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PHILIPPINES CONVENTIONAL ENERGY PROJECT

Evaluation Report on Philippines Segment of
Conventional Energy Technical Assistance Project
(936-5724)

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NATURE OF THE EVALUATION REPORT

This is a final report on the Philippine Coal Water Mix (CWM) Fuels Project of the USAID Conventional Energy Technical Assistance Project (936-5724). This report will be utilized as part of an overall report on the Conventional Energy project, including Pakistan, Morocco, and Costa Rica.

GOAL OF THE CONVENTIONAL ENERGY EVALUATION REPORT

This conventional energy evaluation is carried out under contract LAC-000-C-4085-00 between AID and Georgetown University. It is designed as an evaluation of the existing Conventional Energy Technical Assistance Project (936-5724) of AID S&T/EY, including how it was developed and managed and lessons learned for future project implementation.

First, the procedures carried out by the investigating team are outlined. Following that, in accordance with the statement of work, the particular country project is described, its impact on the host country analysed, and generic lessons for future projects drawn.

METHODOLOGY OF THE INVESTIGATING TEAM

A two-man investigating team, consisting of Dr. Charles K. Ebinger and Mr. Richard J. Kessler of the Center for Strategic and International Studies of Georgetown University, carried out the evaluation by examining project documents and by conducting on-site interviews with AID staff, Philippine government officials, Asian Development Bank personnel, private sector representatives, and other interested parties. Documents

reviewed included AID project papers and correspondence, various AID memoranda, documents from Philippine sources, and contractor reports on the project.

AID personnel interviewed included Charles Bliss (Washington), Mary Kilgour (AID/Manila), Robert Ichord (Washington), and Richard Stephenson (AID/Manila). Officials of the Asian Development Bank in Manila interviewed included Donald R. Sherk and Robert Bakley.

Philippine personnel interviewed included the principal contractors from the Philippine Economic Development Foundation, Purita Festin, Gil C. Guevara, and Victor M. Taylor. Additional interviews were conducted with Jose U. Jovellanos of the National Power Corporation, Manuel G. Domingo, Jr., Senior Vice President of the Semirara Coal Corporation, Mr. Del Rosario, Deputy Energy Minister and Fred Velayo, President, Semirara Coal Company. Others interviews were conducted with Mr. Florentino Feliciano, Jose V. Grey, Eduardo Regala and Emilio Abello of the First Holdings Corporation, Dick Smiley, Commercial Officer - US Embassy, Manila, Ed Landis, USGS, Thomas O'Hare and Thomas Butcher, Brookhaven National Laboratory, Egon Kimel, Burns and Roe, and Morton Gorden and Jeffrey Humber of DSI.

Dr. Ebinger also participated in an interim briefing given by all the participant consultants at AID headquarters in Washington, D.C. on December 20, 1984 and a final briefing held at Brookhaven National Laboratory on February 25-26, 1985.

PROJECT EVALUATION

This evaluation is organized into three sections on (1) project rationale and procurement, (2) project realization, redirection and impact, and (3) generic lessons.

1. Project Rationale and Procurement

In this section, the processes of (a) country selection, (b) project selection, (c) project history, (d) relation to S&T/EY goals and (e) procurement procedures are investigated.

A. Selection of the Country

The Philippines was selected because its economy has been ravaged by the soaring price of imported oil. Between 1973-83, the oil import bill of the nation soared from \$188 million to \$2.1 billion, an amount equal to 28% of the country's total imports. This dependence on imported oil is a major factor contributing to the country's deterioration in its terms of trade, which severely affects its economic growth. Currently, the country is undergoing a major political and economic crisis and receiving structural adjustment loans from the World Bank and the IMF. According to the World Bank: "the energy sector of the Philippines is of critical importance to the structural adjustment effort since it has the largest potential for efficient import substitution."

The two energy resources which are the most promising alternatives to imported oil in electric power generation are geothermal reservoirs and indigenous coal. Current geothermal generating capacity is 784 MW. Current proven coal reserves (December 1982) are 263.2 million metric tons. Nevertheless,

much of the thermal generating capacity continues to be based on fuel oil. However, under a low growth scenario, the World Bank predicts that coal use will increase from 3.5 million barrels of fuel oil equivalent in 1982 to 8.2 mmbdoe by 1990. Much of this increase is seen as coming from domestic coal resources. However, coal imports valued at \$40 million per annum will continue to be needed. The Philippines have an estimated 350 MW of coal-fired installed capacity, with an investment of 1,135 million pesos in 1984. It is anticipated that one million metric tons of coal per year, will be used in the 300 MW Calaca plant, using Semirara and imported coal. In 1984, the Philippines imported about 1.5 million metric tons of coal.

It is because of the desperate nature of the country's energy crisis that in February 1983, the Philippines asked S&T/EY to look into the subject of coal-water-fuels. A project agreement was signed in March 1984

B. The Selection of the Project

Because of the current political and economic crisis in the Philippines, the AID mission's priorities are undergoing substantial reorientation towards an emphasis on projects which will have a more immediate impact on the Philippines rural problems. The new Country Development Strategy Statement (CDSS) is under review. It will likely contain most of the same targets of previous statements, while redirecting funding towards certain sectors. Previous strategies have emphasized "sustained and more productive employment for the rural poor" as the overall program goal with three supporting objectives:

- o The creation of more jobs in rural areas;
- o The attainment of higher productivity among those already gainfully employed, and
- o The reduction in the rate of growth of the labor force.

Recent adaptations in this strategy have resulted in shifting away from targeting the poorest of the poor to identifying those activities which promote the broadest-based employment generation prospects.

The Mission's core programs are:

- o Fertility and Infant Mortality Reduction;
- o Rural Private Enterprise Development;
- o Rainfed Resources Development and Local Resources Management and
- o Energy Development.

The Mission's energy strategy involves a rural element focussed on renewable energy resources and an urban element, concentrating on technology transfer for energy conservation.

AID currently has four projects under its rural energy development strategy:

- o A Conventional Energy Development project begun in 1978, funded at \$7.1 million, to identify, test and evaluate energy technologies.
- o A Rural Energy Development project with an anticipated funding of \$38 million in Economic Support Funds (ESF) which includes a Wood-fired Power Plant project, a Gasifiers for Irrigation project, and a Charcoal Production project.
- o A Rural Energy Technical Assistance project funded through ESF at \$2 million to provide support to the Rural Energy

Development project.

- o An Energy Technology for Fisheries project originally scheduled to have begun in late FY1984, funded through Development Assistance (DA) at \$9.8 million to use biomass to assist municipal fishermen. However, the National Electrification Administration, the project coordinator, has no dollars to finance a new project. Current financing is all dedicated towards debt service payments. The GOP does not place a high priority on rural electrification.

AID's urban energy sector strategy currently includes three projects:

- o A Managing Energy and Resource Efficient Cities (MERC) pilot project begun in 1981, funded through the S&T Bureau at \$350,000 and administered by the Tennessee Valley Authority to improve resource efficiency in cities;

- o A Technology Transfer Project to Improve Energy Management funded at \$8 million from DA funds to promote improved energy technology use in the modern sector and to improve institutional capabilities;

- o S&T/EY has invested in technical assistance activities in the Philippines in three different situations:

FY 83, Development Sciences, Inc., \$130,228. Their work was aimed at identifying useful technical assistance activities in the coal sector in the Philippines, and led to the identification of the coal-water-fuels project as a priority item as well as the identification of further areas that needed more investigation.

FY 84, Development Sciences, Inc., \$45,000. This task was aimed at completing the unanswered questions and producing a suggested program for USAID/Manila consideration, exclusive of activities in coal-water-fuels area.

FY 84, to five different organizations, USGS, Brookhaven National Laboratory, Economic Development Foundation, Burns & Roe and Development Sciences, Inc. cumulative about \$900,000 to assess the project feasibility of introducing indigenous coal-water mix fuels to the Philippines.

AID's efforts in support of the Philippine's energy sector have been intensified in response to the policy objectives outlined in the Philippine Energy Development program of 1982-87:

- o Supply objective: To provide timely, adequate, secure and affordable energy supplies to support the goals set out in the National Development Plan;

- o Efficiency objective: To promote the best use of energy fuels, within the content of given socio-cultural institutions and constraints and

- o Environmental Objective: To insure that both objectives above are met in an environmentally acceptable fashion.

AID's efforts to date to help develop an indigenous Philippine coal industry are commensurate with the policy goals of the GOP.

C. Project History

AID's interest in coal development commenced in March 1982 when Charles Bliss, S&T/EY, a representative of AID/Washington

went to Manila and identified coal utilization as a possible project area for AID activity.

In February 1983, Bliss returned to Manila to attend a coal symposium on coal utilization in the Philippines sponsored by the TDP and the GOP. During the Conference, Bliss was invited to a luncheon meeting which was attended by a number of people among whom was Peter Schaeffer, representing Atlantic Research Corporation, where the suggestion of using coal-water-fuels in the Philippines was presented and discussed. The presentation was technically inappropriate. (The interest was in the partial oxidation of CWF for use in reducing mineral ore roasters, and Bliss suggested that the interest should be directed toward total combustion for steam generation.) This is the area where developmental progress had occurred. Lawrence Ervin of the Mission was supportive and this led to the first DSI tasking order described above.

From the outset, Bliss' interest in Filipino coal was strongly supported by Lawrence Ervin and by the faculty of the Philippine's Chemical Engineering department at the University of the Philippines. Ervin was deeply interested in all aspects of the Philippine energy situation and devoted himself to identifying possible areas for AID assistance in the energy field.

DSI visited the Philippines twice: in July-August 1983 and September-October 1983. Its investigation coincided with a visit by a U.S. Geological Survey team headed up by Ed Landis but directed by AID's S&T/EY to assess the extent of the Philippines' coal resources. During its second trip, DSI worked

with the Economic Development Foundation (EDF) of the Philippines to establish a technical assistance project. DSI submitted its draft report to AID in January 1984.

Upon receipt of the report, AID determined that no one organization had the capability to undertake the complete feasibility study and thus broke the project into five component parts at a total cost eventually reaching about \$900,000. In February 1984, Bliss returned to the Philippines and assisted the Mission in preparing a draft project agreement to undertake an assessment of the feasibility of introducing CWF fuels to the Philippines. In March 1984, an agreement was signed with the GOP. AID through its Office of Energy, delegated its responsibilities for carrying out this assessment to four organizations:

- o USGS: to evaluate the quantity and quality of the coal resources of the Semirara, Malangas and South Mindoro areas;
- o DSI: to provide the feasibility determination;
- o Burns & Roe, Inc.: to provide the technical inputs in the form of technology assessment, estimates of capital costs, and estimates of operating cost factors involved in retrofitting;
- o Brookhaven National Laboratory: to test Semirara and Malangas type coal samples.

In the Philippines, the Office of Energy coordinated its activities with the Economic Development Foundation which was to provide a financial plan and to assist the other contractors in the field.

Since the combined work of the different consultants was

designed to serve as a feasibility study, the project's future development was predicated upon the satisfactory burning of Philippine coal in Brookhaven's laboratories, a sound financial justification of the project and a test run of the coal in a power plant on NONOC Island. The second phase of the project was to entail plant conversions costing between \$20-\$30 million for which ESF funding would be requested.

While the original DSI report had identified possible opportunities for coal technical assistance projects, in reviewing the paper, AID/Washington had found that its "recommendations however, seem diffuse in nature and raise questions in terms of feasibility and significance of impact." Thus, it was AID/Washington which recommended a focus on CWM, using a successful demonstration on the NONOC Island steam generator, with the Sucat power plant as a second option. During the course of the work, by mutual agreement the focus of the project shifted away from the NONOC Island boiler to the Sucat power station of the National Power Corporation.

The project grant agreement with the GOP was signed by the National Power Corporation and the Development Bank of the Philippines (DBP) which then subcontracted its responsibility to EDF with AID providing the funding. EDF had previously been working for Marinduque Mining regarding its fuel needs and had approached Bliss during the February 1963 coal conference about AID's possible involvement.

EDF is a private, non-stock, non-profit corporation established in 1964 with soft loan support from USAID and,

formerly, the Philippine National Economic Council. It provides the private and public sectors with professional management consultancy, research and training services. In 1970 it formed an engineering and industrial research services branch.

Initially, the project had two tracks: the total combustion of CWM to raise high-pressure superheated steam for electric power generation and the partial combustion of CWM to provide high-temperature resulting gases to operate the roasters at the Marinduque Mining and Industrial Corporation (MMIC) plant on Nonoc Island.

From an examination of the project documents and interviews conducted by the evaluation team, DSI and EDF were envisioned as the primary contractors. The Pittsburg Energy Technology Center of the Department of Energy was seen as a possible candidate for evaluating the coal samples in the total combustion phase of the project with Florida Power and Light conducting a demonstration test. EBASCO was a possible candidate for a joint study with MMIC in the partial combustion side of the project. It should be noted that in reviewing a draft of this report, AID S&T/EY took exception to this perception of the organizational arrangement of the project. During the feasibility phase of the project, EDF was to take technical direction from DSI and in the application phase was seen as a "disinterested consultative group" but only "if EDF acts during the earlier phases to take advantage of the opportunities offered and enhances appropriate technical and economic analysis capabilities in their staff." (Memo from Bliss to AID/Manila dated December 1, 1983).

Within the Mission there was considerable support for the

project from the energy officer, Lawrence Ervin, and the AID Director, Schwartzwalder. The director and Ervin were close, but were dynamic personalities, which, to a certain degree, upset the sensitivities of others in the Mission.

When DSI undertook its first report, the use of CWM was, as noted, predicated upon the prospective availability of a surplus 30MW steam generator at MMIC's Nonoc Island nickel production plant for demonstration and the subsequent retrofitting of the Sucat Station of the NPC to use CWM fuels permanently.

Several problems however arose in relation to the Nonoc Island plant which served to refocus the project's attention on the feasibility of using CWM at Sucat. First were problems relating to Nonoc's use of Semirara coal which in the words of one respondent was a "terrible coal for them." The plant could not dispose of the ash produced in its roaster as it solidified "as hard as bricks." Instead the plant preferred to rely on imported coal. More important were problems associated with the plant running out of limonite ore suitable to the ammonium carbonate leaching process upon which the plant's entire operations were based. Alternatives to it were prohibitively expensive and the general Philippines financial crisis, coupled with MMIC's own financial problems, made it likely that the steam generators and associated turbo-generation equipment on the plant would not be available as a possible client to test the CWM process. Burns & Roe examined the Nonoc plant, concluding that because of its retrofit cost and the probable occurrence of a bad burn test, Nonoc would not be suitable. (A burn test lasts

between six months to a year). Thus, Sucat became the fall-back test.

However, the decision to abandon Nonoc in October/November 1984 was opposed by the DBP, one of the signatories of the Project Grant Agreement with AID. The DBP's director, Alejandro Melchor, had been a "prime mover" of the project and was in the words of one respondent "narrowly focused on MMIC's operations on Nonoc Island." AID'S interest in a CWM mixture relying on Philippine coal was profound. However, it was not interested in a CWM mixture using imported coal. Because AID's primary mission was to reduce the GOP's dependence on external energy, it followed up on the interest first generated at the week-long team meeting held at Brookhaven National Laboratory in August 1984 and recommended that the project shift its focus towards looking at the feasibility of using a CWM in the Sucat power plant outside Manila..

This second option however, also had defects, both financial and technical. The technical problems centered on how to get the coal, once it landed on Luzon, to Sucat. The three principle alternatives were rail, pipeline or barge. The use of an existing pipeline was deemed questionable both because of the uncertainty of whether its steep elevation would be able to handle a CWM fuel and because of the large capital costs that might be necessary to upgrade the pipeline. The First Holdings Group, the principal owners of the pipeline, while interested in the pipeline, was in a poor economic condition. The option of using barges posed problems since the barges would have to go up the Pasig River with its low bridges, entering a shallow lake in

which numerous fish ponds were located. In any case, during the investigation, it was also discovered that there was a river lock which blocked access to the lake. The railway alternative which received less detailed examination was believed to be too expensive given various points at which the CWM would have to be handled. An all sea route from Semirara to Sucat was ruled out owing to dangerous weather during the typhoon season. Combination routes, involving both water and pipeline modes of transportation generated some interest and demonstrated that they might be feasible.

In addition, there were also concerns about the adequacy of coal supplies from Semirara. If CWM were to be used at Sucat, at peak production 2 million metric tons of coal would be needed, necessitating the opening of another mine at Panian (45+ million tons of reserves). The reason for this was that existing Semiraran coal production was already contracted for with the National Power Company and Atlas mining. (The price of Semirara coal in these contracts is based on a complex formula composed of the import parity price and a spot price based on a discounted Btu content of the coal). The Panian coal posed major problems because of its quality and the difficulty of mining it. Two other possible sources of coal on Semirara - the Himalian Mine (37 million tons) and the Unong Mine presently operating it (17 million tons) have been identified by Austrian consultants as possible alternatives but financing is needed to determine the feasibility of mining them. Of critical concern at Panian and perhaps at the other two sites is the danger of sea water seepage

since these mines are below sea level.

According to several people interviewed, if AID could demonstrate that a market for the coal existed at Sucat, then financing the two mines would be possible from sources inside the Philippines. In this regard, it should be noted that the Minister of Energy has recommended to the President that he approve the leasing of one of the units (200 MW) at the Sucat Station to a private sector group which would undertake all responsibilities to provide electricity from CWF fuel and receive in return payment from the National Power Corporation under a mutual agreement contract.

While many people remain enthusiastic about the project, problems relating to high levels of moisture in the coal, and quality reliability continue to plague Semiraran coal development. Likewise, some respondents expressed concern about what tariffs would be charged for power generation at Sucat based on CWM fuels. Other respondents expressed concerns about the close links between Marcos and the leadership of the NPC.

During the course of our investigation, we were told different things about who owned the Unong reserves on Semirara Island. Three respondents told us that the reserves are owned by the National Steel Corporation and the National Power Company, which have shown little proclivity to developing them to their full potential owing to their poor quality. AID in reviewing this report commented that the Semirara Coal Company is held entirely by a government-owned national development corporation. We were unable to verify to our satisfaction not only the legal entity which owns the Semirara Coal Company but who the principal

individuals are that control the company.

What emerges from the analysis is that in the absence of a guaranteed market, it will be difficult to get these mines into production. In order to pay off the Austrian loan and to get the mines into production, it will be necessary to raise 260 million pesos. Several observers noted that it is difficult in the current political and economic climate to see how this money could be raised except at interest rates higher than allowed in the Philippine/IMF Agreement. Several respondents noted that no large scale investment will occur until confidence in the economic and political system is restored.

The quality of Philippine coal continues to plague the Semirara Coal Company and its customers. There are no investment funds available, given the Philippines' current economic crisis, to purchase the technology to "beneficiate" the coal to make it usable. In this regard, it is interesting to note that while both USGS and AID believe that Philippine coal producers lack adequate knowledge of coal beneficiation and handling techniques, this view was not shared either by Fred Velayo or the staff of the First Holdings Corporation. Indeed, Fred Velayo made a compelling argument that many of the problems plaguing Semirara coal could be handled by (1) more selective mining methods which can eliminate high clay concentrations that hold moisture, (2) by covering the stockpiled coal and (3) by redesigning the coal silos. Mr. Velayo stated that utilizing these methods would be cheaper than beneficiation and that the problems of "unusable coal" would largely disappear.

Still other problems affecting the implementation of a CWM facility focused on the financing of the proposed Sucat conversion. In 1982, a study was conducted by the Canadians to convert the entire plant to coal but even then such a conversion (N.B. not a CWM facility) was deemed to be "prohibitively expensive." In addition, at least three Philippine respondents and one ADB official noted that once the controversial nuclear power plant is brought on stream, Sucat may have to be closed down. The reason for this is that because the nuclear power plant is oversized it will have to operate as a baseload plant making Sucat "redundant." AID S&T/EY disputes this view and notes that the role of the Sucat Station in serving the Luzon Grid was analyzed as part of the assessment work.

While several other respondents disputed this view and argued that the GOP would need both facilities, some AID officials in the Mission and several ADB respondents were highly critical of the GOP's energy policy arguing that too much emphasis was being placed on supply and not enough on managing energy demand. Several respondents noted that very little or no work had been done on the pattern of energy end use in the residential and commercial sectors and how demand management could reduce the need for new power plants. AID/Washington seems to have little interest in this area.

On December 20, 1984, Dr. Charles Ebinger and Dr. William Ramsay of CSIS attended an all day presentation of the five consultants' "tentative findings" at an AID workshop in Washington. This meeting was followed by a two day meeting at Brookhaven National Laboratory on February 25-26, 1985.

At the Brookhaven meeting, the reports of the consultants were delivered in detail. The results of the consultants work was that while problems remain, the project at all levels (the mining on Semirara Island, the transportation to Sucat, the suitability of Semirara coal for a CWM fuel, the retrofit of Sucat, and the burnability of the fuel) were all technically feasible. While CSIS had some questions regarding the project's finances, as presented by DSI, these centered more on the fact that CSIS' own view of the Philippine economy and political system is more somber than that represented in DSI's economic analysis. Nonetheless, the work of all consultants was of excellent professional calibre given the data limitations involved.

While we were heartened by the top quality work done on the project up to that time, we could not agree, as proposed by DSI, that another year of study was necessary before proceeding with a full go or no-go decision. We were therefore pleased that AID S&T/EY pressed to have the consultants' reports presented to senior officials of the GOP and other interested parties on April 17, 1985 in Manila. AID's further involvement in the project needs to be carefully assessed, especially if non-AID project financing cannot be assured following the presentation of the consultants' report to the GOP. AID's future involvement in this energy project is currently being discussed with AID's Private Enterprise Bureau.

D. Relationship to S&T/EY Program Goals

If S&T/EY program goals are taken to center on the development of energy independence in developing countries

through the replacement of imported oil, the CWM program in the Philippines is in principle directly related to effecting these goals. Nevertheless, to date the project has had no impact on alleviating the Philippines' balance of payments problems stemming from a dependence on imported fuel. However, this is to be expected as the project to date has only been in the feasibility stage. It has however clarified the problem facing the development and utilization of domestic coal resources and could provide the basis for improving the country once the current economic and political crises are overcome.

The project was specifically designed to test the commercial feasibility of utilizing a plentiful domestic conventional energy resource to replace imported fuel oil in the production of electricity. Problems associated with the commercial feasibility of the resource appear to be tied to the country's general economic deterioration and lack of technical-management expertise rather than to the resource itself. Once the situation in the Philippines stabilizes, it is likely that coal, if not CWM, will find a place in the country's energy mix.

E. Mode of Procurement

The mode of procurement was not unique to the project but related to the Conventional Energy Program's reliance on IQC contractors to perform work in a timely and effective manner. The method of procurement appears to have been one reason why the project took only a few months to implement. Some Filipino respondents expressed concern however at the one to three year delay from conception of the project to the project's implementation. This was not, however, an issue of procurement in

this project's case. It was noted by several respondents that the Japanese aid program is able to respond far faster than USAID can.

Once DSI had completed its initial study on Philippine coal, approximately three months elapsed before the project's commencement and approximately another nine months before its completion. All the contractors appear to have done their work in a timely manner although some concern was expressed by Philippine contractors regarding the DSI group. In the view of some Filipinos, the DSI group had difficulty in identifying what information they required to carry out their analysis. DSI dissents with this view and argues that requests for information were not responded to on a timely basis.

Several people interviewed queried why AID could not have selected local consultants which would have lowered cost, avoided delays and helped to develop valuable local technological expertise. Specifically, it was stated that Filipino firms had the capability to do all the financial analysis of the project and to conduct a detailed examination of what was required to retrofit the Sucat power plant. Filipino respondents said the consultants kept them poorly informed as to their findings once they left the country; AID S&T/EY in contrast, faulted their Philippine contacts for not keeping them informed.

2. Project Realization: Redirection and Impact

In this section, funding adequacy and modifications, task redirection, personnel problems, interagency interactions, project management and project impact on the host country are

investigated.

A. Funding Adequacy and Task Redirection and Personnel

There have been no major changes in the \$900,000 funding level of the project. It has taken place almost as initially envisioned in the project plan with some minor delays in the testing of the coal at BNL owing to minor engineering problems at BNL which were overcome without major delay to the project itself.

However, as noted in the Project History, a redirection did occur half way through necessitating a major reassessment as to the project's client from the MMIC Nonoc Island plant to the Sucat power plant.

There were no personnel changes other than the normal rotation of the AID/Manila project officer, and the AID Mission Director.

B. Interagency Interaction

Inter-agency and intra-agency cooperation appear to have been excellent particularly with respect to USG agencies. The USGS was involved at an early stage of the project as was Brookhaven National Laboratories. Most respondents concluded that the USGS had performed its mission well although some raised questions concerning the selection of BNL as a consultant owing to its lack of expertise with CWM technology. BNL's lack of familiarity with the technology was a principal reason for the delay in the evaluation of the coal samples, according to several respondents. Almost everyone interviewed believed that Atlantic Research should have been awarded the contract, though clearly AID's utilization of IQC contractors prohibited this possibility.

AID dissented with this perception of BNL's work and stated that it retained BNL because of its ability to work on a bench scale with coal quantities consistent with those that could reasonably be shipped by air.

Interaction between AID and counterpart agencies, especially the NPC and EDF was generally excellent. The NPC concurred in the selection of consultants but, in the view of one respondent, only after they were "proposed" by AID. Nonetheless, relations between AID, its consultants, and EDF were deemed to be "not always as smooth as possible." While coordination was good in the field, EDF was not kept informed of developments and findings once the consultants left the country. EDF personnel stated that had they been better informed they might have been able to pick up the loose ends especially in the project's financial analysis. EDF expressed frustration that they were not invited to the December 1984 meeting in Washington and were only advised as to the results afterwards. They also expressed concern that they had little foreknowledge of the February 1985 meeting at Brookhaven.

AID's view of their relationship with EDF is at sharp variance with EDF's perceptions. As noted, AID believes EDF did not always keep them informed of the evolution of the thinking in the Philippines ~~via~~ ~~the~~ ~~project~~. In AID's view, the December 1984 meeting was of insufficient significance to warrant the dollar cost of bringing Filipino representation to Washington. EDF was advised as soon as the date for the February 1985 meeting was set. There was little lead time for this date

since it was not known until Brookhaven had performed successful combustion tests on a sample of coal water fuels. Early in the assessment work, S&T/ET suggested that two Philippine counterparts be assigned to work first with Brookhaven National Laboratory and later with other team members to become thoroughly familiar with the details of the project work. This suggestion was turned down by Manila.

EDF personnel stated that this lack of "involvement" made it difficult for them to keep key Filipino policy-makers informed about the project as it evolved. EDF was emphatic that its frustrations were with AID/Washington. The view was expressed that whenever Charles Bliss of AID S&T/EY was contacted with a problem it was addressed. There was a general perception that once Lawrence Ervin left the country the USAID mission in Manila had other priorities that were more important than energy. There were clearly differences in AID/Manila's perception of the importance of the project under successive Mission Directors.

There does not appear to have been sufficient interaction with other donor agencies in this project. The World Bank was not mentioned as having advised on the project's potential once it had moved beyond the feasibility stage. In part the lack of consultation with the World Bank appears to have been motivated by the type of project: as an initial feasibility study, an assessment of the project's financial prospects could not have been undertaken until the technology was proven and the initial cost-benefit analysis completed. However, given the Bank's current skepticism as to the future role of coal in the Philippine's energy mix, such consultation at even this

preliminary stage could have been justified.

AID officials disagree with this criticism and state that the IBRD was invited to the February 1985 meetings but turned the invitation down. The International Finance Corporation did attend the meetings.

The Asian Development Bank was kept informed as to the project's design and progress. However, ADB respondents appeared to be extremely pessimistic concerning the project's future. They also were concerned about the overall thrust of AID/Manila's energy program, particularly in the rural energy development area. This may have been a reason that ADB experts were not relied upon during the project for advice except to review DSI's initial analysis.

AID/Manila was satisfied with S&T/EY's performance, was pleased with the project's initiation by Washington, and complimented the project officer. The only complaints were expressed by AID/Washington staff who believed that the Mission was slow to respond to administrative matters. AID/Washington stated that the change in AID Mission Directors during the project led to sometimes difficult problems of coordination between headquarters and the field.

Another possible coordination problem exists with the Trade and Development program officer and the commercial attache in the U.S. Embassy who have been sending conflicting signals to the Filipinos. These officers have been making contacts, exploring the possibility of exporting U.S. coal to the Philippines, thus directly undercutting the rationale for the CWM project.

1. Generic Lessons

As in the case of the other projects of the conventional energy assistance program, project selection criteria should be based on (1) the project's contribution to addressing the country's pressing energy problems, (2) the availability of appropriate contractors to undertake the project in a timely and effective manner, (3) the ability of project design and management to adapt to the numerous unforeseen factors inherent in operating in a different environment, and (4) the socio-political economic environment in which the project takes place. This project appears to have satisfied the first three criteria. However, the project's initial design does not appear to have taken into consideration the dynamics of a country undergoing a rapid deterioration in its political and economic situation. The situation was well-known to AID as evidenced by the CDSS. Such considerations if taken earlier could have affected the decision to proceed with this project.

The AID/Manila mission argues that it cannot change its program to suit current events but instead must tailor its projects for their impact several years hence when presumably the situation will have stabilized and the Philippines will again be in a position to utilize new capital investment. To some degree this is true but prioritizing a project should take place based on its contribution to addressing the pressing needs of the moment. This project's future is dependent upon private sector financing. But as one respondent said, the economic situation will not improve until capital returns and capital depends upon

political stability.

Such prioritizing of all of AID's projects could have been undertaken by an advisory team prior to the project's selection.

AID/Washington queries whether energy-oriented projects can ever have a short term impact. In its view, the April presentation and team activities in CWM technology provided a unique contribution to the future adaptability of such technologies elsewhere in the Third World where similar quality coal and consumer interest exist. The project led to the identification of possibly five financial groups capable of financing such a project with expatriate technical support. In AID's view, the critical path now appears to be a Philippine Government decision to lease the one large power generating unit to a private sector CWM enterprise.

2. Gaps or Duplication in Project Data

Despite AID's enthusiastic support for this project, CSIS believes there is more room for exploration (drilling, mapping, etc.) of Philippine coal resources which are still inadequately explored. The Philippine Coal Association lacks firm data on the nation's coal resources and private entrepreneurs do not have the risk capital for exploration. Until these resources can be assured, the project will not move towards realization.

3. Effectiveness of the Type of Project for Energy Assistance

This type of project optimized U.S. technical skills and indigenous support. The reliance on an indigenous contractor,

EDF, to provide for much of the overall direction of the project is relatively unique in the conventional energy program and helped maximize the benefits in terms of technology transfer. However, as noted, EDF's expertise was not always adequately utilized. As one respondent noted, EDF could have played a more dynamic role in the economic analysis as opposed to DSI and could have helped identify other local contractors which would have accelerated the benefits of technology transfer and reduced reliance on expatriate services.

4. Private Sector Strengthening

The project improved the capabilities of EDF but its overall role in further strengthening the private sector in the Philippines remains in doubt owing to the current economic crisis.

It is AID's expectation and indeed insistence that future phases of this project will be financed by the private sector, especially the Philippine private sector. As early as September 12, 1983, AID/Washington informed the Mission that the project should "stand on its own and not depend on subsequent USAID financing." Clearly the project may not proceed given the current lack of investment funds in the country. It should be noted that it is the expectation of the Filipinos that USAID and other multilateral lenders will provide the downstream financing to retrofit Sucat and to develop the transportation system for Semirara coal. AID's current position on these two issues, which is under discussion, needs to be clarified as soon as possible.

It should be further noted that several respondents in the

multilateral lending community commented that privatization of the CWM system could not occur without privatization of the entire system for power distribution in the Philippines, currently controlled by a government corporation, necessitating market rates for power costs. The reason for this is that if Sucat were a private sector entity it might be subject during low power demand periods to shutdowns by the NPC which would want to keep its own power facilities operating at higher rates of efficiency.

While the GOP has begun a study of the structure of both wholesale and retail power tariffs of public and private utility agencies which may result in reform of the tariff structure, the recent announcement by the National Power Corporation's Coal Division that it will not make its books available to outside auditors demonstrates the nature of the problems involved.

Moreover, the future of CWM will depend upon strengthening the private sector's involvement in coal mining. To date, the private sector has mismanaged what few good mines they have, partly because of a lack of experience, a price incentive and the absence of a market, but also because it lacks the technical expertise.

5. Technical Advisory Committee

Respondents expressed doubt concerning the utility of a Technical Advisory Committee in this project. One respondent suggested that such a committee might be useful at the beginning of a project to provide suggestions as to how to structure the project. Otherwise, many suggested that such a committee would add another layer of administrative problems. As one respondent

mentioned, there are already "too many consultants."

It is difficult to see how such a committee could have advised or foreseen the problems which developed in this project. The economic situation in the country and the continual technical problems related to the coal would not have been easily amenable to solution by a group of outside technical experts.

6. Replication

This type of technical assistance project appears to be easily replicable and useful for other developing countries, particularly those not undergoing economic and political crises.