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PHILIPPINES ENERGY TRADE

MISSIONS REVIEW

Final Report

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ABBREVIATIONS USED

ADB	Asian Development Bank
A.I.D.	Agency for International Development (U.S.)
AmCham	American Chamber of Commerce/Philippines
BOI	Board of Investments (GOP)
ASEAN	Association of Southeast Asian Nations
BOT	Build-Operate-Transfer
CETA	A.I.D. Office of Energy Conventional Energy Technical Assistance Project
CORECT	Committee on Renewable Energy Commerce and Trade
CREE	Council on Renewable Energy Education (U.S.)
DOC	United States Department of Commerce
DOC/FCS	Foreign Commercial Service of U.S. Department of Commerce
DOE	United States Department of Energy
DTI	Department of Trade and Industry (GOP)
EDC	Engineering and Development Corporation
EDF	Economic Development Foundation, Inc., Philippines
ERB	Energy Regulatory Board (GOP)
ERI	Energy Resources International
FREC	Federation of Rural Electric Cooperatives of the Philippines
GOP	Government of the Philippines
ITA	United States Department of Commerce International Trade Administration
MAI	Multilateral Assistance Initiative
MERALCO	Manila Electric Company
NPC	National Power Corporation (GOP)
NEA	National Electrification Administration (GOP)
NEDA	National Economic and Development Authority (GOP)
NFA	National Food Authority (GOP)
NHA	National Hydropower Association
OEA	Office of Energy Affairs (GOP)
OPIC	Overseas Private Investment Corporation (U.S.)
PASAGA	Philippine Atmospheric, Geophysical and Astronomical Services Administration (GOP)
PAP	Philippine Assistance Program
PAPS	Philippines Assistance Program Support Project, USAID

PCCI	Philippine Chamber of Commerce and Industry
PGI	Philippines Geothermal, Inc.
PIF	Private Sector Pre-Investment Facility of PAP
PNOC	Philippine National Oil Company (GOP)
PURPA	Public Utilities Regulatory Policies Act
RESAPIE	Renewable Energy Southeast Asia Project Identification Effort
SGV	Sycip, Gorres, Velayo & Co.
S&T/EY	Office of Energy/Bureau for Science and Technology
TDP	Trade and Development Program (U.S.)
US EXIM	United States Export-Import Bank
USAID/Manila	United States Agency for International Development Manila Mission
US/ECRE	United States Export Council for Renewable Energy
USGIC	United States Geothermal Industries Corporation
WB	World Bank

Section 1

OVERVIEW

1.1 Background

Over the period from January 1989 to December 1990, seven U.S.-to-the-Philippines trade related missions were undertaken. All of these missions were at least partially sponsored by A.I.D., the Department of Commerce (DOC), or the Department of Energy (DOE). The objectives and scopes of the seven missions varied widely and half involved other countries in addition to the Philippines. A common feature, however, was energy. The missions were either devoted entirely to energy trade or included a significant energy trade component.

Collectively, the seven missions have: identified key Government of the Philippines (GOP) and private sector "players" in future expansion of the Philippines power sector; defined legal and GOP policy changes required to attract substantial amounts of private foreign investment to this sector; and, developed trade intelligence. Trade contacts and intelligence resulting from the seven missions have, to varying degrees, been documented in reports and trade mission related seminars. The seven missions have also provided valuable, relevant lessons about how to conduct business in the Philippines.

Findings from the seven trade missions, GOP's stated policy of attracting private foreign energy investment, and the advent of the Philippines Multilateral Assistance Initiative (MAI) have resulted in plans for additional promotion of U.S. energy business in the Philippines. In order to make future trade missions as effective as practical and avoid duplication with the completed missions, the A.I.D. Office of Energy has undertaken this review of these seven missions. The emphasis of this review is on determining from these trade missions what has been learned about improving energy trade and future trade mission planning and performance.

1.2 Review Objectives

The following four objectives were established for the review:

- Consolidate and summarize information beneficial to planning future trade activities
- Identify trade mission characteristics leading to successful projects
- Identify impediments to U.S. energy trade with the Philippines
- Recommend concepts for planning future trade missions

1.3 Trade Missions Identification

Table 1 identifies chronologically the seven 1989 and 1990 missions reviewed. It also presents their timing and general scopes. In all seven missions, energy activities were focused on identifying trade issues and opportunities associated with electric power generation. As a result, the term power is widely used in this review.

The seven missions have been categorized into three types of missions: 1) trade related missions, 2) sector(s) focused missions, and 3) technology/projects focused missions. Mission 1 and 4 in Table 1 are classified as trade related missions because of their wide scope. Mission 2 and 6 are classified as sector focused. And, Mission 3, 5, and 7 focused on specific technology or types of projects.

1.3.1 Trade Related Missions (1 and 4). Mission 1, the A.I.D. Administrator's Energy Industry Review Group Philippines Mission, was part of a larger effort to review the "development-constraining impacts" of energy shortages in developing countries and advise on how A.I.D. and the U.S. energy industry could cooperate to mitigate this situation. The overall mission was performed by ten major U.S. energy companies. Executives from four of these companies evaluated the Philippines energy situation as one of three sample countries on which to base conclusions and recommendations on energy shortages in all developing countries. Because of its overall objectives, the Energy Industry Review Group, in its Philippines evaluation, concentrated on meetings with key lawmakers, GOP officials, U.S. officials knowledgeable on the Philippines energy situation, the Asian Development Bank (ADB), and private sector chambers of commerce. Even with this focus, the Group found that U.S. energy firms have difficulty in competing against foreign firms because of: lack of U.S. Government concessionary financing, inferior business intelligence, and failure to secure key power positions at ADB and the World Bank.

Mission 4, the U.S. MAI Reconnaissance Trade Mission, was charged with assessment of U.S. business opportunities within the MAI in the energy, transportation, telecommunications, agribusiness, environment, and finance sectors. It concentrated on meetings with key Philippines lawmakers, GOP officials, U.S. Government officials, and Philippines private sector representatives. Major outcomes of the mission were a series of recommendations to the GOP on legislative and policy changes required to attract substantial U.S. private sector financed and operated infrastructure projects and identification of selected key projects and project areas for U.S. industry consideration.

Table 1

<u>TRADE MISSIONS IDENTIFICATION</u>			
<u>MISSION TITLE</u>	<u>DATE IN PHILIPPINES</u>	<u>MAIN SPONSORS</u>	<u>MISSION SCOPE</u>
1. A.I.D. Administrator's Energy Industry Review Group Philippines Mission	January 1989	1. A.I.D.	<ol style="list-style-type: none"> 1. Quantify developing countries power shortage issues 2. Advise Administrator on A.I.D.'s role from U.S. energy industry perspective 3. Multicountry mission
2. U.S. Electric Energy Trade and Investment Mission to ASEAN	October 1989	<ol style="list-style-type: none"> 1. A.I.D. 2. DOC 3. U.S.-ASEAN Council 	<ol style="list-style-type: none"> 1. Directed at power hardware/services 2. One-on-one business meetings 3. Multicountry mission
3. National Hydropower Association Pacific Rim Mission	February 1990	1. DOE	<ol style="list-style-type: none"> 1. Focused on hydropower projects 2. One-on-one business meetings
4. U.S. Multilateral Assistance Initiative (MAI) Reconnaissance Trade Mission	March 1990	<ol style="list-style-type: none"> 1. U.S.-Philippine Business Committee 2. A.I.D. 	<ol style="list-style-type: none"> 1. MAI related trade opportunities survey 2. Development of GOP privatization recommendations 3. Addressed six economic sectors
5. United States Geothermal Industries Corp. Philippines Geothermal Private Power Investment Trade Mission	August 1990	1. A.I.D.	<ol style="list-style-type: none"> 1. Focused on small-medium geothermal projects 2. One-on-one business meetings
6. Renewable Energy Southeast Asia Project Identification Mission	June 1990 September 1990	1. DOC	<ol style="list-style-type: none"> 1. Identification of renewable energy projects 2. Two of three parts completed 3. Multicountry mission
7. Geothermal Prefeasibility Study Mission	December 1990	1. A.I.D.	<ol style="list-style-type: none"> 1. Technology specific focused mission 2. Retrofit and new geothermal projects 3. One-on-one business meetings

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This mission also stressed need for greater cooperation/coordination between U.S. Government and industry for U.S. business to be successful under the MAI. Only the portions of this mission covering energy and finance were considered in this review.

1.3.2 Sector Focused Missions (2 and 6). Mission 2, the U.S. Electric Energy Trade and Investment Mission, paved the way for the three technology/project focused missions by establishing the "right contacts" required for these missions. This U.S.-ASEAN Council organized power sector mission featured: 1) six pre-mission U.S. seminars on private power and energy conservation; 2) a Philippines seminar to inform GOP officials and Philippines private firms of the mission's participating firms capabilities and exchange information; 3) one-on-one meetings between mission participants and carefully selected GOP officials, parastatal corporations, and private industry (the most important mission component); and, 4) a mission follow-up seminar. This mission succeeded in making the right contacts from a business standpoint. Several projects and equipment sales resulted and the three technology/project focused trade missions built-on contacts initiated under Mission 2.

Main objectives of Mission 6, Renewable Energy Southeast Asia Project Identification Mission, were identification of renewable energy (biomass, hydropower, geothermal, photovoltaic, solar thermal, and wind energy) projects in the Philippines and Indonesia. This mission consists of three parts, the first two of which have been completed: 1) an "advanced team" that identified private and public sector agencies and individuals interested in participating in projects; 2) an industry specialist team that developed project profiles; and 3) a conference and trade show to bring together U.S. firms and Government with Southeast Asian decision-makers and investors in renewable energy (scheduled for late-1991). Only the first two parts of this mission were considered in this review. These activities resulted in preparation of 22 Philippines renewable energy opportunity profiles.

1.3.3 Technology/Project Focused Missions (3, 5, and 7). The three technology/project focused missions were the:

- National Hydropower Association Pacific Rim Mission - identification and positioning for hydropower projects and equipment and services sales. The main Mission targets were the National Power Corporation (NPC) and the National Electrification Administration (NEA).
- United States Geothermal Industries Corporation (USGIC) Philippines Geothermal Private Power Investment Trade Mission - specific private geothermal projects

- **Geothermal Prefeasibility Study Mission - application of proprietary Biphase turbine technology to both existing and new geothermal power plants**

1.4 Review Approach

The amount of documentation associated with the seven trade missions is substantial. To avoid unduly extending this documentation, this review has used a tabular approach to summarize main trade missions features and results. In addition to organizational and sponsorship information, the summary tables have been structured to allow direct comparison in the following areas: objectives, approach, organizations contacted, accomplishments, key issues identified/discussed, lessons learned, and recommendations.

Section 2

CONCLUSIONS AND RECOMMENDATIONS

2.1 Introduction

The seven energy trade missions resulted in numerous conclusions related to Philippines energy trade conditions and opportunities and recommendations to both the GOP and the U.S. Government on actions that could enhance energy trade. Major conclusions and recommendations are summarized in this section. These conclusions and recommendations are, with one exception, based on missions printed documentation. The exception is an interview with the National Hydropower Association Executive Director concerning the NHA Pacific Rim Mission.

2.2 Major Conclusions

The following are major conclusions resulting from the seven trade missions:

2.2.1 Current U.S. Position In Philippines Power Market. An overall conclusion from the seven trade missions is that the U.S. power industry is not currently a key player in the Philippines power market. Since the beginning of the Aquino Administration (1986), U.S. firms have not won any major new power projects. Prior to this period, U.S. firms managed to capture major power plant contracts, such as the now closed Bataan nuclear power plant, and were leaders in geothermal power development. In recent years, however, U.S. firms have lost major Philippines power projects and equipment sales to foreign competitors, particularly the Japanese and Europeans. This decline is not attributed to inferior U.S. power technology, but rather to the access of the U.S. main competitors to concessionary bilateral aid programs, the competitors' superior business intelligence, and, the greater willingness of some competitors to make private investments to secure projects. Additional factors contributing to this decline are: U.S. firms general favoring of short-term, high-return projects compared with their competitors' strategy of longer-term foreign investment; the relatively recent emergence of large power equipment-construction consortia in Europe whose capabilities rival or exceed those of the major U.S. power firms; continued strengthening of the capabilities of Asian power consortia; and, decline of the U.S. power equipment-construction industry due to the lack of U.S. power plant orders in the 1980's.

Most trade missions participants believe that the emergence of private power, for both large and small power projects, could present new opportunities for U.S. firms. The multilateral banks (led by the World Bank) and the U.S. Government and other MAI contributors have been encouraging the GOP to create the conditions required for and to actively promote power sector foreign private investment through Build-Own-Transfer

(BOT) projects or similar private power plant financing-operating-ownership approaches. The GOP is responsive to this encouragement. The emergence of Philippines private power could be an advantage to U.S. firms because, compared with their main foreign competitors, they have more extensive private power experience due to the U.S. development of independent power as a result of PURPA.

U.S. power equipment-construction industry restructuring throughout the 1980's also has implications for realization of future Philippines power trade. Previously, major U.S. power firms captured major projects and thereby created sales opportunities for smaller U.S. firms that supply auxiliary equipment and services. If the major U.S. firms are not as competitive as previously, the second tier power firms must market directly to the Philippines to realize sales. For many of the traditional second tier firms, foreign sales and/or projects development are areas where they have only limited experience. These companies are increasingly requesting U.S. Government help in establishing marketing capabilities, obtaining accurate business intelligence, and reducing projects/sales financial risks.

2.2.2 Current Philippines Energy Situation. The following energy situation conclusions, most of which have been widely publicized, relate to the current state of the Philippines electric power sector and plans to meet projected future electricity demands:

- Philippines electricity shortages are severe (particularly in Luzon) and are impeding economic growth. Some industries are constrained from operating at demand capacities because of power shortages. Power shortages are also a constraint to attracting new business.
- Only 50% of the current population is supplied with electricity.
- Power demand growth rate is 8 % per year.
- Substantial new generating capacity will be required even with aggressive energy conservation and load management programs.
- NPC projects a doubling of installed electricity generating capacity between now and 2000. This corresponds to a growth in installed capacity from 6,500 MW (1988 capacity) up to 12,900 MW.
- NPC is planning to rely significantly on geothermal power to meet future power demand.
- NPC does not see environmental issues as a limitation to construction of coal-fired power plants for meeting its new capacity requirements.

- Indigenous energy resources development could significantly reduce fuel imports and associated hard currency expenditures. Primary indigenous energy resources are: geothermal, hydropower, coal, and renewables.

2.2.3 Potential U.S. Philippines Energy Trade Opportunities. The seven missions identified both general power opportunities and specific planned power projects that appear attractive for U.S. firms. The general power opportunities ranked the highest are:

- Geothermal projects that produce either electricity for sale to a Philippines power grid or steam for sale to NPC power plants. In the short-term, Luzon geothermal projects are attractive because of: Luzon's critical need for power (particularly in Metro Manila); the current inability to transmit power to Luzon from other islands (particularly from Leyte, a major geothermal resource); power grid availability; and, NPC's apparent willingness to enter into long-term contracts for Luzon power. In the longer-term, geothermal projects on other islands will become attractive. This requires the interconnection of individual Philippines power grids by high-voltage submarine power transmission cables.
- Small-to-medium hydropower projects, particularly on Mindanao and the Visayas islands group
- Coal-fired power plants based on both indigenous and imported coal, including indigenous coal mining projects
- Barge mounted power plants

Specific major power projects identified by one or more missions are (other potential projects have been identified by missions' participants, but are currently considered confidential):

- Geothermal: 1) Pinatubo, Cagua, Natib, Del Gallego, Bac-Man I and Bulusan on Luzon; 2) Tongonan (up to 440 MW) on Leyte; and, 3) Palinpinon II on Negros
- Hydropower: 1) Camotu Island; 2) 268 MW Casecnan Project; 3) 450 MW San Roque Project; 4) Chico River Project; and, 5) two 10 MW Mindanao Projects (Cagayan Power & Light)
- Coal: 1) 400 MW Isabela mine and power plant; 2) 600 MW Masinloc power plant; and, 3) 700 MW San Juan power plant

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- Oil: 1) 300 MW Bataan combined cycle power plant (this project is viewed by NPC as the most rapid way to obtain urgently needed generating capacity) and 2) 200 MW Mindanao barge mounted power plant

To fully realize the potential of Philippines power resources, NPC requires outside technical assistance, particularly in the commissioning and operation of base load power plants. OEA could also benefit from technical assistance, particularly in the development and assessment of geothermal power projects.

2.2.4 Government Of Philippines Legal And Political Energy Trade Impediments. All missions identified serious Philippines legal and political constraints to U.S. energy trade. However, trade constraints identification and recommendations on their removal was a major focus of the two trade related missions. Most major constraints identified were associated with private investment power projects development, rather than direct sales of equipment/services. Reasons for this emphasis, as previously indicated, are the judgement that private power development would be particularly advantageous to U.S. firms and the general opinion that development of a significant amount of private power (and other privately financed and operated infrastructure facilities) is essential if the Philippines is to attract the capital required to achieve its ambitious power sector expansion plans. (Attraction of private investment is a key component of the MAI and is deemed critical to its success.)

The following summarizes conclusions related to major GOP legal and political energy trade constraints, many of which are interrelated (this summary is taken directly from missions documents; as a result, it does not reflect legal-political changes which have taken place since these missions):

- Limitation of foreign equity ownership to 40% of total equity is detrimental to foreign private power investment. This constraint is exacerbated by the very limited Philippines long-term capital market, GOP's poor credit rating, and the high capital intensity and long-term nature of power projects.
- Lack of BOT (or related private power financing and/or operations concepts) regulations and a policy that does not allow unsolicited private power proposals on a noncompetitive basis discourages private power interest. Specific major regulatory-policy areas requiring changes in order to realize BOT projects are: GOP guaranteeing of the obligations of its entities (especially NPC and PNOC) and investment and profits convertibility and repatriation; realistic BOT contracts terms; and, NPC's view that BOT projects must at least match the economics of NPC projects involving concessionary financing. Effective BOT regulations need to recognize the differences between small-scale hydropower projects and large fossil power plants.

- Lack of realistic BOT power price offerings is an additional major constraint to foreign private power investment. The current NPC avoided cost approach to power price setting results in unattractive prices. Power pricing is also complicated by NPC's ability to establish power rates without regulatory oversight.
- Provision of private power within industrial zones is a potentially attractive private power option. Development of such projects is constrained by the need to obtain Philippine's congressional approval.
- Too many GOP entities are involved in energy planning and operation. As a result, important policy decisions are not well coordinated, excessive interagency bureaucracy exists, and excessive time is required to implement power projects. Some mission participants also perceive lack of focus and direction on the part of some entities toward business development and economic progress.
- Energy projects tax preferences are confined to projects that are majority-owned by Philippine nationals.
- Security due to insurgency limits investment and power projects development due to inability to freely access potential project sites.
- Complaints about corruption and bureaucratic red tape within the GOP continue to concern prospective U.S. investors.

2.2.5 U.S. Government Trade Policy. Compared with the governments of the main firms in competition with U.S. firms, there is a missions' consensus that both more U.S. Government trade support to U.S. firms and greater Government-industry cooperation are required to improve Philippines (and other nations) energy trade. Main conclusions regarding U.S. Government trade policy are:

- U.S. firms have a serious trade disadvantage because of lack of U.S. Government concessionary financial aid. This is the major reason given for the decline of U.S.-Philippines energy trade.
- Business intelligence available from the U.S. Government is inferior to that provided by the main competitors' governments.
- Compared with its main trade competing countries, U.S. development assistance concentrates more on basic human needs and rural development. Governments of the major energy trade competitors, such as the Japanese, structure their aid

programs to have strong linkage to power trade and investment by their power sectors.

2.3 Recommendations

This subsection summarizes the major recommendations resulting from the seven missions. It also presents recommendations, derived from missions' experiences on future planning and performance of Philippines energy trade missions.

2.3.1 Government Of Philippines Legal And Political Energy Trade Impediments. Most mission recommendations to the GOP concerning removal of legal and political energy trade impediments relate directly to the issues associated with the subsection 2.2.4 conclusions. Specific major recommendations are:

- (1) Pass legislation and adopt proactive policies that make foreign private power investment and plant operations financially attractive.
- (2) Establish realistic power prices, contracting terms, and guarantees for BOT projects (and related private power project concepts).
- (3) Modify the Public Sector Act to allow foreign private firms to provide power within an industrial zone without the need to obtain Philippines congressional approval.
- (4) Extend energy projects tax preferences to foreign private power companies as a method of attracting foreign investment.
- (5) Streamline the power projects approval process. Clear delegation and centralization of approval authority needs to be part of this streamlining process.

2.3.2 U.S. Government Trade Policy. As for actions recommended to the GOP, missions recommendations to the U.S. Government concerning energy trade policy relate mainly to the issues associated with the subsection 2.2.5 conclusions. Specific recommendations are:

- (1) The U.S. Government should either develop a competitive trade concessionary finance program or neutralize competing countries' concessionary financing programs through trade agreements. The current Philippines mixed credit fund is judged to be the type of concessionary financing required.

- (2) The U.S. Government should create an "Energy/Power, Infrastructure, and Trade Institute' as a public-private partnership to promote energy and infrastructure-related activities."
- (3) The U.S. Government should develop mechanisms for providing U.S. firms with more comprehensive and timely business intelligence. One aspect of securing business intelligence is more effective U.S. Government use of World Bank and ADB appointments.
- (4) The U.S. Government should provide clear information on how U.S. firms can structure energy projects under the MAI.
- (5) The U.S. Government should enhance the energy capabilities of USAID/Manila and provided required technical assistance to GOP entities.
- (6) MAI should be extended to beyond five-years.
- (7) As an effective approach to infrastructure development, the U.S. Government should consider financing power transmission and distribution projects while continuing to encourage conditions that will allow the private sector to construct-operate power plants.
- (8) TDP should consider reinvigorating its Philippines program.
- (9) As a follow-up to the seven missions, reverse trade missions should be conducted to bring Philippine delegations to the U.S.

None of the trade mission documents provided actual statistics concerning deterioration of U.S. energy trade to the Philippines. They also did not provide specifics on the level of intelligence and intelligence gathering techniques used by their main foreign competitors. If suitable energy trade statistics exist, they should be used to quantify the level of energy trade deterioration and quantify the effectiveness of trade policy changes. It is also recommended that an assessment be undertaken of the intelligence capabilities and techniques of the U.S. major energy trade competitors.

2.3.3 U.S. Business Philippines Trade Strategy. Use of trade mission results to formulate effective Philippines marketing strategies is the main objective of most trade mission participating firms. Mission recommendations related to potential successful strategies are:

- (1) Form a trading company among U.S. firms that have common marketing goals to share the expenses and risks of developing energy projects and/or

marketing products in the Philippines. This approach appears particularly attractive for medium-to-small firms because of the high cost of marketing in developing countries. Formation of two trading companies have resulted, at least in part, from trade missions participation: USGIC and a hydropower trading company being organized by NHA member companies.

- (2) Establish an in-country business presence. Methods to accomplish this are the use of an in-Philippines representative and/or formation of joint ventures with Philippines companies.
- (3) Use technical seminars to market services and equipment.

2.3.4 Trade Missions Planning And Performance. An objective of the Philippines Energy Trade Missions Review was to recommend concepts, based on experience gained from the seven trade missions, for planning and performing future Philippines energy trade missions. Unfortunately, the missions documentation on which the review is based contains little information on the actual "mechanics" of each trade mission; such as what plans worked and did not work, and what changes would be made, based on hindsight, to improve mission effectiveness. Rather, the missions documentation, understandably, concentrates on mission contacts, potential trade opportunities, and presentation of energy sector and GOP organization background information. It is, therefore, recommended that future trade missions include in their documentation discussion of mission effectiveness from a planning and performance perspective. Development of a consistent set of guidelines for trade missions debriefings is recommended. Such guidelines would facilitate both debriefing comprehensiveness and comparisons between missions.

Mission Planning. Though not emphasized in most mission documentation, it is clear that comprehensive mission planning is essential for effective, successful missions. Key aspects of such planning are:

- (1) **Screen mission participants.** Experience from the seven missions provides an indication of the types of energy firms and services/products required by the Philippines. If a firm fits this profile, an effective method to ascertain their seriousness in pursuing the Philippines energy market is to require mission participants to cost share in the mission.
- (2) **Assess the soundness of mission participants technologies to safeguard mission credibility.** Is the technology adequately demonstrated? Is it economic? Will it perform and can it be maintained under Philippines conditions?

- (3) Check to ensure that the technologies and services match the Philippines market. Does a potential market exist? Does the technology capacity (scale) requirements fit this market? How severe is U.S. foreign competition in the market?
- (4) Provide mission participants with information on the availability of U.S. Government assistance. Many companies (particularly medium and small companies) are not familiar with the large number of Governmental organizations that provide assistance for both prefeasibility studies and actual project financing.
- (5) Protect trade mission participants proprietary rights. Protection is important because of differences between U.S. law concerning proprietary rights and Philippines law. Mission participants frequently need counsel on how to avoid divulging proprietary technical information as part of mission business discussions and projects development.
- (6) Identify GOP and private sector customers. Arranging meetings with the proper business contacts is probably the most critical aspect of mission planning. It is through these contacts that a firm can establish the business network and long-term ties with the Philippines business community that are essential for sustained Philippines business success.

Along with identifying the proper mission contacts goes actually arranging meetings with these contacts. To the extent possible, these meetings need to be arranged prior to a missions' arrival. The trade specific missions reviewed were able to overcome this difficulty by drawing on the services of the U.S. Philippines Business Committee and the U.S.-ASEAN Council's Philippines country director in Manila.

- (7) Publicize the mission in the Philippines. Effective ways to accomplish this are to make use of the American Chamber of Commerce/Philippines, the PCCI, and the Makati Club. In the U.S. Electric Energy Trade and Investment Mission to ASEAN, a seminar involving presentations by participating mission firms was used effectively for publicity purposes. This was this mission's first in-Philippines activity.
- (8) Gather intelligence on foreign competition. Though this can be difficult, it can save pursuing project/sales where foreign competition has an overwhelming advantage, such as the ability to use concessionary finance. As addressed in subsection 2.3.2, this is an area where help is needed.

- (9) Coach mission participating firms in making effective presentations. Many U.S. firms lack experience in making foreign presentations. They tend to use acronyms, terminology, and style which are meaningless and/or ineffective in communicating with foreign audiences.

During business meetings, to the extent practical, U.S. firms should present well-defined proposals or technology to Philippines parastatals and private companies. Such offerings are the approach used by foreign competition and are expected by Philippines customers.

- (10) Careful, comprehensive planning of in-Philippines mission logistics. In addition to business meeting arrangements, this includes ground transport, hotel, and communications logistics. Use of an in-Philippines company, such as SGV, can be an effective way to handle mission in-Philippines logistics.

Mission Performance. In addition to mission planning, the seven trade missions provide guidance on in-Philippines mission activities. Specific recommendations on performing a successful trade mission are:

- (1) Brief USAID/Manila, the U.S. Embassy, and key GOP officials. These groups provide current business, legal, and security information. They can also be effective contacts for mission follow-up activities and providers of current information on funding sources for project development.
- (2) Conduct one-on-one meetings between U.S. firms and the Philippines business contacts (customers) identified in pre-mission planning. These meetings are critical for a successful mission. However, success frequently depends on having well focused meetings objectives and being well prepared to present proposals for specific projects and/or technologies. Making a good first impression on the potential customer is important.
- (3) Provide advice to mission firms on charting a business strategy. Firms lacking experience in dealing with the Philippines usually require assistance in obtaining GOP approvals, negotiating contracts, organizing projects, and obtaining financing. To the extent feasible, assistance should be given to conceptualize a viable business strategy.
- (4) Provide advice to mission firms on arranging for a local representative that can follow-up on mission business contacts. Energy trade missions usually only initiate projects development and/or identify potential customers. Actual energy projects realization or technology sales usually occur some

time after an actual mission is completed and frequently after considerable negotiation. A Philippines representative (or joint venture partner) is usually required to develop mission contacts into successful projects or sales. This is one aspect of the need for continuous in-Philippines business presence previously recommended.

- (5) Arrange informal, unofficial functions (lunches, dinners, receptions, etc.) with GOP officials and the Philippines business community. These activities provide an excellent opportunity for identifying additional business contacts, gaining an understanding of Philippines business practices, and developing relationships required to conduct Philippines business.

Post-Mission Activities. In-Philippines activities should not end a trade mission. If the U.S. is to be successful in Philippines energy trade, the U.S. Government and energy firms need to build-on the experiences and contacts developed in each trade mission. The ability to build-on trade mission experience is a feature of the U.S. main Philippine competitors. Specific recommendations for post-mission activities are:

- (1) Use the recommended trade mission debriefing guidelines to conduct post-mission evaluations. These evaluations need to be both thorough and honest while protecting business information that mission firms consider confidential. Ways of making missions debriefing results available to future missions is an area where considerable effort is required. It is also an area where U.S. Government trade agencies can be of major assistance. In some cases, such as trade missions conducted by trade groups, a post-mission seminar(s) is one way of making mission results widely available.
- (2) When appropriate, trade mission sponsors/organizers should continue after a mission to be a source of financing sources identification assistance. Mission sponsors/organizers frequently have better resources to track development of new, improved, and discontinued projects financing sources than U.S. firms, particularly medium and small firms. These resources need to be used to realize projects and equipment/services sales.
- (3) Inform trade mission sponsors of success stories to encourage further trade mission support. Missions successes will justify the funding of additional trade missions as well as funding support to implement projects.
- (4) Organize and perform reverse Philippines trade missions. Reverse trade missions provide opportunities to build on and strengthen Philippines business contacts and identify new trade opportunities for U.S. firms.

Section 3

A.I.D. ADMINISTRATOR'S ENERGY INDUSTRY REVIEW GROUP PHILIPPINES MISSION

3.1 Background

In March 1988, A.I.D. issued a Report to Congress entitled: "Power Shortages in Developing Countries: Magnitude, Impacts, Solutions, and the Role of the Private Sector." As a result of his concern about the "development-constraining impacts of energy shortages, particularly for electric power" the then Administrator of A.I.D., the late Hon. Alan Woods, asked executives from the U.S. energy industry to review the situation and suggest steps that could be taken to solve the problem." This request resulted in formation of The Energy Industry Review Group on Power Shortages in Developing Countries. Ten major energy companies contributed their time and effort as the members of The Energy Industry Review Group. The member companies were: Arco Solar, Inc.; Bechtel Power Corp.; Combustion Engineering, Inc.; General Electric Corp.; Hadson Corp.; Qualtec, Inc.; RCG International, Inc.; Stone and Webster Engineering Corp.; United Engineers and Constructors, Inc., and Westinghouse Electric Corp.

The Congressional Power Shortages in Developing Countries Report addressed all developing countries. Since consideration of all of these countries was not practical, The Energy Industry Review Group selected three countries which appeared to be representative of the energy shortage attributes of developing countries as a whole. The Group then conducted fact-finding missions in each country to develop factual information for use in responding to the Administrator's request. The three countries were: the Dominican Republic, Indonesia, and the Philippines. In each country, selected Review Group members interviewed representatives from energy ministries, parastatal utilities, legislative bodies, U.S. Embassies, A.I.D. Missions, multilateral development agencies, private sector companies, and U.S. firms operating in these countries.

The mission, addressed in this section, is the Philippines fact-finding mission undertaken by four Energy Industry Review Group members in January 1989. The mission members were:

Henri-Claude Bailly

Sr. Vice President, RCG International, Inc.

William Bigge

Manager of Finance and Project Development, Stone & Webster Engineering Corporation

Brooks Howell

Director of Federal Programs,
Combustion Engineering

Harold Wilson

Vice President, United Engineers &
Constructors, Inc.

Nancy Ellis, Special Assistant to the Administrator, and John Hammond, Ernest Y. Lam, and Will Polen from the A.I.D. Office of Energy accompanied the mission and provided staff support.

3.2 Mission Description

Table A summarizes the A.I.D. Administrator's Energy Group Philippines fact-finding mission. This five-day mission had a wider scope than most other missions assessed. It used the Philippines as a sample country for drawing conclusions about power shortage impacts in all developing countries. The mission concentrated on meetings with key GOP officials, U.S. officials knowledgeable on the Philippines energy situation, the ADB, and private sector chambers of commerce. Results were integrated with those from the other two fact-finding missions and presented in a Report of the Energy Industry Review Group on Power Shortages in Developing Countries (April 1989). This report, which supplements the Congressional Report, concluded that A.I.D. assistance "to help developing countries provide adequate and reliable supply of electricity is a good investment for the United States" for the following four reasons:

- It addresses a high development priority area that is critical for developing countries to achieve self-sustaining economic and social growth.
- It benefits important U.S. national security, foreign policy, and trade development goals.
- It offers the U.S. the opportunity to cooperate with developing countries in addressing global climate and other environmental issues.
- It offers substantial opportunities for cooperative actions between A.I.D. and the U.S. energy industry.

3.3 Information Sources

1. Administrator's Energy Industry Review Group Visit to the Philippines -- A Trip Report. Memorandum to Alberto J. Sabadell, USAID, S&T/EY, from Ernest Y. Lam, Bechtel, February 16, 1989

2. Report of The Energy Industry Review Group on Power Shortages in Developing Countries to Ambassador Alan Woods, Administrator of the U.S. Agency for International Development, April 17, 1989.

Table A - Mission 1

A.I.D. Administrator's Energy Industry Review Group Philippines Mission

A. Mission	Administrator's Energy Industry Review Group Philippines Mission
B. U.S. Industry Participants	<ol style="list-style-type: none"> 1. RCG International, Inc. 2. Stone and Webster Engineering Corp. 3. Combustion Engineering, Inc. 4. United Engineers and Constructors, Inc.
C. Organizer	1. A.I.D. Office of Energy
D. Sponsor	1. A.I.D. Administrator
E. Objectives	<ol style="list-style-type: none"> 1. Quantify power shortage impediments to economic development 2. Advise Administrator on how A.I.D. could more effectively structure its assistance programs 3. Determine electric power supply capabilities most urgently needed 4. Define how A.I.D. and the U.S. energy industry can work together more effectively
F. Date	9-13 January 1989
G. Approach	<ol style="list-style-type: none"> 1. Advanced briefing by senior A.I.D. officials 2. Interviews with: Philippines lawmakers, senior GOP officials, GOP parastatals, U.S. Government officials, private energy sector trade groups, and financial community members 3. Recommend to A.I.D. Administrator ways for U.S. industry to mitigate power shortage problem 4. Recommend to GOP regulatory changes that would enhance private power investments
H. Organizations Contacted	<ol style="list-style-type: none"> 1. U.S. Government: U.S. Embassy, DOC, USAID/Manila 2. GOP: Congress, OEA, NEA, Central Bank, BOI, Dept. of Trade and Industry 3. Parastatal: NPC 4. Multilateral banks: ADB 5. Philippine companies: SGV 6. Private industry groups: PCCI and AmCham

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<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Confirmed power shortages are adversely affecting economic development 2. Identified general strategy to add new power capacity 3. Gained an appreciation of legal-legislative issues affecting power expansion 4. Identified ways for U.S. firms and government to cooperate in providing power plant, equipment, and services 5. Provided input to lawmakers and GOP on legal changes required to attract U.S. private capital and power projects
<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. NPC needs technical assistance 2. Coal environmental issues not deemed critical 3. Metro Manila power transmission upgrading/expansion <p style="text-align: center;"><u>Legal</u></p> <ol style="list-style-type: none"> 1. Adequate power pricing is critical to private power 2. Power pilferage <p style="text-align: center;"><u>Political</u></p> <ol style="list-style-type: none"> 1. Power shortage contributes to political instability 2. Need for utility system planning to lead regional development and deurbanization <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Potential energy conservation/load management programs to reduce demand 2. New power capacity financing 3. NPC expects private BOT projects to compete with public projects involving concessionary financing 4. Indigenous versus imported coal use 5. Poor GOP credit rating

K. Lessons Learned

Technical

1. Coal and geothermal preferred power plant fuels
2. Power plant rehabilitation assistance is not regarded as high priority by NPC

Business

1. Energy situation handled by competent officials, but implementing actions slow
2. GOP formulating private power policies, regulations
3. NPC open to fossil power BOT proposals
4. NPC does not regard solar, biomass, wind, and geothermal power projects as significant BOT prospects
5. U.S. equipment, while higher in quality, is deemed noncompetitive in price
6. U.S. firms generally favor short-term, high-return projects while foreign competition (particularly Japanese) apply a longer-term strategy
7. Japanese "least first cost" approach, concessionary financing, and excellent business intelligence has been effective in securing projects
8. Appreciating yen costs are resulting in "secondary cost" financial problems for GOP
9. A.I.D. assistance focused on basic human needs and rural development while Japanese and others have assistance programs with strong power sector trade and investment linkage

Section 4

U.S. ELECTRIC ENERGY TRADE AND INVESTMENT MISSION TO ASEAN

4.1 Background

The U.S.-ASEAN Council for Business and Technology, Inc. (U.S.-ASEAN Council) has a mandate to promote increased trade and investment between U.S. firms and ASEAN. The Council, clearly recognizing the potential for U.S. energy trade with ASEAN, organized and conducted the U.S. Electric Energy and Investment Trade Mission in 1989. Under this Mission, 15 U.S. electric energy sector firms visited four ASEAN countries: the Philippines, Malaysia, Thailand, and Indonesia. This report deals with only the Philippines trade mission conducted in October 1989.

4.2 Mission Description

The mission was designed from the beginning as an opportunity for one-on-one meetings between U.S. firms and both key private national and multinational energy companies operating in the Philippines. Table B summarizes the U.S.-ASEAN Council mission.

Key mission organizational features, in addition to one-on-one Philippines meetings, were:

- Six seminars on Opportunities in Private Power and Energy Conservation in Developing Countries conducted in the U.S. prior to the mission. This has been demonstrated to be an effective method of attracting the right U.S. firms to participate in a trade mission and communicate trade opportunities to a wide audience of U.S. Government and business.
- The conducting of a Philippines full-day seminar, titled U.S. Technologies for Electric Power Generation, Transmission, and Distribution and Energy Conservation, to showcase the mission participating U.S. firms. This activity proved to be an effective way to communicate U.S. energy firms technology and trade interests. It also provided a venue for Filipino executives to communicate their requirements and concerns to U.S. firms and U.S. government officials.
- Distribution of a directory describing mission participating U.S. firms to GOP and Philippines companies prior to the Mission and its associated opening seminar.

- Conducting a trade mission follow-up seminar. This provided both a form for mission evaluations as well as communication of results to non-participating firms and U.S. government trade agencies.

In one-on-one meetings, the mission's participants gained valuable exposure to senior GOP, utility, and private industry executives. For small-to-medium firms it is normally difficult to make these contacts.

4.3 Information Sources

1. Short evaluations of the mission (1-2 pages) by:
 - 1.1 American Line Builders, Inc.
 - 1.2 National Hydropower Association
 - 1.3 Delta C Company
 - 1.4 Reliable Power Products, Inc.
 - 1.5 Synergics, Inc.
2. U.S.-ASEAN Council for Business & Technology, Inc. agenda for a Seminar on Technologies for Electric Power Generation, Transmission & Distribution & Energy Conservation Equipment & Services. The Manila Peninsula Hotel, October 10, 1989
3. Roster of Seminar Speakers not in Mission Delegation, October 1989
4. Roster of Mission and Seminar co-sponsors
5. U.S. ASEAN Center for Technology Exchange, Inc. Special Announcement: Electric Power Generation, Transmission & Distribution Mission from the United States of America Highlights Energy Technologies & Alternatives; The Manila Peninsula Hotel, October 10 - 12, 1989
6. U.S.-ASEAN Council for Business & Technology, Inc. Executive Summary. Final Report on U.S. Electric Energy Trade & Investment Mission to ASEAN, undated
7. U.S.-ASEAN Council for Business & Technology, Inc. Update Report on U.S. Electric Energy Trade and Investment Mission to ASEAN. Six-month Follow-up Report, June 1990

Table B - Mission 2

U.S. Electric Energy Trade and Investment Mission to ASEAN

A. Mission	U.S. Electric Energy Trade and Investment Mission to ASEAN (Philippines)
B. U.S. Industry Participants	<ol style="list-style-type: none"> 1. American Line Builders, Inc. 2. Delta C Company 3. National Hydropower Association (NHA) 4. Reliable Power Products, Inc. 5. Synergics, Inc. 6. Warzyn Engineering, Inc.
C. Organizer	1. U.S.-ASEAN Council
D. Sponsors	<ol style="list-style-type: none"> 1. A.I.D. Office of Private Sector Development 2. A.I.D. Office of Energy 3. DOC 4. U.S.-ASEAN Council 5. Philippine Chamber of Commerce and Industry 6. ASEAN-U.S. Business Council/Philippines Committee 7. AmCham-Philippines
E. Objectives	<ol style="list-style-type: none"> 1. Promote power sector and energy conservation trade and investment 2. Promote private power 3. Identify potential sales agents/representatives 4. Identify potential Philippines joint venture partners 5. Develop market assessments
F. Date	9-12 October 1989
G. Approach	<ol style="list-style-type: none"> 1. U.S. seminars prior to mission 2. U.S. Technologies for Electric Power Generation, Transmission & Distribution & Energy Conservation seminar in Manila 3. Interviews with: GOP and U.S. Government officials, GOP parastatals, international companies, and Philippines companies 4. Development of a U.S. Energy Companies directory for Philippines distribution 5. Trade mission follow-up seminar

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<p>H. Organizations Contacted</p>	<ol style="list-style-type: none"> 1. U.S. Government: USAID/Manila 2. GOP: OEA, BOI 3. Parastatal: NPC 4. Multilateral banks: ADB 5. International companies: Cogentrix, Caterpillar Far East, Ltd., Cummins 6. Philippine companies: Communications Electrical Equipment & Supply Co., Inc., Visayan Electric Co., Asia Energy Resources International, Inc., Impact Technical Services, Adrian Wilson International Associates, Inc., ALC Industries, Engineering Development Corp. of the Philippines, Monark Equipment Corp., Prime Index Philippines, Inc., Alpha Machinery & Engineering Corp., Central Azucarera De Tarlac, Electrobus Consolidated, Inc., Engineering Equipment Inc., Trust International & Bataan Pulp & Paper, General Diesel Power Corp., Hydro-Electric Development Corp., Davao Light & Power Co., Inc., Cagayan Electric Power & Light Co., Inc., Philippine Power Development Corp., ALL-Asia Capital, Philippine Industrial Engineering Co., Plexchem International, Inc., Paperland, Inc., Roblett Industrial Construction Corp., A & B Export Import Group, Aklan Electric Co., First Philippine Holdings, Contracs International, BaBB & Associates
<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Cost-effective exposure to top Philippines utility and private industry representatives 2. Sufficient contacts/agreements for subsequent business trips 3. NHA received DOE grant for forming hydropower trading company 4. One firm considering a Manila office 5. One firm bidding on \$1m in sales and invited to conduct utility technical seminars 6. U.S. and mission follow-up seminars interested other firms in Philippines opportunities 7. Cogeneration firm pursuing 11 projects 8. Renewable energy firm negotiating cogeneration project 9. Cogeneration and diesel engine firms established Philippines subsidiaries

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<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Technical</u></p> <p>1. Use of U.S. engineering standards to enhance equipment sales potential</p> <p style="text-align: center;"><u>Legal</u></p> <p>1. Private power legislation</p> <p style="text-align: center;"><u>Political</u></p> <p>1. Political risk</p> <p style="text-align: center;"><u>Business</u></p> <p>1. Joint venture merits 2. Obtaining accurate Philippines firms background/ financial information 3. Projects identification where U.S. firms have reasonable success probabilities 4. Sales and projects financing options</p>
<p>K. Lessons Learned</p>	<p>1. Mission approach cost-effective way for small-to-medium firms to assess trade potential 2. Establishment of joint venture marketing companies viable approach to penetrating Philippines energy market 3. Adequate briefing of government officials and private companies critical 4. In-country seminar effective approach to communicating mission objectives and obtaining feedback 5. Technical seminars effective sales tool</p>
<p>L. Recommendations</p>	<p>1. Avoid repetitive briefings 2. Ensure GOP representatives know their audience 3. Improve U.S. Government assistance in projects financing, identification, and feasibility studies 4. Better information on the political risks of investing in the Philippines 5. Periodic updates on U.S. Government agencies responsible for supporting U.S. business 6. Clear information required on how U.S. firms can work under the MAI</p>
<p>M. Other Pertinent Information</p>	<p>1. Some participating companies have become US-ASEAN Council members 2. Mission firm expanded technology seminar concept into a marketing tool and organized Philippines utilities technical seminars</p>

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Section 5

NATIONAL HYDROPOWER ASSOCIATION PACIFIC RIM MISSION

5.1 Background

The National Hydropower Association (NHA) is a non-profit trade association whose members represent all segments of the U.S. hydropower industry: public and private entities, equipment manufacturers, engineering firms, environmental firms, and hydro project developers. One objective of NHA is to assist foreign governments and private companies who are interested in developing their hydropower resources to connect with U.S. project developers and equipment/services suppliers.

NHA's Executive Director participated in the October 1989 U.S. Energy Trade and Investment Mission to ASEAN (Section 4). Based, in part on the information obtained and contacts made as a result of this mission, NHA planned and conducted a more focused business development hydropower trade mission of their own in February 1990. This mission involved both the Philippines and Malaysia. This report deals with the Philippines part of the NHA mission.

5.2 Mission Description

Key objectives of the NHA mission were identification and positioning for private hydropower projects and hydropower equipment or services sales. The primary equipment markets for U.S. firms are plant auxiliary equipment, such as controls and electrical equipment. Currently, U.S. firms are not internationally competitive in manufacture of hydro turbines, particularly large turbines.

Using previous contacts and having an appreciation of the Philippines energy situation, the mission met one-on-one with the key Philippines hydropower owners/users, particularly NPC. These contacts and other mission attributes are summarized in Table C.

As a result of the NHA mission and the U.S. Energy Trade and Investment Mission to ASEAN, NHA has developed a good overview of the Philippines hydropower situation and specific projects opportunities profiles, including specific Philippines project contacts for its members. As a result of this mission NHA has decided to form a trading company that would combine the members capabilities and share the cost and risks of Philippine marketing.

5.3 Information Sources

1. Pacific Rim Trip Report; a memorandum to Elaine Evans of the National Hydropower Association from W. B. Smith, the Benham Group/Tulsa, March 8, 1990.
2. Southeast Asia Renewable Energy Project Identification Effort -- Opportunity Profile. (Provided to Bechtel by National Hydropower Association, undated.)
3. Summary of Philippines Hydropower Opportunities (Provided to Bechtel by National Hydropower Association, undated)
4. Interview with Elaine Evans, Vice President, National Hydropower Association

Table C - Mission 3

National Hydropower Association (NHA) Pacific Rim Mission

A. Mission	National Hydropower Association (NHA) Pacific Rim Mission
B. U.S. Industry Participants	<ol style="list-style-type: none"> 1. NHA 2. The Benham Group/Tulsa
C. Organizer	NHA
D. Sponsor	DOE
E. Objectives	<ol style="list-style-type: none"> 1. Identify private hydropower equipment and services sales opportunities 2. Assess hydropower projects legal and financial aspects 3. Obtain information to develop hydropower trade strategy
F. Date	26-28 February 1990
G. Approach	<ol style="list-style-type: none"> 1. Build on experience and information from U.S. Electric Energy Trade and Investment Mission to ASEAN (Mission 2) 2. Interviews with: GOP and U.S. Government officials GOP parastatals, Philippine companies, and energy trade groups 3. Identify proposal opportunities 4. Development of hydropower equipment and services trade strategy
H. Organizations Contacted	<ol style="list-style-type: none"> 1. U.S. Government: USAID/Manila 2. GOP: OEA, NEA 3. Parastatal: PNOC, NPC 4. International companies: Energy Resources International 5. Philippine companies: Cagayan Electric Power and Light Corp., Engineering and Development Corp. 6. Private industry groups: U.S.-ASEAN Council

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<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Benham Group pursuing small hydropower program qualification request 2. Identified immediate and long-term opportunities 3. Established hydropower project development procedures 4. Identified key energy sector players 5. Established BOT project guidelines status 6. Determined financing for Philippines business entities 7. Established important GOP and private companies contacts 8. Detailed information on hydropower system and expansion plans 9. NEA proposal request on watershed management operation and maintenance practices
<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Legal</u></p> <ol style="list-style-type: none"> 1. Adequate power pricing critical to private power 2. Small hydro BOT contracts must have different structure-conditions than fossil BOT. Contract terms-conditions critical for private hydropower projects 3. NPC's position to establish rates without regulatory oversight 4. Inability of NEA to subsidize rates, as does NPC 5. Power pilferage <p style="text-align: center;"><u>Political</u></p> <ol style="list-style-type: none"> 1. Insurgency limiting of trade missions site inspections 2. Complexity of energy program and operations <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Significant amount of Chinese hydropower equipment purchased in 1980, but not yet installed. 2. Unclear how small-medium size firms can develop projects under MAI 3. Investment attractiveness compared with other ASEAN nations

<p>K. Lessons Learned</p>	<p style="text-align: center;"><u>Technical</u></p> <p>1. Sedimentation a major problem</p> <p style="text-align: center;"><u>Business</u></p> <p>1. Potential hydropower projects: east side Camotu Island; 268 MW Casecnan Project (Luzon); 31 Mindanao and 20 Visayas small projects; two 10 MW Cagayan Electric Power & Light Corp. projects (Mindanao)</p> <p>2. GOP pioneering tax exemption appears applicable to private small hydro</p> <p>3. PAPS has \$17m for feasibility studies</p> <p style="text-align: center;"><u>Legal</u></p> <p>1. NPC is responsible for Philippine hydropower projects but water rights belong to National Water Resources Council</p>
<p>L. Recommendations</p>	<p>1. Knowing how to make Philippine contacts and connections critical to mission success</p> <p>2. Cut down on number of trade missions and keep actual missions focused. Too many missions with competing interests and programs aspire for the same funding</p> <p>3. Be prepared with specific, well defined projects. GOP officials anticipate this from project developer</p> <p>4. U.S. firms competitiveness would be enhanced if U.S. agencies could provide better, more timely business intelligence</p> <p>5. Establishment of a trade company with a permanent Philippines representative appears an effective approach to competing. NHA currently testing this approach</p> <p>6. U.S. needs to develop methods to counter competitors concessionary financing</p>

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Section 6

U.S. MULTILATERAL ASSISTANCE (MAI) RECONNAISSANCE TRADE MISSION

6.1 Background

The MAI/PAP is a five-year Multilateral Assistance Program (starting in 1990), multi-donor program to alleviate Philippine poverty "by accelerating infrastructure development and attracting larger flows of private capital, both domestic and international". The key word here being private capital. As a result, MAI is designed to encourage GOP policy reform in infrastructure creation and maintenance to allow the private sector to operate more effectively in the Philippines. To date \$3.5 billion in Philippines assistance has been pledged under the MAI.

The objective of the MAI Reconnaissance Trade Mission was to assess U.S. business opportunities across major economic sectors under MAI. To accomplish this, a group of eleven senior U.S. executives with international business and trade experience met with high-level Philippines and U.S. Government officials and Philippines private sector representatives. Specific reconnaissance team members concentrated on particular economic sectors. The six sectors considered in the mission were energy, transportation, telecommunications, agribusiness, environment, and finance. Forming the Reconnaissance mission were:

Keneth M. Aoyama, Ag West Group
Frank E. Butters, Sea-Land Service
Humbert R. Causing, Morrison-Knudsen International
Allen C. Haile, Bechtel Corporation
Harry C. Johnston, GTE/Hawaiian Telephone
Jose Ben Laraya, Dole Foods
Ian G. Lutes, Foster-Wheeler Energy Corporation
Rom Michalek, World Environment Center
Richard Serikaku, Motarola Communications
Albert J. Smith, Destec Energy, Inc.
Eldridge D. Wood, Jr., Inter-Pacific Capital Corp.

Accompanying the mission were:

John J. Callebaut, U.S.-Philippine Business Committee
Lance Marston, U.S. Agency for International Development
John D. Forbes, Office of Special Representative of the President for the MAI

This report addresses two of the six economic sectors: energy and finance. Finance is included because it is usually a critical factor in any energy project of significant size.

6.2 Mission Description

Like the A.I.D. Administrator's Energy Industry Review Group Philippines Mission (Section 3), the MAI Reconnaissance mission is classified for purposes of this report as a trade related mission. Its scope was wider than most other missions assessed. It, also, concentrated on defining GOP policy and legal changes that are required to attract the substantial amount of both domestic and foreign private capital required for sustained Philippines economic growth. The mission was not designed to initiate discussions on specific energy projects nor make equipment/services sales. It did, however, identify several major energy projects that should be of potential interest to U.S. firms and recommended areas where U.S. firms could be important players under MAI.

Table D summarizes the MAI Reconnaissance mission. As a result of the mission, the participating business executives were "universally bullish about business prospects in the Philippines despite on-going problems."

A detailed mission report was prepared. Mission results were expressed as bulleted items presented by economic sectors in the following recommendation categories: Business Opportunities for U.S. firms, Issues and Recommendations to Philippines Government and Private Sector, and Recommendations to U.S. Government and Private Sector.

Table D summarizes major energy issues and opportunities identified and recommendations made by the mission. Many of the issues and recommendations to the GOP and private sector serve to define key issues facing Philippines energy development. If many of the recommendations are fully implemented, they would represent a profound shift toward a privately owned and operated energy sector.

6.3 Information Sources

1. **Business Opportunities in the Philippines.** Briefing on the Energy Section, June 27, 1990. Jointly sponsored by: the Agency for International Development; Bureau for Asia, Near East and Europe; Bureau for Private Enterprise; the U.S.-Philippine Business Committee; U.S.- ASEAN for Business and Technology; and Ernst & Young.

Table D - Mission 4

U.S. Multilateral Assistance Initiative (MAI) Reconnaissance Trade Mission

A. Mission	U.S. Multilateral Assistance Initiative (MAI) Reconnaissance Trade Mission (energy aspects only)
B. U.S. Industry Participants	1. Destec Energy, Inc. 2. Foster-Wheeler Energy Corp.
C. Organizer	U.S.-Philippine Business Committee
D. Sponsors	1. U.S.-Philippine Business Committee 2. A.I.D.
E. Objectives	1. Assess business opportunities within the MAI framework in energy, transportation, telecommunications, environment, and agribusiness 2. Recommend trade enhancement actions to GOP and U.S. Government 3. Inform U.S. industry of MAI related trade
F. Date	26-31 March 1990
G. Approach	1. Interviews with 11 senior U.S. executives and high-level GOP officials (including key Congress members) and Philippines private sector 2. Recommendations to GOP on trade enhancing regulatory changes 3. Recommendations to U.S. Government on MAI trade opportunities 4. Identification trade opportunities and strategies 5. Trade opportunities briefings selected U.S. cities
H. Organizations Contacted	1. U.S. Government: USAID/Manila, U.S. Embassy, DOC 2. GOP: Congress, OEA, BOI, Central Bank 3. Parastatal: NPC, PNOC 4. International companies: PGI, Ormat Energy Systems, ARMCO-Marsteel Alloy Corp. 5. Philippines companies: MERALCO, Basic Petroleum & Mining, Inc. 6. Private industry groups: U.S.-Philippine Business Committee

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<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Mission "very optimistic about the potential for increased U.S. business involvement" under MAI 2. General energy opportunities are: 2.1) power generation, transmission, and distribution equipment/services; 2.2) oil, gas, geothermal, and coal resources development; 2.3) industrial estates power; and, 2.4) small hydropower 3. Specific energy trade opportunities are: Isabela coal mine and power plant (400 MW); Leyte geothermal power and transmission lines; Bataan combined cycle power plant (300 MW); and Masenloc coal-fired power plant (600 MW)
<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. Reopening Bataan nuclear plant <p style="text-align: center;"><u>Legal</u></p> <ol style="list-style-type: none"> 1. Energy prices deregulation 2. Revision Public Service Act regarding industrial zone power 3. Foreign equity ownership 40% limit 4. BOT regulations and guarantees 5. Hard currency profits and capital repatriation 6. Streamlining GOP projects approval 7. Extension presidential emergency infrastructure projects powers 8. PNOC privatization 9. Foreign land ownership 10. Industrial estates condominium law 11. Private sector oil and gas exploration 12. Senate Multilateral Investment Guarantee Agency ratification <p style="text-align: center;"><u>Political</u></p> <ol style="list-style-type: none"> 1. Security due to insurgency 2. Match between education system and industry needs <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Adequate foreign investors rates of return 2. Foreign investors contract terms 3. Philippine long-term capital development 4. Foreign exchange shortage 5. Export credit (Philguarantee revival) 6. GOP U.S. investment promotion 7. GOP energy pricing

K. Lessons Learned

Technical

1. GOP promoting geothermal resources exploitation
2. Transmission and distribution systems provide for only 50% of population
3. GOP encouraging energy resources diversification
4. GOP priorities are on geothermal and small hydro

Legal

1. GOP changing electricity pricing from current average cost of supply to a long-run marginal cost
2. NPC's allowed 10% net rate of return
3. Executive Order 215 allows private sector power plants with excess capacity saleable to NPC
4. Private sector has right to independently investigate geothermal sites

Business

1. Hydropower is an attractive area for U.S. investment
2. Power shortages result in lost industry production
3. NPC uses avoided cost to determine geothermal steam and power prices
4. GOP developing satisfactory rates of return power projects mechanism
5. High Philippines industry energy prices result in comparative disadvantage with competitors
6. "Cultural sensitivity is important"; "GOP and church leaders role should be taken into account"

<p>L. Recommendations</p>	<ol style="list-style-type: none"> 1. U.S. Government consider financing power transmission/distribution projects 2. U.S. private sector finance BOT power plants 3. U.S. finance coal prospects and reserves evaluation 4. U.S. mission focused on hydropower development 5. Increase U.S. infrastructural development financing 6. "MAI should be extended beyond initial five-years 7. Greater cooperation/coordination between U.S. Government and business 8. Greater U.S. Government role needed in technical analysis to allow U.S. firms to win projects on non-bid competitive basis 9. Need to develop "vehicle" to encourage "U.S. firms to team up, and pool resources to better compete" 10. TDP "reopen" Philippines program 11. Philippines "Exim bank financing should be revitalized" 12. OPIC "premiums on BOT and MAI capital development projects should be reduced or A.I.D. funds used to subsidize." 13. "U.S. government equity needed in some projects on buy-back short-term basis" 14. Draft PIF application form is too long, too much irrelevant information, provides inadequate confidentiality safeguards" 15. Reverse trade missions beneficial 16. "25-year foreigner leases with 25-year extension are too short. Recommend 50-year leases."
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Section 7

UNITED STATES GEOTHERMAL INDUSTRIES CORPORATION (USGIC) PHILIPPINES GEOTHERMAL PRIVATE INVESTMENT TRADE MISSION

7.1 Background

USGIC is a private company, whose 20-plus stockholders are companies and individuals providing a wide range of goods and services for use in exploring, drilling, and developing geothermal resources for power generation, and for operating geothermal fields and power plants. USGIC was founded in 1990 to increase exports of U.S. equipment and services for geothermal resources development. Because of the potential geothermal resources present in the Philippines, it has targeted this country as a potential business opportunity. This trade mission was specifically designed to quantify this opportunity with emphasis on small geothermal projects that could be rapidly implemented.

7.2 Mission Description

Initially results from the previous Philippines energy trade missions and the participants experience were used to plan a very focused trade mission. The main Philippines targets were: PNOC, NPC, OEA, and EDF. In addition to information on geothermal project sites the mission was designed to define the legal constraints and energy pricing that an actual project would have to deal with.

Table E summarizes mission accomplishments. These were extracted from a mission report that provided a clear understanding of the current Philippines geothermal situation and defined specific geothermal projects, which are being pursued by USGIC.

7.3 Information Sources

1. Briefing on Philippines Geothermal Mission. GeothermEx, Inc.
2. Office of Energy, Bureau for Science and Technology, USAID Report on a Mission to the Philippines regarding the Opportunities for Private Investment in Geothermal Power Generation, 26 August - September 1990. Sponsored by A.I.D. Office of Energy. Prepared by United States Geothermal Industries Corporation and Bechtel, December 1990.

Table E - Mission 5

United States Geothermal Industries Corporation (USGIC) Philippines Geothermal Private Power Investment Trade Mission

A. Mission	United States Geothermal Industries Corporation (USGIC) Philippines Geothermal Private Power Investment Trade Mission
B. U.S. Industry Participants	<ol style="list-style-type: none">1. GeothermEx, Inc.2. Barber-Nichols, Inc.3. Independent Power Corp.4. Bechtel Corp.
C. Organizers	<ol style="list-style-type: none">1. USGIC2. Bechtel Corp.
D. Sponsors	<ol style="list-style-type: none">1. A.I.D. Office of Energy2. USGIC
E. Objectives	<ol style="list-style-type: none">1. Assess geothermal power private investment opportunities2. Identify specific geothermal projects3. Review geothermal project financing opportunities
F. Date	26 August - 1 September 1990
G. Approach	<ol style="list-style-type: none">1. From previous missions identified Philippines contacts2. Interviews with 20 organizations: GOP and U.S. Government officials, multilateral banks, international and Philippines companies3. Identification specific geothermal projects

<p>H. Organizations Contacted</p>	<ol style="list-style-type: none"> 1. U.S. Government: USAID/Manila, U.S. Embassy 2. GOP: Congress, OEA 3. Parastatal: NPC, PNOC 4. Multilateral banks: ADB, WB, EDF 5. International companies: PGL, Caltex Philippines, Inc., Morris Corp., Bechtel Corp., Parsons International Ltd., ARMCO-Marsteel Alloy Corp., Energy Resources International 6. Philippine companies: SGV, C. Virata & Associates, Acorn Petroleum & Mineral Corp., Blackgold Oilfields Supplies, Inc. 7. Private industry groups: AmCham, U.S.-Philippines Business Committee, PCCI
<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Assessed Philippines geothermal resources 2. Assessed NPC geothermal power generation plans 3. Identified current geothermal power organizations and relationships 4. Determined geothermal industry legal structure 5. Identified foreign geothermal competition 6. Assessed legal/economic private investment impediments 7. Established contacts with entities controlling geothermal leases-ventures, and potential partners 8. Identified geothermal investment strategies 9. Submitted to PNOC and NPC joint venturing "Statement of Principles" 10. Requested feasibility funds from EDF and others; EDF expressed interest

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<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. Absence submarine power cables to Luzon from Leyte 2. Grid expansion plans to exploited geothermal resources 3. Proven geothermal reserves for planned power plants <p style="text-align: center;"><u>Legal</u></p> <ol style="list-style-type: none"> 1. Foreign equity ownership 40% limit 2. Philippines companies tax preferences 3. Tax and royalty percentages 4. Hard currency royalty, profits, and capital repatriation 5. Power sales guarantees 6. Performance obligations and development timetables <p style="text-align: center;"><u>Political</u></p> <ol style="list-style-type: none"> 1. Nationalist sentiment 2. Forthcoming Presidential election 3. Geothermal sites security <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Establishment adequate power purchases prices (NPC proposed avoided cost appears unrealistic) 2. Philippine long-term capital market 3. PNOC slow response of PNOC to private development proposals 4. Project financing
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<p>K. Lessons Learned</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. Geothermal cost-effective power source 2. Luzon geothermal projects make most short-term sense due to power need and grid limits 3. Longer-term projects make sense after inter-island power cables installed 4. Some proposed power plants based on unproven reserves <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Investment options are: joint ventures with PNOC, and prospects in OEA's inventory 2. Philippines partner required for energy projects tax benefit 3. PNOC offering properties for joint venture exploration and development because of: desire to recover sunk costs, and exploration budget constraint 4. NPC willing to buy steam/power 5. NPC power prices appear unrealistic 6. PNOC slow to respond to proposals and reluctant to enter joint venture negotiations 7. PNOC desirable as a partner because of inventory holdings and advanced development state of properties 8. NPC has excluded selected sites from foreign investment
<p>L. Recommendations</p>	<ol style="list-style-type: none"> 1. NPC 1990-2001 power generation plans unrealistic 2. Geothermal legislation needs clarification 3. NPC should develop realistic avoided cost
<p>M. Other Pertinent Information</p>	<ol style="list-style-type: none"> 1. Sept. 1990 - Mission members explained their intentions to PNOC, NPC, and EDF 2. USGIC and Ormat considering joint course of action on 6 sites

Section 8

RENEWABLE ENERGY SOUTHEAST ASIA PROJECT IDENTIFICATION MISSION (RESAPIE)

8.1 Background

The RESAPIE trade mission was conducted by the U.S. Government interagency Committee on Renewable Energy Commerce and Trade (CORECT) and the Council on Renewable Energy Education (CREE) and was funded by a grant from the DOC International Trade Administration. The main objective of the mission was to identify renewable energy opportunities in the areas of: biomass, hydropower, geothermal, photovoltaic, solar thermal, and wind energy. This mission covered both the Philippines and Indonesia. Only the Philippines part was considered in this review.

8.2 Mission Description

The RESAPIE mission consists of three parts:

- 1) An advance mission team comprised primarily of U.S. Government officials visited the Philippines to "identify private and public sector agencies and individuals interested in participating in renewable energy projects (completed activity)."
- 2) A second mission team of industry specialists representing specific renewable energy technologies followed-up on the advance team contacts. These specialists developed for each country technology project profiles providing an assessment of potential projects and constraints to development of specific projects (completed activity).
- 3) The third part of the RESAPIE mission is a conference and a trade show to bring together U.S. industry and Government and Southeast Asian decision makers and investors in the renewable energy sector (scheduled for late 1991).

Table F summarizes the RESAPIE trade mission parts 1 and 2 for the Philippines. This mission resulted in the following numbers of Philippines renewables potential opportunities profiles: biomass, 3; geothermal, 1; hydropower, 4; photovoltaic, 4; solar thermal, 1; wind, 8.

8.3 Information Source

1. **RENEWABLE ENERGY SOUTHEAST ASIA PROJECT IDENTIFICATION EFFORT, Reports and Opportunity Profiles for the Philippines and Indonesia, DRAFT, Final Report. Prepared by: United States Export Council for Renewable Energy (US/ECRE), 1/91.**

Table F - Mission 6

Renewable Energy Southeast Asia Project Identification Mission (RESAPIE)

A. Mission	Renewable Energy Southeast Asia Project Identification (Effort) Mission (RESAPIE)
B. U.S. Industry Participants	<ol style="list-style-type: none"> 1. National Geothermal Association 2. National Hydropower Association (NHA) 3. American Wind Energy Association 4. National Wood Energy Association 5. Solar Energy Industries Association
C. Organizers	<ol style="list-style-type: none"> 1. US/ECRE 2. CREE 3. CORECT
D. Sponsor	<ol style="list-style-type: none"> 1. Department of Commerce/ITA
E. Objectives	<ol style="list-style-type: none"> 1. Identify renewable energy project opportunities (biomass, hydropower, geothermal, photovoltaic, solar thermal, and wind energy) 2. Develop project opportunities profiles 3. Promote renewable energy projects
F. Date	<p>June 1990 Sept. 1990</p>
G. Approach	<ol style="list-style-type: none"> 1. First stage - advanced team identified GOP agencies and private firms for further discussions 2. Second stage - industry specialists identified specific renewable energy projects and developed opportunities profiles 3. Third stage - conference and trade show to bring together U.S. Government and firms with Southeast Asian decisionmakers/investors

<p>H. Organizations Contacted</p>	<ol style="list-style-type: none"> 1. U.S. Government: USAID/Manila, DOC/FCS 2. GOP: Congress, OEA, NEDA, NEA, ERB, Department of Environment and Natural Resources 3. Parastatal: NPC, PNOC, Philippine Telegraph and Telephone Corporation, Philippine National Railways, Baranway Water District Authority, Radio Communications of the Philippines, Philippine Atmospheric, Geophysical and Astronomical Services Administration, National Irrigation Administration 4. Multilateral banks: ADB, EDF 5. International companies: ERI, Aquatech, Inc., Tradewest Asia 6. Philippine companies: Assistco Energy & Industrial Corp., Engineering and Development Corp., Fabcon Philippines, Inc., Alcorn Petroleum & Minerals Corp., SGV, Cagayan Electric Power & Light Corp., Homegle Trading Corp., Sunpower, Ayala Land, Inc., Solar Electric Co., FluidTex Corp., Kerry Philippines, Inc., Marga Engineering, The Victoria Group, J.A. Filipina Construction Co., TradeInvest Asia, Facilities Inc., San Miguel 7. Private industry groups: U.S.-ASEAN Council
<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Assessed Philippines renewable energy resources in: biomass, geothermal, hydropower, solar thermal, and wind 2. Identified GOP-proposed generation programs and projects 3. Assessed economic and financial considerations for development of renewable projects 4. Established contacts with GOP agencies and numerous Philippine private companies 5. Produced 21 project opportunities profiles for the seven renewable technologies 6. Identified alternative Philippines projects financing arrangements for U.S. firms

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J. Key Issues Identified/ Discussed	<u>General</u>
	<ol style="list-style-type: none"> 1. Power shortages economic impacts 2. GOP interest in promoting renewable energy 3. Japan and Europe renewables competition 4. GOP energy structure 5. Energy sector regulation 6. Renewables projects financing
	<u>Biomass</u>
	<ol style="list-style-type: none"> 1. NPC plans for biomass facilities 2. OEA expressed interest in 1 MW biomass plants 3. Difficulty of using biomass due to its dispersed nature 4. WB, GOP and Asian Pacific Development Center biomass resource assessment (due in 1991)
	<u>Geothermal</u>
	<ol style="list-style-type: none"> 1. Recent legislation establishing geothermal as centerpiece of energy policy 2. Contradiction between PNOC and NPC on buying universal power modules 4. BOT plans 5. Dep. of Environment and Natural Resources permitting process 6. Large-scale market share taken by Japanese and Italians
	<u>Hydropower</u>
	<ol style="list-style-type: none"> 1. Cost of hydro versus geothermal power 2. FREC's potential request for A.I.D. small hydropower feasibility study 3. WB report on small hydropower feasibility 4. WB micro-hydro projects study 5. Hydropower project licensing
	<u>Photovoltaic</u>
	<ol style="list-style-type: none"> 1. NPC ability to incorporate technology into power market 2. Absence of U.S. technology
	<u>Solar Thermal</u>
	<ol style="list-style-type: none"> 1. Lack of experience and data for medium and high temperature solar thermal products 2. Potential market for private solar thermal commercial/industrial applications
<u>Wind</u>	
<ol style="list-style-type: none"> 1. Current lack of market 2. Inoperable A.I.D.-installed wind systems 	

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K. Lessons Learned

General

1. Despite Japan and Europe renewables competition, opportunities exist for U.S. firms in smaller-plant markets

Biomass

1. No biomass utility power generation planned
2. Biomass not considered demonstrated at utility scale
3. Potential waste-for-energy plants in metropolitan areas
4. U.S. projects need to overcome underscaling problems and success of German technology

Geothermal

1. GOP committed to geothermal power
2. NPC and PNOG inviting private sector geothermal development
3. Competition for smaller plants less keen than for big plants
4. Multiple market niches appear to exist for U.S. firms

Hydropower

1. Market for small hydro good prospect for U.S. firms
2. NPC planning only mini-hydro for off grid applications
3. NPC interested in prioritizing small and mini-hydropower; Mindanao, Visayas, and Luzon

Photovoltaic

1. Large opportunity for household-scale and telecommunications remote units
2. Germany has competitive edge
3. A.I.D. does not appear interested in PV

Solar Thermal

1. Solar thermal appears to be wide-open market for U.S. firms
2. U.S. has lead in small-scale solar thermal and heat recovery systems
3. Limited residential market

Wind

1. Limited market

L. Recommendations	<ol style="list-style-type: none">1. Project concessionary financing is required for both small and large-scale projects2. Recommended contacts for financing are A.I.D. and Winrock International3. U.S. firms in renewable energy projects advised to find local development partners and facilities4. Demonstration of photovoltaic technology needed to show viability5. Necessity to refurbish and restart existing Enertech wing turbines to establish wind systems credibility
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Section 9

GEOTHERMAL PREFEASIBILITY STUDY MISSION

9.1 Background

Douglas Energy has developed, demonstrated, and installed in the U.S. a Biphase turbine for energy recovery from mixtures of geothermal steam and condensates. This Biphase turbine can be used to recover energy directly from geothermal fluid as a stand-alone power plant or in-series with a turbine operating on geothermal steam in a series extraction power plant.

The objective of this trade Mission was to convince potential Philippines users of the turbine's merits and identify projects for its demonstration. This was a very focused mission that drew on the findings of the U.S.-ASEAN Council (Section 4) and the USGIC (Section 7) missions.

9.2 Mission Description

This mission is summarized in Table G. Key mission meetings were with PNOC, OEA, and NPC. Douglas Energy is currently planning to market their Biphase turbine in the Philippines.

9.3 Information Source

1. Report on Prefeasibility Study Meetings in Manila during December 4-7, 1990, by Douglas Energy

Table G - Mission 7

Geothermal Power Prefeasibility Study Mission

A. Mission	Geothermal Power Prefeasibility Study Mission
B. U.S. Industry Participants	1. Douglas Energy Co.
C. Organizer	A.I.D. Office of Energy, CETA Project
D. Sponsors	1. A.I.D. Office of Energy 2. Douglas Energy
E. Objectives	1. Educate GOP on Biphase turbine technology to increase geothermal power generation 2. Identify potential agents/joint venture partners 3. Initiate a Biphase turbine prefeasibility study
F. Date	4-7 December 1990
G. Approach	1. Build on experience of previous missions, particularly USGIC Mission (Section 7) 2. Interviews with: GOP and U.S. Government officials, GOP parastatals, Philippines companies, ADB, and private industry groups 3. Identification Biphase turbine applications
H. Organization Contacted	1. U.S. Government: USAID/Manila 2. GOP: OEA 3. Parastatal: NPC, PNOC 4. Multilateral banks: ADB 5. International companies: Bechtel Overseas Corp., PGI 6. Philippine companies: F.F. Cruz & Co, Inc., Fenix Development Management Services 7. Private industry groups: U.S.-ASEAN Council

<p>I. Accomplishments</p>	<ol style="list-style-type: none"> 1. Estimated Biphase turbine application could generate approximately 200 MW additional geothermal power without additional geothermal wells 2. Estimated required power price for a BOT 172 MW Biphase turbine plant is 4-5 ¢/kWh 3. PNOC, NPC, and OEA agreed to provide necessary resource and plant data for BOT prefeasibility study for existing plant 4. Identified possible BOT partners and direct turbine sales 4. ADB expressed project interest with provision of 25% equity and 25% or more debt financing
<p>J. Key Issues Identified/ Discussed</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. Biphase turbine applicability under Philippines geothermal conditions 2. Characterization of Philippines geothermal fields <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. Biphase project financing conditions 2. NPC and PNOC approach to use of Biphase turbines
<p>K. Lessons Learned</p>	<p style="text-align: center;"><u>Technical</u></p> <ol style="list-style-type: none"> 1. Biphase turbines applicable to Philippines <p style="text-align: center;"><u>Business</u></p> <ol style="list-style-type: none"> 1. PGI is currently proposing to generate and sell power to NPC. PGI expressed possible interest in Biphase turbine purchases 2. ADB would accept an NPC power purchase agreement and PGI/NPC and PNOC brine supply agreement as security for project financing 3. NPC favors BOT project rather than NPC joint venture
<p>L. Recommendations</p>	<ol style="list-style-type: none"> 1. Proceed with Biphase turbine feasibility study

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The Office of Energy

The Agency for International Development's (A.I.D.) central Office of Energy plays an increasingly important role in providing innovative mechanisms and approaches for solving the growing energy and environmental crisis in A.I.D.-assisted countries. Situated in A.I.D.'s Bureau for Science and Technology, the Office helps to set energy policy direction for the Agency, while making its projects available to meet the generic and short-term needs of A.I.D.'s field offices in assisted countries.

Three problems drive the Office's programs: high rates of energy demand and economic growth accompanied by a lack of energy, especially power in rural areas; severe financial problems, including a lack of investment capital, especially in the electricity sector; and growing energy-related environmental threats, especially global climate change, acid rain, and urban air pollution.

To address these problems, the Office of Energy leverages financial resources of multilateral development banks such as the World Bank and the Inter-American Development Bank, the private sector, and bilateral donors to increase energy efficiency, expand energy supplies, and enhance the role of private power. The Office strategy involves implementing novel energy sector approaches through research, adaptation, and innovation. These approaches include improving power sector investment planning ("least-cost" planning) and encouraging the application of cleaner technologies that use both conventional fossil fuels and renewable energy sources. Promotion of greater private sector participation in the power sector and a wide-ranging training program also help to build the institutional infrastructure necessary to sustain cost-effective, reliable, and environmentally sound energy systems that are integral to broad-based economic growth.

Much of the Office strategy focuses on abatement of the increasingly severe environmental problems associated with the energy cycle, especially those involving fossil fuels, which pollute land and water during the extraction stage and cause atmospheric degradation—air pollution, acid deposition, and global CO₂ buildup—principally from power plant emissions during the conversion process. The Office's environmentally related assistance efforts have also anticipated and support recently enacted congressional legislation directing the Office and A.I.D. to undertake a "Global Warming Initiative" to mitigate the increasing contribution of key developing countries to greenhouse gas emissions. This strategy includes the following elements: expanding least-cost planning activities conducted in collaboration with the multilateral development banks to incorporate environmental concerns; increasing support for feasibility studies in renewable energy, end-use energy efficiency, and cleaner fossil energy technologies that focus on site-specific commercial applications; launching a multilateral global energy efficiency initiative; and enhancing training of host country nationals and A.I.D. staff in areas of energy that can help to reduce expected global warming and other environmental problems.

To pursue all of its activities, the Office of Energy implements the following seven projects: (1) The Energy Policy Development and Conservation Project (EPDAC); (2) The Biomass Energy Systems and Technology Project (BEST); (3) The Renewable Energy Applications and Training Project (REAT); (4) The Private Sector Energy Development Project (PSED); (5) The Energy Training Project (ETP); (6) The Conventional Energy Technical Assistance Project (CETA); and (7) its follow-on Energy Technology Innovation Project (ETIP).

Further information regarding the Office of Energy's projects and activities is available in our Program Plan and our Office Directory (both updated annually), which can be requested by using the following address:

Office of Energy
Bureau of Science and Technology
U.S. Agency for International Development
Room 508, SA-18, Washington, D.C. 20523-1810

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