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**SUMMARY OF THE CENTRAL AMERICAN  
AND CARIBBEAN WORKSHOP ON  
ELECTRIC POWER:**

**ROLE OF DEMAND MANAGEMENT  
AND POLICY ISSUES FOR  
INDEPENDENT POWER GENERATION**

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# **SUMMARY OF THE CENTRAL AMERICAN AND CARIBBEAN WORKSHOP ON ELECTRIC POWER: ROLE OF DEMAND MANAGEMENT AND POLICY ISSUES FOR INDEPENDENT POWER GENERATION**

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## **1. Background and Objectives**

The Central American and Caribbean Electric Power Workshop was held in San Jose, Costa Rica, from August 29 to September 1, 1988 and was sponsored by three organizations: the Ministerio de Recursos Naturales, Energia y Minas of Costa Rica (MRNEM), the Instituto Costarricense de Electricidad (ICE), and the U.S. Agency for International Development (A.I.D.). A Workshop Agenda is attached as Exhibit 1.

More than 130 representatives of national electric power companies and governments in the Central American and the Caribbean region, multilateral and bilateral development agencies, and a number of regional and U.S. private-sector firms attended the workshop. Government representatives included several energy ministers and many of the key energy officials in the region. A List of Participants is attached as Exhibit 2.

The objectives of the workshop were twofold:

- (1) To provide a forum for discussions among senior representatives from the region (national electric power companies and ministries), officials from multilateral lending agencies and A.I.D., and private-sector representatives
- (2) To define the potential for demand management and identify opportunities for, and impediments to, effective participation by the private sector in power generation in the region.

## **2. Summary of Workshop Findings**

The workshop participants acknowledged the critical power situation in the region. Electricity demand has grown more than expected in many countries of the region, forcing utilities to reexamine their expansion programs and move forward many

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projects. However, the financing options available to these utilities for capacity expansion are very limited.

In planning their power supply, these countries must take account of several key issues:

- Electricity is essential for economic growth
- Electricity demand growth is higher than projected in many countries in the region (7 to 10 percent higher)
- Capital availability is limited
- Large investment will be required (some U.S. \$3 billion to U.S. \$5 billion for the period 1989 to 1994)
- Systems are operating below capacity and/or are not properly maintained
- Tariffs are inadequate.

The workshop included a Public Utility Round Table, which was held in the morning of the first day.

**Public Utility Round Table.** The representatives of national electric power companies participating in the Public Utility Round Table stressed that the major issue in the power sector was the limited capital available to satisfy operating and expansion needs. Mr. Rafael Moscote, Chief of Energy and Infrastructure of the Latin America Technical Department of the World Bank, said that the lending implications of project development need to be taken more fully into account. The power sector will have difficulty obtaining the capital it needs in the future. Its requirements will be too great for the multilateral and bilateral agencies alone to satisfy, given their limitations on available capital and other priorities in the economy.

Assuming that power-sector investment requirements will be on the order of billions of U.S. dollars in the short- to medium-term, the participants generally agreed that new financing sources need to be found. The expansion of electricity transmission and distribution systems in the region as a whole has not received proper attention, and the generation expansion projects planned for the 1990s need to come on line.

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Furthermore, many countries in the region are still unable to maintain electricity tariffs at, or increase them to, their economic cost.

Some of the concerns expressed by each country are summarized below:

Mr. Mario Hidalgo, Deputy Chief of Energy of the Instituto Costarricense de Electricidad (ICE) of **Costa Rica**, said that the country has a large external debt, balance of payment difficulties, limited financial resources, an increasing dependence on imported petroleum fuels for power generation in peak demand periods, and a higher than estimated electricity demand growth rates in recent years. As a result, ICE has emphasized the adoption of energy conservation measures and has entered into negotiations with small (less than 20-MW) private-sector suppliers of power, including power generated by small hydro and by cogeneration in sugar mills. ICE's expansion plan calls for the use of gas turbines in the 1990s that would be fueled by imported diesel, creating additional pressures on the country's balance of payment.

In **Belize**, Mr. Derek Davis, Manager of Transmission and Distribution of the Belize Electricity Board (BEB), pointed out that BEB has achieved a major breakthrough, reducing power system losses from 25 to 15 percent. If a demand management program is undertaken in Belize, he added, it should be focused on peak reduction.

Mr. Francisco Granadino, Manager of Generation and Transmission of the Comision Ejecutiva Hidroelectrica del Rio Lempa (CEL) of **El Salvador**, indicated that CEL faces serious financial constraints with tariff increases of 130 percent required to cover operating costs and contracted debt. The demand for electricity is more than 2 percent above the level projected. This will require the expansion projects to be moved forward. In addition, El Salvador increasingly relies on thermal power generation since up to 75 percent of its power line towers have been damaged by internal conflict, thus, interrupting the hydropower-based supply. To tackle some of these problems, CEL is investigating mechanisms to reduce peak demand and is studying the use of cogeneration at sugar mills.

In **Guatemala**, Mr. Edgar Flores Izaguirre, Manager of Planning and Projects of the Instituto Nacional de Electrificacion (INDE), indicated that as a result of the completion of the 300-MW Chixoy hydropower plant, Guatemala has an overall power

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surplus in the short term. It is now focusing on the rehabilitation of its thermal plants. Mr. Roland Castillo Contoux, Minister of the Ministerio de Energia y Minas (MEM), noted that electricity tariffs are below economic cost and are unlikely to be increased in the near future.

In **Honduras**, Mr. Jose Danilo Esquivel, Manager of the System Planning Office of the Empresa Nacional de Energia Electrica (ENEE), said that, as a result of the 290-MW El Cajon hydropower plant, Honduras has surplus power. However, ENEE is in a critical financial situation, and the investments needed to expand the transmission and distribution system have been delayed because of lack of financing. Furthermore, the surplus of hydropower is only temporary. ENEE thus considers two actions necessary in the 1990s: the rehabilitation of the thermal plants and demand control through load management.

In **Jamaica**, Mr. Orville Cox, Chairman and Chief Executive of the Jamaica Public Services Company Limited (JPS), noted that the most critical supply problems are the high cost of imported fuel and the high cost of capital. Future expansion depends heavily on imported petroleum fuels. JPS is investigating energy efficiency improvements as well as the substitution of imported coal for imported diesel fuel to use in power generation.

In the **Dominican Republic**, Mr. Eduardo Sagredo, President of the Board of the Corporacion Dominicana de Electricidad (CDE), noted the particularly critical situation facing the company: negative cashflows, tremendous financial constraints, political influence, lack of competent personnel at all levels, demoralized technical and administrative staff, and a very strong labor union. In addition, power system losses have reached about 20 percent, only 70 percent of the electricity invoiced is paid for, and only about half of the installed capacity is operational. Consequently, special subsidies from the central government are necessary for CDE's continued operation. The rehabilitation of the thermal power plants is a priority. Mr. Sagredo stressed that the country experiences numerous power shortages, which are of considerable economic cost. For example, a kWh costs about U.S. \$0.06 to produce, but for each kWh not produced, the Dominican economy loses an average of U.S. \$1.15.

The solutions suggested by workshop participants to some of these energy problems focused on two approaches: the use of energy demand management techniques and efficiency improvements to delay generation expansion, and the promotion of private-sector involvement in power generation to relieve the public sector of some of the financial burden and associated risks.

## **2.1 Potential for Energy Demand Management and Efficiency Improvements**

### **2.1.1 Demand Management**

The savings that can result from adopting energy demand management techniques are substantial and well known, providing the highest payback on investment. However, workshop participants mentioned repeatedly that if demand management is to be effective, it must involve customers in a new partnership, and the decision makers and policy makers must signal their commitment to such a partnership.

Participants generally agreed that the utility should seek economic pricing and promote energy conservation. However, as pointed out by the official representatives of El Salvador and Guatemala, inflation and current government policies subsidizing consumers make it difficult, if not impossible, to raise electricity tariffs to long-run marginal costs. An aggressive energy conservation and efficiency campaign was considered necessary by the workshop participants to reduce the supply and demand imbalance and avoid future rationing.

Dr. James Sullivan, Director of A.I.D.'s Office of Energy, stressed that energy conservation is one of the key priorities in the Office. He said that the Office of Energy plans to support several major regional programs, particularly on load management and end-use conservation.

Considerable interest was expressed by workshop participants in A.I.D.'s experience in Costa Rica on load management. The pilot project being implemented by ICE with assistance from A.I.D. has reduced peak demand by more than 5 MW in just one year for selected energy users.

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However, the workshop participants identified two factors that are critical to the success of load management programs:

- Active participation of customers
- Attractive tariff structures.

According to Dr. William Smith, Manager of Demand-Side Planning and Information of the Electric Power Research Institute, generic load shape changes are the key to resolving some utility financial problems. From a utility's perspective, the list of potential benefits from demand-side management includes: improving cashflows, reducing or postponing capital investments, providing customers with options that offer a measure of control over their monthly electric bills, and minimizing potential environmental impact.

### **2.1.2 Efficiency Improvements**

The potential savings from power plant rehabilitation are also substantial. At a time of higher-than-expected electricity demand, many countries in Central America have had to depend on old and inefficient thermal power generation because of adverse hydroelectric or other conditions.

In the Caribbean, power generation depends almost entirely on thermal power. The case of the Dominican Republic was cited for the poor condition of its thermal plants. Such inefficient power plants -- the result of financial and institutional constraints -- increase power generation costs even more.

Mr. Kenneth Duval, Manager of Utility Services Division of U.S. Southern Electric International (SEI), said SEI achieved almost a 20 percent improvement in system availability by adopting a formal Availability Improvement Program. For the SEI system (installed generating capacity of over 27,000 MW), more than 5,200 MW of additional generating capacity are estimated to have been eliminated or substantially deferred. The ratio of these savings, which translate into U.S. \$5 billion in capital expenditure, to the cost of the program is more than 6 to 1.

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## 2.2 Independent Power Generation

Most of the workshop discussions focused on the opportunities for, and impediments to, independent power generation. The workshop participants agreed that private-sector capital is advantageous in reducing the heavy burden on the public sector and the economy and in introducing additional capital. In addition, private-sector capital creates competition in the power sector, which can enhance efficiency and reduce lead times. Furthermore, the countries of the region must consider whether they can invest most of their capital in the power sector while neglecting other sectors of the economy.

The workshop participants identified four main requirements for independently produced power:

- Serious commitment by the country's government
- Existence of legal and institutional framework
- Preparation of serious proposals using a least-cost approach, and preparation of sound technical, economic, and financial analyses
- Available financing.

### 2.2.1 Country Commitment

Participants generally agreed that the government plays a critical role in the development of a private-sector power generation project from the outset, and political will is necessary for effective private-sector participation.

The current strategy of the power sector in **Costa Rica** is to avoid rationing of electric power through the use of small independent power producers and the adoption of an aggressive energy efficiency program. Utility financial difficulties have often led to delays in large hydropower projects, which require substantial capital up front and are less adaptable to electricity demand growth rates.

Mr. Roland Castillo Contoux, Minister of MEM of **Guatemala**, indicated that, unlike other countries in the region, Guatemala has a manageable foreign debt. He said,

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however, that over 60 percent of the population still does not have access to commercial energy resources and electricity demand is widely dispersed. Given this situation, Mr. Contoux said that the private sector could play a role in the national energy strategy.

### 2.2.2 Legal and Institutional Framework

During the workshop, discussion about independent power generation concentrated on the framework necessary to promote the participation of the private sector. Officials from the **Dominican Republic's** Technical Secretariat of the Presidency and the Senate, and private-sector representatives of that country, stressed that once clear guidelines have been defined, the private-sector is ready to assume the risk. Although the power sector is in a critical situation, current law stipulates that CDE is the only agency with the right to generate and sell electricity. Senator Hugo Lembcke, President of the Energy Commission, said that a revised law allowing the participation of the private sector in power generation has been presented to the Dominican Senate.

In **Costa Rica**, Mr. Francisco Cordoba, Director of the regulatory agency, Servicio Nacional de Electricidad (SNE), said that SNE, together with MRNEM and ICE, is analyzing electricity tariffs that would be adequate for purchases from independent power producers. ICE is already interested in purchasing electricity from reliable suppliers at an average of about U.S. 5¢/kWh, which is equivalent to the average utility avoided cost. Furthermore, Costa Rica is in the process of raising the limit on projects requiring legislative approval from 500 kW to 20 MW.

Costa Rican private-sector representatives, however, stressed that legal and institutional barriers to their effective participation in power generation remain. ICE, SNE, and MRNEM have held detailed discussions, but have not yet agreed on the buyback price of electric power from private producers. Private-sector representatives indicated that they are ready to participate in power generation but need clear guidelines from the beginning. They maintain that tariffs should be based on the utility's avoided cost and not the financial rate of the small supplier with a predetermined rate of return. According to the law, SNE has the final word on the buyback price.

The President of the California Public Utility Commission, Mr. Stanley Hewlett, noted the success of the Public Utility Regulatory Policies Act (PURPA), which established

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the rules for the private sector in power generation in the U.S. The objective of PURPA was to address the concerns of the utilities and establish a regulatory pricing structure. While independent power sources represented less than 1 percent of capacity in California in 1980, said Mr. Hewlett, by 1988, they represented about 6 percent of capacity (10,500 MW). Independent production of power, which has relieved California utilities of much of the burden of financing new plants, has succeeded because the utilities offer standard contracts to buy power at its avoided cost.

Mr. Hewlett said the situation in the Central American and Caribbean region is not that different from the situation in California where increasing electricity demand and limited resources required an alternative approach to power production. He noted that PURPA should be considered a model that can be adapted to conditions in the region, and added that California is ready to share its experience with country officials. He suggested that the best way for regional private-sector representatives to deal with uncertainty is to create a consortium of organizations that can develop a project. A joint venture between a utility and group of developers in California has proven very useful. The utility invested up to 50 percent of the project and built a series of small projects rather than one large one. By combining expertise and financial capabilities, risk can be reduced. Since many parties may be involved, each with its own self interest, a successful private power project requires universal recognition of the problems faced by the power sector as well as the good faith and creativity of all.

### 2.2.3 Least-Cost Proposals

For a project to go forward, it must be a least-cost energy alternative for the country. Dr. Alvaro Umana, Minister of MRNEM, emphasized that, although **Costa Rica** is very interested in the PURPA experience in the U.S., it is still relatively new. Costa Rica needs time to analyze properly the least-cost energy alternatives and define the rules.

During the workshop, various proposals were discussed.

Mr. Carlos Chaves, Manager of the Empresa Electrica de Matamoros (a small hydro private power producer) indicated that in **Costa Rica** only about 6 to 7 percent of the hydropower potential has been developed. The producer said he is seeking financing to expand his system by 8 MW so that he can sell power to the cooperative. However, he

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faces tremendous obstacles in price negotiations with the SNE and is having difficulty obtaining commercial loan guarantees because of the uncertainties involved.

Mr. Gary Shulman, President of the U.S. Geothermal Power Company, said that **Costa Rica** and the entire Central American region are sitting on a tremendous geothermal potential that has not yet been effectively exploited. He said that since 1980, discussions have been held on the development of the Miravalles geothermal field, but not 1 kWh has been generated.

The national electric power company for the **Dominican Republic**, CDE, is considering proposals from the private sector, which has expressed interest in investing in generating units and selling the entire production to CDE. In the Dominican Republic, there is a precedent for private power generation (Falconbridge (100 MW) and sugar mills (5 MW)), even though current law limits the participation of the private sector in power generation.

The high price of electricity (i.e., U.S. 20¢/kWh) makes the development of indigenous energy resources very attractive to independent power producers in **Belize**. The country has a substantial biomass potential that has not yet been exploited.

**Jamaica** has limited indigenous energy resources and must rely on imported petroleum fuels for electric power. However, more must be done to develop the energy resources that Jamaica does have, one of which is bagasse. Electricity demand is expected to grow more rapidly than previously projected, i.e., greater than 8 percent rather than 5 percent. This growth places additional financial pressure on the utility, JPS, forcing it to move forward its expansion projects by 5 years. The tight timeframe is expected to limit the utility's options.

#### 2.2.4 Available Financing

There was considerable interest by the participants, particularly those from the **Dominican Republic**, in establishing a private-sector fund similar to that in Pakistan.<sup>1</sup>

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<sup>1</sup> A U.S. \$800 million Private-Sector Energy Development Fund was recently created in Pakistan to finance independent power projects with contributions from the World Bank (U.S. \$146 million), A.I.D. (U.S. \$125 million), and Japan, Britain, and several other countries. The fund will provide up to 30 percent of the financing required by independent power projects.

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The World Bank, the Inter-American Development Bank, and A.I.D. have indicated to workshop participants that the request for establishing such a fund in Central America and the Caribbean must come from the governments of countries in this region.

### **2.3 Conclusions and Recommendations**

Workshop participants stressed the need to increase economic efficiency in the power sector. They said creativity was needed, including the adoption of nontraditional approaches, e.g., a major energy efficiency initiative in the region to reduce investments and the participation of the private sector in power generation to alleviate some of the financial burdens and associated risks.

The workshop provided an excellent opportunity for key energy officials in the region to discuss problems in the power sector. Among the major problems are: the sector's critical financial situation, higher than expected growth in electricity demand, the foreign debt burden on the economy and the significant portion from power sector investments, and limited capital available to the region from multilateral and bilateral agencies to satisfy all the needs of the power sector.

Viable alternatives to the critical problems facing the power sector include encouraging energy efficiency in the sector by reducing power system losses, using load management techniques and end-use conservation programs to delay generation expansion requirements, and promoting the participation of the private sector in power generation. The latter would alleviate pressure on government financing of the power sector, assist in the development of nonconventional indigenous energy resources, and enhance overall economic efficiency.

Dr. Alvaro Umana, Minister of Costa Rica's MRNEM, noted that the strong representation at the workshop of power sector officials from the region indicated the urgency of the matter. Although many energy conservation efforts were halted when the price of petroleum declined worldwide, the energy crisis continues. Dr. Umana emphasized that Costa Rica is seriously considering all least-cost alternatives to avoid a crisis in the power sector. Along these lines, he said that independent power suppliers could contribute 50 to 90 MW in Costa Rica through cogeneration and small hydro projects, displacing imported petroleum fuels. Dr. Umana noted that the World Bank

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and the Inter-American Development Bank can provide only limited support to Costa Rica under the current structure; therefore, alternatives are needed.

Dr. Umana also told the workshop participants that governments cannot continue the current policy of subsidizing consumers, given the tremendous drain on the economy. He predicted stronger cooperation with the bilateral development agencies and suppliers that can provide attractive financing. Dr. Umana said that in Costa Rica, he plans to implement a major energy efficiency program in Costa Rica, in which A.I.D. has already played an effective role. The first step is to develop pilot projects with the greatest economic impact. He felt strongly that a major energy efficiency initiative should be considered in the other countries of the region.

Dr. Umana concluded that the multilateral development agencies should consider some of the elements discussed in the workshop, and that cogeneration and the participation of the private sector in power generation could be as successful in the region as they had been in California and elsewhere.

**Next Steps.** The workshop recommendations focused on energy efficiency and independent power generation.

- **Energy Efficiency.** A major regional energy efficiency initiative is needed. This initiative would provide technical assistance and specialized instrumentation to the national electric power utilities in the areas of: system efficiency, including power plant rehabilitation and line loss reduction; end-use conservation; and load management, with such program components as (1) pricing/rate structure studies, (2) staff and management training, (3) project feasibility studies, and (4) assistance in implementing the most economically attractive options. An energy conservation training program should also be established to develop and strengthen local capabilities in loss reduction and load management.

The power sector efficiency initiative should address all options, including: increasing the availability of existing generation units, extending the life of existing power plants, minimizing the technical losses of transmission and distribution systems, improving end-use efficiency, and developing effective

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load management techniques to optimize the use of electricity and decrease demand, particularly peak demand.

- **Independent Power Generation.** Technical assistance should be provided to the governments of the region in establishing guidelines on the participation of the private sector in power generation. This assistance can include: development of a computerized procedure for the prefeasibility screening of projects; development and application of consistent costing and appraisal procedures for private sector projects; development of procedures for calculating avoided cost and incorporating estimates of avoided cost in project appraisal; and development of computerized facilities for drawing up contracts between government agencies and private power companies.

Once the governments have provided a clear indication of their commitment (by amending their countries' laws, if necessary) they might seek assistance from multilateral and bilateral development agencies to establish a Pakistan-type fund. A private-sector energy development fund could provide part of the financing required by independent power projects. Loan funds would be distributed through private and/or public banks to finance feasibility studies and new investments by private companies in the country. Funding for feasibility studies under the loan fund would be limited to a percentage of expected investment. The purpose of the loan fund is to catalyze investments in independent power generation.

# EXHIBIT I

## WORKSHOP AGENDA

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### CENTRAL AMERICAN AND CARIBBEAN WORKSHOP ON ELECTRIC POWER: Role of Demand Management and Policy Issues for Independent Power Generation

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*Co-Sponsors:*

Instituto Costarricense de Electricidad (ICE), Costa Rica  
Ministerio de Recursos Naturales, Energia, y Minas (MRNEM), Costa Rica  
U.S. Agency for International Development (A.I.D.)

*Objectives:*

To identify potential for energy demand  
management techniques in the region

To define opportunities for independent  
power generation systems in the region

*Site:*

Sheraton Herradura Hotel  
San Jose, Costa Rica

*Dates:*

Monday, August 29 to Thursday, September 1, 1988

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# August 29: Country Review

**Goal:** Define and discuss key electric power issues in the region, on a country by country basis.

## Morning:

### The Perspective of the Region

Chairman: Mr. Alberto Sabadell  
AID, Washington, DC

- 8:30 A.M.**     **Welcome and Opening Remarks**  
*Mr. Carl Leonard, Mission Director, U.S. A.I.D., Costa Rica*  
*Mr. Antonio Canas, Executive President (ICE)*  
*Dr. Alvaro Umana, Minister, (MRNEM)*
- 9:00 A.M.**     **Power Sector Issues in Central America and the Caribbean**  
Speaker: Mr. Alain Streicher  
RCG/Hagler, Bailly, Inc.,  
Washington, DC  
*The key regional power issues discussed will be: the impact of the energy sector investment in the total external debt, the financial constraints of the utilities and the power sector expansion requirements, and the potential for demand management and independent power generation in the region.*
- 9:30 A.M.**     **Coffee Break**
- 9:45 A.M.**     **Public Utility Round Table: The Views from the Participating Countries**  
*Energy sector officials will present background papers on the current power situation in each participating country. Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, and Panama will participate.*
- 12:00 P.M.**    **Chairman's Summary**
- 12:30 P.M.**    **Lunch**

## Afternoon:

### The Perspective of Development Agencies

Chairman: Dr. Alvaro Umana,  
Minister, MRNEM, Costa Rica

- 2:00 P.M.**     **The World Bank Perspective**  
Speaker: Mr. Rafael Moscote  
World Bank, Washington, DC  
*The World Bank current and future activities in the region will be presented. The potential role for demand management and independent power generation will be reviewed.*
- 2:20 P.M.**     **The Interamerican Development Bank Perspective**  
Speaker: Mr. Jose Villegas  
Interamerican Development Bank,  
Costa Rica  
*The IDB experience and perspective in the region will be presented. The potential role for demand management and independent power generation will be reviewed.*
- 2:40 P.M.**     **The A.I.D. Experience with Independent Power Generation**  
Speaker: Dr. James Sullivan, AID,  
Washington, DC  
*The A.I.D. experience with independent power generation opportunities and impediments in developing countries will be summarized. This experience will be related to the Central American and Caribbean context.*
- 3:05 P.M.**     **Coffee Break**
- 3:15 P.M.**     **Discussion**  
*Chairman and selected participants will conduct an open discussion highlighting the key issues covered in the day.*
- 5:00 P.M.**     **Adjournment**

# August 30: Demand Management Techniques and Electricity Generation Alternatives

**Goal:** Review demand side approaches to dealing with the power sector issues and discuss opportunities for independent power generation.

## Morning:

### Demand Management

Chairman: Mr. Mario Hidalgo  
ICE, Costa Rica

- 8:30 A.M. Overview**  
Speaker: Dr. William Smith,  
Electric Power Research Institute,  
California  
*The demand management concept  
and approaches will be defined.  
Specific examples will be presented.*
- 8:50 A.M. Power Plant Rehabilitation  
and Efficiency Improvements**  
Speaker: Mr. Ken Duval,  
Southern Electric International,  
Georgia  
*A recent program in Puerto Rico will  
be discussed. Current initiatives in the  
Central American and Caribbean  
region will be summarized with  
financing mechanisms, and benefit/  
cost analysis.*
- 9:10 A.M. Power Loss Reduction**  
Speaker: Mr. Jose Herrera  
Electrotek, Tennessee  
*The potential for power loss reduction  
(technical and non-technical) in power  
supply systems along with a  
benefit/cost analysis will be reviewed.*
- 9:30 A.M. Load Management in U.S.  
Utilities and its Application in  
Costa Rica**  
Speaker: Mr. Juan Gonzalez  
Florida Power & Light, Florida  
*Specific experiences in the U.S. will be  
related to ICE's Pilot Project in Costa  
Rica and other potential projects in the  
region.*
- 9:50 A.M. Coffee Break**
- 10:05 A.M. Discussion and Chairman's  
Summary**
- 12:30 P.M. Lunch**

## Afternoon:

### Private Power

Chairman: Mr. Abraham Selman,  
IEMCA, Dominican Republic

- 2:00 P.M. The "BOT" Concept**  
Speaker: Mr. Richard Buta, Bechtel,  
Washington, DC  
*The build-operate-transfer or "BOT"  
concept as currently being implemented  
in Turkey will be described, as well as  
other experiences worldwide.*
- 2:20 P.M. The PURPA Experience**  
Speaker: Mr. Stanley W. Halett,  
California Public Utility Commission  
*How independent power generation is  
made possible in the U.S. by PURPA  
legislation and how this concept is  
spreading to other countries.*
- 2:40 P.M. Sugar Based Power**  
Speakers: Mr. Orlando Posadas,  
ICAITI, and Mr. John Kadyszewski,  
AID, Washington, DC  
*The conclusions of the ICAITI Co-  
generation Workshop will be presented,  
summarizing the potential for sugar  
based power/cogeneration in the region  
and its possible contribution to the  
energy picture.*  
*A presentation will also be made on the  
results of the recent sugar cane study  
carried out by AID in Costa Rica.*
- 3:15 P.M. Coffee Break**
- 3:30 P.M. Technical Issues of Private  
Power**  
Speaker: Mr. Roberto Balsells  
Power Sector Specialist, Guatemala  
*The key technical problems involved in  
non-utility power generation will be  
described. These include syn-  
chronization, protection and backup  
power, interconnection and control,  
distribution losses, dispatching, peaking  
and scheduling. Issues related to  
availability and quality of fuel supplies  
and existing infrastructures will also be  
covered.*
- 3:50 P.M. Discussion and Chairman's  
Summary**
- 6:00 P.M. Adjournment**

# August 31: Independent Power Generation: Initiatives, Opportunities, Impediments, and Directions

**Goal:** *To identify potential applications for demand management and independent power generation systems in the region and ways to maximize their contribution.*

## Morning: Policy and Finance Issues

Chairman: Mr. Alain Streicher,  
RCG/Hagler, Bailly, Inc.,  
Washington, DC

- 8:30 A.M. Pricing Policy**  
Speaker: Mr. Fernando Montoya,  
ICE, Costa Rica  
*Toward determining the financial attractiveness of private power projects the paper will cover the key concerns related to tariffs with respect to defining a clear and explicit pricing policy on privately generated power, and its link with public utility pricing.*
- 8:50 A.M. Financing**  
Speaker: Mr. Mike Kappaz,  
K&M, Washington, DC  
*Lack of financing for private power projects, both from international commercial banks and local capital markets will be covered, as well as foreign exchange restrictions. Innovative financing mechanisms will be mentioned, including debt/equity swaps. Within that context, an overview of the economic and financial constraints faced by the power sector in the region will be given.*
- 9:10 A.M. Institutional and Legal Issues**  
Speaker: Mr. Teofilo de la Torre,  
Vice-Minister, MRNEM, Costa Rica  
*The existing institutional structure of the power sector including the legal and regulatory environment will be examined. The institutional barriers and policy issues that must be resolved before the private sector, foreign or domestic, can actively participate in the power sector will be covered.*
- 9:30 A.M. Coffee Break**
- 9:45 A.M. Discussion and Chairman's Summary**
- 12:30 P.M. Lunch**

## Afternoon: Workshop Conclusion

- 2:00 P.M. Summary of Workshop and Program Definition**  
Dr. James Sullivan, AID,  
Washington, DC  
*The conclusions of the workshop will be presented including possible directions for future activities in demand management and independent power generation in the region.*
- 2:30 P.M. Wrap Up & Open Discussion**  
**Closing Statement**  
Dr. Alvaro Umama, Minister,  
MRNEM, Costa Rica
- 5:00 P.M. Adjournment**

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## September 1: Field Trip (Optional)

- 9:00 A.M. Empresa Electrica de Matamoros**  
*A small independent power plant based on hydropower will be visited. This plant is in the process of being upgraded to produce additional power for sale to a local cooperative. As such it constitutes an interesting example of independent power generation in the region.*
-

**EXHIBIT 2**

**SEMINARIO CENTROAMERICANO Y DEL CARIBE  
SOBRE ENERGIA ELECTRICA**

**PARTICIPANTES INSCRIPTOS**

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**CENTRAL AMERICAN AND CARIBBEAN ELECTRIC POWER WORKSHOP**

**REGISTERED PARTICIPANTS**

**San Jose, Costa Rica**

**August 29 - September 1, 1988**

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