SUSTAINABLE ENERGY SERVICES IN SECONDARY CITIES

FINAL REPORT

PRIVATE SECTOR ROLE FOR ELECTRICITY IN HAITI

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for

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1. Introduction

This report contains the results of an investigation for USAID/Haiti conducted by Bechtel National, Inc., supported by Econergy International Corporation and Resource Management International. The investigation explores means to "Improve Sustainable Energy Services to Secondary Cities in Haiti", i.e., the city of Cap Haitien in the North and Jacmel in the Southeast. The study is made pursuant to Contract LAG-1-00-98-00006-00, Delivery Order No. 801. It is based on observations and extensive discussions during two visits to Haiti (October 26 to November 6, 1998 and February 2 to February 6, 1999), as well as review of available data and information on the energy and general resource situation in Haiti. Finally, this report describes the situation in Haiti as of mid-March 1999, where it should be noted that this situation is extremely fluid, with conditions affecting Haiti's power sector changing rapidly.

The overall objective of the study is to assist the USAID Mission in Haiti in its efforts to:

1. Help improve the investment climate in Cap Haitien and Jacmel through the production and distribution of reliable and affordable electricity;
2. Help induce and broker private sector investments and public/private partnerships focused, in whole or in part, on producing and distributing reliable and affordable electricity in these secondary cities;
3. Identify the appropriate structure(s) for brokering or facilitating "deals" in the power sector of the secondary cities;
4. Help rank the options available to USAID/Haiti toward achieving these objectives.

The above USAID objectives must be seen in view of the Mission's Secondary Cities Program. This program is aimed at capturing high economic growth in the cities of Cap Haitien and Jacmel and their respective economic hinterlands, so as to achieve USAID's strategic objective of attaining sustainable increases in income for the poor of Haiti. Based on visits to Cap Haitien and Jacmel it can be concluded, beyond any doubt, that unreliable and insufficient supply of electricity is indeed among the most important constraints for economic and social development. Hence, successful implementation of USAID's Secondary Cities Program is seriously jeopardized if USAID does not pay special attention to the development of an effective and efficient power sector in both cities.

Moreover, strategically it appears desirable for USAID to facilitate, and possibly broker, the entry of private sector participants into the power sector of Cap Haitien and Jacmel for the following reasons. Firstly, the focus of USAID assistance in these secondary cities is clearly on economic development by the private sector. Secondly, private sector provision of supply and distribution of electricity in a competitive environment leads to the most efficient power systems, throughout the world. This is particularly relevant since EdH has proven to be incapable to reliably provide electricity at affordable prices and sufficient to meet all demands.

To logically address the above objectives, this report focuses on three closely related issues. First, what should be the strategy for the USAID mission to become engaged in Haiti's electricity sector, thus being in a position to constructively influence development of the

secondary cities and safeguarding the success of the secondary cities program? Second, How can USAID facilitate and contribute to private sector participation in the provision of electricity in Cap Haitien and Jacmel? Finally, what initiatives and projects could be envisioned in physically realizing private sector participation in the provision of electricity; initiatives and projects supportable by USAID?

Chapter 2 of the report first addresses the major issues, conclusions and recommendations that result from this investigation in an Executive Summary. Subsequently, the remaining chapters address the above three issues in an essentially self-contained manner, meaning that each issue is addressed by itself, with acknowledged overlap between the chapters. Chapter 3 focuses on the USAID engagement strategy for the electricity sector, with emphasis on the foundation for this strategy and the strategy formulation. Subsequently, Chapter 4 discusses the subject of private partnerships for electricity in Jaçmel and Cap Haitien, providing an assessment of current strengths and capabilities together with a discussion on how local capability can and should be strengthened. Finally, Chapter 5 focuses on an assessment and identification of private sector power projects for Cap Haitien and Jacmel, and elaborates on what is needed to bring such projects to fruition.

2. Executive Summary

Development of a reliable power system in Cap Haitien and Jacmel, providing electricity in sufficient quantities at affordable prices, is the responsibility of Electricité d'Haïti (EdH). EdH, a public sector enterprise owned and operated by the Government of Haiti (GOH), is at present a government monopoly, legally responsible for providing power to all areas and all people of Haiti. In its efforts to modernize Haiti's parastatals, the GOH passed in the October 1996 the law on the modernization of Haiti's public enterprises. Mandated by the law, the Council for the Modernization of Public Enterprises (CMEP) was established in December 1996 by Presidential Decree.

With respect to EdH, and supported by the Inter-American Development Bank (IDB), CMEP had, in January 1999, developed a recommendation for its modernization. Briefly summarized, this recommendation called for transfer of full responsibility for managing EdH to a private sector entity. First, after an initial transition period, a private company will be appointed for three years to manage and revitalize the company. Second, after the first three years, the GOH will enter into a long-term lease (concession) arrangement for EdH's entire operation; with the GOH as the lessor and a private sector entity as the lessee. CMEP has developed a draft "Electricity Law", to be incorporated in the management contract, and subsequently into the lease contract, providing the overall regulatory framework for the provision of electricity in Haiti.

CMEP is essentially implementing the above recommendation, but a major change has occurred in terms of IDB support. Where in January 1999 IDB had intended to support the GOH with a technical cooperation program and a $40 million public loan to aid in the EdH privatization process, as of mid March 1999 IDB has suspended all loan preparatory activities. However, IDB will continue to provide technical support to CMEP, principally to bring in an Investment Bank to advice CMEP on the best, practical and implementable way of continuing with the "privatization" of EdH. This will include finalization of all necessary documents such as bid documents, concession contract, etc., finalization of the draft electricity law and a legal code governing disconnection of customers, and financial support for a rural electrification study.

The above "power system improvement scenario" for Haiti, as envisioned by CMEP, is in principle straightforward. Actual and full implementation of CMEP's recommendation would go a long way toward improving power supply on Haiti, and hence would impact positively on USAID's Secondary Cities Program. *However, herein lies the crucial finding of this investigation, implementation of CMEP's recommendation is surrounded by extreme uncertainty caused by three inter-related factors:*

- **Political Developments in Haiti.** At present (mid-March 1999) there is no Prime Minister as the Head of the Government of Haiti nor is there a duly elected Parliament, which has resulted in the most serious political instability since democratic and parliamentary rule returned to Haiti in 1994. Elections for members of parliament will need to be held and a Prime Minister, appointed by the President, will need to be ratified by a new parliament. In addition, Presidential elections are slated for December 2000, which in Haiti is also of influence in terms of timing and

substance of parliamentary elections. Technically, the current instability has serious consequences for the above power system improvement scenario because only the Prime Minister is legally empowered to actualize the results of the CMEP process, while only parliament can ratify laws such as the draft electricity law. More importantly, the outcomes of the election process itself, although democratically conducted, will have a major impact on the privatization process of parastatals, as not all political factions in Haiti agree on the fundamental desirability of privatizing governmental entities.

- **Economic Development**. Economically, Haiti is experiencing severe stagnation. This is the result of earlier inappropriate economic policies, political instability, a shortage of good arable land, environmental degradation, continued use of traditional and outmoded technologies, under-capitalization, migration of large portions of the skilled population, and a weak national savings rate. Justifiably, USAID considers its secondary cities program as the only way to achieve the economic growth that Haiti needs in order to move its people out of abject poverty. However, the lack of available and reliable cheap electricity is among the most important constraints to achieve such growth. Haiti's current economic outlook is bleak indeed, and, pending further political developments could potentially even get worse.

- **Power System Development itself.** There are two aspects here: (1) the current condition of EdH and the associated electricity crisis; and (2) efforts to "privatize" EdH as a means to solve the electricity crisis. EdH is at present technically bankrupt and is not capable of maintaining even minimal services. In the Port au Prince area there was as of mid February 1999 a total of about 50 MW of thermal capacity on line, compared to a minimum demand of 120 MW. In other cities there is virtually no working capacity left, with the possible exception of Jacmel, where the Canadian Aid Agency (CIDA) supports the rehabilitation of the system. Lack of EdH service has resulted in the most serious service curtailments ever experienced. This is further aggravated by the fact that as of mid February EdH does not have the working capital needed for minimal repairs, spare parts and purchase of fuel. This had led, among others, to cannibalization of some equipment to keep other equipment running while fuel is bought "once customers pay their bills"; a truly "hand-to-mouth" existence. Despite massive investments by multilateral development banks and bilateral agencies (around $100 million since 1994) in a system that has now less than 50 MW effective capacity, the IDB has stated that the major lesson learned is that all these investments have not been sustainable.

  Clearly, in view of the current situation of EdH, the solution worked out by CMEP and supported by the IDB must, by all accounts, be considered the best way out. Yet, the current political instability must be resolved first. There must be a Prime Minister and a parliament. Then, a management contractor must be found, willing and able to take on the enormous task of rebuilding EdH, which under current economic conditions is synonymous with taking on a most risky undertaking. In view of the dire economic circumstances that the country finds itself in and without loan support of the IDB to make the privatization process work, it is very difficult to imagine how

there would be sufficient funds to entice a private operator to take on the significant risks associated with running the EdH system. As a consequence, current conditions may very well further deteriorate beyond the point that EdH could be salvaged. At that point, the mode of operation would be one of "saving what is left to be saved", rather than "breathing new life" into the present EdH.

Careful reflection on the above issues leads to one major, inescapable, conclusion. *The current electricity crisis in Haiti is so overpowering and severe that USAID has no choice but to become involved in the electricity sector of Haiti in general, and of the secondary cities of Cap Haitien and Jacmel in particular.* It must do so to protect past investments in such activities as hillside programs and artisan development, while it must also do so to create the necessary conditions to work towards economic growth envisioned for the secondary cities program. It must do whatever is necessary to develop solutions for the electricity crisis in the framework of the secondary cities program. It should be noted explicitly that this does **not** include financial support for a bankrupt EdH. Rather, USAID must find ways to facilitate the emergence of private sector initiatives in Cap Haitien and Jacmel, directed to contribute to the resolution of the electricity crisis in these cities and their hinterlands. In this regard, USAID should be the catalyst that will enable private entrepreneurs in these areas to take an active part in the development of an adequate electricity infrastructure, in parallel with, and in support of, whatever positive results may come out of the current CMEP process.

The above provides a clear conceptual starting point and rationale for USAID intervention. The necessary next step is to address what activities and projects USAID can and must undertake to improve the power systems in Cap Haitien and Jacmel through private sector participation. "On the ground" realities in these two cities, as well as the overall policy environment for power system reform in Haiti including the CMEP modernization program, must be taken into account. To move beyond the conceptual and to address possible USAID intervention requires that careful attention be given to the following issues:

- **An ill-defined CMEP "process".** Thus far the CMEP process has exclusively focused on solving the "EdH-problem", where it should be recognized that EdH in fact is a very small and very "sick" utility. Insufficient attention has been given to clear definition of the EdH service area (i.e. the perimeter) and the use of *multiple operators* to achieve an electric infrastructure that is adequate for the nation of Haiti, both inside and outside the EdH perimeter. Although not prohibited, the entry of multiple operators should receive major emphasis in the draft electricity law. Because of the rural nature of most of the country, adequate *rural electrification* must be a major component of Haiti's electric infrastructure in particular in view of the secondary cities program, a subject currently treated as an afterthought.

- **Insufficient Public Participation and Public Information.** In order to mobilize the creative and financial potential of those segments of Haiti's society, which fall outside the GOH proper, it will be essential to involve them in solving the energy crisis. This requires broad public participation and the provision of detailed and accurate information on how the public can and must play a role. Thus far the public considers the energy crisis as a problem of the GOH, in which they are powerless to

do anything, despite the fact that, left to their own devices, they can and try to do something. (i.e., widespread auto-generation, a very inefficient solution). The CMEP process has so far given scant attention to the public's role.

- **Animosity between the Haitian Private Sector and the GOH.** Past and present experiences with the GOH has deeply poisoned any spirit of cooperation between Haiti's private sector and the GOH. No private Haitian entrepreneurs were found who are willing to invest in the provision of electricity for the common good and earning a fair return, without legally enforceable mechanisms to fully protect their own legitimate interests. At present EdH only collects 45% of the costs to produce electricity, reportedly because customers steal electricity or plainly don't pay their bills. This investigation found that this may not so much be a problem of wrongdoing on the side of customers in general, but rather a deep seated mistrust of EdH because of corruption, collusion and nepotism.

- **Insufficient Private Sector Technical and Financial Capability to Improve Current Power System Conditions in an Organized Fashion.** Visits to Cap Haitien and Jacmel confirm that in both areas there is a genuine desire by local interest groups to fully participate in the development of their respective regions. However, it must also be recognized that there has been a severe "brain drain" leaving the country with a severe shortage of skills and know-how. Technically, the expertise to run a "utility-type" company is not locally available, while raising domestic capital for power sector projects-- a necessity for any private sector company-- is close to impossible in Haiti.

Finding satisfactory solutions for the above issues, while clearly recognizing the basic uncertainties associated with political, economic and power system development in Haiti, is the key challenge in formulating any USAID intervention in the electricity area, in the context of the secondary cities program. To deal with basic uncertainties, this investigation first postulated alternative scenarios on what may happen, or may have happened, by the year 2000, thus accounting for events already set in motion. Each scenario represents a consistent set of assumptions with respect to economic development, political development and power system development. Subsequently, options for USAID intervention are identified for each scenario, which taken together represent alternative strategies composed of specific actions. The full matrix of options and scenarios is presented as Table 3 in Chapter 3. Following is a summary of scenarios considered. Which scenario will materialize is a matter of judgement. At present (mid-March 1999), Scenario 2 is considered the most likely.

- **Scenario 1** (most optimistic, least likely):

  a. Steady improvement in economic development; the economy of Port-au Prince is slowly recovering; moderate to rapid growth in Cap Haitien and Jacmel is pulling Haiti out of stagnation; USAID's Secondary Cities Program is working.

b. A new parliament is elected and has accepted a newly appointed Prime Minister.
c. The CMEP process completed and a management contract adopted; new electricity law approved and multiple operators allowed; an IDB loan to support electric sector reform.

- **Scenario 2:** (Status quo, most likely):

  a. Economic development does not change; the economy of Port-au-Prince remains seriously "ill"; growth in Cap Haitien and Jacmel remains stagnated; USAID's Secondary Cities Program is seriously jeopardized;
  b. No parliament is elected; new PM appointed;
  c. The CMEP process is stalled; EdH struggles on, no new contractor brought in; draft electricity law debated, within the EdH perimeter monopoly maintained; IDB does nothing.

- **Scenario 3** (most pessimistic, medium likelihood):

  a. Continued deterioration in economic development; the economy of Port-au-Prince is near total collapse; the Cap Haitien and Jacmel economies are dead; USAID's Secondary Cities Program in its original concept is not working and possibly suspended;
  b. No PM or Parliament;
  c. CMEP process stopped; EdH officially bankrupt, no new operator; impasse on the interpretation of legal status of EdH; donor community resorts to emergency measures or gives up.

In the following, a summary of activities, programs and projects for Scenario 2 (the most likely one) is presented as the recommended electricity/energy program, a new component of USAID's Secondary Cities Program. The program is structured along four dimensions:

i) Support Institutional/Legal Development of the Power Sector.
ii) Support for Physical Development of the Power Sector.
iii) Support for Specific Power Projects regarding the Power Sector.
iv) Focus of USAID/Haiti Financial Assistance, notwithstanding the financial assistance implications of activities required by the above strategy elements.

It is recommended that the program be executed over the next five years. However, in view of basic uncertainties it is also recommended that in the detailed program design special attention be given to progress monitoring and evaluation. At a minimum, a comprehensive program assessment should be made at the end of two years, with the explicit possibility of terminating the program at that time, and diverting budgetary outlays to higher priority programs. In the following program description emphasis is placed on program objectives. In addition, the key program milestones to be achieved and a preliminary assessment of required budgets are added in parentheses, as input to detailed program design. An order-of-magnitude preliminary cost estimate for the recommended program is $5.04 Million.

1. Support for Institutional/Legal development of the Power Sector.

Focus: Promote private sector involvement in the power sector of Cap Haitien and Jacmel.

- Support the Chamber of Commerce in Cap Haitien, and APDESE in Jacmel, in their efforts to become substantively engaged in legal framework and power sector development in their areas. **(Two special full time private Haitian Power Sector Taskforces, $250,000/yr for a program total of $1,250,000; 2x 13 Training Fellowships for a program total of $ 520,000.)**

- Establish formal contact with CMEP as an observer in the Electricity Law debate, in close coordination with IDB and other interested donors. **(One senior economist in EG devoted full time to the electricity sector, no budgetary implication.)**
- Analyze the specific applicability of NRECA-type legislation for inclusion in the new electricity Law **(Rural Electrification Implementation Study, $250,000.)**
- *Translate the draft electricity law in English, convene as soon as possible an expert workshop in Haiti to review and analyze the law,* and support additional legal development work aimed at including multiple operators in Haiti's power sector. **(Translation and Workshop, $100,000; Draft Legal Proposal to CMEP, $150,000.)**
- Promote broad participation in power sector affairs by local interest groups. **(Program Design, $30,000; Program Operation, $55,000/yr for a three-year program total of $165,000.)**

2. Support for physical power system development and management

Focus: Assist the private sector in Cap Haitien to redress the present total collapse of the existing system, and continue the CIDA initiated improvement in Jacmel.

- Explore the opportunity to negotiate a public/private partnership between Cap Haitien businesses and EdH in order for Cap Haitien businesses to come to the rescue in the interim, through securing additional capacity and fuel supply, including fuel storage. **(Detailed Assessment, Negotiated Deal and Legal Contract, $45,000.)**
- Develop in Jacmel the local capability to assure long term sustainability of the CIDA assistance project, including technical planning as well as means to improve collections on a long-term basis. **(One full-time utility planner/manager and staff support, $100,000/yr for a four-year program total of $400,000.)**

3. Support for specific projects regarding the Power Sector

Focus: Facilitate the development of power-related projects outside the perimeter of EdH.

- Promote the development of a private Integrated Resource Company (IRC), capturing synergies between the need for electricity in the Ag. -based export industries (processing, packaging, refrigeration, etc.) and the opportunity to sell company produced excess power to near-by demands. **(Two IRC Feasibility Studies at $125,000 each for a program total of $250,000.)**
- Initiate in cooperation with the Chamber of Commerce the development of one specific IRC in the Cap Haitian Productivity Zone and one IRC in the Jacmel Productivity Zone with the cooperation of APDESE. **(Two IRC Business Plans at $50,000 each for a program total of $100,000.)**

4. Focus of USAID/Haiti financial assistance, notwithstanding the financial assistance implications of activities required by the above strategy elements

Provide Capital for:

- Analysis/development of export markets for users/members of Integrated Resources Companies (IRC). **(Four export products, $35,000/product for a program total of $140,000.)**
- Project development and pre-investment analyses for the IRCs in Cap Haitien and Jacmel. **(Project Planning and Design Studies at $250,000 each for a program total of $500,000.)**
- Emergency repairs for the current Cap Haitien system, including additional fuel storage. **(Fuel Storage, Generation and Transmission Repair for a program total of $1,000,000.)**
- Capacity building in Jacmel to build on the CIDA project. **(Seven Training Fellowships for a program total of $140,000.)**

3. USAID Engagement Strategy for the Electricity Sector

The current focus of the USAID Mission in Haiti on the country's electricity sector represents a bold and welcome change from a past policy of total disengagement.[1] There may have been valid reasons for such policy in the past, in the sense that other donors were heavily engaged in the sector, the linkage to other programs was not clearly established, and there were other, more pressing, needs. However, for anyone with only the slightest knowledge of Haiti, it is quite clear that the lack of an adequate, economical, reliable, and safe supply of electricity is the biggest obstacle to economic development and social progress, which are focal points for USAID programs in Haiti. Such realization calls for innovative and focused intervention, especially at a time when the sector is undergoing potentially momentous changes.

The secondary cities program, one of the key new initiatives taken by the Mission, is critically dependent on the provision of sustainable electricity services to principal demand centers like Jacmel and Cap Haitien, each one considered the nucleus of a High Potential Zone or HPZ[2]. However, there is no guarantee, at present, that in the next five years such services will be available in the amount and quality that will be necessary for the successful implementation of the secondary cities program, thus seriously undermining the entire HPZ concept.

It is for this reason that it is of paramount importance for USAID to develop a strategy on how the agency can become engaged in a substantive way in contributing to the successful rebuilding of the electricity sector. Doing so promises to result in significant direct and indirect benefits. Clearly, rebuilding of the sector will lead to direct benefits, because improved conditions will help to accelerate economic and social development. However, and since one of the key precepts of the HPZ concept is promoting private sector involvement in development of those zones, there will also be indirect benefits. Such involvement, directed to the provision of electricity, will help improve the investment climate in the zone, considered crucial for a host of other initiatives needed for the successful execution of the secondary cities program.

This chapter addresses alternative USAID engagement strategies, or options. The focus throughout the chapter is exclusively on the role of USAID in the context of the secondary cities program, best captured by the following question. Given current conditions in Haiti, and given USAID's strong commitment to the HPZ concept, what should USAID do for the electricity sector in Cap Haitien and Jacmel to advance overall economic and social development of the HPZs, centered around these cities? Where at present the Agency does nothing, this chapter points out that, despite the current dire conditions, there are indeed several options open to USAID. In addition, a recommendation is made on what strategy to follow, and what energy program to implement that would be consistent with the recommended strategy. Thus it is recommended that USAID undertake specific activities and projects related to the electricity sector, as an integral part of the secondary cities program.

[1] Draft Energy Strategy Direction for Haiti, T.J. Wilbanks, Oak Ridge National Laboratory, March 16, 1998
[2] Haiti High Potential Zone Strategy: A Concept Paper, USAID Haiti Mission, March 1998

The chapter consists of two parts. Part A establishes the foundation for any strategy to be adopted by USAID. It does so by review and analysis of the extremely complex conditions that characterize Haiti at the present time, with specific emphasis on efforts by the Haitian government to "modernize" the electricity sector. Subsequently, Part B deals with strategy and program formulation. With respect to the latter, and where necessary, subjects are also discussed which are further elaborated on in Chapters 3 and 4. However, the main focus remains on what USAID should do at the present time.

PART A. STRATEGY FOUNDATION

There are numerous factors that influence the position USAID should take with regard to possible interventions in the electricity sector of Cap Haitien in the northern department of Haiti and Jacmel in the southeastern department. These factors range from the current energy situation in both cities, to the present political and economic conditions in Haiti, to the GOH efforts to improve the electricity sector, and so on. In the following an attempt is made to deal comprehensively with each of these factors. The analysis presented in this part is based on two trips made to Cap Haitien and Jacmel during which extensive interviews were conducted. In addition, and although there is a paucity of published information, relevant reports and studies provided by the Mission have been reviewed.

1. Energy Supply and Use in Jacmel and Cap Haitien, and the Importance of Electricity for the Development of both Cities and their Hinterlands

Energy supply and use in Jacmel and Cap Haitien is very similar to energy supply and use in most cities of similar size and characteristics in Haiti. Most of the energy used in Haiti is derived from local resources (80 percent), and the rest (20 percent) is imported. Table 1 shows the origins and percentages of these energy resources[3]. Table 2 shows energy utilization by sectors in Haiti[4].

Table 1. ENERGY SUPPLY SOURCES IN HAITI

Local Sources 80%	Wood & Wood Charcoal	71%
	Bagasse	4%
	Hydro-energy	5%
Imported Sources 20%	Petroleum Products	19.5%
	Coal	0.5%

Most of the energy used by the residential sector for cooking, and by some industrial processes for alcohol production, aromatic oils, and baking is derived from local wood and wood-charcoal sources. Petroleum products are all imported and supply: (1) a third of the demand from the industrial sector, (2) the entire demand from the transportation sector, and (3) the entire demand

[3] Projet Gouvernement Haitien/PNUD: HAI/93/001/99, Politique En Energie, May 10, 1993
[4] Atelier sur l'Energie et l'Environnement, Ministry of Environment, Bureau of Mines and Energy, January, 1998

for thermal electricity production. Essentially, local wood, wood by-products, and petroleum products are the main sources of energy supply in Haiti. Both sources pose grave problems for the country. The cutting down of forests for charcoal production has led to deforestation, loss of topsoil, and desertification. The import bill for petroleum products represents about 12 percent of total imports and approximately 75 percent of the trade balance deficit[5].

Table 2. ENERGY UTILIZATION BY SECTORS IN HAITI

Domestic	70%	Wood/Charcoal Kerosene Electricity Natural Gas	95% 2% 2% 1%
Industrial	18%	Wood Oil Electricity	60% 30% 10%
Transport	10%	Oil	100%
Electricity	2%		

In addition to these negative environmental and economic impacts, Haiti is a country ranking among nations with the lowest energy consumption per capita in the world, it has a very low energy efficiency, and is among nations with the lowest installed electric capacity per capita in the world. Current projections point to very severe electricity supply bottlenecks, and associated dire economic consequences. Overall, the present situation is due to a lack of coherent government policies and projects to address both the environmental degradation and the energy supply situation. In Haiti, the two are inexorably linked, and solutions are needed that address both simultaneously.

Most interested observers agree that without an adequate, reliable, and affordable electricity service, there can be no economic and social development. Tourism, agribusiness, and industry, which rely on abundant, dependable and cheap electric energy, will not develop despite potentially low and attractive labor rates. Individual self-generation is not an option when one considers regional development involving a city, its hinterland, and the multitude of end users.

Already, the current cost of shortages and outages is prohibitively high for the business community. In addition to the high cost of providing backup generation (with high fuel, labor, and maintenance cost), businesses very often incur additional costs. These include the cost of burned out or damaged refrigeration compressors, electronic cash registers, and other sensitive office equipment when they utilize the services of the national utility, Electricité d'Haïti or EdH. One banker reported shelving a proposal to open a branch in one of the targeted secondary cities because of the high cost of the self-generation option, an absolute necessity given the current situation of EdH. Therefore, any program of economic development, job creation, and

[5] Etudes pour la Modernisation du Secteur de l'Electricité en Haiti, CRC/SOGEMA, November 1997

agricultural expansion that does not guarantee the provision of an economic, reliable, and safe supply of electricity is doomed. The most pernicious impact is the link between lack of an adequate electric service and the resultant environmental degradation:

- If there is no economic growth, there is no job creation.
- If there is no job, there is no income to allow the people to purchase the more efficient electric cooking stove.
- If cooking efficiency is not achieved, environmental degradation cannot be stopped, and potentially reversed.

It seems, therefore, that electricity is key to reversing this disaster.

2. Fundamental Uncertainties Affecting Electric Sector Development in Haiti

Much has been said and written about what is wrong with the present political and economic development of Haiti. Because these factors are indeed critically important to the development of an USAID engagement strategy, they warrant the following brief summary.

Political Developments. Since June 1997 there has been no Prime Minister, approved by the Parliament of Haiti, as the head of Government. This fact is crucial, as it is the Prime Minister's function to effectuate, for example, the recommendations of the duly appointed modernization council, such as the signing of contracts to modernize parastatals. It is also the Prime Minister's function to submit laws, such as a draft electricity law developed by the council, to Parliament for debate and ratification.

In addition, in January 1999, the term of the present Parliament expired, without there being a new parliament to take its place. Without a duly elected and functioning parliament, the Government of Haiti can not enter into loan agreements with lenders such as the Inter-American Bank (IDB), because approval by parliament is a legal requirement.

In summary, political developments over the last year and a half have resulted in a serious political stalemate, which potentially may last until December 2000, the time at which new presidential elections are scheduled. It is further noted that in Haiti the December 2000 presidential elections also influence timing and substance of the needed parliamentary elections. Perhaps, the most important issue is that the outcomes of both parliamentary and Presidential elections, although democratically conducted, will have a major impact on the privatization process of parastatals, as not all political factions in Haiti agree on the fundamental desirability of privatizing governmental entities.

Economic Development. Political developments in the early nineties, culminating in the 1991 UN embargo, dealt a major blow to the already impoverished economy of Haiti; a country with an extremely limited resource base. Further and serious erosion of this resource base is continuing as people struggle for existence. Virtually every economic sector has experienced serious decline during the nineties.
External aid is essential to Haiti's future development. Haiti is the least-developed country in the Western Hemisphere and one of the poorest in the world. Comparisons of social and economic

indicators show that Haiti has been falling behind other low-income developing countries (particularly in the hemisphere) since the 1980s. Haiti's economic stagnation is the result of earlier inappropriate economic policies, political instability, a shortage of good arable land, environmental degradation, continued use of traditional and outmoded technologies, under-capitalization, migration of large portions of the skilled population, and a weak national savings rate.

Since democratic and parliamentary rule returned in 1994, the GOH has embarked on an ambitious economic reform agenda, supported by multilateral development banks and others, in order to create necessary conditions for private sector growth. However, results from reform have been slow in coming. Much of the population expected more immediate results from tough reforms. The skeptical views on economic reform of the highly influential former president Aristide have also influenced discussions of needed reforms.

Despite significant efforts by the donor community to restore and expand, for example, the physical infrastructure, it must be said that private domestic and foreign investment has been slow to return to Haiti. Lack of progress in economic reform and political instability are of utmost concern, which is further aggravated by high domestic interest rates and poorly developed internal capital markets.

In summary, Haiti's current economic outlook is bleak indeed, and, pending further political developments, could potentially even get worse.

3. Power System Development in Haiti: EdH and CMEP

The Electric System and EdH. Prior to 1971 the power system in Haiti was a decentralized system, with separate private entities providing electricity in the cities of Cap Haitien and Jacmel. In fact, Jacmel was the first city to be electrified in Haiti in 1895, and until the late 1960's was supplied with electricity by a private sector Haitian Company. Cap Haitien was also supplied by a private American Company, until about the same time. Since then the GOH nationalized the power system for all of Haiti, with EdH as the operator and controlled by the Ministry of Public Works, Transport and Communications. The government took over the existing private companies and formed, EdH, as a parastatal electric utility endowed with a legal monopoly to provide electricity services throughout the country.

Relative to the population of Haiti, EdH is a very small "public utility", with about 132,000 legal customers. Total installed capacity is 141.8 MW, 87.4 MW of thermal capacity and 54.4 MW of hydro capacity provided by Lake Peligre, of which only 12 MW is guaranteed during the dry season.[6] During 1999 the generation capacity of the system has gotten considerably worse, when EdH lost the Peligre capacity because of total break down of transformers. As a result, in the Port-au-Prince area there was as of mid-February 1999 a total of about 50 MW of thermal capacity on capacity left, with the possible exception of Jacmel.

Throughout its life electrical losses incurred by EdH have continued to get worse, from about 25 percent in 1975 to about 56 percent at present, out of which 38 percent are estimated to be non technical (theft of electricity and fraud), representing staggering financial losses. In Port-au-

[6] Report of the U.S. Department of Energy on the Current Energy Situation in the Republic of Haiti, January 20, 1995

Prince it is estimated that for every legal customer there are four illegal ones, while outside Port-au-Prince the ratio is perhaps one to one. In addition, the ratio of collections versus billing is unacceptably low. During 1990 to1995 it reached as low as 50 percent, although, in places it has improved to as much as 90 percent during 1997 to1998, as a result of technical assistance provided to EdH by outside donors. It can be concluded that as a result of the political and economic developments during the seventies, eighties and early nineties, the EdH system throughout Haiti has continuously deteriorated.

The actual state of deterioration is visible, and felt, everywhere. An assessment of the current capacity of EdH to provide electricity to both targeted secondary cities reveals a blatant inability to provide even the bare minimum. Recently, production was resumed in Jacmel after an 11-day period of complete blackout due to a lack of fuel. Even when fuel is available, production is limited to certain hours due to security considerations and fuel delivery uncertainty. The economic impact on business and industry is never a consideration of EdH. In this environment, electricity services are not only inadequate for economic growth and social development, but represent a major stumbling block.

At present EdH is technically bankrupt since liabilities greatly exceed all assets, and is kept alive because the GOH absorbs all of EdH's losses. The company is non-salvageable, a drain on the public finances, and the biggest impediment to economic recovery. Its corporate focus is to meet the needs of the Port-au-Prince region, the seat of power and the focus of political attention. Secondary cities, like Jacmel and Cap Haitien, have practically been forgotten.

The principal problem of EdH is the complete control that a few political operatives, i.e., individuals not necessarily connected to or employed by EdH, exercise over the administration. This has led to widespread corruption in its varied forms, namely inability to accurately bill usage, deals struck to avoid paying the enormous arrears, etc. It is for this reason that legislation to simplify disconnection, reduce fraud, and break the stranglehold of the vested interests has languished in Parliament for years.

Absent a strong and meaningful legislation to empower a private operator to force recalcitrant customers to pay, no operator would dare venture in such a minefield. As the Black and Veatch report of March 1995 documented, it is not the lower end of the customer usage spectrum that creates the problem. Quite the contrary, it is the big, high-end user who has the means to effectively manipulate the system.

It should be noted here that this orientation of EdH is not the result of deliberate actions on the part of the current EdH management. To the contrary, EdH management has developed coping mechanisms to deal with a bad situation, where decisions are remotely made in the political arena in Port-au-Prince, and the consequences are left to be managed locally by staff. As explained below, the current modernization process, being implemented by the modernization council, has created an additional level of uncertainty and anxiety among the EdH staff. The end result of the modernization process will eventually be the replacement of the current management by a new operator.

Modernization of the Electricity Sector: CMEP. In its efforts to modernize Haiti's parastatals, the GOH passed in October 1996 the law on the modernization of Haiti's public enterprises. Mandated by the law, the Council for the Modernization of Public Enterprises (CMEP) was established in December 1996 by Presidential Decree.[7] The CMEP law mandating the modernization of EdH, as well as eight other parastatals, does provide very general guidelines for the process to be followed. Since its inception CMEP has spent considerable time and effort on determining the best way of modernizing EdH. Early on a consultant hired by the Inter-American Development Bank (IDB) in support of the EdH modernization effort made the following recommendations[8]:

- Do not disintegrate the company and maintain the principle of monopoly.
- Allow for the establishment of regional monopolies while favoring the establishment of an integrated entity encompassing the Port-au-Prince region, the Central Artibonite Valley, and the Cap Haitien region.
- Give preference to the "concession" option while keeping in reserve the "management contract" as a fallback position.
- To test the willingness of private sector participants to take over the task of modernizing the sector, allow for a short-term management contract with financial incentive tied to performance.
- Draft the enabling legislation that will allow the GOH and the private operator the opportunity to meet the terms of their contractual obligations without creating areas of potential friction.

The consultant report also recognized the desire of certain regional groups in Haiti to seek monopoly concessions for service areas located outside of the current EDH system. This is the case for Jacmel and Cap Haitien, where businesses and civic associations would like to take over the system with the complication that those targeted areas are within the perimeter theoretically being served by EdH, and thus subject to the modernization law.

Since these early recommendations, CMEP has presently progressed to the point that it has now adopted a formal recommendation, supported by the Inter-American Development Bank (IDB). This recommendation is considerably less comprehensive compared to the above recommendations. Briefly summarized, this recommendation calls for transfer of full responsibility for managing EdH to a private sector entity. First, after an initial transition period, a private company will be appointed for three years to manage and revitalize the company. Second, after the first three years, the GOH will enter into a long-term lease (concession) arrangement for EdH's entire operation; with the GOH as the lessor and a private sector entity as the lessee. CMEP has developed a draft "Electricity Law", to be incorporated in the management contract, and subsequently into the lease contract, providing the overall regulatory framework for the provision of electricity in Haiti.

The above recommendation reflects CMEP's thinking as of January 1999. It is the result of an already long process during which CMEP considered several options, including the so-called

[7] Loi sur la Modernisation des Entreprises Publiques, Le Moniteur, October 10, 1996
[8] Etudes pour la Modernisation du Secteur de l'Electricité en Haiti, CRC/SOGEMA, November 1997

capitalization alternative. In the latter option the GOH would sell a majority interest in EdH - 60 to 70percent - to the private sector and retain the balance, thereby creating a "mixed" private company with the GOH as a "minority" shareholder. Since this option has proven to be extremely difficult to implement, CMEP recommended the above modernization option. Although this is the politically preferred option there are still significant hurdles to be overcome, which still could mean that the present system may have to last a while longer. This in turn will put any USAID effort targeted for the secondary cities at risk. These relate to further clarification and passage of the draft electricity law, realization of the financial assistance provided by the IDB, without which the entire modernization process would come to a screeching halt, and resolution of remaining issues and uncertainties within the CMEP process.

The Draft Electricity Law. The draft law being prepared by CMEP and dealing with the regulatory framework for the modernized electric sector is still undergoing revisions. For this report a preliminary copy, provided by CMEP, was reviewed. It is apparent that it does not address the provision of service to areas outside the perimeter currently served by EdH. This draft legislation is a laudable attempt at establishing an economic regulatory body in Haiti and, as such, should be encouraged. However, the document needs substantive correction if the objectives of the secondary cities program are to be met. It is also hoped that several sections of the law that could be abused to intimidate, micro-manage, and shake down an independent operator would be modified before its submittal to Parliament. Another legal team is supposedly scheduled to look at what can be done in the rural areas and to areas not presently served by EdH. In its present form the proposed legislation does not offer the opportunity to try innovative, cooperative approaches. Absent such opportunities, the current CMEP process will lead to a situation where the eventual operator will concentrate its efforts around Port-au-Prince to curry political favor and reduce the fiscal hemorrhage. At a later time, attention will be paid to the other demand centers.

Revisions of the law, or complementary legislation, to include full consideration of rural areas are sorely missing. In this respect the United States is the example to emulate. To provide incentives for private, investor-owned, electric and gas utilities, serving rural areas, required special legislation. President Roosevelt created the Rural Electrification Administration through Executive Order 7037 in May 1935. Statutory provision for the agency was made in the Rural Electrification Act of 1936. Similar rural electrification legislation is urgently needed to avoid potential conflict with any future operator, who could, potentially, obtain the entire country franchise via long-term lease.

IDB Involvement in Modernizing the Haiti Power Sector. The IDB is the recognized lead player in the international community's efforts to assist in restructuring Haiti's electricity sector. They have funded most of the studies supportive of this restructuring exercise and are still directly engaged in the provision of direct credit supporting the procurement of materials in the distribution sector. Among the other major donors playing a role in the sector are CIDA of Canada, CFD of France, the European Union, and the German Development Fund. The Canadian International Development Agency (CIDA) is gearing up to provide assistance in Jacmel and is already involved in the provision of technical assistance through a Hydro Quebec International team working at EdH headquarters. The Caisse Francaise de Development has funded extensive

equipment rehabilitation, and is also engaged in the provision of technical assistance through an Electricité de France (EDF) team working at EdH headquarters.

The European Union and the German Development Fund are scaling down or phasing out their involvement in the sector. The U.S. has never been an influential player in the sector. One major exception should be made however. This applies to the U.S. Army provision of fuel to support electricity operation during the first four months following the landing of the UN Multinational Force. In addition U.S. assistance led to a DOE assessment mission in January 1995, and funding of the World Bank/International Finance Corporation study on privatization of State Enterprises in early 1995.

At this point it can be said that multilateral development banks (World Bank and IDB) and other donors have made great efforts to repair, improve and strengthen EdH and the physical power system. Both before and after the Embargo, the donor community has spent several hundred million dollars in loans and grants. Since 1994 multilateral development banks and bilateral development agencies have invested around $100,000,000 on the rehabilitation of the EdH system. Despite this huge infusion of funds in a system that still has less than 100 MW (in mid-March 1999 around 50 MW!), effective capacity, the IDB has stated that the major lesson learned is that all these investments have not been sustainable. The system has now lower effective capacity, with higher losses and is working worse than during the eighties.

Against the above background and supported by the IDB, CMEP has worked especially hard to find ways to "modernize" EdH, which for all practical purposes needs to be interpreted as finding ways to "privatize" EdH. At this point the CMEP recommendation is the result of considerable discussion within GOH government circles. As indicated earlier it is preferred that the GOH remains the owner of the EdH system, but intends to relinquish control over the management and operation of the system.

In January 1999, IDB expressed its intention to support this "privatization" process by financing priority actions through a $40 million loan, to improve expectations of private firms interested in EdH, and to increase the probability of successful "privatization" under the currently difficult and risky atmosphere of the country. In mid-March 1999, however, IDB had modified its earlier stance by suspending any preparatory activities related to the $40 million loan package, although, it would continue its technical cooperation program with CMEP. Thus as of mid-March 1999 IDB will continue to provide technical support to CMEP, principally to bring in an Investment Bank to advice CMEP on the best, practical and implementable way of continuing with the "privatization" of EdH. This will include finalization of all necessary documents such as bid documents, concession contract, etc., finalization of the draft electricity law and a legal code governing disconnection of customers, and financial support for a rural electrification study.

The earlier IDB work/loan program, i.e. as of January 1999, was structured in three phases as described below. In essence CMEP has decided to follow this same program, albeit without the loan support of the IDB:

- **Phase 1** during which IDB continues its technical assistance grant of $2 million (of which approximately $1.3 million has already been spent). The main focus is to finalize

the electricity law, with the help of outside consultants. They also plan to hire an investment-banking firm to prepare the management contract bid documents, and to prepare a study on rural electrification priorities in Haiti. IDB expects the law and the rural electrification study to be completed by June 1999, and the bid documents by September 1999.

- **Phase 2** lasting approximately one year, during which a new party will operate the EdH system for a fee. The IDB would loan the GOH $11.5 million for this period. $6.5 million of the loan will go toward early-retirement and layoff/retraining of about 50percent of EdH personnel to be managed by CMEP. $2.5 million will go to reducing illegal customers and reducing non-technical losses; and $1.5 million will be used for the management fee for the first transition year. CMEP hopes to have a management contractor selected and a contract signed by December 1999.

- **Phase 3** the concession period. This 25-year period entails granting a long-term concession to the operator of the system, with the operator being responsible for electricity supply, distribution and management. The geographic concession is expected to coincide with the present perimeter of the EdH system. The operator will receive his fees through collection of tariffs, as any other utility would. The IDB would provide a loan of $28.5 million to the GOH to improve the system within the perimeter, further reduce losses and study the extension of services to rural and other areas outside the perimeter. During this phase the IDB private sector division would also consider making a separate loan to the operator, to further facilitate entry of a private sector operator to manage EdH's system. This particular type of finance is as of mid-March 1999 still under consideration, despite IDB's suspension of the $40 million loan package.

In its assessment of risks, the IDB identified both a commercial risk as well as political risks associated with the earlier proposed loan program. The main commercial risk was that, despite the terms of the contract there may not be any private party willing to take on the task of managing the EdH system. In terms of political risks, approval of the concession contractor by December 1999 requires that there will be a Prime Minister as the head of government of Haiti. Furthermore, despite current preparations there is the possibility that the GOH may not approve the concession contract. Finally, an integral part of the concession contract will be the new electricity law and its regulatory provisions. Passage of this law requires that there will be a duly elected parliament, and that the parliament approves the law.

Key Uncertainties Still Unresolved in the CMEP Process. Although it appears that the CMEP process has come to a conclusion, reality indicates that the process is far from over. At this time the political stalemate is the prime reason preventing closure. Despite this situation however, CMEP is anxious to successfully conclude the process, without the interference of any other party. There is fear that such interference may jeopardize that a private party would take on the management of EdH. However, there are several issues related to the process which are still unclear and which require resolution before everything is "set in stone". These issues are important in particular because they have a bearing on the role that USAID potentially might play. Key among them are the following:

- **Timing Considerations.** In general, IDB and CMEP are justifiably concerned with finding a long-term solution for the ailing EdH, although it is noted that short-term needs such as repair of the transformers at Peligre do figure prominently. In fact, a large part of the most recent IDB investments has been short-term to prevent EdH from further deteriorating. However, it has also been observed that emergency measures to improve the current situation in Cap Haitien and Jacmel seem to be of lesser priority than getting a private operator "on board". And yet, the situation is deteriorating by the day. Luckily, in the Jacmel area, CIDA stepped in with a two-year program to repair existing generation capacity and add new capacity, improve and repair distribution capacity, improve collections and improve planning and management of the local EdH system. In Cap Haitien on the other hand it is expected that nothing will be done until the CMEP process has run its course. The time frame for completing the CMEP process is uncertain however. Although CMEP expects that there will be a management contractor by December 1999, this may be very optimistic. If the process is not completed by early 2000 it is likely that completion will not take place until some time after the December 2000 presidential elections.

- **Definition of the Concession Area and Multiple Operators.** It is understood that to attract a reliable operator it is necessary to maintain the integrity of the EdH system, within the so-called EdH perimeter, and to not break up the current system. However, thus far this perimeter has not been precisely defined, adding another element of uncertainty. Yet, it is envisioned that within the "perimeter" the new operator would have a monopoly with respect to generation, transmission and distribution, to prevent what is usually called "cherry picking". In particular the secondary cities of Cap Haitien and Jacmel contain opportunities for a new operator that could be highly profitable (the "cherries") as compared to Port au Prince. No new operator would like to be left with having to serve the less attractive customers, because other operators are serving the more attractive ones.

  While not opposed, CMEP seems most reluctant to contemplate at present the possibility of multiple operators for the overall power system of Haiti before a management operator for EdH is in place. Although multiple operators are not forbidden, there is the fear that allowing multiple operators at present may erode the bargaining position of the GOH in its dealings with any private operator. On the other hand, CMEP conceptually agrees that the concept of having multiple involved in the development of Haiti's electrical system is sound. There may be multiple operators at some time, in particular to provide electricity to areas clearly outside the EdH perimeter.

  At this point there is no certainty yet as to what the "Draft" law will contain regarding multiple operators when it finally will be presented to Parliament. However, in view of the above argument it appears that the Jacmel and Cap Haitien areas will remain an integral part of the EdH franchise. Thus, CMEP intends that these regional EdH service areas will not be separately partitioned. Therefore, the establishment of an autonomous regional utility, as had been discussed earlier, is not considered in the

current "Draft" legislation. On the issue of multiple operators the law is at present largely "silent".

The basic uncertainty associated with the definition of the EdH perimeter is of paramount importance in the CMEP process. The franchise territory of EdH by law is the entire geographic area of Haiti. In reality, various estimates suggest that only 15 percent of the territory are presently served by EdH. What is then the perimeter of those areas? These areas include the major urban centers, and some rural/agricultural areas in the Artibonite Valley. Therefore, there is this vast area, potentially 85 percent of the entire country, which could and should be made available to private power operators. Given the congestion of most large cities in Haiti, it stands to reason that most sustainable private power projects would be economically sited outside of EdH's current perimeters, closer to the agricultural hinterland surrounding the secondary city, and closer to the source of biomass or hydro resources available. In this context, the concept of an Integrated Resource Company (IRC), i.e., one of the "multiple operators", initially energy self-sufficient, then expanding outside its own fence to exploit local or regional opportunities makes good sense as a focal development opportunity for the secondary cities program.

Finally, form a practical and pragmatic perspective the concept of multiple operators and their inclusion in developing Haiti's electrical system also makes sense. Given the magnitude of investment that even a minimal provision of service would require of one single operator, the proposed "all or nothing" approach may not work. Any attempt to stagger the investment will, for obvious political reasons, favor Port-au-Prince at the beginning, and postpone for the foreseeable future any improvement in the provision of electric services to other cities. On the other hand, allowing multiple operators would bring more capital to the resolution of the basic underlying problem, and that is the building of an efficient electricity sector in Haiti.

- **Public Participation and Public Information**. The CMEP process has thus far been conducted primarily between the GOH and the multilateral development banks. There is no evidence that local people or local businesses in Cap Haitien and Jacmel have participated in, or have been given detailed information on the progress of the process. As a result there is generally very limited understanding on the issues at stake. On the other hand, and because the impact of the electricity crisis is obviously most acute at the local level, there is considerable desire among the local people to do "something" to improve current conditions. CMEP and IDB realize the need to bring local people into the CMEP process. Yet, they are reluctant to move, fearing that it may once again jeopardize the chances to bring in a management operator for the EdH system.

Conclusion. Currently envisioned power system development is far from certain. The present political stalemate has severely reduced the financial support by the IDB to help implement CMEP's recommended course of action. In view of the dire economic circumstances that the country finds itself in, and without the financial support of the IDB to make the privatization process work, there would be no funds to entice a private operator to take on the significant risks

associated with running the EdH system. As a consequence, current conditions would most likely further deteriorate beyond the point that EdH could be salvaged. At that point, the mode of operation would be one of "saving what is left to be saved", rather than "breathing new life" into the present EdH.

4. The Haitian Private Sector and the Modernization of EdH

A key objective for USAID in implementing the secondary cities program is to promote and facilitate that the private sector in Cap Haitien and Jacmel plays a much greater role in the provision of infrastructure essential for economic growth. This naturally applies to the electric sector. However, this also necessitates taking into account the experiences and perspectives of the private sector in these two cities when it comes to the provision of electricity.

Past and Present Experiences. Most, if not all, industrial and commercial establishments have small generating units installed to provide backup service for their own electricity needs. A few industrial customers have sizable generating capacity, but there is almost no attempt at cooperation among such customers in an effort to reduce their operating cost. There is no parallel operation with the EdH grid, as the cost of interconnection would be prohibitive, and the risks extremely grave for the private operator's equipment due to excessive variations in EdH voltage and frequency.

In both Jacmel and Cap Haitien, most private sector operators admitted that they could not rely on EdH for their energy supply. Most would use it for lighting purposes when it is available, but not count on it for anything more than operating office equipment. It is obvious that within the perimeter of areas theoretically served by EdH, EdH has monopoly rights for the production, transport, and distribution of electricity. Few have challenged that monopoly, even when it could be in their best interest. For example, the industrial park around the Varreux generating station in Port-au-Prince could be self-generating, economically, if they would aggregate the demand within their fences and be assured of a reasonable load by their tenants.

In Jacmel and Cap Haitien, there is no similar, large industrial park with the potential to challenge the EdH monopoly. As a result, the option is to individually self-generate with the attendant excess capacity of redundancy, the high cost of operation and maintenance, and the safety risk associated with storing flammable fuel on the site.

Public Perceptions and Opportunities for Cooperation. It is recognized that those most vocal about the inadequacies of EdH are those most severely injured: businesses, local entrepreneurs, commercial establishments, and large residential consumers. We obtained their visions of what would constitute a bare minimum electrical service, an improved service, and the ideal service. Most would be willing to pay a reasonable rate (higher than they are paying now) for normal service provided during business hours and reduced services at other times. Some voiced the opinion of favoring business concentration in business parks where service would be available and guaranteed during all hours, and a reduced schedule for other sectors. Those customers view EdH, the government monopoly, as non-responsive, arrogant, and corrupt. It was recognized that any local organization that would be involved in providing electric service, and would desire to collect all of its revenues, would necessarily involve the community it serves as to the desired level of service and the rate it must charge.

This form of organization is the basis for the cooperative/municipal concept so widely utilized in the United States. Such service ranges from the simple distribution of electric energy purchased in bulk at reduced price from a bigger entity with excess capacity, to a transport/distribution cooperative where more investment is required for the high voltage transport lines, to a complete generation/transport/distribution entity. Such endeavor would necessitate more complex legal structures. More importantly, it would require public education and collaboration, and match the economic, political, and social requirements of the local population.

Such education and collaboration are more easily achieved when the results are delivered within a short time horizon. Under such conditions, it would be reasonable to expect peer pressure to reduce fraud and abuse, and to guarantee revenue recovery. In such a fashion, a sustainable supply of electric energy would be within the reach of most secondary cities in Haiti. It is recognized that outside of Port-au-Prince, the secondary cities have less trouble with illegal connections, non-payment of bills, or access to sophisticated gangs of meter tamperers. The business communities of Jacmel and Cap Haitien expressed willingness to take the lead in fostering such education in cooperation with the local authority. The municipality in Cap Haitien sees strong incentive to such an approach, because it would result in increased economic activity and additional tax revenues.

Animosity between the Haitian Private Sector and the GOH. Because of past experiences there is considerable mistrust and animosity between private sector representatives in both Cap Haitien and Jacmel on the one hand, and the GOH and EdH on the other hand. As a result, there is at present little or no interest among private sector representatives to cooperate with EdH in order to resolve the present electricity crisis in Cap Haitien and Jacmel. The overwhelming sentiment in both areas is for the GOH and EdH to step aside, so that the private sector can fully take over the provision of basic services, including electricity. It is of interest to note here the so-called EdH "collections" problem, i.e., collecting revenue for electricity supplied. In reality this problem may not be so much an issue of customers unable to pay, but rather unwillingness to pay because of the perceived inability of EdH and the GOH to provide essential services in an efficient manner.

Organized Private Sector Capability to improve current Power System Conditions. Visits to Cap Haitien and Jacmel confirm that in both areas there is a genuine desire for local interest groups to fully participate in the development of their respective regions. In Jacmel, for example, this has led in 1996 to the creation of APDESE or "Association pour La Promotion et le Developpement Économique du Sud-Est". APDESE is a civic organization established under Haitian law. Its aims are to catalyze and promote setting up and implement structures that will manage, within a partnership with the Haitian government and on a commercial basis, the southeast department's basic infrastructures. These include electricity, telecommunications, water conveyance and all other aspects related to economic development: roads, harbor, airport, etc. In Cap Haitien it is the Chamber of Commerce which is the dominant force in rallying and organizing private sector support for development and infrastructure projects.

Where the desire to make a difference is genuine for both organizations, it must also be recognized that both organizations are lacking in technical as well as financial capability to undertake specific projects in the power sector. Technically, the expertise to run a "utility-type"

company is not locally available, while raising domestic capital for power sector projects-- a necessity for any private sector company-- is close to impossible in Haiti. With respect to the latter there is no such thing as project finance in Haiti - where the assets of the project itself are collateral for the debt and the debt does not appear on the sponsor's balance sheet. Because of the common nature of this type of financing for power projects in other countries, it is likely that that the only source of debt financing, in the near future, will originate outside of Haiti.

Disincentive for Private Sector Involvement. At present, one of the biggest institutional roadblocks to private sector involvement in the provision of electric service is the ability of the operator to stop fraud and abuse and to collect from the consumer for services rendered. Even a simple disconnection policy is fraught with legal traps requiring the participation of a Justice of the Peace, the writing of a legal report, and the presence of a police officer before a meter can be removed and the empty meter box legally sealed. A new draft law has been prepared since August 1991 and has not yet been presented to Parliament. There is no guarantee that if this new law were to be enacted, its application would be simple and straightforward. Some of the more notorious delinquents have the means to mount a legal challenge, and try to preserve their illegal subsidy under the current state monopoly status.

PART B. FORMULATION OF THE USAID ENGAGEMENT STRATEGY.

As earlier discussed the Mission's secondary cities program is the basic rationale for considering the formulation of a strategy aimed at USAID's substantive engagement in seeking improvements in the electricity sector of Cap Haitien and Jacmel. Moreover, USAID's energy program associated with such strategy responds one-to-one to the fundamental Mission's Energy/Environmental objective of ensuring a reliable, reasonably priced and adequate supply of electricity in those cities.

This part of Chapter 3 discusses alternative strategies and programs, options, available to USAID. These options differ in view of what may happen in Haiti related to the uncertainties and issues discussed in Part A. Subsequently, the remainder of the Chapter focuses on a number of elements considered critical for any strategy that USAID may decide to adopt. Here the discussion turns specifically to USAID assistance in institutional development, legal development, public information and participation. At this point it should be noted that the success of any strategy relates to USAID's ability to influence the institutional reforms now underway for the eventual modernization of EdH. Multiple private sector involvement is the desired outcome. Since the specific and ultimate modalities of such involvement have not been cast in stone, influencing the process to include more creative alternatives should be a major goal for USAID, as well as the primary performance indicator for USAID engagement.

1. Strategic Options for USAID to become engaged in the Electricty Sector of Haiti

The fundamental political and economic uncertainties in Haiti, coupled with the large number of unresolved "CMEP related" issues covered in Part A of this chapter, present USAID with a seemingly insurmountable task when addressing power sector development in the context of the secondary cities program.

In order to identify a possible program for USAID to pursue, several options for USAID intervention have been identified first. To reflect the basic uncertainties associated with the present situation in Haiti a scenario approach has been used. Each scenario represents a consistent set of assumptions of what actually may happen in Haiti in regards to economic development, political development and power system development. Subsequently, options for USAID intervention are identified for each scenario, which taken together represent alternative strategies composed of specific actions.

Table 3 presents three scenarios and the various strategies, including the major program objectives to be achieved. Subsequent detailed program design for a USAID energy component, as an integral part of the Secondary Cities Program, will yield the specific activities, programs and projects to be undertaken. At this point it can be stated that such activities, programs and projects will fall along four dimensions:

1. Support Institutional/Legal Development of the Power Sector
2. Support for Physical Development of the Power Sector
3. Support for Specific Power Projects regarding the Power Sector
4. Focus of USAID/Haiti Financial Assistance, notwithstanding the financial assistance implications of activities required by the above strategy elements

Scenario 1, in Table 3, is the most optimistic one, and Scenario 3 is the most pessimistic, while Scenario 2 is somewhat of a continuation of the status quo. For each scenario the question addressed is what may happen, or may have happened, by the year 2000, thus accounting for events already set in motion? Although Table 3 is largely self-explanatory, in terms of options available to the USAID Mission, a brief explanation is provided below.

Under **Scenario 1** all presently identified uncertainty has essentially been resolved and one may say, "a new EdH has arisen". Economically, Port-au-Prince is slowly recovering, while moderate to rapid growth in secondary cities such as Cap Haitien and Jacmel is pulling Haiti out of stagnation. The stage has been set for USAID to play a most constructive role in the development of Haiti through the implementation of the Secondary Cities Program. Key in this scenario is that all regulatory power sector issues have been satisfactorily resolved, and multiple operators are allowed to work side by side with the EdH management contractor in order to fully develop a distributed power sector in Haiti. The major program thrust under this scenario is for USAID to broker U.S.-Haitian partnerships as Electrical Cooperatives [and possibly Independent Power Producers (IPPs)], and to assist, technically and financially, in the establishment of such private electrical companies in the Cap Haitien and Jacmel areas.

Scenario 2 basically reflects the assumption that not much will change from the present situation, in which the "old EdH remains seriously ill but is not dead". Economically, Port-au-Prince remains seriously ill, while there is no discernible improvement in the economies of Cap Haitien and Jacmel. USAID's Secondary Cities Program is seriously jeopardized because basic assumptions for its successful implementation can not be satisfied. Under this scenario the strategy for USAID/Haiti toward power system improvement is envisioned to follow essentially two tracks. On the one hand USAID/Haiti can and must support IDB and CMEP in the attempt to introduce the concept of multiple operators, and specifically to introduce NRECA type legislation into the Electricity Law debate. On the other hand, and because there is no new management contractor, USAID/Haiti should promote and facilitate that the Chamber of Commerce in Cap Haitien and APDESE in Jacmel play an active role in improving power supply in these two areas. Several activities have been identified in Table 3. It is assumed that the CMEP process is stalled but not stopped altogether. Hence, any direct role by these organizations as "power companies" is most likely not feasible. However, in order to provide electricity outside the EdH perimeter, and to stimulate economic growth in the Cap Haitien and Jacmel High Productivity Zones, USAID should promote the concept of establishing Integrated Resource Companies (IRCs). IRCs are companies developed by the private sector in Cap Haitien and Jacmel. They capture synergies between the need for electricity in agriculture-based export industries (processing, packaging, refrigeration, etc.) and the opportunity to sell company produced excess power.

Table 3
Options for USAID Interventions

What May Happen in Haiti by 2000? in terms of: Economic Development (ED); Political Development (PD); Power System Development (PSD)		
Scenario 1 Motto: "A new EdH has arisen"	**Scenario 2** Motto: "The old EdH is seriously ill, but not dying "	**Scenario 3** Motto: "The old EdH is dying; save what can be saved""
ED: Steady Improvement - Economy of Port-au-Prince is slowly recovering - Secondary Cities, including Cap Haitien and Jacmel pull Haiti out of stagnation - USAID Secondary Cities Program working **PD**: - New Parliament elected and new Prime Minister (PM) appointed and accepted by Parliament **PSD:** - CMEP process completed - Management Contractor appointed - New Electricity Law approved and multiple operators allowed - IDB Loan to support Electric Sector Reform approved	**ED:** Status Quo - Economy of Port-au-Prince remains seriously ill - Growth in Cap Haitien and Jacmel remains stagnated - USAID Secondary Cities Program seriously jeopardized **PD:** - New PM appointed but no new Parliament elected **PSD:** - CMEP process stalled - EdH struggles on; no new management contractor brought in - Draft Electricity Law debated, monopoly in EdH perimeter maintained - Wait and see approach by IDB	**ED:** Continued Deterioration - Economy of Port-au-Prince is near total collapse - The Cap Haitien and Jacmel economies are dead - USAID Secondary Cities Program is not working, and possibly suspended **PD:** - There is neither a PM nor a duly elected Parliament **PSD:** - CMEP process is stopped - EdH accepted as officially bankrupt, no new operator - Impasse on interpretation of the legal status of EdH - Donor community resorts to emergency measures or gives up altogether
Likelihood: LOW	**Likelihood: HIGH**	**Likelihood: MEDIUM**

Table 3
Options for USAID Interventions

	What May Happen in Haiti by 2000? in terms of: Economic Development (ED); Political Development (PD); Power System Development (PSD)		
	Scenario 1 Motto: "A new EdH has arisen"	**Scenario 2** Motto: "The old EdH is seriously ill, but not dying "	**Scenario 3** Motto: "The old EdH is dying; save what can be saved""
Strategies for USAID/HAITI			
1. Support for Institutional/Legal development of the Power Sector.	**Focus:** Assist in realizing a distributed power system in Haiti with multiple operators • Promote US-Haitian private sector partnership for power in Cap Haitien and Jacmel, working as electrical Coops (and possibly as Independent Power Producers (IPPs)) • Assure the legal foundation for such partnerships • Assist in negotiating working/operating agreements between the partnership, and the regulatory agency, and/or the new EdH • Train the Haitian side of the partnership in utility planning, operation and management	**Focus:** Promote private sector involvement in the power sector of Cap Haitien and Jacmel. • Support the Chamber of Commerce in Cap Haitien, and APDESE in Jacmel, in their efforts to become substantively engaged in legal framework development for the power sector in their areas • Establish formal contact with CMEP as an observer in the Electricity Law debate, in close coordination with IDB and other interested donors • Analyze the specific applicability of NRECA-type legislation for inclusion in the new electricity Law • Translate the draft electricity law into English, convene as soon as possible an expert workshop in Haiti, and support additional legal development work aimed at including multiple operators in Haiti's power sector.	**Focus:** (1) Strengthen and support emergency power supply provisions for hospitals, schools, and other vital community services; (2) Promote public/private partnerships in Cap Haitien and Jacmel for local private sector entities to take the lead role in restoring and improving existing systems. • Take the lead in establishing an emergency power supply task force, including all other interested donors and representatives of the public and private sector • Provide technical and legal support to local groups in Cap Haitien and Jacmel in their discussions and negotiations with the GOH/EdH to form a partnership
	• Promote broad participation in power sector affairs by local interest groups	• Promote broad participation in power sector affairs by local interest groups	• Promote broad participation in power sector affairs by local interest groups

Table 3
Options for USAID Interventions

	What May Happen in Haiti by 2000? in terms of: Economic Development (ED); Political Development (PD); Power System Development (PSD)		
	Scenario 1 Motto: "A new EdH has arisen"	**Scenario 2** Motto: "The old EdH is seriously ill, but not dying "	**Scenario 3** Motto: "The old EdH is dying; save what can be saved""
2. Support for physical power system development and management	**Focus:** Develop additional generation and distribution capacity in the High Potential Zones centered on Cap Haitien and Jacmel; thus augmenting the power system operated by the new EdH • Analyze and forecast supply and demand in Cap Haitien, Jacmel and their respective economic hinterlands • Develop integration/coordination plans for the new partnership with the new EdH • Develop in Jacmel the local capability to assure long term sustainability of the CIDA assistance project, including technical planning as well as means to improve collections on a long term basis	**Focus:** Assist the private sector in Cap Haitien to avert the present total collapse of the existing system, and continue the CIDA initiated improvement in Jacmel • Explore the opportunity to negotiate a public/private partnership between Cap Haitien businesses and EdH in order for Cap Haitien businesses to come to the rescue in the interim, through securing additional capacity and fuel supply, including fuel storage. • Develop in Jacmel the local capability to assure long term sustainability of the CIDA assistance project, including technical planning as well as means to improve collections on a long term basis	**Focus:** (1)Develop an emergency power supply plan for the Cap Haitien and Jacmel areas (2) Assist in rehabilitation, maintenance and repair of current systems in Cap Haitien and Jacmel, pending the emergence of public/private partnerships in these areas • Additional emergency generation capacity and other needed emergency facilities • Provide for additional capacity and fuel supply storage in Cap Haitien • Develop in Jacmel the local capability to assure long term sustainability of the CIDA assistance project, including technical planning as well as means to improve collections on a long term basis
3. Support for specific projects regarding the Power Sector	**Focus:** Provide assistance in brokering a US-Haitian Partnership for power • Identify specific power companies in the US as potential partners • Identify specific companies in Haiti and/or assist in their formation • Assist in mitigating the risks to the US partner associated with its entry into Haiti	**Focus:** Facilitate the development of power-related projects outside the perimeter of EdH • Promote the development of a private Integrated Resource Company (IRC), capturing synergies between the need for electricity in the Ag.-based export industries (processing, packaging, refrigeration, etc.) and the opportunity to sell company produced excess power to near-by demands • Initiate in cooperation with the	**Focus:** (1) Based on priorities identified in an emergency power supply plan, provide support to specific high priority projects; (2)Pending formation of public/private partnerships, provide support for specific projects, based on priorities determined by the partnerships; (3) Facilitate the development of power-related projects • Promote the development of a private Integrated Resource Company (IRC),

Table 3
Options for USAID Interventions

	What May Happen in Haiti by 2000? in terms of: Economic Development (ED); Political Development (PD); Power System Development (PSD)		
	Scenario 1 Motto: "A new EdH has arisen"	**Scenario 2** Motto: "The old EdH is seriously ill, but not dying "	**Scenario 3** Motto: "The old EdH is dying; save what can be saved""
		Chamber of Commerce the development of one specific IRC in the Cap Haitian Productivity Zone, and one IRC in the Jacmel Productivity Zone with the cooperation of APDESE	capturing synergies between the need for electricity in the Ag.-based export industries (processing, packaging, refrigeration, etc.) and the opportunity to sell company produced excess power to near-by demands • Initiate in cooperation with the Chamber of Commerce the development of one specific IRC in the Cap Haitian Productivity Zone, and one IRC in the Jacmel Productivity Zone with the cooperation of APDESE
4. Focus of USAID/Haiti financial assistance, notwithstanding the financial assistance implications of activities required by the above strategy elements	Provide capital for: • Training local private company staff in Cap Haitien and Jacmel • Start-up of US-Haitian Partnership in Cap Haitien and Jacmel • Participation in power system development (generation, distribution and management) • Capacity building in Jacmel to build on the CIDA project	Provide Capital for: • Analysis/development of export markets for users/members of IRCs • Project development and pre-investment analyses for the IRCs in Cap Haitien and Jacmel • Emergency repairs for the current Cap Haitian system, including additional fuel storage • Capacity building in Jacmel to build on the CIDA project	Provide Capital for: • Emergency power supply projects • Emergency repairs for the current Cap Haitian system, including additional fuel storage • Capacity building in Jacmel to build on the CIDA project • Priority projects identified by the public/private partnerships in Cap Haitien and Jacmel • Analysis/development of export markets for users/members of IRCs • Project development and pre-investment analyses for the IRCs in Cap Haitien and Jacmel

Scenario 3 reflects the situation where Scenario 2 is allowed to continue for too long. In fact, the situation has deteriorated to the point that CMEP can not even find private parties willing to take on the job of managing EdH, and the donor community resorts again to emergency measures to provide electricity. At this point the economy of Port-au-Prince is close to total collapse, while the Cap Haitien and Jacmel economies are essentially dead. The Secondary Cities Program in its original concept cannot be implemented, and USAID may possibly suspend it all together. This scenario is perhaps best characterized by an official GOH statement acknowledging that the useful life of EdH has expired. Faced with this situation, the USAID strategy is essentially twofold. Firstly, play an active role in providing emergency electricity supplies for the most essential services. Secondly, promote and support the emergence of public/private partnerships in Cap Haitien and Jacmel in order for local private sector entities to take the lead role in restoring and improving existing power systems. In essence, the latter would imply that power supply in Cap Haitien and Jacmel would be as it was prior to 1971, when private power companies serviced these cities. To the extent that the GOH would have title to physical assets they would have to be represented within the partnership, although it is entirely possible that private sector interests would merely acquire such assets in the formation of electric utilities in Cap Haitien and Jacmel.

Although, the three scenarios presented in Table 3 are distinctly different, there are common elements in the strategies associated with these scenarios. Most importantly, regardless of the specific scenario it is considered essential that USAID initiates and undertakes a broad based public participation and public information program with regard to power sector issues. Thus far, the entire power-system-reform process has primarily seen the participation of CMEP and the GOH together with multilateral development banks. Those most effected, i.e., the general public and private businesses, have only been involved to a minimal degree. Yet, their participation in terms of changing behavior patterns as well in terms of actual contributions (technically, financially, and otherwise) towards the improved operation and management of existing systems is critical. The three strategies displayed in Table 3 also recognize the potentially valuable contribution that the CIDA assistance project makes in Jacmel. It is essential that further activities be undertaken to assure the long-term sustainability of this two-year effort, scheduled for completion in June of 2000.

A common element in strategies 2 and 3 is the establishment of Integrated Resource Companies. Recognizing the fact that under both of these scenarios it will be difficult to obtain funding for the improvement or establishment of power companies proper, IRCs are a means to ameliorate the power crisis by focusing on developing agribusiness export projects. Technically and economically feasible in their own right, the planned excess power provided by these projects will be beneficial to near-by customers. Not only will these projects provide needed growth, income and employment, but they will also provide a boost to local initiatives in dealing with the power crisis. Prior to promoting IRCs, however, it will be essential to negotiate the approval of CMEP and the GOH to actively pursue this type of opportunity. Given the dire situation envisioned under both scenarios it is expected that such approval can be obtained, in particular if progress toward finding a management contractor for EdH proves more difficult than presently envisioned.

Finally, the likelihood that any one of the scenarios presented in Table 3 will be realized is clearly a matter of subjective judgement. Consequently, whether or not USAID/Haiti should pursue anyone of the strategies listed in Table 3 is also a matter of judging how events and conditions in Haiti will unfold. Although there may be much speculation, there is precious little certainty. To assist in this elementary assessment process, a likelihood of occurrence has been attached to each scenario. It is considered highly unlikely that by the year 2000 Scenario 1 will be realized. It is considered most likely that the status quo will be maintained and that in 2000 Haiti is faced with Scenario 2. However, Scenario 3 can not be discounted, because the longer the present situation lingers on, the more likely Scenario 3 will become. Hence, Scenario 3 is placed "between" Scenario 1 and 2.

Based on the above assessment, it follows that the strategy identified for Scenario 2 constitutes the recommended strategy. The major program objectives listed for Strategy 2 will provide focus to a logical and coherent program to be executed by USAID/Haiti. It is recommended that this program be executed over the next five years. However, in view of basic uncertainties it is also recommended that in the detailed program design special attention be given to progress monitoring and evaluation. At a minimum, a comprehensive program assessment should be made at the end of two years, with the explicit possibility of terminating the program at that time, and diverting budgetary outlays to higher priority programs.

Further detailed program design will be required to provide complete activity, program and project descriptions and cost estimates. In the following initial steps toward detailed program design have been made for the recommended strategy, by indicating major milestones for each program objective, as well as a preliminary assessment of required budgets. This information, stated in bold letters, is included in parentheses The result of this preliminary assessment is that $5.04 million is required to implement the recommended strategy. It should be clearly recognized that this is a preliminary order of magnitude cost estimate. Having said this, it should also be recognized that in the opinion of the authors of this report this estimate represents a minimum level of effort in order for USAID to become genuinely involved in improving the electricity sector in Cap Haitien and Jacmel. The energy crisis in Haiti in general, and in Cap Haitien and Jacmel in particular, makes it extremely difficult to do anything useful or sustainable with investment levels that are significantly less. With this caveat the recommended program can now be described as follows:

1. Support for Institutional/Legal development of the Power Sector.	**Focus:** Promote private sector involvement in the power sector of Cap Haitien and Jacmel. • Support the Chamber of Commerce in Cap Haitien, and APDESE in Jacmel, in their efforts to become substantively engaged in legal framework and power sector development in their areas. **(Two special full time private Haitian Power Sector Taskforces, $250,000/yr for a program total of $1,250,000; 2x 13 Training Fellowships for a program total of $ 520,000.)**

- Establish formal contact with CMEP as an observer in the Electricity Law debate, in close coordination with IDB and other interested donors. **(One senior economist in EG devoted full time to the electricity sector, no budgetary implication.)**
- Analyze the specific applicability of NRECA-type legislation for inclusion in the new electricity Law **(Rural Electrification Implementation Study, $250,000.)**
- *Translate the draft electricity law in English, convene as soon as possible an expert workshop in Haiti to review and analyze the law,* and support legal development work aimed at including multiple operators in Haiti's power sector. **(Translation and Workshop, $100,000; Draft Legal Proposal to CMEP, $150,000.)**
- Promote broad participation in power sector affairs by local interest groups. **(Program Design, $30,000; Program Operation, $55,000/yr for a three-year program total of $165,000.)**

2. Support for physical power system development and management

Focus: Assist the private sector in Cap Haitien to redress the present total collapse of the existing system, and continue the CIDA initiated improvement in Jacmel.

- Explore the opportunity to negotiate a public/private partnership between Cap Haitien businesses and EdH in order for Cap Haitien businesses to come to the rescue in the interim, through securing additional capacity and fuel supply, including fuel storage. **(Detailed Assessment, Negotiated Deal and Legal Contract, $45,000.)**
- Develop in Jacmel the local capability to assure long term sustainability of the CIDA assistance project, including technical planning as well as means to improve collections on a long-term basis. **(One full-time utility planner/manager and staff support, $100,000/yr for a four-year program total of $400,000.)**

3. Support for specific projects regarding the Power Sector

Focus: Facilitate the development of power-related projects outside the perimeter of EdH.

- Promote the development of a private Integrated Resource Company (IRC), capturing synergies between the need for electricity in the Ag.-based export industries (processing, packaging, refrigeration, etc.) and the opportunity to sell company produced excess power to near-by demands. **(Two IRC Feasibility Studies at $125,000 each for a program total of $250,000.)**

- Initiate in cooperation with the Chamber of Commerce the development of one specific IRC in the Cap Haitian Productivity Zone and one IRC in the Jacmel Productivity Zone with the cooperation of APDESE. **(Two IRC Business Plans at $50,000 each for a program total of $100,000.)**

4. Focus of USAID/Haiti financial assistance, notwithstanding the financial assistance implications of activities required by the above strategy elements

Provide Capital for:

- Analysis/development of export markets for users/members of Integrated Resources Companies (IRC). **(Four export products, $35,000/product for a program total of $140,000.)**
- Project development and pre-investment analyses for the IRCs in Cap Haitien and Jacmel. **(Project Planning and Design Studies at $250,000 each for a program total of $500,000.)**
- Emergency repairs for the current Cap Haitien system, including additional fuel storage. **(Fuel Storage, Generation and Transmission Repair for a program total of $1,000,000.)**
- Capacity building in Jacmel to build on the CIDA project. **(Seven Training Fellowships for a program total of $140,000.)**

2. Institutional Development

A key element in the USAID engagement strategy is to contribute to the development and strengthening of all institutions associated with, related to, or impacted by the modernization of Haiti's electric sector. The following are key focal points in this regard.

Establish Formal Contact with CMEP. Besides recognizing the importance of assuring reasonable electric services and expressing a desire to get involved, USAID needs to be discreetly engaged in influencing the current CMEP process. New and innovative strategies must be part of the modernization process. The speed and magnitude of the required investments to provide minimum acceptable and affordable services to most secondary cities within a "reasonable time frame" will overwhelm all but the most committed private sector operator. Since the country is not electrically interconnected, some cities should be offered the opportunity to seek their own innovative and independent partners.

Therefore, it is absolutely necessary that a high level, formal contact is established with the authority most likely to positively influence this highly political and politicized process. Since the CMEP reports directly to the Prime Minister, such contact will assure that those concerns are registered at the highest level of the decision making process. A weekly meeting would be sufficient to take an accurate pulse of the situation and provide input supportive of the objectives USAID has established for its secondary cities program.

Establish Regular Contact with Other Donors. Given the importance of the secondary cities program, and the realization that an adequate, economic, and reliable supply of electricity is essential to achieving the program objectives, the importance of establishing a working contact with the other involved donors cannot be over stressed. However strong caution is expressed against wanting to, or appearing to, take the lead.

Engage Local Groups in the Targeted High Potential Zones. In Cap Haitien and Jacmel well-intentioned and active local organizations have expressed a strong desire to have an adequate supply of electric services. Their expressed frustration with the present EdH lack of responsiveness has not resulted in a coordinated approach to solving this problem. They are acting separately and are not very effective. The Mission would be well advised to secure their cooperation, establish them as partners, and facilitate a common dialogue toward advancing the goals of a Secondary City Private Sector Energy Initiative. It is expected that if this effort at dialogue is successful, other important cities like Les Cayes, Jeremie, Port-de-Paix, and Gonaives may actually like to join the "movement" toward independent, totally integrated, private suppliers of electric services on a local basis.

3. Legal Development

As discussed in Part A of this chapter the most critical issues affecting the participation of private sector operators in the electricity sector of Haiti are legal ones. The revisions to be made to the draft electricity law will to a large degree resolve what type of electricity system will emerge in Haiti. At present there still is the opportunity for the USAID Mission to participate in an effort aimed at building one that is efficient, based on maximizing opportunities for the private sector to contribute in a competitive environment. However, it requires that USAID commit itself to two critical actions.

Pursue a Revision of the Draft Electricity Law to Include Multiple Operators. An attempt should be made to clearly ascertain what *exactly* is in the final "Draft" legislation regarding multiple operators. If such a provision in lacking, USAID should work with IDB and the other donors to put pressure on CMEP to modify/revise the "Draft" to include such option. To this end *USAID should without delay translate the current draft law and convene an expert workshop in Haiti to review and analyze the draft law in detail.* Based on the results of the workshop, a detailed scope of work is to be developed for follow-on legal development work, assuring that in the future "no doors are closed" preventing the emergence of the most efficient and effective power system for all of Haiti. The rationale is that multiple operators, within an integrated monopoly concept, would actually provide an incentive to compete for best practices and provide the regulating authority with the economic information needed for enlightening and mutually beneficial regulation. The inclusion of such provision in the draft law, and some lobbying before Parliament for its passage, when it is submitted, could be the most that can be expected now. If the process moves on, beyond the international bidding process, and the law is not modified, it might be next to impossible to reverse course at a later date.

Fund Development of Complementary Rural Electrification Legislation. In meetings and discussions with CMEP and IDB, it was alluded that additional draft legislation was being considered to address the 85percent of the territory outside EdH current perimeter, the so-called rural areas. The need to address this question, from a legal standpoint, is of critical importance to all concerned communities, including not only Cap Haitien and Jacmel but also others. Funding for alternative/complementary legislation that provides for private cooperative participation in the provision of electric services should be an integral part of the energy component of USAID's secondary cities program.

Support could be obtained from the International Programs Division of the NRECA, which has broad experience in providing technical and management assistance, and creating cooperatives and other decentralized utilities. Securing various "models" of contracts and adapting them to the situation in Haiti could be an expeditious and low-cost method to provide the necessary information to CMEP before the transfer of the EdH monopoly franchise to a private operator. Once again, if this possibility of co-ops as multiple operators is not clarified in the law, whoever leases the franchise would probably not be receptive to the idea after the fact. USAID should follow up on the visits made by the National Rural Electric Cooperative Association to Haiti, in September 1998 and more recently. Although reports of these visits have not been reviewed, it is believed that the NRECA is the key partner for USAID to make progress on the development of rural electric cooperatives in Haiti.

4. Public Information

An effective public information package promoting the benefits of private sector power supply requires broad and active participation of those groups or sectors that will benefit the most. This includes civic/professional/business associations, the Chamber of Commerce, as well as the Cap Haitien and Jacmel. Key activities are as follows.

Enlist Support of Local Groups. Both in Jacmel and Cap Haitien, civic groups, Chambers of Commerce, and individual business people were identified which would be receptive and supportive of the goals of the USAID secondary cities program and its energy component. This dovetails nicely with the stakeholder participation aspect as discussed in the HPZ concept paper. The latter calls for enlisting the support of community groups, local non-governmental organizations, and local government offices.

In Jacmel, the APDESE organization should be the prime source of information and suggestions for a locally tailored program. In Cap Haitien, the Chamber of Commerce should fill that role. Since the secondary cities program targets also the surrounding agricultural/rural areas, it would be wise to canvass local organizations in the targeted zones to gather their input also.

Essential Components of a Public Information Package. A public information package promoting the benefits of localized, private sector provision of electric service must conform to the legal structure in place. In other words, unless and until the CMEP law is revised to allow such undertaking, it can be considered bad taste, impolite, or even subversive to promote such ideas. The assumption here is that such proposition has been sanctioned by appropriate legislation. Such package should address the regional/local benefits of the provision of electric services in the following areas:

Agriculture:	- Irrigation with electric water-pumping - Harvesting, drying, and storage - Refrigeration - Packaging
Industry:	- Assembly/Export - Manufacturing - Packaging/Light Industrial - Mining
Tourism:	- Hotels - Restaurants - Handicrafts
Health:	- Health Centers - Hospital - Pharmacies
Education:	- Lighting - Cooling - Audio Visual Resources - Web Access to Outside World

The point should be stressed that such endeavor will result in job creation, individual advancement, and a very big step up the economic ladder. Engaging a professional public relations firm is the best way to design the appropriate message, method of: "packaging" and delivery, with the help, guidance, and support of the local partner in the secondary cities program.

Coordination with Environmental Ad Campaigns. Energy issues and environmental ones are very closely linked in Haiti. To achieve the desired synergy, it would be beneficial to coordinate the secondary city environmental campaign with the promotion of private sector participation in providing electricity. It is envisioned that the linkage could be as follows:

- Economical energy leads to
- Economic growth and good jobs, which leads to
- Making personal energy decisions, which will
- Protect the environment

There is, however, a very subtle point to be made. This campaign should not give the impression that electricity is to be used for cooking; this is the most wasteful use of energy. Rather, it should be stressed that an increased income makes the new, efficient cooking stoves more attractive. Such purchase is of interest, since it substantially reduces overall fuel expenditure, and protects the environment.

5. Public Participation

While the public information element must, by necessity, have as its primary objective to reach and influence the largest audience possible, the public participation element must be focused and targeted on a specific segment of the population. Specifically people capable of understanding the message, willing to be an active participant in the process, and representing a well-defined constituency, should be targeted. Those most able to positively influence events in Haiti and provide the necessary local input are:

- Professional Associations
- Business Associations
- Local Elected Officials
- Local Non-Governmental Organizations
- Community Associations

USAID's efforts should be concentrated on the local partners in Cap Haitien and Jacmel to secure local leadership and coordination among the participants, thus guaranteeing a meaningful public participation process. This is all the more important to counteract the potential intervention of well-financed and misguided opposition.

Public participation should result in close cooperation between various actors and players with an interest in private sector provision of electricity. Such cooperation aims at clarifying and resolving the following issues. Firstly, support for the concept of the provision of electric services by a private operator. Secondly, support for the principle of a regulated monopoly, controlled by the relevant government agency established to safe guard the interest of the consumer. Thirdly, support for the application of legislation dealing with obligation to pay for services utilized. Finally, foster and promote regular contact with an advisory group to provide regular reports on the progress and financial health of a private sector venture providing electricity services.

To facilitate this type of public participation it will be necessary for USAID to provide leadership training, group dynamic training, and other motivational skills to selected individuals of the local business partner group in Cap Hatien and Jacmel. Specialized and competent training consultants should provide this type of "skills" training, with experience in "grass-roots" community organizing.

4. Private Sector Partnerships for Electricity in Jacmel and Cap Haitien

USAID's secondary cities program in Haiti is a major new initiative to support efforts by local governments, business groups, civic groups and Parliament to develop economic alternatives to rapid migration by the poor to Port au Prince. Focused on Cap Haitien and Jacmel as the centers of High Potential Zones (HPZ), the program will assist these cities to attract private investment and create jobs, develop reliable infrastructure, and strengthen public education and training. Central to the program is the realization that the private sector in these cities can and must play a major role in both removing the bottle necks towards growth, as well as in taking the lead role in realizing the potential for growth. Where governments can and must develop a policy environment conducive to growth, in the end private sector initiatives account for the majority of sustainable economic development. Facilitating that such development will emerge in the HPZs of Cap Haitien and Jacmel is the raison d'être of the secondary cities program.

As discussed elsewhere in this report, one of the most important constraints for economic development of Cap Haitien and Jacmel, and their respective economic hinterlands, is the current crisis in providing reliable and affordable electricity, sufficient to meet the demands of all economic sectors. Regardless of the specific reasons, the GOH and EdH have failed to provide this most basic of services. The impacts of lack of sufficient electricity services have been very severe. Without electricity for lighting and cooking in the residential sector people are forced to find alternative fuels, which in the case of cooking has led to increased use of wood and charcoal with devastating effects on the environment. Perhaps, the effects on the productive sectors of the economy have been even more disastrous. In agriculture, for example, any attempt to increase value added invariably requires electricity for such activities as processing, packaging, refrigeration etc. Assessments of the potential for agribusiness in Haiti indicate that there is a significant potential for growth, if, among other constraints, the electricity constraint would be removed.[9]

In view of the basic objective of the secondary cities program, and in view of the fundamental role of electricity for the growth of the High Potential Zones centered on Cap Haitien and Jacmel, USAID requested assistance in addressing the following objectives:

1. Help improve the investment climate in Cap Haitien and Jacmel through the production and distribution of reliable and affordable electricity.
2. Help induce and broker private sector investments and public/private partnerships focused, in whole or in part, on producing and distributing reliable and affordable electricity in these secondary cities.
3. Identify the appropriate structure(s) for brokering or facilitating "deals" in the power sector of the secondary cities.
4. Help rank the options available to USAID/Haiti toward achieving these objectives.

[9] Haiti Agribusiness Assessment, APAP III, Draft Technical Report, April 1995, Abt Associates and others.

From the above objectives it is concluded that it is desirable to get the private sector and/or public/private partnerships involved in the power sector of Cap Haitien and Jacmel. This chapter addresses the question whether this can be done, and, if so, how this should be accomplished. Part A provides a general assessment on the feasibility of private sector involvement in the power sector of Cap Haitien and Jacmel, while Part B identifies activities for USAID to undertake to facilitate such involvement in the future.

PART A. ASSESSMENT OF PRIVATE PARTNERSHIPS FOR POWER IN JACMEL AND CAP HAITIEN

The words partner and partnership have various meanings. Properly defined a partnership is a **legal** relationship between two or more entities, contractually associated as joint principals (partners) in a business. However, mere cooperation towards a common goal, without a contract is at times also considered a partnership. Furthermore, the partners may be representatives of the public sector, or government, or they may be representatives of the private sector, i.e. an individual private business, civic grouping, or individual citizen. In addition, in the case of Cap Haitien and Jacmel, partners could be Haitian legal business entities or Haitian citizens or they could be of a different nationality, such as the U.S. In the following assessment any type of partnership (legal or non-legal) is considered as long as at least one of the partners is a member of the private sector in Cap Haitien and Jacmel. Of particular interest in this investigation is to determine the possibility of a private U.S.-Haitian partnership, between one or more private entities in the U.S. and one or more private entities in Haiti. Since there is a compelling need to inject capital and technology by non-Haitian participants into any partnership, to help secure long term sustainability of power system improvement, a partnership among Haitian entities, established with financial, managerial and technical support of U.S. interests, is clearly of great interest to USAID.

1. Potential Partnership-Models for the Provision of Electricity in Jacmel and Cap Haitien

One way of discussing partnership models for the provision of electricity is to focus on the role such partnerships might play as business enterprises in the electricity sector of Cap Haitien and Jacmel. To provide the context for such discussion the following first addresses the general business structure of companies providing electricity throughout the world, and its evolution over time.

Evolution of the General Structure of the Electricity Industry. Generally, businesses (public or private) in the industry, in any locality, are characterized by three basic parameters: (1) type of ownership of the business enterprise; (2) scope of services/products; and (3) type of services/products. Table 1 shows the most common choices for each of these parameters.

Traditionally and for most of the world, the most common forms of organization in the electricity sector are the government owned and the private investor owned full service utility, exclusively devoted to the provision of electricity and regulated in terms of service area, allowable tariffs, etc. As time went by, the scope of services for some of these companies extended to include also the provision of other energy products for their customers such as, for example, natural gas.

Other forms of organization have developed over time, frequently in response to very specific events. In the United States, for example, Rural Electric Cooperatives were "born" during the depths of the Great Depression in the 1930s. Under the leadership of President Roosevelt, the Government enacted the Rural Electrification Act of 1936, in order to bring electricity to rural America. The large investor owned utilities of the time were not willing to do so, as it would not pay of for them. Individual citizens banded together to form a cooperative which could receive financing on favorable terms from the newly established Rural Electric Administration (REA). It was now the cooperative who would build the transmission lines and bring power to rural families and farms.

Table 1

Business Enterprise Structure in the Electricity Sector

Type of Ownership	Scope of Services	Type of Services
• Publicly (Govn't) owned -National Level -State/Provincial Level -Municipality Level • Investor owned - Private * shares publicly traded * shares privately held - Public/Private * shares privately held • Cooperatively owned, ownership shares held by members of a cooperative	• Exclusively oriented to provide electricity • Electricity is one of the energy products, in addition such products as natural gas, LPG and other refined products, etc. • Electricity is one of the by-products of the business enterprise.	• "Full Service (utility)" - Generation - Transmission and Distribution - Billing and Collection • "Partial Service" - Generation only (Bulk Power Sales) - Transmission and Distribution Only - Billing and Collection only - Combination of the above

From these early beginnings the rural electric cooperative movement has continued to flourish and today forms a powerful element of the overall U.S. energy sector. Each cooperative is a private independent electric utility business, incorporated under the laws of the states in which they operate, established to provide at-cost electric service, owned by the consumers they serve, and governed by a board of directors elected from the membership, which sets policies and procedures that are implemented by the cooperative's professional staff.

At present there some 900 electric co-ops serving 31 million people in 43 states. They serve more than 13 million businesses, homes, schools, churches, farms, irrigation systems and other establishments in 2600 of 3128 counties in the U.S. They serve 11 percent of the total U.S. population, accounting for 7.9 percent of kilowatt-hours sold and 5 percent of all electricity generated by the utility industry. Most co-ops deal only with distribution, delivering electricity to the consumer. Some 65 co-ops are generation and transmission cooperatives, generating and transmitting electricity to distribution co-ops The National Rural Electric Cooperative Association (NRECA) represents the national interests of cooperative electric utilities. NRECA provides legislative, legal and regulatory services; and programs in insurance, management and employee education, training, consulting, public relations and advertising[10]

[10] For Information on Rural Electrical Cooperatives see the NRECA Website: http://www.nreca.org

Finally, it is of interest to note that, in addition to electric service, many electric co-ops are also involved in other projects. These include community development and revitalization projects, such as small business development and job creation, improvement of water and sewer systems, and assistance in delivery of health care and educational services.

Other forms of organization in the electricity sector have been brought on by other events. In the U.S. the energy crisis of the seventies led to enactment of the Public Utility Regulatory Policies Act (PURPA) of 1978. This signaled the birth of the Independent Power Industry in the U.S. Private entrepreneurs or Independent Power Producers (IPPs) were for the first time allowed to develop, own or operate electric power plants (e.g., a co-generation facility) and sell power to the public or investor owned utility for subsequent transmission and distribution to end users. More recently, and in particular during the early nineties, the drive toward greater efficiency and productivity through competition has speeded up considerably, in the U.S. and throughout the world.

In the U.S. this led to the enactment of the Energy Policy Act of 1992, perhaps constituting the most dramatic deregulation effort ever experienced. Passage of the law has created many new types of energy companies and ways of delivering energy services. Deregulation (also called privatization) in England (in 1991) is another example that demonstrates how traditional organization forms are rapidly changing. At present National Power, a privately owned publicly traded UK company, has become one of the world's largest independent power producers exclusively in the business of generating electricity. National Power not only generates power in the UK but also in 12 other countries.

Potential Structure of the Electricity Sector in Cap Haitien and Jacmel. At present, only EdH, Haiti's national government owned full service utility, provides electricity in Cap Haitien and Jacmel. Without regard for any other factors, one could potentially envision that the electricity services provided by EdH be augmented (or replaced) by one or more of the following structures, characterized by ownership, type of services and service area:

1. Municipal full service utilities owned and operated by the cities of Cap Haitien and Jacmel, and providing services to their respective cities.
2. Departmental full service utilities owned and operated by the Northern and Southeastern Departments, and providing services within their respective departments.
3. Haitian owned public/private companies operating as full service utilities in the High Potential Zones centered on Cap Haitien and Jacmel.
4. Haitian owned private companies operating as full service utilities in the High Potential Zones centered on Cap Haitien and Jacmel.
5. Haitian owned private companies, providing partial services; generation or transmission and distribution or billing and collection or some combination of services, in the High Potential Zones centered on Cap Haitien and Jacmel.
6. U.S.-Haitian owned private companies, operating as full service utilities, in the High Potential Zones centered on Cap Haitien and Jacmel.

7. U.S.-Haitian owned private companies, providing partial services; generation or transmission and distribution or billing and collection or some combination of services, in the High Potential Zones centered on Cap Haitien and Jacmel.
8. Municipal co-ops owned by individual entities and citizens of Cap Haitien and Jacmel, and operating as full service utilities in Cap Haitien and Jacmel.
9. Municipal co-ops owned by individual entities and citizens of Cap Haitien and Jacmel, providing partial services; generation or transmission and distribution or billing and collection or some combination of services, in Cap Haitien and Jacmel.
10. Departmental co-ops, owned by individual entities and citizens in the Northern and Southeast Departments, and operating as full service utilities within the Departments.
11. Departmental co-ops, owned by individual entities and citizens in the Northern and Southeast Departments, providing partial services; generation or transmission and distribution or billing and collection or some combination of services within the Departments.
12. Rural co-ops, owned by individual entities and citizens in the rural areas of the High Potential Zones centered on Cap Haitien and Jacmel, and operating as full service utilities for the rural areas.
13. Rural co-ops, owned by individual entities and citizens in the rural areas of the High Potential Zones centered on Cap Haitien and Jacmel, providing partial services; generation or transmission and distribution or billing and collection or some combination of services in the rural areas.

The above provides a rather exhaustive list of potential service providers, with an exclusive focus on the provision of electricity. In addition, one can envision additional structures where the entity involved, i.e., a public entity, private company or co-op, is engaged in business activities which allow for the provision of electricity as a by- product. Numerous examples can be cited here, such as a publicly owned waste management facility, generating electricity by processing waste; a private agriculture-based company, utilizing biomass fuel to produce electricity for its operations; a rural co-op of sugar cane growers utilizing bagasse to produce electricity for their own use. In each of these cases the prime business purpose is not related to electricity, yet electricity is a most useful and desirable by-product. Opportunities to use the electricity outside of the "company" proper, leads to additional electricity service providers, called Integrated Resource Companies (IRCs), as follows:

14. Haitian privately owned IRCs within the Cap Haitien and Jacmel High Potential Zones, with the potential to generate excess electricity for distribution and sales to customers outside of the IRC.
15. U.S.-Haitian privately owned IRCs, within the Cap Haitien and Jacmel High Potential Zones with the potential to generate excess electricity for distribution and sales to customers outside of the IRC.
16. Cooperatively owned IRCs within the Cap Haitien and Jacmel High Potential Zones, with the potential to generate excess electricity for distribution and sales to customers outside of the IRC.

Review of the above potential structures for the provision of electricity reveals that there are potentially also many different type of partnerships associated with the actual implementation of any of those structures. These range from formal partnerships, required for the formation of

public/private companies, private companies and co-ops, to less formal ones, such as in the case where entities or private citizens decide to provide assistance in the formation and development of any of the structures mentioned above. Hence, with the exception of the first two structures mentioned in this section, all other structures represent also the set of potential private sector partnerships for the electricity sector of Cap Haitien and Jacmel.

Based on discussions with various groups and citizens in both Cap Haitien and Jacmel, it can be concluded that several of the above structures are being considered as potential solutions to the current electricity crisis in both cities. In Jacmel thought has been given to the formation of a Departmental utility, either as a totally private partnership or as a public/private partnership between EdH and local private interests. Also, in Jacmel a proposal has been made by a private company to establish an IRC producing essential oils from vetiver and selling excess power, generated in the production process, via local EdH distribution lines. In Cap Haitien, experience has been gained with the formation, a few years ago, of a private Haitian company involved in generating electricity for sale to EdH. However, the company- Inter Select- has since ceased operations. Despite this experience the Chamber of Commerce has expressed willingness on the part of the local private sector to invest in generation projects, but are unwilling to do so in the absence of clear guidelines from the GOH and EdH.

2. Requirements for Private Sector Partnerships for Power in Haiti and the Role of the Private Sector

Whether or not any of the above mentioned structures, and the implied partnerships, can in fact be implemented in Cap Haitien and Jacmel, depends on conditions, which are specific and unique to Haiti in general, and to Cap Haitien and Jacmel in particular. These conditions are described here in terms of requirements that must be met before specific structures and the implied private partnerships can become a reality. Briefly summarized, these requirements are as follows:

- There must be a legally binding **regulatory framework** for the power sector in Haiti, conducive to the emergence of alternative electricity provision structures (or multiple electric sector operators) in Cap Haitien and Jacmel.
- Private parties interested in becoming electric sector operators must have the **professional and technical capability** to form an electric sector enterprise.
- Private parties interested in becoming electric sector operators must have the **financial capability** to raise working and investment capital needed for the formation of an electric enterprise.
- Private sector entrepreneurs interested in becoming electric sector operators must have **profitable business opportunities** to choose from, as the foundation of their electric sector enterprise.
- In the case of potential **U.S. private sector participation** in any Haitian private sector partnership, it should be possible to **mitigate business risks**, to the extent possible and practicable.

Regulatory Framework. A conducive regulatory environment is, by far, the most important of the above requirements. At present such environment has not yet been created, although CMEP is conceptually open to the introduction of multiple operators for the electric sector of Haiti. As

explained in the previous chapter, EdH has a monopoly in the electricity sector of Haiti. Even a management contractor taking over from EdH is currently expected to have a monopoly within the current EdH perimeter. CMEP and the IDB, in their efforts to bring in a private sector contractor to manage EdH during the transition period, can be expected to be reluctant to relinquish this monopoly status. Not having a monopoly can potentially effect profitability of EdH operations, and thus it may deter any potential private party from bidding for the management contract.

Although, the current draft electricity law is still under development, the version reviewed for this report as of yet did not provide clear guidelines for private sector participation in the electricity sector. To the contrary, paragraph 17 of the draft law seems to limit generation and use of electricity by private parties strictly for their own use, and not for sale to others.

Related to Haiti's present efforts to define the regulatory framework for the provision of electricity, the following issues affect entry of private sector partners into the electric sector of Cap Haitien and Jacmel. Firstly, precise definition of what constitutes the EdH perimeter. Secondly, monopoly for the management contractor within the EdH perimeter and the potential role of multiple operators. Thirdly, potential possibilities for private sector involvement outside the EdH perimeter, in particular in rural areas. These are the issues that will need to be resolved in the current refinement effort of the draft electricity law, undertaken by CMEP with the technical assistance of IDB. They also constitute an agenda for action for USAID in their efforts to promote a greater role for private partnerships in the electricity sector of Cap Haitien and Jacmel. Specifically, there is a compelling need to bring the U.S. Electric Cooperatives experience into the current discussions on how to revise the draft electricity law.

Professional and Technical Capability. At the more practical level of considering the formation of electric sector enterprises the other requirements stated above are equally important. Professional and technical capability in developing and managing either a full service utility or a partial service utility can not be taken for granted. Significant expertise is required, or significant training needs to be provided, in order to run the day to day operations of such enterprises. This applies to all aspects of the utility or electric enterprise business. It includes many aspects such as strategic and financial planning, planning capabilities to develop short and long-term integrated resource plans, technical operations such as maintenance and dispatch, commercial operations including billing and collection, public information and marketing, etc. Critically important to the success of any private sector electric enterprise is the ability to raise capital. In particular full service utilities are capital intensive because of the physical and technical nature of generation, transmission and distribution. Even partial service providers frequently need significant resources to get started, covering the acquisition of physical assets and working capital.

Profitable Business Opportunities and Mitigation of Risks. Where the above dealt with the general regulatory environment as well as with the capabilities needed to start a private sector partnership, the last two requirements address the "situation on the ground". Generally, private sector involvement can be expected if private entrepreneurs are faced with, or can identify, specific business opportunities and when they can manage the risk associated with capturing any one of those opportunities. Based on extensive discussions in both Cap Haitien and Jacmel it is

not at all clear what specific business opportunities do exist. Generally, the opportunity is presented in terms of an idea, such as the development of a small-scale hydro facility along a particular stream. Although the idea is valuable, it is far from a specific business opportunity. Much more project development work is needed to turn such idea into a business opportunity. Once a business opportunity is identified, issues of risk mitigation become of paramount importance. In Haiti major risk factors are associated with current political developments, prevailing institutional and legal arrangements, and the state of the economy. At this time these risk factors are perceived to be very large. This is further evidenced by the virtual lack of foreign businesses presently operating in Haiti compared to other periods in the past.

Preliminary Assessment of the Private Sector Role. Based on visits to Cap Haitien and Jacmel, and extensive discussions with local business leaders, and in view of the above requirements, it is possible to make a preliminary assessment of the feasibility of the potential electricity enterprise structures discussed in the previous section. Thus, the idea is to first determine what type of structure may actually work in Cap Haitien and Jacmel, based on judging how the above requirements might be met by the implied partnership associated with each of the 16 possible structures mentioned in the previous section. In addition, this judgement is also based on the assumption of the "Status-Quo" scenario discussed elsewhere in the report. At present this scenario is judged to be the most likely one. Thus, it is assumed that CMEP, supported by the IDB, will continue their search for an EdH management contractor, with a longer-term view of giving a concession to a private party for all of EdH's operation within the EdH "perimeter".

The results of the preliminary feasibility assessment are provided in Table 2, with a brief explanatory statement as to why particular structures are deemed feasible or not feasible. Those structures considered feasible or possibly feasible subsequently become the focus of USAID efforts to promote private sector involvement in the electricity sector of Cap Haitien and Jacmel.

Table 2

FEASIBILITY ASSESSMENT OF ELECTRICITY ENTERPRISE STRUCTURES IN CAP HAITIEN AND JACMEL

Type of Enterprise Structure with Partnership Arrangements Implied	Statement on Feasibility/Likelihood with emphasis on Key Factors underlying the Statement
1. Municipal, Full Service	Not feasible; lack of professional, technical, and financial capability
2. Departmental, Full Service	Not feasible; lack of professional, technical, and financial capability
3. Haitian, Public/Private, Full Service	Feasible, but unlikely in current CMEP process
4. Haitian, Private, Full Service	Unlikely within the EdH perimeter, but possibly feasible outside the EdH perimeter, needs legal clarification on multiple operators
5. Haitian, Private, Partial Service	Possibly Feasible but not desirable in current CMEP process
6. U.S.-Haitian, Private, Full Service	Not Feasible, no clear business opportunities and high commercial risks
7. U.S.-Haitian, Private, Partial Service	Not Feasible, no clear business opportunities and high commercial risks
8. Municipal Co-op, Full Service	Not Feasible in current CMEP process
9. Municipal Co-op, Partial Service	Not Feasible in current CMEP process; perhaps for billing and collection
10. Departmental Co-op, Full Service	Not Feasible in current CMEP process
11. Departmental Co-op, Part. Service	Not Feasible in current CMEP process; perhaps for billing and collection
12. Rural Co-op, Full Service	Feasible, provided the new Electricity allows for these services
13. Rural Co-op, Partial Service	Feasible, if coordinated with new EdH, and new Electricity allows for it
14. Haitian IRC, full service potential	Feasible, if other products render the IRC feasible and the law allows for it
15. U.S.-Haitian IRC, full service pot.	Feasible, if other products render the IRC feasible and the law allows for it
16. Co-op IRC, full service potential	Feasible, if other products render the IRC feasible and the law allows for it

As can be gleaned from Table 2 the major conclusions to be drawn at this point areas follows.

Conclusions

- The new electricity law is the key for private sector involvement in the electricity sector of Cap Haitien and Jacmel. If the final version of the law is restrictive and strongly adheres to the monopoly status for the new EdH within the EdH perimeter, it is unlikely that private sector involvement will be realized. The possible exceptions are private sector companies operating outside the EdH perimeter, primarily as full service utilities. Private provision of partial services (e.g., as an IPP) is not likely at this point. Other possible involvement relates to rural electrification.

- With regard to rural electrification, involvement by the private sector is certainly feasible provided that such involvement is clearly established within the law. For this to happen it would be absolutely necessary to introduce Rural-Electrification-type legislation into the current discussion on how to finalize the draft electricity law. Rural Co-ops would be an option to be pursued, although only careful analysis of the actual situation "on the ground" can determine whether this would be the best institutional arrangement. As an alternative to Rural Co-ops, a private company, practicing broad public participation in working with its customers may be a more efficient solution.

- At this point it is unlikely that partnerships aimed at establishing Municipal or Departmental Utilities, or Municipal and Departmental Co-ops would be successful. Similarly, the likelihood of private sector partnering with EdH should be considered highly unlikely given the present situation.

- Given the major uncertainties caused by the present political and economic developments in Haiti, the possibility of U.S.-Haitian private sector partnerships is considered unlikely without major efforts to mitigate the risks associated with the entry of U.S. partners into the electricity sector of Cap Haitien and Jacmel. Key among these efforts would be substantial strengthening of the technical and financial capabilities of Haitian partners seeking such partnerships, leading to clearly defined business opportunities for a potential U.S.-Haitian private sector partnership.

- Perhaps the most promising private sector partnerships are those where electricity is a by-product of the business enterprise, or the establishment of IRCs. Establishing such IRCs is considered feasible provided the IRC's main business lines are feasible. Entry by the IRC into the electricity sector can be accomplished gradually and in phases. Whether or not IRCs are allowed to play a constructive role in rebuilding the energy sector of Cap Haitien and Jacmel is once again a legal issue. The new electricity law would have to provide and allow for the entry of such operators into the electric sector.

3. Local Partners in Jacmel and Cap Haitien; A Role for CCIPN and APDESE

In the course of this investigation, an important objective for visits to Cap Haitien and Jacmel has been the attempt to identify specific groups or individuals, which would be willing, interested and capable to become local partners in an electric business enterprise. It can be concluded that at this time no such parties exist in any organized way. For example, no private company was found which, as part of its business plan, had identified the provision of electricity as a potentially profitable business opportunity. Neither were individuals identified, with the exception of one, who had developed specific and detailed project proposals for the provision of electricity, and who were looking for partners to implement their projects. The exception referred to here concerns a very general proposal for an agribusiness oriented energy project, further discussed in the next Chapter.

What was found during the visits was a great amount of interest to do something about the deplorable state of the electric system in Cap Haitien and Jacmel. Undoubtedly, this large interest among the local population stems from the frustrations associated with frequent and long outages, unreliable and insufficient service at best, and the general sense of powerlessness in dealing with issues which are largely decided in Port au Prince. During the discussions in both cities a recurrent theme was that people at the local level would be best placed to constructively work on the economic and social development of their respective cities and surrounding areas. Furthermore, in each city one particular organization had evolved over time, which was perceived the "key actor" to get things done. In Cap Haitien all discussions centered on the role of the Northern Region's Chamber of Commerce, Industry and Professions (CCIPN), seemingly the only organization devoted to planning, development and promotion of the Northern Department of Haiti. In Jacmel, any type of partnership inquiries invariably wound up with the potential role of the "Association pour La Promotion et le Developpement Économique du Sud-Est" or APDESE, a civic group established to promote the rebuilding and development of the Southeastern Department of Haiti. In Jacmel contact was also made with the local Chamber of Commerce. Compared to its counterpart in Cap Haitien, the Jacmel Chamber of Commerce is less development oriented, while all its members, being also members of APDESE, consider the latter the development equivalent of the Chamber of Commerce in Cap Haitien.

Since this investigation has not yielded a clear identification of local private sector partners capable and interested in providing electricity in Cap Haitien and Jacmel, it is obviously too early to identify strengths and weaknesses of specific partners. However, CCIPN and APDESE can be highly instrumental in having private sector partners emerge in both cities. Essentially these are the only two Haitian organizations with a vested interest in promoting greater involvement of the private sector in economic and social development of their respective areas. Therefore, USAID should closely cooperate with both CCIPN and APDESE in an effort to build the capability of groups and/or organizations and/or individuals that can take on a partnership role in a, private sector, electric business enterprise. Thus, although it is false to assume that there are at present local partners ready "to make a deal"; it certainly is appropriate to assume that such partners can be "built". In fact, since there is every reason to believe that private sector provision of electricity in both areas is the most efficient, USAID should not waste any time in constructively engaging both organizations in specific activities aimed at developing local partner capabilities.

CCIPN and APDESE also have their strengths and weaknesses, and working with each one, to promote greater private sector involvement in providing electricity requires careful consideration. CCIPN and APDESE are both legal entities under Haitian law. CCIPN was founded on July 24. 1989 and officially recognized (by the GOH) for its public service on January 28, 1997, with the required publication in "Le Moniteur" of February 6, 1997. APDESE was granted authorization to operate by the City Council of Jacmel on September 24, 1996, and "Le Moniteur" of April 17, 1997 published the organization's statutes and charter as official recognition by the GOH. CCIPN counts virtually anyone of some importance to the northern region among its members, including not only business enterprises but also representatives of schools and universities. As such CCIPN has successfully positioned itself to take on a lead role in the promotion and facilitation of development of the northern region. It perceives its function as broader than mere business promotion, and tries to assert its role in solving broader regional

problems such as water supply, rehabilitation and management of basic infrastructure such as the local airport, etc. To provide visibility to the region as well as to work undertaken by CCIPN, the Chamber publishes its own magazine with the appropriate name "Renaissance".

APDESE, on the other hand, must still be considered in the formation stage, with emphasis on the conceptual orientation of the organization, and as of yet short on actual accomplishments. APDESE was formed as a civic organization to serve both as an "incubator" for private sector solutions to public sector problems, as well as an investment vehicle to finance such solutions. APDESE was realized through the devoted efforts of primarily one man Dr. Michel Lominy, a prominent physician. APDESE states that its primary mission is to set up and implement the structures, which will manage, within a partnership with the Haitian Government and on a commercial basis, the Southeast Department's basic infrastructure elements. The latter include electricity, telecommunications, water conveyance, and all other aspects related to economic development: roads, harbor, airport, etc.

APDESE wants to accomplish its mission through private or mixed (semi-public) institutions, made possible by mobilizing mainly the savings of Haitians native to the Southeast region, and to which all Haitians and foreign investors are welcome. To further its goals, APDESE has set up specific separate investment accounts (in Gourdes and in U.S. Dollars) with SOGEBANK, one of the largest private banks in Haiti. It has raised a significant amount of capital, which is at present deposited with SOGEBANK. Individuals contributing to these funds are considered investors, becoming the owners and co-owners of the companies created by APDESE.

The early orientation for APDESE was to consider itself, or the companies created by APDESE, as potential concessionaires, bidding for the concessions that would be created by the CMEP process. In doing so it envisioned also the participation of foreign firms and companies. APDESE stated: "(we) will invite foreign firms and companies, renowned for their good reputation, their know-how and their expertise, to join us not as donors but as partners. These firms will invest with us by bringing technology, machinery, equipment and other assets if necessary. They will have nothing to loose if we offer enough guaranties for their investment. In turn, our workers, technicians, and specialists will benefit from the technology transfer and know-how in general"

CCIPN and APDESE are both organizations based on the principle that cooperation among members of the organizations will not only benefit individual members, but will contribute measurably to the development of their respective regions. As earlier mentioned, in the case of APDESE such benefits as of yet have not been obtained. In regards to CCIPN, the organization has demonstrated that cooperation can indeed pay off in the formation of a highly successful company called "Le Ciment du Nord" in the early nineties. Its formation is an example of innovative business formation under extreme difficult external circumstances. This was not a case of creating a business opportunity of interest to potential outside investors. This would not have worked as there were few, if any, willing to invest in any Cap Haitien enterprise at that time. Rather, the idea behind Ciment du Nord was for cement retailers (i.e. normally fierce competitors!) to get together and establish a company that would have only one supplier of cement, who would also be a minority shareholder of the company. This unusual organization was largely financed by the shareholders themselves. Despite having experienced difficult times

the company has since prospered and has developed to the point that its product is shipped all over Haiti. In view of the actual situation in Haiti formation of Ciment du Nord must be considered a first rate accomplishment, in particular for the broad based benefits that accrued to the northern region as a whole.

The strength of both CCIPN and APDESE lies undoubtedly in their strong commitment to the successful development of their respective regions. Both organizations are made up of people who decided to stay and work in Haiti, despite extremely difficult circumstances. They not only believe, but are committed to the basic premise that economic development in this day and age can only take place if it is lead by the private sector. With respect to their involvement in the provision of electricity in their respective areas, both CCIPN and APDESE also exhibit major weaknesses. On the one hand, these are related to the ability to substantively contribute to and influence the development of a national electricity strategy for Haiti. On the other hand, both organizations are weak when it comes to identification and formulation of specific technical measures that potentially could alleviate the present electricity crisis in Cap Haitien and Jacmel. As a result, while most local people are already frustrated by virtue of the deplorable state of the electric system in Cap Haitien and Jacmel, this frustration is further compounded by the considerable uncertainty regarding the outcomes of the CMEP process.

Since both CCIPN and APDESE are essentially "grassroots" organizations, it stands to reason that they would try to have their voice heard in the current CMEP process. This is particularly true because the outcomes of the process will have a serious impact in both areas. For example, and assuming that there will be a new concessionaire for the old EdH system, the specific priorities and activities to be undertaken by the new operator will be crucial in rebuilding the systems in Cap Haitien and Jacmel. It is not unthinkable that, for political and other reasons, during the initial two to three years prime emphasis be given to rebuilding the system in Port au Prince. As a result the provinces may get less emphasis; a situation that describes past practices.

Since the overall electric system in Haiti is in such desperate state, bringing the system up to an acceptable standard will take a considerable amount of time, qualified manpower and a considerable amount of capital, all of which are in very short supply. In such situation the setting of priorities in rebuilding the system becomes an extremely important task. To do this right requires that all those who will benefit from the new system be brought into the process. It should be recognized that such participation is much more than what usually is considered a lobbying effort. For example, and in the case of Cap Haitien, the real question becomes one of assigning priorities to activities such as the total replacement of the current generation station at St. Philomène. It becomes crucial for CCIPN to know what size of new generating station is being contemplated, and when this station will come on line. In other words, it is crucial to know the position of this project on the overall list of capital improvement projects to be undertaken by the new operator. Size and timing are important parameters when it comes to planning other growth-related activities, which depend on a reliable power supply.

Clearly, the situation mentioned is merely an example. However, it illustrates that both CCIPN and APDESE should become substantively involved in the national level CMEP process in order to represent their legitimate interest in the development of their respective regions. Without their participation it can not be assumed that their interests will be fully taken into account, in

particular because CMEP's prime incentive is to complete the legally mandated "modernization process for EdH. This is at present entirely focused on finding a management contractor to "run" EdH during the transition period.

In order to become substantively involved in the rebuilding of the electric systems in the northern and southeastern departments will require that both organizations will need to focus their attention on technical issues related to the provision of electricity in their respective regions. These issues relate to analysis of current sources of generation and potential new sources, repair of current transmission and distribution networks and extension of such networks to new geographic areas, finding ways of resolving the billing and collection problems through, for example, greater participation of the public, providing electricity to the rural areas in the respective departments, and so on.

All of the above problems in the end will have to be resolved through very specific projects. It is imperative that both organizations become knowledgeable as to what these projects will entail, technically, organizationally and financially, and how they can be integrated within the tasks that the new EdH operator will have to undertake. It is only at such level of specificity that potential conflicts between local interests and the new EdH can be clearly identified, and hopefully resolved. Solutions must mesh or dovetail with what is being discussed and negotiated in the CMEP process. For example, in Cap Haitien the idea was developed by CCIPN to establish a separate private company to generate electricity, called SOGENOR, and capital was raised for its formation. SOGENOR would in essence be an IPP. However, it is clear that such idea at present would be a non starter because any new management contractor or any concessionaire would in principle refuse to allow such competition in its service area, in particular in view of the actual conditions on the ground. Discussions on entry of IPPs, although theoretically sound, will considerably complicate the task of CMEP to find a private sector party to take over from EdH.

4. Organizational, Technical, and Financial Requirements: "Developing" Local Partners.

As indicated in Table 2, there is potentially scope for private sector participation in the electricity sector of Cap Haitien and Jacmel. This could take the form of a private Haitian company operating as a full service utility outside the perimeter of EdH, a Rural Electric Cooperative, or an Integrated Resource company producing electricity as a by-product and potentially growing into full service provider of electricity to nearby customers. As indicated in the previous section, as of now there are no candidate-partners, within each of the two areas, actively pursuing such business opportunities. Under these conditions it falls within the mandate of the CCIPN in Cap Haitien and APDESE in Jacmel to take the initiative in further developing these opportunities though cooperation among its members.

The first requirement to be met is for CCIPN and APDESE to make sure that such initiatives are not only recognized by CMEP and the GOH, but will receive their endorsement. Thus, whatever is done at the local level must dovetail with CMEP's efforts to "modernize" EdH. This must be achieved through substantive discussions with CMEP, recognizing that a modern electricity system for Haiti will be the result of efforts by many, and not just the efforts of the new EdH operator. It is believed that to make substantial progress in a relatively short amount of time, given the present state of the system, will indeed require the participation of multiple operators.

In short, there is a lot of work to do in rebuilding the electricity sectors in Cap Haitien and Jacmel, and few to do it.

Discussions with and endorsement from CMEP however will only serve as the starting point of activities for CCIPN and APDESE. They must subsequently focus on organizational, technical and financial requirements to be met, to successfully realize the aforementioned business opportunities.

Organizational Requirements. Critical to the long-term success of a private utility, a rural cooperative or the electrical operations of the IRC is the ability to conceive the appropriate organizational form, in accordance with both Haitian legal requirements as well as prevailing practices, attitudes and norms. The latter is especially important. For example, where in other parts of the world cooperatives are easily formed because of perceived advantages, experience in Haiti indicates that cooperatives are much harder to establish. Thus what works in one place does not necessarily work in Haiti. Several surveys conducted in provincial towns in Haiti help to underscore this point.[11]

Above all, however, organizational form must realize that the provision of electricity is a service business, focused on understanding the needs of customers and developing cost-effective solutions to meet these needs. In addition, marketing of electricity services in areas previously not served opens up a whole array of new business opportunities. For example, access to electricity may allow for refrigeration of products for export; products that would otherwise have perished. These characteristics of the provision of electricity set important requirements for the type of organization to be established, and go well beyond mere generation and distribution of electricity and collection of revenues. In particular in the area of rural electrification where it is always difficult to balance revenues and costs, a recent study recommended that all possibilities for community involvement, including financial and labor contributions, electrification committees, and assistance with maintenance and revenue collection should be assessed[12]. Clearly, such activities have a profound influence on the organizational structure of any business enterprise related to rural electrification. In short, the first major set of issues to be addressed by both CCIPN and APDESE is to determine the type of organization(s) that will be required in their respective areas, including such issues as ownership or membership in the case of a cooperative. Analysis and discussion of such requirements provides also an opportunity for specific private parties to emerge as being interested in becoming engaged in setting up electric enterprises. Alternatively, as a result of such analysis and discussion CCIPN and APDESE are in a much better position to consider establishing the right type of company themselves.

Technical Requirements. Aside from organizational issues the next important set of requirements is technical in nature. As said previously, during visits to Cap Haitien and Jacmel many ideas were discussed, but few of those ideas had been developed beyond a very rudimentary level. In the formation of private sector utility companies it will be essential to become much more precise in

[11] Rapid Reconnaissance Survey, LES CAYES, John Currelly, USAID, Nov 1989; Jacmel, Etude de la ville de Jacmel réalisée par la Fondation Haïtienne de Développement (FHD0, Développement de l'Entreprise Privée en Province (PPED); Comparative Study of the Towns of Jacmel, Jeremie, Les Cayes, Cap Haitien, Prepared by the Haitian Development Foundation (HdF), Provincial Private Enterprise Development (PPED), January 1994

[12] Low Cost Electricity Installation, Dr. Nigel Smith, Intermediate Technology Consultants, June 1995

the identification of specific projects to be undertaken, and in a *preliminary* analysis of project feasibility. This requires that for a selected service area: (1) electricity demand and supply must be forecasted with due consideration for potential new customers; and (2) plans for generation, transmission and distribution must be made highlighting the physical projects required.

Each of the above activities requires preliminary but still detailed work, focused on specific projects. For example, in the Jacmel area it would require a preliminary analysis of potential (mini) hydro projects such as Bas en Bleu. Also included would be the projects to transmit and distribute power, including customer connections and meters or load limiting devices if appropriate. The elementary point in these exercises is that any private sector entity interested in entering the electricity business must systematically focus on a set of projects it intends to undertake. To do so requires that CCIPN and APDESE avail themselves of the necessary expertise, or develop such expertise, to make a list of projects covering all areas of business for the energy enterprise to be established. It should be noted that the level of analysis envisioned still stops well short of that actually required for the execution of these projects. However, it is sufficient to clearly establish the scope of the enterprise and to undertake a cost and financing analysis.

Financial Requirements. Once organizational and technical issues that a private sector electricity enterprise will have to face are clarified, the focus shifts to financial requirements. Tentative organizational arrangements, coupled with a preliminary list of projects, allow for a first estimate of costs and revenues for the enterprise. This subsequently is the starting point for CCIPN and APDESE to begin identifying the financial implications of the company to be established. It is also at this point that it starts to make sense to identify ways of how the enterprise can be financed, with full consideration of all sources of finance, including loans, grants and equity financing by potential owners of the enterprise. For example, it is at this point that APDESE may decide to allocate part of the accumulated contributions for the development of the Southeast Department, currently deposited with SOGEBANK, to the establishment of an electric enterprise for the Southeast department.

The work implied by the above discussion on organizational, technical and financial requirements constitutes what is required for what commonly is called the development of a business plan for any company. To make progress in seeking private sector participation in the electricity sector of Cap Haitien and Jacmel CCIPN and APDESE should take the initiative in the development of such business plans, be it for a private sector utility, a rural cooperative or an IRC. Whether CCIPN or APDESE undertakes these activities themselves or whether they play a coordination role is immaterial. The essential point is that a business plan for a private sector electric enterprise is an absolute requirement to constructively mobilize the private sector in both Cap Haitien and Jacmel.

5. Action Plans to Establish Private Partnerships for Power in Jacmel and Cap Haitien: A Role for CCIPN and APDESE

Although, at present no private sector parties have been identified as potential partners in a private electric enterprise for Cap Haitien and Jacmel, it is believed prudent to start taking action now, despite considerable uncertainty at the national level. The ultimate objective of such action is threefold. Firstly, action is required to prepare for private sector involvement in the provision of electricity in Cap Haitien and Jacmel. As can be concluded from the previous section a significant amount of work is required to develop the specifics of a private sector electric enterprise appropriate in each of the two areas. This will take time, and can be done in parallel with the ongoing CMEP process. Secondly, this preparation is needed in order to be able to properly represent the commercial and other interests of the people of Cap Haitien and Jacmel in continued discussions with the GOH and CMEP. Thirdly, action is required to search for and identify private sector parties willing and capable to assume ownership in any private sector electric enterprise in the two areas. The natural focal point, under the present circumstances, for actions to be taken is the CCIPN for Cap Haitien and APDESE for Jacmel.

The essence of an action plan for both CCIPN and APDESE can be summarized as follows:

- Establish a **Taskforce** for Private Sector Involvement in the Provision of Electricity in Cap Haitien and Jacmel.
- Conduct a broad-based **Public Participation** process in Cap Haitien and Jacmel to solicit support for a private sector electric enterprise, and to identify the appropriate organizational parameters for such enterprise.
- Initiate and maintain a substantive **Dialogue with the GOH and CMEP** to obtain approval and consent for private sector electric enterprises in the Cap Haitien and Jacmel areas, and to develop a constructive relationship between such enterprise and the new EdH operator.
- Develop a **Business Plan** for an electric business enterprise in the Cap Haitien and Jacmel area, either a private sector, full service, utility outside the EdH perimeter, a rural cooperative, or an IRC with full service potential for the provision of electricity.
- Search for and facilitate the **Participation by Individual Business Interests and/or Individual Citizens** in the formation of a private sector enterprise.

Of immediate concern is the establishment of a taskforce, in both CCIPN and APDESE, specifically dedicated to getting the private sector involved in providing electricity in both Cap Haitien and Jacmel. In particular with respect to APDESE it is considered crucial that the association becomes much more focused on the specific contributions it can make to improve the current situation. Although its mission is conceptually relatively clear, it must also be acknowledged that at an operational level it is not clear at all what APDESE intends to do, in particular because its mandate is extremely broad. The establishment of a taskforce for the electric sector will allow a much more focused approach towards this end. Such taskforce must be charged by the membership with conducting the other elements of the overall action plan, namely conducting public participation, dialogue with CMEP, development of a business plan, and being the catalyst for bringing in private partners as potential owners of an electric

enterprise. It is the role of such taskforce to "broker" the participation of private partners in the electricity sector for the benefit of all businesses and individuals in the region.

Once established the taskforce should proceed on a twofold track. On the one hand, and as explained before, the taskforce needs to undertake a number of tasks aimed at establishing private electric enterprises. On the other hand the taskforce can and must devote its attention to interim measures it can take now to prevent that the current electric situation deteriorates further. Such measures are also useful in working on the longer-term solution of establishing private partnerships for power. In the case of Jacmel this means that the taskforce needs to consider how it can help assure the sustainability of the present CIDA-supported project. This project which will be concluded in mid 2000 has provided much needed repairs and rehabilitation of the EDH system in Jacmel. However, it is less clear what will, or may, happen when foreign consultants working with EdH in Jacmel will be leaving next year. Clearly, it is in everybody's interest to see to it that activities initiated under the project be continued and further extended. In particular in commercial areas such as billing and collection a continuous effort will be required to remedy present problems. In coordination with EdH, the taskforce should establish a short-term work program on how to best assist EdH so that the long-term benefits of the CIDA project can be realized.

In the case of Cap Haitien interim measures to be undertaken by the CCIPN taskforce can best be characterized by activities aimed at preventing the total collapse of the present EdH system. In addition, there is scope for private "contributions" toward much needed improvements, such as the establishment of a fuel storage facility near the port of Cap Haitien. Contributions is placed in parentheses to indicate that private investors in Cap Haitien have an incentive to see the situation corrected as it will affect their other business activities. To obtain a return on their investments they may, for example, charge rent for storage facilities developed with their "contributions". In this particular case the taskforce should take the lead in negotiations with EdH on how best to assist EdH in the interim, i.e. prior to a new EdH operator taking full responsibility of the EdH system. It is clear from visits to Cap Haitien that something needs to be done soon, before the situation is totally out of control. It should be emphasized however that any interim measures undertaken by the taskforce, and thus by CCIPN, be clearly negotiated and not be considered charitable contributions on the part of the Cap Haitian business community. Such negotiations are also expected to advance the cause of private sector participation in providing electricity, when the taskforce deals with CMEP to obtain approval and consent for such participation.

The other elements of the action plan for CCIPN and APDESE, i.e. public participation, dialogue with the GOH and CMEP, development of business plans, and finding private partners, have been touched upon in previous sections. The keys toward success of the action plan are a carefully structured public participation process and the development of sound business plans.

With respect to public participation a broad segment of the population must be brought into a discussion on how the private sector can best provide electricity services. Here it should be recognized that at present a great deal of animosity has developed between the private/business sector and the government. The public at large assumes little or no responsibility for the provision of general services. It is believed that the public perceives that the responsibility for the

current deplorable state rests entirely with the government. Regardless of whether this is true, any constructive alteration of these perceptions needs to aim at developing a community spirit for solving infrastructure-type problems such as the provision of electricity, water, telephone and so on. Successful solutions for these problems will to a large degree depend on public response. With respect to the provision of electricity by a private company, through a cooperative or through an IRC, public understanding and cooperation are required to increase the chances that such initiatives will be successful, in particular during the initial period. Thus it is important for the taskforce to obtain as much public input as possible.

Finally, the business plans developed by the taskforce are the concrete results of how CCIPN and APDESE intend to meet the organizational, technical and financial requirements discussed in the previous section. They contain concrete ideas on what private sector entities are considered best suited to become part of the electricity sector of Cap Haitien and Jacmel. They are location and project specific in order to be able to project costs and revenues for the envisioned business enterprise, which in turn is the basis for exploring possibilities for financing the enterprise. Only when the business plans contain the latter possibilities is it practicable to discuss specific partnership arrangements. Hence, development of sound business plans is the most important task to advance the cause of private sector participation in providing electricity in Cap Haitien and Jacmel.

PART B. A USAID PROGRAM TO SUPPORT PRIVATE SECTOR PARTNERSHIPS FOR ELECTRICITY IN JACMEL AND CAP HAITIEN

The main results of the assessment carried out in Part A can be briefly summarized as follows:

- At present there are no entities/individuals interested, willing and capable to enter into private sector partnerships for electricity in Cap Haitien and Jacmel. However there is scope for developing (building) such partnerships.
- Partnerships should be focused on developing either a private sector, full service, utility operating outside the EdH perimeter, a rural electric co-operative, or an Integrated Resource Company (IRC) with electricity as a byproduct. Among these three, the IRC is expected to require the least development effort.
- Under present conditions no partnerships will emerge by themselves, without sharply focused initiatives and activities by the Chamber of Commerce, Industries and Professions in Cap Haitien (CCIPN) and APDESE in Jacmel. CCIPN and APDESE must, with approval and consent of the GOH and CMEP, appoint taskforces, specifically directed to advance the cause of private sector participation in the provision of electricity in the Northern and Southeastern Departments.
- The CCIPN and APDESE taskforces have two main tasks. Firstly, immediately assist in the improvement of the current EdH system through emergency measures in Cap Haitien and through cooperation with, and extension/continuation of the CIDA-supported project in Jacmel. Secondly, in the short to medium term, be a catalyst for the emergence of private sector electricity enterprises, through dialogue with the GOH and CMEP, conducting broad public participation, developing specific business plans for such enterprises, and searching for specific private sector participants in such enterprises.

Overview of a USAID Program for the Electricity Sector. As mentioned in the beginning of this chapter USAID's secondary cities program aims to support local efforts devoted to development of reliable infrastructure. Since the work to be conducted by the CCIPN and APDESE taskforces is clearly aimed at improving production and distribution of reliable and affordable electricity through private sector participation, support for CCIPN and APDESE appears a necessary element of the secondary cities program. More specifically, it is recommended that the Haiti mission develops and implements a focused energy program as part of the overall secondary cities program, to provide technical and financial support to CCIPN and APDESE for building private sector electricity enterprises.

A USAID energy program for the secondary cities of Cap Haitien and Jacmel must build on initiatives taken locally by CCIPN and APDESE. Therefore, prior to initiating any activities there must be a clear expression of desired cooperation on the side of CCIPN and APDESE. Assuming that such expression would be obtained, there are a number of areas where the expertise and experience that USAID can bring to these two organizations will be of immense importance. These areas form the following focal points for USAID involvement, and constitute the energy program to be conducted by the mission

- In cooperation with other donors, substantively support CCIPN and APDESE in their negotiations with the GOH and CMEP to play a role in the (re)building of the electricity sector of the northern and southeastern departments of Haiti.
- Provide assistance in the identification of priority emergency measures to be undertaken by CCIPN and APDESE in the electric sector, and financially support their implementation.
- Introduce and develop the necessary framework for rural electrification, based on the successful experience in the United States, with the assistance of the National Rural Electrification Association (NRECA).
- Provide organizational and technical support for a broad based public participation program to be conducted by CCIPN and APDESE.
- Assist in the development of business plans for private sector electric business enterprises, with particular emphasis on organizational structure of these enterprises, identification and formulation of projects to be undertaken by these enterprises, technical and economic project feasibility analyses, and financial assessments.
- Assist in the formation of electric enterprises in Cap Haitien and Jacmel by providing start up capital , in the form of loans and/or grants from the Municipal Development Fund, for initial investments and working capital.

The expected results of a USAID energy program focused on the improvement of the electricity sectors of Cap Haitien and Jacmel will basically stem from a general improvement of the investment climate in both areas. Thus, it is expected that when both CCIPN and APDESE are able to demonstrate that these grass roots organizations are capable of organizing themselves to improve the provision of electricity in their respective areas, other investors can be induced to participate in the rebuilding of the electricity sector. The key point here is that local organizations demonstrate through actual project implementation that the private sector can successfully tackle the electricity sector's problems, much like CCIPN demonstrated that Ciment

du Nord could be built. Such demonstration will help considerably in the mitigation of risks perceived by any investor considering investing in Cap Haitien and Jacmel. Involvement and participation by USAID is the necessary catalyst to make this a reality.

Once the electricity sector starts improving a host of different results can be expected because lack of electricity is indeed one of the key infrastructure constraints in Cap Haitien and Jacmel. In the area of manufacturing and agribusiness, major results can be expected because for the first time in a long period it will be possible to revive businesses that have closed since the onset of the Embargo. In particular with respect to agribusiness exports, provision of electricity will allow companies to explore more fully Haiti's comparative advantages as an exporter of products to the U.S. Such opportunities invariably depend on the local ability to add value to products harvested, be it coffee, mangoes or any other products. Adding value in turn means additional processing, refrigeration where required, packaging, etc.; all of which depend heavily on having a source of electricity. Aside from an improved business climate, better provision of electricity can potentially contribute significantly to improved social and environmental conditions. These range from having a reliable source of lighting allowing people to read and study when it is dark to having a source of energy for cooking which is considerably less harmful to the environment compared to the use of wood and charcoal.

In general, reliable and affordable provision of electricity will set in motion a chain reaction of activities, which in the present situation of Haiti will immediately be felt in terms of a range of beneficial outcomes for the Cap Haitien and Jacmel areas. Most importantly, the rate of economic growth and poverty reduction will be significantly higher as compared to today's conditions. New economic activities such as tourism and agribusiness will emerge, providing opportunities for new employment opportunities. Cap Haitien and Jacmel will begin to function as centers of commerce for the entire northern and southeastern departments, thus stimulating the growth of the respective economic hinterlands, with additional multiplier and spillover effects.

The impacts of a USAID energy program, focused on assisting CCIPN and APDESE in their efforts to improve the provision of electricity in Cap Haitien and Jacmel, will be measurable in terms of the performance measures such as:

- Increase in the Amount of Private Sector Investment in the Electricity Sector of Cap Haitien and Jacmel and their economic hinterlands.
- Increase in the Amount of Energy Use per Capita.
- Increase in the Value of Agricultural Production, Agribusiness and Manufacturing.
- Increase in Manufacturing, Agriculture and Agribusiness Employment.
- Increase in the Value of Exports from Cap Haitien and Jacmel.
- Increase in Disposable Household Income.
- Improved Social Conditions, resulting from improved Economic Conditions.
- Decrease of the rate of Environmental Destruction.

Structure of the USAID Program for the Electricity Sector. The structure of a recommended program for USAID, as part of its secondary cities program, to promote and strengthen private sector participation in providing electricity in Cap Haitien and Jacmel evolves around the following elements:

- Organizational Development
- Business Development
- Technology Development
- Financial Development
- Training and Technology Transfer
- Assessment, Monitoring and Evaluation

The above elements are grouped so as to collect similar tasks within one element of the overall program. Thus, the organizational development element addresses the tasks to be conducted to establish the various organizations involved in the overall program. Similarly, the technology development element focuses on technologies to be utilized in the provision of electricity, including all aspects from generation to transmission and distribution to collection and billing to marketing etc. In the following each of these elements is briefly discussed. However, at this point it should be clearly noted that throughout each of these elements various methods must be utilized to conduct the various tasks. Most notably, and as discussed before one of the most important methods will be broad-based public participation in order to firmly anchor and build the entire program on the aspirations and perceptions of the local people in Cap Haitien and Jacmel.

Organizational Development. Critical to the program's success is to establish the appropriate organizational structure for the overall program. In fact, the importance of developing the right structure for this program can not be underestimated; a program which is projected to last at least five years. Given current conditions progress in the program most likely will be slow in coming, and can only be achieved through the methodical and systematic efforts of people who all know and understand their respective assignments and are able to work as a well functioning team over an extended period of time.

As earlier discussed this element involves in first instance the establishment of CCIPN and APDESE taskforces, specifically dedicated to promote and develop private sector solutions to the provision of electricity. The taskforces will be the essential "receptacle" for the technical and financial assistance provided by USAID. In particular in the beginning of the program special attention should be given to selection and short-term training for the full time members of the taskforces established by CCIPN and APDESE. It is the capability of individual Haitian team members that will be instrumental in changing conditions on the ground. Since the taskforces will work at various levels further thought needs to be given to taskforce structure, to deal with negotiations with CMEP and EdH, to deal with planning and implementation of emergency measures, and to deal with analysis and development of new business enterprises for the provision of electricity.

On the side of USAID, similar attention needs to be given to establishing the fulltime support structure in Cap Haitien and Jacmel to work with the CCIPN and APDESE taskforces on a day-to-day basis. It is considered desirable to develop such support structure within the context of a Secondary Cities Program Office located in Cap Haitien and Jacmel. Such office would function as the logistical and programmatic base of the program, thus eliminating the need for operational activities to be conducted from Port-au-Prince.

Business Development. This element addresses all tasks associated with the analysis and formulation of the type of private sector business enterprises to provide electricity, that will be feasible within the specific context of Cap Haitien and Jacmel, and that will receive the support of CMEP and the GOH. Initial attention will be given to those types considered feasible at this time, i.e. a private sector company operating as full service utility outside the EdH perimeter, a rural co-operative or an IRC with the potential to operate as a full service utility for near-by customers. To successfully undertake these tasks will require the input of Haitian and foreign consultants with expertise in business formation in general, and in the electric sector in particular. It is within this set of tasks that the legal foundation for any private sector electric enterprise in Haiti must be clearly established, including but not limited to the actual development of legislation additional to the new draft electricity law currently debated in CMEP. Crucial for this element is a well-planned and well-executed effort to establish public support for the efforts by CCIPN and ASPDESE, through a public participation campaign.

Technology Development. This element deals with all technical and technology issues to be addressed by the taskforces. Logically they break down in two sets, one set dealing with the technical and emergency aspects of current EdH systems in both Cap Haitien and Jacmel, and the other set dealing with technical issues associated with generating and distributing electricity. Regarding the first, the focus in Jacmel will be on continuing and extending the current CIDA project. In Cap Haitien the emphasis will be on emergency measures as discussed earlier. USAID support here is of a technical and financial nature, to plan the most appropriate technical measures that the taskforces can provide to shore up the EdH system in Cap Haitien and Jacmel, and to finance needed interim measures.

The second set of technical tasks is focused on systematic formulation of business or project opportunities for the different type of private sector enterprises envisioned for Cap Haitian and Jacmel, i.e. a private sector utility operating outside the EdH perimeter, rural cooperative and IRC. In this case the analysis must first address forecasting of the demand for electricity within the service areas of the various type enterprises, taking into account new demand for electricity. Subsequently, the technical means of meeting demands are developed. This will require resource assessments in the case of mini-hydro development or in the case of solar and wind applications. Then, this analysis must be extended to consider technically feasible means of transmission and distribution to demand centers as well the connections to be made to customers. In short, an electric system must be developed consisting of individual projects to be implemented if the enterprise is to provide the full range of services. In the case of rural electrification the system design must incorporate low cost means of providing electricity in order for customers to be able to afford the electricity provided. In essence this set of tasks requires the preliminary design of complete systems, in order to be able to determine the costs associated with their implementation. USAID support is required to engage Haitian and foreign consultants in system design.

The set of technical tasks for the IRC must by necessity go further and determine first the type of products that the IRC should focus on, and analyze their export potential. The basic idea for promoting the IRC is that the export earnings of products developed would in essence pay for the development of the IRC, including the generation of the electricity needed in the production

process. Once self-generation of electricity for the IRC is technically and economically feasible, the analysis extends to optimizing the electric system of the IRC by taking also the demands of nearby customers into account. Since agriculture and agribusiness are the most likely candidates for the IRC concept, expertise in agribusiness project development must be provided by USAID, in conjunction with utility system planning. Of particular importance is the question of location for the IRC, considering its primary mission as an agribusiness and its secondary mission as potential full service utility for nearby customers, including other manufacturing facilities, tourism facilities and residential customers. Using the earlier mentioned vetiver project to produce essential oils while using plant waste to generate electricity as an example, the challenge in project design is to fully exploit the synergy between the IRC's primary and secondary missions.

Financial Development. This element of the energy program contains the tasks related to the development of business plans for each of the three type of enterprises considered, with particular emphasis on how their development can be financed. It should be noted that the work involved here could only take place after sufficient progress has been made regarding tasks discussed earlier. Thus, once the preferred organization is established and technically feasible projects have been identified, the set of tasks in this element addresses financial viability of the enterprises to be developed. This requires a full exploration of the various ways of financing the establishment and operation of private sector enterprises in the electricity sector of Cap Haitien and Jacmel. The role of USAID in this set of tasks is crucial for CCIPN and APDESE, in that the agency may consider financially supporting the proposed enterprises itself, or may play a key role in bringing in required financing by coordinating other donor support, facilitating communication with other lenders, or obtaining the support from U.S.-based funding sources. Support from Haitian and foreign consultants will be required to assist the Taskforces in conducting the necessary work.

Training and Technology Transfer. Next to the organizational development tasks, the set of tasks in this element are the most crucial for the entire USAID secondary cities energy program. Implicit in the discussion of all the above tasks is the requirement that the work necessary to promote and establish private sector involvement in the electricity sector of Cap Haitien and Jacmel is primarily the responsibility of Haitian entities and individuals, supported by technical and financial support of USAID. Thus, achieving private sector participation in providing electricity in Cap Haitien and Jacmel is accomplished "by Haitians for Haitians". As a result the USAID energy program is best considered as "self-help" program with USAID providing the necessary inputs to make the program a reality.

This basic orientation has key implications for the USAID energy program, namely to train Haitians involved in the program so that they themselves can assume the jobs that are generated by the establishment of private sector electric enterprises. In this context technology transfer has a very specific connotation. Using the establishment of a rural cooperative as an example, those CCIPN and APDESE taskforce members that are dealing with rural co-ops are the ones envisioned as the future professional staff of the co-op, if the latter indeed turns out to be feasible. They need to be trained and they need to be conversant in the whole range of "technology" issues associated with establishing and running electric co-operatives. Even if it were shown that a

different type of enterprise would be more desirable, their training would not be for naught because there is a critical shortage of trained individuals in the electricity sector.

As a result of the above orientation the USAID secondary cities energy program not only is geared to promote private sector involvement in providing electricity in Cap Haitien and Jacmel, but it also is geared to developing a professional cadre of people in these two cities. In this element USAID support is required to identify and financially support the most appropriate opportunities for training fellowships, in the U.S. or in other locations if appropriate. An example of the latter, related to rural electrification, may be a tour of duty to one of the other Latin American countries where there is significant progress in rural electrification. The essential point of the above discussion is that training and technology transfer in this particular situation need the greatest amount of attention in the detailed design of the Mission's secondary cities energy program.

Assessment, Monitoring and Evaluation. By and large the tasks in this program element are self-explanatory, and don't need much clarification. However, there is one key aspect that needs to be captured here. The general situation in Haiti and in Cap Haitien and Jacmel in particular is highly uncertain, as can be observed throughout this report. It is the type of situation that generally causes donors to delay action because the outcome of particular initiatives can not be predicted with a great degree of certainty. On the other hand, and in view of USAID's goals for the secondary cities program, it is difficult if not impossible to imagine not taking action to improve the electricity situation in both cities. Faced with such conditions, it is imperative to adopt a flexible program design, assessing program outcomes frequently and changing course when circumstances require doing so. This in turn requires special attention to monitoring and evaluation in order to be able to successfully execute a program that can not be delayed any longer.

5. Private Sector Power Projects in Jacmel and Cap Haitien

PART A. PRIVATE SECTOR POWER PROJECT ASSESSMENT

Haiti currently has approximately 150 MW of generating capacity, comprised of hydroelectric (Peligre – 54 MW) and diesel/fuel oil fired generators. Because of lack of fuel, spare parts, low reservoir levels and other problems, total generation in 1996 was 300,000 megawatt-hours (MWh).[13] Overall capacity factor (actual generation as a percentage of total capacity over the entire year) is on the order of 22 percent, a chronically low number. By comparison, overall capacity factor in the United States in 1996 was approximately 47 percent.

Electric energy consumption per capita in Haiti in 1996 was approximately 40 kWh per person per year, compared with roughly 13,000 kWh per capita in the United States. Of 131 countries included in statistics compiled by the International Energy Agency, Haiti is ranked 129th - third to last, before Nepal and Ethiopia - in terms of electricity consumption per capita. Table 1 below shows selected countries and their energy consumption per capita, along with other energy indicators.

While energy consumption can also be a sign of excess (or cheap energy sources), in the case of Haiti it is a sign of severe lack of capacity as well as ability to utilize capacity. If Haiti were to reach the median level of intensity – 1,827 kWh per capita – with a reasonable capacity factor of 40 percent, it would require a generating capacity of 3,828 MW. This would be a 25-fold increase in installed capacity. Another measure of energy intensity or consumption is to look at generating capacity per capita: in Haiti, intensity is equal to approximately 0.021 kW per capita, compared to the United States, with an intensity of about 3.12kW per capita.[14]

A primary assumption of the authors – and a major impetus for exploring electricity supply in Secondary Cities – is that energy supply – and especially electricity --is crucial to economic growth. In a study of the impact of increased energy intensity on economic growth, the authors found that there was a significant correlation between per capita energy use and the Physical Quality of Life Index (PQLI). The PQLI is an index that focuses on basic human needs: infant mortality rate, life expectancy, and literacy. When comparing among numerous countries, it was found that on average a PQLI of about 90 (a value typical of industrialized countries) is reached for per-capita energy use rates of 1.0 to 1.2 kW (capacity per person). Further increases in energy use cause only very marginal further increases in the PQLI. However, when energy use increases from 0.5 to 1.0 kW per capita, the PQLI value increases from about 20 to 80.[15]

[13] International Energy Agency, "Key World Energy Statistics," from http://www.iea.org/stats/files/keystats/stats_98.htm, (downloaded March 2, 1999).
[14] This is based on a total generating capacity of 150,000 kW and a population estimate of 7.3 million.
[15] Jose Goldemberg, Thomas, B. Johansson, Amulya K.N. Reddy, and Robert H. Williams, "Basic Needs and Much More with One Kilowatt Per Capita," *Ambio*, Vol. 14, No. 4-5, 1985, pp. 191-192.

Table 1:

Energy Production and Consumption in Various Countries

Country	Population (million)	GDP (billion '90 US$)	Energy Prod. (Mtoe)	Elec. Cons. (TWh)	Electricity Consumption (kWh/cap/yr)
Haiti	7.3	2.3	1.6	0.3	39.5
Congo	2.7	2.9	11.5	0.6	203.0
India	945.1	411.2	390.6	358.9	379.7
Dominican Republic	8.0	8.9	1.5	5.1	642.0
Cuba	11.0	15.2	6.7	11.5	1,043.6
Mexico	96.6	298.1	213.5	139.0	1,439.0
Brazil	161.4	557.8	112.3	276.9	1,715.8
Jamaica	2.6	4.4	0.6	5.4	2,113.7
South Africa	37.6	114.4	127.9	179.7	4,774.7
France	58.4	1,276.2	130.1	412.7	7,068.7
Switzerland	7.1	227.5	10.5	52.2	7,343.2
United States	265.6	6,316.4	1,687.3	3,462.9	13,040.1
Canada	30.0	621.2	357.3	491.8	16,415.6
Norway	4.4	145.3	208.2	105.3	24,038.8

Source: International Energy Agency (see footnote 1)

A much more intuitive approach, based on anecdotal evidence from several field trips to Jacmel and Cap Haitien, suggests that not only would quality of life improve, commercial activity would also increase significantly. Availability of supply, along with lower operating costs (compared with small diesel generators), would allow factories to operate longer, more continuous shifts, increasing output and lowering unit costs. It is likely that exports would increase in light manufactures and agri-business products. The number one reason cited by numerous entrepreneurs for not investing in tourism facilities in Jacmel and Cap Haitien was the lack of reliable, cheap electricity. And in general, increased availability of electricity would stimulate economic activity and increase employment.

1. Economic/Industrial Growth Scenarios for the Jacmel and Cap Haitien Areas

The Haitian economy is still recovering from the embargo of the early nineties, and growth has been slow or negative during the past few years. Gross domestic product (GDP) for 1997 was approximately US$ 2.8 billion, or US$384 per capita.[16] GDP in 1997 decreased from 1996, when it was approximately US$3.0 billion. After the return of constitutional rule at the end of 1994 and the end of the embargo, real GDP expanded strongly as substantial financial support returned to the country. However, beginning late 1995, international aid flows began to slow down, accompanied by a slowdown in real GDP growth and an increase in inflation. Real GDP growth of 4.4 percent in 1994/95 (fiscal year ending September) slowed to 2.7 percent in 1995/96 and 1.1 percent in FY 1996/97.[17] The World Bank estimates average annual growth rates of 3.0 percent from 1998 through 2002.[18]

Numerous industries are still struggling to regain the ground lost as a result of the embargo, including the agricultural processing industry, which is a focal point of this study. Export markets for mangos, coffee and several other commodities deteriorated due to the embargo, and like the economy in general, improved dramatically in 1995. However, all have declined significantly since then, and the current political/economic climate is not helping improve the situation. The table below shows exports of several commodities from 1993 through 1997.

Table 2. Haiti: Principal Commodity Exports

(value in millions U.S. dollars, volume in thousand tons, unless otherwise specified)

	1993	1994	1995	1996	1997
Coffee					
Value	8.46	7.72	14.11	6.85	10.19
Volume 1/	136.83	108.00	148.50	70.32	84.90
Sisal and Sisal strings					
Value	1.44	1.08	4.82	0.60	0.84
Volume	3.30	2.54	3.43	1.30	1.87
Cocoa					
Value	1.71	0.97	1.95	0.61	0.68
Volume	3.01	1.84	3.40	1.05	1.08
Essential Oils					
Value	0.37	2.24	7.24	5.66	2.94
Volume	0.01	0.08	0.23	0.17	0.10

[16] The World Bank Group, "Regions and Countries: Haiti at a Glance," from http://www.worldbank.org/data/countrydata/aag/hti_aag.pdf, (downloaded March 3, 1999).
[17] International Monetary Fund, "Haiti: Recent Economic Developments," IMF Staff Country Report No. 98/101, September 1998, p. 6.
[18] Op. *cit.*, The World Bank. Source: International Monetary Fund

Jacmel and Cap Haitien. It is currently not possible to obtain any figures for economic activity or growth for either Jacmel or Cap Haitien, and all the information presented here is anecdotal and somewhat speculative. With 1997 GDP growth at 1.1 percent and taking into account the current political stalemate and lack of investor interest in Haiti, it is not likely that the economy will grow at a fast pace in the next two to three years. The following table shows the expected GDP using World Bank estimates of 3.0 percent per year:

Table 3. Annual Economic Growth Forecast

Economic Growth	1997	1998	1999	2000	2001	2002
Rate of Growth (%)	1.1%	3.0%	3.0%	3.0%	3.0%	3.0%
GDP (US$ bn)	2.80	2.88	2.97	3.06	3.15	3.25

Measured in terms of GDP, Haiti's current energy intensity is 0.054 kW per $1000 of GDP. In order to keep up with economic growth, Haiti's current electric generating capacity should increase by three percent a year. This would lead to an installed capacity in 2002 of 173.9 MW. One could apply these same growth scenarios to Jacmel and Cap Haitien to arrive at projected capacity increases. However, this business as usual scenario will keep up with economic growth but not foster it. In order to estimate the potential load growth – which must take into account pent-up demand and is quite a guessing game with so little data – one can assume a level of energy intensity that Haiti, and thus Jacmel and Cap Haitien, might aspire to in the next five years. It is difficult if not impossible to choose a target for Haiti's capacity growth. For argument's sake, one could say that Haiti should strive to reach the same level of intensity as Jamaica, or 0.268 kW per $1,000 of GDP. To achieve this level of intensity, Haiti needs to increase overall capacity by approximately *480%* between now and 2002, to a total of 870 MW.

Directly matching this capacity growth in Jacmel and Cap Haitien would mean increases in current capacity in Jacmel from 3.2 MW to 18.9 MW and in Cap Haitien from 14 MW to 81.2 MW. Actually, it could be argued that these two cities merit even greater increases because of the intent to make the secondary cities High Productivity Zones. While it is not possible to estimate economic activity in Jacmel and Cap Haitien, and energy intensity as a function of GDP, one can estimate intensity as a function of population. The table below compares Haiti, Jacmel and Cap Haitien.

Table 4. Energy Intensities in Haiti, Jacmel and Cap Haitien

	Haiti	**Jacmel**	**Cap Haitien**
Current Installed Capacity (kW)	150,000	3,250	14,000
Population	7,300,000	30,000	600,000
Current Intensity (kW/cap)	0.021	0.108	0.023

1/ in thousands of 60 kilogram bags

It appears that, at least in terms of installed capacity; Jacmel and Cap Haitien are better than the country as a whole. In fact, Jacmel's capacity related to its small population is quite good. However, one must remember that a lot of the capacity, especially in Cap Haitien, requires replacement soon, if not immediately. The Canadian project will increase the total capacity in Jacmel to 4.5 MW, which will improve the intensity to 0.15 kW per capita.

2. Overview of Possible Electric Power System Development in Jacmel and Cap Haitien

Electricity Supply in Jacmel. The most promising development in Jacmel (and perhaps the country) in the electricity sector is the implementation of a Canadian Government-sponsored project to rehabilitate and improve the Jacmel EdH facilities. The project is approximately US$10 million and will run from July 1998 to July 2000, and is managed by Hydro Quebec International (HQI), working side by side with EdH, the direct beneficiary of the funding. HQI will try to implement the following five program areas:

1. Increase generation capacity at the EdH Jacmel facility through adding new diesel capacity and repairing existing engines (1.25 MW);
2. Repair and improve the distribution network;
3. Initiate a campaign to improve collections, through addition of vehicles, metering, and an advertising/public relations campaign;
4. Develop and install a data communications system between Port-au-Prince and Jacmel, independent of the telephone system;
5. Develop a load and generation forecast plan.

More broadly, the objective of the project is to make EdH-Jacmel profitable and *semi-autonomous.* However, while accounting will be conducted in Jacmel for revenue and expenses, it appears that funds will still go to and from Port-au-Prince. The overall project manager, Pierre Harboun, did note that they believe it will be profitable if they can achieve 70 percent recovery in collections.

The program is proceeding, and the HQI-Jacmel project manager has been set up in Jacmel. This person will work as a colleague of equivalent standing with the EdH manager. Altogether, there will be five HQI personnel in Jacmel alongside 20 EdH personnel. Mr. Harboun feels the ratio will help to ameliorate what he described in detail as the poor work ethic of EdH personnel.

It appears that HQI is a potential operator/concessionaire for the entire system. However, HQI has a clause in their agreement with the government that the project will continue until it is finished even if another operator comes in before July 2000. Interestingly, Mr. Harboun also noted that if this project is considered a failure CIDA will do nothing further in the energy sector in Haiti.

The CIDA-HQI project will provide a near-term solution to some of the problems in Jacmel. At the least, generation capacity will be increased. However, it is unclear how the project will deal with the ongoing problem of lack of fuel supply. It is anticipated that fuel supply will become

more regular if and when EdH Jacmel achieves greater collection coverage, and thus sends more revenue to Port-au-Prince.

Medium- to long-term, however, it is not assured that power supply in Jacmel will continue to meet even the current, existing, demand, not to mention potential demand from unconnected load. Unless major changes occur in the management of EdH, it is likely that the situation in Jacmel will revert to the poor management and lack of supply characterizing the current period.

Electricity Supply in Cap Haitien. Electricity is produced by EdH in Cap Haitien at the St. Philomène Generating Station. The plant has a nominal capacity of 14 MW of diesel engines, though only about 5 MW is operational. EdH hopes to have another 5 MW available in four months. In general, the condition of the plant is abysmal. The generators are in a state of disrepair and disarray, the location and access to the plant are poorly planned and designed. As in Jacmel, fuel supply is a major problem. An estimate of current generation is that approximately 5 MW are available from 6 pm to midnight, or 30,000 kWh per day, or 10,950,000 kWh per year. For a population of roughly 600,000, this translates into approximately 18 kWh per person per year, less than half of the consumption rate for the entire country. While this data is very rough, it validates what is already generally known: that available hydroelectric and fossil fuel resources are primarily utilized for electricity supply in Port-au-Prince. From **Table 4** above, one can see that while installed capacity per capita is in general very low, it is relatively much higher in Jacmel and Cap Haitien than for the country as a whole. The relatively lower rate of *generation and consumption* in the secondary cities is therefore probably related more to lack of fuel and maintenance than to lack of capacity.

In Cap Haitien, the Bechtel Team discussed the proposal of the Cap Haitien group SOGENOR. SOGENOR had proposed to the GOH that a new generating plant be built in CH by local private investors, who would sell the output to EdH. Hans Broder Schutt, a local business leader and a member of SOGENOR, claims that over $1 million was raised and ready to be invested, but the GOH instead chose to enter into a contract with a group named Inter-Select. Their project proved to be without substance, and nothing was accomplished. Apparently the business people in Cap Haitien who were involved with this negotiation are quite cynical of the process as a result.

Schutt noted that the Haitian Chambers of Commerce are based on the French system wherein the Chamber is authorized to act as a sort of fiduciary of the city and thus can make investments and conduct business. It is a "utilité publique." Schutt suggested that the Chamber in Cap Haitien could do numerous projects, such as taking over the management of the airport (by letting a contract to a private operator) or the utility. He does not know how this can be done, however, given the current situation. Schutt also mentioned that there is a serious problem with fuel supply in Cap Haitien; and that there was previously a privately owned fuel terminal at the port but there is not one currently.

3. Potential Private Sector Power Development Projects in Jacmel or Cap Haitien.

Given the current legal/institutional constraints placed on private sector development of power projects in Haiti, it is not likely that any private projects would be approved in the next year.

The reasons for this are outlined clearly in the discussion of the current political situation, especially regarding the privatization/modernization process and the ongoing negotiations with the IDB. Nevertheless, there is significant and diverse potential in both Jacmel and Cap Haitien for small-scale, sustainable energy production. Project development however requires long lead times due to resource assessment and integration of other industries as end users. Therefore it is recommended that these projects be reviewed and supported in order to be able to have results in the time period where private power projects will be allowed.

Based on observations and limited published material, two general conclusions were drawn regarding potential private sector generation projects:

1. The available fuel resources limit the technology choices to mini-hydroelectric, biomass cogeneration, diesel engines, and possibly bunker oil in Cap Haitien (because of the availability of a viable port for delivery of large quantities of fuel). There is the possibility of solar thermal and solar photovoltaic (PV) applications in both areas, though it is likely to be cost effective only in remote, unconnected, areas, as opposed to larger-scale grid applications. Current PV generation costs are in the range of US$.20 to US$.30 per kWh for thin-film technology;
2. Except in the case of a large-scale bunker project in Cap Haitien, the project sizes would be relatively small – less than 5 MW.

Several potential projects from both Jacmel and Cap Haitien are reviewed below.

Plateforme Ecologique. The Plateforme Ecologique d'Haiti (PEH) is a non-profit organization sponsored by the Boucard Group. The Boucard family was a leading business family of Jacmel for many years until the Duvalier regime forced them out. Gueric Boucard, one of the brothers, has returned to Jacmel and has reclaimed the family land and set up a small distillery. The family, based in Texas, is primarily in the essential oil business. Boucard's brother, Victor, is the main proponent of the NGO, whose goal is to establish "Ecological Power and Light Industry Centers" (EPALI) in 12 coastal cities in Haiti, beginning with Jacmel.[19] The EPALI have the following broad goals:

1. *Collection and sorting of municipal waste for fuel and composting*, charging a fee to cities (including maintenance of parks);
2. *Production of two MW of electricity using boilers burning biomass, municipal waste and fossil fuels.* EPALI would try to attract biomass fuels by paying cash to local farmers for such biomass as bamboo and vetiver grass, as well as agricultural waste such as bagasse and cane trash, coconut hulls and leaves. PEH expects that power could be sold to EdH for approximately US$.10/kWh.
3. *Desalination of seawater using waste heat from the boilers* (steam turbine exhaust steam). The goal is to produce 200,000 gallons per day of fresh water for the town, to be paid for by the city.
4. *Development of an Industrial Park surrounding the power plant*, which will provide for five or six industrial buildings to house agri-processing facilities. There would also be several

[19] Boucard Group, "Plateforme Ecologique D'Haiti: Abstract of a Haitian Recovery Plan," unpublished document, November 1998.

commercial buildings for assembly, arts & crafts and small factories. A cold storage facility would also be located in the park. All buildings would be leased to individuals and corporations.

5. *Commissioning from local farmers for a large acreage of lemon grass and milo production.* Lemon grass will be used for essential oil production (extraction being done with steam). The cellulosic waste will be mixed with milo and molasses to produce an all-purpose animal feed, which is to be bagged and sold at a subsidized price to local farmers.
6. *Build a four-star resort condominium* patterned after the time-share concept. The resort would attempt to attract doctors and their families (the contribution being tax deductible) for vacations. The doctors would be invited to volunteer three days of their week to offer medical services to nearby hospitals. PEH considers this component very important and also believes it would attract a great deal of support and also generate significant revenue.
7. *Creation of an Ecological Extension Service* to engage in development of tree nurseries, reforestation, erosion control and watershed management. This part of the EPALI would be a cost – as opposed to revenue – center.
8. *Sponsoring of a school for "street kids" and trade school under the auspices of the Catholic Kolping Society.* The project would also sponsor the establishment of a small medical clinic that would be offered free land and utilities. Neither the school nor the clinic would be paid for by the EPALI.

The above describes one location – the first one being proposed is for Jacmel – though the entire concept of the PEH is far more ambitious. Besides the development of 12 EPALI Centers, the goal of the project is to create a "floating command center." This is essentially a sea-going vessel that would house various donor organization personnel such as USAID, UNDP, the World Bank, and the EU. While the basic concept behind the command center – decentralization and a lack of roads to visit the EPALI – makes sense, it is a somewhat grandiose scheme that has limited chance of success. However, the individual EPALI Centers, especially the one in Jacmel, merit further review. While the numbers need verification, PEH estimates that each Center would result in 10,000 new jobs.

Of the eight-point program described above, some elements seem feasible, and mesh well with the overall objectives of the USAID Secondary Cities program. Development of sustainable industry and infrastructure – power and water – are critical for economic development. In addition, the focus of the EPALI on the locally available resources – municipal solid waste, agricultural waste, biomass crops, seawater – makes a great deal of sense, especially in light of the recurring inability of EdH to supply fuel and the dearth of potable water. The production flow sheets developed by PEH are in line with the concept of Integrated Resource Centers/Companies (IRCs) discussed earlier, as there is a symbiotic relationship among the participants in the park.

The heart of the IRC is the power plant, which uses the by-products of the agri-processing industries and local farming operations to produce power. More importantly, the power plant provides the necessary power and thermal energy to allow the industrial facilities to operate and produce revenue. At least in theory, the EPALI is an ideal sustainable distributed generation project, located off grid, providing its own fuel, and allowing economic growth as a result of energy supply. In the case of the EPALI, outside sources of fuel, such as vetiver grass, bagasse

and bamboo are required for the boilers; these may be problematic to grow and deliver in sufficient quantities for the two MW productions. The estimated supply of (dry) biomass fuel is 200 tons per day, which is not an unreasonably large quantity. However, organizing the supply – contracting with local farmers, setting up collection and transportation – is a project in itself and is somewhat risky as the basis for a power plant. The additional fuel sources, e.g., bunker oil and MSW, are obtainable. However, there are non-trivial technical issues that need resolution. Namely, the boiler design must be fairly robust to accommodate such a wide variety of fuels, and it might be quite expensive to design such a boiler on a two-MW scale.

The agri-processing industries located at the EPALI Center would be vetiver and lemon grass distilleries, sugar and alcohol production from cane, and animal feed pellet production. It is possible that other industries such as coffee processing (in Jacmel) and mango processing (in Cap Haitien) could be included. In fact, the agri-business and biomass resources would likely be different for each EPALI Center, based on the locally available resources. For instance, coffee production is prevalent in Jacmel but not in Cap Haitien. There is a coffee sorting and bagging operation in Cap Haitien, though the exact origin of the beans is uncertain. This can be confirmed in follow-on work. It is quite conceivable that coffee processing would be included in the EPALI Center, though it would not necessarily be the main industry or producer of biomass. Likewise, the majority of Haiti's sugar cane is produced in the northern plain near Cap Haitien, and therefore an IRC in Cap Haitien might concentrate its production and biomass resources on sugar cane.

The EPALI Center concept, even when limited to one location without the "command center," is very ambitious. One could go so far as to say there are "too many moving parts." **Error! Reference source not found.** shows the production flow as developed by the Boucard Group for PEH. It is apparent that there are numerous co-dependent entities, which usually tends to make the possibility of failure greater, if one entity becomes critical to the entire process. In addition, it makes the development process far more complex, especially if the individual components cannot be done on an incremental, phased basis. Trying to develop all of the different components shown in **Error! Reference source not found.** would take an enormous amount of time and is the principal drawback of the concept. When one adds the other components, such as the resort and schools, it becomes even more complex.

There are clearly elements presented in the PEH proposal which deserve further attention, as the core concept is sound. To summarize, these concepts are:

- Use locally available resources for generating power, steam and potable water;
- Operate the facilities on a profitable basis;
- Use waste or by-products from agricultural processing as sources of fuel, supplementing these with conventional fuels;
- Provide incentives for farmers to generate biomass fuels for cash;
- Generate export earnings through some of the products;
- Involve the local community and include outside parties and investors;
- Generate jobs for local citizens;
- Provide ancillary services to the local community at cost or on a subsidized basis.

On the negative side, the following problems stand out:

- Overly complex process flow with too many components;
- Reliance on EdH for large source of revenue;
- Reliance on resort community for volunteer doctors for large source of revenue;
- Assumption that organization of land and collection of biomass fuels can be done on a broad scale;
- Larger concept of 12 centers with command center.

In Table 5 below the cost of the EPALI power plant is estimated, along with generation. These estimates are not based on PEH *pro forma* financial statements, but rather on standard cost estimates for biomass cogeneration projects. The EPALI Center financial estimates include all components, including the desalination plant, farmland, power plant, resort, buildings, and vehicles. The total investment is proposed as $12 million, of which $6 million would be raised as grants from donors and $6 million in debt. The profit and loss projections estimate the following on an annual basis:

Revenues:	$5,304,000
Expenses:	$3,191,676
Net Profit:	$2,112,324

In general, the financial projections appear to be professionally done, and some thought has gone into the project costs. Some of the assumptions, of course, bear further study and grounding, especially on the revenue side. However, there is an advantage to having a willing sponsor who has already prepared some of the ground.

Bassin Bleu Hydro. Bassin Bleu is a small river basin located in the mountains east of Jacmel. The Petite River flows through the basin. It is approximately 12 km from the city of Jacmel. According to Rene Michel, an engineer and long-time resident of Jacmel, the river has a waterfall of 270 meters and potential for hydroelectric generation of between 1,250 kW to 1,500 kW.

Petit L'étang. Another potential hydroelectric project located on the La Valley River approximately 18 km from Jacmel. Under optimal condition, the project could generate 1,500 kW. This project has also been studied in a preliminary manner. Additional feasibility assessment needs to be performed.

Coffee and Other Agribusiness in Jacmel. The Jacmel area is one of the main coffee production areas in Haiti, and though coffee production in the country declined from 1995 to 1996, it has since rebounded and several coffee exporting initiatives have been started (such as the USAID-sponsored Haitian Bleu project). Discussions with a local entrepreneur in Jacmel, Gaston Michel (son of René Michel, a member of APDESE) showed that there are interesting and relatively ambitious plans to set up coffee processing facilities. Michel has purchased an old coffee processing facility near the pier in Jacmel, which has not operated as a coffee facility for many years. A fairly large-scale operation could be set up there; however, it was clear that

Michel was reluctant to invest in the current environment; one of the constraints mentioned, of course, was lack of energy supply.

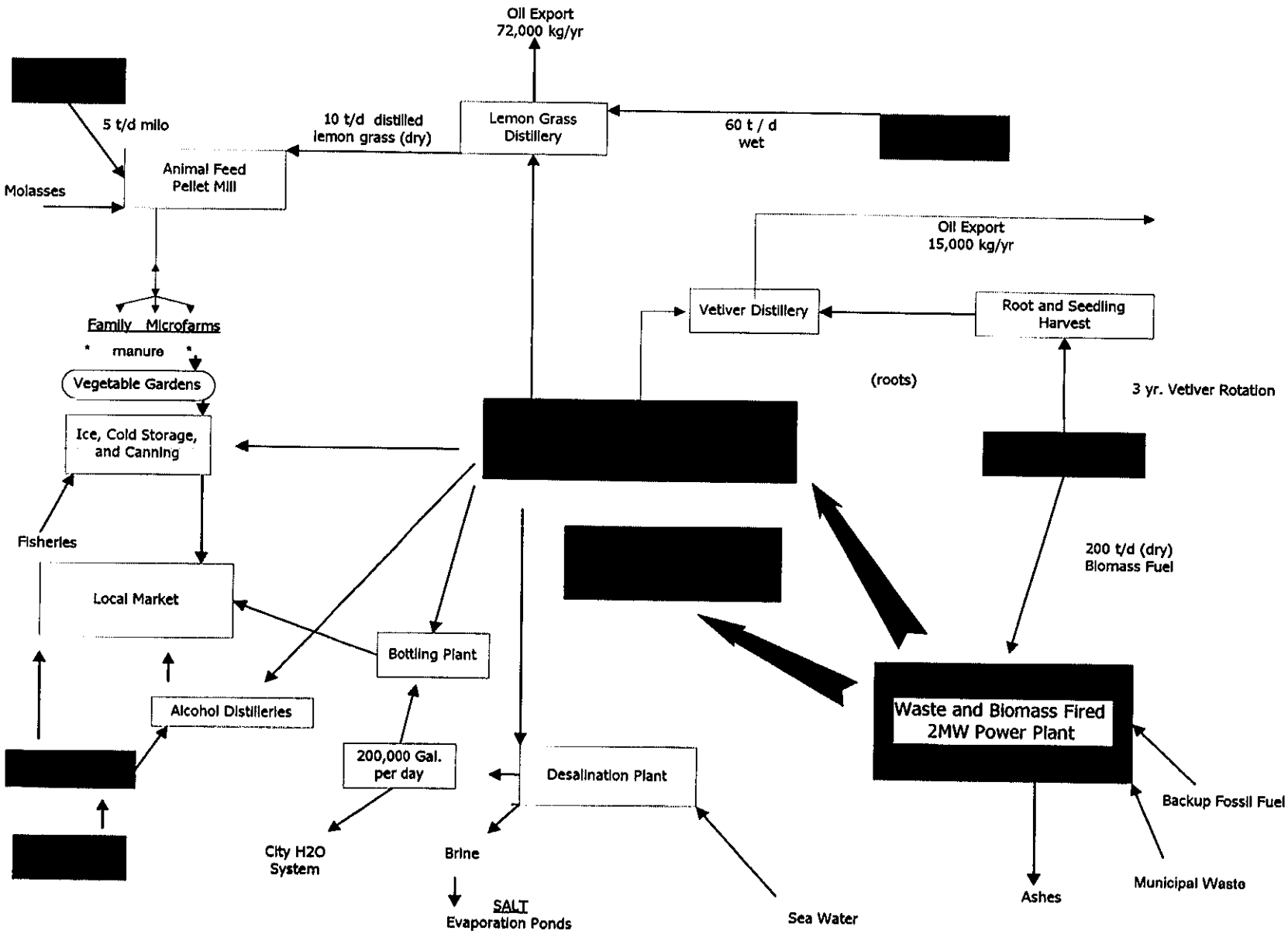
As a resource for energy production, coffee has potential for some generation of electricity, although the seasonal nature and the volume limits it potential (similar to bagasse in Haiti). From harvested coffee "cherries," there is only about 18 percent (by weight) left after removal of husks, pulp, oils and the thin shell of the bean itself. Therefore, there is a quite a lot of biomass waste as a percentage of total harvested bean. The first stage of processing removes the husk, pulp and oils, which is relatively moist at about 55 percent moisture content. The shell, on the other hand, is quite dry. The first stage biomass is about 77 percent of the total bean by weight; the second stage biomass is about 5 percent by weight. In 1996, Haiti produced 13,000 metric tons of coffee[20], which, if it were all processed for export, would yield approximately 10,660 tons of biomass. (1993 figures from the USDA estimated coffee production of 37,000 metric tons.[21]) Some, though not all, of this could be used for energy production. There are currently no readily available figures for coffee production in the Jacmel area, and no estimates for centralized coffee-processing throughput. Without these figures it is not possible to estimate the potential for energy generation.[22] However, it is not likely, given the current promotion of the coffee processing business in Jacmel, that it could serve as the "anchor" of an integrated resource company, purely on the basis of scale. Nevertheless, coffee processing should definitely be considered in any IRC conceived in the future.

[20] Op. *cit.*, International Monetary Fund, p. 34.

[21] U.S. Agency for International Development, "Agricultural Policy Analysis Project, Phase III," prepared by Abt Associates, April 1995, p. 5.

[22] There are several donor-sponsored projects going on and several reports for the PPK Project, which have been reviewed. This suggests that there is a body of knowledge related to coffee production in the Jacmel area, which could be of use, if focused on the topic of energy.

Figure 1: EPALI Production Flow Sheet



Distillerie LaRue. Distillerie LaRue is the largest distillery of clairin (clear rum) in the Cap Haitien area and one of the largest in the country. Mr. Nazon, the owner of the plant who was out of country, is planning to build an ice factory on site and to install a small steam turbine to produce enough electricity to power the distillery and the ice factory. He is not considering a larger plant that could sell power, though he might be interested. The distillery is in relatively good condition and they hope to increase their output and eventually to export.

A larger cogeneration project is a possibility for the distillery, though it would require significant changes in configuration and new equipment, and the economic viability is unknown at this time. There seems to be potential to attract additional biomass fuel, such as cane trash, which could increase the size of the project. In addition, it is possible to co-fire bagasse and bunker fuel to produce a significant amount of power.

The distillery is currently processing approximately 182 metric tons of cane per day, which would allow for electric power production of approximately 380 kW. With a demand of 180 kW, the distillery would have surplus electric power of 200 kW, which would probably be used for the ice factory. For a cogeneration plant of this small size, the installation cost (new equipment) could be as high as $750,000. With annual generation (bagasse only) of approximately $2.5 million kWh, the generation cost – including operation and maintenance charges, debt amortization (50 percent debt), and return on equity – would be approximately US$.062/kWh. This is about 20 percent higher than the cost for a larger bagasse cogeneration plant, yet it is still considerably cheaper than the cost of running a diesel generator.

However, given the resource availability, the scale of the project is such that only a very small amount of excess power could be distributed to others outside of LaRue. While this would be beneficial to the LaRue business, it would have little or no impact on other businesses or people, and therefore would not contribute greatly to the development of the city.

A more ambitious project would entail increasing the capacity of the cogeneration plant by either increasing the amount of cane processed, buying cane trash, or using bunker fuel as a supplemental fuel. The latter would be the most straightforward and easy to implement; though the cost of generation would perhaps increase somewhat. Using bunker as both an in-season (September through June) supplemental fuel and an off-season primary fuel would create the potential for two to three megawatts. This would in turn create the potential for considerable excess sales of electricity. Located near the distillery are four small villages that currently are just outside the EdH Cap Haitien grid. There are several private diesel generators. However, the majority of the houses is unconnected and has no electricity. A local cooperative could possibly be organized to buy power from LaRue and distribute to the local homes and businesses. This would entail training, institutional support, and technical studies to be supported by USAID. In addition, some support for the LaRue distillery might be appropriate in order to get the project underway.

Georgemin Prophète owns a small distillery (about one-tenth the size of LaRue), approximately three miles to the north. The Bechtel Team met in his home to discuss potential projects that USAID could support. He described in detail the area, which has four small villages, and 13 other smaller distilleries besides his and Nazon's. None of these are connected to EdH, and only

he and a few other people have their own generators. He also noted that the water supply plant for Cap Haitien was nearby and has a generator, which often does not run. They have a demand of about 250 kW.

Prophète was very knowledgeable about the city, EdH, and local politics. He believes that nothing will happen to improve the situation unless the local people are allowed to take matters into their own hands. He also thought that a small cogeneration plant at LaRue would be supported locally, and that the local villages and business could form a sort of coop to buy excess power from the project. He would be willing to help organize such a project.

Other Agribusiness in Cap Haitien. Historically, the northern plain between the sea and mountains and surrounding Cap Haitien was a major sugar cane production area, with a large-scale sugar mill near Cap Haitien, the Usine Sucrière du Nord (USN). USN, like the three other major mills, is completely shut down at this time and is not likely to be re-opened. The sugar cane in Haiti mostly goes toward production of rum and clairin, as well as very small-scale sugar production. Haiti has not had sugar exports in more than a decade. It appears, therefore, that without a major effort, sugar cane bagasse is not a viable option as a fuel source except perhaps on a small scale at Distillerie LaRue.

Project Cost Comparison. In order to examine the possibilities of developing private sector generation projects in Jacmel and Cap Haitien, a rough capital cost and generation cost has been calculated for each project. Table 5 below shows the results of the comparison.

Table 5. Comparison of Project Economics

Project	Capacity (kW)	Capacity Factor	Annual Generation (kWh)	Capital Cost ($/kW)	Capital Cost ($)	Generation Cost ($/kWh)
Bassin Bleu	1,500	40%	5,256,000	$ 1,750	$ 2,625,000	$ 0.113
Petit L'étang	1,500	40%	5,256,000	$ 1,750	$ 2,625,000	$ 0.113
EPALI[23]	2,000	70%	12,264,000	$ 1,500	$ 3,000,000	$ 0.059
Distillerie LaRue	500	60%	2,628,000	$ 1,500	$ 750,000	$ 0.067
Diesel (generic)	1,000	80%	7,008,000	$ 500	$ 500,000	$ 0.090

The capacity figures are all derived from documents or conversations with local sponsors or interested parties, except for the diesel generation, which is added mainly as a point for comparison. The additional generator being added in Jacmel by the Canadian project is 1,250 kW, and this size range is probably the most practical, though not the most efficient, given the lack of funding in Haiti in general.

[23] Costs shown in the table are for the electricity production of EPALI only. The total estimated costs for one EPALI Center is approximately $12 million, which includes other processing facilities (desalinization, pellet processing, etc.), transportation, and farm machinery, land, buildings and miscellaneous costs.

Capacity factors are estimates derived from similar projects in other countries and are mostly determined by availability of fuel or water. The 40 percent estimate for the two hydro projects is a conservative figure, as very little data is available on hydrologic resources and watershed characteristics. Because hydroelectric power costs are largely driven by capital costs, (and not fuel) an increased capacity factor reduces generation cost significantly. This emphasizes the importance of good data when developing hydro projects, allowing the developer to accurately predict the cash flow and ability to service debt. Figure 2 shows the cost curve as the capacity factor increases to 60 percent (a factor which is entirely possible).

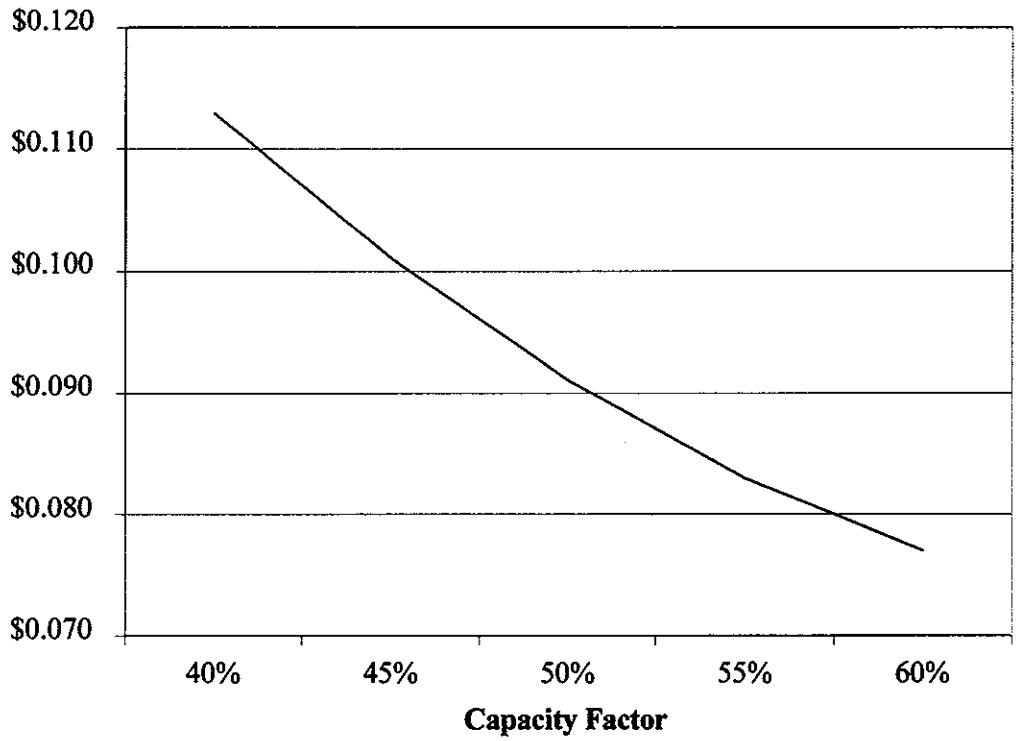
Annual generation is derived from multiplying the capacity by the capacity factor and the total number of hours in a year (8,760). The capital cost figures are based on projects in other countries (bagasse cogeneration in India and the Philippines, mini-hydro in Nepal, Philippines, and Guatemala[24]). Diesel costs are based on the approximate cost paid by the Canadian project for a 1,250 Caterpillar generator, as well as other projects. The costs include development costs. Generation costs consider capital costs, using the following assumptions:

- 50 percent of the project costs are in equity, the other 50 percent in debt;
- Debt is amortized over 10 years at 15 percent interest;
- Equity has a 10-year investment horizon and a 20 percent discount rate.

These two costs are annualized. In addition, operation and maintenance costs are included, at the rate of $5.00 per MWh for thermal and $3.90 per MWh for hydro. No fuel costs are assumed except in the case of diesel fuel, which is estimated at US$1.35/gallon, based on discussions with

[24] Econergy International Corporation

Figure 1. Hydro-Generation Cost as a Function Of Capacity Factor ($/kWh)



owners of private diesels generators. (Fuel consumption for the one MW generator is taken from Caterpillar specification sheets.[25]) Total annual costs for debt and equity service, O&M, and fuel charges are combined and then divided by total annual generation to arrive at generation cost per kWh.

As a point of reference, levelized costs of energy are shown in the Table 6 for various technologies. In general, these projects would be larger than those in Table 5.

[25] Caterpillar, "Generator Set 3512 Prime Power," from www.cat.com, (downloaded March 3, 1999).

Table 6. Capital and Energy Costs for Various Technologies[26]			
Technology	Capital Cost ($/kW)	Variable Costs ($/kWh)	Levelized Cost of Energy ($/kWh)
Wind	900	0.009	0.06
Bagasse[27]	900 – 1,500	0.005 - 0.01	0.05 - 0.08
Hydro	1,000 - 4,600	0.01	0.037 - 0.136
Geothermal	1,000 - 4,000		0.03 - 0.075
Solar PV	2,000 - 7,650	0.005-0.07	0.25 - 3.00
Coal	1,300	0.025	0.051
Natural Gas CC	450	0.02	0.03

4. Issues and Constraints for the Development of Private Sector Power Development Projects in Jacmel and Cap Haitien.

Many of the problems of the current electric power system are described in previous sections. In this section, we can relate these and other problems directly to the impact on development of private power generation projects.

EdH Structure and Jurisdiction. The current franchise area of EdH includes Jacmel and Cap Haitien cities, and there is no plan to change this or relinquish control in the near term. This is based primarily on numerous discussions with CMEP and the IDB, who have both reiterated that the current plan to hire a system manager would be put in jeopardy by any private generation projects in either city. In fact, the point of both organizations relates more to *distribution* of power by the private sector. In several instances CMEP has noted that private power projects would be allowed as long as the projects sell to the Distribution Company (currently EdH). This is essentially a wholesale environment, which has one major flaw: EdH is in no position, administratively, politically or financially, to let a long-term contract for power purchase. And private sector people do not believe that EdH would pay its bills. The SOGENOR attempt to enter into a contract with EdH was disastrous and it is not likely that it would be repeated.

[26] Econergy International Corporation and Battelle, Pacific Northwest National laboratory, "Financing Renewable Energy and Energy Efficiency in Emerging Markets: A Targeted Fund for Project Development," November 1997, p. 35.

[27] Bagasse is used as a proxy for all biomass, although many other sources of biomass exist and have well-developed technologies for conversion. Especially important in developing country context are rice husks, palm oil and palm waste, and wood waste.

The current draft electricity law confirms this by allowing private generators to generate only in fulfillment of their own demand. It might be possible to get around this provision if the project – and customers – are outside the immediate jurisdiction of EdH. This could perhaps be done through one of the projects mentioned in this chapter: most are located outside the local grid areas, and in the case of the EPALI Centers, the sites are not chosen. Nevertheless, this would require serious negotiation and perhaps a provision to turn over the assets at some point in the future when a new operator is in place and ready to expand the grid.

Local Sponsors. There are currently a very limited number of private sector individuals and/or companies in Haiti, let alone in Jacmel and Cap Haitien, who are willing to put significant time, effort and risk capital at stake in order to bring a generation project to fruition. This is based on two factors: 1) a general lack of capital, except that which is concentrated in a few hands; and 2) a lack of clear guidelines as to the way in which a private sector project would be treated.

In addition, there is a lack of expertise regarding project development and the power business in general. While there are many capable entrepreneurs in Haiti, the power business is fairly specialized and requires some technical background as well as financial expertise. This constraint is less problematic, as it can be easily solved through training. More importantly, once the rules are clear and mechanisms are put in place, experienced foreign developers will get involved and will partner with Haitian business. As a result, the know-how will be transferred.

Finance. Commercial finance for private sector energy projects in Haiti is potentially a major constraint to project development. Project finance, which relies on the project itself to generate revenue and thus service the debt, is non-existent in the country. Project finance is the typical lending vehicle for most private electric power projects in the U.S. and other developed countries, and in many developing countries in Asia and Latin America. Alternatively, the debt raised for a project would become a direct liability of the project sponsor.

In general, bank debt in Haiti is very limited, in scope and scale. Based on central bank regulations, the lending requirement for all commercial banks in Haiti are characterized by the following:

- Banks are authorized to lend up to 30 percent of a company's net worth, for companies not associated with the bank;
- The maximum loan is 27 million gourds, or about $1.7 million;
- Syndication of loans is possible though rare;
- Interest rates are approximately 9 to 12 percent in dollars; 17 to 25 percent in gourds;
- Term loans have a maximum tenor of five years;
- Cash, mortgages, "comfort letters", and receivables from international institutions such as the World Bank may be used as collateral.

In essence, it appears that it would be very difficult to arrange commercial debt in Haiti for any generation project in Haiti. It would need to be very small and have a strong sponsor with a strong balance sheet behind it.

Sources of project equity may be available, though it is likely that these would be from the rich families of the country. It appears that there are not many cash-rich companies that are willing or able to part with significant equity to finance even a small power project, especially with no debt to leverage the equity. Probably the most likely sources of equity finance are groups of individual investors – such as those in Cap Haitien who formed SOGENOR – from Haiti and from the Haitian Diaspora, i.e., a fund of interested investors. This was actually started, with limited success, by APDESE in Jacmel.

Technical and Logistical Issues. Because of limited indigenous resources, such as coal, oil and natural gas, Haiti is dependent on imported liquid fuels and hydroelectric power. Currently, the price of oil is at a 12-year low, which makes this a relatively cheap fuel, but it is unclear how long this situation will last. Even in this situation, for petroleum fuels to be used for power generation on a sustainable basis in Jacmel and Cap Haitien, a delivery infrastructure *must* be developed. The currently delivery mechanism is tanker trucks which operate on a poorly developed road system. Of course, lack of fuel supply in Jacmel and Cap Haitien cannot be blamed entirely on poor roads: in many cases it is simply a diversion of fuel to Port-au-Prince instead of secondary cities (or theft by employees).

There are opportunities, at least in Cap Haitien – which is much farther from Port-au-Prince than Jacmel – to develop a fuel supply infrastructure that would make the city virtually independent from the capital. Cap Haitien has the luxury of a reasonably good port, with deep enough water to accommodate large ships. The port facilities are in need of improvement but are not disastrous. The World Bank is currently working on a port improvement loan that would take care of this. Apparently there was an adequate fuel storage facility in Cap Haitien at one time, but currently all the fuel is trucked infrequently and at high cost. Regardless of the outcome of the modernization process and/or private sector power generation in Cap Haitien, a fuel supply facility is needed. Because of the size of Jacmel and the demand for fuel, it may not be possible to have fuel delivered directly by ship, though this should be explored. Of course, this is dependent on port improvement, which is currently in the planning stages.

Other technical issues, such as interconnection with the grid – should that be allowed – or development of "inside-the-fence" distribution facilities should not pose great problems, provided that the technical expertise is available. In fact, there should be quite a few qualified technicians from EdH should the early retirement plans succeed.

5. Assessment of Project Implementation Requirements to be Resolved in USAID's Follow-on Energy Program

Leaving aside the issue of EdH jurisdiction, modernization, CMEP and the entire political process, there are still major obstacles to be cleared before private sector projects can be implemented in Jacmel and Cap Haitien.

First, the arena in which USAID may choose to become involved – namely electric power project development – requires enormous amounts of data. In addition, it requires detailed and intensive planning and highly trained personnel to complete the analysis and planning. In order

to get to a level where the most basic questions can be answered, a significant amount of fieldwork is required. This work will entail resources assessments, canvassing of local businesses, discussions with potential partners and investors, and even some rough physical surveys for site planning. This will require a full-time, knowledgeable professional. Preferably, this person would be Haitian, who knows the local people but with sufficient foreign training to understand most of the technical and financial issues involved. Ideally, two people would be involved so that both cities could be covered simultaneously.

Second, presuming that physical resources exist, USAID will need to assist in piecing together the partners and suppliers and customers for the projects. In the case of an IRC, it is unlikely that all the businesses will already be in place, together, on the same site. Therefore it will require some matchmaking and logistical support.

Third, the problem of finance needs to be overcome. This may require significant effort in reaching out to U.S. sources of capital. The most likely sources are the "private sector arms" of the development banks and Haitian-Americans. USAID needs to play a role in the promotion of projects to potential financiers.

6. Focal Points for USAID's Involvement and Expected Results

USAID's involvement in the development of private sector electricity projects in Jacmel and Cap Haitien should be such as to not overtly interfere with the current struggle to restructure EdH and find an operator for the system. Activities within the perimeter of EdH potentially could lead to protracted negotiations and frustration on the part of CMEP, IDB, USAID, and local interests, which is unproductive.

Development of activities outside the perimeter of EdH, on the other hand, may have some chance for success. The main concern of IDB and CMEP is that "cherry picking" does not occur in the period when the new operator is still getting established. In other words, the potentially most lucrative areas – where there may be a concentration of industry in Cap Haitien, for example, should remain untouched because the new operator will want to eventually service those customers. However, it is unlikely that the new EdH or operator will be able to extend the grid to those areas outside the current perimeter in the next four to six years. There is simply too much to do, and without a massive investment program (which is not likely), the unelectrified areas will likely go unserviced.

However, in both Jacmel and Cap Haitien there are several potential projects which can be developed very near the EdH grid but which lie outside. It is likely that such areas can be close enough to the cities that they will still have a major impact on the cities themselves, and would probably draw employment from the cities.

The focal point for USAID should be on early stage support for projects that can supply enough electricity for at least one and up to several commercial ventures. These ventures could be manufacturing or agricultural processing, ideally with export potential. The best opportunities will come where facilities and operations exist, in order to minimize the unknown issues.

Namely, USAID should not focus on creating *demand* but rather on creating *supply*. There is sufficient demand already that is not met. Nevertheless, the lines can be blurred: if new power supplies are created, new facilities will try to locate there in order to benefit. So it is very likely that the projects will attract, if not create the demand.

Some of the projects described above could be potential candidates for early stage support. These projects are in various stages of development. For instance, there is a desire to build energy production capacity at Distillerie LaRue though no detailed work has been done. The EPALI Centers, on the other hand, have had some effort put into them, though there is nothing on the ground, unlike at LaRue. There is a major advantage to having existing infrastructure and operations. The two hydro projects have some analysis done, but it is mostly anecdotal and needs verification. Again, these projects have no existing facilities at or near the sites, and in fact it may be considerably more complex to create a group of facilities based around a hydro plant, simply because of the location. Moreover, these facilities will take much longer to prepare, engineer and construct than a small biomass cogeneration or diesel facility.

When considering diesel, it has the benefit of being the cheapest in terms of capital cost, the fastest to develop and install, and the simplest to configure. However, the problem of fuel supply cannot be dismissed, even though the private sector seems to be able to buy adequate supplies of diesel, though at a high cost. This is the second problem. While the capital cost is low, the operating cost over the life of the project is not necessarily attractive. In the earlier comparison of generation costs cogeneration using biomass appears to have an advantage. In addition, it is somewhat more complex to capture the waste heat from diesel engines of this size, therefore reducing the overall efficiency compared to cogeneration. Diesel generators run at about 28 percent thermal efficiency while cogeneration (regardless of the fuel) can operate at thermal efficiencies as high as 85 percent.

Based on this analysis, it would seem foolish to focus on anything but cogeneration when it comes to energy supply. While there are advantages to other technologies, there appears to be a strong case for cogeneration, and also a strong case for basing the fuel source on biomass. Unfortunately, because of the scale of the agricultural processing industries in Jacmel and Cap Haitien, it seems unlikely that a project larger than one or two megawatts can be developed on biomass alone. A sugar mill the size of USN (2,500 tons cane per day) can easily generate 8 MW of power during the crushing season, using higher pressure boilers (40 bar) and efficient back-pressure steam turbines. However, there are no mills left in Haiti, although there is still a large amount of cane grown. The problem is aggregating the cane.

By combining several agri-process industries into an Integrated Resource Center/Company it may be possible to aggregate different biomass fuels, and thus overcome the problem of small size. While there are technical issues (namely, boiler design) which need attention because of the varying chemical compositions of different biomass fuels, these are not overwhelming. In addition, it is possible and probably desirable to include provisions for supplemental fossil fuel (bunker).

If one decides that a reasonable prospect is to assist in the development of an IRC in Jacmel and Cap Haitien, then one must examine several issues to go further along the path. The principal issues requiring focus are:

- Location in relation to the EdH perimeter;
- Optimal "anchor tenant" – distillery, coffee processor?
- Likely fuel mix and thermal/electrical loads;
- Possibility for exporting products;
- Possibility for exporting some excess electricity for villages, schools or hospitals.

Expected Results. Given the current political and economic environment, USAID should set its expectations relatively low. Even in rapidly growing economies with decent infrastructure, without clear rules defining the process for increasing electricity supply it is very difficult to successfully develop and finance power projects. Numerous complex issues require solving: optimal design of the plant, including load matching; fuel and water supply; contracts for fuel and power sales; permits for fuel, construction, environmental, and equipment; interconnection requirements; backup power; local opposition; operation and maintenance; financial structuring. For these reasons alone, it is recommended that USAID focus on relatively simple projects that do not have high profiles. And also for these reasons, it is important that USAID *understand the risks involved and be prepared to walk away from the project or projects, after preliminary feasibility studies indicate that they are not successful.* It should be noted however that only such feasibility studies could provide answers. The nature of the business is that it is fairly risky, and most projects do not succeed. In Haiti, the risk of failure is higher, but one could argue that the benefits or rewards are sufficient to justify the risk. Therefore, in order to proceed it is necessary to initiate preliminary feasibility studies for those projects that potentially can help solve the current electricity crisis.

And, if done properly, it is highly unlikely that USAID would walk away empty handed from the process. Because so little has been done in this arena – one could argue that nothing has been done by the private sector since EdH took control of the power sector --even going through the process of planning and analysis will have great benefit to those involved, including USAID. On a very concrete level, USAID should expect the following:

Stage 1: Year 1: Significant USAID Involvement

- Identification of a project sponsor and securing of a letter of intent to proceed;
- Development and completion of a project plan, including potential suppliers of power and potential consumers;
- Completion of a conceptual design for a power supply project;
- Completion of a detailed resource assessment (fuel supply);
- Completion of a first stage feasibility assessment;
- Development of a preliminary financing plan and identification of potential financial partners.

Stage 2: Year 2: Limited USAID Involvement

Assuming the feasibility assessment shows viability, USAID should expect the following:

- Partnership between local sponsor and foreign partners;
- Signing of agreements for energy supply to IRC participants;
- Signing of agreements with others, such as schools or villages who will benefit from excess power;
- Acquisition of permits from relevant authorities;
- Letters of intent from financial backers;
- Financial closing.

Stage 3: Years 2 & 3: Minimal USAID Involvement

- Construction and beginning of operations.

7. Program Performance Measures for a USAID's Energy Program

USAID should examine the following issues and milestones in order to measure the success or performance of energy project development activities:

- Completed assessment of demand in Jacmel and Cap Haitien, including survey of commercial and industrial facilities,
- Local project sponsors identified,
- Projects and sites identified,
- Letters of intent formulated with sponsors,
- Resource assessments completed,
- Feasibility studies completed,
- Project financial plans complete,
- Construction bid package complete,
- Permits obtained,
- Financial closing,
- Construction and operation.

Many of these items will be out of USAID's hands and the responsibility of the local and U.S. partners who are developing the project(s). However, USAID's early stage financial and institutional assistance should have helped push the projects forward and therefore the ultimate success should be at least partly attributed to this assistance. Therefore some tracking of the development is necessary.

PART B. PRIVATE POWER PROJECT IMPLEMENTATION IN JACMEL AND/OR CAP HAITIEN

1. Electric Power Consumption Element

Electric power consumption in both Jacmel and Cap Haitien is currently limited to supply, which is wholly inadequate due to reasons stated in Part A. To obtain a better grasp on the potential demand for power and to make reasonable load growth forecasts, the USAID Energy Program needs to address the following tasks:

1. Obtain accurate population estimates for Jacmel and Cap Haitien;
2. Complete detailed survey of industrial facilities in each city, estimating final output and describing process;
3. Complete same for commercial facilities, including hotels;
4. Complete steps 2 and 3 for existing facilities lying within a 25 kilometer radius of each city;
5. Obtain EdH and city hall records and estimates of potential demand (including Cap Haitien mayor's office survey of households);
6. Obtain estimate of number of substations and feeders in each city.

These data can be used to prepare short-term load forecasts. USAID should plan to work in collaboration with Hydro Quebec in Jacmel, which plans to prepare generation planning. It is likely that some load forecasting will be done by HQI in their two-year project. This data would be sufficient for USAID's planning purposes and would save considerable time and expense. Much of the survey work can be performed by local firms and individuals familiar with the cities and with this type of work.

In addition, USAID should be prepared to formulate more detailed assessments of population and economic growth in each city.

The outputs of the analysis should be the following:

- Estimate of current population and economic activity
- 5- and 10-year growth estimates for population and economic activity
- Trends in economic growth (e.g., tourism, light industry, etc.)
- Current estimated energy consumption
- Estimated pent-up demand (i.e., load which would exist right now if capacity and connections were available)
- Growth in demand assuming 100 percent connection

2. Project Definition/Formulation Element

The first step USAID should take in preparing project definitions is to accurately define the EdH perimeter. This will entail close coordination with CMEP and EdH, as well as HQI in Jacmel. It is crucial that this mapping exercise be completed early so that USAID knows where it can work with partners to develop projects, rather than trying several possibilities and then learning that these are unacceptable because of interference or lack of cooperation from EdH or the GOH. Ideally, USAID should prepare or obtain detailed maps showing the boundaries of EdH penetration, and obtain approval from CMEP for preparing projects outside these boundaries.

Using surveys of industrial and commercial facilities from the above tasks and combining these with the maps, USAID can begin to formulate project concepts. This will include site definitions, and should consider location of roads, port facilities, distance from substations, and most importantly, location of industrial and commercial facilities.

Once site ideas are formulated, with rough ideas of potential hosts for cogeneration or other projects, discussions should begin with the facility owners or managers to solicit interest in developing projects.

In addition, some very preliminary resource assessment should be performed in order to confirm the basic concepts presented in this document: for instance, general availability of sugar can in the Cap Haitien region, coffee in Jacmel, etc.

USAID may have to play a very active role in developing the partnerships that ultimately will create the basis for the IRCs or other projects. There may be cases where all the necessary elements – primary host/sponsor plus secondary hosts and customers – are already in close proximity and working synergistically. However, this is highly unlikely. It is more probable that these elements will need to be pieced together, and USAID will need to act as a catalyst for this process, though the primary sponsor should take the lead. USAID might be able to assist in this process by sponsoring public meetings or conferences to bring interested parties together.

3. Commercial Arrangement between USAID and Partners/Sponsors

It is suggested that USAID provide the bulk of the financial assistance in project development through a cost-sharing grant mechanism to project sponsors. Other activities, such as sponsoring conferences, USAID-directed fieldwork, surveys etc., will not require any special relationship. The cost-sharing mechanism will require some understanding of the sponsors' financial situation (their ability to carry through on the projects, for instance). However, this should not require any unusual agreements between USAID and the sponsor, as cost sharing has been done before in other countries by USAID.

4. Feasibility Study Element

USAID will be most effective in promoting private sector power projects if it provides mostly financial support to capable and willing project sponsors, rather than attempting to prepare studies and analyses itself or through foreign consultants. It is the early stage risk that is most daunting to developers, especially in environments such as that existing in Haiti now. Some assistance from USAID will go a long way in promoting the confidence necessary to take the even bigger risks that will occur later.

However, because of the lack of development experience among the Haitian business community, and the likelihood that experienced U.S. developers will take some time to become involved or interested in such small projects, some guidance will be required from USAID or its contractors. Also, it is not recommended that project sponsors with no power project development experience perform all the work themselves, as feasibility studies require a certain level of organization and detail which may not yet be available. Rather, it should be possible for the sponsors to hire, using matching funds from USAID, engineering firms which are capable of performing much of the work involved. Having some involvement from the sponsors is important; nevertheless, sponsors should not view financial assistance as a means to simply be paid to perform a study, with little intention of following through on the project itself.

A fairly generic feasibility study outline is presented here to provide an idea of the level of detail required, and some of the elements are described in more detail following. The sample project is a biomass-based cogeneration project serving several customers, and the factory is assumed to be the sponsor as well. In addition, it is assumed that by this point USAID has made initial assessments of sites and availability of biomass resources (though not detailed – this will be done in the feasibility study).

Feasibility Study Outline.

1) Review Existing Operating Data of Factory
2) Plant Review
   a) Process
   b) Equipment
   c) Economics
   d) Fuel & Water Supply
3) Prepare Energy Balance Information
4) Mass & Energy Balances
   a) Review Plant Information
   b) Prepare Plant Walk-through Questions
   c) Plant Walk-through
   d) Preliminary Balances
   e) Review with Plant Staff
5) Demand Analysis – Other Facilities in Park

6) Conceptual Design
   a) Resource Assessments
      i) Fuels: biomass quantities and compositions; supplemental fuels
      ii) Water
   b) Preliminary Cogeneration Design
   c) Interconnection (inside IRC) Issues Outlined
   d) Initial Cost Estimates
      i) Cogeneration and Distribution
      ii) Process Changes if Any
      iii) Fuel-related Costs
   e) Build Financial Model
   f) Prepare Interim report
7) Interim Review with Factory/Sponsors
   a) Design
   b) Fuel Supply – Availability and Logistics
   c) Confirm Water Supply
   d) Financial Review
8) Make Go/No-Go Decision
9) Finance Meetings
   a) Prepare Project Briefing
   b) Local Banks/IFC/IIC
10) Review Permitting Requirements
   a) Critical Path Analysis
11) Revise Cogeneration Design
12) Revise Process Changes
13) Revise Cost Estimates
   a) Cogeneration
   b) Process
   c) Fuel
14) Finalize Cogeneration Design, Fuel Supply and Customer Demand
15) Financial Model
16) Financial Structure Prepared
17) Prepare Agreements with Customers/Suppliers
   a. Financing Plan and Schedule
18) Prepare Permitting Schedule
19) Report & Presentation
20) Meet with Potential Equity Investors/Donors/Lenders
21) Prepare final study document to submit to financial partners

Natural Resource/Fuel Verification. This part of the feasibility assessment is perhaps the most important because it is the least known element. In addition, because of the potential for using a wide variety of fuels coming from different places by different means, the natural resource element will also have a major impact on the design and cost of the cogeneration system.

Because the availability of supply will likely be dependent somewhat on local partners/customers, it is important to engage them at the beginning. For example, in a

hypothetical IRC, the main host/sponsor is the sugar cane processor. This will be the primary host for the cogeneration facility. In addition, a mango processor/exporter will be located on the premises, and will use steam and electricity. A third facility could be a coffee processor/exporter, and a fourth may be a small assembly plant. Each of these four facilities will use power (and possibly steam). In addition, some may provide fuel. In this example, the main supplier of fuel will be the sugar cane processor (in fact, the sponsor of the power facility should be someone who can supply the majority of the fuel and electrical/thermal load as well). The coffee processor will also be a supplier, while it is unclear how much biomass waste will be available from the mango processor. It is likely that the assembly plant will have no waste for fuel.

If these sources of fuels appear to be sufficient to meet the cogeneration requirements (which will be based on the loads of the tenants), then the next step is to verify the raw material supplies to the processors. In other words, does the sugar cane processor have a steady, reliable supply of cane? How might this supply be interrupted or curtailed? Is there a likelihood of major price fluctuation that will affect the operations of the processor, and thus the supply of bagasse? The same questions need to be asked for each processor, in order to determine long-term reliability of supply and price for the resource.

It is possible that additional – or perhaps even the majority of -- biomass fuel could be procured directly from farms, as is proposed in the EPALI Center Business Plan. In this case, the cogeneration plant would be responsible for procurement of the feedstock, such as cane trash, or vetiver grass. Verification of these resources and supply chains will require more intensive field surveys, including on site discussions with farmers. In fact, some level of this should be done even if all of the supply is coming directly from IRC participants.

The example used here is a biomass project, which has very specialized resource assessments associated with it. The same will be true for other technologies, such as hydropower. There may be existing hydrological assessments performed by EdH, which should be obtained in order to determine the initial viability of the projects. This is something USAID could do prior to embarking on any detailed project feasibility assessments. Assuming that detailed data were available, then USAID could make an initial assessment and based on the results, embark on a more exhaustive project development effort. Of course, the same would be true for biomass, though it is our belief that no detailed data exist. This is not known for the case of hydropower.

Conceptual Design and Project Cost Estimates. The conceptual design phase begins after selection of a candidate site. Ideally, at this point USAID will have identified sponsor/partners to develop projects, and will have initial business plans in hand. In order to promote these projects, USAID should consider matching grants to project sponsors, who will use the funds to pay for engineers and other consultants. The end product should be a document that will provide a preliminary assessment of the project's viability, allowing the sponsor to make a decision to go forward or stop. If the decision is to proceed, a more detailed feasibility analysis will begin; at which point further USAID financial assistance will begin. However, USAID should maintain the ability to decline to fund any further parts of the study should it feel the project is not viable or other problems have arisen.

Project Finance and Partnership Search. Assuming a decision to proceed has been made, the project sponsor should begin searching for financial partners (equity) and lenders. This may require separate assistance from USAID or could be included as part of the feasibility study grant. In particular, this phase of the process will require some travel, especially since there is not much probability of securing project debt from Haitian sources. Institutions considered most likely to provide finance include the International Finance Corporation and the Inter-American Investment Corporation (part of the IDB); both based in Washington, DC.

A separate, more broadly based program element that USAID could consider would be to assist local business people in mobilizing Haitian diaspora money. This has been started on a very modest level by APDESE in Jacmel. This program element would entail the following actions:

- Identification and qualification of U.S.-based Haitian interest groups and individuals;
- Preparation of a document describing several potential projects (in early stage form) and an outline of a financial plan for funding these projects;
- Sponsorship of a conference in Haiti, preferably in Cap Haitien, bringing qualified Haitian-Americans to Haiti, together with potential sponsors;
- Preparation of a fund document, based on interest generated at the conference.

Such a fund would go a long way toward solving the problem of availability of finance in Haiti.

Detailed Project Planning and Design. Presuming the previous steps are successful and a "go" decision has been mutually made, USAID could provide matching funds for the completion of the feasibility and planning stage. The objective of this stage is to verify and vet all project details, and to come up with a financing plan. The end result of this phase is a bankable document that can be taken to investors.

5. Project Financing, Procurement and Construction Element

If the project is successfully financed, based on the sponsor's involvement and the results of the feasibility study, USAID's role in the project should be complete. It would not fund any more project elements, and would move on to monitoring and evaluation of the project's construction and performance.

6. Assessment, Monitoring and Evaluation Element

USAID should plan to have an ongoing review process with the project sponsors it has provided assistance to, keeping in mind that too much review and monitoring becomes an unnecessary burden on the development process (likewise, it should make the application process as easy as possible).

The main issues of concern to USAID during the process should be:

- Rapid definition of EdH boundaries and field surveys of Jacmel and Cap Haitien businesses and economic assessment;

- Identification of four to five potential projects/sponsors;
- Projects should be a minimum of 1 MW in potential generating capacity;
- Letters of commitment from sponsors, with financial statements;
- Completion of a simple financial assistance application to be distributed;
- Project feasibility study scopes of work should be submitted and reviewed by USAID staff or consultants;
- Qualification of proposed engineers/consultants for feasibility assessments.

As the development process proceeds, USAID should hold monthly meetings, in the spirit of partnership, with the project sponsors in order to assess progress. Having local USAID personnel would facilitate this monitoring process tremendously.

USAID should also be involved in the decision to proceed once the first phase of the assessment is complete. While it should not dictate the decision, it can have an influence and make its own decision about follow-on funding. In other words, USAID should go into the process planning to fund the full feasibility assessment but in two tranches.

Finally, USAID should require quarterly updates on progress once the second-phase feasibility study is fully underway. Quarterly updates should also be provided once financing has been achieved and construction is underway.

6. SLIDES

IMPROVE SUSTAINABLE ENERGY SERVICES TO CAP HAITIEN AND JACMEL

Debriefing, March 30, 1999

Bechtel National, Inc.

- **Study Objectives**
- **A Very Brief Assessment**
- **Need for USAID Intervention**
- **Key Guidelines Governing Intervention**
- **Alternative Strategies**
- **Recommended Strategy**
- **Continued Program Development**

STUDY OBJECTIVES

- **Help Improve Investment Climate IN Cap Haitien and Jacmel through Production and Distribution of Reliable and Affordable Electricity**

- **Help Induce and Broker Private Sector Investments in the Power Sector of Cap Haitien and Jacmel**

- **Identify Appropriate Structure(s) for Brokering or Facilitating "Deals"**

- **Help rank the options available to USAID/Haiti toward achieving these Objectives**

ASSESSMENT

- **The essential premise of the Study Objectives Not Realistic at Present**
  - **There are no Private Sector Parties in Cap Haitien and Jacmel, capable of entering the sector**
  - **The CMEP/EdH "Privatization" Process overshadows everything**
- **Implementation of ANY CMEP solution HIGHLY uncertain due to 3 interrelated factors:**
  - **Political Instability**
  - **Economic Stagnation**
  - **Power System Development itself**
    - **EdH**
      - **All Donor Investments not sustainable ($100,000,000 after 1994!)**

- **EdH technically bankrupt, artificially kept alive by the GOH**
- **EdH has no working capital left, cannibalization of equipment, no funds for fuel**
- **Current effective capacity throughout Haiti has dropped, as of late, to 50 MW, out of about 150 MW installed capacity.**

  (NOTE: Even under better circumstances, in 1996, Haiti's use of electricity per capita ranked number 129 out of 131 nations, before Nepal and Ethiopia)
- **Continued system deterioration, EdH not salvageable, no hope for improvement, Port-au-Prince near total collapse, Cap Haitien virtually dead, Jacmel kept alive by CIDA**

♦ **<u>CMEP Process Itself</u>**

- **Latest version: " put EdH up for sale",**

+ Input from Investment Bankers, financed by the IDB, to advice CMEP on whether and how EdH can be sold

+ Finalize Electricity Law, etc.

+ Planned completion: End of 1999

- **Commercial Risk, Possibly No bidder**
- **IDB has suspended loan support of $40 million as previously planned, will continue TA support to prepare the sale**
- **<u>Thus</u> : IDB WILL NOT PROVIDE A PUBLIC SECTOR LOAN TO AID IN EdH'S PRIVATIZATION PROCESS**
- **Possibly no new "electricity" law**
- **The "disconnection code" may not be enacted, already lingering in Parliament since August of 1991**

CONCLUSION: Given the present situation the chance that the electricity crisis will be resolved any time soon is extremely small. Furthermore the chance for improvement in Cap Haitien is even smaller, with a slightly better chance in Jacmel because of CIDA.

But, without safe, reliable, cheap and abundant electricity there cannot be economic development. Thus: No tourism, No Industry, No agribusiness, or any related activity. This applies to all secondary cities, not only Cap Haitien and Jacmel

Current focus in power system privatization WRONG. Saving a very small, very sick, national utility is wasting "energy". Instead, one should build an effective and efficient power system for Haiti.

NOTE: With a median level of electric intensity of 1827 KWh/capita and a reasonable annual capacity factor of 40% Haiti

would require an installed capacity of 3,828 MW, compared to current installed capacity of about 150 MW, or 25 times what is installed at present.

NEED FOR USAID INTERVENTION

- **Current Crisis is so overpowering, USAID has no choice but to become involved in the electricity sector of Cap Haitien and Jacmel in order to**
  - **Protect Past and Present Investments (hillside programs, artisan development programs, etc.)**
  - **Create conditions necessary for economic growth envisioned under Secondary Cities Program**

- **USAID must find ways to facilitate emergence of private sector initiatives in Cap Haitien and Jacmel**

- **USAID should be the catalyst for private entrepreneurs to build an adequate electric infrastructure in Cap Haitien and Jacmel, in parallel with, and in support of, WHATEVER CMEP may come up with**

THE CHALLENGE FOR USAID

- **While recognizing fundamental uncertainties in**
  - **political developments**
  - **economic developments**
  - **current power system developments**

Develop a strategy for engagement that will address and resolve key issues, left largely unattended thus far,

- **define the EdH service area (perimeter!) and use multiple operators to build the electric infrastructure, <u>both inside and outside the EdH perimeter</u>**
- **rural electrification an integral part of Haiti's electric system (85 % rural, including Cap Haitien and Jacmel)**
- **insufficient public participation and information**
- **animosity between Haitian Private Sector and GOH**

- **No Private Sector Technical and Financial Capability to improve current conditions in an organized fashion**

KEY GUIDELINES GOVERNING INTERVENTION

- **Observe the CMEP process closely, let it run its course, do not interfere, ("Turn away from Port-au-Prince")**
- **Secure approval and consent from the GOH and CMEP for private parties in Cap Haitien and Jacmel to participate in power system development**
- **<u>DO NOT</u> use USAID investments to merely build power systems in Cap Haitien and Jacmel, or to assist EdH**
- **Rather, build in Cap Haitien and Jacmel local private capability to systematically and methodically**

  ♦ Develop Electric Sector Enterprises (private full service companies, rural coops or Integrated Resource Companies)

- ♦ **Plan, Develop, and Execute Power Projects of such Enterprises**

- **USAID Investments to leverage other funding (e.g. IDB)**

CONTINUED PROGRAM DEVELOPMENT

- **Establish and Meet Basic Requirements for Local Electric Enterprises (Private Companies, Rural COOPs, IRCs):**
  - **Assist in Building Regulatory Framework**
  - **Develop Professional and Technical Capability**
  - **Develop Financial Capability**
  - **Develop Profitable Business Opportunities/Projects**
  - **In case of US Private Sector Participation, mitigate risks**

- **Work with Chamber of Commerce, Industry and Professions (CCIPN) in Cap Haitien and APDESE in Jacmel, as the RECEPTACLE of USAID assistance. (See Chapter 4 of Report)**

  <u>They must</u>
  - **Establish full time dedicated "taskforce", i.e. "working personnel**
  - **Conduct Public Participation**

- **Maintain dialogue with the GOH and CMEP**
- **Develop specific BUSINESS PLANS**
- **Search for Participation by Individual Businesses Haitian and possibly US), and or Individual Citizens**

♦ **Assist the CCIPN and APDESE Taskforces with the identification, analysis, planning, development and implementation of SPECIFIC PROJECTS, i.e., the "heart and soul" of their respective business plans, (See Chapter 5 of Report), such as**

- **Proposal made by Plateforme Ecologique for "Ecological Power and Light Industry Centers (EPALI), an Integrated Resource Company Example**
- **Bassin Blue, Hydro opportunity near Jacmel**
- **Petit L'étang, Hydro opportunity near Jacmel**
- **IRC focused on Coffee & Agribusiness near Jacmel**
- **Distillerie LaRue in the Cap Haitien Area (Cogen.)**
- **IRC focused Agribusiness in Cap Haitien area**
- **Etc., Etc.**