-Ene-02		
SAN JOAQU N.	HIDRONOR S.A.		18 800.0	DOTA, SAN JOS	15-Jul-S9	23-Ene-01	23-Ene-02		
FLORFNCIA	HIDROFLORENCIA S.A.		20,000.0	FLORENCIA, SAN CARLOS, ALAJUELA	21-Oct-99	08-Feb-01	06-Feb-02		
SERENO	AGUA Y ENERGIA CENTROAMERICANA, SA.		7,000.0	CORREDORES, CORREDORES, PUNTARENAS	16-Nov-99	06-Feb-01	06-Feb-02		
RIO BLANQUITO	S Y M ALIMENTOS ROPICALES S.A.		3,800.0	GUAPILES • OCOCI LIMON	17-Nov-99	08- eb-01.	08- e. 12		
MANU	PROYECTOS AMBIENTALES DEL AT NTICO SA,		12,600.0	QU PILES, POC' LItA•N	17-Nov-99	13-Mar-01	13- ar-02		
LOS REYES	EMPRESA ELECTRICA LOS REYES S. A.		20,000.0	SAN MARCOS, TARRAZU, SAN JOSE .	21-Nov-99	13-Mar-01 '	13-Mar-02		
RIO JABONAL	PROYECTOS RUMS, S.A.		3,150.0	ZAPOTAL, SAN RAMON, ALAJUELA	0-sop-99	03-Abr-01	03-Abr-02		
LOS NEGROS 2	HIDROELECTRICA CUATRO BOCAS		20,000.0	UPALA, AGUAS CLARAS, ALAJUELA.	02-Dic-99	03-Abr-01	03-Abr-02		
SANTA CECILIA	INGENIERIA LEDEZMA S.A.		4,000.0	MOGOTE, BAGACES, GUANACASTE	28-Mar-0Q	03-Abr-01	Q3-Abr-02		

TOTAL: 181,229.0

CUADRO 1.2

PROYECTOS CON ELEGIBILIDAD EN ESTUDIO A MAYO DEL 2001

NOMBRE DEL PROYECTO	NOMBRE BE LA EMPRESA	CAPAC. KW	I UEIICACI6N DEL PROYECTO	PRESENT. SOLIC.
BAGACES GU CIMO P.H. GU • CIMO S.A.	BEL INGENIE- A S.A,	15000.0	CA S GU ' GU CIMO LI •	26-M 99 29-Se -97

TOTAL: 225,327.4

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OROS				MARGOT OSES RODR GUEZ			
MENA				MARGOTH OSES RODR GUEZ			
S • BALD				MARGOTH OSES RODR GUEZ			
PARRITaN				GEOINGENIE AINGENIEROS OiSU T•R SS.A.			
R 0 HULE				HIDROEL CTRICA R 0 RULE SA.			
SANTA CLARA				HIDROEL CTRICA R 0 SAN CARLOS S.A.			
LA MISI•N				HIDROEL CTRICALAMISI•N			
LOS NEGRITOS 2				EMPRESA CENTRAL HIDROELEC - ICA LOS EGRITOS $.A.			
CANO GRANDE I (AMPL)				HIDROEL CTRICA CANO GRANDE			
SINGRI				A CECILIA MORA MORA			
TABOGA				INGENIO TABOG • S.A			
COT • N				MARIANO RAM REZ STELLER			
ARISMINA				DESARROLLOS HIDROEL TRICOS ARISMINA SA.			
SAN LUIS II				T.T. TECNO TICO SA.			
CAPULIN				HIDROLAGARTO S.A.			
BELLA VISTA				HIDROBRUJO SA.			
NOBLE				HIDROELECTRICA NOBLE, SA.			
ANGELITA				EL ANGEL S.A.			
POS EL NGEL				EL • NGEL S.A			
CHUTA				HIDROMEGA NUMERO U 0 SA.			
R O BLPNCO				PROENERG A, S.A.			
CORINTO				HIDROCORINTO SA.			
CHACH UA				HIDROEL CT•ICACHACHAGUA $A.			
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EL EMB ALSE (AMP L)	EL EMB ALSE SA.	$A	CAR LOS, ALAJ UELA	09- Ma r-01			

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20000.0	PARRITA PU TARENAS		1 - -00
3 300.0	SARA- QU ALAJ ELA		7-Ma -00
9000.0	SAN CA OS ALAJUELA		1-Jun-00
4,695.0	STACRUZ TUR .1 BA		12-Jun-00
1900.0	GUAS ZARCAS ALAJUE		23-Jun-00
600.0	- •		30-Jun-0Q
15438.0			20-J -00
5 000.0	G ANACASTE		
15 000.0	SAN VI s COTO BRUS PU LTARENAS		08-Se -00
7 500.0	GU' CIMO LIM •N		28-S -00
19,968.0	REZ ZELE • • SAN JOB		**03-Oct-00**
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6,000.0	CERCA CARIBLANCO ALAJUELA		10-Oct-00
1 000.0	CERCA CARIBLANCO JUELA		**10-pct-oo**
4 600.0	CERCA CARIBLANCO UELA		**10-Oct-00**
803.0	LA FO -T A ALAJUELA		07-Die-00
13,000.0	V, DE CORONADO, SAN JOS		22-Dic-00
4 230.0	GUACIMO LIM N LIMON		03-Ene-01
4100.0			04-Ene-Q1

CUADRO 1.3

PLANTAS **EN** OPERACIbN A MAYO DEL 2001

NOMBRE DE LA PLANTA	NOMBRE DE LA EMPRESA	FUENTE ENERGIA	CAPAC• KW	UBICACI6N DEL PROYECTO	FIRMA CONTRATO	INICIO OPERAC.	**VENCIMIENTO** CONTRATO
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CUADRO **1,.5** Sistema de Generation Existente (at al o 2000)

1. pLANIA5HIlJKULLL'~IKIGAb

Nombre				Potenoa instalada (MW)	Generaa6n promedio anual (1982.1998) (GWh)	Volurnen Wit Embalse (Hmc	TWO	Costos de O&M Fgos i$.kW.aAo)	Variables (SO.1Wh)
/6 r3 e0 r a l	1605 .00		17 50						
(6 ¿1 c5 l i	**4 7 . 8 8**	E M B AL SE	17 50						
(7 ¿3 r0 (t i (i			17. 50						
(1 ¿6 r9 t a	**0.40**	F. D E A G U A	17. 50						
Menores (3)				32	164	-	F. DE AGUA	17.50	-
Rio Macho				120	570	0.39	F. DE AGUA	17.50	-
Ventanas Garita				100	456	0.66	F. DE AGUA	17.50	-
Sandillal				32	120	4.82	F. DE AGUA	17.50	-
Toro I				**23**	91	-	F. DE AGUA	17.50	-
Toro 11				66	277	0.23	F. DE AGUA	17.50	-
Angostura				177	900	11.00	F. DE AGUA	17.50	-
CNFL (4)				78	-	-	F. DE AGUA	17.50	-
Generaci6n Privada (Induye Coopelesca 8MW)				135	-		F. DE AGUA		-
Subtotal				1233	**4722**				

. rectos e rontera a navel de diciembre de 1999.

2. Para las plantas termoelbctricas se considerb el consumo especifico a plena carga, ademAs se supone el use de diesel de 10248 kcallkg, con peso especifico de 0.832 kgfd y de bunker C do 10207 kcaUkg, con peso especifico de 0.982 kgAt.

WS

78'

3. Plantas Menores : 32.4 MW (Cacao+Echandi+Avarice+Lutes+Pto. Escondido = 5.7 **MW).**

14Z.

1~ I g SNP

(ESPH+ IASEC = 26.7M1AA (, 4.

Daniel Gutierrez (21MW) + Brasil **(24MW)** + **Otras (33MW)**

2. FLA NI Ab t tt(M ULL .L t *KILA S*

pro me dio	espe cific a	Indis po-	*O & M*	Potenoa	Generaci6n anual Ot_ 5 afos)	Efiaencia	Tasa de nibilidad	Costos de Ftjos	Costos de Variables
Nombre				**(MW)**	(GWh)	(kWMitro)	(%)	(SIkW-aAo)	(S/MWh)
tlarrance				JO	60	Y.br	50	11.00	1.81
Colima				14	**43**	3.20	50	67.92	**3.72**
Moin Piston				26	30	**3.70**	50	14.75	**0.68**
SA Gas				30	50	2.50	50	62.42	1.35
Moin Gas				**134**	**314**	2.98	18	823	**5.98**
Subt otal				**4 9 7**					

Z. FLAN **I Ab ULU I tMMI(Ab**

Nombre	Potenoa elediva **(MW)**	Generaci6n promedio anual histOna .(GWh)	Eficienaa **especifia** (kWhfitro)	Tasa de Indisponi- bilidad (%)	Costos de OWM Fjos (S/kW-aAo)	Coslos de OW Variables (SIMWh)
Mrravalles 1	52.25	450		8	28.55	0.0
Iiravalles II	52.25			8	28.55	**0.0**
Boo de Pozo	5.00	30	-	8		
biravalles III	27.50			8		
Subtotal	137					

4. **UIFIAbNLANIAb**

	Potenoa efectiva (MW)	Generaci6n promedio anal histOria (GWh)
LJ Viejo (Gen. Pnv. 8iomasa Edlic 1 o 6 Priva1 do	4	6
	r+bNl 165 4	**MW**

CUADRO 1.6

SISTEMA NACIONAL INTERCONECTADO PROPUESTO AL **2020**

PLAN DE EXPANSION DE LA GENERACION
PLAN RECOMENDADO

DEMANDA			**OFERTA**		
Año	Mes	Energia (GWh)	**Crecim.** (%)	**Pot.** (MW)	**Crecim.** (%)

2 ((1	671 9	116 4		P.E. Tejona (20 MW)	200 1	6
2 ((2	705 9	5122	5	P.H. Penas Blancas (35.4 MW)	200 2	6
				P.H. Los Gemelos (20 MW)		8
				P.H. Ampliacion Garita (10 MW)		1
				P.T. Gas CNFL (2x 36 MW)		6
2	757	71	7	P.H	200	1

0 0 3	6	3 1 2	. 4	. Amplia ci6n Cachi (10 MW)	3	
				Reconstruccion Linea Moin - R. Macho		12
2 0 0 4	8131	71 4 0 8		P.G. Miravalles V (20 MW)	2004	1
				P.T. Ciclo Com. Barranca (100 MW)		1
				Retiro Termico Barranca (30 MVV)*		1
				P.H. BO		6

			T (130 MW)		
			Retiro Termico S. Antonio (30 MVV)*		12
2006	8726	1511	T.....	2005	
2006	9210	1595	P.H. Cariblanco (75 MVV)	2006	1
			P.H. Pirris (128 MVV)		4
			P.T. Motor M. Veloc. Moin (30 MW)		1
			Retiro Termico Moi		1

			n (26 MV V)		
			P.T. Motores M. Veloc. Colima (30 MW) Retiro Termico Colima (14 MV V)		1
2006	9718	116833	[illegible]	2007	
2008	10252	117766	P.H. Guayabo (234 MW	2008	1
			P.G. Borinquen - Las Pailas (1 x 55 MW)		1
2006	10813	1187	P.T. Motore	200	1

9		3	s Media Veloc. (1 x 20 MW)	9	
2(1(	11403	1975	P.T. Ciclo Combinado (100 MVV)	2010	1
2(1(	12023	2082	P.H. Pacuare (156 MW)	2011	1
2(12	12675	2195	P.H. Los Llanos (84 MVV)	2012	1
			P.T. Motor Media Veloc. (1 x 20 MR		1
2(13	13362	2314	P.T. Ciclo Combinado (10	2013	1

			0 MR		
			P.T. Gas (1 x 35 MR		1
2014	14084	!243 9	!P.T. Motor Media Veloc. (4 x 20 MW)	2014	1
2015	14845	!257 1	!P.T. Ciclo Combinado (100 MR	2015	1
2016	15646	!271 0	!P.T. Ciclo Combinado (100 MW)	2016	1
2017	16489	!285 6	!P.T. Bajo Boruca (593 MW)	2017	1
2	173	!3	!P.T	2	1

(' 8	76	0 0 9	. Mot or Me dia Vel oc. (1 x 20 MR	0 1 8		
2 (' 9	183 10	!3 1 7 1	{P.H . Siq uirr es 1 (20 6 MW)	2 0 1 9	1	
	192 94	!33 42	{P.T . Mot or Me dia Vel oc. (5 x 20 MW)	2 0 2 0	1	

Total para 2020 ***4441,20***

Valor presente ***delde PlaExpansion*** ***(275 3,20***

n, s..:..... *.s.,a,,* I .....- of--,, *I I.Il vwi m..,* *ti--* ***Jnndi***

Nivel de precios: Diciembre 1999

CUADRO 1. 7

Cooperativas de Electrificaci6n Rural de Costa Rica
Maxima demanda conjunta proyectada
1999-2020

Ano	% crecimiento	Capacidad MW	Ano	% crecimiento	Capacidad
1999	2010	169			
2000	2011	179			
2001	2012	188			
2002	5.05	105	**2013**	5.42	198
2003	7.33	113	2014	5.41	209
20	2015	5.42			

2004		1
2005	2016	5.42 3 2
2006	2017	2 4 5
2007	2018	2 5 8
2008	2019	2 7 2
2009	**2020**	2 8 7

** Fuente: Proyecciones d e la demanda de energla electrica en Costa Rica, ICE, Mayo 2000 ***
Fuente: Cooperativas de Iectrificacib rural de Costa Rica.

2. **Pocosol Hydroelectric Project**

2.1 ICE's Hydro Project Penas Blancas, 35 Mw installed capacity, is under construction using Penas Blancas River waters derived at maximum elevation of 311 m.s.n.m. Upstream, there are several possibilities of hydropower developments which should be studied to optimize the hydroelectric potential of the river. In order to compare with other possible sites, with the available information, the Pocosol site was chosen within elevations of 550 and 315 m.s.n.m. Due to its location in Canton San Carlos, a few kilometers away from San Lorenzo Hydroelectric Plant, reliable hydrological information available, topographic and access conditions, installed capacity > 30 Mw, its study has been recommended to CONELECTRICAS. Field visits to the site confirm favorable conditions for water conveyance, pondage, forebay, pennstock and power house locations. Tailrace will discharge at Penas Blancas reservoir.

Main characteristics of Pocosol Project are:

2.2 **Drainage basin**

Has an area of 99 km2, with a large proportion of forest protected by law and environmental societies. CONELECTRICAS has established contact with Monteverde's Bosques de los Nifios to obtain access to dam proposed site.

2.3 Hydrologic issues

ICE has a measuring flow station 14-20 Pocosol in Penas Blancas River, down stream diversion site, in operation for more than 20 years. Duration curves included in this report have more than the usual degree of confiability.

2.4 Geophysical issues

In relation to Penas Blancas Hydroelectric Project in construction by ICE, geologic, seismic and geographical studies were made that included the zone affected by Pocosol Project. From that study and the type of civil works involved with Pocosol, the risk issues expected are normal ones. Tunnel excavation, already finished at Penas Blancas, probably will have similar conditions at Pocosol.

2.5 Capacity

Using 18.00 m^3/s as design flow, with exceeding flows during 100 days (27.5% of the year) and total head of t 234.0 m, the installed capacity will be of the order of 36 Mw - and annual energy output will be ± 223.00 Gwh.

With useful pondage of 150000 m^3 and minimum flows of 5.0 m^3/s, the installed capacity may be delivered at 5 peak hours.

2.6 Project Description

See map, 1:25000, included here.

- *Diversions work site* Gravity concrete overflow diversion dam, 6.0 m height, uncontrolled crest at ± 550.0 m.s.n.m. Sluice way and intake works, including desilting facilities, to diver 18.0 m^3/s.

b) Conveyance

b.1 Tunnel section, 3.2 km long, 3.2 m equivalent diameter. b.2

Underground concrete pipe. L = 3.5 km D = 3.2 m

•*Pondage - Daily flow regulation*

Volume: 200000 m^3. *d) Forebay*

- *Pennstock* L=750.OOm D=3.OOm For total head ± 240 m plus water hammer.

f) Power House

Installed capacity 36.00 Mw. Probably 2 units.

g) Tailrace to Penas Blancas Reservoir.

h) Transmission Line to deliver at Penas Blancas

Substation at + 3.5 km.

CURVA DURACION

P.H. PENAS BLANCAS

(aguas arriba)

(Elev 550 msnm)

"

≈≈

Conelectricas

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P = 36 Mw

Qd= !8 [N ^{3} *~A*

Hb= 234 Gm

2.7 **Estimated Cost**

Based upon figures obtained from information from similar works.

	US$ Millions
Construction facilities	1.5
a) Diversion works	
b) b. I Tunnel 3.2 km	
c) Pondage	
d) Forebay	
e) Pennstock	

f) Power House and Tailrace	2.5
g) Transmission Line	
h) Electromechanical equipment	
i) Righ h of way	
Direct Cost	
Indirect Cost 35% x 43.5	15.2
Total Cost	US$ 58.7

Per Kw - $1630.00
Energy out put: 223.2 Gwh

With a capital recovery factor of 0.13147 (n = 15 years i = 10%), and OM cost of 0.015, we obtain

$$CostKwh = \frac{60.000.000 \times 0.1465}{223200000} = \$0.0394$$

2.8 Potential pumped storage scheme

InCentral America there is not a pumped storage project. There is in Costa Rica a daily variation in demand from around 1200 Mw at peak hours to about 400 Mw at night. During several hours at night there is an excedent of more than 100 Mw of installed capacity in run of a river projects,

even if they have pondage available. So there is an excess of low value off - peak, energy that used to pump and later turbine water in high value or peak energy, will justify such a type of project. There are other additional advantages as available reserve, improvement of power factor of the transmission system, etc.

As alternative in the Pocosol Project scheme is shown the possibility of combining the Pocosol Hydroelectric Project with a pumped storage scheme of 50 Mw. Pocosol pondage, enlarged to about 500000 m^3 of useful volume, would operate as the upper reservoir, with the Penas Blancas reservoir of more than 3000000 m3 of capacity as lower one.

With 50 Mw of installed capacity, 5 peak hours will required about 450000 m^3 of storage (t 25 m^3/s) at upper reservoir and about 6.5 hours of pumping that volume from Penas Blancas lower one.

Probable cost around US$50.000.000.

Estimated revenues:

$100 / Kw	Capacity =	US $5.000.000

0.035		Energy Gwh =	2.275.000
	US $7. 275 .00 0		

3. **Terms of Reference - Feasibility Study**

Stage 1 - Reconnaissance Study

Preliminary appraisal has been made. Should be completed to explore the alternative of the left side location on Rio Peflas Blancas, asses site issues especially diversion site, and verify right of way and water concession limitations. With GPS information to check IGN map used, recompute the technical and economic feasibility to assert its desirable implementation. Cost proposal: **US$30.000.00**

Stage 2 - Feasibility Study

Will comply with information and preliminary designs as required by credit institutions as BIRF, BID, CABEI, AID or project investors or bankers. Will include the following activities: *3.1 Basic information*

3.1.1 Gathering and ordering basic data.

3.1.2 Topographic information (our practice is to obtain detailed plans that will also be used in final design).

3.1.3 Hydrological and meteorological information.

3.1.4 Geological mapping.

3.1.5 Soils and materials investigation including sub soil explorations and drillings. 3.1.6 Environmental study to comply with SETENAS'S, MINAE, FEAP required information.

3.1.7 Unit costs of construction.

3.2 *Project Formulation*

3.2.1 Water availability. 3.2.2 Design maximum flow. 3.2.3 Sediments. 3.2.4 Pondage operation.

3.2.5 Power and energy production.

3.2.6 Transmission. 3.2.7 Preliminary designs. 3.2.8 Project implementation.

3.2.9 Quantities and costs of the Project.

3.2.10 Complete benefit and cost analysis.

3.2.11 Financial aspects.

3.3 Feasibility Report

3.3.1 Conclusions and Recommendations.

Cost proposal: US$600.000.00

NRECA International Ltd.

Your Touchstone Energy' Partner

4301 Wilson Boulevard IPD7-202
Arlington, VA 22203-1860 U.S.A.

September 20, 2002

Carlos Rodriguez Chaves
Consorcio de Cooperativas Electricas de Costa Rica, R.L.
Ciudad Quesada
San Carlos
Costa Rica

Dear Carlos:

This letter concerns the NRECA/CONELECTRICAS agreement of March 1998 relating to the San Lorenzo watershed protection and restoration project. In accordance with that agreement, we formed an Executive Committee that has periodically convened to plan the activities envisioned by our agreement. This letter documents the actions and decisions that we have taken to date, as follows:

I . A special account for joint climate change activities is hereby established by the parties. Funds will be committed to this account in equal proportions to implement mutually-agreed projects that contribute to the objectives of protecting virgin rainforest in its natural habitat, restoring watersheds to maintain or increase hydroelectric production potential, and contributing to greenhouse gas avoidance or sequestration.

2. The initial contribution of funds will be $60,000 including the transfer to CONELECTRICAS of $30,000 by the NRECA International Foundation, to be effected immediately.

3. CONELECTRICAS and NRECA will undertake to obtain official GHG emissions credits from the uses of funds in the special account for the mutual benefit of the parties.

4. CONELECTRICAS has purchased a parcel of land totaling 114 hectares in the San Lorenzo watershed to be financed from the special account. The uses of the remaining funds in the account, and any additional funds contributed to the account in the future, will be decided by the Executive Committee.

5. CONELECTRICAS has entered into an agreement with the University of Costa Rica for the purpose of monitoring and protecting this land in its natural state and to undertake any activities as may be feasible to enhance carbon sequestration and to obtain official carbon credit associated with such activities.

6. NRECA and CONELECTRICAS agree to explore the feasibility of establishing a special program to involve electric cooperative youth from the U.S. and Costa Rica in advancing the objectives of the NRECA/CONELECTRICAS agreement.

Attached to this letter is documentation pertaining to the purchase of the San Lorenzo land parcel. Your countersignature in the space provided below will affirm our mutual concurrence of the information documented herein.

Sincerely,

,Paul J. Clark
Vice President
NRECA International, Ltd

Countersignature:

_____
Carlos Rodriquez Chaves

General Manager
CONELECTRICAS, R.L.

ANNEX E

INTERNA TIONAL ELECTRIC COOPERA TIVE INITIA TIVE ON ENERGY EFFICIENCY

Revised Project Description

I. PROJECT DESCRIPTION (Revised)

A. NRECA's Program Focus

Area of Interest- The project will address the objectives of Area of Interest No. 6 (B): International Energy Efficiency and Renewable Energy: Information Dissemination, Outreach, and Training.

Key countries-- The project will focus on initiating a program in the Latin America/Caribbean (LAC) region where NRECA is developing EE/RE programs.

Principal participants and beneficiaries - The project is designed to form a broad participative framework for pro-active and voluntary action to promote energy efficient *rural electric development, including climate change mitigation,* ***of, by, and for the global community of electric cooperatives and the energy users they serve,*** including the U.S. electric cooperative industry, up to some 1,000 electric cooperatives overseas, and most of all the disadvantaged populations overseas needing economically beneficial and environmentally acceptable options for electrification.

B. Project Summary

NRECA is an association of over 1,000 U.S. electric cooperative utilities, affiliated agencies, and associated technology developers, equipment suppliers, and other related industries. It represents a well-defined rural electric industry in the U.S. covering roughly 10% of the total electric power market, serving roughly 30 million people. NRECA has an international subsidiary, NRECA International, Ltd. ("NRECA"), which has been exporting the U.S. electrification pattern overseas since 1962, developing electric cooperatives and working with governments and development agencies to promote rural electrification. An estimated 50 million people receive electricity from electric cooperatives that have been developed by NRECA and this model may expand rapidly in the coming years. Altogether NRECA has relationships with some 1,000 electric distribution cooperatives in ten countries worldwide.

Many of NRECA's current programs overseas involve improving the overall efficiency of existing and planned rural electrification through improved technology choices, construction, operation, and management. For example, NRECA is promoting the use of distributed renewable energy power plants to feed additional electricity to existing and new rural electric cooperatives and other distribution projects. These smaller distributed systems make sense in order to bypass choked transmission grids and to speed up the process of capacity adding where markets remain underserved,

Attachment E to
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thus improving reliability and putting the investment decisions closer to where the demand exists. Also, where poles-and-wire electrification isn't economically justified, NRECA is also expanding the use of solar PV and other stand-alone renewable energy systems. Last but not least, NRECA is working extensively in areas of technical and non-technical loss control, technology modernization, demand-side management and operational improvements to reduce needless waste of generated power once it enters the distribution systems. This latter area is the principal focus of this application to
DOE.

All of this is needed to assure that electrification is being developed more quickly, efficiently, and more sustainable in order to meet the exploding demand for energy in developing countries. There is also a big pay-off in terms of greenhouse emissions avoidance from cutting losses in distribution systems that carry power generated from thermal generation plants, and from expanding the role renewables as the technology of choice for meeting new demand. One of NRECA's aims is to devise a formal mechanism that can capture the tangible benefits of these emissions-reducing effects, and by doing so, create a new basis for obtaining new capital to expand these projects and programs overseas, as well as creating the opportunity for electric cooperatives worldwide to participate voluntarily and jointly in a dynamic and structured effort on climate change.

Many of these projects require varying levels of capital investment to complement technical assistance and technology transfer. NRECA has therefore proposed the creation of specially directed capital instruments to channel privately sourced capital to support these activities. NRECA has been successful in raising funding and interest from a wide range of sources to work collaboratively in the implementation of these activities. Putting together the common areas of interest of electric cooperatives both in the U.S. and overseas, and building on NRECA's on-going development of projects with funding mechanisms that reduce or avoid carbon emissions, the purpose of this initiative is to create a unique international system and "community" of cooperative action on energy efficiency and also climate change mitigation.

NRECA's application to DOE is for an activity to design, develop, and launch an appropriate mechanism for mobilizing and coordinating resources among the participating beneficiaries for obtaining and "banking" carbon emissions credits, including education and promotional activities among NRECA's membership in the U.S, and presentation of a portfolio of projects with NRECA's counterpart cooperatives. NRECA will gear the program to incorporate project that are already under development in the LAC region, including Central America; Brazil, the Dominican Republic and/or other countries where a portfolio of alternative energy efficiency projects can be identified.

C. Beneficiaries and Benefits

NRECA -*increases its capacity to finance and carry out programs that meet its international program mission of increasing sustainable* ^{electrification} *worldwide and develops a mechanism to obtain official credit for climate change activities*

- U.S. electric cooperative industry - *gains a new opportunity to participate overseas in worthwhile projects that contribute to sustainable electrification development and that expand the market for US technology and practice*

- Electric cooperatives overseas requiring new means to serve their rapidly growing membership - *gain access to new electrification resources and technology*

- Rural populations still waiting for electricity -*may reach that goal by forming new cooperatives or joining existing cooperatives and participating in the initiative*

D. Team Composition and Roles

NREG4 International, Ltd.: NRECA will serve as the consortium leader and will manage the activities, reporting, financial submittals, etc.

NRECA International Foundation: The Foundation is organized under federal tax laws as a charitable tax-free organization that musters donations of money and goods to promote rural electrification worldwide. The Foundation receives donations of funding and equipment (meters, conductor, insulators, etc.) that may be used in implementing projects.

National Rural Utilities Cooperative Finance Corporation ("CFC'9: The CFC is a utilityowned finance corporation with some $11 billion in assets having a membership very similar to NRECA's. CFC will assist in designing the proposed mechanism and in its oversight and operation.

Energy Resources International ('VU"'.' ERI is a reputable international energy consulting firm that specializes in GHG emissions offset mechanisms. ERI will assist in the program design as regards the GHG credit system, and supporting the program during the operational stage.

E. Project Funding and Other Resource Contributions

The Project will be implemented with a number of sources and forms of resources, including:

- DOE grant: $210,000 over two years

- NRECA International Foundation: Contribution of in-kind project development materials

- CFC/NRECA International, Ltd: Capital funds and in-kind contributions raised through related project initiatives from host-country and international participants, NRECA member systems, and individuals

- International cooperative partners: Counterpart support for logistics and technical staff in project development.

II. PROJECT NARRATIVE

A. Background

Electric cooperatives overseas face a variety of challenges. Unlike their U.S. counterparts, in general they have no constant source of technological, financial and advisory support as are found in the Rural Utilities Services and other U.S. Government agency programs that are designed to assist them, the NRECA and its various affiliates and subsidiaries that provide all these kinds of services, and a wide range of service and product industries that keep them supplied with high-quality products that make them increasingly able to be efficient and reliable energy distributors. Second, they have an ever-widening gap between their demand for these kinds of assistance needs and their means of supplying them, since, while their capacities remain more or less constant, the demands on them - from growing population and the energy demand levels - are typically rising at annual rates reaching or exceeding 10%. Third, they increasingly find themselves coming under new forms of regulatory and competitive pressures to address these needs, as the process of power sector restructuring and privatization sweeps across the world. These are positive changes in their operating environment, generally speaking but theyy need to benefit from the transformation that is taking place in the form of new financing, technology, and management expertise is now entering overseas power sectors.

As a group, like most developing-country electric power systems, they suffer from extremely high rates of energy loss - typically between 2 and 5 times the distribution loss levels found in U.S. electric cooperatives - and other operational weakness that come from lack of money, know-how, technology, and the means to increase their supply of reliable electricity production. Most important, of all the forms of electric service organizations in developing countries, electric cooperatives overseas, like their U.S. counterparts, they are typically the closest to a growing crisis in the international power industry, namely the socially and environmentally dangerous problem of rapidly growing, already large, and largely ignored, rural populations without access to electricity. The fact that half or more of the population may be without electricity in any given country that is privatizing, and without any obvious way of getting it anytime soon, is political dynamite, not to mention the potential environmental consequences.

NRECA and the U.S. rural electric community in general is in a position to alleviate this crisis, and a confluence of interests in this community is emerging at this point in NRECA's international program history that presents an unusual opportunity to match domestic U.S. interests directly with NRECA's international program mission interest.

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B. Project Activities

The proposed "International Cooperative Initiative on Energy Efficiency" ("Initiative") will establish a program to channel resources from the U.S. electric cooperative community into feasible and attractive electric energy efficiency improvement projects overseas. The explicit purpose of this program is to (1) advance the cause of extending electric service to any who seek it by building-in higher levels of energy efficiency in existing supply systems and those planned for the future; (2) develop opportunities for U.S. electric cooperative industry, as represented by NRECA', to develop overseas markets for U.S. electrification technology, practices, and services; (3) create a system to capture GHG offset credits for voluntary early action on climate change, and (4) mobilize new capital resources for accomplishing all of these goals through direct capital subscription to the participants and by capitalizing on the inherent GHG offset credits that may be obtained.

Component 1: Establish the Mechanism The central feature of the initiative, that is to be designed during the first year, is a mechanism having the following basic features:

- A project portfolio of electric distribution efficiency improvement projects, such as described further below;
- A brokerage capability to match resources (funding, materials, volunteers) with projects;
- An appropriate program or corporate structure that will assure a high degree of accounting structure, compliance monitoring and representative governance to satisfy participants that all due diligence is being applied in managing their resources and interests, without sacrificing management flexibility and efficiency; and
- A sanctioned method for valuing GHG mitigation effects and for obtaining official credit for voluntary early action.

The Initiative will provide the means to design, develop, and initiate this new program mechanism, as the primary objective of the proposed project, using one of several models. One model is a CFC fund. From time to time, CFC establishes special purpose funds under which CFC members participate with contributions of year-end CFC capital credits (from operating margins) and other financial contributions. As an experienced portfolio manager of a diverse group of U.S. electric cooperative investment and economic development projects, CFC would form an appropriate management basis for receiving funds, performing financial due diligence on projects and compliance supervision, reporting portfolio performance to investors, etc. As envisioned, CFC will assist in providing this level of support for the Initiative regardless of the format. A second model is similar but instead would establish this type of facility

[1] NRECA's formal membership includes not just electric cooperatives, but a wide array of service associations and providers, equipment manufacturers and procurement agencies, financial agencies, technology development companies, and other elements of a full-

as a separate international corporation, which could facilitate a more direct collaboration and participation with international electric cooperatives. A third model is found in a series of relatively new initiatives within NRECA which are special-purpose membership entities in fields such as technology R&D and marketing. A new NRECA marketing initiative "Touchstone Energy," and NRECA's "Cooperative Research Network" are examples of this model, which would involve a separate program management. scheme that would serve under a membership board or steering committee made up of the entity's participants. This model may also allow direct participation by international electric cooperatives. A general schematic of the "Center" in this Initiative appears on the following page.

Component 2: Proiect Portfolio The mechanism's financial feasibility, its overall sustainability, and its ability to succeed from a capital subscription standpoint and from an operational standpoint as an investment vehicle, will rely largely on the quality of projects that NRECA will bring to it. Therefore a significant portion of the project will be dedicated to preparing a project portfolio of high-impact projects that do all of the following:

Increase efficiency in terms of better delivery and use of energy and plant capacity, provide quantifiable reduction or avoidance of GHG;

- Promote the principle consumer participation through cooperative formation and direct participation in energy saving programs;
- Facilitate compliance with regulatory and other policy standards relating to efficiency and quality of electricity service;
- Improve the capacity of the host cooperative to serve its membership and service area constituency; and
- Afford opportunity for application and export of U.S. technology products and equipment.

The Initiative will focus primarily on the distribution efficiency activities. NRECA is already heavily involved in renewables overseas in a number of complementary projects, including solar PV electrification, hybrid diesel/renewables in an off-grid application mode, and on-grid distributed power development including small hydro, wind, and biomass/steam plants, and will integrate these project activities within the proposed Initiative structure.

Distribution utilities including electric cooperatives in Latin America are hampered by having little access to technology and financing needed to make significant improvements in their distribution systems. The Initiative will help to serve this need, and will establish a region-wide program to provide expertise, technology, and financing to support projects to reduce losses and increase demand-side efficiency. NRECA/CFC have contacted the Inter-American Development Bank and the Multilateral Investment Fund about setting up a regional fund to support electric cooperative development. The Initiative will work through this companion initiative to develop a targeted portfolio of

distribution efficiency improvements projects with electric cooperatives in the LAC region. The Initiative, in any format that is selected, will strive to assure sustainability through full capital recovery plus return on investment for the participating U.S. electric cooperatives and other participants. Each participant would have a separate account with a record of contributions made and returns earned, counting both the financial value of their participation in projects and GHG offset credits.

Component 3: Outreach NRECA will dovetail the Initiative with on-going outreach activities for its member cooperatives and CFC members, in order to obtain guidance on their preferences and ideas in designing the Initiative, and eventually in enlisting their formal participation. In particular, solicitations for materials and equipment will be made to NRECA member cooperatives and other U.S. utilities through the NRECA International Foundation, based on the specific requirements of projects in the portfolio. Also, some 20 NRECA member cooperatives have sister co-ops overseas; these sister co-ops will be recruited to help develop projects for the Initiative's portfolio.

C. Project Resources

The Initiative will be established under a combination of NRECA staff and membership voluntary participation, DOE funding, and counterpart support from NRECA international cooperative partners in carrying out project development activities. Once operational, the participants in the Initiative will provide a large and on-going stream of resources, depending on the level of project activity and investment that results from the Initiative. The primary resource components for the Initiative would consist of $210,000 over two years from the DOE grant, contributions of equipment and labor, capital funds and in-kind contributions raised through related project initiatives from host-country and international participants, NRECA member systems, and individuals totaling a minimum $150,000.

The counterpart support that will be provided in the project implementation phase, as well as the large downstream investment levels that are anticipated - expected to reach millions of dollars on a worldwide footing - underlies the economic efficiency of NRECA's application to DOE. A copy of the revised SF-424 form is attached.

D. Project Implementation and Deliverables

The Initiative will be developed around an advisory group of NRECA and CFC member cooperatives, including managers and directors who will help guide the team's decision-making and development of the mechanism. At the outset, NRECA will approach members (e.g. sister cooperatives) who are deemed most likely to participate in the initiative in identifying and orienting this group. A briefing paper will be distributed outlining the background of the initiative and a general definition of the Initiative mechanism, type of projects to be implemented, expected benefits, etc. as the basis for soliciting comments and ideas. Following this period of opinion gathering and initial analysis of the mechanism, climate change mitigation policies/trends, and project

implementation conditions, a second paper will be developed and distributed that presents a more formal structure for the Initiative, including alternative options with pros and cons on aspects ranging from project eligibility criteria to basic legal status issues. By this time NRECA will have had initial consultations with local partners in portfolio candidate countries (e.g. electric cooperatives, government authorities) and also with the IDB/MIF, local USAID missions, and other agencies involved in related NRECA project activities. The paper will also describe the outlook for candidate projects, scenarios and issues regarding carbon credits, and institutional inter-relationships during implementation. NRECA will schedule a meeting no later than the NRECA/CFC annual meeting with the advisory group in order to discuss the details of the mechanism and to determine a future course of action.

The team will then complete the due diligence on the preferred Initiative format and an initial portfolio, and will present a final prospectus-quality document on the Initiative by the time of the NRECA summer meeting of its Board of Directors (June 2000) for formal action as required. Thereafter, NRECA will proceed with implementation, including incorporation actions, formal solicitation notices to previously identified NRECA/CFC members, execution of project implementation contracts, etc. with the goal of being ready to launch the Initiative in a pilot phase by September 1, 2000, subect to obtaining implementation funding. NRECA will present a written report to DOE on the results of the first year's work by July 31, 2000. A proposal for follow-up assistance in the second year (implementation phase) will be outlined in this report. Deliverables to DOE will including the following:

Project Workplan	September 30, 1999
Background Paper	October 31, 1999
Options Paper	January 31, 1999
Initiative "Prospectus"	June 30, 1999
Annual Report	July 31, 1999

E. Administration and Results Monitoring

NRECA will serve as the consortium leader and will manage the activities, reporting, financial submittals, etc. NRECA will take the lead defining the proposed mechanism, consulting with key representatives of NRECA's membership on the direction of the initiative, educating membership on the purpose and benefits of the initiative, coordinating with U.S. and counterpart agencies including the MDBs and hostcountry agencies, orchestrating NRECA field office efforts to select and prepare projects in the portfolio, and will participate in the implementation team. The Foundation will responsible for providing counterpart support (cost share), and will conduct an outreach program to solicit support in the form of materials and other forms of participation from NRECA's broader membership.

CFC's role will be to assist in the development of the mechanism, focusing on the structure, financial due diligence, interaction with other project-specific entities and will also participate in the membership education aspects and the implementation phase.

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ERI will assist in the development of the mechanism in order to gain official credit for activities yielding carbon offsets including coordination with US and international authorities, and will also participate in soliciting direct and indirect collaborative support from outside NRECA's membership, as appropriate.

NRECA's core project team will include Paul Clark who will lead the effort; Dan Waddle who handles renewable energy, and James Willis, who will provide engineering expertise and interaction with member co-ops through the NRECA International Foundation. In view of budgetary contstraints, in-country work on portfolio development activities will be carried out in close coorindation, where possible, with NRECA staff in on-going projects that are separately funded, and by recruiting local personnel, as needed. A small amount of salary budget ($2,000) has been reserved for this purposes. Martin Crowson will represent CFC in the core team, and David South will represent ERI.

NRECA will be responsible for all compliance reporting to DOE for the Initiative, and will provide present annual work plans describing activities, levels of effort planned, and expected milestones, and quarterly reports to DOE/EERE on progress on key activities.

In terms of monitoring results, once operational, the Initiative will be structured as an enterprise that maintains annual operating data on overall performance in annual reports. There will also be specific project performance data including resource value contributed, denominated in money terms and by source, and project investment activity by project and by participant account, that will be denominated in money terms and GHG offset credit terms. In this manner, it will be readily seen what the overall performance impacts of the Initiative is in terms of the degrees of participation, sustainability, leveraging, U.S. exports, and GHG offset impacts.

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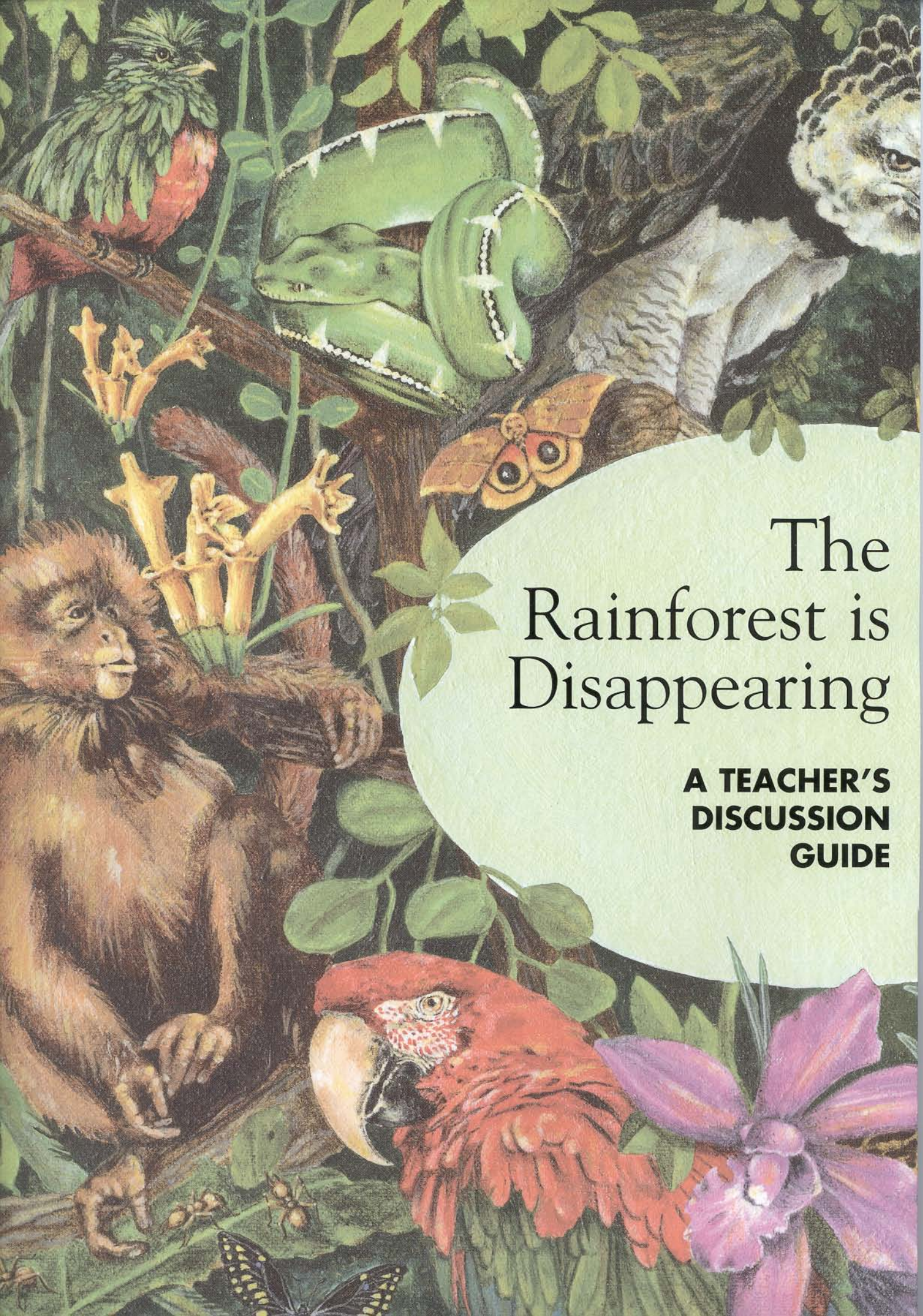

The Rainforest is Disappearing

A TEACHER'S DISCUSSION GUIDE