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Report No. 15657

IMPLEMENTATION COMPLETION REPORT

PHILIPPINES

ENERGY SECTOR PROJECT
(LOAN NOS. 3163-PH, 3164-PH, 3165-PH)

May 23, 1996

Infrastructure Operations Division
Country Department I
East Asia and Pacific Region

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CURRENCY EQUIVALENTS

Currency Unit	=	Philippine Peso (P)
P1.00	=	100 Centavos (ctv.)
(end-July 1989)	=	US$1.00 = P 21.5
(end-Dec 1995)	=	US$1.00 = P 26.2

WEIGHTS AND MEASURES

kV	=	Kilovolt (1,000 volts)
kW	=	Kilowatt (1,000 watts)
kWh	=	Kilowatt-hour (1,000 watt-hours)
MW	=	Megawatt (1,000 kilowatts)
MWh	=	Megawatt-hour (1,000 kilowatt-hours)
GW	=	Gigawatt (million kilowatts)
GWh	=	Gigawatt-hours (million kilowatt-hours)

FISCAL YEAR

Republic of the Philippines
January 1 - December 31

ABBREVIATIONS AND ACRONYMS

BOT	-	Built-Own-Transfer
BOOT	-	Build Own-Operate-Transfer
DENR	-	Department of Environment and Natural Resources
DOE	-	Department of Energy
ECC	-	Energy Coordinating Council
EMB	-	Environmental Management Bureau
ERB	-	Energy Regulatory Board
ERR	-	Economic Rate of Return
GOP	-	Government of the Philippines
JEximbank	-	Export Import Bank of Japan
ICB	-	International Competitive Bidding
IPP	-	Independent Power Producer
NEA	-	National Electrification Administration
NPC	-	National Power Corporation
OEA	-	Office of Energy Affairs
PNOC	-	Philippine National Oil Company
PNOC-EDC	-	PNOC-Energy Development Corporation
ROM	-	Rehabilitate-Operate-Maintain

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IMPLEMENTATION COMPLETION REPORT
PHILIPPINES
ENERGY SECTOR PROJECT
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Preface

This is the Implementation Completion Report (ICR) for the Energy Sector Project (the Project) in the Republic of Philippines, for which US$390 million equivalent, was approved on February 1, 1990 and made effective on June 12, 1990. The Project provided for three Bank loans for: (a) the National Power Corporation (NPC) for US$200 million (Loan no. 3163-PH); (b) the Philippine National Oil Company (PNOC) for US$150 million (Loan no. 3164-PH); and (c) the Government of the Philippines (the Government) for US$40 million (Loan no. 3165-PH).

Loan 3163-PH to the National Power Corporation closed on June 30, 1995 compared to the original closing date of December 31, 1994. The Loan is fully disbursed and final transaction took place on February 23, 1995.

Loan 3164-PH to the Philippines National Oil Company was closed on December 31, 1995, compared to the original closing date of December 31, 1994. Apart from partial cancellation of some US$10.7 million equivalent, being earmarked for on-lending to Petron, the loan was fully disbursed and final transaction took place on April 15, 1996.

Loan 3165-PH to the Republic of the Philippines was closed on April 30, 1996, compared to the original closing date of December 31, 1994. Some US$8.7 million equivalent was canceled and final transaction took place on February 3, 1996.

The ICR was prepared by Ephrem Asebe, Consultant, EA3IN, under the supervision of John Irving, Senior Power Engineer, Infrastructure Operations Division of the East Asia & Pacific Region, Country Department I. It was reviewed by Mr. J. Shivakumar, Chief, Infrastructure Operations Division, and Mr. Walter Schwermer, Project Adviser.

Preparation of this ICR was begun in October 1995 followed by an ICR mission in February 1996. It is based on material in the project file as well as data provided by the Borrower. The Borrowers contributed to the preparation of the ICR by stating their views as reflected in the mission's Aide-Memoire (Appendix A), and by preparing their own evaluation of the Project's execution (Appendix B). The Borrower agencies have also commented on this ICR, and their comments were taken into consideration when finalizing it.

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Evaluation Summary

Introduction

i. Bank involvement in the Philippine energy sector dates back to 1957. Bank lending in the sector was limited until 1981, at which time the Bank began lending to support various energy subsectors, including geothermal. In 1988, the Bank conducted a comprehensive Energy Sector Study in an effort to identify how the Government and the Bank could jointly work to address weaknesses in that sector, and The Energy Sector Project (1989) was conceived to support this effort. The Project involved eight beneficiaries and included three Bank loans totaling US$390 million to the National Power Corporation (NPC), the Philippine National Oil Corporation (PNOC), and four separate entities in the Government. Repayment will be over 20 years, including a five year grace period, at the Bank's variable interest rate. (paras. 1-3)

Project Objectives

ii. The Project had two distinct but complementary objectives. The first objective concerned the implementation of the energy sector development program, which had a number of facets: increasing sector coordination, adopting a least-cost development strategy, strengthening the pricing regime, encouraging private sector participation, improving environmental standards, and enhancing institutional development. The second objective was to finance a time-slice of the energy sector investment program for the period 1989-93. (paras. 4-6)

iii. The objectives of the Project were extensive as their scope was sector-wide; however, they had been carefully thought out and were directly relevant to the Bank's Country Assistance Strategy. They were also responsive to the desire of the Government to explore alternative ways to manage the sector. The Project was demanding on all parties involved. (paras. 7-10)

Implementation Experience and Results

iv The Project substantially achieved its objectives, despite initial problems reconciling the least-cost development objectives with increased private sector participation (particularly regarding NPC) and reshaping the geothermal drilling program. The time-slice of the 1989-93 investment program had to undergo some revisions to induce the Independent Power Producers (IPPs) to participate in the fast-track generation program in 1991-93. This development, while costly to the sector, proved critical to ending the power crisis and, in so doing, restored the economic health of the economy as a whole. Moreover, as the number of IPPs increased and the power crisis eased, NPC was able to negotiate more favorable contract terms. Encouraged by such results, the Government accelerated the program for the privatization of NPC's various operations in its 1992 Energy Section Action Plan (ESAP). The role of NPC was thus redefined. Its role would no longer be as a generator of power, but as a purchaser of power (mainly on a take-or-pay basis) and as an operator of the transmission system. (paras. 11-13)

v. PNOC benefited from a small technical assistance component to facilitate privatization of its subsidiaries. PNOC-EDC (PNOC-Energy Development Corporation) received a substantial amount of the loan proceeds to conduct geothermal exploration. After disappointing results in Luzon, PNOC-EDC shifted its focus to Leyte, and with the support of two subsequent Bank loans, is successfully exploiting Leyte's geothermal resources. Petron successfully upgraded two facilities at its refinery under the Project. (paras. 13, 18 and 19)

vi. The management of the country's energy sector changed significantly under the Project. In 1992, the defunct Department of Energy (DOE) was restored to give the energy sector cabinet-level representation. Further changes saw the folding of Office of Energy Affairs (OEA) into DOE and a substantial reorganization of DOE itself. While these institutional changes did not in themselves result in the improvements in sector-wide coordination as envisioned under the Project; nevertheless, the power crisis served as a catalyst in bringing the Philippine entities together to solve the problem. The Project also enhanced the efficiency and capabilities of entities in the sector by funding several topical studies in the sector, by upgrading hardware and software, and by providing additional staff training. The Energy Regulatory Board (ERB) acquired new capabilities to discharge its responsibilities with respect to inspecting and enforcing conformity to standards of metering equipment, petroleum products, etc. ERB also acquired computer hardware and software under the Project. The Environmental Management Bureau (EMB) also enhanced the skills and tools it needed to monitor the environmental impact of energy projects. The Project also succeeded in providing stop-gap technical assistance to National Electrification Administration (NEA) and the rural electrical cooperatives, in advance of a subsequent Bank project. (paras. 13 and 20)

vii. Project sustainability. Project sustainability appears likely. The country's power crisis has been resolved, the macro situation has stabilized, and the energy sector looks set to enjoy orderly energy growth with cost optimization. Moreover, a number reforms in the pipeline will act to carry forward the process of orderly energy growth. (paras. 30-33)

viii. Project costs and financing. Due to NPC's decision to enter into BOT arrangements with IPPs to increase generating capacity, and because of PNOC-EDC's poor results in prospecting for geothermal developments in Luzon, total project costs were only about US$2.6 billion, or 80% of the original planned. The Bank disbursed US$373 million through its three loans, or 96% of the full amount. The original closing dates of these loans were extended by 6 to 16 months (see Preface, Annex A: Tables 1b, 4a-c, 8A and 8B). JEximbank, which was providing parallel financing, is expected to disburse about US$62 million by end-1996, against US$150 million which was made available. (para. 14)

ix. Factors affecting project objectives. The major factors affecting the achievement of Project objectives were mainly those subject to the control of the Government or the implementing agencies, and the risks associated with exploration. At the Government level, the main factors affecting the achievement of Project objectives included tradeoffs between the pursuit of a least-cost or a fast-track strategy, the politicization of tariff adjustments, the weak financial position of NPC, and delayed budgetary allocations to ERB and EMB. NPC's failure to revalue its assets also contributed to its financial problems, and its organizational weakness compounded them. PNOC-EDC tended to be overly optimistic, both in planning for the number of wells to be drilled at geothermal sites in Luzon and in estimating the power capacity from the geothermal steam these were to provide. The original program had to be revised drastically downwards mid-way through the project cycle and the geographical focus had to be shifted to Leyte, a move which helped utilize the loan allocation. (paras. 22-29)

x. Bank and Borrower performance. Bank performance through all stages of the project cycle was satisfactory. This performance was particularly noteworthy regarding the design of the Project, the assistance rendered to NPC during its financial crisis, and the close working relationship with PNOC-EDC. Overall, the Borrowers also performed satisfactorily. However, NPC's failure to deal with its financial weaknesses and its absorption in pursuing private investment, led to problems and delays, especially at the on-set. PNOC-EDC's optimism over geothermal potential also impacted Project performance. (paras. 34-38)

xi. Project outcome. Overall, the Project outcome was satisfactory. The matrix in Annex A, Table 1B outlines the core factors and justifies this assessment. (para. 39)

Summary of Findings, Future Operations and Lessons Learned

xii. Findings:

(a) The Philippines provides an example of how, under the right conditions, private investment in power generation can be forthcoming and how market forces help secure contracts with fair terms for both sides. In due time, most of the commercial risks should be borne by private investors, and the power development program should suitable accommodate independent power production. Such programs will be useful to investors, and further benefit would be derived by periodic market surveys of energy demand and growth. (paras. 32 and 43)

(b) A focal point is necessary within a government to conduct energy policy. It should be the center for planning, guidance, monitoring, coordination and strategy development. (para. 13)

(c) Those institutions which manage the environmental and regulatory aspects of the energy sector would gain a better appreciation of their tasks and discharge them more effectively with greater exposure to external developments and expertise. (para. 13)

(d) Until petroleum prices and power tariffs are deregulated and operate in a competitive climate, their determination and adjustment should be a transparent process. (paras. 13 and 25)

xii. Future operations. DOE has mapped out a comprehensive restructuring of the energy sector, to consolidate the gains made so far regarding institutional strengthening, generation and transmission, coordination, and to prepare for an eventually restructured and competitive environment. (para. 40)

xiii. Key lessons learned. To the lessons inherent in the findings above, the following should be added:

(a) Effective supervision is critical to project success, and projects could benefit from more innovative approaches. Supervision could be made into a more proactive exercise, for instance, by considering supervision as part of an ICR exercise and trying to apply any lessons learned during the course of the project, where they would be of immediate use. (para. 45)

(b) For the Bank, a feature of a sector loan as distinguished from a subsector individual project loan is the dialogue at the macro policy and central level, which is important too. A judicious and overlapping mix of both types is desirable.

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PART I: IMPLEMENTATION ASSESSMENT

A. Statement/Evaluation of Objectives

1. **Background.** Bank involvement in the Philippine energy sector dates back to 1957. Bank lending in the sector was limited until 1981, at which time the Bank began lending to support various energy subsectors, including geothermal. In 1988, the Bank conducted a comprehensive Energy Sector Study in an effort to identify how the Government and the Bank could jointly work to address weaknesses in that sector. The findings of the Study proved very useful in assisting the Government in devising its Statement of Energy Policy (1989) and in formulating an agreed strategy for a five-year, least-cost development program for the sector.

2. The Energy Sector Project (1989) was conceived to support this development program, and also drew heavily on the work of the Energy Sector Study. The Project provided for three Bank loans totaling US$390 million for: (a) the National Power Corporation (NPC) for US$200 million (Loan no. 3163-PH); (b) the Philippine National Oil Company (PNOC) for US$150 million (Loan no. 3164-PH); and (c) the Government of the Philippines (the Government) for US$40 million (Loan no. 3165-PH). There were four beneficiary agencies in the Government: the Energy Regulatory Board (ERB); the Environmental Management Bureau (EMB) within the Department of Environmental and Natural Resources (DENR); the National Electrification Administration (NEA); and the Office of Energy Affairs (OEA), which was later subsumed into the Department of Energy (DOE) in 1992.

3. Repayment will be over 20 years, including a five year grace period, at the Bank's variable interest rate. The Government passed on US$17.8 million of the proceeds of its loan to EMB, ERB, and OEA as budgetary contributions, and made US$22.2 million available to NEA as an equity contribution. PNOC on-lent US$147.0 million to PNOC-EDC and Petron on the same terms as the Bank loan, with PNOC-EDC and Petron bearing the foreign exchange risk.

4. **Project Objectives.** The Project had two distinct but complementary objectives. The first objective concerned the implementation of the energy sector development program. This program aimed at (a) developing a sector-wide capability to increase energy resources and coordinate policy implementation; (b) adopting a least-cost development strategy for energy development; (c) strengthening regulatory activities for rational consumer energy pricing and improving product and service standards; (d) encouraging private sector participation through joint ventures and other schemes; (e) improving environmental standards and monitoring in areas of high energy use or resource development; and (f) enhancing the technical capabilities of sector institutions.

5. The second objective was to finance a time-slice of the energy sector investment program, for which each of the beneficiary institutions prepared its respective five-year investment program. Of the planned total of investments of US$3,509.2 million during the period 1989-93, the proposed expenditure of NPC was the highest (77.6%), followed by PNOC (21.1%), NEA (0.8%),

EMB (0.3%), DOE (0.1%) and ERB (0.1%). Bank loans under the Project were to provide 11.1% of the total investment. Loans from JEximbank were to finance a further 4.2%, and would be disbursed under a parallel financing arrangement with the Bank. The balance of 84.7% was to be financed through internal cash generation and from additional borrowings.

6. **Project Components.** The Project was to finance, *inter alia*, imported equipment and materials required for geothermal field development, power plant construction, power transmission and distribution, rural electrification, modernization of office and laboratory equipment of sector institutions, training, technical assistance, and a number of studies. In terms of physical work, the Project was to finance the development of 610 MW of geothermal resources, 1,650 MW of power generation capacity, and substantial expansion in transmission and distribution systems. In terms of policy and institutional reform, the Project was designed to redirect the country's energy development strategy.

7. **Evaluation of Objectives.** The objectives of the Project were the result of extensive dialogue between the Government and the Bank on issues raised by the Energy Sector Study. They were conceived subsequent to the election of a new Government in 1986, which was seeking alternative ways to manage the sector, and which abolished the Ministry of Energy in an effort to avoid concentrating too much power in the hands of a single Minister. The objectives were manifest in the Government's Statement of Energy Policy, which recognized that projects in the energy sector had intricate linkages with each other and with the sector as a whole and, further, that such linkages had implications to the overall health of the country. The sector institutions involved in the Project recognized that for their components to be viable, the sector program as a whole would have to succeed.

8. The Project was by nature complex, demanding and optimistic. It encompassed a wide range of policy and institutional issues, and included three IBRD loans and one JEximbank loan involving eight separate beneficiaries. Moreover, the implementation capabilities of these institutions were not initially known, as most of them had no recent experience handling sizable investment projects. In addition, the availability of additional sources of financing for the entire sector investment program was uncertain (para. 5). The BOT arrangements which came into vogue subsequent to the approval of the Project added to its complexity. In practical terms, NPC had little control over the choice and siting of BOT plants, and had to react quickly to accommodate changes to such plans. Also, because BOT financing arrangements incorporated new risk considerations, it was difficult to assess the long-term economic viability of this privatization policy. These factors could alone or together impact on the timely implementation and disbursement of the Bank loans, and were outside of Bank control.

9. The objectives of the Project were in line with the Bank's Country Assistance Strategy (CAS). The CAS aimed to revitalize economic growth, improve the efficiency of public corporations, and accelerate privatization. The Project stands as an example of how the Bank was able to influence the direction of a sector far exceeding its relative financial contribution.

10. The Project was responsive to changes in the Government's priorities regarding macroeconomic strategy and sector policy reforms. The design of the Project afforded flexibility in financing components of the energy sector development program. Uncertainty with regard to the availability of other external sources of financing, especially the unsecured part, was recognized at the outset, and financing arrangements were so designed to allow the beneficiaries options in shifting around timings for World Bank/JEximbank financing, depending upon procurement policy

considerations. Accordingly, the loan agreements for PNOC and NPC prepared annual rolling investment and financing plans.

B. Achievement of Objectives

11. **Overall.** The Project has substantially achieved its objectives, despite initial problems faced by (a) two sub-objectives with regard to introducing a least-cost power development strategy in the energy sector and encouraging greater private sector participation (especially with regard to NPC); and (b) the reshaping of the PNOC-EDC geothermal drilling program.

12. **Macroeconomic policies.** The Project contributed to the revitalization of the energy sector and improved the efficiency and capabilities of key sectoral entities (particularly NPC), all of which benefited the economic recovery of the country. These were important objectives of the Philippine CAS.

13. **Sectoral and institutional policy objectives.** The Project achieved its primary sectoral and institutional policy objectives, albeit, after initial delays. An examination of the separate sectoral and institutional policy components of the objectives follows:

(a) Developing a sector-wide capability to increase energy resources and coordinate policy implementation. The Project sought to assist OEA in playing a coordinating role in policy planning. Until 1992, sector coordination was poor and important legislation often lagged. In that year, the defunct DOE was restored to give the energy sector cabinet-level representation. This development allowed the Secretary of Energy to replace the President's Executive Council Secretary as chairman of the Energy Coordination Council (ECC), which exercised broad powers in the sector. A further development saw the OEA attached to the ECC and later transformed into DOE. DOE was reorganized into four bureaus to better deal with (a) monitoring and assisting with demand management, conservation and efficient use of energy resources; (b) formulating policies and helping develop energy resources; (c) regulating financial and fiscal policies related to energy supply entities; (d) developing and monitoring energy plans and demand forecasts; and (e) incorporating national environmental goals into energy programs. In order to handle these functions successfully, DOE needed to undertake a number of studies, provide additional training to staff, and purchase modern computers and other equipment. The Project provided financing to allow DOE to undertake these activities; however, due to substitutions of some studies and with the transformation of OEA to DOE, only about 72% of the funds allocated for these purposes under the Project were utilized. While these institutional changes did not in themselves result in the improvements in sector-wide coordination as envisioned under the Project, nevertheless, the power crisis served as a catalyst in bringing the Philippine entities together to solve the problem.

(b) Adopting a least-cost development strategy for energy development. The Government chose to defer a least-cost development strategy while the country faced a power crisis in 1991-93, and while NPC was in financial distress. To alleviate the power crisis, the Government opted for a fast-track program to attract IPPs as mentioned above. Although these projects were not necessarily least-cost options from a sectoral viewpoint, they were justified by longer-term strategic considerations in the energy sector and by the immediate benefits they brought to the economy as a whole. Only after the crisis eased did it pursue policies driven by least-cost considerations.

(c) Strengthening regulatory activities for rational consumer energy pricing and improving product and service standards. Tariff reform was to be accomplished by adopting price

adjustment mechanisms (fuel price, foreign exchange and power purchase) and by incorporating demand charges. However, such reform was initially delayed by international oil price increases caused by the Gulf War and by the power crisis, and later by NPC's financial difficulties. The tariff structure eventually adopted was revenue-neutral for NPC and was implemented in January 1995. Through an array of adjustments, it promoted energy efficiency by reducing peak power demand and by promoting the more uniform use of electricity during daylight hours.

(d) Encouraging private sector participation through joint ventures and other schemes. The role of private firms in the energy sector increased dramatically during the course of the Project, especially with regard to generation. However, this achievement was not without cost. In order to induce the Independent Power Producers (IPPs) to participate in the fast-track generation program in 1991-93, the time-slice of the least-cost development program had to undergo substantial revision. Nevertheless, the execution of the modified strategy created more favorable conditions for attracting sufficient numbers of IPPs, which proved critical to ending the power crisis -- a development that greatly facilitated the economic well-being of the country. Moreover, NPC was able to secure better terms from the IPPs as it gained greater experience in negotiating with IPPs and, with the easing of the power crisis, as it was increasingly guided by market considerations and less by crisis management. Encouraged by such results, the Government accelerated the program for the privatization of NPC's various operations in its 1992 Energy Section Action Plan (ESAP). The role of NPC was thus redefined. Its role would no longer be as a generator of power, but as a purchaser of power (mainly on a take-or-pay basis) and as an operator of the transmission system. As of end-June 1994, NPC was involved in 15 private generation projects (BOT, ROM, etc.), with some 18 more in the pipeline. The aggregate capacity of 20 projects for which data are available is about 4,000 MW, with private sector investment estimated at about US$4.2 billion. These figures surpassed the expectations at appraisal of both the Bank and the Government. The further privatization of NPC appears on track. Over the medium- to long-term, NPC will transfer its generation assets to a holding company which will spin off each individual generating plant to the private sector. The transmission function alone will remain with NPC. Privatization efforts at PNOC-Petron have also progressed. While the Government owns 40% of the shares of the company and Saudi Aramco holds another 40%, the remaining 20% is owned by about half a million Filipino stockholders. Petron has sought the Bank's consent to prepay the entire loan proceeds of US$20 million, which it had utilized for upgrading two facilities. PNOC-EDC also sought greater private sector participation by attracting IPPs into BOTs to convert over 600 MW of steam to electricity from fields in Leyte. This steam resource was partly identified by the current Project, and is being exploited by the Bank-financed Leyte-Luzon Geothermal Project (Loan no. 3747-PH) and the Leyte-Cebu Geothermal Project (Loan no. 3702-PH). The Project also advanced privatization efforts at PNOC, which utilized a small technical assistance component to facilitate privatization of its subsidiaries.

(e) Improving environmental standards and monitoring in areas of high energy use or resource development. This involved the modernization of environmental monitoring facilities and capabilities in response to energy developments. The Project succeeded by and large in enhancing the quality and competence of the EMB. It is now better equipped, and its personnel better trained with consultant assistance, to carry out its various functions. However, EMB was only able to utilize 75% of its allocation, as delays at the Department of Budget prevented the timely release of funds under the Project.

(f) Enhancing the technical capabilities of sector institutions. The Project improved the technical capabilities of ERB staff by financing their participation in various local and foreign

training courses, conferences and seminars, and by supporting technical assistance in regulatory procedures, price and tariff determination, and related subjects. ERB acquired new capabilities to discharge its responsibilities with respect to inspecting and enforcing conformity to standards of metering equipment, petroleum products, etc. ERB also acquired computer hardware and software under the Project. The Project financed technical training for staff at NEA, as well as at the Rural Electrical Cooperatives (RECs) which NEA oversees. Such training allowed the RECs to upgrade and rehabilitate critical transformer/substations and distribution equipment. It also laid the groundwork for a broader development agenda for the RECs, which was addressed under the subsequent Rural Electrification Revitalization Project (Loan no. 3439-PH).

14. **Financing objective.** The total investment program under the Project was to be financed from four sources: (a) World Bank loans (with JEximbank parallel financing); (b) other committed loans (including from bilateral sources); (c) other uncommitted loans; and (d) internal cash generation. While adequate financial mobilization from external sources was largely realized (primarily due to interventions by IPPs under BOT contracts), counterpart financing for the Bank component from internal cash generation was found wanting, particularly with regard to NPC. This development was not anticipated by the Bank in its appraisal in 1989, at which time the Philippine economy and the energy sector were both growing by 5% annually. However, this situation changed dramatically as a series of events unfolded which impacted the sector in general and NPC in particular: the lack of a replacement for the Bataan nuclear power plant and the breakdowns of badly maintained thermal plants, combined with the effects of the drought, which precipitated a period of extended brown-outs; the Gulf War, the increase in international oil prices, and Peso devaluation, which impacted on both NPC's costs and revenues; and NPC's asset undervaluation and the political unpopularity regarding tariff increases, which further compounded NPC's abilities to increase revenues. As a result, NPC became in technical default of its loan covenants and was unable to attend adequately to its investment program. All of this coincided with (and contributed to) the country's power crisis. These problems caused a delay in the effectiveness of the JEximbank loan until October 23, 1992, and the extension of its closing date until December 31, 1996. While the Bank has been able to disburse 95% of its loan to NPC, JEximbank disbursements have been slow, but Jeximbank is expected to disburse about US$62 million by end-1996, against US$150 million which was made available.

15. **Physical objectives.** The overall physical objectives of the Project were substantially achieved. The physical objectives of the sector program in geothermal exploration, power generation and transmission were substantially achieved, albeit, with an increased focus on fossil fuel-based generation.

16. **NPC.** The construction of the Palimpinon II (2x20MW) four modular geothermal power plant commenced on May 13, 1992. All four units became operational between February 1994 and May 1995. While the cost of Palimpinon II was originally estimated at US$80.2 million, the eventual cost totaled US$105.1 million, reflecting increases associated with implementation delays and exchange rate losses. The procurement of 69kV transmission line materials for Luzon, Visayas, Mindanao, and the Small Island grid have been completed, and some transmission lines in Luzon and Visayas have already been erected and energized. The US$200 million Bank loan for these purposes has been fully disbursed. The remaining transmission system construction will be financed by JEximbank (70%) and by NPC's internal cash generation (30%).

17. The contract for the rehabilitation of the Ambuklao hydroelectric plant was terminated effective November 1, 1991 to encourage private financing. The rehabilitation is now

being effected under an ROL agreement by a consortium including MERALCO Industrial Engineering Services Corporation, Morrison-Knudsen Corporation, Mindanao Shipbuilding Corporation, and J.G.S. International Corporation.

18. **PNOC-Petron.** PNOC-Petron successfully upgraded two facilities at its refinery under the Project. The Gas Oil Desulfurizer Unit (GODU) was commissioned on April 23, 1995 and the LPG treating facilities were completed on February 25, 1995. During the performance test-run, the GODU operated with a sulfur product of 0.12 wt % based on a 1.33 % feed sulfur content. The LPG produced yield has increased by 13%, equivalent to a 400 barrels per day increase in LPG production, but this was below 1990 projections.

19. **PNOC-EDC.** PNOC-EDC drilled 38 of the 76 geothermal exploration wells in Luzon, but the results were disappointing, as large geothermal reserves in commercial quantities were not discovered. Priorities then shifted to Leyte, where 28 of the wells had been drilled. The target commission dates were postponed, while completion of resource assessment and development strategy targets were met between one and two years later than scheduled. Despite these delays and the lack of commercially viable geothermal resources in Luzon, PNOC-EDC has continued exploiting geothermal resources in Leyte under two subsequent Bank-funded projects, and in new BOT ventures.

20. **NEA.** The Project provided for the rehabilitation of 12 RECs and financed an additional eight substations and 21 power transformers and substation packages.

21. **Economic Rate of Return.** The economic rate of return for the project has been computed at 13.5%. This computation did not follow the methodology used in the SAR. The earlier methodology did not make allowance for the role of independent power production, which has become very prominent in the interim, and therefore would likely overestimate the value of the project's benefits. Because of this new phenomenon, NPC's investment streams have focused on lower return rehabilitation/retrofitting of old plants and transmission networks, and not on new generation capacity. The 13.5% ERR assumes that the economic value of a kWh of electricity sold to the distributors at high voltage terminals, after transmission in the main grids, is US7cents/kWh (in 1994 terms). This, in fact is approximately the amount currently being realized through existing tariffs. This ERR of 13.5%, without having to bring into reckoning "consumer surplus," is indeed satisfactory. While it is somewhat lower than the 17% computed at appraisal, a value comparable to the appraisal estimate would have been likely had the original methodology been followed.

C. Major Factors Affecting the Project

22. The major factors affecting the achievement of Project objectives were mainly those subject to the control of the Government or the implementing agencies, and the risks associated with exploration.

23. **Factors generally subject to Government control.** The main factors affecting the achievement of Project objectives at this level included tradeoffs between the pursuit of a least-cost or a fast-track strategy, the politicization of tariff adjustments, the weak financial position of NPC, and delayed budgetary allocations to ERB and EMB.

24. In its drive to end the power crisis (power outages and brown-outs of the late 80s and early 90s), the Government was anxious to attract private interest in fast-track power generation,

even assuming some commercial risks itself. It accomplished this by supplying fuel at its own cost to IPPs, by providing counter-guarantees on NPC guarantees for take-or-pay contracts, and by offering incentives for power production above contracted quantities. At first, the IPPs installed mostly gas turbines. These were favored because of their low gestation time and relatively lower capital costs; however, their operational costs were relatively high as typifies peaking facilities used for base load generation. Relieved from the pressures of the power crisis, NPC was able to introduce competition in the selection of IPPs and choose lower generation cost through longer lead-time projects, thus achieving much lower generation costs.

25. The politicization of tariff reform brought to the forefront a controversy concerning NPC's exemption from fuel taxes. These taxes were assessed and collected at P2,950 million in 1992, but not refunded (as was the normal practice) in view of the controversy. The Supreme Court eventually ruled in favor of the exemption, greatly facilitating NPC's financial recovery.

26. By 1991, NPC's financial situation had deteriorated to the extent that its rate of return was just 3% against the covenanted 8%, and the debt service ratio dropped to 0.9, the lowest level since 1985. As a result, NPC was in technical default of loan covenants as stipulated by the Energy Sector Project and the Bacon-Manito Geothermal Project (Loan nos. 29690-PH and 29691-PH). NPC's situation was, in part, precipitated by factors beyond its control, including the devaluation of the Philippine Peso in 1990, the catastrophic droughts in Mindanao, and the upsurge in oil prices caused by the Gulf War. However, NPC contributed to its travails by its failure to disclose its true financial condition during 1987-90, when it resorted to a limited revaluation of its assets and depressed its rate base. Had it carried out a full revaluation -- as was done subsequently with consultants in 1992-93 -- the drastic remedies administered through a reform program in 1992 might not have been necessary. At present, NPC's financial condition is satisfactory; however, to maintain its financial health, NPC must remain vigilant. NPC, in its own evaluation of the Project, states this as a key lesson learned.

27. **Factors under the control of the implementing agencies.** Factors relating to NPC were partially addressed in the previous paragraph, as they interrelated with Government actions, but other factors exclusive to NPC affected the achievement of Project objectives. For one, NPC's organizational weakness led to its fighting "brush fires" under exigencies of power outages and brown-outs, diluting its attention from construction and expansion projects. Implementation delays (in procurement, engineering design, and right-of-way acquisitions) in the course of the Project became endemic with NPC, a feature from which it is now recovering.

28. While other implementing agencies did not face this range of problems, the encountered delays in start-up and implementation, owing to their unfamiliarity with Bank procurement procedures and with the preparation and evaluation of bid documents.

29. PNOC-EDC tended to be overly optimistic, both in planning for the number of delineation/development wells to be drilled at geothermal sites in Luzon and in estimating the power capacity from the geothermal steam these were to provide. The original program had to be revised drastically downwards mid-way through the project cycle and the geographical focus had to be shifted to Leyte (which proved a fruitful move). It seems advisable, in planning for delineation/development of uncertain prospects and providing for funds, that probability assessment techniques be used (e.g., Monte Carlo).

D. Project Sustainability

30. Project sustainability appears likely. At the macro level, the economy has been recovering. The country has resolved the power crisis and appears to have learned from this experience. This resolution also allowed Project objectives to come back into play. The energy sector looks set to enjoy orderly energy growth with cost optimization. The DOE, since its restoration in 1992, and with renewed authority over the various entities in the energy sector, has been framing pragmatic energy policies and medium- to long-term plans. The Medium-Term Energy Plan (1993-2000) was initiated in 1993 and was updated as the Philippine Energy Plan (1994-2010) in 1994. DOE is also cognizant of emerging issues, such as demand side management and energy conservation. It is also mindful of the financial implications and timing of new capacity additions by IPPs. Such prudence is important, as a mismatch between guaranteed purchases of power and NPC's forecasts of sales growth or readiness to receive supplies could be financially costly, but power outages must be avoided in the end.

31. A number of reforms in the pipeline would carry forward the process of orderly energy growth, including: (a) restructuring NPC and privatizing its various generation plants; (b) developing an independent transmission company (NPC may be wholly assuming this function) which will provide IPPs with open access to the power market and thus introduce competition among power suppliers; (c) deregulating energy pricing (targeted for end-1996); (d) strengthening the capabilities of NPC's BOT Center to ensure competitive private investments; and (e) developing adequate projects suitable for private participation. NPC's latest effort to reward and promote good performance, its Productivity Enhancement Program, should also contribute to sustainability.

32. Further, the allocation of risks between the Government and its entities on the one hand, and the private sector on the other, is being studied. This analysis will focus in particular on policies guiding guarantees and pricing. Limits on the overall use of guarantees, consistent with a realistic evaluation of the country's fiscal capacity and macroeconomic priorities, will be part of this initiative.

33. Finally, the Bank's CAS will support the strengthening of infrastructure to ensure that new generation capacity will benefit the public at large. The Bank's continued participation in the energy sector (as detailed above) is expected to reinforce the prospective policy thrusts that the Government is currently contemplating.

E. Bank Performance

34. **Preparation.** Bank performance with regard to Project preparation was satisfactory. Project identification was carried out in conjunction with the beneficiary institutions, and flowed from previous work with the same parties during the preparation of the Energy Sector Study. While the objectives of the Project were clear, the Project was necessarily complex, owing to the participation of eight separate beneficiaries, and its sector-wide scope. This complexity allowed for a degree of innovation with regard to Project design, and called for a great deal of effort on the part of Bank staff. Since the Project was financing only a time-slice of the investment program (of which there were many sub-projects), suitable sub-projects were selected from a rolling list which was prepared annually. The Project afforded additional flexibility by allowing the beneficiary institutions to seek alternative financing arrangements using Bank funds as a backstop. Since it was anticipated that some sub-projects would involve BOTs, an innovative mechanism for financing procurement was worked out for such cases, though never used, apparently due to the perceived burden of

complying with Bank procurement procedures. With regard to environmental considerations, the Bank reserved the right to review the Environmental Impact Assessment, and stipulated that it must be satisfied before the Bank could approve the use of loan proceeds for particular sub-projects. The geothermal development around Mt. Apo was excluded from the 1989-93 time-slice until an environmental assessment could be completed, but given the continuous protests by NGOs regarding the environmental impact of such development, it was subsequently dropped from consideration for Bank financing.

35. **Appraisal.** Bank performance with regard to appraisal was satisfactory, especially given the complexity of the Project. In fact, one Executive Director commented that the Project was a "well designed operation which is central to the Bank's Assistance to the Philippines." However, it should be pointed out that, between the first appraisal mission in July 1989 and the first supervision in June 1990, when Bank staff were concentrating on the loan approval process, the financial situation of NPC quickly deteriorated. While the Bank had recognized that NPC's finances were weak from the on-set, it had not fully appreciated the severity of its financial position, nor anticipated how vulnerable NPC was to the exogenous factors which quickly brought about its financial crisis (para. 14). However, the Bank was quick to adapt its supervision priorities and respond to NPC's financial crisis by providing strong support during the crisis that followed.

36. **Supervision.** Bank supervision was satisfactory. Given the complexity of the Project and the fact that there were eight Philippine entities involved (para. 8), supervision efforts focused on a few, key issues. With regard to NPC, the aim was on alleviating its financial problems, compliance with legal covenants, improving its efficiency, and encouraging private participation in generation and privatization. With regard to PNOC-EDC, supervision was more hands-on, with Bank staff involved in implementing sub-projects and in guiding the steps for BOT power generation. The DOE entities did not require much supervision given the relatively simple scope of their participation.

F. Borrower Performance

37. **Preparation.** Overall project preparation by the Borrowers was satisfactory. Such preparation was in large part a follow-up on the Bank's Energy Sector Study (1988) and to the Government's Statement of Energy Policy, as the sector reforms embodied in the Project (e.g., privatization, least-cost development, economic prices, etc.) were set out in these earlier works. In such a framework, NPC, OEA and PNOC drew up action plans and investment programs which could be coordinated, yielding economies of scale and scope. However, NPC made overly optimistic assumptions about its internal cash generating capabilities, and this error, in combination with a number of exogenous factors, contributed to its financial distress -- and to subsequent problems with implementation and performance.

38. **Implementation.** The overall implementation performance of DOE, EMB, ERB, NEA and PNOC was satisfactory. In the case of NPC, Project implementation was unsatisfactory in the early years, due to its absorption in the pursuit of private investment, but improved with the easing of the power crisis and its own financial recovery. Project implementation problems included slow disbursement, procurement complications, delays in the availability of counterpart funding, and delays in acquiring rights-of-way. There was further a deferment in the effectiveness date of parallel financing by JEximbank, resulting in a delay in the implementation of the subproject, which is not expected to be completed until 1996.

G. Assessment of Outcome

39. The outcome of the Project was satisfactory. The Project substantially achieved its major objectives, given the changed environment, and is likely to achieve satisfactory development results with only a few shortcomings. Annex A Table 1b provides a breakdown of the extent to which estimates in the SAR were realized.

H. Future Operations

40. At the sectoral level, future operation would be greatly advanced by undertaking appropriate measures to improve the private business environment, strengthen policy formulation, and ensure efficient project implementation. The Bank has succeeded in shaping a favorable investment climate, despite its relatively minor resource commitment. Further, the Bank will continue its on-going dialogue with the Borrowers in the course of follow-on projects, further improving the operating environment. In addition, DOE has mapped out a comprehensive restructuring of the energy sector to be accomplished in three phases (Annex B, Table 2). Phase one (1994-98) is directed at strengthening all sectors and participants in the industry, restructuring generation and transmission, facilitating coordination, and preparing the industry for increased competition, privatization and decentralization. Phase two (1998-99) will focus on evaluating results and further restructuring and privatization. Phase three (1999-04) envisions moving into a completed restructured and competitive environment. With respected to the operating units of NEA, NPC and PNOC financed under the Project during Phase I, the associated measures should help guarantee proper maintenance of their respective operations.

I. Key Lessons Learned

41. It would be trite to state that any commercial institution must maintain a continuous vigil over its financial position. However, considering the experience of NPC, this lesson bears restatement. Financial and commercial policies must be adopted with due consideration of their ultimate consequences. Exigencies of operation must not result in onerous financial conditions, as it could have long-term repercussions. It would be desirable that NPC study the implications of the several IPP contracts it has signed with take-or-pay clauses and high plant factors. While contract conditions must be honored, NPC should have a clear idea of the problems which may arise from such obligations, including the problems associated with coordination of the IPPs.

42. Privatization can succeed if implementing agencies are committed to the new policy paradigm, take bold but flexible steps, and institutions provide incentives for prospective participants (such as IPPs). In the design of future energy sector projects, policymakers and managers need to recognize how and when to modify (or abandon) conventional assumptions, and to apply a strategy that will introduce innovative solutions in a fast-changing global economic environment. For example, to resolve the power crisis, it was necessary drop the belief/paradigm that NPC should/could have a monopoly on the energy supply in the Philippines. This paradigm shift made private funding possible.

43. Private investment must be secured under competitive conditions to ensure that market forces help achieve least-cost solutions. Investors must be expected to bear all commercial risks. Where exigencies of circumstances, such as the pressing need for external capital/new technology, obliges governments or their agencies to assume some of the commercial risks, there

should be a thorough analysis of the long-term implications with objective, expert assistance, and then the terms of such offers should be negotiated on fair terms for both sides.

44. Bank guidelines for procurement have uniformly been appreciated by the Borrowers for their transparency and integrity of the processes involved, yet developing a mastery of these guidelines seems to be a protracted undertaking. Apart from the Bank educating concerned personnel of the Borrowers (even during appraisal), it may be worthwhile to require borrowers to maintain continuity of key personnel to handle procurement from loan to loan.

45. Given the complexity of the Project and the critical nature of the work which needed to be carried out during supervision, particularly regarding NPC's financial situation and implementation problems, the Bank could have undertaken more initiatives to make such supervision more effective. One approach would be to consider some of the topics during supervision that are normally considered during an ICR exercise (Borrower performance, Bank performance, Lessons Learned, etc.) so that supervision would become more of a proactive exercise and any lessons could be applied during the course of the Project, when they would be most useful. Moreover, a more judicious allocation of responsibilities among professional staff may be called for in order to cover as much ground as possible, with the possibility of rotating Task Managers.

IMPLEMENTATION COMPLETION REPORT
PHILIPPINES
ENERGY SECTOR PROJECT
(Loan nos. 3163-PH, 3164-PH, 3165-PH)

PART II: STATISTICAL ANNEXES
ANNEX A: STATISTICAL TABLES

Table 1: Summary of Assessment

A. Achievement of objectives	Substantial	Partial	Negligible	Not applicable
	(/)	(/)	(/)	(/)
Macroeconomic policies	☒	☐	☐	☐
Sector policies	☒	☐	☐	☐
Financial objectives	☒	☐	☐	☐
Institutional development	☒	☐	☐	☐
Physical objectives	☒	☐	☐	☐
Poverty reduction	☐	☒	☐	☐
Gender concerns	☐	☐	☐	☒
Other social objectives	☐	☐	☐	☒
Environmental objectives	☐	☒	☐	☐
Public sector management	☐	☒	☐	☐
Private sector development	☒	☐	☐	☐
Economic benefits	☒	☐	☐	☐

B. Project Sustainability	Likely	Unlikely	Uncertain 1/
	(/)	(/)	(/)
	☒	☐	☐

C. Bank Performance	Highly Satisfactory	Satisfactory	Deficient
	(/)	(/)	(/)
Identification	☐	☒	☐
Preparation assistance	☐	☒	☐
Appraisal	☐	☒	☐
Supervision	☐	☒	☐

D. Borrower Performance	Highly Satisfactory	Satisfactory	Deficient
	(/)	(/)	(/)
NPC (Loan 3163-PH)			
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☐	☒
Operation (if applicable)	☐	☐	☐
PNOC (Loan 3164-PH)			
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐

D. Borrower Performance	Highly Satisfactory (/)	Satisfactory (/)	Deficient (/)
PNOC--EDC (Loan 3164-PH)			
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐
PNOC -PETRON(Loan 3164-PH)			
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐
DOE (Loan 3165-PH)	(/)	(/)	(/)
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐
ERB (Loan 3165-PH)	(/)	(/)	(/)
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐
NEA (Loan 3165-PH)	(/)	(/)	(/)
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐
EMB (Loan 3165-PH)	(/)	(/)	(/)
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☒	☐
Operation (if applicable)	☐	☐	☐

E. Assessment of Outcome	Highly Satisfactory (/)	Satisfactory (/)	Deficient (/)
	☐	☒	☐

Table 1b: Summary of Assessment
(Overview: Expectations and Performance)

Brower	Beneficiary agency	Core goals of ESP	Results achieved	SAR estimates of project costs 1989-1993 $M	Actual project costs 1990-1995 * $M	Bank loan amount $ M	Bank loan utilized $ M
GOP L3163-PH	OEA/DOE	Lead & coordinate sector activities;	DOE under a full time Secretary in Charge of Energy affairs created;	4.3	3.1	4.3	3.1
		Carry out studies with expert help.	Done, and findings used for policy				
	ERB	Raise professional competence to regulate energy prices/inspection.	Done, more remains to be done	3.0	3.5	3.0	3.5
	EMB	Raise professional competence to safeguard the environment implementing energy projects	Done, but more remains to be done	12.2	7.8	10.1	7.8
	NEA	Boost rural electrification, where moribund pending a comprehensive revitalization project	First-aid type assistance provided. Revitalization of project is ongoing	26.5	18.3	22.6	18.3
	Subtotal			46.0	32.7	40.0	32.7
NPC L3163-PH)	NPC	Adopt a least cost development program over 1989-93 and optimize investments/returns; invoke private participation, etc.	Energy crisis and financial woes of NPC in 1990-91 upset the program; but this accelerated private investments in power generation - initial fast track projects were not cost effective, but subsequent ones were, mainly due to market competition and enormous interest in the Philippines. If NPC had been more alert in 1990, the financial crisis would have been mitigated and drastic steps of the Recovery program enforced by IMF with Bank support obviated	2722.0	2292.0	200.0	200.0
PNOC-L314-PH	PNOC-EDC	Develop Steam Delivery in Luzon/ Visayas & Provide a local economic resources for power generation, seek private, participation	Luzon did not keep its promises, so PNOC-EDC diverted attention to Leyte where there has been success; and BOTs will convert steam to electricity.	466.0	265.0	133.0	118.0
	Petron	Upgrade quality of diesel oil/ increase LPG production/ privatize	Done in all respects	29.0	37.0	14.0	20
	PNOC	Re-orient towards privatization of almost all its subsidiaries	Largely done; PNOC-EDC will also be privatized in the coming two years.	3.0	1.3	3.0	1.3
	Subtotal			498.0	303..3	150.0	139.3
	Total Project Loan Disbursement			3266.0	2628.0	390.0	372.0
	% actual to Planned Disbursements			100%	80%	100%	95%
	Overall Economic Rate of Return			17.0%	13.5%		

*Includes costs financed from Energy Sector Project loan. For breakdown of total cost and financing- see table 8A & 8B

Table 2: Related Bank Loans

Loan/credit title	Purpose	Year of approval	Status
Preceding operations			
Loan 2201-PH & 2202-PH Petroleum Exploration Promotion Project	Promote private oil companies in petroleum exploration and strengthen the expoloration capabilites of Bureau of Energy and PNOC.	1982	Closed
Loan 2203-PH Geothermal Exploration Project	Improve national strategy for geothermal exploration, government geothermal development policy and institutions; facilitate private involvement in geothermal exploration etc.	1982	Closed
Loan 2969-PH Bacon-Manito Geothermal Power Project	Support the least cost source incremental capacity for Luzon grid; and strengthen institutional capabilities and financial viability	1988	Closing
Loan 3084-PH Manila Power Distribution	Improve MERALCO's sub- transmission and distribution system and its institutional capacity	1989	Active
Following operations			
JEXIM NPC- JEXIM component of Loan 3163-PH	First phase of a least-cost energy sector development program	1992	Active
Loan 3439-PH Rural Electrification Revitalization Project	Enhance National Electrification Administration's effectiveness, REC's Investment Program for 1992-95	1992	Active
L3626-PH NPC-Power Transmission & Rehabilitation Project	Alleviate power shortage in Luzon	1993	Active
Loan 3700-PH/Loan 3702-PH NPC-Leyte-Cebu Geothermal Project	Develop geothermal resources for power generation, strengthen institutions and their financial viability.	1994	Active
Loan 3746-PH/Loan 3747-PH NPC-Leyte-Luzon Geothermal Project	Develop geothermal resources for power generation, strengthen institutions and their financial viability	1994	Active
Loan -PH Power Transmission & Rehabilitation	Support the Government's plan to restructure the National Power Corporation and power sector privatization	1996	Appraisal stage

Table 3: Project Timetable

Steps in project cycle	Date planned	Date actual/latest estimate
Identification	October 1988	October 1988
Preparation	May 1989	May 1989
Appraisal	June 1989	June 1989
Negotiations	October 1989	October 1989
Board presentation	January 1990	February 1, 1990
Signing	March 1990	March 16, 1990
Effectiveness	May 1990	June 12, 1990
Project completion	December 31, 1994	December 31, 1995
Loan closing (Loan 3163-PH))	December 31, 1994	June 30, 1995
Loan closing (Loan 3164-PH, 3165-PH)	December 31, 1994	December 31, 1995

Table 4: Loan Disbursements: Cumulative Estimated and Actual

(US$ million)

Bank FY	FY90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	15.00	70.00	160.00	280.00	372.00	390.00	
Actual	15.00	82.53	155.90	234.18	315.01	368.96	370.77
Actual as % of estimate	100	115	93	83	82	94	95

a) Loan 3163-PH: National Power Corporation

Bank FY	FY90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	6.00	26.00	62.00	127.00	189.00	200.00	
Actual	!5.00	53.32	100.04	159.00	188.18	200.00	
Actual as % of estimate	250	211	161	124	96.0	100%	

b) Loan 3164-PH: Philippines National Oil Company

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	6.0	28.0	64.0	112.0	142.0	150.0	
Actual	0.0	19.82	36.97	54.61	105.05	139.21	139.31
Actual as % of estimate	0	7168	58	49	105.05	93	93

b1) Loan 3164-PH: PNOC-EDC

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal/revised estimate*	2.5	33.3	65.5	122.1	133.0	133.0	
Actual	0.0	19.0	33.7	49.6	84.3	117.9	118
Actual as % of estimate	0	57	51	40	63	89	89

*Revised appraisal estimate not consistent with appraisal disbursement for the loan as a whole.

b2) Loan 3164-PH: Petron Corporation (Part A (2) of Loan Agreement)

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate*							
Actual	0.0	0.52	2.94	4.36	19.97	19.97	
Actual as % of estimate							

*Planned disbursement for part A(2) of loan agreement not available in appraisal document. Figure only for total loan.

c) Loan 3165-PH: Republic of the Philippines

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	3.0	16.0	33.3	40.0			
Actual	0.00	6.50	14.88	22.16	25.83	28.61	32.70
Actual as % of estimate	0	41	44	55	64	72	80

c1) Loan 3165-PH: Department of Energy (DOE/formerly OEA)

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	0.50	2.50	4.30				
Actual	0.34	0.53	0.68	1.26	1.91	2.53	3.11
Actual as % of estimate	68	21	16	29	44	59	72

c2) Loan 3165-PH: Energy Regulatory Board (ERB)

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	0.50	2.50	3.00				
Actual	0.00	0.08	1.21	1.97	2.39	3.45	3.45
Actual as % of estimate	0	3	40	66	80	115	

c3) Loan 3165-PH: National Electrification Administration (NEA)

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	1.00	7.00	16.60	22.30			
Actual	0.00	8.78	16.87	16.87	16.87	18.33	18.33
Actual as % of estimate	0	87	90	80	80	81	

c4) Loan 3165-PH: Environmental Management Bureau (EMB)

Bank FY	FY 90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	1.00	4.00	9.40	10.40			
Actual			0.13	0.47	0.61	5.44	7.80
Actual as % of estimate			1	5	6	52	75

Loan 3163-PH final transaction on February 23, 1995.
Loan 3164-PH final transaction on April 15, 1996.
Loan 3165-PH final transaction on May 3, 1996.

Table 5: Key Indicators for Project Implementation

a) Loan 3163-PH: NPC

(As of June 30, 1995)

Components	Location	Appraisal estimates			Actual or latest estimates		
		Capacity (MW/KV)	Completion year	Total cost	Capacity (MW)	Completio n year	Total cost
Geothermal Palimpinon II	Visayas	4 X 20 MW	1992	80.20	4X20MW	2/1/94	109.11
Rehabilitation-Thermal (oil)Sucat 2&3 (advance procurement)	Luzon	400 MW	1991	114.9	400 MW	12/31/94?	2.28
69KV transmission lines and New Island Grid transmission Lines	Luzon, Visayas & Mindanao	670 km 747.5 km 400 km 1818.5km	1993	51.5	634km 199.9km 484.2km 1318.1km	continued under JEXIM	21.91

Table 5: Key Indicators for Project Implementation

b) Loan 3163-PH: NPC's Generating Capacity from Independent Power Producers(IPPs) by Source of Energy (MW)

Private Capacity	Source of Energy				
	Oil	Coal	Geothermal	Hydroelectric	Total
Year 1993					
Benguet Hydro				22	22
Sucat Land Base	30				30
Subic-Zambales	28				28
Gas Turbin Barges	150				150
Subic-Zambales	108				108
Novatas GT	100				100
Limay CC GT	210				210
MacbanBinary Geothermal			16		16
Clark Base Diesel	50				50
Pinamucan Batangas	150				150
Binga Hydro				100	100
Maibara Geo			13		13
Calaca Batangas	90				90
Limay, Bataan CC	210				210
Tomen Diesel	40				40
NSC Diesel	50				50
Iligan Diesel	98				98
Year 1994					
Bataan EPZA Diesel	58				58
North Harbor Barge	90				90
Cavite EPZA Diesel	63				63
Bacman Geothermal			16		16
Malya Skid Mounted	50				50
Engg Island Barge	100				100
Novatas Diesel Barge	120				120
Limay CC Cycle B	90				90
Limay CC Cycle B	90				90
Bauang, La Union	215				215
Ambuklao			75		75
Mindanao Barges	200				200
Year 1995					
Pagbilao, Quezon I		350			350
Year 1996					
Pagbilao, Quezon II		350			350
Leyte-Cebu Geothermal			200		200
Year 1997					
Leyte-Luzon Geothermal			440		440
Year 1998					
Mindanao Geothermal			240		240
Year 1999					
Sual Pangasinan		1000			1000
Total	2345	1700	925	197	5167
Percentage	45%	33%	18%	4%	100%

Table 5: Key Indicators for Project Implementation

c) Loan 3164-PH: PNOC-EDC - Resource Assessment & Development Strategy

Subprojects	SAR estimates				Actual			
	Capacity MW	Target Commissioning	Completion of Resource Assessment	Completion of Development Strategy	Capacity MW	Date Commissioned	Completion of Resource Assessment	Completion of Development Strategy
Bacman I&II	40	1992	Dec. 1988	Apr. 1989	40	1993	Dec. 1988	Apr. 1989
Pinatubo	60	1993	Dec. 1989	Apr. 1990	-	abandoned	Apr. 1990	-
Natib	60	1993	Dec. 1989	Apr. 1990	-	abandoned	Jan. 1990	-
Bulusan	60	1994	Dec. 1990	Apr. 1991	-	need further evaluation	N/A	N/A
Labo/de Gallego	120	1994	Jul. 1990	Oct. 1990	120	1997	Apr. 1993	3rd. Q. 1995
Cagua	40	1994	Jun. 1990	Oct. 1990	-	-	Aug. 1991	N/A
No. Negros	40	1994	Jun. 1991	Oct. 1991	40	1997	Mar. 1995	Jun. 1995
Apo I	120	1993	Dec. 1988	Jun. 1989	120	1994/96	Dec. 1988	Jun. 1989
Upper Mahiao	110	1995	Jun. 1990	Dec. 1990	130	1996	Jun. 1990	May 1992
Maltibog	110	1995	Jun. 1990	Dec. 1990	240	1996/97	Jun. 1990	May 1992
Mahanagdong	110	1995	Feb. 1991	Nov. 1991	165	1997	Feb. 1991	May 1992
Alto Peak					80	1997	Feb. 1993	N/A

Table 5: Key Indicators for Project Implementation

d) Loan 3164-PH: PNOC-EDC- Drilling Program Implementation

	Appraisal Targets						Actual/latest outlook						
	1989	1990	1991	1992	1993	Total	1990	1991	1992	1993	1994	1995	Total
Bacman II		3	4			7	2	1					3
			5	5		10							0
Natib	1	4	5	5		15							0
Labo	1		5	5	9	20					2	1	3
Bulusan	1	1	5	5	2	14							0
Cagua	1	3		5	1	10							0
N.Negros						0					3	1	4
Leyte						0	3	4	6	6	9		28
Total	4	11	24	25	12	76	5	5	6	6	14	2	38

Table 5: Key Indicators for Project Implementation

e) Loan 3164-PH: PNOC-Petron

	Item	Per Approved Schedule	Actual	Variance
1	Contract negotiation/finalization of basic design consultancy	1 month	2 1/2 months	1 1/2 months
2.	Approvals (PNOC/BIRD) & signing letter of intent	1 month	3 months	2 months
3.	Slack from signing of LOI to start of design works	0 month	1 month	1 month
4.	Basic design	3 months	6 months	3 months
5.	ITB package third party review	0 month	2 months	2 months
6.	Solicitation of additional bids	0 month	7 months	7 months
7.	Award approval (PNOC/IBRD)	1 month	2 months	1 month
	Total	6 months	23 1/2 months	17 1/2 months

Table 6: Key Indicators for Project Operation

a) Loan 3163-PH: National Power Corporation

FY ended	1986	1988		1989	1993	1989	1990	1991	1992	1993	1994	1995
	....Actual....			.....Projected.....		.....Actual or latest estimates.....						
Key operating indicators In SAR												
Physical:												
Energy sales ('000 gwh)	17.6	21.2		22.9	31.8	22.2	22.9	23.6	24.0	24.9	28.7	30.7
Financial :												
Operating revenue (P billion)	17.5	19.8		22	48.9	20.6	25.8	32.3	37.6	40.5	50.5	54.7
Average net revenue (ctv/kwh)	96.8	93.5		96.3	155.2	93	112	140	158	164	177	181
Net operating Income (P billion)	0.7	5.6		5.5	9.6	2.4	1.0	-3.7	7.1	6.8	12.1	9.8
NPC Investments:												
FY	1989	1990	1991	1992	1993	1989	1990	1991	1992	1993	1994	1995
Capital expenditures	13.3	15	16.8	19.4	23.4	6.6	11.2	9.7	14.7	28.6	36.6	37.1
Internal cash generation	4.6	6.9	10.7	10.3	9.5	-0.2	2.2	-4.9	11.6	10.0	23.2	24.9
Shortfall (financing requirement)	8.7	8.1	6.1	9.1	13.8	6.8	8.9	14.6	3.1	18.6	13.5	12.2
Financing												
Local component	5.0	4.9	5.7	7.4	8.5	0.3	0.6	2.5	4.5	9.5	11.9	15.5
Foreign component	8.3	10.1	11.1	12.1	14.9	8.49	10.2	10.7	10.2	19.0	24.8	21.6

Table 6: Key Indicators for Project Operation

b) Loan 3164-PH: Philippines National Oil Company

FY ended	1986	1988	1989	1993	1989	1990	1991	1992	1993	1994	1995
	....Actual....		.....Projected....		.....Actual or latest estimates.....						
Key Operating Indicators In SAR											
Physical:											
Petroleum product sales (million barrels)	21	32.1	33.3	46.5	36.3	40.4	40.3	46.2	51.5	54.2	54.3
Coal sales ('000 tons)	4.19	874	1061	1103	578	726	853	575	648	746	906.8
Geothermal sales (Gwh)	605	738	990	3664	1486	1487	1498	1493	1912	2240	2201
Financial :											
Revenues (P billion)	15.7	20.4	21.5	41.8	21.3	33.7	46.7	43.2	47.8	25.2	4.3
Net earnings (P billion)	0.4	1.3	1.2	3.5	1.6	1.7	2.0	2.5	3.5	19.2	2.4
Return on capital employed (%)	9.6	9.8	10.4	10.4	10.8	10.8	9.7	10.3	11.7	45.5	7.1

Table 6: Key Indicators for Project Operation

c) Loan 3164-PH: Philippines National Oil Company-Energy Development Corporation

FY ended	1986	1988	1989	1993	1989	1990	1991	1992	1993	1994	1995*
	....Actual....		.....Projected....		.....Actual or latest estimates.....						
Key Operating Indicators In SAR											
Financial :											
Revenues (P million)	391	544	681	3,240	1041	1211	1367	1500	1970	2285	2275
Net earnings (P million)	38	114	144	1,632	276	387	395	422	607	1207	730
Return on capital employed (%)	2.2	2.4	3.2	8.5	8.6	11.2	11.2	16.6	10.2	11.0	7.4

* Unaudited

Table 6: Key Indicators for Project Operation

d) Loan 3164-PH: Philippines National Oil Company-Petron Corporation

FY ended	1986	1988	1989	1993	1989	1990	1991	1992	1993	1994	1995
	Actual		Projected		.....Actual or latest estimates.....						
Key Operating Indicators In SAR											
Financial :											
Revenues (P million)	391	544	681	3,240	19103	30995	43495	40712	44938	45943	44641
Net earnings (P million)	38	114	144	1,632	859	868	1153	1472	2777	3736	4020
Return on capital employed (%)	2.2	2.4	3.2	8.5	9	7	10	10	14	15	18

Table 7: Studies Included in Project

Study/technical assistance	Purpose as defined at appraisal/redefined	Status	Impact of study
DOE/OEA/ Loan 3165-PH			
A. Environmental Impacts of Accelerated Geothermal Energy Development	Study sites producing geothermal steam and examine the environmental situation, current and in the future; train OEA staff to discharge their functions satisfactorily.	Completed in Aug. 1995 instead of the planned date of Mar. 1993	"Field Application of Reverse Osmosis System in the Treatment of Geothermal Wastewater Brine" was initiated. Provided framework for DOE to discharge its enhanced responsibility for the energy sector under the Republic Act 7638
B. Coal Preparation Testing Station Facility and Pilot Research	Establish mobile coal testing facility; replace non-power application of geo-thermal effluents - case study in Mak-Ban	The drum coal preparation Plant was commissioned in 2nd quarter of 1994	Identify potential for upgrading for Philippine coal industry.
C. Institutionalization of Methods and Procedures for Local Non-Conventional Energy Planning at Regional and Sub-Regional Levels	Draw up-to-date local plans and capability for the increase and widespread use of non-conventional energy systems and then integrate these into a national energy system.	Completed in 1993. Developed the " Frame work for Integrated Energy Planning of sustainable Development" (IREP). All components were completed.	Developed a frame work for Integrated Energy Panning of sustainable Development(IREP). DOE to pilot test..
D. Fuel Contingency Plan	Define roles/functions of various government agencies and the oil industry under contingencies and suggest policy guidelines on : administration, control, domestic production, refining, inventory control, allocation, distribution and security.	Fuel contingency plan was undertaken ahead of schedule because of the Gulf-War and continued being updated to conform with current situation. (Financing was from other sources.)	Served as input in the Contingency Planning Committee chaired by NEDA, created to formulate a national plan for which the national contingency plan was the focal point
E. Cost Structure and Transfer Pricing in Petroleum	Operating, financing, & investment costs) of the oil component. Produce computerized database, software and purchase recommended hardware and train OEA staff	No- longer pursued under the WB-ESL. USAID has agreed to finance the study	
EMB (Loan 3165-PH)			
A. Manuals for Air and water quality monitoring	Reevaluate the requirements for satisfactory Environmental Impact Assessments(EIASs)	Manuals for air and water monitoring were completed	Applied
PNOC (Loan 3164-PH)			
Bacman II	For each site, prepare a resource assessment and development strategy study to form the basis for geothermal power development investments.	Completed in-house. TDP Consultants' final report was presented to PNOC-EDC in Aug. 90	Commissioned in 1993

Table 7: Studies Included in Project (continued)

Study/technical assistance	Purpose as defined at appraisal/redefined	Status	Impact of study
PNOC (Loan 3164-PH)			
Natib	Ditto	Completed in house. Final report was submitted to PNOC EDC in Dec. 90. Low priority based on the results of two wells results of two wells drilled.	No development strategy has been programmed as area is considered less promising/low priority
Pinatubo	Ditto	Completed in-house. TDP consultant's final report was submitted to PNOC-EDC in Sept. 1990.	Project was abandoned
Cagua	Ditto	Completed in-house. TDP consultant's final report was submitted to PNOC-EDC in July 1992. Report of Mesquite was completed in Oct. 1992.	Project was abandoned.
Labo	Ditto	Preliminary in-house-resource assessment using discharge results of LB1D and LB3D was completed in April 1993.	Completed March 1995.
Bulusan	Ditto	Need further evaluation	No definite schedule yet.
Leyte Areas (upper Mahiao, Malitbog, Mahanagdong)	Ditto	Review of in-house studies was presented to PNOC-EDC and WB in Mar 91. Resource Optimization for Upper Mahiao and Malitbog which was completed in Aug. 1992 was confirmed in Oct. 1992.	Included in Leyte A Project.
Alto Peak	Ditto	Final resource assessment report completed in June 1993.	Final report based on results of AP9D is expected to be completed by December 1995
Mahagnao	Ditto	Consultant's report completed during second quarter of 1992.	Low priority - not included in the first 600 MW in Leyte A.
A Study of Power Tariffs, petroleum product pricing, and coal pricing	Restructure energy pricing and use. Long run marginal pricing scheme	conducted	It is now possible to make monthly correction after separate adjustments formula for fuel oil, diesel, coal and geothermal steam is designed.
Study on Privatization Options for the Philippines Power Sector	Define independent (depoliticized) regulatory system which: a) establishes fair and stable conditions for all potential participants; b) implements an economically rational, financially viable, power tariff system that promotes efficient use of capital and energy.	conducted.	Saw its first application in the form of basic rates, fuel cost adjustment and currency exchange rate adjustment. NPC now able to cover its volatile costs.

Table 8A: Project Costs

SAR Estimates

Agency/Item	Local	Foreign	Total	Local	Foreign	Total
	Pesos million			US$ million		
Loan 3163-PH: NPC						
Base Cost	11001.6	41252.1	52253.7	511.7	1918.7	2430.4
Contingencies	2305.7	4685.8	6991.5	95	196.6	291.6
Subtotal	13307.3	45937.9	59245.2	606.7	2115.3	2722
Loan 3614-PH: PNOC						
Base Cost	7698.5	5326	13024.5	358.1	247.7	605.8
Contingencies	2263.6	1566	3829.6	80	55.4	135.4
Subtotal	9962.1	6892	16854.1	438.1	303.1	741.2
Loan 3165-PH: GOP						
OEA/DOE	46.2	47.4	93.6	2.1	2.2	4.3
ERB	47.3	17.2	64.5	2.2	0.8	3
EMB	6.4	255.8	262.2	0.3	11.9	12.2
NEA	92.5	478.5	571	4.3	22.2	26.5
Subtotal	192.4	798.9	991.3	8.9	37.1	46
Total Investment	23461.8	53628.8	77090.6	1053.7	2455.5	3509.2

Actual or latest estimates

Agency/Item	Local	Foreign	Total	Local	Foreign	Total
	Pesos million			US$ million		
Loan 3163-PH: NPC						
Subtotal	9081.8	50505.0	59586.8	349.3	1942.5	2291.8
Loan 3614-PH: PNOC						
Subtotal	9764.8	5891.6	1565.4	376.0	229.6	602.9
Loan 3165-PH: GOP 1/						
OEA/DOE	36.4	44.2	80.6	1.4	1.7	3.1
ERB	24.2	66.1	90.3	0.9	2.5	3.4
EMB	6.5	157.8	164.3	0.3	6.3	6.6
NEA	114.4	475.8	590.2	4.4	18.3	22.7
Subtotal	181.5	743.9	925.4	7.0	28.8	35.8
Total Investment	19028.1	57140.5	76168.6	732.7	2200.3	2932.9

Table 8B: Project Financing

	Appraisal Estimate (US$ M)			Actual/ Latest Estimate (US$ M)		
Agency/Source	Local	Foreign	Total	Local	Foreign	Total
Loan 3163-PH: NPC						
Committed Loan (OECF, Eximbank)						
ADB, World Bank, Italian, French)	110.5	794.5	905.0	65.2	996.1	10613.0
Loan under negotiation/negotiated	22.0	143.0	165.0	11.7	74.2	85.9
World Bank Sector Project	50.0	150.0	200.0	31.1	168.9	200.0
Eximbank Loan	50.0	100.0	150.0	32.5	117.5	150.0
Internal & Other financing	374.2	927.8	1,302.0	208.8	585.8	794.6
Subtotal	606.7	2,115.3	2,722.0	349.3	1942.5	2291.8
Loan 3614-PH: PNOC						
OECF, ADB, World Bank /a	-	100.0	100.0	211.4	124.1	335.5
World Bank Sector Project	-	150.0	150.0	-	139.3	139.3
Internal cash & other financing	438.1	53.1	491.2	133.7	-	133.7
Subtotal	438.1	303.1	741.2	345.1	263.4	608.5
Loan 3165-PH: GPR						
OEA/DOE						
World Bank Sector Project	2.1	2.2	4.3	1.4	1.7	3.1
ERB						
World Bank Sector Project	2.2	.8	3.0	0.9	2.5	3.4
EMB						
World Bank Sector Project	.3	10.1	10.4	0.3	6.3	6.6
Grant funds	-	1.8	1.8	-	-	-
Subtotal	.3	11.9	12.2	0.3	6.3	6.6
NEA						
World Bank Sector Project	-	22.2	22.2	-	18.3	18.3
Local Financing	4.3	-	4.3	4.4	-	4.4
Subtotal	4.3	22.2	26.5	4.4	18.3	22.7
Total	1,053.7	2,455.5	3,509.2	701.4	2234.7	2936.1
Of which:						
Committed loans from foreign sources	132.5	1,037.5	1,170.0	288.2	1194.4	1482.6
World Bank Sector Project	55.2	334.8	390.0	33.8	337.0	370.8
Eximbank Loan	50.0	100.0	150.0	32.5	117.5	150.0
Internal cash & other financing	816.0	983.2	1,799.2	346.9	585.8	932.7

/a US 41 million from Bank Loan No. 2969-PH.
/b US 59 million from Bank Loan No. 2969-PH.

Table 9: Economic Cost and Benefits

	IPP Generation/Transmission							NPC's own Generation & Transmission from 1989						
	Purchased power GWH	Assumed Installed MW @70% PF	Incremental MW	Purchased power cost $M=Million	Fuel Appropriation cost M	Transmission Apportioned Cost M	Total costs $M	NPC Sales of own power GWH	NPC Capex Generation 1994 $M	Fuel Apportioned Cost M	Transmission Apportioned Cost M	Total Costs $ M	Economic Benefits Valued per kWh 0.07	Net Economic Benefit $ M
1989	0				0.00	0.00	0.00	21180	1591.36	612.49	323.65	2527.51	1482.60	(1,044.91)
1990	87	14.2	14.2	0.63	3.62	1.19	5.44	22828	327.46	790.31	311.89	1429.66	1604.05	168.96
1991	614	100.1	85.9	23.84	28.49	4.60	56.92	22984	256.70	883.83	172.07	1312.60	1651.86	282.34
1992	1142	186.2	86.1	48.74	45.65	5.41	99.80	22816	545.05	752.46	108.05	1405.56	1677.06	171.70
1993	4322	704.8	518.6	135.78	135.73	40.55	312.07	20483	916.51	513.44	192.19	1622.14	1736.35	(197.86)
1994	8866	1445.9	741.0	357.12	270.62	62.59	690.34	19880	1144.30	460.57	140.35	1745.22	2012.22	(423.34)
1995	12288	2003.9	558.1	402.97	290.85	154.13	847.95	18068	376.07	307.90	226.62	910.60	2124.92	366.38
1996	13305	2169.8	165.9	622.98	359.24	310.88	1293.10	20105	1181.22	461.41	469.77	2112.41	2338.70	(1,066.81)
1997	18605	3034.1	864.3	859.45	502.34	407.42	1769.20	17912	1259.62	411.08	392.24	2062.94	2556.19	(1,275.95)
1998	24427	3983.5	949.4	814.42	659.53	314.64	1788.59	16103	910.91	369.56	207.42	1487.90	2837.10	(439.39)
1999	28532	4653.0	669.4	1112.99	770.36	281.87	2165.22	14208	774.03	326.07	140.36	1240.46	2991.80	(413.88)
2000	32534	5305.6	652.6	1055.95	878.42	161.64	2096.01	13713	419.50	314.71	68.13	802.35	3237.29	338.94
2001	33956	5537.5	231.9	1068.29	916.81	177.47	2162.58	15117	410.11	346.94	79.01	836.05	3435.11	436.48
2002	37841	6171.1	633.6	1214.33	1021.71	92.23	2328.27	15871	308.60	364.24	38.68	711.52	3759.84	720.06
2003	42524	6934.8	763.7	1337.40	1148.15	143.38	2628.93	15435	391.52	354.23	52.04	797.79	4057.13	630.41
2004	46077	7514.2	579.4	1382.39	1244.08	128.73	2755.20	16373	395.07	375.76	45.74	816.58	4371.50	799.72
2005	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266	389.19	488.05	33.02	910.26	4714.01	959.94
2006	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2007	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2008	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2009	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2010	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2011	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2012	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2013	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2014	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2015	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2016	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2017	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2018	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2019	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2020	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2021	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2022	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2023	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2024	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
2025	46077	7514.2		1528.20	1244.08	71.54	2843.81	21266		488.05	33.02	521.07	4714.01	1,349.13
NPV @10%	185923.3		3253.0	7003.3	5048.5	1009.8	12425.0	192561.0	5988.6	5153.0	1723.9	12865.5		
Costs/US cents/kWh				3.77	2.72	0.54	6.68		3.11	2.68	0.90	6.68	ERR=	13.5%

Table 10: Status of Legal Covenants

a) Loan 3163-PH: National Power Corporation

Agreement	Section	Covenant type	Present status	Original Fulfillment Date	Revised Fulfillment Date	Description of Covenant	Comments
LA	3.03	2	C			Conclude agreement with PNOC for steam price	Completed
LA	4.04	3,12	CD	Each November		NPC shall furnish its investment plan annually to the Bank for review and comment.	Project development program has been provided annually to the Bank
LA	4.05	2, 12	NC	12/31/90	09/30/94	NCI shall implement first phase of plan. Agreed with the Bank, to introduce LRMC - based tariffs by correcting the mis-allocation.	Demand charges could not be introduced under 6 to 8 hours power outages. .A proposal for a new demand charges in Luzon was prepared to ERB in June 1993 to be implemented in September 1994. Proposal for Visayas and Mindanao was followed
LA	4.06	5,9	CD	06/30/90		NPC shall prepare and implement training program for its staff and furnish results to the Bank for review and comment.	A satisfactory training program was prepared and implemented under loan 2969-1 (since this loan has been fully committed)
LA	5.01 (b) & (c)	1	CD	July 1		By July 1 of each year, NPC will furnish an audit report from an auditor acceptable to the Bank for its financial statements, Special Account and SOE.	Audit reports were submitted after due date.
LA	5.02 (a)	2, 9	CD	Annual		NPC shall earn for its fiscal years, after its fiscal year ending on Dec. 31, 1990, an annual return of not less than 8% of the average current net value of the Borrower's fixed assets in operation.	RORs in 1991(3.3%); 1992 (8.0%); 1993 (6.2%); and 1994 (8.3%)
LA	5.02 (b)	1,9		Annual		NPC shall (before Dec. 1 in each fiscal year), on the basis of prepared forecasts and satisfactory to the Bank, review if it would meet the requirements set forth.	Defaulted. Assets not revalued since 12/87. ROR estimates below 8% for 1989-91. NPC approved a tariff increase in 3/91 but was blocked by Supreme court and ERB.
LA	5.03 (a)	2, 4	CD	Annual		NPC shall not incur any debt unless a reasonable forecast of its revenues for each fiscal year during the term of the debt to be incurred shall be at least 1.3 times its estimated debt service requirements in such year on all its debt including the debt to be incurred.	Debt service ratio for 1991 (0.5); 1992 (0.8); 1993 (0.9); and 1993 (1.3). Deficient cash situation in 1992 even after tariff increase, require measures (including authorization of tariff adjustment with oil prices and exchange rates)
LA	6.01 (b)	4	CD	12/31/90	06/25/92	JEXIMBANK loan shall become effective by Dec. 31, 1990.	JEXIM loan signed June 25, 1992. signing of loan agreement delayed due to NPC's financial situation. Initially implementation was very slow.

(continued)

Table 10: Status of Legal Covenants

b) Loan 3164-PH: Philippines National Oil Corporation

Agreement	Section	Covenant Type	Present Status	Original Fulfillment Date	Revised Fulfillment Date	Description of Covenant	Comments
LA	3.01 (b)	3	C			PNOC shall relend $ 147, 000, 000 out of the proceeds of the Loan to PNOC-EDC and PETRON under two separate subsidiary loan agreements to be entered into between PNOC and PNOC-EDC, and PNOC and PETRON, respectively, under terms and conditions which shall have been approved by the Bank.	Satisfactory.
LA	4.03	5	C			Maintain insurance	Satisfactory.
LA	4.04	12	C	November 15		PNOC shall, by November 15 of each year, prepare its investment plan, for geothermal and refinery bottlenecking activities, for the forthcoming year and for the following four years and furnish such plan to the Bank for its review and comment.	Satisfactory.
LA	4.05	5	C	6/30/90		PNOC shall, by June 30, 1990, prepare and thereafter implement a training program for its staff in engineering operations, maintenance and management and furnish the results to the Bank for review and comment.	Several training programs were implemented. However, Government required grant financing for foreign trainings. Satisfactory.
LA	5.01 (b) & (c)	1	CD	July 1		By July 1 of each year, PNOC shall furnish audited financial statements and the records and accounts for the Special Account and statement of expenditures for the year just concluded, along with the report of an acceptable auditor.	Satisfactory; delayed by COA
LA	5.02	2	C			PNOC shall take all measures required on its part to increase PNOC-EDC's and PETRON's share capital, inter-company loans and other means for raising funds to enable PNOC-EDC and PETRON to carry out their obligations pursuant to the Project Agreement.	PNOC increased PNOC-EDC's equity in 1989.
LA	5.03	2,3	C			PNOC shall, or shall cause PNOC-EDC to take all actions which may be required on its part to ensure the timely conclusion of the agreement between PNOC-EDC and NPC for the supply of the steam needed for the Project.	Completed.
PA	3.04	11	CP	Annual		PNOC-EDC and PETRON shall, by November 15 of each year, prepare investment plans for the forthcoming year and for the following four years and furnish such plan to the Bank for its review and comment.	Satisfactory
PA	4.01 (b)	1	CD	July 1		By July 1 of each year PNOC-EDC and PETRON will furnish audited financial statements for the year just concluded, along with the report of an acceptable auditor.	Delayed by COA
PA	4.02	2	C	Annual		PNOC-EDC & PETRON shall maintain a ratio of current assets to current liabilities of not less than 1.0.	Satisfactory
PA	4.03	2	C	Annual		PNOC-EDC & PETRON shall not incur any debt, if after the insurance of such debt, the debt to equity ratio shall exceed 70/30.	Satisfactory
PA	4.04	2,3	C	Annual		For the period of the loan, PNOC-EDC shall not incur debt unless a reasonable forecast affirms that it will maintain a debt service ration of at least 1/2.	Satisfactory

(continued)

Table 10: Status of Legal Covenants

c) Loan 3165-PH: Government of the Philippines

Agreement	Section	Covenant type	Present status	Original fulfillment date	Revised fulfillment date	Description of covenant	Comments
LA	3.01	5	CD	Dec. 31, 1993	Dec 31, 1995	Strengthening of EMB's Operational capabilities; establishment of baseline sampling stations; strengthening of regional offices; and technical assistance. Quarterly coordination meetings were conducted and reports were submitted quarterly.	
LA	3.03	5	C			A Project Implementation Committee with memberships, powers and functions acceptable to the Bank was constituted for monitoring and coordination of all activities under the Project.	Committee under the chairmanship of OEA was established until DOE was re-established.
LA	4.01	1	CD			By July 1 of each year, the Government will furnish audited reports regarding the records and accounts for the Special Account and statements of expenditures. In addition, by July 1 of each year NEA will furnish audited financial statements for the year just concluded along with the report of an acceptable auditor.	No expenditure in 1990 was allowed. Congress limited the annual budget for some components, particularly for EMB and DOE.
LA	4.02	4	CD			The Government shall make an equity contribution to NEA in an amount of US $22,200,000.	
Minutes of Negotiations							
	Para. 3.	10	CD	annual		Implement the Energy Policy Framework	The plan was satisfactory implemented but with some delays. The revised and updated version was incorporated in an Energy Sector Plan approved by Cabinet on January 1, 1993 and was being monitored.

Status:
C = Covenant complied with
CD = Complied with after delay
CP = Complied with partially
NC = Not complied with

Covenant type:
1 = Account/Audits
2 = Financial performance/revenue generation from beneficiaries
3 = Flow and utilization of project funds
4 = Counterpart funding
5 = Management aspects of project or executing agency
6 = Environmental covenants
7 = Involuntary resettlement
8 = Indigenous people
9 = Monitoring, review, and reporting
10 = Project implementation not covered by categories 1-9
11 = Sectoral or cross-sectoral budgetary or other resource allocation
12 = Sectoral or cross-sectoral policy/regulatory/institutional action
13 = Other

Table 11: Compliance with Operation Manual Statements

Statement number and title	Description and comment on lack of compliance
None	No significant lack of compliance with applicable Bank manual statements

Table 12: Bank Resources: Staff Inputs

Stages of project cycle	Staffweek Actual	Amount US$('ooo)
Through Appraisal	98.8	180.9
Appraisal-effectiveness	47.0	98.8
Supervision	169.5	373.0
Completion	12	22.5
TOTAL/planned/	327.3	6674.3

Table 13: Bank Resources: Missions

Stages of project cycle	Month/ Year	Number of persons\1	SW in field:	Specialized staff skills represented	Performance rating Implement status	Develop. impact	Types of problems
Through appraisal	Nov/Dec	9	N/A	EEc, ES, FA(2), PrS, PE, Ree, SC EM	-	-	
	June/July 1989	11	N/A	ES(2), PE, PE, PrS, PE, L, FA, EM, L,	-	-	
	Nov. 1989	5	11/19/89 to 12/8/89	PE(2), ES,FA Constant.,	advance procure-ments		NPC to reduce procurement of 20MW Geothermal Modular steam turbine generators to ten; procurement to proceed in two stages, first submission of technical bids, and following their evaluation, price bids and financial proposals to be invited in second stage. NPC's revaluation of assets and increase in fuel prices may require significant changes in price to meet the 8% Rate of Return.
Supervision I	June 1990	2	6/18/90 to 6/30/90	EE, PE	1	1	Difficulties in ICB Procurement e.g. 20 MW geothermal modular units, transmission line, equipment and materials
Supervision II	Mar 1991	4	3/11/91 to 3/22/91	EEc, FA, PE, PS	1	1	Disbursement progressing as scheduled for NPC, PNOC. No disbursement for NEA due to delays on-lending arrangements between the Government and NEA. Delays in budget appropriation may affect procurement of OEA, ERB. Request for 100% Bank financing. Bank agreed to amend the Loan agreement as requested, except 95% for works on 7/23/91. Delays in implementation of long-run marginal cost pricing. Implementation to be made by end Sept. 1991. Co-financing with JEximbank not finalized
Supervision IIa	June 1991	1	6/24/91 to 7/04/91	FA	_	_	NPC financial performance in 1990 was unsatisfactory. Government bail out of US$280 million and tariff increase from Jan. 1992 of about 0.27 kWh required.
Supervision IIa (limited supervision)	June 1991	1	5/30/91 to 6/13/91	ES	_	_	PNOC needs to sign a steam price contract with NPC, as agreed in the case of all Luzon. NPC in financial crisis & delays in tariff increase based on revalued assets. Geothermal projects commercially not feasible at Natib and Pinatubo; delays in obtaining environmental clearance at Bulusan.
Supervision IIb (limited mission)	Sept.-Oct 1991	1	9/23/91 to10/2/91	FA	_	_	1990 financial performance unsatisfactory and could deteriorate further. Require Gov. bail-out of about US$280 million. Financial irregularities & inefficiencies in financial management observed New conditions: 6% ROR on revalued assets; satisfactory cash position with out additional Gov. contributions; potential difficulties for all NPC loans.
Supervision IIc (limited mission)		1	8/10/91 to 16/10/91	PE			Reviewed issues related to small hydro-power development .e.g. avoided cost, implementation options. etc.,
Supervision III	Nov. 1991	4	11/18/91 to11/28/91	FA (2), PE, ES	2	1	Financial crisis likely to delay projects like Leyte Geothermal, and Japanese Loan of US$150 million not likely to be approved NPC's & PNOC's loans are being executed satisfactorily Sector coordination and other legislation lagging. Difficulties in confirming BOT/BTO and/or because of delays of environmental decisions. Potential energy crisis. Bank mission recommended loan suspension. Disbursement slow for loan 3165-PH due to counter part funding. Delays in approving bills to establish DOE. Delays in approving ECC for Bulusan for three years.

EE - Energy Economist; ES - Energy Specialist; FA - Financial Analyst; PE - Power Engineer ; PS - Petroleum Specialist

Table 13: Bank Resources: Missions (continued)

Stages of project cycle	Month/ Year	Number of persons\1	SW in field:	Specialized staff skills represented	Performance rating Implement status	Develop. impact	Types of problems
Supervision IV	June/July 1992	4	06/17/92 to 07/3/92	FA (2), PE,ES			**NPC**: defaulted on financial covenants (ROR %) below 8%. Required Gov. bail out partly due to delays on P0.17/kwh increase approved by the Board in Feb 1991. Under the agreed Reform Program of Sept. '91 Bank waved the 8% ROR for 92 , if NPC achieve 6%, and not require cash contribution from GOP. Restructuring of NPC tariffs, a revenue-neutral way designed to introduce demand charges equivalent to 30% of present billings delayed(expected implementation by Sept. 1992). Sucat plant had four blackouts after being rehabilitated at cost of US$130 million. Delays in training program implementation and in sending audit reports for SOE and special account. **PNOC-EDC**: Pinatubo (acid wells), Natib & Cagua areas due to lack of commercially viability of the steam reserves. Bulusan awaiting environmental clearance of DENR. Utilization of loan uncertain due to uncertainty over drilling of wells at Labo & Bulusan. **PNOC-Petron**: implementation behind time. Cost of project US$27.3 m compare to $65.5m at appraisal. **OEA's Energy Policy Frame**: satisfactory; but DENR has yet to release the ECC for Masinloc & Pagbilao Plants. Similar delays (Calaca II coal & Bulusan geothermal) has stopped for more than three years Delays in elimination of the 8 years royalties to give incentive for geothermal development Restructuring relationship between petroleum prices require the completion of energy pricing. Out of US$4.4 million only US$0.52million disbursed. **NEA**: audit report for SOE was overdue; Need to set a Steering Committee(ERB, OEA, NPC, PNOC, NEA) to review the energy pricing study, so that its conclusions can be applied EMB: only 2% of US$10.4 million loan disbursed due to Gov. budgetary appropriation.
Supervision Ivb	Nov. 1992	1	11/2/92 to 11/6/92	PS	_	_	Problems associated with drilling low pressure volcanic rocks under the extremely high temperature characterized most of PNOC-EDC geothermal fields resulting in hole drilling fluid loses, stuck drilling strings and inadequate casing cementing. PNOC-EDC coping well. But need to contract out international experience and improve its drilling capacity.
Supervision V (supervision done with evaluation of the Sector Structure)	Aug. 1993	3	N/A to 8/30/93	FA, EE, ES	2	1	NPC: Audit report not received as of Sept. 1993. Disbursement were to stop if audit not received by October 30, 1993. Tariff approval needed to ensure ROR 8%. PNOC: legislative change on royalty and provision of other incentive needed for privatization Loan 3165-PH: loan disbursement substantially delayed for DOE & EMB. EMB suffers from reduced budgetary appropriation
Supervision VI	June 1994	2	6/6/94 to 6/30/94	PE, FA	S	S	NPC: extension of loan requested to complete civil works & foundation works at Palinpinon Geothermal stations due to unexpected ground condition found during construction. Implementation of JExim component delayed due to the prolonged brownout and transfer some components to loan 3163-PH. PNOC: Contracts for refinery awarded in March 1994 after delays in award. Extension of loan required. Loan 3165-PH: Delays in disbursement, loan extension required.
Supervision Via (limited supervision)	Jan. 1995	1	_ to 1/26/95	E	_	_	Reviewed the status oc EMB. agreed on use of the remaining fund under loan. Availability of counterpart funding was still an issue.
Completion	Feb./Mar 1996	1	2/25/95 to 03/95	FA	_	_	ICR mission.

EE - Energy Economist; ES - Energy Specialist; FA - Financial Analyst; PE - Power Engineer ; PS - Petroleum Specialist

ANNEX B: SECTOR SPECIFIC DATA

Table 1: Cumulative Actual and Planned Installed Generating Capacity 1993-2010
Megawatts (MW)

	Actual								Department of Energy Forecast									
Type	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Hydro	2259	2323	2325	2332	2360	2374	2390	2397	2700	3089	3246	3553	4456	4910	4927	4930	4933	4989
coal	441	441	1441	1441	1441	2041	3241	3541	3991	5236	6236	6736	6736	7236	9236	12036	15436	18036
Geothermal	11018	1094	1211	1431	1471	1991	1991	2111	211	2111	2111	2111	2151	2151	2151	1926	1926	1926
Oil-Thermal	1985	1985	1985	1685	1685	1485	1135	285	285	60	60	60	60	60	60	60	60	60
Diesel	1016	1967	1967	2001	2089	2171	2165	2122	2103	2103	2103	2103	2103	2103	2103	2103	2103	2103
Combined-Cycle (CC)	-	180	180	180	180	180	330	330	330	330	330	330	330	330	330	330	330	330
Gas Turbine	-	-	-	-	-	-	-	1350	1800	2700	3150	3150	3150	3150	3150	3150	3150	3150
Gas Combined-Cycle	-	-	-	-	-	-	-	25	25	50	50	75	75	100	100	125	125	125
Total	8014	9285	10404	10395	10611	11627	12637	14146	15330	16569	18421	20053	21796	23834	26292	29195	32598	35704

Table 2: Phases Of Power Sector Restructuring and Privatization

Phase I: Strengthen and Restructure Industry	Phase 2: Evaluate results, implement further restructuring and privatize	Phase 3: Move into final structure and competetive environments
Time Frame: 1994-1998 (4-5 years) **Objectives**: Stregthen all sectors and participants in the industry; restructure generation and transmission; establish coordination and arrangements and prepare industry fr increased completio, privatization aand decentralization.	**Time Frame**: 1998-1999 (2 years) **Objectives**: Evaluate results and industry performance; set final restructuring goals; adopt policies that accelerate participants' growth into new structure and responsibilities: privatize generation	Time Frame: 1999-2004 (4-5) years) Objectives: Achieve full restructuring and decentralized planning: establish fully effective competetion in generatio, retail sales and resouce planning: monitor competiveness and industry performance.
Major Activities: • Unbundle generation horizontally and vertically • Unbundle transmission • Unbundle hydroelectric to hydro authority • Decentralize planning responsbility and adopt all source IRP • Establish opreations coordination arrangemens • Rationalize pricing • Stregthen disbursment sector • Promote private particpation in generation (IPP bidding. ROM, etc) • Stregthen regulatory and policy agencies • Stremline NPC threogh additional susbsidaries; rationalize staffing levels	**Major Activities:** • Conduct key evaluation (e.g. competetive conditions; success of utility IRP, coordination arrangements and regulatory programs. • Make structural goal adjustments; re-visit workability of "English" model in Luzon; improve coordination aggangements • privatize Generation: sell Mindanao and Visayas subsidiaries; select aand implement final Luzon generation privatization plan • Expand retail wheeling • Implement policies to achieve utilitie' adoption to new structure	**Major Activities:** • Implement programs determined by assessing development of the industry under the restructuring and privatization intiatives • Extend practces such as retail whelling and retail sales competition • Adopt incentive regulatory schemes proven to be effective • Monitor cometitiveness, market behavior and the potential for market dominance
Major Results: • NPC power supply susbsidaries in Mindano, Visayas, & Luzon • NPC national transmission subsidary responsible for transmission, dispatch and opreations coordination of planning from national perspective • RP Hydro Development Authority • Integrate resouce planning by all utilities • Coordination arrangements to achieve effcient operations and planning • Transperent, unbundled prices • Increased private particpation in generation • Regulatory programs that improve distribution performance and rationalize structure • Improved regulatory and policy capabilities • Streamline NPC	**Major Results:** • Adjustments to structural and ownwership goals • Adjustments to regulartory oversight and policy programs • Improved IRP and coordinated utility planning • Enhanced opretions coordinations; full economic dispatch on all grids • Privatized generation • Increased competition: generation, retail sales, supply side vs. demand side resouces • Imptpvements in structure and performance of distribution sector	**Major Results:** • Full functioning of all utilities under decentralized decion making • Comptetive generation markets • Competetive retail sails markets • Widely practiced, state of the art IRP • Innovative regulatory incentive programs • Effcient inter- andintra-grid coordinated operations.

Bacon Manito Geothermal Power Project (Loans 29690-PH and 29691-PH) Energy Sector Project (Loans 3163-PH, 3164-PH and 3165-PH)

February 1996 ICR Completion Mission

AIDE-MEMOIRE

1. A World Bank Completion Mission comprising Messrs. John Irving (Senior Power Engineer - Task Manager), Jose R. Escay (Consultant) and P. Venugopal (Consultant) visited Manila, with overlapping stays, during the period February 12-27, 1996, to hold discussions with the following entities, and (a) complete the ICR of the Bacon Manito Geothermal Power Project and (b) collect the balance of data and borrowers' evaluation reports for the ICR of the Energy Sector Project:

(a) Department of Energy (DOE) - Loan 3165-PH
- Office of the DOE
- National Electrification Administration (NEA)
- Energy Regulatory Board (ERB)
- Environmental Management Bureau (EMB)

(b) National Power Corporation (NPC) - Loans 29691-PH and 3163-PH

(c) Philippine National Oil Company (PNOC) - Loans 29690-PH and 3164-PH
- PNOC Holding Company
- PNOC-Energy Development Corporation (PNOC-EDC)
- PETRON Corporation (PETRON)

2. The mission wishes to express its deep appreciation for the cooperation and hospitality extended to it by the above entities. The list of officials met by the mission is given in Annex 1. This Aide-Memoire summarizes the findings and conclusions of the mission, that are subject to confirmation by Bank management.

Bacon Manito Geothermal Power Project

3. NPC and PNOC-EDC, on behalf of PNOC (borrower), presented the mission with abbreviated versions of their respective evaluation reports, that will form part of the ICR. The ICR, finalized in the field, was given to NPC and PNOC-EDC for review. Letters have been received from them accepting the ICR (Annex 2).

Energy Sector Project

4. For Loan 3165-PH, DOE prepared a combined borrower's evaluation report covering its own subprojects with those of NEA and ERB. A separate evaluation report was provided by ERB. For Loan 3164-PH, PNOC-EDC and PETRON provided their individual evaluation reports to the mission. For Loan 3163-PH, NPC prepared a final evaluation report.

5. For calculation of the Economic Rate of Return (ERR), the mission obtained from PNOC-EDC and NPC the required data relating to energy sector investments during the project time-slice. Both entities have agreed to furnish the Bank with any other information and data that may be required for this purpose.

6. Prior to finalization of the ICR in Washington, draft copies will be sent to the borrowers for their review and comments.

BORROWER'S IMPLEMENTATION COMPLETION REPORT FOR WORLD BANK LOAN 3163-PH

ENERGY SECTOR PROJECT

NATIONAL POWER CORPORATION

February 21, 1996

A. STATEMENT/EVALUATION OF PROJECT OBJECTIVES

Discussions of the completed Energy Sector Study resulted in the agreement between the Government and the Bank on the development strategy to be pursued in the energy sector. The components of that strategy are: (a) development of a sector-wide capability to plan for energy resource and to coordinate policy implementation in the sector; (b) adoption of the least-cost development strategies for the various energy subsectors; (c) strengthening of the regulatory activities, with the intentions of nationalizing consumer energy prices and improving product standards and quality of service; (d) encouragement of private sector through joint ventures and other schemes; (e) improvement of environmental standards and monitoring in areas of high energy use or resource development; and (f) enhancement of the technical capabilities of sector institutions, particularly OEA, ERB and EMB. The proposed project thus has two complementary but distinct objectives: the first is to assist the Government to implement the agreed strategy, and the second is to help the Government to finance a time-slice of its investment program for the period 1989-93.

The projects will be co-financed by the World Bank and Japan Eximbank. The Bank will review together with the Government and the concerned entities, the approved projects and finalized the list of components to be funded by the World Bank and Japan Eximbank loans. The list of projects eligible for financing are listed in Annex 3-4 of the Staff Appraisal Report.

B. ACHIEVEMENT OF PROJECT OBJECTIVES

Under the generation expansion, the construction of Palinpinon II Modular Geothermal Power Plant commenced on May 13, 1992. The first unit located in Nasuji was synchronized to the grid on December 13, 1993 and started its commercial operation on February 1, 1994. The second unit located in Okoy was synchronized to the grid on November 28, 1994 and started its commercial operation on December 22, 1994. The third and fourth units both located in Sogongon were synchronized on January 28, 1995 and April 22, 1995 respectively, while the commercial operation of both units started on February 18, 1995 and May 5, 1995 respectively.

For the generation plant rehabilitation, the contract for the Rehabilitation of Ambuklao Hydroelectric Plant was terminated effective November 1, 1991. The project was instead implemented under the Rehabilitate-Operate-Leaseback (ROL) contract by a consortium headed between MERALCO Industrial Engineering Services Corporation (MIESCOR), Morrison-Knudsen Corporation, Mindanao Shipbuilding Corporation and J.G.S. International Corporation. The project is still ongoing and expected to be completed by February 1997.

The procurement of 69 KV transmission line materials for Luzon, Visayas, Mindanao and the Small Island Grid were completed. The construction/erection will be financed by Japan Eximbank (70%) and NPC's Internal Cash Generation (ICG) (30%). Some of the transmission lines especially in Luzon and Visayas were already erected and energized.

The incremental working capital which is consist of spare parts and initial inventories of fuel for newly installed power plants were procured in accordance with the Bank's guidelines.

C. MAJOR FACTORS AFFECTING THE PROJECT

Problems/Causes of Delay:

1. In Procuring Goods and Works

   a. Complex and cumbersome procurement procedures.

   b. Rigid government procurement procedures.

   c. Rigid government procurement regulations/rules.

   d. Lack of counterpart funds for local procurement or delay in release of such funds.

   e. Failure of supplier to comply with the provisions of contract.

   f. Cost overruns.

2. In Construction Management

   a. Delay in providing engineering designs.

   b. Changes in work specifications/contract conditions.

   c. Poor quality of contractors work.

   d. Financial problems on the part of contractor.

   e. Right-of-way problems.

3. In Organizing and Staffing of Project Office

   a. Weak or inappropriate organizational structure

   b. Staff appointed for project implementation not being involved in the preparation or appraisal of the project.

4. In Making the Loan Effective

a. Delay in obtaining approval from the ratifying agency.

b. Delay in complying with special conditions for loan effectiveness such as organization of a project office, appointment of a Project Manager, and acquisition of land rights-of-way.

Solution to the Problem:

1. In the procurement of spare parts, the list of items to be financed should be prepared with some mechanism for flexibility, in order to avoid frequent Bank approvals for changes made in the list.

2. In the construction, the qualification and financial capability of the contractors should be carefully evaluated so that the project will not suffer a delay due to the contractors inefficiency.

3. The right-of-way should be cleared first before a project could start the construction.

D. PROJECT SUSTAINABILITY

The project generated benefits instantly as the newly operation of 80 MW Palinpinon II and the constructed transmission line circuits were energized. Significant savings were achieved in fuel used by diesel plants, gas turbines and mobile power barges along the Visayas Grid, which were no longer required to operate during peak load periods. The Project's sustainability appears to be assured, although it depends on the realization of assumptions used in the economic re-evaluation, including: 1) continued routine maintenance by NPC of all grid network components from the geothermal fields in Negros Occidental to the NPC distribution facilities in Luzon, Visayas, Mindanao and the Small Island Grid transmission lines and substations (which should be inspected from time to time), and 2) the ability of the geothermal facilities at Palinpinon II to continue generating electricity. This depends primarily on NPC's provision of adequate maintenance funds and on personnel at the geothermal facilities until the end of the Project's life. NPC is aware of its commitment to adequately maintain the Palinpinon facilities and it is currently involved in further developing the geothermal resources.

Spare parts and initial inventories of fuel for newly installed power plants procured have contributed to the improvement of maintenance of NPC's power facilities in Luzon, Visayas and Mindanao.

E. BANK PERFORMANCE

The Bank's performance in administering the implementation of the Project was generally satisfactory. NPC's request for changes in allocations, extensions of loan closing dates were treated with flexibility. However, it is noted that the Bank had limited review mission.

F. BORROWER PERFORMANCE

The performance of the Borrower/Executing Agency (NPC), was generally satisfactory. However, NPC was not able to ensure timely acquisition of lands and right-of-way, causing delays in erection/construction works. Also, time-consuming procurement procedures of NPC and the Government were among the major causes for delays in implementation. Further, prequalification procedures of NPC were not effective enough to eliminate contractors/suppliers with financial problems.

G. ASSESSMENT OF OUTCOME

The Project is considered generally successful on the basis of its satisfactory Economic Internal Rate of Return (EIRR) and Financial Internal Rate of Return (FIRR) results, and because it has fully achieved its objectives.

H. FUTURE OPERATION

NPC Management, in its effort to direct the overall employee efforts towards the achievement of the corporate mission of providing efficient, reliable and economic to the country, developed and adopted in April 1995 the Productivity Enhancement Program (PEP), a mechanism to reward good performances. The program components and brief description of the procedures follows:

1. Performance Targets

   Within the first quarter of every year, the corporate sets the annual corporate performance targets which should result from consultation and discussion with all the functional groups. The targets are made in the following performance factors or key indicators:

		1995 Targets
a. Capacity Addition		
- generation capacity in megawatts	=	1,228 MW
- transmission lines in circuit kilometers	=	705 ckm
- substation capacity in million volt-ampere	=	1,000 MVA

b.	System Efficiency	=	96.92
c.	Reliability Indicator	=	0.31
d.	Operating Ratio	=	0.80
e.	Collection Efficiency	=	39 days
f.	Others		

Each work group (i.e. functional group/regional center, department and division) shall prepare its performance targets and work program in support of the corporate target. Such targets and standards shall be agreed upon by both the head of the work group and his/her immediate superior, and confirmed by the next higher supervisor.

2. Performance Standards

Performance indicators are indicators of desirability and acceptability in relation to targets established. The targets are expressed in terms of average or normal expectation or as an ideal expectation. To ensure common understanding in the performance standards and to forestall confusion in the assessment of actual performance, the standards for the ratings of Outstanding, Very Satisfactory, and satisfactory shall be established in each performance factor at the time of target setting.

3. Performance Evaluation and Appraisal

Every six (6) months, an evaluation of performance will be conducted and the accomplishments will be appraised vis-a-vis targets and standards. The corporate performance shall be appraised by the Management Committee and reviewed by the NP Board and, at the national government, the Government Corporations Monitoring and Coordinating Committee. In assessing achievement level of performance targets, the actual performance shall be compared against standard set.

4. Performance Incentive Bonus

The actual performance levels on the corporate and group targets shall determine the actual amount of bonus to be granted.

The overall corporate performance for the period January-November 1995 reached a SATISFACTORY level. Based on this satisfactory performance and consistent with the pertinent orders from the national government (24 March 1994 Memorandum Order No. 198 of Malacañang), the NP Board approved the grant of two (2) month performance bonus to all qualified NPC officials and employees.

It is worthy to take note that this PEP is to a great extent assures the corporation from its employees a continuous effort to strive for good performance due to the incentive bonus component of the program. From the utility operations' point of view this effort for good performance is manifested by maintaining the reliability and efficiency of NPC generating units.

I. KEY LESSONS LEARNED

For NPC to maintain sufficient cash flows to service satisfactorily future borrowings, it must continue to ensure that tariff levels are broadly in line with the Long-Run Marginal Cost (LRMC) of generation and transmission and that all user groups are charged a tariff that matches the average LRMC of generation and transmission. NPC must continue to design power projects where the financial and economic benefits are transparent and where subsidies from the Government are not required for any developmental works.

When procurement contracts contain construction materials that experience a sudden, unexpected increase in price on World markets, concerted efforts should be undertaken by the executing agency and the Bank to minimize the time of bid processing and evaluation and to award the contract without delay.

As for the financing of spare parts, the list of items to be financed should be prepared with some mechanism for flexibility, in order to avoid frequent Bank approvals for changes in the list. Also, procurement of spare parts could be simplified by grouping similar type of items into the same package.

EVALUATION REPORT

PHILIPPINE NATIONAL OIL COMPANY

WORLD BANK LOAN NO. 3164

IBRD ENERGY SECTOR LOAN NO. 3164 PH
PART I - GEOTHERMAL INVESTMENTS PROGRAM (EDC)

A. STATEMENT/EVALUATION OF OBJECTIVES

The objective of the Energy Sector Project (ESP) is to orient the development strategy for the Philippine energy sector toward minimizing the cost of energy supply. This objective which came out as a result of the Energy Sector Study in 1988 consists of various components undertaken by various Government agencies. One of these agencies is PNOC-EDC, whose share of the Energy Sector Loan was intended to support part of the costs for the 1) completion of delineation drilling on prospective sites in Luzon and the Visayas; 2) engineering, procurement, fabrication, installation and commissioning of Fluid Collection and Disposal System (FCDS) at various sites for about 380 MW; 3) drilling of additional production and reinjection wells; and 4) technical assistance for geothermal resource assessment and engineering

The above activities are sequels to previous geothermal exploration and development activities under the earlier projects funded by the World Bank namely: 1) the Geothermal Exploration Project wherein geoscientific and drilling activities and technical assistance were financed under Loan 2203 (Oct.'87-Dec.'88) and 2) the Bacon-Manito Geothermal Project wherein drilling of additional production and reinjection wells and the delineation/appraisal of geothermal sites for future power supply to the Luzon grid were financed under Loan 2969 (June'88-Dec'93)

World Bank Loan 3164 to PNOC amounting to US$150.0 million (of which US$133.0 million was originally allocated to PNOC-EDC) was approved by the World Bank Board on Feb. 1, 1990, loan agreement was signed on March 20, 1990 and was declared effective on June 12, 1990. Financing was retroactive for eligible expenditures in an aggregate amount not exceeding the equivalent of US$8.0 million beginning April 30, 1989.

B. ACHIEVEMENT OF OBJECTIVES

1. Physical

a. Geothermal Exploration and Development Drilling

The geothermal development component of the Energy Sector Loan (ESL) originally covers, among others, the drilling of a total of 76 wells (Please refer to Annex I for Well Drilling Appraisal Target). However, due to unfavorable geothermal resource assessment in areas such as Labo, Pinatubo, Natib and Cagua, coupled with the delay in securing environmental permit for Bulusan, the drilling program was altered and priority was shifted to Leyte A. The decision to shift was backed by Mesquite's, (a third party consultant), resource assessment of the Upper Mahiao and Malitbog sectors of Leyte A in 1991 which confirmed PNOC-EDC's resource estimate availability in these areas. The move to focus on Leyte A aimed to support the project's objective of completing the delineation drilling in the Visayas. Thus, out of the total 38 wells actually drilled under the project, 28 were located in various areas in Leyte A. (Please refer to Annex I Well Drilling Data)

In Bacon Manito II, three wells were drilled under the project in addition to wells earlier drilled to supply the required steam to the power plant.

b. Fluid Collection and Disposal System

An independent resource assessment of Bacon Manito II was carried out by the Mesquite group, commissioned by PNOC EDC under a grant from USTDP. A resource of 40 MW was confirmed and development of 2 x 20 MW modular units was undertaken in two sectors: Botong and Cawayan. The following are the milestones of the FCDS activities in Botong and Cawayan Sectors:

EVENTS	DATE		
	CAWAYAN	BOTONG	
1. FCDS Pipeline Flushing	Dec 1992	Dec 1992	
2. Pressurization	Jan 1993	Jan 1993	
3. FCDS Inauguration	Jul 1993	Jul 1993	
4. FCDS Testing/Commissioning	Aug 1993	Apr 1994	
5. NPC Steam Admission	Aug 1993	Apr 1997	(tentative)
6. Synchronization to the Grid	Mar 1994	May 1997	(tentative)
7. Performance Test	Mar 1994	May 1997	(tentative)

The commissioning of Bacman II FCDS brings PNOC EDC's total MW capacity to 461 as follows:

STEAMFIELD	MW CAPACITY
Tongonan I	112.5
Palinpinon I	112.5
Palinpinon Pilot	6
Palinpinon II	80
Bacman I	110
Bacman II	40

As a consequence of the curtailment of drilling activities in the Luzon areas no other FCDS activities were undertaken under the project other than those in Bacman II. FCDS activities in Leyte A are currently on-going but are funded by subsequent World Bank Loans, 3702 (for Leyte-Cebu) and 3747 (for Leyte Luzon) and Japan Eximbank.

c. Technical Assistance

Kingston, Reynolds, Thom and Allardyce (KRTA) has been retained by PNOC as its third party consultant in the field of geosciences, well drilling, production and systems engineering. Its engagement under the project was embodied under its extended contract with PNOC EDC, covering the period 1990 to 1995. Engagement and extension of KRTA contract was approved by the Bank.

d. Environmental Impact and Safety

The Environmental Management Division (EMD) of PNOC EDC enforces and oversees the prescribed environmental standards. The Environmental Management Bureau of the Government reviews environmental impact assessments prepared by EMD prior to implementation of projects and issues compliance certificates.

Significant activities were undertaken by PNOC EDC in compliance to various environmental requirements as follows:

PROJECT	DATE OF	
	EIS Completion	ECC Acquisition
Bacman I & II	1985	Aug 1987, Amended Nov 1995
Labo (exploration)	Nov 1989	Feb 1990
Cagua	Aug 1989	Jan 1990
Natib	Aug 1988	Sept 1988
Pinatubo	1990 (baseline data)	exempted
NorthernNegros (exploration)	Jun 1993	Dec 1993
Leyte A	May 1991	May 1992
Alto Peak	July 1990	Sept 1990
Upper Mahiao/Malitbog	Mar 1991	Sept 1991
Mahanagdong	Aug 1991	May 1992

*** EIS means Environmental Impact Statement (A report)**
ECC means Environmental Clearance Certificate (A permit)

Special studies on the "Effect of Geothermal Effluents on Rice and Soil in Bacman Area" and the "Botong Silica Removal and Disposal" were also conducted in 1989 and 1992 respectively. The latter is still on-going.

2. **Financial**

The original amount relent by PNOC to PNOC EDC is US$133.0 million intended to finance the portion of the cost for the development of 380 MW in Luzon and Visayas. This relending was supported by a subsidiary loan agreement between the said two parties. The first application for withdrawal was made on July 5, 1990 and was debited against the loan account on July 24,1990. Special Dollar Account (SDA) amounting to US$10.0 million was applied on August 19, 1990 and was disbursed on August 22, 1990. (Please refer to Annex 2 for the Actual Loan Disbursement Schedule).

In the early part of 1993, however, PNOC, PNOC EDC and Petron discussed the possibility of reallocating the US$150.0 million loan amount among them. The main objective of the reallocation is to finance the increased cost of Petron's debottlenecking project. In view of the reduced drilling and FCDS activities, PNOC EDC presented to the Bank during its mission in April 1993 its intention to reallocate US$15.0 million, thereby reducing its loan allocation to US$118.0 million. A formal request for reallocation was sent to the Bank through PNOC on December 14, 1993. A request for extension of the loan closing date from December 31, 1994 to December 31, 1995 was also made and approved by the Bank.

As of December 31, 1995 PNOC EDC has withdrawn a total of US$118.6 million including the unrecovered portion of the SDA of US$0.6 million. The Bank has started its recovery of the SDA in March 1995. Final disbursement in the form of recovery of the remaining SDA is expected to be made during the first semester of 1996.

C. MAJOR FACTORS AFFECTING THE PROJECT

In Mt. Pinatubo, the three wells drilled under the other two earlier World Bank loans showed poor quality of geothermal resource. PNOC EDC, nevertheless attempted to further explore the area and planned to eventually develop it. Ten wells were programmed under the project. Subsequent unfavorable drilling results prompted PNOC EDC to abandon the area. Then, the eruption of Mt. Pinatubo in July 1991, forced PNOC EDC to eventually phase out Mt. Pinatubo from among its prospective geothermal areas. Favorable resource assessment of the Leyte A project as mentioned earlier, made management set aside exploration activities in Luzon and focus its priority to the former.

PNOC EDC as a borrower was subjected to the Bank's guidelines with regard to its procurement. Procurement arrangements for the project followed the Bank's prescribed procedures. Goods and services financed by the Loan were procured under ICB. All contracts for goods and services involving Bank financing, costing US$1.0 million and above were subjected to the Bank's prior review and approval. This is a lengthy exercise which required a lot of communications between the Bank and PNOC EDC and as the Bank would say in its draft Implementation Completion Report, resulted to time losses.

D. PROJECT SUSTAINABILITY

The project is expected to sustain the benefits which the Energy Sector study aimed for. The commissioning of 40 MW Bacman II project emerged as a significant outcome of the project and is a valuable contribution to the Philippine energy sector. While the other Luzon areas did not warrant further investments, Leyte A project proved to be very encouraging and enticed further development. Thus, to further sustain the contribution of PNOC EDC to the country's energy sector, exploration activities under the project were extended to a more promising area, Leyte A. PNOC EDC, thus prepared for the development of Leyte A in two phases, first, the 200 MW Leyte Cebu Geothermal Project; and second, the 440 MW Leyte-Luzon Geothermal Project. The Bank has extended financing to PNOC EDC for the two projects.

E. BANK PERFORMANCE

The Energy Sector Review carried out by the Bank in early 1988 has examined the place of geothermal energy in the power development program. Through this and the earlier projects (as previously mentioned), the vital importance of the geothermal resource in the economy had been adequately established. The Bank's efforts to have the steam pricing issue resolved resulted to the determination of a fair price for steam from the Bacon-Manito.

The Bank had been supportive throughout the implementation of the project. During its supervision missions, the Bank representatives played a key role in identifying and resolving various problems and issues encountered by PNOC EDC in the course of its

procurement and disbursement from which key implementors of the Energy Sector Project were amply benefited.

The Bank had been realistic and flexible enough in granting the request for reallocation of the Loan among PNOC, PNOC EDC and Petron and the extension of the loan closing date from December 31, 1994 to December 31, 1995.

F. BORROWER PERFORMANCE

Substantial preparation on the part of PNOC EDC had been made to undertake the energy sector project. In Bacman, both exploration and development activities of Bacman I and the drilling of exploratory and other production wells in Bacman II are prelude to the development of the 40 MW Bacman II geothermal project under the ESL. Likewise in other prospective areas geoscientific studies had been undertaken prior to the execution of the energy sector project.

The project was undertaken by PNOC EDC for a period of 66 months under the Loan starting from the effectivity of the Loan on June 12, 1990 until the closing date on December 31, 1995. But prior to that, groundwork had already been established by PNOC EDC in preparation for the ESP.

Throughout the implementation however, PNOC EDC was bound by the requirements, covenants and procedures prescribed by the Bank. PNOC EDC substantially complied with the Bank's proper monitoring requirement through submission of the quarterly progress report and furnish the Bank required data as requested especially during the supervision missions.

In compliance to the Bank's requirement of the Audit of the Statement of Expenditures and the SDA, PNOC EDC commissioned the Philippine Commission on Audit to conduct such examination. Timely submission of audit reports was fulfilled.

PNOC EDC was able to comply with financial covenants imposed by the Bank which include among others maintaining a debt to equity ratio of not more than 70:30 and current ratio of at least 1.

As beneficiary of the loan through the subsidiary agreement, PNOC EDC carried out its geothermal exploration, development and other related activities in accordance with the terms and conditions set in the loan agreement. PNOC EDC was able to utilize fully its US$118.0 million revised loan allocation.

G. ASSESSMENT OF OUTCOME

PNOC EDC has been successful in its exploration activities under the project, such that it was able to develop geothermal resource in the case of Bacman II and identify potential geothermal resource for future use in the case of Leyte A, Labo, and Northern Negros. Development of the latter two areas are to be financed by the OECF of Japan.

potential geothermal resource for future use in the case of Leyte A, Labo, and Northern Negros. Development of the latter two areas are to be financed by the OECF of Japan.

H. FUTURE OPERATION

The 20 MW Cawayan module of Bacman II has currently 3 production wells hooked-up to the power plant . One more production well, CN 5D is currently being hooked-up. Steam generation for 1994 reached 95,629 MWH and for 1995 it increased to 95,690 MWH. For the other 20 MW in Botong area, 6 production wells are expected to be hooked-up to the power plant. Admission of steam by NPC power plant is expected to start in April 1997. The steamfield is expected to provide steam to NPC power plant for 25 years.

I. KEY LESSONS LEARNED

Several lessons can be drawn out of PNOC EDC'S implementation of the ESP. Despite significant accomplishments of the project, PNOC EDC, however experienced cost overruns and delays in the project's implementation. The Bank, in cooperation with PNOC EDC took an active role in the reassessment of the physical and financial targets of PNOC EDC. This provided both parties a rationale for modifying the targets by which the project was implemented in terms of time frame and funding.

The bank's concern on the efficient administration of the project provided PNOC EDC the opportunity to acquire useful knowledge in procurement and disbursement aspects. Appropriate training program could actually be incorporated by the Bank in future projects to enhance implemetation skills of project implementors and is most welcomed by PNOC EDC.

Finally, harmonious working relationship between the Bank and the Borrower is a significant factor for the successful adminstration of the project.

Note: 1. The **Bank** as used here in this report means the **World Bank.**
2. The **Loan** means **World Bank Loan 3164-0-PH** *(for the Energy Sector Project-PNOC EDC portion).*
3. The **Borrower** means PNOC EDC.

IBRD ENERGY SECTOR LOAN NO. 3164 PH
PART II - PETROLEUM REFINING (PETRON)

The funded projects of the Petroleum Refining portion of Petron Corp. consisted of a) an 18,000 BPSD Gas Oil Desulfurization Unit (GODU) for the purpose of providing sufficient diesel oil desulfurizarion capacity to meet Petron's current LSD demand in the domestic market including the postulated diesel supply shortfall in the oil industry, and b) an upgrade of the LPG Treating Facilities covering the revamp of caustic facilities to increase production capacity from 3.1 MBSD to 5.0 MBSD including the installation of a new Spent Caustic Treating Facility, the replacement of a TCCU Wet Gas Compressor and revemp of TCCU Light-End Towers, all intended to meet the increasing demands for LPG.

Petron Corp. engaged the services of Exxon Research & Engineering Co. for the preparation of Schedule A package for the GODU and Merichem for the Spent Caustic Treater. Stanley Associates Engineering Ltd. (Canada)/RTM Engineering was also commissioned for the comprehensive review of the entire engineering package prior to the release to EPC contractors for bidding. Most of the basic engineering portion of LPG Facilities Upgrade project were undertaken by Petron's own technical personnel.

The Engineering Procurement & Construction (EPC) of the projects were awarded and undertaken by the consortium of Daelim-Mitsui Engineering Companies. Onshore construction and fabrication works were subcontracted to EEI Corporation, a locally registered company.

The LPG Treating Facilities upgrade project was successfully commissioned last February 25, 1995 producing good results both in terms of increasing LPG production and treating capacity. The GODU on the other hand, was put on-stream last April 23, 1995 and had produced products more than the design quality specifications since then.

Total project cost was US$37.73 million. Total amount drawn from the bank was only US$19.968 million out of the allocated US$29.0 million. The remaining funding requirement to complete the project was internally generated by Petron.

Petron Corporation is very positive that the benefits generated by the projects will be sustained. In addition to meeting the oil industry's shortfall on both LPG and diesel products, the projects, specifically GODU, enabled Petron to comply with the government's move to reduce air pollution especially in the urban centers by way of lowering specification for sulfur content of diesel to 0.5 wt % effective this year. The government is planning to further lower the sulfur content limit in diesel to 0.2 wt % by the year 2000 and the GODU can very well this requirement. During its performance test run, GODU attained 91% desulfurization efficiency (1% higher than its 90% design efficiency) with a sulfur content of .12 wt % on the product based on 1.33 wt % feed sulfur content.

The installation of a spent caustic treating facility will also enable Petron to comply with the stringent pollution abatement requirements to be enforced by the Environmental Management Bureau (EMB) in the near term. The 1.9 MBSD increase in LPG production will be fully availed of as LPG demand is projected to increase by an average 15% per year for the next five (5) years. At present, the three (3) oil refineries in the country are importing LPG to satisfy consumer demand.

The projects' benefits are expected to be fully utilized for the entire operating design life of the units which is twenty (20) years and beyond under normal preventive maintenance and corrosion control measures practiced in the refinery.

The completion of the above projects positions Petron as an industry pacesetter that can very well adjust to current and upcoming government statutes directly linked to pollution control and economic interest of this country. The project was hailed by President Fidel V. Ramos as a big boost to the attainment of Philippines 2000 status and cited for its significance in relation to government efforts towards a cleaner and greener environment.

IBRD ENERGY SECTOR LOAN NO. 3164 PH
PART III - INSTITUTIONAL STRENGTHENING

The institutional development component was aimed at strengthening and enhancing the technical capabilities of the PNOC staff in systems planning, project monitoring and management. Employees who were deployed to attend various trainings and seminars in these fields from 1991 to 1995 were mainly from the Company's petroleum refinery and geothermal business units, i.e., now Petron and EDC, respectively. The component was orginally allocated US$3.0 Million in 1990 but has since been reduced to US$2.088 after requests for cancellation was forwarded to the Bank in mid 1995.

As of December 31, 1995 total drawdowns on this component amounted to PHP1.337 Million or 64% of the revised loan amount. Of this total availment, Petron utilized US$.694 Million while EDC's share was US$.643 Million. (Schedule A)

Petron's drawdowns consisted mainly of payments for professional services rendered by the Arthur D. Little International, Inc. (85%) for studies on petroleum demand and supply and for trainings/seminars (15%) in refinery operations and management, financial and human resource management. The Arthur D. Little studies served as basis for preparing the Corporation's refinery expansion/upgrading plans.

EDC's drawdowns were mainly used to send its staff to various technical and management competency trainings and seminars abroad and the conduct of in-house trainings. A Management Development Program commissioned with the Asian Institute of Management acounted for over 34% of the availment. Other trainings attended were in the specialized fields of geochemistry, environmental economics, oil & gas accounting/management and water quality management.

In addition to meeting the objectives of the component, the Company was able to derive other benefits such as the establishment of an information network with other agencies and counterparts and raising the technical credibility of our staff to standards comparable with other ASEAN countries.

EXECUTIVE SUMMARY
World Bank - Energy Sector Loan 3165-PH (Second Draft)

On March 16, 1990, the Republic of the Philippines availed of a US $390 M loan from the World Bank through Energy Sector Loan. Envisioned as a means of strengthening the role of the then Office of Energy Affairs (OEA) as the coordinating agency for the sector's policy planning, the loan provided for the upgrading of institutional capabilities as well as technical assistance projects. Of the total loan amount, US$ 40 million or 10.7% was allocated to the government comprising of the following energy agencies as beneficiaries : (a) Department of Energy/Office of Energy Affairs (US$4.34 million); (b) National Electrification Administration (US$ 22.24 million); (c) Environmental Management Bureau of the DENR (US$ 10.48 million); and the (d) Energy Regulatory Board (US$ 3.00 million). The Philippine National Oil Company (PNOC) was allocated US$ 150 million while the remaining portion amounting to US$ 200 million was appropriated to the National Power Corporation (NPC).

The government portion of the loan or WB-ESL No. 3165-PH was officially terminated last 31 December 1995 after having been extended for one year. This was in view of the delayed implementation of some project components caused primarily by the late releases of funds as well as periodic manpower and technical problems. As Administrator of the government portion of the loan, the Department prepared in consultation with the beneficiary agencies, a consolidated contribution/inputs to the Implementation Completion Report which is part of the loan requirements. Prior to the termination of the loan, government loan utilization amounted to US$ 31.46 Million or 78.47% of the total allocation.

DEPARTMENT OF ENERGY

The DOE portion of the WB-ESL has three (3) major components, namely: Technical Studies (US$ 0.74 M), Institutional Capability Building (US$ 0.91 M), and Building Expansion (US$ 1.06 M).

Under the *Technical Studies* component, three projects were completed, namely: a) the Environmental Impacts of Accelerated Geothermal Energy Development which aimed to identify the impacts of accelerated geothermal energy development and institute measures to mitigate the same, b) Institutionalization of Methods and Procedures for Local Non-conventional Energy Planning at the Regional and Sub-regional Levels Study with significant outputs to wit: "Framework for Integrated Energy Planning of Sustainable Development which prescribes the integration of energy planning mechanisms into the national development planning process, the Census of New and Renewable Energy Sources Systems Installations at the National Capital Region, and the conduct of series of seminar on Long-range Energy Alternatives Program (LEAP) Software. However, three of the technical projects were not implemented per the loan agreement because of the following reasons: (a) The Non-Power in Geothermal Study was replaced by the establishment of coal testing facility due to existence of similar study undertaken by the PNOC; (b) The project " Cost Structure and Transfer Pricing Study" was financed by the USAID through its Technical Resource Project and was completed in 1993; (c) only the capital outlay of the project "Fuel Contingency Plan" was drawn as it was pre-empted by the 1991 Gulf crisis.

The Institutional Strengthening component of the loan provided technical assistance, training, supplies and equipment for two completed projects, namely : Establishment of the Energy Database and Power Systems Planning. The Regional Energy Demand Forecasting which is part of this component was pursued under a USAID grant. On the other hand, 50 percent of its total allocation was utilized from the Manpower Training component. The completion of the DOE Annex Building which was inaugurated on September 28, 1995 by President Fidel V. Ramos is a fitting landmark of the Bank's support to the country's energy sector.

The following are the plans of DOE after the completion of various components of the WB-ESL projects:

A. Environmental Impacts of Accelerated Geothermal Energy Development

Republic Act 7638 vests upon the DOE the authority over energy projects. This will ease the way for DOE to institute measures to safeguard the environment while pursuing its mandate to ensure adequate supply of energy for the country. This authority, in joint coordination with the EMB-DENR mandates the DOE to be the central coordinator of all agencies involved in geothermal regulatory proceedings in consonance with the one-stop-shop concept. DOE shall facilitate timely actions on environmental applications/requests by investors related to geothermal development. In order to efficiently carry this out, it was recommended that a Memorandum of Understanding (MOU) be drawn to define the role and responsibility of each agency involved in geothermal permitting.

B. Nonconventional Energy

The DOE will pilot test the "Framework for Integrated Energy Planning of Sustainable Development" in one province. There will be two-tiered consultation meetings at provincial and regional levels to validate the drafted framework.

Locally-funded projects will be conducted to develop mechanisms for monitoring NRES and to assess their contributions to the national energy mix. Strategies developed by DOE-ANECs and the NCR Census will be integrated into a single methodology capable of both monitoring the status of NRES installations and their contributions to the energy mix.

C. Coal Testing Facility

The plant will be made available to researchers from the academe, the coal industry and students on coal beneficiation processes to demonstrate the technology for a broader understanding and appreciation of its environmental merits.

D. Power Systems Planning

Transfer of technology plan will be strategized by the proponent division of DOE at the regional level possibly under a different funding source.

Bank Performance

Records showed that the Bank's performance was satisfactory in terms of lending assistance during project preparation and implementation.

ENVIRONMENTAL MANAGEMENT BUREAU
Department of Environment and Natural Resources

The DENR-EMB component of the Energy Sector Project is entitled "Modernization of Environmental Monitoring Facilities and Capabilities in Response to Energy Developments". It was included in the Philippine Energy Sector Project in view of the expected environmental impact of the rapid energy sector expansion. Corollary to this, there is a need to properly equip the agency in terms of facilities and institutional capacities.

The general objective of the project is to assess the impact of energy projects on air and water quality and specifically to intensify air and water quality monitoring and surveillance activities, control and prevent pollution from stationary sources, enhance environmental impact assessments, modernize laboratory and monitoring facilities.

The components of the EMB Energy Sector Project consisted of the following:

1. Air and Water Quality Monitoring
2. Pollution Prevention and Control
3. Environmental Impact Assessments (EIAs)
4. Modernization of laboratory and monitoring facilities
5. Manpower training and development

The project has successfully met its objectives with the purchase and installation of the following equipment: (a) portable monitoring facility for the use of EMB and the regional offices of DENR (b) establishment of nine (9) air quality monitoring stations and acquisition of three (3) module air quality monitoring van. Consultants were commissioned to advise EMB on the purchase of these equipment and accessories as well as to set up programs for data collection, analysis, quality assurance and staff training.

Implementation Experience and Results

The EMB with a total allocation of Ten Million Four Hundred Thousand US Dollar (US$10.4 M) has satisfactorily implemented the project in its entire duration. From the year 1992, the project has achieved its annual disbursement target.

Since the physical and price contingencies were deducted from the total loan amount of US$ 10.4 M by the DBM, accordingly, US$ 8.56 M became the total based cost of the project funds. Of this, only US$ 7.797 M was disbursed by the EMB Energy Sector Project indicating an 84.26 percent utilization rate.

The project on "Modernization of Environmental Monitoring Facilities and Capabilities in Response to Energy Developments" which was given a one-year extension was completed in 1995. The loan disbursements were slow during the first year of implementation due to the delays in the bidding and procurement processes as well as the untimely release of funds from the Department of Budget and Management (DBM). These problems consistently surfaced until the last year of implementation.

Key Lessons Learned, Future Operation and Sustainability

With an expanded database and knowledge acquired from the project implementation, the DENR will have a sound and sufficiently drawn basis to formulate appropriate policies regarding air and water pollution from power plants, rules and regulations for stationary sources and enhance criteria for the environmental impact assessments of energy projects.

While substantial gains have been made from the WB-ESL assisted project, it would be significant to the EMB to acquire further external funding and support for the installation of more air quality monitoring stations in other parts of the country where power projects/stations are in operation. This will ensure the development of a countrywide database profile to expand DENR's framework for its policy and program planning and implementation.

The sustainability of the project is guaranteed in view of the following: (1) the acquired equipment are accuracy and durability proof considering the reputable standing of its manufacturers in the field of environment, (2) equipment are provided with a five-year supply of accessories and spare parts, (3) training of technical personnel in the operation and maintenance of equipment; and "after sales service" of the suppliers are satisfactory.

Performance of the Bank

The bank facilitated the equipment procurement processes through its immediate response to EMB queries, fast-tracked evaluation and approval of the required documents.

ENERGY REGULATORY BOARD

A portion of the government loan for ERB was basically envisioned as a means of strengthening the agency by way of upgrading its institutional capability as well as provision for technical assistance projects. Of the total loan amount, the ERB got a slice amounting to US$ 3.0 M. In 1995, the Board got an additional loan amounting to US$ 0.38 M which was withdrawn form EMB's surplus. The ERB spent a total US$ 3.45 M.

The ERB's portion of the WB-ESL has four (4) major components, namely:

1. Human Resource Training and Development.

2. Technical Assistance on:

   a. Power Tariff Consultancy
   b. Petroleum Product Pricing
   c. Coal Pricing
   d. Management Information System
   e. Purchase Power Study
   f. Technical Assistance on the Institutional Dev't. Project
   g. ERB's Physical Resource Development
   h. Legal Aspects of the Study on the Regulation of Transmission and Sub-transmission charges
   i. Regulatory Cost and Finance Analysis and Training
   j. Electric Utility Rates Analysis
   k. An Analysis of the Philippine Antitrust Laws

3. Physical Resource Development.

4. Strengthening of ERB's Information and Production unit.

Implementation Experience and Results

Under the Human Resource Training and Development, the ERB personnel have participated in various local and foreign training/conferences which broadened their perspective in terms of appreciating the implications of regulatory policies and decisions.

Under the Technical and Management Assistance component, joint undertakings of the hired consultants with the ERB counterpart ensured transfer of technology such as in the use of software or on the adoption of the applicable rate setting methodology in the Philippines, and the like.

To compliment its growing tasks and responsibilities and to ensure its mobility and accessibility, the physical resources of ERB were upgraded with the acquisition of vehicles,

communications and information equipment such as fax machines, two-way radio system and cell phone. The ERB likewise acquired testing facilities , procured books and subscribed to energy periodicals.

With regard to the strengthening of its information and production units, the ERB acquired necessary equipment, computer hardware, software and other accessories. Networking and document imaging were also put in place. These were also transfers of technologies in practically all the applicable tasks of the projects.

Problems and Major Factors Affecting the Project

There were some administrative problems that affected the project implementation, like the delay in the 1991 budget allotment, late approval of the General Appropriation Act, lack of government counterpart for the 70%-30% loan utilization, no budgetary allocations approved for ERB in 1994 and technical issues with DBM in the disbursement of funds allotted for consultancy services in view of E. O. 205 dated January 3, 1991.

Bank Performance

The Bank's performance was satisfactory in terms of its extending the necessary lending assistance from the preparatory stage up to the project implementation.

Borrower's Performance

To ensure that the project objectives are complied, the ERB assigned a Project Director and an Alternate to oversee the implementation. A Technical Committee was also created whose members came from the different units of the agency. It was tasked to screen prospective consultants for the Technical Assistance component. Correspondingly, a secretariat arm was designated to coordinate with the project consultants.

Overall Outcome

The objectives were satisfactorily met within the five-year (1991-1995) period of project implementation.

Key Lessons Learned

Several lessons were learned in the course of project implementation. First, there should be closer coordination between the agency's technical and financial groups. Second, the Board should create a Project Review Committee to assess the status of the projects and how they contribute in meeting the objectives. Third, is the regular and constant communication with DBM, Bureau of Treasury , BSP and the administrative agency (like DOE). Lastly, the Board suggests that a more systematic administration of the financial aspect of the loan be ensured by the concerned agency or better yet a loan/grant should be given directly to ERB.

Plans for the Future

ERB faces an even greater challenge with the passage of several bills such as the RA. 7832, the Omnibus Bill (An act to ordain reform on the power sector to ensure the optimal electrification of the Philippines), the Energy Competition Bill (An anti-monopoly bill), Senate Bill No. 886, to name some adding powers and functions to the Board. This scenario call for more technical assistance, e. g., appraisal of assets, impact of DSM to rates, consolidation and merger, load forecasting, and other reforms in the distribution sector particularly the 120 electric cooperatives nationwide. If the ERB has to meet these critical tasks, it needs to house a great number of employees, hence it is more beneficial if it can build its own office than renting a roughly 2,460 square meters at its present address. It is hoped that the Bank can extend assistance in this regard.

NATIONAL ELECTRIFICATION ADMINISTRATION

1. Improving NEA's Institutional Capabilities

This component of the loan, includes the provision of computers, professional and office equipment, communication equipment, vehicles and warehouse equipment for NEA. All of these items were purchased except for the proposed procurement of two (2) shuttle busses for NEA employees which was not pushed through as the requested approval from the Office of the President was turned down. Delivery of computers and engineering software and other testing equipment under IFB 62 was not completed before the loan closing date. However, the Bank agreed to finance this procurement under the Rural Electrification Revitalization Project (Loan 3449-Ph). The acquisition of these items, increased NEA's mobility in project implementation and make effective communication link between NEA and the Electric Cooperatives (ECs). It enhanced NEA's capabilities to handle and deliver materials to the ECs.

2. Improving NEA's Functional Capacity

This component of the loan aims to establish and provide operational and maintenance equipment for its regional operation offices and zonal repair and maintenance facilities. A total of seven (7) units of Test Vans including laboratory equipment were procured for this purpose, six (6) were allocated for use in the regional offices who operate and maintain these equipment

while one (1) unit is being used at the central office in Manila.

3. Upgrading and Repair of Distribution System

This component of the loan provides for the rehabilitation of the distribution system of twelve (12) ECs. Electrical materials and equipment including maintenance trucks to support the rehabilitation and upgrading project were procured and issued to eighteen (18) beneficiary ECs. These rehabilitation and upgrading projects eventually contributed in the improvement of the quality of electric service being provided by the recipient ECs.

4. Installation of Additional Substation

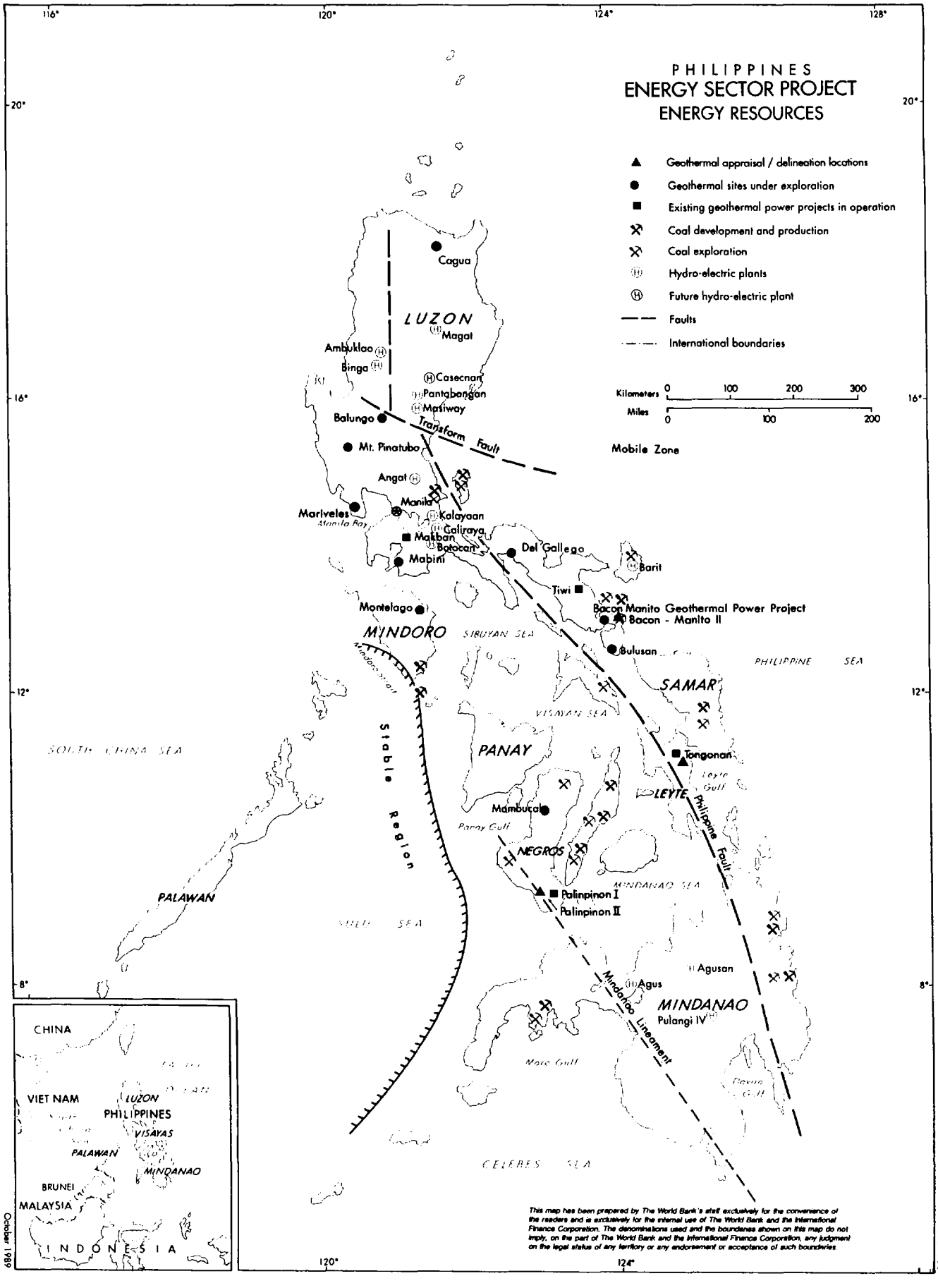
Aside from financing the necessary rehabilitation equipment and materials requirement of ECs under the No. 4 component, the loan also finances the procurement of additional eight (8) substations intended to be installed in eight (8) ECs. A total of twenty one (21) Power Transformer and Substation Packages were procured to sustain the availability of power supply in recipient ECs. Installation of these equipment were already completed except for the remaining five units expected to be installed in 1996.

5. Training and Technical Assistance

There were two major consultancy projects for this component: one is the Banking Consultancy Contract with the Private Development Corporation of the Philippines (PDCP); and the Technical Assistance on Materials and Handling conducted by the National Rural Electric Cooperatives Association (NRECA).

The Banking Consultancy Contract with PDCP was intended to assist NEA; (i) to implement its revised lending program, together with the rescheduling of existing debt obligations of the ECs and for the appraisal and origination of new investment loans; and (ii) to develop and institutionalize a loan appraisal and administration function within NEA by organizing a core lending group which shall undergo on-the-job training. The training component of the consultancy contract was accomplished. However, the overall performance of the contractor was not satisfactory as it failed to complete the reconciliation of loan accounts and the restructuring of accounts.

NEA is receiving significant donor support for the funding of specific rehabilitation and expansion projects of the ECs and as the central procurement agency for the ECs, NEA is procuring significant amount of distribution material and equipment in support of the construction of the identified projects. Because of these services of the NRECA was engaged for the following: (i) development of a strategy for the efficient procurement, staging and delivery of materials and equipment to recipient ECs; (ii) development of a detailed workplan for the implementation of the strategy that is developed; and assessment of the ECs capability to timely construct the identified projects. This technical assistance on materials handling consists of two parts, the Phase-I which is the study phase, was completed 1993 and the Phase-II, which is the implementation phase is on-going and is being financed under the existing Rural Electrification Revitalization Project. The study phase was able to identify likely bottlenecks to the smooth


PHILIPPINES
ENERGY SECTOR PROJECT
ENERGY RESOURCES
Geothermal appraisal / delineation locations
Geothermal sites under exploration
Existing geothermal power projects in operation
Coal development and production
Coal exploration
Hydro-electric plants
Future hydro-electric plant
Faults
International boundaries
Kilometers 0 100 200 300
Miles 0 100 200
Mobile Zone
Cagua
LUZON
Magat
Ambuklao
Binga
Casecnan
Pantabangan
Masiway
Balungo
Transform Fault
Mt. Pinatubo
Angat
Manila
Mariveles
Manila Bay
Kalayaan
Caliraya
Makban
Botocan
Mabini
Del Gallego
Barit
Tiwi
Bacon Manito Geothermal Power Project
Bacon - Manito II
Montelago
MINDORO
SIBUYAN SEA
Bulusan
PHILIPPINE SEA
SAMAR
VISAYAN SEA
SOUTH CHINA SEA
Stable Region
PANAY
Tongonan
Leyte Gulf
LEYTE
Philippine Fault
Mambucal
Panay Gulf
NEGROS
MINDANAO SEA
Palinpinon I
Palinpinon II
PALAWAN
SULU SEA
Agusan
Agus
MINDANAO
Pulangi IV
Mindanao Lineament
Moro Gulf
Davao Gulf
CELEBES SEA
CHINA
VIET NAM
LUZON
PHILIPPINES
VISAYAS
PALAWAN
MINDANAO
BRUNEI
MALAYSIA
INDONESIA
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October 1989
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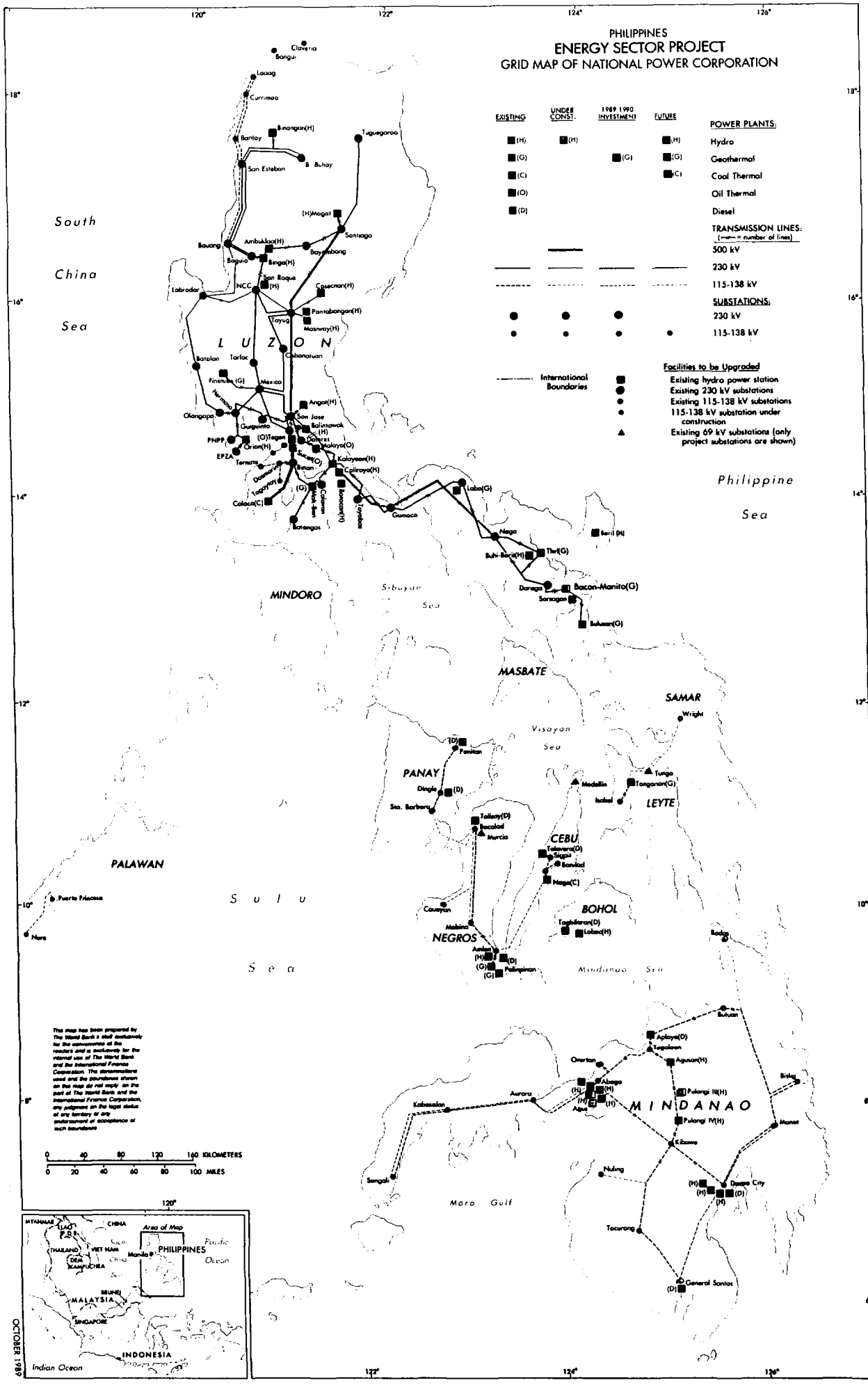
PHILIPPINES
ENERGY SECTOR PROJECT
GRID MAP OF NATIONAL POWER CORPORATION
EXISTING
UNDER CONST.
1989 1990 INVESTMENT
FUTURE
POWER PLANTS:
Hydro
Geothermal
Coal Thermal
Oil Thermal
Diesel
TRANSMISSION LINES:
(—— = number of lines)
500 kV
230 kV
115-138 kV
SUBSTATIONS:
230 kV
115-138 kV
International Boundaries
Facilities to be Upgraded
Existing hydro power station
Existing 230 kV substations
Existing 115-138 kV substations
115-138 kV substation under construction
Existing 69 kV substations (only project substations are shown)
South China Sea
Philippine Sea
LUZON
MINDORO
MASBATE
SAMAR
LEYTE
PANAY
CEBU
BOHOL
NEGROS
PALAWAN
MINDANAO
Sibuyan Sea
Visayan Sea
Sulu Sea
Mindanao Sea
Moro Gulf
Claveria
Bangui
Laoag
Currimao
Binangan(H)
Bantay
San Esteban
B. Buhay
Tuguegarao
(H)Magat
Santiago
Bauang
Ambuklao(H)
Baguio
Binga(H)
Bayombong
San Roque (H)
NCC
Labrador
Casecnan(H)
Pantabangan(H)
Tayug
Mosiway(H)
Batolan
Tarlac
Cabanatuan
Pinatubo (G)
Mexico
Angat(H)
Olongapo
San Jose
Gugenio
Balintawak (H)
PNPP
(O)Tagan
Dolores
Orion(H)
Malaya(O)
EPZA
Ternate
Kalayaan(H)
Calirayan(H)
Calaca(C)
Batangas
Caliraya
Botocan(H)
Tanabon
Gumaca
Labo(G)
Naga
Buhi-Barit(H)
Tiwi(G)
Daraga
Bacon-Manito(G)
Sorsogon
Bulusan(G)
Baril (H)
Wright
Tacloban
Tongonan(G)
Medellin
Isabel
Ormoc
Tolong(D)
Bacolod
Murcia
Talisay(D)
Sagay
Bonbon
Naga(C)
Cauayan
Mabinay
Tagbilaran(D)
Loboc(H)
Bacolod
Puerto Princesa
Nara
Butuan
Aplaya(D)
Agusan(H)
Overton
Abuga
Aurora
Kabacan
Pulangi III(H)
Pulangi IV(H)
Kibawe
Bislig
Manat
Nuling
Davao City
Tacurong
General Santos
Sangali
Area of Map
PHILIPPINES
Manila
Pacific Ocean
South China Sea
CHINA
MYANMAR
LAO P.D.R.
THAILAND
VIET NAM
DEM. KAMPUCHEA
BRUNEI
MALAYSIA
SINGAPORE
INDONESIA
Indian Ocean
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0 40 80 120 160 KILOMETERS
0 20 40 60 80 100 MILES
OCTOBER 1989
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IMAGING

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