Folder Title:	Masood Ahmed - Chronological File - June to December 1980
Folder ID:	30450189
Series:	Sector and Operational energy and industry unit chronological files
Dates:	06/10/1980 - 12/18/1980
Subfonds:	Masood Ahmed files
Fonds:	Records of Individual Staff Members
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OFFICE MEMORANDUM

TO: Mr. Warren C. Baum, CPSVP

DATE: December 18, 1980

FROM: Yves Rovani, Director, EGY

SUBJECT: Addendum to Energy Assessment and Sector Work

1. The purpose of this memo is to clarify the relationship between energy assessments and energy sector work as defined in my note to you of December 16.

2. In substance, country energy assessments are not different from sector work because they represent one way of doing sector work in energy. Thus, they share many of the objectives that have traditionally been associated with sector work in the Bank: the identification of needed policy reforms and technical assistance and of the priorities for preinvestment and investment in the future development of the sector.

3. Nevertheless, there are enough differences of form, emphasis and audience between the energy assessments we propose and much of the other sector work which has been carried out in the Bank and by other agencies, to make their separate classification a useful conceptual and presentational tool. Some of these differences can be summarized as follows:

(i) The energy assessment is essentially a diagnostic exercise focussed on identifying issues and actions which sets it apart from the much more comprehensive, encyclopaedic and costly general surveys which are also part of sector work;

(ii) The purpose of the energy assessment is not just to provide a framework for our own energy lending but equally importantly to provide the Government and other donor agencies with an assessment of the needs and priorities in the energy sector. Consequently, in nearly all instances, these reports will be addressed to a much wider audience than has been the case for the bulk of our traditional sector work in energy. This aid coordination function is a new dimension in our work which is acquiring increasing importance and merits more explicit recognition;

(iii) Country selection criteria for the energy assessment program will differ from the usually supply driven approach to other sector work. Countries with little indigenous resource potential, including many smaller and poorer countries, need just as much attention--and often more urgent help--as those which offer a large potential for future Bank involvement;

(iv) Finally energy assessments differ from much of our other work in energy which is really subsector work. They enable us to focus on the interlinkages between the various supply subsectors and between energy supply and the major energy using sectors--industry, transport, etc. This point is worth stressing because it is only recently that we have begun to think of "energy" in this integrated context and not just as the sum of the work we do in power, coal or petroleum.

4. In short, coining this new word serves to identify substantive differences with other forms of sector work. It also serves to emphasize and hopefully achieve selectivity and concision, and to attract the attention of decision-makers, which have also been the stated goals of sector work in the Bank.

YRovani/MAhmed:ks

December 17, 1980

Mr. M. A. Mansoor
School of Administration
University of Mauritius
Reduit
Mauritius

Dear Mr. Mansoor:

Thank you for your letter of November 25. I am sorry that we did not get a chance to meet during my recent short visit to Mauritius to study the energy sector. I would very much have welcomed the opportunity to discuss with you your paper on the Mauritian Energy Situation which I thought was interesting and well written. However, as I mentioned to your colleague Mr. Yeung Lam Ko, the paper's estimates of the potential savings of foreign exchange from the substitution of gasoline by ethanol may be somewhat high as they do not take into account the balance of payments impact of the reduction in molasses exports that would result from such a substitution program. I believe that a revision of your estimate to take this into consideration would add considerably to the policy implications of your paper.

I am glad to hear that you are participating in the national energy conference - which I was sorry I could not stay for - and I am sure that it will provide a lively forum for the discussion of these important issues.

As regards employment possibilities with the World Bank, I have passed on your curriculum vitae to my colleagues in the Personnel Department of the Bank who will contact you directly should a suitable opening arise.

I hope that we can meet to discuss your ongoing work in the energy sector during my next visit to Mauritius, currently planned for the spring of 1981.

I look forward to meeting you then.

Yours sincerely,

Masood Ahmed
Economist

MAhmed:sl

THE UNIVERSITY OF MAURITIUS

SCHOOL OF ADMINISTRATION

TELEPHONE: 4-1041

HEAD OF SCHOOL
Prof. D. AH-CHUEN M.B.A. (Strath.);
F.C.A.; M.B.I.M.; A.I.P.M.

REDUIT
MAURITIUS

Mr. Masood Ahmed
Energy Department
The World Bank
Washington, D.C 20433

Dear Mr. Ahmed,

It is rather unfortunate that I have been unable, because of a problem of internal communication at the University, to meet you during your short stay in Mauritius.

I would have thought that, given a paper has been worked out jointly with Mr. L Yeung Lam Ko on "The Energy situation in Mauritius: Present "attend and future Trends" it would have been essential to have your views on that study before presenting it at the National Energy conference of December next. I understand that Mr. Yeung Lam Ko had discussions with you in this connection, but there are some issues which I would have been delighted to have your comments on. We could have also discussed about ~~future~~ future research projects in this field at the University of Mauritius.

I have also been given to understand that the World Bank intends recruiting "Energy Economists" in the near future, and my meeting you would have provided me with an opportunity of discussing my chances for these posts. If it is not too much asking, I would be very grateful if you would kindly have a look at my curriculum vitae (herewith attached) and let me know the possibilities of seeking a job with the World Bank. I have already responded to the World Bank's recent advertisements for vacancies for Country and Agricultural Economists (Personnel Dept, Candidates' Identification Unit).

Thanking you very much and apologizing for the inconvenience caused,

Yours sincerely
Raymond Mauroor

Record Removal Notice

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File Title	Barcode No.
Masood Ahmed - Chronological File - June to December 1980	30450189

Document Date	Document Type	
December 1980	CV / Resumé	

Correspondents / Participants

Subject / Title
Curriculum Vitae Mahmood Ariff Mansoor

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.

Withdrawn by	Date
Sherrine M. Thompson	November 08, 2022

Mr. P. C. Garg, PAS

December 12, 1980

Masood Ahmed, EGY

Resource Implication of Energy Sector Work Indicative Statement.

1. Further to our conversation, I would like to clarify the following points with regard to the indicative statement of energy sector work we sent out on December 9.

(i) The resource requirements of the program indicated therein do not include any resources for the identification or preparation of energy projects. There is thus, no double counting of resources allocated for this activity from the lending program budget.

(ii) As mentioned in paragraph 3, the resources required for the review of this program would be additional to the total program costs of 669 staff weeks. We estimate that this function will require a regional input of approximately 40 - 50 staff weeks.

(iii) Our indicative statement relates to work programmed for the energy sector as a whole and does not include subsector work (for oil, gas, coal, power, etc.), that may be done by the various operational divisions as part of their regular project preparation activities.

(iv) The Energy Department's contribution to this program (536 staff weeks) includes approximately 240 staff weeks of staff and consultant time supplied under the UNDP Inter-Regional project for integrative energy assessments. Thus, the total Bank financed resources required for this program would be 430 staff weeks (exclusive of the review input) of which 133 staff weeks would be supplied by the Regions.

(v) As I mentioned to you, it is not feasible at this stage to separate the UNDP input from the Bank input on a country specific or even regional basis because (a) requests for assistance under the UNDP project have only just begun to come in and it is difficult to forecast which of the countries in the program will ultimately ask for such assistance, and (b) the resources supplied to the Bank under the UNDP project essentially comprise 4 staff and associated consultant and travel funds to be used to augment the Bank's own program of energy sector assessments. These resources are not earmarked for specific countries and it does not follow that a country which asks for assistance under the UNDP project will be worked upon by UNDP staff or that these staff will not work on countries which have not asked for such assistance.

2. For these reasons, I believe that the best working assumption we can make at this stage about the Bank financed EGY contribution - i.e., net of the resources supplied through the UNDP project - is to multiply our total contribution in each region by a factor of 0.55, which represents the share of Bank financed resources in our global program, as shown below.

	SW	%
Total EGY input	536	100
Of which:		
UNDP input	240	45
Bank financed	296	55

MAhmed:ams.-

cc: Messrs. R. Gulhati, (EANVP); L. de Azcarate, (WANVP); P. Hasan, (AENVP); W. Bussink, (AWA); J. A. Holsen, (ASNVP); H. Pilvin, (ASA); V. Dubey, (EMNVP); G.P. Pfeffermann, (LCNVP); B. Kavalsky, (EM1); Bronfman, Ware, (EAP); Bouhaouala, Thiam, Schmedge, Billington, (WAP); Jennings, Landau, Moscote, Linder, (LCP); Geli, Lamson-Scribner, (ASP); Wyss, Beach, Baldwin, (AEP); Carmignani, Reekie, (EMP); Vergin, (PAB); Rovani, Sheehan, Bourcier, Sadove, Fish, Davis, Bhatnagar, McCarthy, Fallen-Bailey, Dosik, Ristorcelli, Elejalde, Bauer, Bharier, Nayyar, Byer, (EGY)

OFFICE MEMORANDUM

TO: Distribution List

DATE: December 9, 1980

FROM: Masood Ahmed, EGY (thru Yves Rovani, Director)

SUBJECT: Indicative Statement of Energy Sector Work FY82

1. Attached please find an indicative statement for energy sector work in FY82. It is based on discussions with the Regional Program and Projects Divisions, the Petroleum Projects Divisions and other parts of EGY. The program, including the choice of countries, scope of work, size and timing of missions, etc. has evolved in the following way:

a) Preliminary indication of country priorities from discussions of FY81 economic and sector work program earlier this year.

b) Requests from governments, for assistance in energy planning either directly to the Bank or through the United Nations Development Program.

c) Inclusion in Bank power or petroleum projects of an energy planning technical assistance component.

2. The main objective of our sector work for most of these countries will be to produce an energy assessment report which will identify the major issues and options in the energy sector. Where appropriate, this report will also assist in drawing up a program of technical assistance which will be required to develop a national energy planning capability. In some countries, however, (e.g., China, Yugoslavia, Indonesia) a more ambitious and manpower intensive program of sector work is proposed to take account of the complexity of the energy sector and the large scope for Bank involvement in lending for the development of different energy resources.

3. The total resource requirements of this program are estimated at 669 staff weeks, which includes a proposed regional contribution of 133 staff weeks. The bulk of this input will therefore be provided by the Energy Department from its own resources and from resources supplied under the UNDP Interregional Project for Energy Assessment. It is worth emphasizing that these resource estimates do not take account of the extensive staff and management review process which will be needed to ensure standards both in terms of the selection of issues and their analytical treatment. Our experience to date suggests that this input is likely to range from 10 to 15 percent of the total program costs and that roughly half of this will need to come from regional programs and projects departments.

4. We believe this program accords well with Bank and country priorities, has a good regional balance and allows for some inevitable droppage and slippage. At the same time, however, we also feel that the complexity of the sector, the large number of countries involved, the limited resources available for this task and the need to ensure internal and external coordination in effectively carrying out this program all provide compelling reasons for developing a more analytical basis for the programing of energy sector work in the Bank. As you may know, we have recently been working on developing such a framework which would allow for sector work priorities to be set on a country by country basis and thereby enable its improved programing at the aggregate level. I would therefore like to take this opportunity to attach for your consideration a sample format country table for Kenya which illustrates the type of analysis we hope will be carried out for all member countries.

5. This table is divided into four sections as follows:

Section A is the five year energy and structural adjustment lending program which enables us to determine: (a) when energy sector work is best undertaken, (b) what subsector resources will be provided for through the lending process, (c) what project or SAL vehicles will be available for policy reform and preinvestment work.

Section B is the analytical tool to record the current state of knowledge of the sector. This will be the most difficult section to fill in because it requires the making of an informed - but necessarily subjective - judgement on the basis of often incomplete and inadequate data. Nevertheless, we believe that this judgement has to be made because without it the programing for parts C and D would be far less satisfactory. Comments indicate the kind of issues that require primary emphasis.

Section C itemizes the specific resources required to supplement those already provided for lending: the first line is the integrative technology and economic energy expertise to be provided from our own EGY/UNDP staff; the next lines indicate what additional resources would be needed for coal, geothermal, etc., subsector work; the rest is self-explanatory.

Section D indicates where these resources should come from: EGY for the integrative function and the petroleum sector; IPD for coal and refineries; regional projects for power; programs for review and coordination with the macroeconomic framework, etc. Once this exercise has been completed for all countries, we can compare the aggregate resource requirements with the levels we can realistically obtain given the competing needs of other sectors.

6. The above format should be viewed as a first attempt to set out an extremely complex problem. A more comprehensive treatment of the major energy consuming sectors - industry, transport, etc. - and the integration of existing and planned sector work by other agencies into this table are two of the ways in which we intend to refine it further during subsequent iterations. We also hope to benefit from your comments and reactions and from discussions with the regions and other energy related CPS departments during the next few weeks.

7. In the meantime, Julian Bharier, or in his absence this week, I will be happy to meet with you at your convenience to discuss or further clarify either the indicative statement of energy sector work or the proposed new format for the programing of this work for the energy sector.

Distribution list: Messrs. R. Gulhati (EANVP)
L. de Azcarate (WANVP)
P. Hasan (AENVP)
W. Bussink (AEA)
J. A. Holsen (ASNVP)
H. Pilvin (ASA)
V. Dubey (EMNVP)
G.P. Pfeffermann (LCNVP)
B. Kavalsky, (EM1)

cc: Messrs. Rovani, Sheehan, Bourcier, Sadove, Fish, Davis, Bhatnagar, McCarthy, Elejalde, Bauer, Bharier, Nayyar, Byer, (EGY); Garg, (PAS); Bronfman, Ware, (EAP); Bouhaoula, Thiam, Schmedje, Billington, (WAP); Jennings, Moscote, Linder, (LCP); Geli, Lamson-Scribner, (ASP); Wyss, Beach, Baldwin, (AEP); Carmignani, Reekie, (EMP); Vergin, (PAB)

Attachments

MAhmed:ams.-

KENYA

ATTACHMENT I

SAMPLE ENERGY SECTOR WORKSHEET

A. Lending Program

	$ million				
	80	81	82	83	84
Petroleum Expl.Promotion		5.0			
Forestry III			75.0		
SAL			95.0		
Power IV				60.0	
Energy II					52.0
SAL III					80.0

B. State of Sub-sector Knowledge

Subsector/most recent document		Rating of Knowledge 1/
Petroleum:	Expl.Prom. Project Brief, July 80 (EGY)	3
Refineries:	GOK Eco.Summary '80	3
Renewables:	Regional Task Force Report, May 80	3
Electricity:	Olkaria Geoth. Appraisal Report, December 79	2
Pricing:	Electricity Tariff Study, June 78 (EGY)	2
	Petroleum - GOK Statistics	4
Overall:	Tuschak: Kenya's Energy Situation, Aug. 79	3

Comments: Dependent on oil imports for 80% of commercial energy consumption. No known oil, gas or coal resources. Available hydro and geothermal resources. Serious fuelwood depletion crisis. Large and active energy lending program. Considerable sub-sector knowledge (especially power) but need for updating and integration. New Energy Ministry formed in December 1979, but still in formative stage. Overall energy planning and policy weak. Urgent need for integrative assistance.

C. Sector Work Program:

Applications: Task No.	---Manweeks--- 81	82	84
1 Institutional/organizational framework	2/		
2 Integr. energy assessments 3/	16	25	
3 Energy Pricing Study			10
4 Rural Energy Survey			10
5 Updating & CPP, CEM		5	15
6 Other, unidentified			10
Total	16	30	45

D. Sector Work Program:

Sources: Task no.	----EGY---- UNDP	Other	---EAP---- Power	Agr	EAN	IPD	Other
1	2/						
2 (41 SW)	18	15	2	2	2	2	-
3 (10 SW) 4/		5	2		2	1	
4 (10 SW) 4/		7		3			-
5 (20 SW)		3	5	2	10		
6 (10 SW)							10
Total (91 SW)	18	30	9	7	14	3	10
Of which in FY81:	10	2	1	-	1	2	-
FY82:	8	11	3	2	6	-	-
FY83:	-	17	5	5	7	1	10

1/ Based on subjective scale of 1-5, where 1 implies complete knowledge of all issues and 5 means no data available.

2/ Being carried out by EEC Consultants and GOK.

3/ Includes 5SW of sub-sector work in petroleum, 2 on refineries, 4 on renewables. Remaining input is for integration of sub-sector work and analysis of policy, pricing, planning and institutions by energy economist and energy technologist (25 SW);and review (5 SW).

4/ Includes Bank staff input only,with much larger input being made by GOK or their consultants or other donor agencies. These studies may be financed under Forestry III or Power IV.

Attachment II

SUMMARY OF FY82 SECTOR WORK

Commitments

	------Staff Weeks------		
	Region	EGY	Total
East Africa	38	98	136
West Africa	26	74	100
East Asia & Pacific	9	75	84
South Asia	19	46	65
EMENA	10	126	136
LAC	31	117	148
TOTAL	133	536	669

11/6/80

EAST AFRICA

Country	Staff Weeks EAP	EGY	TOTAL
Sudan 1/	10	20	30
Zambia *	10	25	35
Rwanda *	8	15	23
Comoros *	5	10	15
Seychelles	2	13	15
Tanzania 2/	3	15	18
TOTAL	38	98	136

* Countries which have already made formal requests for Energy Assessment Study under UNDP Inter-Regional Project.

1/ Would make use of petroleum subsector work done in FY81 by PPD (EGY).

2/ Energy Assessments would make use of information generated by consultants under energy planning components of petroleum projects.

11/6/80

WEST AFRICA 2/

Country	Staff Weeks WAP	EGY	TOTAL
Benin	5	15	20 (?)
Togo	5	15	20
Mali 1/	5	13	18
Mauritania 1/	5	13	18
Niger	6	18	24
Total	26	74	100

1/ Energy assessments would make use of information generated by consultants under energy planning components of petroleum projects.

2/ This program has been discussed with Mr. Billington on Dec. 8, 1980. The regional submission for energy sector work accords well with this program in terms of country selection. Except for Mauritania, all the above countries are also included in the regional program. Mr. Billington indicated that he would try to get Mauritania into this program during the regional meeting held on December 8 to finalize their FY82 sector work program.

EAST ASIA AND PACIFIC

Country	Staff Weeks AEP	Staff Weeks EGY	Staff Weeks TOTAL
Fiji 1/	3	10	13
Western Samoa 1/	3	10	13
Solomon Islands* 1/	3	10	13
Carry Over from FY81 2/			
China		25	25
Indonesia *		15	15
PNG	—	5	5
TOTAL	9	75	84

1/ To be carried out as contiguous missions.
2/ Only EGY input for carry over work on China and Indonesia included.

* Countries which have already made formal requests for Energy Assessment Study under UNDP Inter-Regional Project.

11/6/80

SOUTH ASIA

Country	Staff Weeks ASP	Staff Weeks EGY	Staff Weeks TOTAL
Burma	8	22	30
Nepal 1/	8	16	24
Maldives	3	8	11
TOTAL	19	46	65

1/ Would make use of petroleum subsector work being done by PPD in FY81.

11/6/80

EMENA

Country	------Staff Weeks------ EMP	EGY	TOTAL
Malta *	4	16	20
Morocco	6	30	36
Carried over from FY81 1/			
Romania		20	20
Turkey		30	30
Yugoslavia	—	30	30
TOTAL	10	126	136 1/

1/ Includes only EGY input for carry over work from FY81.

* Countries which have already made formal requests for Energy Assessments Study under UNDP InterRegional Project.

LAC

Country	------Staff Weeks------ LCP	EGY	TOTAL
Dominican Republic	5	25	30
Bolivia 1/	3	22	25
Costa Rica	5	25	30
Peru	10	25	35
Paraguay	8	20	28
TOTAL	31	117	148

1/ Would make use of information generated by EGY/PPD in FY81.

Note: This page is not being circulated outside EGY.

Resource Application	Staff Weeks
Total Input	669
- Regional	133
- EGY	536
Breakdown of EGY Input	
- PPD & Exploration staff	85
- UNDP (staff)	140
- Other Front Office	15
- Consultants	150
- EGY Planning staff	146
Total	536

This would allow:

a) 0.5 SY of UNDP for management/administration;

b) 2.0 SY of EGY Planning and 1.0 SY of EGY consultants' time for (i) preparation, appraisal and supervision of planning projects/components, (ii) support to structural adjustment loans and economic missions;

c) 0.4 SY of EGY Planning for policy work, guidelines, studies, etc.

Energy assessment and advisory work

The purpose of this work is to help member countries to identify and initiate the actions acquired to stimulate the search for and exploitation of indigenous sources of energy, to improve the efficiency of energy use, to insure adequate supplies in rural areas for productive and domestic uses and to develop the capability to plan and execute these activities and to coordinate external aid and private resources continuously as an integral part of their development strategy.

Very few countries now have the capacity and the resilience to react coherently to the large price increases of 1979, to the current supply uncertainties and to the likely further flare up of oil prices to $50 or more per barrel. The resources and experience to assist in this matter are scarce in the international community and generally ill focussed, being aimed more at longer term, higher cost exercises, or at the sophisticated treatment of doubtful data than the more immediate problem solving effort now acquired. The Bank's own efforts are still sparse, poorly programmed, unevenly executed, not well understood or supported. Yet, the scope of the Bank's lending for energy supply and for the principal energy consuming sectors, the breadth of its development experience and the credibility and leverage of its development advise give it a unique capability to effectively assist countries in improving their strategy and using more effectively outside help from all sources with very high return to their economies. To realize this potential, however, requires considerable improvements in focussing objectives, programming the work, budgeting for it, ensuring suitable standards of performance and ensuring that its conclusions are implemented and followed up through the Bank's normal decision process.

The following is a preliminary overview of the approaches being developed to deal with the various issues raised above.

Objectives

The ultimate objective is to ensure that a member country has an energy strategy with targets for consumption, indigenous production and imports, the policies and investment programs, the human and financial resources, and the institutional framework to implement them. Under present circumstances of countries and Bank knowledge and resources such objective is not attainable within a reasonable period of time for most countries. The vast majority of countries do not have now an energy strategy, and many amongst the smaller countries only have the rudiments of a development strategy. The few countries which do have both such as Brazil or Korea, press for Bank or other external assistance to help resolve complex tradeoff or to serve as a sounding board much as IEA does for the industrialized countries amongst other things. The normal pattern - consistent with the Bank's country economic work - is that this is a continuum. Most of the countries which have had Bank help in this area have requested follow-up visits.

Telex 4337 RH Salisbury

Dec. 10, 1980 74545

HOTEL MONOMATAPA

FOR WORLD BANK GUEST AHMED ZIA MIAN, ROOM 1014.

REURTLX. WHILE BANK IS AGREEABLE IN PRINCIPLE TO CARRYING OUT AN ENERGY ASSESSMENT FOR ZIMBABWE, THE SCOPE, TIMING AND NEED FOR A FULL ENERGY ASSESSMENT MISSION COULD BEST BE DETERMINED AFTER THE MAIN FINDINGS OF YOUR OWN MISSION HAVE BEEN DISCUSSED IN WASHINGTON AND THE ADDITIONAL SUBSECTOR WORK NEEDED PRIOR TO A FULL ASSESSMENT MISSION BETTER IDENTIFIED. SUGGEST THEREFORE THAT YOU INFORM GOVERNMENT THAT FOLLOWING THE REVIEW OF YOUR MISSION'S FINDINGS IN WASHINGTON, WE WILL INFORM THEM OF THE STEPS THAT NEED TO BE TAKEN TO COMPLETE THE PREPARATION OF AN ENERGY ASSESSMENT. REGARDS, AHMED.

ZIMBABWE: Energy Assessment

MAhmed:ams.-

cc & cleared by: Mr. Reese (EA1)
Mr. Ware (EAP)

cc: Messrs. Tuncay, Sneddon,

R.H. Sheehan, Sr. Adviser
Energy

Record Removal Notice

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File Title	Barcode No.
Masood Ahmed - Chronological File - June to December 1980	30450189

Document Date	Document Type	
04 December, 1980	Form	

Correspondents / Participants

Subject / Title
Performance Assessment Julian Bharier

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.

Withdrawn by	Date
Sherrine M. Thompson	November 08, 2022

FORM NO. 27 - OCR
(11-78)

WORLD BANK OUTGOING MESSAGE FORM (Telegram, Cable, Telex)

Masood. Chron

IMPORTANT (PLEASE READ INSTRUCTIONS BELOW BEFORE TYPING FORM.)

Class of Service: TELEX Date: December 2, 1980

Telex No.: 41273 Originators Ext: 7-4545

12 10

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START 1 HERE TO INTBAFRAD

CITY/COUNTRY DAR-ES-SALAAM, TANZANIA

MESSAGE NO

4 FOR KWAKU. REURTEL A. ARMAR. MR. ARMAR PRESENTLY IN INDONESIA

5 ON MISSION. HE WILL RETURN TO WASHINGTON ON DECEMBER 12. WOULD

6 YOU WANT US TO PASS THIS MESSAGE ON TO SOMEONE ELSE? REGARDS

7 MASOOD AHMED, ENERGY DEPARTMENT

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21 END OF TEXT

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SUBJECT:	DRAFTED BY: MAhmed:ks
CLEARANCES AND COPY DISTRIBUTION: cc: Mr. A. Armar (o/r)	AUTHORIZED BY (Name and Signature): Richard Sheehan
	DEPARTMENT: ENERGY
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FORM NO. 27 - OCR
(11-78)

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Class of Service: Telex Date: Dec. 2, 1980

Telex No.: 919462 Originators Ext: 74545

12 10

START HERE TO: INTBAFRAD

CITY/COUNTRY: LONDON

MESSAGE NO:

FOR MR. WALLACE PRYKE. THIS IS TO CONFIRM THE BANK'S AGREEMENT WITH THE TERMS OF REFERENCE OUTLINED IN YOUR TELEX OF NOVEMBER 21 REGARDING YOUR FORTHCOMING CONSULTANCY ASSIGNMENT WITH THIS DEPARTMENT. I LOOK FORWARD TO HAVING YOU ON BOARD IN EARLY JANUARY. REGARDS, YVES ROVANI, DIRECTOR, ENERGY DEPARTMENT

END OF TEXT

NOT TO BE TRANSMITTED

SUBJECT:

DRAFTED BY: MAhmed:ams.

CLEARANCES AND COPY DISTRIBUTION:

cc: Messrs. Sheehan, Bharier-EGY
Miss Wilkerson, PMD

AUTHORIZED BY (draft) and (signature): R. H. Sheehan

DEPARTMENT: Sr. Adviser, EGY

SECTION BELOW FOR USE OF CABLE SECTION

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November 17, 1980

Mr. Gene Cretz
The Institute for Energy Research
State University of New York at Stony Brook
Long Island, N.Y. 11794

Dear Mr. Cretz:

As promised, I am sending you an updated version of the list of energy institutions in the developing countries which you left with me some weeks ago.

As you expected, we have not made much headway on the second questionnaire regarding the activities of these institutions. I hope this information will be useful. Please call me if I can be of any further assistance.

Sincerely,

Masood Ahmed
Energy Economist

MAhmed:ams.-

MIDDLE EAST

Abu Dhabi

Habib Ahmed
Director General
Water and Electricity Dept.
P.O.Box 219
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Dr. Hussein Abdallah
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General Director
Ministry of Electricity and Energy
Abassia Masr City

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EUROPE

Azores

Secretaria Regional Do Comercio E. Industria
Rua Dr. Caetaro de Andrades 17
9 500 Ponta Delgala (Across)

Portugal

Ministry of Industry and Technology
General Directorate of Energy
Rua Da Beneficencia 241
Lisboa, Portugal

AFRICA

Burundi

Ministry of Energy and Mines
Bujumbura

Ethiopia

Ethiopian National Energy Committee
P.O.Box 486
Adds Ababa

Ghana

Ministry of Lands and Natural Resources
P.O.Box M 212
Accra

Kenya

Ministry of Energy
Nairobi

East Africa Power & Lighting Company, LTD.
(EAP&L) P.O.Box 30099
Nairobi, Kenya

Forestry Department
Ministry of Natural Resources

Nigeria

Nigerian National Petroleum Corp.
P.M.B. 12701
Lagos, Nigeria

Federal Ministry of Economic Development
Ikoyi, Lagos

Nigerian National Petroleum Corporation
P 17B
12701 Lagos

Senegal

Ministry of Industrial Development and Artisanal

Sudan

Ministry of National Planning
P.O.Box 2092 Khartoum

Ministry of Energy and Mining
P.O.Box 2087, Khartoum

AFRICA

Tanzania

Rubiji Basin Development Authority
P.O.Box 9320
Dar-es-Salaam, Tanzania

Ministry of Water, Energy and Minerals
Tancot House
P.O.Box 9153
Dar-es-Salaam

Tanzania Petroleum Development Corp.
P.O.Box 2774
Dar-es-Salaam

Zambia

National Commission for Development Planning
P.O.Box RW 268
Lusaka

Zambia Electricity Supply Corp. Limited
P.O.Box 620
Ndola, Zambia

LATIN AMERICA

Jamaica

Energy Division
Ministry of Mining and Natural Resources
P.O.Box 495, 2 St. Lucia Ave.,
New Kingston - 5, Jamaica

Petroleum Corporation of Jamaica
P.O.Box 579
Kingston - 10
Jamaica

Bolivia

Direccion Nacional de Electricidad
Av. Mariscal Santa Cruz No. 1332 40 Piso
La Paz

Ministry of Energy
Ave. Mariscal
Santa Cruz #1322
La Paz, Bolivia

LATIN AMERICA

Brazil

Ministry of Mines and Energy
Brasilia 70.00Q DF
Brazil

Electrobras
642 Rio Branco Ave.
Rio De Janeiro

Guyana

Ministry of Energy and Nat. Resources
Georgetown, Guyana

Caricom Secretariate
Energy Department
Georgetown, Guyana

Chile

Empresa Nacional de Electricidad (ENDESA)
Santa Rosa 76 Santiago Chile Casillo (1392)

ODEPLAN (National Planning Office)
Ahumada 48, 7 piso Santiago, Chile

Colombia

Dept. of National Planning
Javier Riva
Cable 26 No 13-19
Department National Planning
Bogota

Petroleum

ECOPETROL
Carrera 13 No. 36-34, Piso 11
Bogota, DE, Colombia

Coal

CARBOCOL
Calle 40A No. 13-09, Piso 5
Bogota, DE, Colombia

Electricity

Interconnexion Electrica, SA (ISA)
Calle 50 No. 50-21
Edificio Banco dela Republica
Medellin, Colombia

Costa Rica

Instituto Costarricense de Electricidad
Apartado 10032
San Jose, Costa Rica

LATIN AMERICA

Dominican Republic

Comision Nacional de Politica Energetica

Central Bank of Dominican Republic
Santo Domingo

Secretariat of Industry and Commerce
Comision Nacional de Energia Politica

Ecuador

Direccion General de Hidrocarburos
Santo Prisca No. 215 y 10 de Agosto
Quito

National Planning and Economic Coordinating Board
10 de Agosto Goo y Checa
2114 Junapla
Quito

National Energy Institute
Santa Prisca No. 223 y Manuel Harrea-Quito

OLADE (Organization Latinoamericana de Energia)
Quito, Ecuador

Haiti

Electricite d'Haiti

Honduras

National Planning Council

Barbados

Ministry of Caribbean Affairs & External Trade
Bridgetown, Barbados

Caribbean Development Bank
Bridgetown, Barbados

Mexico

Direccion Secretaria de Patrimonio y Fomento
Industrial General de Energia
Rio Rhin #22 - 3 piso
Mexico 5 D.F.

Secretaria de Patrimonio y Fomento Industrial
Rio Rhin 25
Mexico 5, D.F.

LATIN AMERICA

Nicaragua

Nicaraguan Institute of Energy

Empresa Nacional de Luz Y Fuerza (ENALUF)
P.O.Box 55
Managua

Peru

Electroperu - INIE Branch
Eng. Miguel Suaro Giovannini
General Director Electroperu - INIE
F. Masias B60, Lima 27 Peru

ASIA

Bangladesh

Ministry of Planning
Sher-e-Bangla Nagar
Dacca, Bangladesh

Units: External Resources Division
Power Division

Indonesia

State Electricity Corporation
P.O.Box 1/KBYT
Kebayoran Timor Jakarta Selata
Jakorta, Indonesia

Units: Planning
Electric Power Research Center

Ministry of Research and Technology
Jln. Iman Bunjol 58 Jakorta Rusat
Jakarta

Unit: Planning Division

Department of Mines and Energy

Unit: Directorate General of Energy and Electric Power
Sub: Directorate for Energy Resources Development

Division: Subdirectorate for Data

Korea

1. Ministry of Energy and Resources

Unit: Planning Division

2. Korea Atomic Energy Research Institute
P.O.Box 7 Cheong Ryang
Seoul

3. Economic Planning Bureau
82 Sejung-Ro-Jongro Ku
Seoul 110 Korea

4. Ministry of Energy and Resources
6 Kai Ulgiro Chunggu
Seoul

Unit: Office of Emergency Planning

ASIA

Pakistan

1. Ministry of Petroleum and National Resources

Unit: Directorate General of Energy Resources, Islamabad

2. Water & Power Development Authority, Lahore

People's Republic of China

1. Committee of Science and Technology

Unit: Energy Department

2. Bureau of Automobiles

Unit: Chang Chung Institute of Automobile Engineering

Philippines

1. Philippine National Oil Company
   7901 Makati Avenue Makati Metro
   Manila

2. Ministry of Energy
   P.O.Box 1031 Makati Commercial Center
   Metro Manila

3. Bureau of Energy Development

Unit: Non-Conventional Resource Division

Units: Bureau of Energy Utilization
Merritt Road
Fort Bonifacio
Metro Manila

Unit: Planning Services
Sub: Resource Management Division

Sri Lanka

1. Ceylon Electricity Board

2. Ministry of Finance and Planning
   Secretariat, Colombo 1

ASIA

Thailand

1. Natural Gas Organization of Thailand
   1 SOI YASOOB 1 VIBHAVADI, RANGSIT Road
   Bankok

   Unit: Economic Analysis Project Division
   Sub: Gas Technology and Utilization Division

2. Bangkok Oil Refinery
   Soi 64 Sukhumvit Road
   Prakanong, Bangkok

3. Provincial Electricity Authority
   200 Ngam Wongwam Road
   Bangkok

4. National Energy Administration
   Pibultham Villa
   Rama 1 Road
   Bangkok

   Unit: Regulatory Division
   Sub: Energy Policy Section

5. Electric Generating Authority
   Nontlaburi, Thailand

6. National Economic and Social Development Board
   962 Krung Kasem Road
   Bangkok, Thailand

   Unit: Energy Planning Sector
   Sub: Infrastructure Projects Division

10/27

JBharier

MAhmed

TByer

AEzzati

ALiebenthal

ZMian

JJohnson

JKoch

HKraske

SBaile

OFFICE MEMORANDUM

TO: Energy Planning Unit Staff

DATE: October 24, 1980

FROM: Masood Ahmed, EGY

SUBJECT: Energy Institutions in Less Developed Countries

1. The Institute of Energy Research is compiling a list of energy institutions in less developed countries.

2. Their Mr. Cretz left with me today a preliminary list of these institutions which I am attaching. Could you take a look at this to see if we could suggest any changes or additions?

3. Also attached is a questionnaire which attempts to get more substantive information on policy making in the energy sector on a country by country basis. You might take a look at this, but I doubt whether we will be able to fill this out for more than a few cases.

Attachments

MAhmed:ams.-

MIDDLE EAST

Abu Dhabi

Habib Ahmed
Director General
Water and Electricity Dept.
P.O. Box 219
Abu Dhabi

Egypt

Dr. Hussein Abdallah
Undersecretary
Ministry of Petroleum
2 Latin America Street
Garden City, Cairo

Dr. Mostaba Suidan
General Director
Ministry of Electricity and Energy
Abassia Masr City

Ministry of Electricity and Energy
Nuclear Power Plants Authority
18 Huda Sharawi Street
BAB-E-LOUQ
Cairo

Jordan

Ministry of Industry and Trade
P.O. Box 2019
Amnan Jordan

EUROPE

Azores

Secretaria Regional Do Comercio E Industria
Rua Dr. Caetaro de Andrades 17
9 500 Ponta Delgala (Acores)

Portugal

Ministry of Industry and Technology
General Directrate of Energy
Rua Da Beneficencia 241
Lisboa, Portugal

AFRICA

Burundi

Ministry of Energy and Mines
Bujumbura

Ethiopia

Ethiopian National Energy Committee
Ethiopian National Energy Committee
P.O. Box 486
Adds Ababa

Ghana

Ministry of Lands and Natural Resources
P.O. Box M 212
Accra

Kenya

* East Africa Power + Lighting Company, Ltd (EAP + L). P.O. Box 30099 Nairobi, Kenya

Ministry of Energy
Nairobi

Ministry of Finance and Planning
National Council for Science and Technology
P.O. Box 30623 Nairobi, Kenya

* Forestry Department Ministry of Natural Resources

Nigeria

Nigerian National Petroleum Corp.
P.M.B. 12701
Lagos, Nigeria

Federal Ministry of Economic Development
Ikoyi, Lagos

Nigerian National Petroleum Corporation
P 17B
12701 Lagos

Senegal

Ministry of Industrial Development and Artisanal

Sudan

Ministry of National Planning
P.O. Box 2092 Khartoum

Ministry of Energy and Mining
P.O. Box 2087, Khartoum

AFRICA

Tanzania

Rubiji Basin Development Authority
P.O. Box 9320
Dar-es-Salaam, Tanzania

Ministry of Water, Energy and Minerals
Tancot House
P.O. Box 9153
Dar-es-Salaam

Tanzania Petroleum Development Corp.
P.O. Box 2774
Dar-es-Salaam

Tunisia

Enterprise Tunisienne di Activities Petrolieres (ETAP)

Zambia

National Commission for Development Planning
P.O. Box RW 268
Lusaka

Zambia Electricity Supply Corp. Limited
P.O. Box 620
Ndola, Zambia

LATIN AMERICA

~~Barbados~~ JAMAICA

1. ENERGY DIVISION
Ministry of Mining and Natural Resources, P.O. Box 495
2 St. Lucia Ave, ~~Kingston~~ New KINGSTON 5, JAMAICA.

2 → Petroleum Corporation of Jamaica
P.O. Box 579
Kingston - 10 Jamaica.

Bolivia

Direccion Nacional de Electricidad
Av. Mariscal Santa Cruz No. 1322 40 Piso
La Paz

Ministry of Energy
Ave. Mariscal
Santa Cruz #1322
La Paz, Bolivia

LATIN AMERICA

Brazil

Ministry of Mines and Energy
Brasilia 70.000 DF
Brazil

Electrobras
642 Rio Branco Ave.
Rio De Janeiro

Guyana

~~Caricom Community Secretariat~~ 1. MINISTRY OF ENERGY AND NAT. RESOURCES.
~~Third Floor~~ GEORGETOWN, GUYANA.
~~Bank of Guyana~~
~~Republic, Georgetown, Guyana~~ 2. Caricom Secretariate.
Energy Department
George Town, Guyana.

Chile

Empresa Nacional de Electricidat (ENDESA)
Santa Rosa 76 Santiago Chile Casillo (1392)

ODEPLAN (National Planning Office)
Ahumada 48, 7 mo piso Santiago, Chile

Colombia

Petroleum 1. ECOPETROL / Carrera 13 NO. 36-34, Piso 11
Coal 2. CARBOCOL
Calle 40A NO. 13-09, Piso 5
Bogota, D.E., Colombia

Dept. of National Planning
Javier Riva
Cable 26 No 13-19
Department National Planning
Bogota

Electricity 3. Interconnexion Electrica, S.A. (ISA)
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Medellin, Colombia

Costa Rica

Instituto Costarricense De Electricidad
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Dominican Republic

Comision Nacional De Politica Energetica

Central Bank of Dominican Republic
Santo Domingo

Secretariat of Industry and Commerce
Comision Nacional de Politica Energia

LATIN AMERICA

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Santo Prisca No. 215 y 10 de Agosto
Quito

National Planning and Economic Coordinating Board
10 de Agosto Goo y Checa
2114 Junapla
Quito

National Energy Institute
Santa Prisca No. 223 y Manuel Harrea-Quito

→ OLADE (Organización Latinoamericana de Energía)
QUITO, Ecuador

Guyana

~~Ministry of Energy and National Resources~~

Haiti

Electricite d'Haiti

Honduras

National Planning Council

~~Jamaica~~ BARBADOS

~~Ministry of Mining and Energy~~ MINISTRY OF CARIBBEAN AFFAIRS + EXTERNAL TRADE
BRIDGETOWN, BARBADOS.

~~Ministry of Mining and Natural Resources~~
~~I.C.W.I. Building~~
~~2 St. Lucia Ave.~~

caribbean Development Bank
Bridgetown. Barbados.

Mexico

Direccion Secretaria De Patrimonio y Fomento
Industrial GEneral de Energia
Rio Rhin #22 - 3 __ piso
Mexico 5 D.F.

Secretaria De Patrimonio Y Fomento Industrial
Rhio Rhin 25
Mexico 5, D.F.

Nicaragua

Nicaraguan Insitutue of Energy

Empresa Nacional de Luz Y Fuerza (ENALUF)
P.O. Box 55
Managua

LATIN AMERICA

Peru

Electroperu - INIE Branch
Eng. Miguel Suaro Giovannini
General Director Electroperu - INIE
F. Masias B60, Lima 27 Peru

(Argentina, Panama } Mr. Getz has already obtained what I had AR

ASIA

Bangladesh

Ministry of Planning
Sher-e-Bangla Nagar
Dacca, Bangladesh

Units: External Resources Division
Power Division

Indonesia

State Electricity Corporation
P.O. Box 1/KBYT
Kebayoran Timor Jakarta Selata
Jakorta, Indonesia

Units: Planning
Electric Power Research Centre

Ministry of Research and Technology
Jln. Iman Bunjol 58 Jakorta Rusat
Jakarta

Unit: Planning Division

Department of Mines and Energy

Unit: Directorate General of Energy and Electric Power
Sub: Directorate for Energy Resources Development

Division: Subdirectorate for Data

Korea

1. Ministry of Energy and Resources

Unit: Planning Division

2. Korea Atomic Energy Research Institute
P.O. Box 7 Cheong Ryang
Seoul

3. Economic Planning Bureau
82 Sejung-Ro-Jongro Ku
Seoul 110 Korea

4. Ministry of Energy and Resources
6 Kai Ulgiro Chunggu
Seoul

Unit: Office of Emergency Planning

PAKISTAN

1. Ministry of Petroleum and Natural Resources
   Unit: Directorate General of Energy Resources, Islamabad
2. Water & Power Development Authority, Lahore

People's Republic of China

1. Committee of Science and Technology

Unit: Energy Department

2. Bureau of Automobiles

Unit: Chang Chung Institute of Automobile Engineering

Philippines

1. Philippine National Oil Company
   7901 Makati Avenue Makati Metro
   Manila

Units: Bureau of Energy Utilization
Merritt Road
Fort Bonifacio
Metro Manila

2. Bureau of Energy Development

Unit: Non-Conventional Resource Division

3. Ministry of Energy
   P.O. Box 1031 Makati Commercial Center
   Metro Manila

Unit: Planning Services
Sub: Resource Management Division

Sri Lanka

1. Ceylon Electricity Board

2. Ministry of Finance and Planning
   Secretariat, Colombo 1

Thailand

1. Natural Gas Organization of Thailand
   1 SOI YASOOB 1 VIBHAVADI, RANGSIT Road
   Bankok

Unit: Economic Analysis Project Division
Sub: Gas Technology and Utilization Division

2. Bangkok Oil Refinery
   Soi 64 Sukhumvit Road
   Prakanong, Bangkok

Thailand

3. Provincial Electricity Authority
   200 Ngam Wongwam Road
   Bangkok

4. National Energy Administration
   Pibultham Villa
   Rama 1 Road
   Bangkok

Unit: Regulatory Division
Sub: Energy Policy Section

5. Electric Generating Authority
   Nontlaburi, Thailand

6. National Economic and Social Development Board
   962 Krung Kasem Road
   Bangkok, Thailand

Unit: Energy Planning Sector
Sub: Infrastructure Projects Division

The Institute for Energy Research
State University of New York at Stony Brook
Long Island, NY 11794

StonyBrook

Country _____.

ISSUES TO CONSIDER: LDC ENERGY ORGANIZATIONS

1. Is there an agency which co-ordinates the activities of the various agencies in the energy sector?

2. When energy options are developed, who sets the final policy?

3. Who is responsible for integrating energy development plans/programs into the overall national economic development plan?

4. Who is responsible for the urban industrial/commercial sector?

5. Who is responsible for energy exploration and development?

6. What agency is responsible for oil import/export policy?

7. Who is responsible for domestic distribution and marketing of energy resources?

8. Who is responsible for procurement of investment and finance for development of indigenous energy resources?

9. Who sets energy pricing policy? Who enforces them?

10. Who establishes conservation or demand curtailment policy?

11. What is the role of the utility? Is it powerful in decision-making or does it follow policy from a higher authority?

12. Who is responsible for energy improvement in the rural agricultural/community services sector.

OFFICE MEMORANDUM

TO: Files

DATE: November 13, 1980

FROM: Masood Ahmed, EGY

SUBJECT: Meeting with Professor Maurice Levy of the United Nations University (UNU).

1. At Mr. Bourcier's request, I met on Tuesday, November 4, with Prof. Levy of the U.N. University to discuss with him the Bank's program of energy planning and sector work and the possibilities for future cooperation between the Bank and UNU.

2. UNU was founded five years ago with its headquarters in Tokyo but with a large office in Paris, where Mr. Levy is based. To date it has been active in carrying out research work in three major areas: (1) food and hunger; (2) human development, and (3) the development of energy and mineral resources. In the energy field UNU's work has focussed on the analysis of the integrated energy needs of villages in developing countries. However, under its new director the university proposes to move towards a more academic orientation in its work in the energy sector.

3. I discussed with Prof. Levy the program of energy sector assessments which we intend to carry out with UNDP collaboration and he indicated that UNU would be interested in working with us in developing a common methodology for these assessments and in developing a model which would relate this methodology to other important national parameters such as population, political regime of the country concerned, the size of mineral resources, etc. He was interested in the guidelines for energy assessments and the presentation of energy data that we are in the process of preparing and I promised to forward these to him as soon as they were ready.

4. UNU would also be interested in developing a model which would help in defining the optimal composition, structure and size of an energy planning unit and its location within the overall organizational framework of the government. Prof. Levy said that his initial feeling was that such a unit should be located outside the mainstream of government policy making agencies and that its composition should emphasize its research nature. He felt that a successful energy planning unit would require a strong team of mathematicians and scientists who would be able to accurately model the long term energy requirements of a country.

5. Finally, Prof. Levy informed me that UNU proposes to hold a seminar on energy modelling at the end of next year, in which they would like the Bank to participate. He will be sending us more information on this seminar once the details have been firmed up further.

MAhmed:ams.-

cc: Messrs. Rovani, Sheehan, Bourcier, Bharier, Ms. Julius (EGY)

Files November 13, 1980

Masood Ahmed, EGY

Meeting with Professor Maurice Levy of the United Nations University (UNU).

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5. Finally, Prof. Levy informed me that UNU proposes to hold a seminar on energy modelling at the end of next year, in which they would like the Bank to participate. He will be sending us more information on this seminar once the details have been firmed up further.

MAhmed:ams.-

cc: Messrs. Rovani, Sheehan, Bourcier, Bharier, Ms. Julius (EGY)

Mr. Masood Ahmed, EGY

Nov. 6, 1980

Julian Bharier, EGY

TERMS OF REFERENCE: Energy Sector Mission to Malawi and Mauritius

1. On November 11 you will proceed for a two-week mission to London, Malawi and Mauritius with the following objectives:

(i) London: You will interview Mr. Alan Gowers, a candidate for an energy planning position within this Department, in the Bank's London office on November 12. You will send your preliminary recommendations from London on whether this candidate should be brought to Washington for panel interviews and follow this up with an interview evaluation report upon your return.

(ii) Malawi: You will arrive in Malawi on November 14 to discuss with government officials the scope, timing and nature of the energy assessment mission which is proposed for February/March 1981. In particular, you should identify with senior officials of the Economic Planning Department the priority areas that the Government would like the mission to concentrate on. You should also clarify with Government officials and with representatives of USAID the possibility of cooperation with USAID in carrying out the proposed energy assessment.

(iii) Mauritius: You will arrive in Mauritius on November 17 for a stay of ten days to carry out an energy assessment. You will be assisted by Mr. I. Tuncay, (EA[illegible]) who will be in Mauritius at the same time. The main objective of your mission will be to identify and analyze the major issues and options in the energy sector of Mauritius. In particular you should look at the following areas:

(a) The adequacy of existing tariff structures in the electric power sector and for petroleum products in assuring that these resources are used efficiently.

(b) The institutional structure of the energy sector and the technical assistance requirements for developing a national energy planning capability.

(c) The work that has been done in developing a program of energy conservation and demand management and the identification of technical assistance requirements for strengthening this program.

(d) The Government's program for accelerating the use of renewable non-conventional energy, particularly in the area of solar, biomass and wave energy.

2. Upon your return to Washington you will write a back-to-office report summarizing the main findings of your mission to be followed by a yellow cover energy assessment report on Mauritius.

cc&cw: Messrs. Schott, Hall (EAD)

cc: Messrs. Rajagopalan, (PAS), (3); Wapenhans, Gulhati, Barry, (EANVP); Adler, (EAP); Bronfmam, Ware, (EAP); Kraske, Reese, Ms. Hashimoto, (EA1); Gue, Blay, Joshi, (EA2); Rovani, Sheehan, Bourcier, Elejalde, Ristorcelli, Davis, Fish, Fallen-Bailey (o/r), Bauer, (EGY); Southall, Cancio, (LEG); Mrs. F. Stone, (PMD)

MAhmed:ams.-

START HERE

TO: BOOK OF THREE (SEE ATTACHED TEXT)

COUNTRY:

MESSAGE NO:

1) H.E. ANDRE BIBWA
MINISTRE DE FINANCE
BUJUMBURA, BURUNDI (LT)

2) H.E. DONATIEN BUTBIHTE
MINISTRE DE PLAN
BUJUMBURA, BURUNDI (LT)

3) MR. GEROME CHEVALIER
INTBAFRAD BURUNDI (TELEX BDI 95)

END OF TEXT

NOT TO BE TRANSMITTED

SUBJECT:	DRAFTED BY:
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	DEPARTMENT:
	SECTION BELOW FOR USE OF CABLE SECTION
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FORM NO 27 OGR
(11-78)

WORLD BANK OUTGOING MESSAGE FORM (Telegram, Cable, Telex)

IMPORTANT (PLEASE READ INSTRUCTIONS BELOW BEFORE TYPING FORM.)

Class of Service: Telex Date: Nov. 3, 1980

Telex No.: GEOMINES BDI 48 Originators Ext: 74545

12 10

START HERE

TO: HIS EXCELLENCY ISIDORE NYABOYA

CITY/COUNTRY: MINISTER OF MINES AND ENERGY

MESSAGE NO: BUJUMBURA, BURUNDI

RE YOUR TELEX OF 24 OCTOBER AND FURTHER TO YOUR DISCUSSIONS IN WASHINGTON WITH MR. BOURCIER OF THE ENERGY DEPARTMENT, I AM PLEASED TO CONFIRM THAT THE BANK PROPOSES TO SEND AN ENERGY ASSESSMENT MISSION TO BURUNDI IN MARCH/APRIL 1981 TO ASSIST THE GOVERNMENT IN IDENTIFYING THE ISSUES AND OPTIONS THAT FACE THE DEVELOPMENT OF THE ENERGY SECTOR.

IT IS OUR UNDERSTANDING THAT THE COST OF THIS MISSION WILL BE ATTRIBUTABLE TO THE UNDP INTERREGIONAL PROJECT FOR ENERGY ASSESSMENT FOR WHICH THE WORLD BANK IS EXECUTING AGENCY. UNDP WILL OF COURSE CONFIRM THIS DIRECTLY TO YOU.

WE ARE COPYING THIS TELEX FOR THEIR INFORMATION TO: H.E. ANDRE BIBWA, MINISTRE DE FINANCE, H.E. DONATIEN BUTBIHTE, MINISTRE DE PLAN, MR. GEROME CHEVALIER, RESIDENT REPRESENTATIVE. REGARDS, BHARIER, ENERGY DEPARTMENT, INTBAFRAD

END OF TEXT

NOT TO BE TRANSMITTED

SUBJECT: BURUNDI: Energy Assessment Mission

DRAFTED BY: MAhmed:ams

CLEARANCES AND COPY DISTRIBUTION:
cc&cw: Messrs. Sheehan (EGY)
Bourcier (EGY)
Ware (EAP)
Ms. Monceaux (EAD)

AUTHORIZED BY (Name and Signature): R. H. Sheehan

DEPARTMENT: Sr. Adviser, EGY

SIGNATURE REQUIRED FOR USE OF CABLE SECTION

Nov. 3, 1980

TELEX - BURUNDI: Energy Assessment Mission

cc: Mr. Y.S.M. Abdulai, EDS

Embassy of Burundi, Washington, D.C.

Messrs. Elejalde (EGYD2)

Bauer (EGYD2)

Bharier (EGY)

Record Removal Notice

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File Title	Barcode No.
Masood Ahmed - Chronological File - June to December 1980	30450189

Document Date	Document Type	
30 October, 1980	Memorandum	

Correspondents / Participants
To: Masood Ahmed
From: Payroll Section

Subject / Title
Dependency Allowance Overpayment

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.

Withdrawn by	Date
Sherrine M. Thompson	November 08, 2022

Telex
K26215

Oct. 28, 1980
74545

RE TO: SEOUL PLAZA HOTEL

COUNTRY: SEOUL, KOREA

SSAGE NO: FOR JULIAN BHARIER.

RE INDONESIA ENERGY SECTOR MISSION. THE FOLLOWING CONCERNS HAVE BEEN RAISED WITHIN THE DEPARTMENT RE STAFFING AND TIMING OF PROPOSED MISSION.

AAA) DOSIK UNABLE TO PREPARE FOR MISSION WITHOUT SACRIFICING OTHER DUTIES PARTICULARLY AS HUGHART AWAY IN CHINA AND IN ANY EVENT, YVES WOULD LIKE HIM HERE FOLLOWING THANKSGIVING.

BBB) OTHER STAFF ON MISSION NOT FAMILIAR WITH INDONESIA AND NO BANK STAFF INPUT ON POWER, INDUSTRY OR COAL.

CCC) NO PLANNED INVOLVEMENT OF ADB WHO COULD MAKE USEFUL CONTRIBUTION ON POWER.

IN VIEW OF ABOVE CONSIDERATIONS, CURRENT DEPARTMENTAL THINKING IS THAT MISSION SHOULD BE POSTPONED TILL EARLY 1981 WHEN STRONGER STAFF INCLUDING MAX WILTON COULD BE ASSEMBLED AND COORDINATION WITH ADB COULD BE EXPLORED. STAFFING CONSIDERATIONS ESPECIALLY CRITICAL BECAUSE OF IMPORTANCE ATTACHED TO OUTCOME OF THIS MISSION BY INDONESIAN GOVERNMENT. WE ARE ALSO CONSIDERING THE POSSIBILITY OF A SMALL RECONNAISSANCE MISSION IN NOVEMBER WHICH COULD GATHER

.../

END OF TEXT

NOT TO BE [illegible]

SUBJECT:

DRAFTED BY:

CLEARANCES AND COPY DISTRIBUTION:

AUTHORIZED BY (Name and Signature):

DEPARTMENT:

FOR USE OF CABLE SECTION

WORLD BANK OUTGOING MESSAGE FORM

START HERE TO
CITY/COUNTRY
MESSAGE NO

FURTHER INFORMATION ON SECTOR ISSUES AND BRING MATERIAL BACK FOR ANALYSIS AND REVIEW PRIOR TO FULL MISSION IN JANUARY. ONE OPTION MIGHT BE FOR YOU TO STOP IN JAKARTA ON YOUR WAY BACK TO ALERT RESIDENT MISSION AND INDONESIAN GOVERNMENT TO POSSIBLE DELAY IN FULL MISSION AND OBTAIN THEIR REACTION TO TWO STAGE FIELD REVIEW. SUGGEST ALSO IF CONVENIENT YOU STOP BY MANILA TO DISCUSS WITH BAKELY IN ADB THEIR POSSIBLE CONTRIBUTION TO JANUARY MISSION. IF AGREEABLE, YVES WILL CALL BAKELY TO BREAK GROUND ON THIS AND ALERT HIM TO YOUR VISIT. PLEASE PHONE YVES WITH YOUR VIEWS ON WEDNESDAY 10 AM WASHINGTON TIME. REGARDS, SHEEHAN, INTBAFRAD

END OF TEXT

SUBJECT
Indonesia: Energy Sector Mission

CLEARANCES
cc& cleared with: Mr. Dosik

cc: Mr. Rovani
Mr. R. Stern

DRAFTED BY
MAhmed:ams

R. H. Sheehan

DEPARTMENT
Sr. Adviser, EGY

Energy Planning Unit Staff

October 24, 1980

Masood Ahmed, EGY

Energy Institutions in Less Developed Countries

1. The Institute of Energy Research is compiling a list of energy institutions in less developed countries.

2. Their Mr. Cretz left with me today a preliminary list of these institutions which I am attaching. Could you take a look at this to see if we could suggest any changes or additions?

3. Also attached is a questionnaire which attempts to get more substantive information on policy making in the energy sector on a country by country basis. You might take a look at this, but I doubt whether we will be able to fill this out for more than a few cases.

Attachments

MAhmed:ams.-

Distribution

October 23, 1980

Masood Ahmed, EGY

Seminar on Energy Conservation

1. Mr. Wallace Pryke, a consultant for the Bank, will give an informal seminar on energy conservation on Tuesday, October 28, at 10:30 a.m. in room D556. Mr. Pryke is currently assisting the Bank in developing an energy conservation program in Barbados in connection with the proposed structural adjustment loan. Prior to this assignment, he helped the Government of Jamaica in formulating a similar program.

2. The seminar will last approximately 90 minutes and will include a question and answer session. You or your staff are invited to attend.

Distribution:
Messrs. Rovani, Sheehan, Bourcier (EGY) All EGY Staff
Messrs. Rajagopalan (PAS), De Vries (IDF), Cash, Kohli, Nayar, Iskander (IPD), Chatelin (TWT), Ware, Nouvel (EAP), Brown, Thiam (WAP), Beach, Gould (AEP), Rowat, Lamson-Scribner (ASP), Reekie, Zaidan (EMP), Moscote, Linder, Renger, Cook (LCP)

October 22, 1980

Dr. R. K. Pachauri
Director, Consulting & Applied Research
Administrative Staff College of India
Bella Vista, Hyderabad - 500 475
India

Dear Dr. Pachauri:

Thank you for your letter of October 3 to Mr. Bharier.

Mr. Bharier is on mission at the time, but is scheduled to return on November 6 and I am sure he will be happy to see you during your forthcoming visit to Washington on November 13.

Please call him at (202) 477-2781 when you arrive in Florida, to arrange for a mutually convenient time.

Sincerely,

Masood Ahmed
Economist
Energy Department

MAhmed:ams.-

cc: Mr. Julian Bharier

FORM NO. 379
(9/80)

WORLD BANK GROUP

INCOMING MAIL

DATE: OCT 16 1980

	Agriculture Dept.			Mr. Newman	E844
	Mr. Aguirre-Sacasa	A912		Mr. Nottidge	E539
	Mr. Aiyer	C719		Mr. Nouvel	F1015
	Mr. Beach	C413		Mr. S. O'Brien	A617
	Mr. J. G. Brown	D312		Mr. Otten	C913
	Mr. Berg	B208		Mr. Palein	D344
	Mr. Bickers	C1103		Mr. Parsons	E516
	Mr. Brandreth	A343		Mr. Peberdy	A240
	Mr. Burmester	C1011		Mr. Pellegrini	D1019
	Mrs. Calvo	D322		Personnel	
	Mr. Carnemark	A442		Population Dept.	N437
	Mr. Carter	E728		~~Mr. Powell~~	~~A410~~
	Mr. Chaffey	D329		Mr. Pranich	F518
	Mr. Chopra	B714		Mr. Price	B608
	Mr. Churchill	D630		Projects	
	Mr. Clements	A535		Publications	A110
	Mr. Clift	E311		Mr. Ramasubbu	A942
	Mr. Cole	F302		Mr. Reekie	F702
	Controllers			Mr. Reese	B1002
	Mr. D.A. Cook	B808		Mr. Reitter	F327
	Mr. Dahlberg	I3-144		Mr. Renger	B802
	Mr. Davar	E745		Mr. Ritchie	D714
	Mr. Davis	E932		Mr. Rowat	F504
	Mr. de Capitani	C1015		Mr. Sandberg	A1010
	Mr. Denning	E327		Mr. Sandstrom	D645
	Mr. Donaldson	D809		Mr. Saunders	D948
	Mr. Doyen	F818		Mr. Senner	C802
	Mr. Dunn	B507		Mr. Scearce	A1117
	Mr. Dutt	B913		Mr. Scherer	F925
	Mr. Eccles	E1005		Mr. Schloss	E913
	E.D.I.			Mr. Schott	B1008
	Education Dept.	D1130		Mr. Scott	C813
	Mr. Elejalde	D551		Secretary's	
	Mr. Elliott	F618		Mr. Serageldin	F713
✓	Mr. El Maaroufi	E705		Mr. Shibusawa	C506
	Energy	D530		Mr. Shields	E528
	Mr. Erkmen	E1039		Mr. Skilling	E928
	Mr. Favilla	E910		Mr. Smith	A642
	Mr. Fernandes	C908		Mr. Soges	B308
	Mr. Ffrench-Mullen	D751		Mr. R. Stern	A638
	Mr. Flood	C611		Mr. Stewart	E803
	Mr. Gibbs	C615		Mr. Sud	F402
	Mr. Gonzalez	E938		Mr. A. ter Weele	C402
	Mr. Gould	A414		Mr. Thys	A742
	Mr. Grimshaw	C302		Mr. Tibor	F418
	Mr. Gyamfi	B1105		Mr. Tillier	E301
	Mr. Haasjes	A942		Travel Office	C201
	Mrs. Hamilton	C514		Treasurer's	
	Mr. Howard	F602		Mr. Tsantis	C607
	Mr. Humphrey	B708		Mr. Wadsworth	E630
	Miss I.Z. Husain	N325		Mr. Walton	F1006
	Mr. A. Hussain	E624		WAPEW	C314
	I.D.F.	D428		Mr. Willoughby	D928
	Industrial Proj.	D1228		Mr. Zaidan	D728
	Internal Auditing	N835		Mr. Zavala	A842
	Mr. Johanson	F802			
	Mr. Kahnert	D639			
	Mr. Kalbermatten	D901			
	Mr. Kopp	C708			
	Mr. Krishna	E610			
	Mr.Lamson-Scribner	B409			
	Mr. Lee	A542			
	Mr. Linder	E903			
	Mr. Madavo	D611			
	Miss Marshall	A1140			
	Mr. Martinussen	D841			
	Mr. McCarthy	D400			
	Mr. Merghoub	A718			
	Mr. Messenger	N445			
	Mr. Mirza	C903			
	Mr. Moscote	F918			
	Mr. Naylor	E645			

FROM: Incoming Mail Unit - Room F126 - Ext. 72023

ADMINISTRATIVE STAFF COLLEGE OF INDIA
Bella Vista, Hyderabad - 500 475 (India)

Grams : BELLAVISTA
Phones: 36952-36956
Telex : Hyd. 0155-390

R.K. Pachauri, PhD
Director, Consulting & Applied Research

October 3, 1980

Mr. Julian Bharier
Energy Department
The World Bank
1818 H. Street, N.W.
Washington, D.C. 20433, USA

Dear Mr. Bharier:

I was disappointed that during my last trip to Washington you were out of town and, therefore, I was not able to see you. I did, however, enjoy meeting your other colleagues in the Energy Department.

As it happens I would be travelling to Florida in early November to present a paper at a seminar on energy. I plan to stop over in Washington for a day on November 13 and was wondering if you would be in office that day. If it is convenient to you I would like to see you when I am there.

I look forward to hearing from you.

Sincerely,

R.K. Pachauri

October 20, 1980

Dr. Behram Kursunoglu
Forum Chairman
International Scientific Forum on
Geopolitics of Energy
University of Miami
Center for Theoretical Studies
P.O. Box 249055
Coral Gables, Fla. 33124

Dear Dr. Kursunoglu:

Thank you for your letter of October 13 to Mr. Bharier inviting him to participate in the above Forum. I regret that because of his other commitments Mr. Bharier will not be able to attend these meetings. However, as you know, Mr. Richard Sheehan, Senior Adviser in the Energy Department, will be participating in the Forum on behalf of Mr. Rovani, and we hope to follow with interest the outcome of these discussions.

Thank you once again for your invitation.

Yours sincerely,

Masood Ahmed
Energy Department

cc: Messrs. Sheehan, Bharier (o/r), EGY

MAhmed:ks

Mr. Yves Rovani, EGY

October 20, 1980

Masood Ahmad, EGY

Travel Exceptions

With reference to Mr. Baum's memo of October 10 on the above subject, Mr. Julian Bharier is the only staff member in the Energy Planning Unit who has travelled in excess of 90 days in the 12-month period ending October 15, 1980. His total travel time during this period was 110 days.

MAhmed:ks

MA

TELEX/FR
44456

October 16, 1980
7-4545

INTBAFRAD

JAKARTA, INDONESIA

FOR MR. CHEETHAM. REYOUR TELEX 2908. FORTHCOMING ENERGY SECTOR MISSION SHOULD BE ABLE TO ASSESS POSSIBLE ROLE OF NUCLEAR POWER IN MEETING INDONESIA'S FUTURE ENERGY SUPPLY REQUIREMENTS IN THE LIGHT OF PROJECTED ENERGY CONSUMPTION GROWTH AND THE ALTERNATIVES AVAILABLE FOR ELECTRIC POWER GENERATION. IF MISSION FINDS THERE IS PRIMA FACIE CASE FOR NUCLEAR ITS REPORT WILL INCLUDE RECOMMENDATIONS ON SCOPE OF FURTHER DETAILED WORK IN THIS AREA. HOWEVER, OUR VIEW IS THAT THIS PARTICULAR MISSION WOULD NOT REQUIRE FIELD INPUT FROM A NUCLEAR ENERGY SPECIALIST. REGARDS BHARIER, ENERGY DEPARTMENT

MAhmed:ks

cc: Messrs. Stern, Colan (AEA),
Dosik, Mian (EGY)

Richard Sheehan

ENERGY

Distribution list October 10, 1980

Julian Bharier, EGY

Sri Lanka: Energy Sector Desk Study

A meeting will be held in Mr. Sadove's office, Room E1015, on Tuesday, October 14 at 10 o'clock to review the above mentioned paper.

MAhmed:ams.-

cc with attachment: Messrs. Rovani (EGY) Sadove (CPSVP)
Bourcier
Sheehan
Fish
Dosik
Fallen-Bailey
McCarthy
Ahmed
Munasinghe

cc: Mr. Byer

Mr. A. Dahlberg, CTR October 1, 1980

Masood Ahmed, EGY

Personal Effect Claim of May 1980.

With reference to the above claim and further to my memorandum to you of June 10, 1980, attached please find a receipt for my replacement prescription eyeglasses which I obtained during my last visit to Pakistan. I hope this will enable the processing of the balance of my claim for $65. Thank you for your cooperation in this matter.

Attachment.-

MAhmed:ams.-

MODERN EYEWEAR

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Mr. Bruce Jones, Acting Division Chief, AEA

September 23, 1980

Eugene D. McCarthy, Chief, EGYD1 and Masood Ahmed, EGY

PHILIPPINES: Working Level Draft CPP

In reference to the Philippines draft CPP and the issues raised in paragraphs 63-65 concerning future Bank lending in the energy sector, we have the following comments. The recent Energy Sector Survey mission recognized a need to develop an operational approach in the sector which would allow the Bank to reach agreement with the Government on policy issues fundamental to the sector's overall development. While endorsing such an approach as part of any Bank involvement, we believe that these policy objectives are best achieved through a phased program of separate project loans over the next few years rather than through a series of energy sector loans. We feel that sector lending in energy* is premature because of the absence of a strong central agency to coordinate such loans, the relative weaknesses of the implementing institutions in the different energy subsectors, the unfamiliarity of such institutions with the Bank, and the administrative complexities that would be involved in having any single Bank division or department assume overall responsibility for preparing, appraising and supervising a single energy sector loan. For these reasons, we strongly recommend that for the near future the Bank's involvement in energy should be effected by means of separate project lending operations.

In particular, in the case of the petroleum subsector we recommend that in line with the recent energy sector mission's findings, and the priorities set out in paragraph 64 of the CPP, two project operations be included in the current FY81-85 lending program. The first of these would be a small FY82 petroleum exploration loan for US$10-12 million to the Ministry of Energy (MOE) and the Philippine National Oil Company (PNOC). This project is already tentatively identified and a brief summary of the project concept is provided in Attachment 1. Bank involvement would be directed primarily at providing technical support to improve PNOC's exploration strategy and to strengthen the Bureau of Energy Development (BED) in MOE. This is an approach we have already adopted recently in several other developing countries. In addition, technical and financial support would be provided to PNOC for field evaluation and further prospecting of its important geothermal resources. The latter component could form the basis of a second project for US$50-60 million in FY83 to assist in the exploration for and development of the Philippines' geothermal resources (see Attachment 2 for details). During recent missions to the Philippines the Ministry of Energy and PNOC expressed considerable interest in the Bank's providing technical support in the exploration for indigenous energy resources. Once agreement is reached on the proposed approach to Bank involvement in the petroleum subsector, a preparation mission should visit the Philippines by late October 1980 in order to define more fully the content of the proposed projects.

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* in the Philippines.

In view of the importance of the petroleum subsector in the context of the Philippines' future energy development, we believe a more comprehensive discussion should be included in the draft CPP. We would specifically propose adding the following to the draft CPP before paragraph 63:

> "The Philippines have been seriously affected by the post-1973 increase in international oil prices because imported oil accounts for over 90 percent of their commercial energy supply (95 mboe in 1979). Commercial energy demand during the 1980s is expected to grow at fairly rapid rates, requiring a near doubling in commercial energy supply to 185 mboe by the end of the decade. A continuation of the existing pattern of energy consumption and supply in the Philippines would result in an annual oil import bill by the end of the decade of about US$6 billion in 1980 dollars. Recognizing the need for significant structural adjustments in the energy sector, the Government launched its Ten-Year Energy Program (first issued in 1978, and subsequently revised in 1979 and 1980) aimed at reducing the country's dependence on imported petroleum by (a) developing domestic energy sources that could substitute for imported energy, and (b) limiting the growth of demand for oil-related forms of energy use. Regarding the development of domestic energy resources, prospects are encouraging in view of recent discoveries of indigenous petroleum, geothermal energy resources, coal potential, and hydroelectric base. Increasing the domestic production of petroleum will be a critical element in the Government's resource development strategy, in which there is a need to examine more closely a number of encouraging prospects which could prove economically beneficial to the Philippines' economy. In addition to its petroleum potential, the geothermal and coal potential of the country is also thought to be considerable. In this context the Bank can play an important technical and financial support role in assisting the Government in carrying out its energy exploration over the next few years."

Attachments

EDM/MA:mc

cc: Messrs. Rovani, Bourcier, Bharier, Sheehan, Fitzgerald, Fallen-Bailey and Daffern.
Kirmani, Jaycox, Beach, Hinkle and Ms. Long.

cc: Mrs. Michael Ruddy.

Attachment 1

PROPOSED PETROLEUM EXPLORATION PROJECT

(FY82S)

Objective.

The involvement of the Bank in the immediate future in the petroleum sector in the Philippines would be aimed primarily at providing technical and financial support to PNOC's and BED's exploration program. A two-year petroleum exploration project is therefore proposed for FY82S, with the objectives of stimulating petroleum exploration, improving the quality of BED and PNOC personnel, and increasing the quantity and quality of technical output and understanding.

Description.

A preliminary assessment suggests the project component might include:

(a) geophysical surveys in the form of seismic surveys possibly for Mindoro and Cagayan Valley and aeromagnetic surveys as well as geochemical studies;

(b) technical assistance in the form of a geophysical interpreter, stratigrapher/petrographer, and reservoir engineer, among others, for the two years of the project as well as some short-term consultancies as needed to assist in organization/management, procurement, etc; and

(c) post graduate training for 6-8 professionals for a year or so.

Costs.

Total project costs are estimated between US$10-12 million, of which approximately 80 percent would be in foreign exchange. The project would be divided roughly evenly between BED and PNOC, with approximately two-thirds for geophysical and geochemical studies and a third for technical assistance and training. Depending upon the findings of the proposed identification mission in late October and the availability of funds, a drilling component could also be included for PNOC.

Timing.

A Project Brief will be prepared upon the return of the identification mission in October/November 1980, with appraisal following in January 1981. Board presentation would follow in mid-FY81.

Attachment 2

GEOTHERMAL EXPLORATION AND DEVELOPMENT PROJECT

(FY83)

Objective.

There is also need for Bank involvement in the evaluation and development of the geothermal energy resources of the Philippines. The objective is to provide technical and financial support to PNOC in exploring and developing some of its known geothermal fields, e.g. Daklan, Manito, Tongonan or Negros, and in evaluating thermal manifestations elsewhere in the Philippines where there is a need for electric power or industrial process heat. An essential prerequisite to the selection of which fields to develop is the assessment of present and future demand for geothermal energy in the proximity of the field. Strengthening of PNOC's capabilities and experience in geothermal evaluation and development is also an important benefit of this project.

Description.

Field development and technical assistance and training for PNOC would be the major project components. Field development would be expected to consist primarily of geophysical and geochemical surveys, well drilling, steam collection, transmission, and effluent and disposal systems; together with the provision of a water supply.

Costs.

A project entailing some 14-18 wells and ancillary field equipment for steam production to provide perhaps 100 mw of power might cost US$50-60 million. As much as two-thirds of this cost might be foreign exchange, largely in the form of hardware such as pipe, casing, well heads, steel products, and drilling muds and cement and some expatriate personnel.

Next Steps.

Subject to management approval of the project concept, an identification mission could be sent out in the first quarter of 1981 and an initial project brief prepared upon its return.

Energy Planning

21. Energy planning has so far received little attention in Botswana, with the Government relying primarily on realistic pricing policies to ensure efficient energy utilization. While this approach may have been appropriate in the past, for a number of reasons it is becoming increasingly necessary to plan for the energy sector in Botswana on a more comprehensive and longer term basis. One of these reasons is the Government's policy to become less dependent on South Africa which is currently its sole source of supply for petroleum products. This may be achieved partly through seeking and evaluating alternative sources of petroleum product supply, but it will also inevitably entail some moderation of the present high rate of growth for petroleum product consumption[1/]. On the resource development side, the immediate priority is to assess the feasibility of substituting indigenous coal--of which there are enormous reserves in relation to the existing domestic market--for imported diesel oil which is used mostly by heavy equipment in the mining sector. There is also a need to formulate a strategy for the development and utilization of renewable energy sources which account for a substantial portion of household energy use but on which existing data are both sparse and unreliable.

The Government recognizes these issues and intends to formulate an Energy Planning Group to coordinate their resolution. However,

---

1/ Between 1976 and 1979 the consumption of diesel and gasoline, which together account for over 90% of petroleum consumption, grew at average annual rates of 11.6 percent and 13.6 percent, respectively.

it needs assistance in determining the exact nature and scope of the Planning Group's responsibilities and in identifying its appropriate location within the Government. In this connection, the Ministry of Finance and Development Planning indicated to the mission that it would welcome Bank advice on these matters.

The Alcogas Program

The alcogas program was launched in late 1979 as the Government's major effort in the field of nonconventional energy development. The program's stated objectives for the 1980s are to progressively replace up to 20 percent of the country's projected consumption of gasoline with anhydrous alcohol (by 1986) and to then use ethanol as an industrial feedstock and in pure alcohol engines as ethanol production rises to nearly one billion litres by the end of the decade. The costs of this program are high -- both in terms of its initial capital investment (estimated at $ million in 1980 prices) and in terms of land requirements which would rise to over a quarter of a million hectares at peak operation.

The program's targets and its economic feasibility are reviewed in detail in Annex of this report. The main conclusions of this review are that the program's physical targets are unlikely to be met, at least over the next five years, in view of attractive alternative markets available for sugar to private cane growers, on whose support the success of the alcogas program depends to a great extent. A more realistic scenario for anhydrous alcohol production over this period would be for production to grow from about 2 million litres in 1980 to 9 million litres in 1982 to 120 million litres in 1984 and 1985, or less than 25% of the target set for 1985 (545 million litres). At the same time, it is not at all clear that meeting these targets would

be advisable. The other main conclusion of the review is that whereas there is a good possibility that alcohol production from sugar cane will become economically viable in the Philippines in the latter half of this decade, on the basis of available evidence this is certainly not likely to be the case for the next five years. The medium term behavior of the volatile world sugar market is a key consideration in these conclusions. The economics of alcohol from cassava or sweet potatoes is expected to be even less attractive than returns from sugar cane because of low yields and high costs of these crops. An attempt has been made to calculate an economic rate of return for the program based on the most plausible assumptions regarding the projected world price of sugar and the associated economic cost of sugar cane, the projected price of crude oil, the costs of plant and equipment, and other key variables affecting the program. The sensitivity of the economic rate of return to alternative assumptions regarding these uncertain parameters has also been examined. Under none of these alternatives does the economic rate of return for the program exceed 12%, and it only approaches that figure if the investment in distillery facilities is delayed to begin in 1984 with alcohol production commencing in 1986. For the program as it is formulated now, the economic rate of return is about 3.5%, well below the opportunity cost of capital to the Philippine economy. An attempt has

also been made to evaluate the economics of biomass alcohol production in the Philippines in terms of the estimated domestic currency costs of that foreign exchange savings that result from the substitution of locally produced fuel alcohol for imported petroleum. This analysis suggests that the domestic resource cost of producing anhydrous alcohol is 15-20% greater than the cost (at the existing exchange rate) of importing crude oil and refining an equivalent amount of gasoline. Alternatively stated, the loss to the economy from alcohol production in one distillery of 120,000 litre/day capacity could be as much as one million dollars annually.

Under these circumstances, the immediate priorities of Government should be to ensure that the program is properly formulated, that technical cadre and relevant institutions are in place and that appropriate technologies for the efficient production and utilization of raw materials are available to foster steady expansion of alcohol production as economic conditions permit. These considerations also suggest that heavy investment in distillation plant and equipment is not advisable in 1980-82. This reflects in part the unfavourable underlying economics of alcohol production in a period of high world sugar prices, but it is also warranted by the rapidly developing industrial technology in alcohol production which may result in the early obsolescence of costly investments made today.

A reformulated national alcohol program should also reflect more fully three basic considerations which characterize its operation in the Philippines. These are (i) the relatively high cost of raw materials; (ii) the scarcity of new land suited for sugar cane; and (iii) the island geography of the country and the associated costs of transporting alcohol as gasoline between production and consumption centres. A strong R and D element is needed in the program to take these factors into account. In terms of agricultural research, a basic objective should be to enlarge the supply of low cost raw materials within existing land constraints. With some notable exceptions, few underutilized areas remain with soils and climate suitable for efficient sugar cane production; to a lesser extent the same constraint applies to the increased production of sweet potatoes or cassava, the other sources of alcohol for energy. However, average cane and sugar yields in the Philippines are relatively low by international standards and could be increased through stronger research and extension efforts. Additional work is also needed to identify and test possible alternative raw materials for alcohol production (e.g. nipah palm, sweet sorghum, cellulosic materials) and to develop cropping systems which integrate the production of food crops with energy crops for alcohol.

On the industrial side, greater emphasis should be accorded to smaller scale distilleries (in the range of 20-40,000 litres/day),

annexed to existing sugar mills wherever possible to minimize capital costs and enhance operating flexibility by permitting the production of either alcohol or sugar, depending on relative prices and national objectives. Finally, the island geography of the Philippines and the presence of numerous relatively isolated countries warrant efforts to decentralize liquid fuel supplies. Therefore, the R & D effort should examine the merits of small distilleries to produce hydrous alcohol for use in pure alcohol engines which could be used in several common applications in rural areas. In this context it may be possible to build upon existing small-scale distillation technology in the Philippines to produce a localized source of liquid fuels where the availability and cost of raw materials and the expenses in transporting other liquid fuels make this option attractive.

Some improvements will also be necessary to the institutional aspects of the program. Despite its short history, PNAC appears to have the potential to develop into an effective policy making and advisory body for the program as a whole. Nevertheless, the success of the alcogas program will depend critically on the degree of support provided by the private sugar industry which is expected to supply the bulk of investment and managerial resources for both the industrial and agricultural aspects of the program. At present, industry participation and interest is limited, partly because of attractive alternative

markets for sugar, but also because of limited awareness of the program and its objectives. To ensure future support, there is a need to bring cane growers and millers more fully into the design of the program. Indeed, if carefully integrated in terms of both cane production and processing, with emphasis on facilities to permit production of either sugar or alcohol, the alcogas program could contribute to the market stability which the Philippines sugar industry has frequently lacked in the past.

August 22, 1980

Dr. N. B. Prasad
Road No. 7
Banjara Hills
Hyderabad, 50034
India

Dear Dr. Prasad:

Further to our telephone conversation earlier today, attached please find a draft program for the South East Asian Regional Workshop on Energy Policy and Management, to be held in Seoul from October 27 to November 1, 1980.

As I mentioned to you, Julian Bharier will be getting in touch with you again in mid-September with further details of the program and regarding your own travel arrangements.

Yours sincerely,

Masood Ahmed
Economist
Energy Department

Att.

MAhmed:ra

Telex
PEDCO K24593

August 18, 1980
72481

KOREA ENERGY RESEARCH INSTITUTE

SEOUL, KOREA

FOR DR. JULIAN BHARIER, WORLD BANK REPRESENTATIVE. REURCAB, THIS IS TO CONFIRM ACCEPTANCE BY DR. PRASAD OF INVITATION TO ATTEND OCTOBER 27, NOVEMBER FIRST WORKSHOP ON ENERGY POLICY AND MANAGEMENT

REGARDS, AHMED

KOREA - Energy Workshop

Ahmed:mds

J. Fish, Acting Director
ENERGY

Telex
PEDCO K24593

August 18, 1980
72481

KOREA ENERGY RESEARCH INSTITUTE

SEOUL, KOREA

FOR DR. JULIAN BHARIER, WORLD BANK REPRESENTATIVE. REURCAB, THIS IS TO CONFIRM ACCEPTANCE BY DR. PRASAD OF INVITATION TO ATTEND OCTOBER 27, NOVEMBER FIRST WORKSHOP ON ENERGY POLICY AND MANAGEMENT

REGARDS, AHMED

KOREA - Energy Workshop

Ahmed:mds

J. Fish, Acting Director
ENERGY

file in key file

REGIONAL BREAKDOWN FOR DESIRABLE OIL & GAS LENDING PROGRAM

FY81-85

$ Million

REGION	FY81	FY82	FY83	FY84	FY85	FY81-85
East Africa	5	55	130	220	250	660
West Africa	120	235	200	300	275	1,130
East Asia & Pacific	35	145	70	125	250	625
South Asia	245	180	265	370	400	1,460
EMENA	105	130	400	300	350	1,285
LAC	230	290	515	865	850	2,750
Guaranteed loans (unallocated)	5	20	20	20	25	90
Total	745	1,055	1,600	2,200	2,400	8,000

MAhmed
8/22/80

Energy Demand in the 1980s

Overview

Commercial energy demand in the Philippines will grow at fairly rapid rates during the next decade, partly because of continued strong economic performance and partly because of the limited opportunities for further structural adjustments in the energy intensity of national output and consumption which have characterized the energy sector in the 1970s and resulted in a sharp reduction in the energy-output elasticity coefficient. Between 1975 and 1979 a 6 percent annual rate of growth for GDP was accompanied by less than 5 percent annual growth in commercial energy consumption. Over the next decade this relationship is unlikely to hold and the planned rate of growth of GDP of 6.5 percent is expected to be associated with an annual rate of growth for commercial energy consumption of between 6.5 and 7.5 percent.

Sectoral Composition of Projected Energy Consumption

This average rate of growth will, of course, derive from the different and changing patterns of energy consumption in the major sectors -- industry, transport and households. The projected evolution of the sectoral pattern of commercial energy consumption is presented in Table 5.1 below. While these projections are useful indicators of the broad orders of magnitude, it is important to emphasize that they are no more than that. The rate at which

commercial energy consumption grows in the different sectors will depend not only on their growth of output (or real income for households) but also on the pricing policy for energy products and on the degree to which the Government's planned energy conservation campaign is successful. On both these points, there remain uncertainties about future developments which raise the margin of error for these figures and emphasize their indicative nature.

Table 5.1

Sectoral Composition of Commercial Energy Demand

	Consumption (in mboe)			
Sector	1979	1984	1989	Annual Average Growth Rate 1979-89(%)
Industry	45.3			6.5
Transport	34.2	39.5	47.4	3.3
Commercial Residential				
Total				

The Industrial Sector

Commercial energy consumption in the industrial sector is projected to grow at an average annual rate of about 6.5 percent during the 1980s, somewhat below the 8 percent per annum growth forecasted for industrial output. This will be accompanied by a substantial reallocation in the source of industrial energy with increased reliance on coal resulting in the displacement of potential petroleum product demand. Nevertheless, the industrial sector will continue to rely on petroleum products for meeting at least half of its energy requirements throughout the next decade and in absolute terms the

consumption of petroleum products will be about a half as much again in 1989 as it was in 1979.

Table 5.2

Industrial Demand for Commercial Energy

(in mboe)

Source:	1979	1984	1989	Annual Average Growth Rate 1979-89 (%)
Electrical Energy	16.2			
Coal	0.8			
- in cement	0.5			
- other uses	0.3			
Petroleum Products	28.3			
Fuel oil	19.4			
Diesel	6.2			
Others	2.7			
Total	45.3			

Source: Staff estimates based on data supplied by MOE.

Even this increase in petroleum product consumption will depend critically on two factors: the success of the coal substitution program and the growing use of energy conservation measures. In arriving at these estimates, it has been assumed that the Government's fuel conversion program for the cement industry would proceed on schedule and that the program for other industries, while falling short of its 1984

target by about a third due to greater than expected delays in initial implementation, would also achieve its objectives for 1989. The success of this program alone would result in the potential displacement of about 2.4 million barrels of petroleum products (largely fuel oil) by 1989; about 1.5 million barrels of which would be replaced by coal and the rest by other wood fuels and bagasses. Further savings in petroleum product consumption of about 400,000 barrels by 1989, have also been assumed for these estimates. These will accrue from the programmed improvements and modifications to existing industrial techniques and machinery.

Details of the Government's planned conservation program for industry and estimates of the potential savings that might accrue from it are presented in Annex of this report. Nevertheless, it is important to emphasize here that the expected rate of return for this program is high -- over 40% -- and the savings in petroleum consumption are also large in absolute terms -- over P600 million a year in 1980 prices. In view of this, it is all the more important to resolve the relatively minor organizational and financial issues that might impede the rapid progress of this program. In particular, the provision of financial incentives to private firms wishing to implement the program and the expansion of BEU's energy management training courses and advisory services need further Government consideration.

The Transport Sector

Projections of fuel consumption in the transport sector are difficult to make on the basis of historical trends, both because the available data are sparser and sometimes contradictory and because the transport sector has been and is still going through a period of rapid and structural adjustment to higher fuel costs. Since 1973, there have been large fluctuations in the growth of transport fuel consumption ranging from a decline of 8 percent in one year to an increase of 6 percent in another. While the data series are far too short for conclusive evidence, it does suggest that much of this fluctuation is attributable to the pattern of the early years after 1973. Since 1976, for example, the total demand for transport fuels has been growing more or less steadily at between 2 and 4 percent a year. The demand for different products has of course been more volatile, largely due to vehicle fleet adjustments caused by the Government's inter-product pricing policy. As mentioned earlier, the consumption of gasoline has declined in absolute terms as vehicle owners shifted from gasoline to diesel powered vehicles to take advantage of the product price differential.1/

In its projections of future demand for transport fuels, the MOE has assumed a continuation of this declining trend in gasoline consumption which results in a reduced overall transport fuel consumption

---

1/ Between 1978 and 1979, the number of diesel powered trucks, buses and jitneys increased dramatically from 115,000 to 185,000 and their share in the total fleet of trucks, buses and jitneys rose from 31% to 45%.

growth rate of 2.8 percent for the period 1979-89.[1/] However, these projections are likely to prove optimistic because much of the decrease in gasoline consumption over the past five years resulted from a once and for all adjustment to interfuel price differentials. If the Government now adopts a more rational pricing policy for gasoline and diesel, as recommended in this report,[2/] further shifts in vehicle type are unlikely to materialize. A more reasonable assumption would be that if any further such shifts were to occur their effect would be counterbalanced by the growth of gasoline demand by existing users and new private car owners and that on balance the consumption of gasoline would remain at its present level for the next five years. Beyond that date, the rate of growth of gasoline consumption will depend critically on the outcome of the Government's alcohol development program.[3/] If, as recommended in this report, this program is implemented at a much slower pace than planned, its impact on gasoline consumption is likely to be limited to the equivalent of less than .1 million barrels a year by 1989 and again this impact could easily be offset by

---

1/ Gasoline consumption is expected to decline at an annual rate of 1.4% during the 1980s (2.1% p.a. to 1984 and 0.6% p.a. thereafter). Total transport fuel consumption is projected to grow at 1.9% p.a. to 1984 and 3.7% p.a. thereafter, resulting in an average annual rate of 2.8% for the entire period.

2/ See above paras 4 .

3/ For a discussion and review of this program, see below para 6 and also Annex .

the growth in the overall demand for gasoline. Therefore, in the following table, gasoline consumption is projected to remain at current levels throughout the 1980s. For the other transport fuels, projected growth rates used are those provided by the Ministry of Energy. This results in a projected overall rate of growth for transport fuels of 2.9% p.a. up to 1984 and 3.7% p.a. thereafter.

Table 5.3

Projected Transport Fuel Consumption

Product	Consumption (million barrels) 1979	1984	1989	Annual Average Growth Rates (%) 1979-84	1984-89	1979-89
Gasoline	14.4	14.5	14.5	0	0	0
Diesel[a/]	17.0	21.4	28.3	4.7	5.7	5.2
Avgas/Avtubo	2.8	3.6	4.6	5.2	5.1	5.1
Total	34.2	39.5	47.4	2.9	3.7	3.3

a/ Includes small amounts of bunker fuel.

Source: Staff estimates/MOE.

These estimates further assume the continuation of Government policies and programs to improve the efficiency of vehicle utilization through appropriate fiscal and pricing policies and an expanded program of traffic management measures to affect the flow of traffic and reduce

vehicle turnaround times. This latter set of measures offers an early potential for fuel conservation and further Government attention in this area is required.

Residential and Commercial Sector

Energy consumption by the residential and commercial sector is expected to continue to grow at rapid rates. The fuel composition of this demand will change, however, as increased access to electricity moderates the growth in consumption of petroleum products, largely kerosene and LPG. The estimates presented below are based on the early adoption of an electric power pricing policy for residential consumers which reflects more fully the costs of supplying power to them.

Table 5.4

Residential and Commercial Energy Consumption

Source	Consumption (mboe) 1979	1984	1989	Annual Average Growth Rates (%) 1979-89
Petroleum Products	5.4	7.5	9.0	5.2
Electricity	12.7			
Total	18.1			

Source: Staff Estimates/MOE.

Energy Demand by Fuel Source

The projections of sectoral energy consumption can be aggregated by fuel type to show the expected national interfuel consumption pattern. This is done in Table 5.5 below.

Table 5.5

Projected Energy Consumption by Fuel (in mboe)

	1979	1984	1989
Refined Petroleum Products			
Coal			
Electricity			

[Table to be filled in and attendant text inserted following preparation of revised figures.]

August 15, 1980

Mr. Herbert E. Hansen
Vice President
Gulf Energy and Minerals
Company-International
Box 2100
Houston, Texas 77001

Re: Proposed Conference at the University of Houston on the Role of the World Bank in the Developing Countries of Latin America

Dear Mr. Hansen:

Thank you for your letter to Mr. Rovani of July 14th on the above subject which has been passed on to me in his absence on home leave in France. Your letter will be brought to his attention upon his return in early September and we will get back to you shortly thereafter.

Yours sincerely,

Julian Bharier
Economic Adviser
Energy Department

MAhmed/rhc

cc: Mr. Rovani

Messrs Rouhani
Bourcier
Elahalyi

TO

☐ FOR YOUR INFORMATION

☐ WOULD LIKE TO DISCUSS WITH YOU

☐ FOR HANDLING

☐ FOR COMMENTS AND RETURN

☐ PER CONVERSATION

☐ FOR RETURN WITH FILE

☐ PLEASE RETURN

REMARKS:

A "think piece" on this proposal for your input. After you have discussed, perhaps we can talk on the phone or get together.

Regards,

Herb-Hansen

DATE 14 July '80

HERBERT E. HANSEN

GULF 7913-D

FRC H. E. Hansen AT Houston IN REPLY REFER TO

TO Addressees Below AT DATE July 14, 1980

PROPOSED WORLD BANK CONFERENCE
ON THE ROLE OF THE WORLD BANK IN
THE DEVELOPING COUNTRIES OF LATIN
AMERICA AT THE UNIVERSITY OF HOUSTON

Mr. C. S. Carman, Director, Corporate Development at the University of Houston, called this morning to indicate that following discussions with the President, Dr. Bishop, they are very interested in proceeding with the suggested seminar. The next step will be to discuss the following suggestions with the World Bank to get their views. Please refer to Mr. Hugh Stephen's memorandum to me dated April 2, 1980 containing a preliminary proposal for a one day conference.

1. Is a single day sufficient, or should it be extended to a day and a half or even two full days?

2. Potential speakers from the World Bank. Dr. Bishop would be available to participate in the program if desired.

3. In view of the many activities involving the World Bank, U.S. elections and political results thereof, we believe it preferable to select a date after the end of this year. Therefore, we suggest Tuesday and Wednesday, February 3 and 4, 1981 as tentative dates.

4. We should shoot for a group of 100-150 attendees. Should this be limited to invited guests, or thrown open to the local community?

5. If it is to be a one day session, the idea would be to have a private dinner hosted by Dr. Bishop the evening before, to be followed by a continental breakfast and luncheon. (Estimated cost per head, $10 each.) If this session is more than a single day, a dinner party could be arranged with an open bar for approximately $25 per head. Our preliminary thoughts are that we should charge a tuition of $50 for the conference plus meals, or perhaps an inclusive fee of $100. The University would provide its facilities and arrangements, and Gulf (with or without other sponsors) would underwrite any deficit estimated not to exceed $10,000.

6. Suggested topics for panel discussion to be discussed with the Bank.

After these preliminary discussions have been held with the Bank, I have undertaken to report back to Mr. Carman in order to further develop the program.

HEH

H. E. Hansen

HEH:vo

Addressees

Mr. N. L. DeBay
Mr. R. J. Allen
Mr. S. D. Nelson
Mr. N. C. Ortiz

Mr. Yves Rovani
Mr. Philippe Bourcier
Mr. Eduardo Elejalde

Unit C + D

RECEIVED
APR 3 1980
GOVT AGMTS

University of Houston
Central Campus
Houston, Texas 77004

Department of Political Science

Unit C + D.

2 April, 1980

Mr. Herbert E. Hansen, Vice President
Gulf Energy and Minerals Company- International
Box 2100
Houston, Texas 77001

Dear Herb:

Enclosed you will find the Preliminary Proposal for a conference on the Role of the World Bank in the Developing Countries of Latin America. I hope it provides enough for you to go on in your discussions with Bank officials. I believe you can proceed with every confidence that the University will support the project.

Sincerely,

Hugh W Stephens

cc: R/B in WB

University of Houston
Central Campus
Houston, Texas 77004

Department of Political Science

PRELIMINARY PROPOSAL

Topic: Conference on the Role of the World Bank in the Developing Countries of Latin America

Location: Continuing Education Center, University of Houston, Central Campus

Date: November? February?
(December would be inconvenient because of final examinations)

Format: Single-day conference

8:00 - 9:00 a.m.	Registration
9:00 -10:00	Keynote address
	Probably WB official reviewing policy, recent innovations; some emphasis on subjects to be covered in panels
10:30 - 12:00 a.m.	First Panel
12:15 - 1:15 p.m.	Luncheon
1:30 - 3:00 p.m.	Second Panel
3:30 - 5:00 p.m.	Third Panel

Each panel would feature one or two presentations, plus comments by a discussant, lasting approximately an hour, leaving one-half an hour for questions

Conference Proposal (2)

Projected Panel Topics:

1 - WB participation in oil exploration and development agreements

2 - WB participation in international agency financing activities (IMF, Inter-American Development Bank, Andean Group, etc.)

3 - WB efforts to encourage private investment participation in sponsored projects (e.g., International Center for Settlement of Investment Disputes)

Other possible topics:

4 - manpower training and technical education activities in Latin American countries

5 - population control programs

6 - economic infrastructure policies and projects

Planning and Administration of Conference:

Under the immediate supervision of Dr. Hugh W Stephens, Associate Professor of Political Science, University of Houston

General support and endorsement from the University of Houston System

Ancillary Activities:

Cocktail party and dinner for participants on panels, sponsors hosted by Dr. C.E. Bishop, President, University of Houston (not yet confirmed) evening prior to conference

Press Conference, late afternoon of day prior to conference

Mr. James J. Fish

August 15, 1980

Masood Ahmed

Draft UNDP Global Project Agreement

In the event that you receive queries about the proposed UNDP interregional project for energy sector assessments, I am attaching for your information a copy of

(i) the draft project agreement; and

(ii) a memorandum sent by Julian to the Regional Chief Economists, setting out a proposed program for energy sector work in FY81.

Subject to the special consideration mentioned in Part II C of the draft agreement -- viz. the 60 countries will be chosen from the list of OIDCs -- no prior allocation has been done between those countries where the planned sector work will be financed through the UNDP project or through the Bank's own normal sector work program. The plan now is to retain maximum flexibility in the use of both the money and the staff charged to the UNDP project and to allocate country assignments and output as we proceed. However, the initial emphasis for deploying UNDP resources is expected to be on those countries where the need for building up our basic knowledge and identifying major issues is greatest.

The other point worth making is that the additional resources provided through this project will enable us to carry out a more comprehensive program of identification, preparation, appraisal and supervision of energy planning projects, either as components of larger energy projects or, where appropriate, as independent technical assistance projects in their own right.

MAhmed/rhc
Attachment

cc: Messrs. Richard H. Sheehan
Julian Bharier

ms. Sarah Henderson
room 396
Speekman Hall
School of Business
Administration
Temple U.
Phila. Pa.
1922

FORM NO. 80
(3–75)

WORLD BANK GROUP

MESSAGES

DATE 8/15

TIME 10:30

TO MA

FROM Mr. Asmerom

DEPT./OFFICE

PHONE 215-337-8044 EXTENSION

- [x] CALLED
- [ ] CAME TO SEE YOU
- [ ] RETURNED YOUR CALL
- [ ] REQUESTS APPOINTMENT
- [ ] CALL BACK
- [ ] WILL CALL AGAIN
- [ ] URGENT

REMARKS

Temple has not received reference. Can you please send another.

RECEIVED BY R.

(over)

August 15, 1980

Ms. Sarah Henderson
Room 396 Speeckman Hall
School of Business
Administration
Temple University
Philadelphia, Pa. 19122

Dear Ms. Henderson:

Enclosed please find copy of my reference report for Mr. Kidane Mariam Asmerom who has applied for admission to your Ph.D. program in economics. I understand that my letter of May 28 with attached recommendation went astray.

Sincerely,

Masood Ahmed

May 28, 1980

Dean of The Graduate School,
Temple University,
Philadelphia,
PENNSYLVANIA 19122

Dear Sir:

Enclosed please find a reference report for Mr. Kidane Mariam Asmerom who has applied for admission to your Ph.D. program in economics.

I apologize for the deåay in returning this form, but I have only just got back after a six-week trip to the far east. I hope that this report is useful to you and that its late arrival will not prejudice Mr. Asmerom's chances of admission.

Yours faithfully,

Masood Ahmed

MAhmed:dvw
Encl.

Record Removal Notice

The World Bank Group Archives & Records Management

File Title	Barcode No.
Masood Ahmed - Chronological File - June to December 1980	30450189

Document Date	Document Type	
May 1980	Form	

Correspondents / Participants

Subject / Title
Reference Report - Kidane Mariam Asmerom

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.

Withdrawn by	Date
Sherrine M. Thompson	November 08, 2022

Energy Sector Organization and Institutions

Overview

One of the Government's major responses to the altered international energy situation of the 1970s has been to strengthen and consolidate the institutional and organizational framework for the energy sector. In this its efforts have met with a great deal of success. The country now has an impressive central policy, planning and regulatory agency in the Ministry of Energy -- not the least of whose achievements has been the preparation and publication of a detailed Ten Year Energy Program for the 1980s. Some institutional strengthening has also taken place at the sub-sector implementing agency level, but there remain weaknesses, particularly in the power sector, which need to be rectified if these agencies are to carry out effectively their enhanced role for the eighties.

The Ministry of Energy

In October 1977 a Presidential Decree creating the Deparment of Energy established the current organizational structure of the energy sector in the Philippines. Shortly thereafter this Department was transformed into a Ministry and its powers and responsibilities extended to include the formulation and implementation of policies, plans and programs for the development of indigenous energy resources. The MOE's other responsibilities include the monitoring and supervision of international trade, domestic refining, marketing and distribution of petroleum products, regulation and control of private sector involvement in the energy sector, including the granting of service contracts for the exploration and development of coal, oil and geothermal fuels, the

coordination of the electric power industry, and the supervision and coordination of research into new and non-conventional energy sources.

In keeping with the Government's overall priorities in the energy sector, the Ministry has been more closely involved with the development and use of hydrocarbon fuels (particularly oil) than with the electric power sector; and this is reflected in its internal organization. Line responsibility in the Ministry is nested in two major bureaus:

(i) The Bureau of Energy Development which is responsible for the development of indigenous energy resources (hydrocarbons, geothermal and non-conventional) and for the regulation of private local and foreign firms involved in this field.

(ii) The Bureau of Energy Utilization which is responsible for regulating the import, refining, marketing and distribution of crude oil and petroleum products, the preparation and implementation of energy conservation programs and utilization standards, and the collection and interpretation of energy sector data and the formulation of energy demand and supply forecasts.

The Ministry also exercized control over three other agencies. The Philippine Atomic Energy Commission responsible for the planning and regulation of the country's nuclear energy program; the Board of Energy which primarily regulates petroleum product prices and retail tariffs for electric power supplied by private utilities; and the Center for Non-Conventional Energy Development whose main focus to date has been on applied research in the application of new technologies.

MOE's staff are competent and, particularly at the senior levels, display an impressive understanding of the issues and options facing the energy sector. There are two areas in which further improvements could be made. First, the high proportion of MOE staff who are employed by and on secondment from the Philippine National Oil Company needs consideration. At the Bureau of Energy Development, for example, over half the staff of 135 and a much higher proportion of senior staff are actually PNOC employees. While this policy is a pragmatic means of attracting and retaining qualified personnel within the salary constraints posed by civil service regulations, the longer term effects could be harmful not only because the Ministry is supposed to regulate PNOC's activities but also because of the impression it creates on the private sector companies who are regulated by the Ministry and are supposed to compete with PNOC. The second area of improvement lies in the relative emphasis placed on technical versus policy or administrative staff. A largely satisfactory energy policy and an overall program for its implementation has already been formulated. The more urgent need now is not so much for the further refinement of this program as for the detailed programming and technical backup of the development plans on a subsector by subsector basis. This more technical orientation of the Ministry's activities will require a commensurate strengthening in its technical resources and staff.

The Hydrocarbon Sector

The Philippine National Oil Company (PNOC)

PNOC is the Government's main executing agency in the hydrocarbon subsector. It was created in 1973 as a fully owned Government corporation and has since then been active in almost every aspect of the petroleum industry and in the development of coal and geothermal resources. Diversity of activity and strong Government support have made PNOC a large and complex organization. Its total revenues in 1978 exceeded $1 billion and at the end of that year it employed about 9000 people. PNOC's revenues are generated largely through the refining and marketing of petroleum products. Its subsidiary, the Bataan Refining Corporation, is the largest domestic refinery with a capacity of barrels per day; and its distribution and marketing subsidiary, Petrophil Corporation, is the country's largest corporation in terms of sales (P4.2 billion in 1978).

PNOC's involvement in the upstream end of the business is also significant and growing. Through its subsidiary group of Energy Development Companies it is engaged in survey and exploration work for oil, mostly onshore where private companies have so far shown relatively little interest; in the exploration and development of coal resources at Malangas and on Cebu; and in exploration and development work for geothermal resources on five sites.[1/] These activities account for the bulk of PNOC's investments (P384 million ($55 million) in 1978 and P million in 1979).

PNOC's staff are competent and dedicated but, particularly in the upstream end of its activities, they are both in short supply and could benefit from further experience and training. Some of this training could be provided through joint ventures with international oil companies and the limited use of expatriate consultants should also be considered.

The Power Sector

National Power Corporation (NPC)

NPC is a stock corporation fully owned by the Government and run by a Board of seven members who are all appointed by the President. Prior to 1972 NPC's role was limited to the construction and operation of hydroelectricity plants and consequently its capacity for corporate, financial or system planning was rather limited. Since then, however, the corporation's responsibilities have been extended to include all future large-scale generation of electric power and it has also taken over the generating stations previously owned and operated by the Manila Electric Company. NPC's expansion program during the next ten years is the total construction it undertook during the first forty years of its existence.

The Government has become increasingly aware of the need to strengthen NPC's institutional capability to enable it to effectively discharge the vastly expanded role envisaged for it and a number of significant improvements have been made. In 1978, the corporation's senior management

structure was reorganized and streamlined and a new president brought in. Steps have also been taken to upgrade NPC's staff capability through improved salary scales and the recruitment of qualified technical personnel. These are welcome steps in the right direction but there are still important areas of weakness, particularly in program planning and procurement, which will continue to require close Government attention and support.

National Electrification Administration (NEA)

NEA is responsible for implementing the Government's ambitious rural electrification program and through the control of the electricity cooperatives, it has rapidly become the major distribution agency in the power sector. Unlike NPC and PNOC, NEA reports not to the Ministry of Energy but rather to the Office of the President. Partly as a result of this but also because of personality differences between the senior managements of these organizations, NEA's programs and activities are inadequately coordinated with those of the energy sector agencies, particularly the NPC. An example of this is the fact that NEA is planning to undertake a program of electricity generation from non-conventional sources that will add roughly 15 percent to the capacity planned for entirely independently by NPC. One or the other of these agencies will need to build this capacity, but not both. The most urgent need for coordination is to explore possible energy interchange arrangements where the generating facilities of both agencies are

connected to both grids. Furthermore, NEA should consider whether it might not be able to achieve its mandate of national electrification more rapidly by concentrating its mini-hydro and dendro-thermal generation schemes in those areas not served by NPC transmission lines. In general, where WPC power is available, it will constitute a cheaper source of supply than non-conventional power and the production from NEA's planned forestry plantations in those areas could be used to augment dwindling firewood supplies for direct use.

Other Organizations

The Philippine National Alcohol Commission (PNAC)

PNAC was established in early 1980 to provide overall policy guidance and support to the Government's ambitious alcogas program which seeks to replace imported gasoline in the transport sector by a blend of gasoline and domestically produced alcohol from sugar and other root crops. This commission is chaired by the Minister of Energy and includes as its members the Chairman of the Philippine Sugar Commission, the Ministers of Agriculture, Industry, Finance and National Resources and an (as yet unnamed) representative of the private sector. It is supported by a small Secretariat of technical staff. Although this Commission provides a potentially strong nucleus for the development and control of the alcogas program, its relatively young age and the uncertainties surrounding the future of the alcogas program itself imply that many of its operational details have yet to be developed.[1/]

1/ See para for a fuller discussion of the prospects for the realization of the alcogas program.

Noncommercial Energy

The existing institutional framework for the analysis of non-commercial energy consumption and supply and for the development of programs to augment their supply and improve their efficiency of use is inadequate and requires further Government attention. The Center for Nonconventional Energy Development (CNED) is doing some useful work on the supply side in testing new applications for non-commercial and nonconventional fuels but much of this work is too research-oriented to have a marked impact on solving the energy problems of rural and poor urban households in the near future. More emphasis needs to be given to analyzing their more immediate needs for cooking and lighting fuel, taking into account both the competing demand from industrial users and the potential for interfuel substitution. This could be achieved either through broadening the focus of CNED's program and staff or by establishing a separate small unit for this purpose in the Bureau of Energy Utilization in the MOE which would also coordinate closely with the Bureau of Forestry Development, the Ministry of Agriculture and other concerned agencies.

DRAFT
MAhmed/rhc
8/13/80

Energy Pricing, Taxes and Subsidies

Introduction

The Philippines are one of the few countries -- developed or developing -- which have adjusted the domestic prices of imported energy quickly and fully to reflect changing world prices for these products. Since 1973, the weighted average of petroleum product prices has registered a sevenfold increase and despite some important anomalies in regard to relative refined product pricing, the structure of prices is broadly satisfactory. This is unfortunately not the case for the power sector where both the level and structure of retail tariffs urgently needs revision.

Petroleum Products

Petroleum product prices have been increased on eleven occasions since January 1973 and because of increased taxation, are today well above import parity. In February 1980, the retail price of a reconstituted barrel was just over $50, of which 20 percent was accounted for by sales taxes. As these taxes are levied in ranging proportions on the different refined products, with the bulk of the burden being placed on gasoline, their net effect has been to widen the gap between the retail prices of gasoline and the other refinery products.

In particular, the differential between gasoline and diesel prices has continued to grow with diesel prices now amounting to about half of the former. This price differential is the result of the Government's explicit objective of shielding public transport users

from the full impact of higher international prices and although it can arguably be justified on these grounds its impact on relative product demand growth needs to be closely monitored. There is already some evidence that the absolute decline in gasoline consumption during 1979 and the consequent buildup of gasoline stockpiles in the country, given the relative inflexibility of the output mix of domestic refineries, was due in part to a large scale shift from petrol to diesel powered vehicles in the transport sector. In this context, the Government may wish to consider the adoption of alternative and more selective means of subsidizing public transport users[1/] and allow the differential in end-product prices to be determined by their relative costs and comparative operational advantages.

Table 4.1

Retail Prices for Selected Petroleum Products (May 1980)

Product	Current Retail Price $US Gal.	Percentage Increase Since Oct.1973	Comparative Prices Import Parity (ex Singapore)	Retail Prices Thailand	S.Korea
Aviation fuel	1.96	900			
Gasoline-regular	2.18	1,200			
-premium	2.28	1,060			
Diesel	1.22	725			
Kerosene	1.22	775			
Fuel Oil	0.85	735			
LPG	1.14	580			

Source: PNOC/MOE data; Staff Estimates

1/ These could include, inter alia, differential import duties or licensing fees for public transport vehicles and private automobiles.

Fiscal Contribution of the Sector

Sales of petroleum products have traditionally been a source of revenue for the national exchequer. Since 1975 these revenues have risen dramatically both because of the increase in the price of these products and because the rising proportion of taxes in the final sales price. The application of these taxes has also been broadened. The traditional 'specific tax' whose proceeds augment the general revenues of the Government has been supplemented since 1974 by a 'special fund' levy. The revenues from this fund, which are again generated primarily through gasoline sales, have been used for other energy related projects. Since April 1979, a Crude Equalization Fund has also been in operation with the objective of reimbursing oil companies for disproportionate increases in the cost of their particular crude oil imports until ex-refinery prices have been raised to reflect these higher costs.

Table 4.2

Structure of Petroleum Product Prices (May 1980)

Product	Oil Company Take 1/	Specific Taxes	Special Fund 2/	Wholesale Price	Taxes as a % of Wholesale Price
Gasoline-regular	2.803	0.91	0.438	4.15	32.5
-premium	2.860	1.000	0.483	4.34	34.1
Diesel	2.040	0.185	0.035	2.25	9.3
Kerosene	2.165	0.070	0.035	2.27	4.6
Fuel oil	1.448	0.045	0.038	1.53	5.4
LPG	2.005	0.078	0.038	2.121	5.5
Average	1.952	0.278	0.160	2.39	18.3

1/ Includes crude equalization differential.

2/ Includes "energy development import" of PO.19/liter on regular and premium gasoline.

Source: MOE/PNOC.

The special fund has provided the Government with a valuable and growing source of revenues for its energy development program. Since its inception in 1974, the fund has disbursed over P1.6 billion ($220 million) for a wide variety of energy related projects. It has been used to provide equity capital for PNOC and its subsidiaries and to finance specific projects undertaken by them; it has helped finance the purchase by the National Power Corporation of power plants previously owned by the private sector Manila Electric Company; and it has provided equity and project finance for the National Electrification Administration. Because of recent increases in product prices and tax rates, the fund's revenues are rapidly growing. Collections in 1979 were over P1.4 billion ($185 million) and they are expected to rise further this year to approximately P2.0 billion ($265 million).1/

Although the special fund provides a useful mechanism for internal cash generation in the energy sector, the degree of central Government control over its disbursements2/ and the fact that its proceeds have been used for such diverse projects3/ raises some questions about its operational effectiveness. As revenues from the fund are not automatically

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1/ Additional revenues generated through the specific tax on petroleum product sales amounted to P2.3 billion ($300 million) in 1979 and are estimated to rise to P3.2 billion ($425 million) in 1980.

2/ Disbursements from the fund can only be made on the basis of a letter of instruction from the President of the Philippines to the Commissioner of the Budget, the Treasurer of the Philippines and the President of the PNOC.

3/ For example, P200 million were disbursed to the National Irrigation Administration in 1978 to help finance the Magat multipurpose project.

disbursed to the various operating companies in the energy sector, they are unlikely to be used as a basis for operational programming and budgeting. Furthermore, there is no reason why the two should be linked in this way. The appropriate investment program for the energy sector has to be defined in the light of broader Government objectives and although for planning purposes its budgetary implications need to be worked out well in advance, there are few benefits in linking them directly to the partial proceeds of sales taxes on petroleum products. The Government might wish to reexamine, therefore, the present complex structure of petroleum product taxation with a view to its further simplification and streamlining.

The Power Sector

Electric power pricing in the Philippines has historically been governed by social and political objectives which have limited the ability of power generating utilities to gain a reasonable return on their assets or adequately finance their investment programs from internal cash generation and have resulted in a retail tariff structure which is complex, distorted and often inconsistent with the Government's own stated objectives of equity and efficiency. The problem has been exacerbated by the multiplicity of regulatory authorities and distribution agencies and the archipelagic nature of the country which results in a fragmented power market and wide differences in the cost of electric power supply across regions.

Electricity tariffs are set at two levels. Wholesale rates for the National Power Corporation, which generates 90 percent of national electricity[1/] are set by its Board with the approval of the National Economic Development Agency and the President. Retail tariffs for the electricity cooperatives are approved by the National Electrification Administration and for the few remaining private utilities by the Board of Energy, an independent three-man Board which, like the NEA, reports to the Office of the President. This wholesale/retail distribution is by and large valid with the exception of direct NPC sales to large industrial consumers outside the Metro Manila area, a practice which is not always welcomed by the cooperatives in those areas and is a source of some inter-agency friction which needs to be resolved by a policy decision in the near future.

NPC Wholesale Rates

The deficiencies characterizing the existing tariff framework can also be analyzed at these two levels. At the wholesale or NPC level the main problem has been financial. Despite a fivefold increase in its overall rates since 1974, NPC still receives an average price for its power which is too low to enable it to earn a reasonable return on its capital. Since 1968, NPC's rate of return on average net fixed assets in operation has ranged from 3% to 6.4%, well below the 8 percent minimum target it has set for itself. The long-term effects of this performance on NPC's creditworthiness and financial

structure are already evident. NPC is unable to meet even its debt service requirements from internal cash generation and as a result all of its expansion program is being funded through (sometimes short-term) borrowing and from Government equity contributions. The increasing severity of this problem is demonstrated by the fact that NPC could not now cover its debt service commitments from its own funds even if its rates were increased to allow it to earn a 10 percent rate of return -- the maximum permitted by its charter.

Partly as a recognition of its increasingly unsatisfactory financial situation, NPC established a special unit in 1977 to prepare a revised tariff based on the marginal costs of supplying electricity to the various consumer categories. This study was completed in 1979 but no comprehensive set of conclusions or recommendations for their implementation has yet been drafted.[1/] The results of the study also need to be updated in the light of the recent sharp increases in fuel prices and the revisions to the power expansion program. Nevertheless, certain basic conclusions can already be drawn from this analysis and appropriate tariff revisions initiated. These conclusions fall into four particular areas. Firstly, despite the substantial increases in NPC tariffs in February 1980, these tariffs are on average still 30 percent below the long run marginal cost of power supply. Secondly, the principal component which needs to be changed is the capacity rather than the energy charge. Currently MECO does not pay anything for capacity use

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1/ Marginal Cost Analysis for NPC, Power Sector Tariff Study, NPC Corporate Planning Department, January 1979.

and the charge for other NPC customers is also minimal. One manifestation of this is the fact that capacity changes constitute only 15 percent of the current NPC tariff when their contribution to LRMC is of the order of 60 percent. Thirdly, the wide difference in NPC's existing rates for Luzon and Mindanao (Luzon rates are about double the rates for Mindanao) is not justified by differential costs of power supply. Finally, average rates for the Visayas should continue to be higher than in the other areas because of the heavy reliance of the Visayas on imported oil. However, in this context the cost implications of interconnecting Panay-Negros-Cebu through Samar-Leyte with the national grid need to be studied further.

Table 4.3

NPC Wholesale Rates and Marginal Costs of Power Supply
(centavos/kWh)

Grid	Wholesale Rates Capacity Cost[b/]	Energy Cost	Total	Marginal Costs[a/] Capacity Cost	Energy Cost	Total	Rates as a % of marg. costs
Luzon			35.32	28	18	46	77
Visayas			139.15	23	34	57	69
Cebu & Panay			42.00				
Bohol & Negros			30.00				
Mindanao			17.00[c/]	30	16	46	37
Mindanao			17.00				
General Santos			40.00				
Overall			33.81	28	20	48	70

a/ NPC estimates for 1978 prices updated to reflect higher fuel costs of 1980. Energy Costs increased by 100 percent and capacity costs by 8 percent per annum.

b/ Capacity cost converted to kWh equivalent on the basis of

c/ Excludes General Santos sub-grid.

Source: Staff estimates based on data from NPC and NPC tariff study, op cit.

Retail Power Rates

Retail tariffs in the power sector reflect the Government's "socialized pricing" policy which aims at cross-subsidizing the electricity consumption of power households through the imposition of progressively higher charges for the consumption of electricity by richer households and by commercial and industrial users. Although such a principle imples some misallocation at the margin between electricity and other fuels, it can be justified within the context of the Government's broader economic and social objectives and variants of it are in force in most other developing countries. Having said that, there remain important and serious inequities in the retail electricity tariff structure as it is now applied in the Philippines.

These distortions fall into two groups. First, the extent of subsidies within the Metro Manila area is excessive, both in regard to those extended to consumers in other parts of the country and in relation to the generally accepted definition of "lower-income" households. Residential consumers in the Manila area with a monthly consumption level below 200 kWh pay ¢/kWh -- a fraction of the cost of supply -- and households with a monthly consumption level of up to 650 kWh (constituting 70 percent of the total consumers in this category) continue to receive electricity at subsidized rates. By contrast, household rates in neighbouring areas are much higher.[1/]

1/ For example, in the neighbouring area of household consumers with a monthly consumption level of pay ¢/kWh, approximately times the corresponding rate for MECO consumers.

These subsidies for middle income consumers in the Metro Manila area are difficult to justify on equity grounds; particularly as they are financed partly through the sales of power by MECO to other neighboring utilities. Furthermore, although MECO itself is able to meet the cost of these subsidies through sales to its other consumers, its calculations reflect the price it pays in turn for the bulk power it purchases from NPC. As discussed earlier, that price is itself too low in relation to NPC's long-run marginal costs of generating power and NPC has to rely increasingly on general Government revenues to finance its investment program.

The second area which urgently needs attention is the variation in the retail rate structure across the different cooperatives and private utilities. Apart from MECO, other private utilities do not follow any discernable policy of cross-subsidization and their residential tariffs are, in most cases, higher than the rates for other consumer categories. Electricity cooperatives, on the other hand, generally subsidize their lower income residential consumers and small business establishments although there is considerable variation in the extent of subsidy. Further variations in coop rates are introduced by differences in transmission losses, load factors which result in different power costs across cooperatives. The essential problem here stems from the excessively localized focus of tariff setting with the cost of subsidizing residential consujption being borne by the large consumers in each franchise area and not on a country-

wide basis. While interregional differences reflecting the different costs of producing and distributing power would continue to exist, the Government should consider the early rationalization of retail power tariffs, perhaps through the establishment of a rate equalization fund.

These changes can only be introduced gradually, but it is important that the Government prepare and stick by a timetable for their introduction. As a first step in this process, the role and interrelationship of three regulatory authorities in the power sector should be examined with a view to their adopting a unified and coordinated approach to pricing in the power sector. An initial increase, and a timetable for further graduated increases, in the concessionary rate charged by MECO should also be given urgent consideration.

8/14/80

Mr. Cosgrove
Mr. Ware
Mr. Moscote
Mr. Linder
Mr. Lamson-Scribner
Mr. Beach
Mr. Reekie

For your information, I am attaching a copy of a recent memorandum on planned FY81 energy sector work sent to the Regional Chief Economists by Julian Bharier. I would be grateful for any comments or observations you might have.

Masood Ahmed
x 72481

Messrs. R. Gulhati, L. de Azcarate, P. Hasan,
J. A. Holsen, V. Dubey, G. P. Pfeffermann

July 30, 1980

Julian Bharier, EGY, Economic Adviser

Energy Sector Work

1. There has been a recent large increase in requests, from member governments and from within the Bank, for energy sector work. This work is needed as a basis for discussions with governments on major energy policy issues, such as pricing, as well as for establishing priorities for sector investment and technical assistance for building up a national energy planning capability. As you know, it also serves as the framework for Bank lending and technical assistance in the various energy subsectors and as an important element in economic CPP work, particularly for the oil-importing developing countries.

2. A description of the current program of energy sector work for FY81 is attached. It is based on the regional submissions of last November/December, supplemented by recent discussions with the regional energy projects divisions and, in some cases, with country economists. Since we may not be able to carry out the entire program, I would be most grateful for your comments on this list, and the priorities it implies, since we are now in the process of allocating staff and consultants for the work. It would also be useful to know if the timing of missions needs to be fixed or changed to fit with country economic or 'structural adjustment' missions.

3. For your information, we have now instituted a procedure in the Energy Department whereby a desk study is completed for review within the Bank before an energy sector mission departs. The mission can then concentrate on major policy issues that have been identified and on obtaining information to fill gaps in our knowledge of the sector. The reports themselves are relatively short, and I am attaching the recent 'model' report on Pakistan to illustrate their scope. Where more detailed work is required, we propose to finance this under technical assistance loans/credits for energy planning or technical assistance components of loans/credits in the various energy subsectors.

JBharier/rhc
Attachment

cc: Messrs. Y. Rovani, EGY
M. Ahmed, EGY

East Africa

New Energy Sector Work

Mauritius: Mission planned for May 1981 to focus on energy planning needs of country. Desk study will be prepared before the mission departs.

Kenya: Desk study to be prepared in September before preliminary discussions with government on scope of energy sector and planning work in early November.

Somalia: Mission proposed for late FY81 following request from government.

Zimbabwe: Region may receive request from government for an energy sector survey in this fiscal year following an economic/project identification mission in August/September 1980.

Tanzania: Desk study to be prepared in October prior to mission expected to visit country in spring 1981. EGY would provide most of the support.

Malawi: Preliminary mission proposed for December 1980 as part of power work. The full mission would require a renewables export.

Zaire: Mission scheduled tentatively for November 1980.

Continuation of FY80 Work

Burundi: Completion of draft report now underway.

Madagascar: Updating and review of Richter's Energy Sector Note now underway.

West Africa

New Energy Sector Work[1/]

Ivory Coast: Desk study will be completed before mission departs in January 1981. EGY will supply the energy specialist.

Senegal: In connection with power and potential petroleum lending, a mission is planned for December 1980. Special emphasis will be place on renewable energy sources.

Benin: Mission planned for FY81, in conjunction with mission to Togo.

Liberia: Mission planned for April 1981 in association with energy planning component of petroleum project and regional power involvement.

Sierra Leone: Mission planned for November 1980 to place emphasis on energy planning needs.

Togo: Mission planned for FY81, in conjunction with mission to Benin.

Congo: October 1980 report will follow on from oil/gas project and identify further lending potential. No mission is planned.

Guinea-Bissau: Short draft report recently completed by Richter. Will be reviewed in Bank and possibly issued as an 'energy sector note'.

Continuation of FY80 work

Ghana: First draft of report ready in August. It is expected that this will be discussed with the government in September at the same time as an energy planning project pre-appraisal team is in the field.

Cameroons: Draft report of mission now being reviewed in the Bank. Discussions with the government planned for October 1980.

1/ In addition, a number of regional studies are being undertaken or proposed for the second half of FY81, including:

a. Power interconnection; and
b. Hydro potential.

East Asia

New Energy Sector Work

Indonesia: Desk study already prepared and will be updated by end October on the basis of a brief mission to discuss the energy pricing study in August. On the basis of the revised study, a sector mission, including specialists on coal and renewables will visit the country in late 1980 or early 1981, and a follow-up work program for FY82 will be developed.

China: Request has been received for an energy sector report. No details as yet.

Papua New Guinea: Following a recent visit of Heitner to PNG, it is likely that a petroleum exploration loan may be made in FY82. To ensure that this is fully justified as part of the country's energy sector development program, a mission will visit the country in late 1980 or early 1981 after a desk study has been prepared.

Continuation of FY80 work

Philippines: Draft report expected to be discussed with the government in September/October.

South Asia

New Energy Sector Work

Sri Lanka: Desk study now being prepared by Visvanathan. Power sector review by Jechotek. Mission expected to visit country in early October in association with an economic mission.

Bangladesh: Power sector review being prepared by Jechotek. Desk study to be prepared in August. Oil and gas sector review done in connection with gas project. Preliminary mission expected to visit country in September 1980 as part of an economic mission and energy sector mission scheduled for early 1981.

Continuation of FY80 work

none.

EMENA

New Energy Sector Work

Morocco: Desk study to be prepared in August by Fremont, prior to Hughart mission to review the energy investment program.

Turkey: Desk study now being prepared by Fremont. Mission led by Sadove will visit Turkey at end of September to review country investment program. Consultants will be used also.

Yugoslavia: Following the mission of Reekie in June/July, an energy sector mission has been planned for March/April 1981. A desk study will be prepared during September/October.

Algeria: Energy sector to be examined as part of a September economic mission. Decaux (consultant) will be on the mission, and will produce a separate report on energy.

Romania: Mission planned in March 1981 to update previous sector report.

Yemen PDR: Report now being prepared by Vedavalli on basis of work done for petroleum project.

Continuation of FY80 work

Egypt: Draft report now being completed. No further work expected until pricing and gas utilization studies are ready.

Jordan: First draft of report now being reviewed. Discussion with the government expected in October/November.

Tunisia: Draft report, based on power and petroleum memos, to be completed by September.

LAC

New Energy Sector Work

Uruguay: Desk study to be prepared for a mission in November which will provide the background for a proposed petroleum exploration project, and follow on from recent technical assistance provided under power loans.

Haiti: Mission now planned for November will include forestry and lignite experts and will focus on these aspects as well as power and petroleum. The draft report is expected by March 1981.

Guyana: In conjunction with an economic mission and a power subsector mission, an energy planning expert will visit Guyana in November.

Colombia: A small mission will visit the country in the coming months as part of the economic work.

Jamaica: The regional energy economist will complete a draft energy report by December on the basis of available information.

Ecuador: A mission is planned for late FY81 which will build on the electric power and petroleum subsector work in progress as well as the energy balance work now being undertaken in the country by OLADE.

Continuation of FY80 Work

Argentina: Draft report being held until new studies on gas utilization and pricing are completed.

Brazil: Draft report now being prepared in Bank.

TELEX
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AUGUST 13, 1980
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COMMISSION OF THE EUROPEAN COMMUNITIES

BRUSSELS, BELGIUM

FOR MR. J. C. RENAUD. REURLETTER OF JULY 7 TO MR. ROVANI, EYE WAS VERY PLEASED TO MEET WITH MR. SCHNIEDERS DURING HIS RECENT VISIT TO WASHINGTON. REGARDING THE OCTOBER MEETING ON ENERGY PLANNING TO BE HELD IN BRUSSELS, MR. ROVANI HAS SUGGESTED THAT YOU MIGHT WISH TO INVITE MR. N. B. PRASAD. MR. PRASAD HAS A LONG EXPERIENCE IN ENERGY POLICY AND PLANNING AND HE WAS A SECRETARY TO THE GOVERNMENT OF INDIA AND CHAIRMAN OF THAT COUNTRY'S WORKING GROUP ON ENERGY POLICY WHICH RECENTLY PRODUCED A COMPREHENSIVE REPORT ON THE PROBLEMS AND PROSPECTS FACING THE INDIAN ENERGY SECTOR. IF YOU SHOULD WISH TO INVITE HIM, HE CAN CURRENTLY BE CONTACTED IN THE UNITED STATES ON THE FOLLOWING TELEPHONE NUMBER: 216-371-5357. REGARDS. BHARIER, ENERGY DEPARTMENT, WORLD BANK.

Masood Ahmed

Richard H. Sheehan

Energy

Commercial Energy Supply

Overview

Commercial energy supply in the Philippines has historically been characterized by an extreme dependence on imported petroleum on the one hand and the presence of substantial, but as yet largely undeveloped, indigenous energy sources on the other. Efforts to harness the country's hydroelectric potential predate the 1973 oil crisis, but it is only since that year that the development of indigenous energy resources to replace imported oil has assumed a central role in the Government's energy policy. The major impact of this policy on national energy supply will only be felt in the 1980s and beyond, but there have already been a number of encouraging developments. The country's first commercial oil discovery has been made and brought on stream; coal production has increased fivefold since 1973; and the first large-scale electric power plants to use geothermal steam fuel have recently been commissioned, making the Philippines the world's second largest user of this resource. Finally, in the field of hydroelectric power, the completion of projects commissioned in the 1960s has resulted in a doubling of capacity since 1972 and an increase in the share of hydro energy in commercial energy supply. In spite of these developments, the country's reliance on imported oil remains high, as the following figures show:

Table 3.1

Commercial Energy Supply by Source

Source	Percentage Share in[b/]			Annual Average Growth Rate	
	1970	1975	1979	1970-75	1975-79
Petroleum Products[a/] (of which domestically produced)					
Hydroelectricity					
Geothermal					
Coal					
Total					

a/ Excluded non-energy petroleum products.

b/ For a description of the assumptions and methodology used to derive percentage shares, see Annex .

Source: Staff estimates based on data from MOE.

The Supply of Petroleum Products

Crude Oil. Prior to 1979, the country's crude oil requirements were met entirely from imports, and even in that year domestic crude production from the Nido field accounted for only 10 percent of the total crude oil supply of 75 million barrels. An important element of the Government's petroleum supply policy since 1973 has therefore been to encourage the geographical diversification of oil imports and to increase its control over them by transferring the responsibility for the bulk of this trade from the private refining companies to the public sector Philippine National Oil Corporation (PNOC).

Table 3.2

Crude Oil Supply by Source

Source	Supply (million barrels)			
	1973	1975	1977	1979
Domestic	-	-	-	7.7
Middle East	65.6	54.5	51.3	47.0
Indonesia	-	5.4	10.4	8.0
Malaysia	3.1	4.3	3.0	3.1
China	-	3.3	6.1	7.1
Brunei	-	-	-	1.9
Total	68.7	67.5	70.8	74.8

Source: PNOC

The other important element in the Government's petroleum supply policy has, of course, been to encourage domestic oil exploration and production by both the public and private sectors. Oil exploration in the Philippines has a long but sporadic history which can be divided into three phases. The first phase, which concentrated on seep drilling, but without much success, began in the 1890s and tapered off soon thereafter. The second surge in exploration activity took place in the late 1950s and early sixties when the major international

oil companies explored the onshore basins but again without success. The current phase of activity, which commenced in 1970, has been the most intensive and the most successful. Exploration has concentrated offshore, particularly on the reefs near Polawan, where the first commercial discoveries were made.

The present resurgence in domestic exploration activity can be attributed partly, of course, to the tenfold increase in international oil prices and the consequent surge in exploration activity worldwide. However, two other factors have also been at work here. The first of these was the replacement of the old concession agreement for oil exploration by the production sharing or service contract system in 1972 which, inter alia, set out more explicitly the work obligations of the contractor. The second factor has been the growing realization by international and domestic companies alike, that the prospects for oil discovery and production in the Philippines had been underestimated in the past and that perhaps undue emphasis had been placed on the poor historical drilling results which may have been caused more by their nature and concentration on the less prospective onshore areas. Of the total of 367 wells drilled to date for hydrocarbons, less than 150 are reasonably valid evaluations -- the rest were too shallow, prematurely abandoned or offstructure. Thus the possibly prospective sedimentary area of the country has only been tested at the low rate of one valid exploratory well per 2800 square kilometres.

Since 1973, the number of exploratory wells drilled has increased dramatically -- from 4 in 1974 to 33 in 1979 -- and it is these 84 wells which provide much of the evidence for estimating the country's oil production potential, but this is still inadequately evaluated. Recent evidence suggests that the country has relatively certain remaining recoverable reserves of between 100-500 million barrels in addition to the approximately 30 million barrels of discovered but as yet unproduced reserves in three offshore fields -- Nido, Mati and Cadlao. These reserves are not large by international standards but, if discovered, they would certainly meet the Philippines own petroleum requirements well into the next century. In addition, there is the small chance that one of the many gigantic offshore reefs would turn out to be oil bearing and add up to 10 billion barrels to the level of reserves. However, while this would be a handsome bonus for the country, the chances of it happening are too small (less than 1 percent) on the basis of current information for it to be taken into account in drawing up national energy plans.

Refined Products

About 85 percent of the country's refined product requirements are met from three domestic refineries. However, net imports of refined products have more than doubled since 1975, partly because domestic refinery output has not increased as fast as product demand,but more importantly, because the structure of demand had increasingly diverged from the mix of refinery output.

Table 3.3

Recent Supply of Refined Petroleum Products

(million barrels)

	1975	1977	1979
Domestic Production	62.22	66.07	69.68
Imports	6.05	9.85	14.07
Exports	1.13	.92	.57
Domestic Supply	67.14	75.00	83.18
Ratio of domestic production to domestic supply	0.93	0.88	0.84

Source: MDE/PNOC data

The bulk of refined product imports is accounted for by fuel oil, over 9 million barrels of which were imported in 1979 to meet local demand. Other products which were imported in large quantities in that year were diesel and LPG -- whose consumption has also been growing at rapid rates in recent years -- and, somewhat paradoxically, gasoline. Gasoline consumption in 1979 was actually lower than it had been in any year since 1973, and large quantities of it were being stockpiled by local refining/marketing companeis who were unable to sell it at the recently increased prices. The reason behind this apparent paradox is that under the Government-to-government contract for crude oil purchases from China, the Philippines were also obliged to import a certain volume of gasoline. However, the Government hopes to resolve this problem in the near future by entering into swap agreements with neighbouring countries which would import this gasoline for fuel oil or diesel.

Table 3.4

Structure of Petroleum Product Supply (1979)

Product	Domestic Output	% Share	Domestic Supply	% Share	Net Imports
Gasoline-premium	6.42	9.2	7.18	8.6	.76
-regular	8.18	11.7	8.18	9.7	-
Aviation fuels	2.21	3.2	2.35	2.8	.14
Diesel	16.53	23.2	17.48	21.0	.95
Kerosene	4.06	5.8	4.11	4.9	.05
Fuel oil	29.28	42.0	38.57	46.4	9.29
LPG	1.96	2.8	3.02	3.6	1.06
Other non-energy	1.06	1.5	2.30	2.8	1.24
Total	69.69	100.0	83.19	100.0	13.50

Source: MOE/PNOC

The Supply of Coal

Coal deposits of reasonably good steam-raising quality are found on several islands of the archipelago, and these have been exploited for many years but only on a limited scale. Organized underground mining began about 1900 and a small coal mining industry developed in the inter-war and post World War II years, with production fluctuating erratically between 50,000 and 150,000 tons per year. Since the

1973 increase in oil prices, increasing the domestic supply of coal has become a major focus of the Government's energy policy and some encouraging results are already becoming evident. Between 1974 and 1979 coal production increased fivefold to about 265,000 tons and the industry reached its historical peak output of 284,000 tons in 1977.

Table 3.5

Coal Production 1973-79

	1973	1975	1977	1979
Production (000 tons)	39.0	105.1	284.6	263.0

Source: MOE

Further large increases in production are almost certain in the 1980s. The country's coal reserves have been variously estimated at between 150 million tons and 1,000 million tons. This variation is due partly to the lack of adequate technical data, but also to the variety of definitions that are currently used for the classification of 'reserves'. While further improvement in this regard is clearly desirable, there is no doubt that coal production could be expanded tenfold and sustained at that rate for half a century with no increase in the present minimum estimate of proven workable reserves.

However, the pace at which this expansion could be achieved is less certain. It is quite clear for example that the MOE's target of 6.0 million tons per year by 1989 will not be met. This is due in part to the long lead times and heavy investment required for the development of large-scale underground mining, but it is also attributable to the existing structure of the coal mining industry which is small, highly fragmented and based on relatively primitive mining techniques. There are currently about 33 coal mining companies operating 36 small underground mines which produce, on average, 8000 tons of coal a year, and none of which produces more than ten times that amount. As a result of antiquated mining techniques, labour productivity is low, with output per man shift less than 0.25 tons which is about a quarter of the corresponding figures for the underground mines of Europe. These problems are exacerbated by the geographical concentration of the existing mining industry on the small island of Cebu which produces 80 percent of the country's coal and the absence of adequate transportation and supporting infrastructure to move this coal to the other regional markets.

The Supply of Electricity

Electric power supply in the Philippines has been characterized by the rapid growth of installed capacity and generation; lessening but still very heavy reliance on oil fired thermal generation; a

complex and fragmented institutional structure; and marked inter-regional contrasts in the structure and growth of power supply. Historical data for electric power generation, particularly by the small private utilities and self-generating industries which have been responsible for about a fifth of total supply, are sparse and unreliable. On the basis of available information, the growth rate for electric power generation has been estimated at about 10 percent since 1970, somewhat higher than the rate of growth for commercial energy as a whole. Nor has there been the same slowing down in the growth of electricity generation in the last five years that has characterized the other energy forms. Between 1975 and 1979 electricity generation continued to grow at just under 9 percent per annum when the supply of commercial energy as a whole was growing at half that rate.

Table 3.6

Electricity Supply by Source

Source	Generation in 1975 GWH	% Share	1979 GWH	% Share	Annual Average Growth Rate %
Thermal Oil	9,947	81	12,601	74	6.1
Thermal Coal	24	-	177	1	64.8
Hydro	2,250	19	3,500	21	11.7
Geothermal	-	-	800	4	-
Total	12,221	100	17,078	100	8.7

Source: MOE, staff estimates.

Over the same period, there was a significant shift in the source of electricity supply. Electricity from indigenous sources such as hydroelectricity and coal grew at above average rates and they were supplemented by the bringing on stream of the first large geothermal electricity generating plant in 1979. Despite this shift, the absolute level of electricity generated in oil fired thermal plants rose by a quarter and the oil requirements of the power sector rose proportionately to million barrels in 1979.

These national statistics subsume important regional diversities. The electricity facilities of the Philippines can essentially be thought of as eight isolated subsystems. One on Luzon which accounts for 72 percent of the country's installed capacity and is virtually all interconnected; six on the Visayas which are in an early stage of development and together account for only 13 percent of installed capacity; and one on Mindanao where less than 30 percent of the region is interconnected. As the following figures show, these three regions rely in varying proportions on the different sources for electrical energy.

Table 3.7

Installed Generating Capacity by Region (1979)

	Luzon	Visayas	Mindanao	Total
Oil thermal				
Coal thermal				
Diesel				
Hydro				
Geothermal				
Total				
Percentage				

Source: MOE/NPC data.

Hydroelectricity

Efforts to harness the country's hydroelectric potential, currently estimated at over 7,000 MW, had been an important element of national energy policy in the 1960s, and this strategy has been given an added impetus by increases in the price of alternative hydrocarbon fuels for thermal power generation. However, given the long lead times acquired for the development of hydroelectric schemes, any increases in hydroelectricity supply since 1975 are more the result of large investments made in this sector in the 1960s than a response to just 1973 higher oil prices. More recently, the Government has compiled with the

assistance of consultants an inventory of 30 potential hydro sites and is preparing detailed prefeasibility studies for ten of these sites.1/ Although the ranking of these sites and the appropriate timing for their development must await the completion of these studies, it is clear that there is considerable potential for further development of this source, particularly on the island of Mindanao. Here most of the hydroelectric sites are of the run-of-river type with a low unit cost (average $700/KW), relatively short construction times and a high utilization factor. Unfortunately, this is not the case for Luzon where the bulk of the power market lies. Most of the hydroelectric projects here are multipurpose in nature -- with important other objectives in flood control, irrigation and water supply -- have high capital costs for the electricity component (about $2000 (KW) and require long construction periods of up to eight years. In general, most of these projects have low utilization factors (about 30 percent) and electricity production is often limited by irrigation requirements. Thus, hydroelectric projects in Luzon would really be adequate only as peaking plants and while their attractiveness is enhanced by the rising price of alternative fuels, their implementation will have to be carried out on a more gradual and selective basis.

1/ The Bank has assisted in the financing of a number of these studies through the loans for the Fifth and Sixth Power Projects (Ref. 809-PH and 1034-PH). Technical assistance has also been provided by the Asian Development Bank.

Geothermal Electricity

The Philippines' location in the so-called Pacific Fire Ring provides it with a rich source of geothermal energy with an estimated ultimate production potential which would be adequate for about 2 to 4 GW of electricity capacity. Proven reserves are much smaller -- about 1000 MW equivalent -- but this is due largely to the fairly recent origin of a large scale exploration and development effort in this area. These resources are spread over from areas (two in Luzon and two in Visayas) where about 140 exploration and production wells have been drilled to date. The first large scale units to become operational were at Tiwi and Mak-ban in southern Luzon which are both operated by a private company[1/] under a service contract with the National Power Corporation. Installed generating capacity in these fields was 220 MW in 1979 with an additional 220 MW due to come on stream in 1980-81 and a further 110 MW in 1982.

The areas with the largest geothermal resources in Visayas are located on the islands of Leyte and Nigros. Responsibility for their exploration and development lies with state owned PNOC -- Energy Development Corporation, again under a service contract with NPC. Although both these fields have a high production potential (450 MW in the case of Tongonan and 115 MW for Palimpinon), the early development

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1/ Philippine Geothermal, Inc; a subsidiary of Union Oil of California. The contract, drawn up in 1971, is for 25 years and renewable for a similar term at the company's option.

of their full potential is hampered by their distance from existing load centres. The Tongonan field, where NPC is now installing 112 MW of generating capacity for commissioning in 1982-83, will supply a copper smelter, now under construction, with a final electricity demand of some 60 MW. The remaining capacity will only be required to meet other industrial demand if the Government's policy for industrial decentralization is successful.

The Palimponon project is located in the southeastern part of the island of Negros and has a production capacity of about 115 MW. Although this region offers an important potential electricity market because of the presence of a number of mines which generate their own electricity largely from oil fired units,[1/] the rapid development of the Palimpinon project is hampered by the difficult terrain in which it is located and the time lag for effecting the conversion of the existing capacity of self-generating producers.

Transmission and Distribution

The electricity transmission system in the Philippines belongs to NPC, with the exception of the few lines owned by the private electricity enterprises and those that the electricity cooperatives have built in the areas where NPC is not yet providing power. In

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1/ The largest of these, Marinduque Mining Corporation, generates about 130 GWH a year, mainly from oil fired units.

1979, NPC had about 5,200 kw of transmission lines, nearly three-quarters of which were located on Luzon. A further 3,760 kw of line between 69KV and 230KV is under construction and expected to enter into service during 1980 and 1981.

Electric power distribution is primarily the responsibility of the hundred or so electric cooperatives which distribute power in the rural areas and the private utilities which cover urban areas, the largest of which is the Manila Electric Company (MECO). About 2.5 million households or 43 percent of potential connections are connected to the electricity network. However, the extent of coverage varies considerably across the different islands and between rural and urban areas. As the following figures show, the percentage of households with access to electricity in Luzon is twice as high than in the Visayas or Mindanao and rural electrification is still relatively low despite a vigorous Government program.

Table 3

Status of Household Electrification 1979

	Potential Connections (000)			Connections Electrified (000)			Percentage Coverage		
Region	Elec. Coops	Private	Total	Elec. Coops	Private	Total	Elec. Coops	Private	Total
Luzon	2,400	1,400	3,800	720	1,360	2,080	30	97	55
Visayas	800	200	1,000	167	18	185	21	9	19
Mindanao	900	150	1,050	157	70	227	17	47	22
Total	4,100	1,750	5,850	1,044	1,488	2,492	25	83	43

Source: MOE

Mr. Robert Sadove, CPSVP

August 6, 1980

Yves Rovani, Director, EGY

Energy Policy Paper Table 2

1. David Hughart has pointed out that the description of the criteria used for the country classification for this table is incomplete and somewhat confusing as it is currently set out. I agree with this and propose that the first two footnotes to this table be replaced by the following:

(a) [referring to NET OIL EXPORTING DEVELOPING COUNTRIES in title] Net oil exporting developing countries include the capital surplus oil exporters.

(b) [referring to NET OIL IMPORTING DEVELOPING COUNTRIES in title] Net oil importing developing countries include all Bank members eligible to borrow and non-members with a population over 500,000 and a 1978 per capita GNP below $3,000.

and footnote (c), the first sentence of which is inaccurate, be amended to read:

(c) Countries were placed in this category if estimated annual consumption of fuelwood could not be sustained through the year 2000 at a level of 0.75 m^3 per capita where income per head (in 1978) was below $300, falling linearly to 0.50 m^3 at $600 and zero at $900. Many countries not included in this group have or will have localized problems not apparent from country level data.

MAhmed/rhc

cc: Messrs. Ahmed
Hughart
Mitchell
Goodman

The Energy Background

Overview

1. In 1979, total primary energy consumption in the Philippines was estimated at 133 mboe, of which 68% was met from commercial energy sources and the rest from firewood, bagasses and other noncommercial fuels. Only limited historical data are available on the consumption of these non-commercial fuels, but commercial energy consumption has grown at rapid rates in the past, doubling in per capita terms since 1965 to 2.0 mboe and growing ever faster in absolute terms from about 36.5 mboe to 89.3 mboe over the same period. Despite this rapid growth, commercial energy consumption in the Philippines is still low by international standards, with per capita consumption levels in 1978 estimated at less than 40 percent of the average for other middle income developing countries and about 5 percent of the average for the industrialized countries. Nevertheless, the Philippines have been seriously affected by the post-1973 increase in international oil prices because imported oil accounts for over 90 percent of their commercial energy supply.

Commercial Energy Consumption

The rapid historical rise in commercial energy consumption in the Philippines can be traced directly to the nature and pace of the country's economic development. Gross domestic product grew at over 5 percent a year in the 1960s and, unlike many other developing countries, at an even higher rate (6.3%) during the 1970s. Moreover, much of

this growth was spearheaded by the energy intensive manufacturing and industrial sector which has grown at above average rates for the past two decades and whose share in GDP has shown a commensurate increase from 28 percent in 1960 to 35 percent in 1978. Finally, the growth in household real incomes -- per capita GNP has grown at about 2.6% a year since 1960 -- has increased the demand for commercial energy and energy using appliances; a situation which has been further reinforced by the reduced access to traditional, noncommercial fuels brought about by increased urbanization.1/

These basic factors provide an overall perspective for the historical evolution of energy consumption, but they subsume two very distinct and markedly different periods that have characterized the energy sector in the Philippines -- the years prior to and following upon the increase in world oil prices in 1973. This division can be made to some extent for most developing countries, but it is particularly appropriate for the Philippines because of the country's extreme dependence on imported oil for commercial energy and because of the (in many ways remarkable) adjustments which have already been achieved there in response to the altered international energy situation.

1/ The share of the population living in urban areas has increased from 30 percent in 1960 to 36 percent in 1980, and recent growth rates for the urban (and particularly Metro Manila) areas continue to be well above the already high national figure of 2.7 percent per annum.

Prior to 1973, total commercial energy consumption was rising at rates well above the growth rate of GDP. Between 1965 and 1972 commercial energy consumption grew at an average annual rate of percent while GDP growth averaged only percent leading to an energy/ GDP growth coefficient value of . Since 1973 this situation has changed radically. Energy consumption has grown at 3.7% p.a., about half the rate of previous years although GDP has continued to grow at about 6%, and the elasticity of energy growth to GDP has consequently declined to 0.62. Much of this change is directly attributable to the Government's pricing policy for energy products which has by and large passed on the increased costs of energy to the final consumers.1/ However, part of it is also the result of the once and for all adjustment process to higher energy prices in 1973/74 when total commercial energy consumption actually declined by 4.8 percent. A more accurate picture of recent trends can be obtained from the data relating to the period 1975-79 during which commercial energy consumption and GDP grew at 4.8 percent and 6.2 percent,respectively, resulting in an energy-output elasticity estimate of 0.78. Even this reduction represents a formidable achievement in terms of the speed and extent to which the Philippines have adjusted to higher oil prices.

Footnote not given

These changes in the overall growth of commercial energy consumption have been accompanied by equally important changes in the sectoral pattern of energy use. As the following table shows, energy consumption in the transport and residential/commercial sectors has grown at below average rates in recent years and there has been a consequent decline in their shares of the total. On the other hand, the industrial sector has continued to exhibit strong growth rates in energy consumption with a consequent increase in its share.

Table 2.1

Sectoral Distribution of Commercial Energy Consumption

Sector	Percentage Share 1975	1979	Annual Average Growth Rate
Industry			
Transport			
Commercia/Residential			
Total			

Source: Staff estimates based on data from Ministry of Energy.

The changing sectoral pattern of commercial energy consumption has been reflected in the demand pattern for the major commercial fuels -- petroleum and electricity. These are dealt with in turn below.[1/]

1/ The consumption of coal in the Philippines has so far been both relatively small (about 250,000 tons in 1979) and concentrated entirely in the industrial sector. However, there are good prospects for increasing coal consumption; these and the government's program for coal development are discussed in chapters below.

Consumption of Petroleum Products

Between 1975 and 1979 the final consumption of petroleum products for energy increased from 66.6 mboe to 79.0 mboe, an annual rate of growth of approximately 4.5 percent. At the same time there was a substantial reallocation of petroleum consumption across sectors. In the transport and commercial/residential sectors higher petroleum prices restrained consumption growth well below the average. This has not been the case for the industrial or power generation sectors where, despite a moderation of past trends, energy consumption has continued to grow at fairly rapid rates.

Table 2.2: Sectoral Distribution of Petroleum Product Consumption

Sector	Percentage Consumed 1975	1979	Annual Average Growth Rate (%)
Industry	34.8	35.9	5.1
Power Generation	21.0	23.0	6.8
Transport	36.5	34.3	2.8
Commercial and Residential Energy	7.7	6.8	1.4
Total Energy (million barrels)	66.6	79.0	4.4

The other point to emerge from these figures is the high proportion of petroleum product consumption in the industrial and power generation sectors where the potential for energy conservation and interfuel substitution is large, at least over the medium-term. This pattern differs from the one that characterizes many other developing countries which have been equally adversely affected by the rise in oil prices but which have less potential for reducing their dependence on imported oil because the consumption of oil is largely concentrated in transport (where the possibilities for substituting other fuels are limited) and household use (where the damaging

implications of reducing mainly kerosene demand on the rate of growth of firewood consumption and attendant deforestation, have to be considered). The Government of the Philippines has recognized this potential and launched major programs for conservation and the substitution of oil by other indigenous fuels and these are discussed further in Chapter 6 below.

In the meantime, variations in the rate of growth of petroleum demand by the major sectors have resulted in marked differences in the structure and growth of demand for the different petroleum products which they consume in varying proportions. The consumption of kerosene, used mainly by households for cooking and lighting, has registered only a moderate increase and gasoline consumption has actually declined in absolute terms. On the other hand, fuel oil consumption has grown at rapid rates because of its almost exclusive use in industry and power generation, and diesel demand has also grown significantly because of the Government's pricing policy which has encouraged the substitution of diesel for gasoline in the transport sector. Whereas there is some justification for such a policy insofar as diesel is used largely for public transport, the continuation of these marked diversities in product demand growth has serious implications for the operation of domestic refining capacity.1/

Consumption of Electricity

Electricity consumption has been growing at about 9 percent a year since 1975, somewhat slower than in the previous seven years but at a rate still well above that characterizing overall commercial energy

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1/ See also paras. _____.

Table 2.3: Demand for Petroleum Products - Percentage Share and Historic Growth Rates

Product	Percentage Share 1975	Percentage Share 1979	Annual Average Growth Rate (%)
Fuel Oil	45.8	48.9	6.1
Diesel Oil	19.8	21.5	6.5
Gasoline	23.0	18.2	-1.5
Kerosene	4.8	4.4	2.3
LPG	3.2	3.4	6.5
AV Turbo/Argas	3.4	3.5	5.0
Total Energy (million barrels)	66.6	79.0	4.4
Non-Energy (million barrels)	2.0	2.2	-
Refinery Fuel & Losses (million barrels)	3.5	3.6	-
Total Petroleum Consumption (million barrels)	72.1	84.8	4.2

Source: MOE/PNOC data.

growth. Over half of the 1979 level of electricity sales, estimated at about 15.1 billion kilowatt-hours, was accounted for by industrial users and the rest split almost equally between commercial and residential demand.

Table 2.4: Sectoral Distribution of Electricity Consumption

Sector	Percentage Share 1975	Percentage Share 1979	Annual Average Growth Rate (%)
Industry	53	54	8.9
Commercial	23	23	8.8
Residential	19	19	9.0
Others	5	4	3.5
Total (GWH)	10,778	15,056	8.8

Source: Staff estimates based on data from MOE/NPC/NEA.

As the figures show, there has been little change in the sectoral consumption pattern in recent years with all sectors growing at much the same annual rate of about 9 percent. However, there have been important changes in the regional pattern of electricity consumption, with consumption growing

at higher rates in the Visajas and Mindanao grids, albeit from a much smaller base.

Table 2.5: Regional Distribution of Electricity Consumption

Region	Percentage Share 1975	Percentage Share 1979	Annual Average Growth Rate (%)
Luzon		67	
Visajas		15	
Mindanao		18	

Source: Staff estimates based on data from MOE/NPC/NEA.

Non-Commercial Energy Consumption

Although non-commercial energy sources account for nearly a third of total energy supply and meet about 65 percent of the energy needs of households, data on their consumption by type of fuel or sector of use are extremely sparse. The most recent body of data derives from a sample household energy consumption survey done in 1977 by the MOE. The preliminary results of this survey confirm the important role played by non-commercial energy sources - primarily firewood and bagasses - in meeting national energy needs. They also reinforce the need to fill in these remaining gaps in knowledge about the sources and patterns of non-commercial energy use, as a first step towards the formulation and implementation of programs for their more efficient utilization. In this context the results of a recent study on the subject carried out by the Government with West German assistance should prove particularly helpful. Pending the outcome of this study and the gathering of additional information for this area, the estimates presented below should be treated as indicative of a broad

order of magnitude only.

Table 2.6: Non-Commercial Energy Consumption (1977)

Fuel	Percentage Consumed In			Total Consumption (000 tons)	'000 BOE	% Share
	Residential	Industry	Other Manufacturing			
Firewood	67	21	12	6,300	19,035	46
Bagasses	-	100	-		8,000	20
Woodwastes	37	63			8,000	20
Coconut Shells, Rice Husks, etc.	88		12		5,815	14
Total	51	42	7		40,850	100

Source: Staff estimates based on data from MOE's Household Energy Consumption Survey.

Two points can be made about the above table. First, as in many other developing countries, firewood is the dominant source of non-commercial energy, supplying approximately one half of the energy derived from such sources. This consumption level implies a rate of extraction of over 6.0 million tons of wood per year and has an important bearing on the overall prospects for the natural renewal of the country's forest resources. Over the past decade, the amount of land under forests has fallen from 55 percent in 1968 to 43 percent in 1978. Although deforestation has not yet become a critical problem in the Philippines, it will become so if in the 1980s past trends continue unchecked.

The second point that emerges from these figures relates to the high proportion of non-commercial fuels consumed outside the household sector. Firewood is used extensively for tobacco curing and woodwastes for steam and power generation in the lumber industry. These examples serve to illustrate not only that programs aimed at the enhanced supply and improved efficiency of non-commercial energy use have a wider range of beneficiaries than is sometimes assumed, but also the increasing competition that households are facing from other sources of demand for non-commercial fuels partly as a result of the increased price for commercial energy.

Mr. Ernest Stern, VPO

August 4, 1980

Yves Rovani, EGY

Energy Lending Program

1. Further to your request, attached please find a table setting out the numbers of projects associated with the current and desirable lending programs for oil and gas, power and fuelwood.

2. I would like to draw your attention to the following two points:

(i) project numbers for fuelwood do not include fuelwood components of other agricultural/rural development projects although these are included in the dollar lending targets;

(ii) the distribution of operations in the current program for electric power has been adjusted to allow for the slippage of three projects from FY80 into FY81 and to smooth out excessive fluctuations in project numbers in the outer years resulting from the temporary allocation of as yet unidentified projects. However, these numbers are fully consistent with the dollar lending program as it was presented to the Board and restated in the Policy Paper.

Attachment.

YRovani:pa.

Numbers of Projects Associated with Current and Desirable Energy Lending Programs

Category	FY81	FY82	FY83	FY84	FY85	FY81-85
Electric Power						
Current	19	20	20	20	20	99
Desirable	19	22	25	28	31	125
Oil and Gas						
Predevelopment-current	18	16	16	12	11	73
-desirable	22	24	26	24	18	114
Oil development-current	4	5	6	7	5	27
-desirable	4	5	8	10	11	38
Gas development-current	3	5	3	3	3	17
-desirable	3	6	3	7	7	26
Subtotal-current	25	26	25	22	19	117
-desirable	29	35	37	41	36	178
Fuelwood						
Current	3	4	5	5	5	22
Desirable	5	9	9	13	13	49

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

chron

OFFICE MEMORANDUM

TO: Mr. Eugene McCarthy, EGY

DATE: August 1, 1980

FROM: Julian Bharier and Masood Ahmed, EGY

SUBJECT: Pakistan Oil and Gas Pricing Study

1. We have now reviewed this study and consider it to be a major contribution to our knowledge of pricing issues in Pakistan as well as a compendium of new and extremely interesting information on the impact of pricing on the budgetary situation, on renewables, especially firewood, on interfuel substitution and on refinery operations. It is certainly a far better report than we had expected given the earlier problems with the consultants.

2. However, some points need clarification and further discussion. The most important are these:

a. In what year's rupees are the recommended wellhead prices? The text implies 1979 prices but they may be 1978 prices. It is clearly necessary to determine this before we make any judgment as to whether the wellhead prices for 1980 and beyond are reasonable. There also needs to be a method for automatically adjusting pricing over time as the various types of costs rise.

b. Is a 30% rate of return to the oil companies a sufficient incentive to develop new fields? This is particularly important since with the recommended wellhead prices a higher rate of return is available on the further development of old fields. An additional premium may well be necessary for new fields.

c. In estimating the wellhead prices for new fields, is it appropriate to use the historical probabilities of success in exploration and appraisal drilling (1 in 5 and 3 in 4, respectively) which are extremely high by international standards? A lower probability of success would, of course, raise the wellhead price and would probably be more suitable.

d. While we cannot judge the technical aspects of expected production levels from new fields, we have a feeling these may be somewhat optimistic.

3. These points show that it would be useful, at some stage in the near future, to carry out a sensitivity analysis to show the range of

wellhead prices which could be obtained under different assumptions. We suggest that this be one of the issues to be raised with the Government in our mission at the end of August. Meanwhile, we feel that the study generally meets the conditions set by the Toot Credit Agreement, and suggest that any further activities in this field be undertaken in the context of our proposed assistance for energy planning.

JBharier/rhc

cc: Messrs. Y. Rovani, EGY
R. Picciotto, ASP
R. L. Clements, ASA
F. H. Lamson-Scribner, ASP

TELEX
742-40571

AUGUST 1, 1980
72481

ASIAN BANK

MANILA, PHILIPPINES.

FOR V. V. DESAI. RE PHILIPPINES ENERGY SECTOR SURVEY. WOULD BE GRATEFUL FOR FOLLOWING INFORMATION TO SUPPLEMENT YOUR NOTE ON NONCOMMERCIAL ENERGY CONSUMPTION. AAA FOR TABLE ON PAGE ONE PLEASE SUPPLY THE CONVERSION FACTORS USED TO CONVERT THE VARIOUS FUELS INTO BOES AND ALSO THE ACTUAL PHYSICAL CONSUMPTION FOR EACH FUEL. BBB DO YOU HAVE ANY FIGURES THAT WOULD MAKE IT POSSIBLE TO SEPARATE WOODWASTE CONSUMPTION FROM OTHERS IN THE SECOND ITEM ON THAT TABLE. QUERY. REGARDS. BALDWIN.

Philippines Energy Sector Survey

Mr. George B. Baldwin

Masood Ahmed

Richard H. Sheehan

Energy

July 31, 1980

Ms. Duersten -

Further to our telephone conversation last week, attached please find the final version of the table on the developed and potential hydro capacity of the fifteen largest fossil fuel consumers.

Masood Ahmed

MAhmed/rhc
Attachment

Developed and Potential Hydro Capacity for 15 Major Fossil Fuel Consumers

	Gross Theoretical Capacity[1] (MW)	Developed Capacity[2] (MW	
		1980	1985
Argentina	48,120	4,542	7,457
Brazil	90,240	28,392	34,700
Colombia	50,000	3,212	5,927
Mexico	20,344	6,300	8,900
Peru	12,500	2,000	2,600
Turkey	15,200	2,169	5,066
Yugoslavia	16,957	6,829	9,329
Romania	8,033	3,745	7,017
Egypt	3,800	2,500	2,720
India	70,000	11,029	16,029
Indonesia	30,000	635	1,235
Philippines	7,504	1,738	2,677
South Korea	5,514	802	1,262
China	330,000	n.a.	n.a.
Thailand	6,242	1,218	2,040

1/ Gross theoretical capacity includes all installed and installable capacity assuming average river flows and no cost restrictions.

2/ Total nameplate capacity expected to be in service by year end.

TELEX

JULY 28, 1980
72083

MR. SOHAIL QURESHI, DGER

PETROMINERAL

ISLAMABAD, PAKISTAN

AAA. HAVE TODAY SENT YOU FIVE COPIES OF PAKISTAN ENERGY SECTOR REPORT THROUGH ISLAMABAD RESIDENT MISSION. BBB. MANY THANKS FOR THE INTERESTING PAPER ON RECENT PROGRESS IN BIOGAS PLANTS AND CONGRATULATIONS ON SUCCESSFUL INAUGURATION OF COMMUNITY BIOGAS PLANT AT RAKH TARAGARH. CCC. MASOOD AHMED AND I LOOK FORWARD TO SEEING YOU IN ISLAMABAD DURING LAST WEEK OF AUGUST TO DISCUSS FINAL REPORT OF ENERGY PRICING STUDY, YOUR COMMENTS ON ENERGY SECTOR REPORT AND POSSIBLE ASSISTANCE FOR ENERGY PLANNING. REGARDS. JULIAN BHARIER, ENERGY DEPARTMENT, WORLD BANK.

Masood Ahmed

Richard H. Sheehan

Energy

cc: Messrs. McCarthy (EGY),
Clements, de Silva (ASA),
Popiel (Islamabad Office),
Ahmed (EGY).

DRAFT
MAhmed/rhc
7/25/80

Introduction

The coverage of energy issues in the Bank's economic and sector work program is expanding rapidly,both as a reflection of the growing importance of these issues for national economic management and to provide guidance and support for the Bank's own much expanded operational program in the various energy sectors. There is also a growing awareness that the treatment of energy sector information in Bank reports could be improved through the adoption of a clearer, consistent and more standardized format for its presentation. This note provides an overview of the problem and suggests general guidelines for the presentation of energy sector information in economic, sector and staff appraisal reports. It is divided into three parts: the first part deals with the use of appropriate units and conversion factors; with the special problems of converting primary electricity into its fossil fuel equivalent; and the third, with the presentational format for national energy balances.

Energy Units and Conversion Factors

The problem of common units for energy measurement arises because the original units in which various fuels are most naturally measured (tons for coal, tons or barrels for oil, kilowatt hours for electricity, cubic metres for natural gas) are very disparate. In theory, any one of these could be used as a basis for recording the other fuels if one had suitable conversion factors. In practice, however, both the choice of a common unit and of the appropriate conversion factor used to reduce other fuels to that unit is not always a straightforward matter.

The generally accepted convention for converting different fuels into common units is to base this conversion on their calorific value which measures the potential energy that could be derived from a natural unit of that fuel. In this respect, this procedure differs from the one employed in constructing input/output tables for other sectors where the different commodities are reduced to a single unit on the basis of their respective market or shadow prices.[1/] The basing of conversion factors for different energy sources on their heat equivalence has the additional effect of introducing into the spectrum of possible common units, those which have been specifically developed to measure heat energy under different systems -- the joule, caloric or BTU, for example. Although the selection of any one particular unit as the base unit must in the final analysis be somewhat arbitrary, general guidelines can be formulated based upon convention, clarity and the purpose for which the energy sector information is required.

Various international organizations have historically compiled and published energy sector information -- generally in the form of consumption and production data for the different fuels -- and they have used a variety of accounting units for this purpose. The Organization for

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1/ However, it is important to emphasize that converting one fuel into its energy or heat equivalency in terms of another does not necessarily mean that it could, in reality, substitute for the equivalent amount of the other fuel.

Economic Cooperation and Development (OECD) publishes complete energy balances[1/] for the member countries in tonnes of oil equivalent (TOE). This unit is also used for the energy balance information prepared -- but not published -- by the Commission of the EEC. On the other hand, the United Nations and the Statistical Office of the European Comunities use tonnes of coal equivalent (TCE) as their basic accounting unit[2/] and the Secretariat of the Economic Commission for Europe has recently adopted terajoules (ITJ = 10^{12} joules) as their basic energy accounting unit. National energy balances also display this near bewildering array of accounting units and in some countries more than one such unit is in concurrent use.[3/] Bank reports have in the past reflected this diversity of choice and energy data have been presented in almost all of the above units. The choice of a common accounting unit for energy sector information can be narrowed by a process of elimination to two possible contenders -- the joule and the TOE.[4/] Various points can be made in favour of both

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1/ For a definition and discussion of energy balances, see part II below.

2/ However, both these agencies are currently reviewing their energy balance methodology which may result in the use of different basic accounting units.

3/ In the United Kingdom, for example, three such units -- the TOE, the TCE and the therum -- are used to present energy sector statistics.

4/

these units. The joule enjoys a growing acceptance in the international community as the basic common unit for energy statistics and under the SI system of units it will supercede the caloric as a measure of heat and energy. Furthermore, even if another unit such as the TOE were chosen to represent aggregated energy data, affecting the conversion of natural units of other fuels -- such as cubic metres of gas, for example -- into that basic unit would require, if that conversion were based on calorific content, an implicit two stage conversion process: first from cubic metres to joules and then from joules to TOE's, where the TOE would again be defined in terms of "X" million joules.

This is an important practical dimension of the conversion problem because it is important to take into account not only the variability of calorific values between fuels but also the differences in average calorific values for the same fuel in different countries and for different products made from the same fuel. In other words, it will not be adequate in general to convert tonnes of coal into tonnes of oil equivalent by using a simple "broad-brush" conversion factor (such as 1.5:1) unless variations in the calorific value of the different types of coal (which range from joules/ton to joules/ton) have been accounted for. The same is true for measuring physical quantities of oil and oil products in terms of TOEs. The calorific content for different types of crude oil varies with their specific gravity, although the degree of variation is not as great as is the case for different types of coal or natural gas.

These above reasons provide a strong justification for moving towards the adoption of the joules as the basic unit for energy measurement in Bank reports. The one important argument which militates against this move, however, is the fact that in spite of the growing acceptance of the joule as the basic energy accounting unit in international scientific circles, the vast majority of national policy-makers still lack an intuitive feel for this unit and find it somewhat esoteric. This has an important bearing for the work of the Bank because the purpose of presenting energy sector information in most Bank reports is to reach this audience of policy-makers and increase their awareness of critical energy issues. The appropriate packaging of energy data in Bank reports therefore has a far greater impact on the ease with which it is absorbed by the prospective audience than is the case for specialized energy reports published by other agencies and intended for a more limited and sector-specific audience.

In the case of the majority of policy-makers, the perception of the energy crisis is inextricably interlinked with recent developments in the international petroleum markets. The questions which interest them most concern the degree of their country's dependencies on oil -- imported or produced domestically; the extent to which indigenous energy resources could be developed to reduce the share of oil in national energy supply; and the extent to which savings could be achieved in the consumption of oil or other energy sources through a program of energy conservation and

demand management and the adoption of more appropriate pricing policies. For these reasons, most national policy-makers and Bank staff not directly concerned with the energy sector, would prefer the packaging of energy data in Bank reports in the form of TOEs.

As a recognition of these needs, it is proposed that until there is a greater understanding of the joule outside the energy sector, all energy sector information in Country Economic Reports, Energy Sector Reports and the energy sector section of Staff Appraisal Reports for energy (oil and gas, coal, power, fuelwood and alcohol) projects be presented in terms of TOEs. It is important to emphasize that for this purpose the TOE should be viewed as a convenient packaging unit and it should be defined in terms of a specific calorific value. We recommend that in keeping with the traditional value for a TOE adopted by other agencies (such as the OECD and the EEC), the TOE be defined in Bank reports as the equivalent of 41.86×10^9 joules (=10×10^6 calories + 39.68×10^6 BTU).

Specific sub-sector information should continue to be presented in the units which are most widely used for those fuels -- barrels for crude oil; litres or gallons for refined petroleum products; cubic metres or cubic feet for natural gas; kilowatt-hours and kilowatts (or some multiple thereof) for electric power; tons for coal; and cubic metres or feet for firewood. However, the corresponding TOE values for these fuels should also be presented in parentheses where these are referred to in the general discussion of the energy sector, although this will not be necessary in chapters or sections of reports devoted to the discussion of specific fuels, but it is necessary to include on the front inside cover of the report a complete list of conversion factors and acronyms used in the report.

Since an energy accounting unit has been selected (TOE) and the basis for converting other fuels into that unit agreed upon (calorific content or heat equivalence), the actual mechanics of effecting this conversion are, in general, fairly straightforward. The calorific content of most primary fuels -- gas, coal, firewood -- can be determined without too much difficulty although care must be taken to ensure that the values used correspond to the actual coal, gas, etc. used in the particular country and also allow for variations in calorific value across different deposits of the same fuel. After this has been done, there still remains one important conceptual problem which has to be resolved in adding up the energy supplied from different primary fuels -- the appropriate conversion factor for primary electricity.

Primary Electricity[1/]

The energy equivalent of primary electricity can be measured in one of three ways: (i) as the amount of fossil fuels that would be required to generate the same amount of electticity in conventional thermal stations; (ii) as the amount of fossil fuel that has the same theoretical energy content as the theoretical energy of the electricity generated from primary sources; and (iii) as quite unrelated to other fossil fuels and reflecting the actual energy content of the primary fuels used -- in the case of hydro-power, this would reflect the energy released by a given mass

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1/ Primary electricity refers to the electricity generated through hydro-power, nuclear, geothermal and solar power stations.

of water falling a given distance and in the case of nuclear energy the primary fuel input would be the amount of energy released by the fission of nuclear material or by the difference between production, net trade and stock changes in fissionable material.

One could argue in favour of each of these methods, although they would yield quite different results. In practice, however, the choice is narrowed to the first two because the third convention is generally accepted as resulting in a somewhat artificial treatment of, in particular, hydro-power. Furthermore, the use of this convention makes it more difficult for policy makers to concentrate on the economic and social aspects of substitution between hydro, nuclear and conventional thermal power generation and on the implications of each type of station for the requirements of indigenous and imported fossil fuels.

Between the first two methods, the difference in results can be attributed directly to the fact that roughly two-thirds of the energy content of the primary fuel input for thermal power generation is lost during the transformation process as waste heat. To generate one kilowatt-hour of electricity with a maximum theoretical heating value of 3.6 million joules, requires in the most efficient thermal power stations the input of primary fuel with an energy content of 10.5 million joules. Therefore, depending on whether the first or the second convention were adopted, a million kwh of electricity generated from hydro-power would be represented in national energy statistics as the equivalent of 252 TOE or

86 TOE. This is obviously an important issue in analyzing the pattern of energy supply for those countries which rely heavily on hydro-power for their electricity generation.1/

There is no theoretically correct answer to resolve this dilemma and, as is the case for most energy statistics, the appropriate method depends on the purpose for which these statistics are presented and on the specific situation of the country concerned. For most countries, it can generally be argued that the choice they face is between the generation of electricity through burning of fossil fuel in conventional thermal stations or through the development of hydro, nuclear or geothermal resources. For these countries the appropriate conversion methodology is the first one because the additional generation of primary electricity results in a proportionate saving in the consumption of fossil fuels in the power sector, including the transformation losses that would thereby have to be incurred. For a few countries, however, this may not be appropriate. These are the countries which depend almost entirely on hydro (or geothermal) energy for electricity generation because they are particularly well endowed with these resources and for whom the appropriate substitute, if these resources were not available, would not be electricity produced in thermal plants but fossil fuels burned at the point of final conversion. For these few countries, it is the second convention which should be adopted in estimating

---

1/ For example, in the case of Pakistan, where about % of the electricity is generated from hydropower, the share of hydropower in total energy supply would vary from % to %, depending on which conversion factor was adopted.

the share of primary electrical energy in total energy supply. However, even in these cases, it could be argued that this method would understate the contribution made by hydro energy because of the higher end-use efficiency of electricity consumption as compared with the burning of other fossil fuels.

The mission recommended this strategy because it felt that:

(i) The various executing agencies in the different energy subsectors are not yet ready to effectively implement a "non-project" loan. The National Power Corporation, which has received seven project loans from the Bank, still needs careful attention because it is weak in procurement, planning, pricing policies, middle management and training; it has never met the rate of return covenant agreed to in previous loan agreements and is consequently unable to meet its debt service from its own source of funds. The Philippine National Oil Corporation, which is responsible for the development of oil, gas, coal and geothermal resources, is itself a young organization whose staff have little or no experience of dealing with the Bank or other international lending agencies and whose programs for the development of different fuels still need close monitoring.

(ii) There is no strong central agency to coordinate and monitor an energy sector loan in the Philippine Government.

(iii) No single Bank division has the expertise or the administrative authority to assume responsibility for preparing, appraising or supervising such a loan.

(iv) The flexibility that would be required for the timing of Bank operations in the different energy subsectors in the Philippines would, in this instance, act as a further

disincentive for packaging such assistance in the form of a single lending operation. The PNOC and the Bureau of Energy Development urgently need assistance in the area of geophysical and seismic survey and interpretation to support their oil exploration efforts. This assistance could be offered in the form of an exploration promotion project and the Petroleum Projects Division of EGY has indicated that it is ready and willing to prepare such a project for presentation to the Board in FY81. This is in keeping with the pattern established through several projects of this kind that have already been approved by the Board. On the other hand, lead times for the preparation of suitable projects in the other energy subsectors in the Philippines at this time appear to be longer. A power project is unlikely to be ready before the middle of FY82 and the same is true for assistance in the geothermal sector.

July 22, 1980

Althea:

Attached is the information on project costs requested by Mr. Stern.

Please note the relatively high proportion of oil and gas project costs that are financed through Bank loans. This is due to the definition adopted for (in particular development) projects as consisting of selected and integrated components of often much larger sector investment programs. In Egypt, for example, the projects we are helping to finance are small relative to the very large (in the order of $1 billion/year) investments being made in the sector by private and public sources.

Yves Rovani

Total Project Costs Associated with Current ($13 bn) and Desirable ($25 bn) Lending Programs

	Current Program $million	Desirable Program $million
Electric Power		
- loan amount	7,590	11,000
- project cost	37,950	47,450
Oil and Gas		
- loan amount	3,985	8,000
- project cost	11,200	18,500
Fuelwood		
- loan amount	425	1,100
- project cost	850	2,200

Mr. Yves Rovani, Director, EGY July 22, 1980

Masood Ahmed, EGY

Impact of Enclaved Development Projects on the Share of IDA Lending for Oil and Gas.

1. The Bank/IDA split for the FY81-85 desirable oil and gas lending program is as follows:

	$ Million				
	Bank	%	IDA	%	Total
Predevelopment	825	(34)	1,585	(66)	2,410
Oil Development	3,215	(97)	105	(3)	3,320
Gas Development	2,045	(91)	225	(9)	2,270
Total	6,085	(76)	1,915	(24)	8,000

2. In the preparation of this program, all oil and gas projects in blend countries have been treated as Bank projects. In addition, the program contains two gas development projects and six oil development projects in IDA countries which have been treated as 'enclaved Bank projects' because of their revenue generating nature. The total lending for these projects is estimated at $825.0 million and they are distributed as follows:

	$ million		
Year	Oil	Gas	Total
FY82	PAK 50.0		50.0
83	MAD 100.0	BOL 100.0	400.0
	CHAD 200.0		
84	NIGER 100.0		100.0
85	PAK 75.0	BOL 100.0	
	MAD 100.0		275.0
Total	625.0	200.0	825.0

3. Treating these enclaved projects as regular IDA credits would raise the overall level of FY81-85 IDA lending for oil and gas to $2.740 million and for oil and gas development projects to $1,155 million. The share of lending made as IDA credits would also rise to 34 percent (up from 24%) for the program as a whole and to 21 percent (up from 6%) for development projects only.

4. The year by year profile of the oil and gas program would then be as follows:

	$ million					
	FY81	FY82	FY83	FY84	FY85	FY81-85
Predevelopment-Bank	145	125	235	120	200	825
Predevelopment-IDA	110	275	370	485	345	1,585
Oil Development-Bank	210	280	195	925	980	2,590
Oil Development-IDA	30	50	375	100	175	730
Gas Development-Bank	125	325	325	570	500	1,845
Gas Development-IDA	125	-	100	-	200	425
Total - Bank	480	730	755	1,615	1,680	5,260
Total - IDA	265	325	845	585	720	2,740

MAhmed/rhc

7/21/80

Miss Duersten -

In response to Mr. Stern's request for additional data, attached please find:

(i) A breakdown of the $13 and $25 billion lending programs by Bank and IDA borrowers for electric power, oil and gas and fuelwood. A breakdown for the other sectors has been sent to Mr. Goodman by IPD.

(ii) A preliminary list of the fifteen largest fossil fuel consumers and their developed and potential hydroelectric capacity.

Masood Ahmed
x72481

Breakdown of Current Lending Program ($13 bn) 1/

$ Million 1/

Category	FY81		FY82		FY83		FY84		FY85		FY81-85	
	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA
Electric Power	1040	350	755	650	1035	435	1070	600	1185	470	5085	2505
Fuelwood	30	20	40	35	55	45	55	45	55	45	235	190
Oil and Gas -												
Predevelopment	15	105	65	115	140	180	50	110	60	180	330	690
Oil Development	340	40	260	-	395		295		425		1715	40
Gas Development	-	85	285	-	225	75	205		235	100	950	260
Sub-Total	355	230	610	115	760	255	550	110	720	280	2995	990

1/ Operations in blend countries have been treated as Bank loans.

Breakdown of Desirable Lending Program ($25 bn)[1/]
$Million[1/]

Category	FY81		FY82		FY83		FY84		FY85		FY81-85	
	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA
Electric Power	1040	350	1209	765	1440	601	1795	780	2040	980	7524	3476
Fuelwood	40	60	80	120	80	120	120	180	120	180	440	660
Oil and Gas												
Predevelopment	145	110	125	275	235	370	120	485	200	345	825	1585
Oil Development	210	30	330	-	495	75	1025	-	1155	-	3215	105
Gas Development	125	125	325	-	425	-	570	-	600	100	2045	225
Sub-Total	480	265	780	275	1155	445	1715	485	1955	445	6085	1915

1/ Operations in blend countries have been treated as Bank loans.

Developed and Potential Hydro Capacity For 15 Major Fossil Fuel Consumers

	Country	Gross Theoretical Capacity (MW)	Developed capacity 1980 (MW)	1985 (MW)
1.	Argentina	48,120	4,359	9,859
2.	Brazil	90,240	28,392	34,700
3.	Colombia	50,000	3,212	5,927
4.	Mexico	20,344	6,300	8,900
5.	Peru	12,500	2,000	2,600
6.	Turkey	15,200	2,910	6,090
7.	Yugoslavia	16,957	6,829	9,329
8	Romania	8,033	3,745	7,017
9.	Egypt	3,800	2,500	2,500
10.	India	70,000	11,029	16,029
11.	Indonesia	30,000	571	1,154
12.	Philippines	7,504	1,738	2,677
13.	South Korea	5,514	753	2,156
14	China	330,000	?	?
15	Thailand	6,242	1,218	2,040.

7/21/80.

FORM NO. 1411
(5–78)

THE WORLD BANK

REQUISITION FOR EQUIPMENT, SERVICES, BOOKS AND SPECIAL SUPPLIES

DO NOT USE THIS FORM FOR REQUESTING PRINTING, CARTOGRAPHIC OR GRAPHIC SERVICES, OR STOCKROOM SUPPLIES. READ INSTRUCTIONS ON BACK CAREFULLY BEFORE COMPLETING THIS FORM.

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DEPARTMENT:	DEPT. NO.:	DIVISION:	DIV. NO.:
ENERGY	307	Office of the Director	05

DELIVER TO:	ROOM NO.:	EXTENSION:	DATE WANTED:
Masood Ahmed	D-534	72481	Immediately

ITEM NO.	QUANTITY	UNIT	COMPLETE DESCRIPTION *Show specific justification for need, i.e., replacement for worn-out or outmoded items, or additional new system, or for new staff, etc., under each item.*	BUDGET COMMITMENT NO.*
	1	1	French-English dictionary for new staff.	

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AUTHORIZATION

I CERTIFY THAT THE ABOVE ARTICLES OR SERVICES ARE ESSENTIAL TO THE BANK.

AUTHORIZED REQUISITIONING OFFICER'S SIGNATURE:	DATE:
[signature]	7/16/80

TYPED OR PRINTED NAME AND TITLE OF ABOVE OFFICER:

Richard H. Sheehan, Sr. Adv. Op.

FOR ADMIN. SERVICES DEPT. USE ONLY

ORDERED:

COMPLETED:

ISSUE/PURCHASE APPROVED BY:

1. SIGNATURE:	DATE:
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3. SIGNATURE:	DATE:

**Requisitioner must fill in Budget Commitment Number for equipment, services or special supplies chargeable against Department Budgets. Responsible Service Unit will fill in Budget Commitment Number for charges against overhead budgets.*

WHITE AND YELLOW - Submit to Responsible Service Unit; PINK - Requisitioning Office's Copy

1. a) Equipment, services, and special order supplies, other than those listed under 3 below, should be requisitioned by submitting this form in duplicate to the appropriate service unit noted in 2 below.

   If the name of the article does not clearly indicate what is needed, a full description - with type or specifications - should be given on the requisition. Requisitions for books should indicate title, author, publisher and price.

   Requisitions containing insufficient information, or without budget commitment numbers where applicable, will be returned to the requisitioner.

   b) All requisitions must be typewritten or printed.

   c) "Date Required" date should reflect advanced planning on the part of the requisitioner to allow sufficient time for procuring items not stocked by the Bank.

   d) Requests for special supplies or materials must indicate whether or not they will be required on a continuing basis. Items that will be required on a continuing basis must show the estimated monthly/annual usage.

   e) Requisitions must be signed by a person authorized to sign in accordance with Administrative Manual Statement 2.40.

2. A separate requisition should be submitted for each of the following groups:

Item	Submit requisition to:
Books, magazines, periodicals, newspaper subscriptions, wall maps	Documents Acquisition & Control
Building Maintenance services	Building Operations & Services
Office Alterations	Building Operations & Services
Business Cards	Procurement
Expendable office supplies not carried in Bank Stockroom	Procurement
Calculators, Dictating Machines, Typewriters (issue and repair)	Property Control
Bookshelves, File Cabinets, Supply Cabinets, other records holding equipment	Property Control
Office furniture, furnishings and equipment other than listed above	Property Control
Office Moving services	Property Control
Telephone installation, changes, relocation	Telephone Installation & Planning

3. Services and supplies listed below should <u>not</u> be requisitioned on this form.

Cartographic services.	Refer to Admin. Manual Statement 6.01 for instructions.
Graphics Arts services.	Refer to Admin. Manual Statement 6.01 for instructions.
Printing and Copying services.	Refer to Secretaries' Guide Statement 6.1 for instructions.
Forms printing.	Use form 750. Refer to Admin. Manual Statement 2.10.
Office supplies listed in World Bank Stockroom Supply Catalog.	Use form # 51 and submit to Stockroom.

Breakdown of $25 Bn Lending Program
(millions of current dollars)

Category	FY81	FY82	FY83	FY84	FY85	FY81-85
Electric Power	1,390	1,974	2,041	2,575	3,020	11,000
Oil and Gas -						
Predevelopment	255	400	605	605	545	2,410
Oil Development	240	330	570	1,025	1,155	3,320
Gas Development	250	325	425	570	700	2,270
Sub Total	745	1,055	1,600	2,200	2,400	8,000
Renewables -						
Fuelwood	100	200	200	300	300	1,100

Mr. Yves Rovani, EGYDR July 7, 1980

Masood Ahmed, EGY

IDA Lending For Energy

1. Attached please find two tables showing:

(a) the split between Bank & IDA lending for the proposed FY81-85 energy lending program; and

(b) details of the historical and projected volume of IDA lending for electric power and the share of such lending for power projects in India.

2. For the period FY81-85 IDA lending for energy totals $6.5 billion or 38% of the overall energy lending program. On an annual basis, the level of IDA lending varies between $1.1 - 1.5 billion as summarized below:

Proposed Lending Program ($ billion)

	FY81	FY82	FY83	FY84	FY85	Total
Bank	1,794	1,694	1,910	2,895	2,498	10,791
IDA	1,091	1,109	1,475	1,429	1,345	6,449
Total	2,885	2,803	3,385	4,324	3,843	17,240

3. Over half of the proposed IDA lending in energy is for electric power. As the figures in table 2 show, the level of IDA lending for electric power during FY81-85 is significantly higher than has been the case for the past five years, but in line with the rising trend established in those years. Two further points can be made. First, IDA lending for power is envisaged to increase at a higher rate than overall power lending, which results in an increased share of IDA in total power lending (up to 45% in FY85 from 26% in FY80). Second, the rise in IDA lending for power cannot be attributed to higher lending for Indian power projects. Lending in India does not show any marked increase from its current level of about $350 million and its share in total IDA lending for power shows a consequent decline over the next five years.

4. The second largest component of the proposed energy lending program is the oil and gas subsector. IDA lending for oil and gas projects totals $1.85 billion over FY81-85. This is accounted for largely by predevelopment projects in oil ($885 million) and development projects in gas ($705 million).

5. The impact of this expanded program of IDA lending for energy on the competing claims of other sectors (within the constraint of the overall availability of IDA funds) may need to be examined separately.

MAhmed:syk

Attachments:

PROPOSED BANK LENDING PROGRAM
CURRENT $ MILLION

Table 1

	FY 81		FY 82		FY 83		FY 84		FY 85		Total	
	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA	Bank	IDA
Coal & Lignite 1/ 2/	238	0	49	8	335	105	440	85	350	20	1412	218
Oil -												
Exploration Promotion	15	70	30	55	20	30	20	40	25	10	110	205
Exploration	130	10	85	155	170	145	135	165	150	205	670	680
Development	195	45	260	-	335	55	550	-	760	50	2100	150
Refineries	150	-	50	-	-	-	-	-	50	50	250	50
Gas - exploration	-	30	-	45	-	35	-	-	-	-	-	110
- development	-	250	235	50	185	125	130	155	155	125	705	705
Renewables -												
Fuelwood	40	60	80	120	80	120	100	150	100	150	400	600
Alcohol	175	-	-	35	40	20	225	35	35	35	475	125
Electric Power 3/	851	626	775	641	665	765	1175	714	743 1/	600	4209	3346
Industrial Retrofitting	-	-	130	-	80	75	120	85	130	100	460	260
All Energy	1794	1091	1694	1109	1910	1475	2895	1429	2498	1345	10791	6449

1/ For unidentified projects, Bank/IDA split based on average for the rest of the program.

2/ Brazil oil shale project ($150m) is included under FY85 to make these figures consistent with lending program table.

3/ The power investment program is based on the latest information available on 6/19 and differs from policy paper table where the totals are: FY81-$1389.5m; FY82-$1405m; FY83-$1471m; FY84-$1670m; FY85-$1409m.

IDA LENDING FOR POWER

Table 2

Year	Total IDA $m	IDA Power as % of total Power	IDA Power for India $m	Indian Lending as % of total IDA Power %
1976	259.0	27	207	80
1977	167.0	18	150	90
1978	246.2	22	200	81
1979	482.4	36	375	78
1980	626.8	26	360	57
1981	626	42	250	40
1982	641	45	310	48
1983	765	54	420	55
1984	714	38	400	56
1985	600	45	(150) 1/	25 1/
FY81-85	3346	44	1530 1/	46 1/

1/ FY85 figures for India exclude projects as yet unidentified, and are likely to underestimate the final volume of lending.

1.20 In addition, estimates of the investment requirements of alternative energy sources must also take into account the widely varying needs for associated infrastructure. For example, most developing countries cannot quickly take advantage of the wide differential between coal and fuel oil prices because they lack port facilities, coal handling equipment, specialized surface transport, and coal burning facilities, all of which require heavy investment. Within the petroleum sector, investment in storage and port handling facilities for larger oil tankers could have substantial payoffs for many developing countries by enabling them to take advantage of the freight differential between large and small tankers which can be as high as $4-5 per barrel of crude.

1.12 The vast majority of developing countries (99 in all), therefore, depend in varying degrees on imported oil. Some of these countries with a high potential and currently low internal needs could become self-sufficient in the next decade (Pakistan, Ivory Coast, Ghana, Chad). Other countries (Brazil, Turkey, Korea) have a considerable absorptive capacity for oil and are likely to remain net importers or to see their import dependence increase over the next 10 years unless they develop alternative resources. The energy potential of many of the countries which are dependent on oil imports for over 75% of their commercial energy needs -- and this includes some of the poorest LDCs -- is currently now well known. A considerable predevelopment effort is required to assess their potential. In most cases even small discoveries of oil (20,000-50,000 bbd) and/or development of alternative sources of power generation could go a long way towards reducing their current dependency on imported oil or improving their development prospects.

June 30, 1980

Ms. Becky Saunders
P & GS - Gen Sve. ILS Library
Shell Oil Company
Room 1281
2 Shell Plaza
Houston, Texas 77001

Dear Ms. Saunders:

We would be grateful if you could send us a copy of the latest edition of The Petroleum Handbook, published by your company.

Sincerely,

Masood Ahmed
Economist
Energy Department

MAhmed/rhc

The Government also needs to devote more attention to analyzing the demand for non-commercial energy sources and developing programs for augmenting their supply and increasing their efficiency of use. In this context, the CNED is doing some useful work on the supply side in testing new applications for non-commercial and non-conventional fuels but much of this work is too research-oriented to have a marked impact on solving the energy problem of rural and poorer urban households in the near future. More emphasis needs to be given to analyzing their more immediate needs for cooking and lighting fuel, taking into account both the competing demand from industrial users (particularly for firewood and bagasse) and the potential for interfuel substitution into kerosene and LPG. This could be achieved either through broadening the focus of CNED's program and staff or by formulating a separate small unit for this purpose in the Bureau of Energy Utilization in the MOE which would also coordinate closely with the Bureau of Forestry Development, the Ministry of Agriculture and other concerned agencies.

The Government also needs to devote more attention to analyzing the demand for non-commercial energy sources and developing programs for augmenting their supply and increasing their efficiency of use. In this context, the CNED is doing some useful work on the supply side in testing new applications for non-commerical and non-conventional fuels but much of this work is too research-oriented to have a marked impact on the energy problem in the near future. More emphasis needs to be given to analyzing the demand aspects of this issue. This could be achieved either through broadening the forms of CNED's program and staff or by formulating a separate small unit for this purpose in the Bureau of Energy Utilization in the MOE which would also coordinate closely with the Bureau of Forestry Development, the Ministry of Agriculture and other concerned agencies.

6/26/80

Messrs. Sheehan, EGY
Bourcier, EGY
Bharier, EGY
Fish, EGY
Fallen-Bailey, EGY
Byer, EGY
Moore, EGY
Hughart, EGY
Mitchell, EGY
Sadove, CPSVP

Please pass by hand

Attached is a compendium of marked-up sections of the policy paper and revised drafts sent to Mr. Goodman from this Department between 6/16 and 6/25.

I would be grateful if you could verify its completeness for me. To expedite this process, please pass this file to the next person on this list if you cannot deal with it immediately.

Masood Ahmed

rhc

TELEX
95205827

JUNE 25, 1980
72481

INTBAFRAD

ISLAMABAD, PAKISTAN

FOR POPIEL. RE ENERGY PRICING STUDY. FURTHER TO OUR CABLE OF JUNE 13, PLEASE RESPOND SOONEST REGARDING EXPECTED COMPLETION DATE FOR REVISED DRAFT REPORT AND EARLIEST DATE WHEN MINISTRY OF PETROLEUM OFFICIALS WOULD LIKE TO REVIEW THE REPORT WITH US. BEST REGARDS. BHARIER.

Pakistan Energy Pricing Study

Messrs. Bharier, McCarthy, Wormser. Clements

Masood Ahmed

Richard H. Sheehan

Chapter IV - Introduction
(Outline)

1. In Chapter I we presented the currently most likely scenario for energy production and consumption in LDCs over the 1980s, based upon existing programs and policies. However, the thrust of this paper is that more could be done to increase energy supply in the LDCs, to further moderate the growth in their energy demand and to arrive at a more favourable overall energy balance for them.

2. Consequently, Chapter II provides more ambitious supply targets for oil, gas and coal production in LDCs and the incremental investment costs associated with them. And Chapter III provides estimates of additional reduction in demand that could be achieved through an enhanced program of energy conservation and management.

3. In this Chapter, these interrelated threads are brought together and their implications discussed. If these higher goals are achieved, the energy balance of the OIDCs in 1990 will be altered as follows: (table presenting revised prod./cons. figures).

And this will result in a corresponding reduction in the OIDC's oil import bill by $____ billion in 1990.

4. However, to meet these higher goals will require a massive global effort to mobilize financial, human and technological resources and a corresponding increase in the capability of LDCs to manage these resources.

5. Resource Mobilization

Financial

As the figures in Chapter II and Chapter III show, the incremental investment associated with these higher goals is large (__$ billion over the decade). To mobilize these financial resources to meet these investment needs, developing countries will need to provide:

(i) proper incentives to attract private capital (both foreign and local) into energy development, not just in the form of suppliers' credits but as equity where this is feasible;

(ii) ensure adequate internal cash generation for self-financing through appropriate domestic pricing policies (particularly important in the power sector); and

(iii) optimize the use of scarce ODA and use this as a catalyst for mobilizing resources from other sources.

6. Human. LDCs will be competing in many fields with developed countries for certain skills that may be in short supply the world over. Two important aspects of human resources mobilization policy will be:

(i) investment in training local personnel; and

(ii) ensuring that remuneration policies (particularly in state oil companies) are based on market conditions and take account of the international market that exists

for many of these skills.

7. Technological - in mobilizing the required technology, cooperation with the private sector will be essential.

8. Resource Management

All this is necessary, but it can only be effective within a proper policy framework for the management of these resources. Governments will have to develop coherent and integrated energy policies. Pricing policies must not only encourage supply but also function to moderate the growth in energy demand and rationalize its structure. But pricing policies alone will often not be enough. Other measures (administrative controls, selective rationing, building codes, etc.) may also be required. Their financial cost is often cheap but their political and administrative costs may be high.

9. Developing this proper policy framework involves a considerable effort in institutional strengthening. Few countries (both developed and developing) today have an adequate national energy planning capability to formulate energy policy, analyze alternative energy supply options and implement programs for energy development and utilization. Institutional strengthening will need to take place at all levels -- from better national economic management (of which energy management is an integral part) to improved planning capabilities

within the various subsector operating agencies and to better coordination amongst them.

10. All this is made more urgent by the nature and volume of the preinvestment work that needs to be done in the next five years. This applies not only to oil and gas, but also to coal (where feasibility studies, reserve delineation and preinvestment in associated infrastructure is required) and hydro (where important ranking and feasibility studies need to be undertaken). Equally important work needs to be done on analyzing the structure of energy demands, in particular in rural areas and for non-commercial fuels about which little is documented in many countries despite their important contribution to energy supply. In the commercial energy fields, gas utilization studies and coal market studies, in particular, will have an important bearing on the pace of development for these resources.

MA - Chron.

Mr. Ernest Stern, VPO

June 20, 1980

Yves Rovani, EGY

Energy Policy Paper

1. The cycle of detailed para by para comments and the updating of figures and tables is now nearly complete. Therefore, I would like to take this opportunity to raise a few general points whose consideration would, in my opinion, improve the overall quality of the paper. These comments are summarized by chapter below.

2. Chapter 1. No comments.

3. Chapter 2. This chapter should conclude with an assessment of the supply impact (for domestic needs and possibly export) of the extra effort that is proposed for oil, gas, coal, etc., over and above what is already being done in these fields. This should be accompanied by a discussion of the investment costs associated with this extra effort. We also need to deal with the implications of this for the countries concerned. These will fall into three main means:

(i) manpower requirements and institutional strengthening; the program will require not only additional skilled manpower which may be in short supply, but also improved management of national energy development institutions and increased cooperation among the various subsector agencies;

(ii) resource mobilization: to stress the critical impact of pricing on domestic resources mobilization. Two further points should be made: (a) the need to attract private foreign capital, not only in the form of suppliers' credits but also as equity finance in those areas where this is feasible; e.g., oil and gas exploration and development, refineries and some coal mining, and (b) the need to optimize the use of the scarce supply of official aid;

(iii) supply planning; it is important to point out an enormous amount of preinvestment work which will have a major effect on energy supply in the developing countries in the 1990s. ~~This applies not just to~~ oil and gas but to coal (including transport infrastructure) and electric power (where large hydro feasibility and ranking studies have to be undertaken).

4. Chapter 3. This chapter should start directly with a discussion of demand management. It also needs a concluding section where the expected savings from energy conservation and more efficient utilization are qualified (with proper qualifications given the Bank's limited experience) and more

closely tied into the projections of energy consumption in LDCs. This section should also summarize what steps need to be taken to achieve these projected savings and a tentative estimate of the associated investment costs. Again we need to stress the importance of appropriate pricing policies and other demand management measures in achieving efficient utilization and point out what the major constraints are likely to be - weak institutional capabilities; complexity of the issues; relatively new techniques, etc. The important issue here is preventing a continuation of practices and policies (building codes, industrial techniques, etc.) that were evolved in an era of cheaper fuel.

5. Chapter 4. This chapter should draw together the likely impact on the OIDC's oil import requirements of the proposed expansion in supply and reduction in demand that would be brought about by the measures discussed in chapters II and III. This should lead into a discussion of the financing requirements for increasing production on one hand, and the energy planning programs that would be the central tool for moderating and rationalizing energy demand on the other.

6. I believe that this involves only a series of minor adjustments and will be feasible within the time constraints available and would meet most of the points raised at yesterday's meeting.

cc: Messrs. Goodman, Sadove

6/20/80

To Mr. Goodman

Ray -

Attached please find:

(i) the final version of the section on refineries, which completes our marked-up comments on Chapter II; and

(ii) the revised glossary table which incorporates IPD's comments on the earlier version.

Yves Rovani

MAhmed/rhc

June 20, 1980

To Mr. Goodman

Ray -

Attached please find a revised copy of Chapter 4 which is complete except for:

(i) table 21 on OIDC investment requirements which is being revised to ensure complete consistency with the new energy production estimates, and to see whether comparable figures for oil exporting LDCs can be incorporated as requested by Ernie Stern;

(ii) table 22 on comparative energy costs which is being finalized; and

(iii) our substantive comments on the lending program which we would like to make separately.

I would like to draw your attention to the main changes we have made to the attached text. We have updated and strengthened the progress report on Bank activities; suggested the deletion of the section on exploration promotion, much of which is repeated in the subsequent section; introduced a section on the work program for energy planning, sector work and research; and strengthened the section on aid coordination.

I believe that this report still needs a discussion of the likely impact of energy conservation and efficient utilization measures on the projected level of energy consumption, and some attempt at quantifying the investment costs that would be associated with such a program to determine the overall priority that should be allocated to it. We are working on this problem and will come back to you on this.

Yves Rovani

FORM NO. 1411
(5–78)

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Masood Ahmed	D-534	72481	ASAP

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A. Ahmed	6/19/80

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   b) All requisitions must be typewritten or printed.

   c) "Date Required" date should reflect advanced planning on the part of the requisitioner to allow sufficient time for procuring items not stocked by the Bank.

   d) Requests for special supplies or materials must indicate whether or not they will be required on a continuing basis. Items that will be required on a continuing basis must show the estimated monthly/annual usage.

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Graphics Arts services.	Refer to Admin. Manual Statement 6.01 for instructions.
Printing and Copying services.	Refer to Secretaries' Guide Statement 6.1 for instructions.
Forms printing.	Use form 750. Refer to Admin. Manual Statement 2.10.
Office supplies listed in World Bank Stockroom Supply Catalog.	Use form # 51 and submit to Stockroom.

June 19, 1980

Mr. Goodman -

Attached is an annotated copy of the revised and expanded section on synfuels we have received from IPD and which has also been sent to you directly by Mr. Fuchs. Our comments reflect suggested editorial changes which could reduce the length of this section and preserve the overall balance of Chapter II.

Yves Rovani

Mr. A. Decarlo Thomas, ADM

June 18, 1980

Masood Ahmed

DAMAGE TO HOUSEHOLD GOODS

1. Attached please find some documents I have received today from American President Lines regarding my claim for damage to the shipment of my household effects from Karachi.

2. Please advise me if I should respond directly to American President Lines.

MAhmed/rhc
Attachment

Please supply
amount of
Claim with
invoices and
return.
Also supply
your ref #.

D. Smith

(2)

INA POLICY 87HF0032 Certificate: 18119

NOTICE OF CLAIM ON CARRIER

1. If an inbound shipment to the U.S., Merchants International, Inc. will complete this form and provide you with a copy when a loss is made known to them.
2. If a shipment to another destination; please complete this form. Send or give it to the company delivering your effects. Attach a photocopy to your claim documentation.

TO: American President Lines
The World Trade Center
Suite 744
Baltimore, MD 21202
name & address of company delivering effects

THE SHIPMENT OF HOUSEHOLD GOODS/ PERSONAL EFFECTS, AN AUTOMOBILE WHICH YOU DELIVERED TO ME ON 4/25/80 ARRIVED IN A DAMAGED CONDITION FOR WHICH I AM HOLDING YOU RESPONSIBLE. THE DAMAGED ITEMS ARE AVAILABLE FOR YOUR EXAMINATION IF YOU DESIRE

(CIRCLE APPROPRIATE)

SHIPMENT FROM KARACHI (origin) TO WASHINGTON (destination)

~~XXXXXXXXX~~ STEAMSHIP COMPANY American President Lines, Ltd "Pres McKinley vo85"

BILL OF LADING # 847093 DATED 17 Feb 80

FROM: ✓ MASOOD AHMED
✓ 2501 Calvert St, NW, #501
✓ Washington DC 20008
INSURED'S NAME & ADDRESS

SIGNATURE [signature] DATE Feb 6 1980

NOTICE OF ARRIVAL & FREIGHT BILLS

(Licensee and Address)

AHMAD

BOOKING NUMBER

PAGE 1 OF BL 847093

EXPORT REFERENCES

(Non-Negotiable unless consigned to order)

OF SALEEMSONS LTD

FORWARDING AGENT (References)

SALEEMSONS LTD

POINT AND COUNTRY OF ORIGIN

KARACHI PAKISTAN

DATE EXPORTED

02/19/50

NOTIFY/INTERMEDIATE CONSIGNEE (Name and Address)

SOOD AHMAD C/O WORLD BANK
H STREET
ASHINGTON,DC,20433

DOMESTIC ROUTING/EXPORT INSTRUCTIONS/ALSO NOTIFY

KHI ROO 073
SIN MCK 085

VESSEL AND VOYAGE	LOADED TO VESSEL AT	ONWARD ROUTING FROM PORT OF DISCHARGE
MCKINLEY VO85	SINGAPORE	THIS CARGO MOVED IN BOND VIA APL ON I.T. 25740186 ISSUED AT SAN PEDRO DATED
DISCHARGE: PEDRO CALIF USA	DESTINATION: MLB/BALTIMORE MARY	

DESCRIPTION OF PACKAGES AND GOODS (PARTICULARS FURNISHED BY SHIPPER)

WGT IN KILOS

MARKS AND NUMBERS	NO. OF PKGS	DESCRIPTION	GROSS WEIGHT	MEASUREMENT
ASOOD AHMA WORLD BANK -H STREET WASHINGTON 20433	3 VPKS	USED HOUSEHOLD GOODS AND PERSONAL EFFECTS SN1225	2500	7.248

CONTAINER INFO

NUMBER	SEAL	TYPE	SIZE	REC/DEL	QUANT/PACK	KGS	CBM
200984	13887	D	40	CFS CFS	3 VPKS	2500	7.248

FREIGHT RATES, CHARGES, WEIGHTS AND/OR MEASUREMENTS SUBJECT TO CORRECTION

		PREPAID	COLLECT
48 M3	@US$173.00/M3		1253.90
	@US$20.68/M3		149.89
	@		
	@		
	@		
	@		
	@		
9 073 OC		00	
		BAL	1403.79

The cargo described above should be available 2 days after discharge of vessel. You may surrender endorsed Bill of Lading, pay all charges due and obtain delivery orders at the Cashier or Freight Department of your local American President Lines, Ltd. office or agent.

No claim for damages on goods will be entertained unless the vessel's agent be notified to attend survey on same before they are removed from the wharf. Goods are at owner's risk of damage, pilferage or loss, however caused, after being landed from vessel. Freight payable in exchange for delivery order. Endorsed bill of lading must be surrendered before delivery orders will be granted.

Demurrage will be assessed on all undelivered shipments in accordance with tariff rules and regulations.

EXPECTED DATE OF ARRIVAL		BILL OF LADING	
	BAL	847093	CFS
AT DESTINATION			CFS

KHI	SPE	BAL	

DRAFT
MAhmed
6/17/80

To: Mr. Robert Picciotto, Director, ASP

From: Masood Ahmed, EGY

Subject: PAKISTAN - LPG and Urban Transport

1. Mr. Lamson-Scribner has raised the possibility of financing, possibly through an urban transport credit, buses which would run on LPG which is currently being used as refinery fuel. As you noted, the main constraint in promoting the use of LPG as an important source of energy for the transport and household sector, has been the Government's pricing policy for this fuel in the past. Ex-refinery prices for LPG have been too low ($40/ton) to provide adequate incentives to the refinery companies to invest in the facilities required for expanding its production. At the same time, consumer prices have been kept at a fairly high level ($250/ton) in relation to kerosene, thereby discouraging LPG use as a cooking medium by lower income households.

2. The main beneficiaries of this policy have been the three LPG marketing companies, whose profit margins have been high,[1/] and private automobile owners, many of whom have reduced their gasoline bills by shifting to LPG from even higher priced gasoline ($600/ton).

1/ The net-of-tax return on equity for a company marketing 40 tons of LPG a day has recently been estimated at between 28 and 35 percent.

The technology for effecting such a conversion is both relatively simple and cheap ($300-500). There has been no corresponding shift towards LPG use in the public transport sector, partly because the technology for converting diesel engines to LPG is less well developed and partly because the lower price of diesel provides little incentive for this change.

3. The Government recognizes these anomalies and has recently taken steps to increase the processing and net supply of LPG by doubling its ex-refinery price. At the same time, it is also discouraging the use of LPG in private cars, partly because it is believed to crowd out household sector demand, but also because of the potential impact on revenues from gasoline taxes. Because of these recent changes, the LPG market is currently in a state of flux and it is difficult to assess the relative strengths of the different underlying policies which will determine the future balance of supply and demand. For example, it is uncertain how quickly the refineries will react to the increased LPG prices or how effectively the Government will actually be able to curb LPG use in private cars.

4. Under these circumstances, it would probably be wise to proceed a little slowly in identifying an LPG using urban transport project. Nevertheless, once the current uncertainty is resolved, a project supporting LPG use in public transport would certainly look attractive,

particularly because it would replace diesel which is an import-deficit product. However, one of the issues that would have to be resolved would be whether such a program would slow down the substitution of LPG for kerosene (another import-deficit product). It would also have to be integrated into the Government interfuel pricing policies and the overall fiscal objectives of the sector.

CHAPTER I: INTRODUCTION - THE SETTTING

1.1 Eighteen months ago the Board considered and approved an accelerated program to help the Bank's developing member countries reduce their dependence on imported oil. 1/ Since then, the price of oil has doubled and accelerating inflation has greatly increased the cost of other LDC imports. Slower growth of the industrialized countries and the recent onset of recession, partly induced by attempts to bring down the rate of inflation, have caused a weakening of commodity prices and restricted the market for exports of manufactures from the developing countries. In consequence, it has become increasingly difficult for developing countries to meet the higher cost of imports. The deficit on current account of the oil importing developing countries (OIDCs) has risen sharply, from $25 billion in 1977 to an estimated $61 billion in 1980. Oil import costs in each year were larger than the deficit--$29 billion net in 1977 and $67 billion in 1980.

1/ Presented in "A Program to Accelerate Petroleum Production in the Developing Countries" (R78-2-262, dated Nov. 30, 1978). Referred to hereafter as the 1978 Report.

1.2 The rapid rise of oil prices in real terms after several years of decline, and the loss of supplies from a major producer (Iran), have led to greater awareness that the energy problem of the 70s was not a passing phenomenon but marked the end of cheap coal and oil, and the transition to an era of high cost energy. But while the growth of energy consumption in many of the main uses has begun to slow down as its price increases, energy has not yet been accorded the important place it deserves in economic planning and management.

1.3 Except in traditional societies, where animal and human energy is still dominant, the burning of mineral fuels provides most of the motive power for all organized human activities. Now that energy is no longer cheap, it ranks in importance with the classical factors of production--land, labor and capital--and its supply and cost must be given due weight in the plans of economic managers at all levels. These considerations apply not only to forms of energy that are traded internationally, but also, because of inevitable interrelationships between different energy forms, to energy that is produced domestically, and to non-commercial as well as commercial fuels.

1.4 There are few models of well-articulated energy policies in the more mature economies, which are themselves having difficulty in adapting to the rising costs of imported oil. Indeed, some developing countries have shown greater readines to adjust to the new conditions than many of the industrialized countries. While the potential for more efficient use of energy is greatest in the advanced countries, it is even more important for the developing countries to use energy efficiently, because they are poorer and because their energy requirements are growing more

rapidly. In industrialized countries the ratio of the growth in the demand for energy to GDP growth has traditionally been one to one and is now falling. In most developing countries energy demand grows faster than the economy and in some much faster. Furthermore, the low income countries must be concerned with the energy efficiency of their development programs, because investments made today will determine their energy requirements as their modernization accelerates. These considerations will have an important bearing on planned investments both within and outside the energy sector.

World Energy Demand and Supply

1.5 Global commercial energy consumption is projected to increase at an annual rate of 3.75% to about 200 mbdoe by 1990. This growth in demand will be met by only moderate increases in the supply of petroleum and its share in global energy supply will decline, while the shares of other energy sources - coal, gas, nuclear and hydropower - rise to reflect their more rapidly increasing supply.

Table 1

Global Energy Supply By Source

1977 and 1990

(In Million Barrels per Day of Oil Equivalent)

	1977		1990	
	mbdoe	%	mbdoe	%
Oil	65.5	49	77.2	38
Coal	51.7	30	62.1	31
Hydro	2.8	2	6.8	4
Nuclear	0.9	1	4.2	2
Gas and Other	13.3	18	50.7	25
Total	134.2	100	201.1	100

1.6 Within this global picture, a variety of energy supply and demand scenarios will evolve for different groups of countries. For the majority of developing countries, the most important aspect of the energy problem is their present and projected heavy reliance on imported petroleum to meet their commercial energy needs. The reliance of these oil importing developing countries (OIDC's) on imported commercial energy (primarily oil) is projected to increase in absolute terms by the end of the decade. This despite the fact that their production of commercial energy is likely to grow faster than demand, and that demand is itself projected to grow at a slower rate than in the past because of a lower GNP growth rate and the effect of substantially higher prices for petroleum.

Table 2

Energy Production and Consumption for the Developing Countries

1977 and 1990

(In mbdoe)

	1977				1990			
	OIDC		LDC		OIDC		LDC	
	Prod.	Cons.	Prod.	Cons.	Prod.	Cons.	Prod.	Cons.
Oil	1.2	7.1	11.8		3.3	12.1	18.6	
Coal	2.2		2.3		3.9		4.3	
Hydro	1.6		1.7		3.5		4.3	
Nuclear	0.1		0.1		2.0		2.4	
Gas & Other	1.9		3.0		5.8		8.3	
Total	7.0	13.2	18.9	17.1	18.5	26.0	37.9	34.3

1.7 The costs of this heavy reliance on petroleum are exacerbated by the uncertainty surrounding the price and availability of petroleum on world markets in the future. It would be prudent to assume that, while conditions of supply and demand may lead to wide swings in the price of oil, the long-term trend in the real price of oil and coal imports will be upwards. In these circumstances, it behooves

all countries to economize oil by shifting it from low-value to higher-value uses, by improving efficiency in energy production and utilization in order to minimize the impact of the cost of energy on their development objectives and their rates of growth and to look for domestic alternatives which could be developed at a lower cost than imports. Developing countries are in a sense better placed to do this than the industrialized countries in that they are not yet fully committed to a capital stock and life styles evolved in an era of cheap coal and oil. They therefore have the opportunity to plan the modernization of their societies with due regard for the high cost of energy. But they are hampered by inadequate information about resources and uses and, in most cases, by lack of experience in commercial fuel production. The large majority have not yet tapped their own resources to any considerable degree and there is great scope for reducing dependence on imports. A principal aim of this paper is to suggest the elements of an integrated energy policy for developing countries, and how the international community and the Bank can help them to acquire the necessary knowledge, skill and institutional tools.

An Energy Classification of Developing Countries

1.08 The appropriate policy mix will not be the same for all countries. Every developing country faces a unique set of conditions in designing policies to help resolve its energy problems, including its level of income and degree of industrialization, its energy resource endowment, the relative importance of commercial and traditional fuels, its degree of dependence on oil imports, and other factors. Since the rise in the price of oil, the degree of dependence on petroleum imports has become the most important single factor. Table 2 lists countries according to the share of imported oil in total commercial energy consumption.

Table 3: AN ENERGY CLASSIFICATION OF DEVELOPING COUNTRIES

--Oil Exporting Developing--- Countries		----------Oil-Importing Developing Countries---------- Net Petroleum Imports (1978) as Percent of Commercial Energy Demand				
OPEC Members	Non-OPEC	0-25%	26-50%	51-75%	76-100%	
ALGERIA	BAHRAIN	ARGENTINA	CHILE	ALBANIA	Bahamas	Mauritius
GABON	BOLIVIA	COLOMBIA	Mongolia	BRAZIL	BARBADOS	Nicaragua
IRAN	EGYPT	Korea, Dem. Rep.	YUGOSLAVIA	Greece	Costa Rica	Panama
IRAQ	MALAYSIA	South Africa*		Korea, Rep. of	CUBA	Papua New Guinea
KUWAIT	MEXICO			Lebanon	Cyprus	Paraguay
LIBYA	OMAN			Spain	Dominican Rep.	Portugal
QATAR	PERU			Taiwan	Fiji	Seychelles
SAUDI ARABIA	ROMANIA			TURKEY	GUATEMALA	Singapore
UNITED ARAB EMIRATES	SYRIAN ARAB REP.				Guyana	Suriname
VENEZUELA	TRINIDAD AND TOBAGO				Hong Kong	Uruguay
	TUNISIA				ISRAEL	
					Ivory Coast	
					Jamaica	
					Jordan	
					Malta	
Countries with Actual or Potential Fuelwood Problem +						
ECUADOR	ANGOLA	Botswana*	BANGLADESH	AFGHANISTAN	Benin	Mauritania
INDONESIA	BURMA	INDIA	Mozambique	Burundi	Bhutan*	MOROCCO
NIGERIA	CHINA	Lesotho*	PAKISTAN	GHANA	CAMEROON	Nepal
	CONGO	Swaziland*	Zambia	Malawi	Cape Verde Is.	Niger
	ZAIRE	Viet Nam		Rwanda	Central African Rep.	PHILIPPINES
		Zimbabwe			Chad	Sao Tome and Principe
					Comoros	Senegal
					Djibouti	Sierra Leone
					El Salvador	Solomon Is.
					Eq. Guinea	Somalia
					Ethiopia	Sri Lanka
					Gambia	Sudan
					Grenada	Tanzania
					Guinea	THAILAND
					Guinea-Bissau	Togo
					Haiti	Uganda
					Honduras	Upper Volta
					Kampuchea,Dem.	Yemen Arab Rep.
					Kenya	Yemen,PDR
					Lao PDR	Western Samoa
					Liberia	
					Madagascar	
					Maldives	
					Mali	
Population (mid-1978) (in millions)						
320 (Indonesia 135)	1,200 (China 950)	800 (India 645)	210	310 (Brazil 120)	405	

Countries shown in CAPITALS are oil and/or gas producers.

Table based on UN World Energy Statistics ,1978 and staff estimates of fuelwood situation. The position of individual countries can change dramatically and rapidly. As of 1980, Guatemala and Cameroon are net exporters, Bolivia has become net importer, and Peru and Argentina are very close to the margin. Tunisia may soon become a net importer, while Pakistan may soon become a net exporter. Population data from World Development Report, 1980 and rounded to nearest 5 million.

* Bhutan is not included in UN World Energy Statistics; its place in the table is estimated. Botswana, Lesotho, South Africa, and Swaziland are grouped together in UN World Energy Statistics as "Customs Union of South Africa;" their place in the table reflects the energy balance of the group rather than the countries individually.

+ Grouping based on country-level data. Many countries not included in this group have or will have less severe or localized problems not apparent from country-level data.

- 29 countries with a population of over 1400 million, including China, export oil;
- A further 9 countries with a population of about 875 million, depend on imported oil for one half of commercial energy consumption or less;
- 66 countries, with a population of about 600 million, including most of the low income countries but also much of Latin America and such rapid growing countries as Brazil and Korea, depend on imported oil for more than half of commercial energy.

The vast majority of the population of the developing world is in countries that are either exporters of oil or are dependent for less than half of their commercial energy consumption on oil imports. But even small imports relative to total consumption can make a large claim on export earning and dependence in excess of 10% can present major problems of economic management.

1.09 A second classification of developing countries in Table 2 relates to the dependence of their populations on fuel-wood and other traditional sources of energy. One of the difficult choices faced by these countries is how to stop the rapid depletion of forests and soil fertility without unduly stimulating the use, and therefore the import, of petroleum. An essential element in this solution is afforestation and the more efficient design of cooking stoves. A large majority of the low income countries are in this category, including most of those which are almost totally dependent on oil imports for their supply of commercial energy. These are the countries which face a double enrgy crisis.

1.10 Countries also differ in their capacity to design and carry out programs for the exploitation of their domestic energy resources:

(a) The large majority have relatively weak energy sector institutions outside of the power subsector. They are for the most part countries that have little or no production of fossil fuels and stand in the greatest need of external assistance in formulating and executing appropriate energy policies and investment programs;

(b) Some countries have stronger and more experienced institutions, mostly those with experienced national oil companies that have been involved in exploration and production, either alone or jointly with foreign oil companies. They may need technical or financial help in particular areas of energy development.

1.11 Clearly, an energy policy must be based on the specific circumstances of each country. The alternative sources of supply and associated investment must be assessed and the energy implications of alternative development policies for the key sectors have to be appraised. The applicability of renewable forms of energy must be assessed. An assessment must also be made of the incentives needed to

promote development of indigenous energy resources and the disincentives to consumption, as well as of the role of Government in production and regulation.

Structured Outline

1.12 The three remaining parts of this paper deal in greater detail with (i) the prospects for energy production in the developing countries, (ii) the potential savings that might accrue from the more efficient management of energy demands,and (iii) the investment needs of the developing countries in implementing appropriate programs to exploit their indigenous energy resources and the way in which the Bank and other agencies can assist them in meeting these needs. This analysis is based upon a series of background papers on different energy sources that have been prepared for this report and on additional information gathered during the course of the Bank's operational work. A paper has been issued on coal and lignite and one on the prospects for the development of alcohol. Additional papers will be issued shortly on natural gas and retrofitting. In the petroleum sector, since the completion of the studies on the petroleum potential of 70 developing countries summarized in the 1978 Report, the Bank has been enlarging its own information on LDC resources in the course of project and survey missions to some fifty countries. In the renewable energy sector, a special study has been undertaken within the Bank by a task force on traditional and renewable energy sources and their applicability to developing countries.1/

1/

1.13 Within this framework, Chapter II discusses the prospects for accelerating energy production in the developing countries. A brief account is given of the present state of knowledge about the resources of conventional fuels in developing countries, and to assess the likelihood that the so-called unconventional fuels and renewable sources -- synthetic liquid fuels, biomass, solar energy, etc. -- will make a significant contribution to the energy needs of the LDCs during the 1980s. Many developing countries have potential sources of commercial energy that could substitute for imports. These include petroleum and coal, as well as large resources of hydropower. Investment in indigenous energy sources almost invariably offers high economic returns, but import substitution is not a simple matter. Thus coal, natural gas and hydropower can substitute for imported fuel oil in electric power generation or industrial and household uses, but not yet on a significant scale for automative fuels. Even where such substitution is possible, care must be taken to integrate import substitution measures with other elements of a national energy policy. For example, the replacement of imported fuel oil by other indigenous sources may require the installation of secondary refining facilities to crack the replaced fuel oil into lighter fractions.

1.14 An attempt is also made to judge the relative priority of the newer technologies, taking into account both technical and economic feasibility, and to suggest where investment in research could most fruitfully be directed. This includes a discussion of the local applications of solar bio-mass and other renewable forms of energy which hold out considerable promise for the 1990s and beyond. The present dependence of developing countries on wood

and other traditional fuels is examined, and the means of reversing the potentially disastrous depletion of the world's forests. Finally, Chapter II also estimatees the investment needs of developing countries in the exploration and development of conventional energy sources. It concludes that these needs are large, but that if they could be met, the production of energy (and particularly oil) in the LDC's could increase rapidly and substantially alleviate the strains that would otherwise be flared on their balance of payments situation.

1.15 Chapter III discusses the management of energy demand and the potential savings that might arrive from a series of energy conservation measures in the major energy consuming sectors -- industry, transport, agriculture and household use. It concludes that the potential for such savings is large, particularly in industry, transport and electric power generation. Though careful planning, better management and operating procedures, investment in energy-saving devices and other similar measures, the oil importing developing countries could hope to reduce their oil import bill in 1990 by 25-30%.

1.16 However, bringing about these changes in the efficiency of energy utilization will not be an easy task. Energy consumption patterns established over a long period when energy, and particularly oil, was cheap with only be altered gradually. Furthermore, the freedom to manuever for many governments is restricted by the political and social sensitivity of energy prices, which are the central tool of demand management. Nevertheless, many developing countries have already taken bold steps to realize the structure of domestic prices to reflect the changed international energy situation. In these countries there are already some encouraging signs of moderation in the sale of growth of energy demand and a rationalization of the structure of that

demand. However, many other countreis have yet to taken adequately the demand aspects of their energy situation and some of the measures discussed in Chapter III warrant their consideration.

1.17 Chapter IV, the last Chapter of the paper, discusses the investment needs of the developing countries in implementing appropriate energy programs to exploit their indigenous resources. A brief account is given of the asisstance by aid agencies for energy development. Most of the aid has been and continues to be for electric power; unless it is for hydro (or nuclear) power, it does not reduce dependence on oil imports. Total aid falls far short of the need. The progress of the Bank's own work in energy since the accelerated program for petroleum was adopted in early 1979 is reviewed. A program of further technical and economic work is proposed, together with a lending program in energy for the period FY81-85. The case for new initiatives to enchance the capability of developing countries to plan and manage their energy programs is considered, and ways in which the Bank can help coordinate the growing international effort to assist them.

TELEX
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JUNE 13, 1980
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INTBAFRAD

ISLAMABAD, PAKISTAN

FOR POPIEL. RE ENERGY PRICING STUDY. HAVE TODAY RECEIVED A LETTER FROM IQBAL, DEPUTY DIRECTOR ENERGY RESOURCES, STATING THAT DUE TO OTHER IMPORTANT ENGAGEMENTS, ENERGY RESOURCES WILL NOT BE ABLE TO REVIEW ENERGY PRICING STUDY WITH US UNTIL END OF JULY AND SUGGESTING WE POSTPONE OUR MISSION CURRENTLY SCHEDULED FIRST WEEK OF JULY. HOWEVER, LETTER DOES NOT MENTION THE STATUS OF PREPARATION OF THE STUDY ITSELF. THEREFORE, WOULD APPRECIATE IF YOU COULD VERIFY PROGRESS ON THE FINAL DRAFT OF THE STUDY AND WHETHER THE TIMETABLE AGREED FOR ITS COMPLETION IS STILL EXPECTED TO BE MET. ALSO EARLIEST DATE WHEN SECRETARY MASIHUDDIN AND OTHER MINISTRY OF PETROLEUM OFFICIALS WOULD BE ABLE TO DISCUSS WITH US STUDY RESULTS AND PROPOSED IMPLEMENTATION SCHEDULE. AS YOU WILL APPRECIATE, IMPLENENTATION OF PRICING RECOMMENDATIONS DOES NOT NECESSARILY INVOLVE ENERGY CELL OFFICIALS. REQUEST EARLY RESPONSE. BEST REGARDS. BHARIER

Pakistan Energy Pricing Study

McCarthy, Ahmed, Clements

Masood Ahmed

Richard H. Sheehan

Energy

6/13/80

File
Chron

Mr. Chadenet -

Attached please find the information you requested listing the Bank's energy projects for FY77-81. I am also enclosing some additional information on (i) cofinancing of energy projects, and (ii) the estimated incremental oil and gas production from these projects, which Mr. Rovani thought you might find useful.

Masood Ahmed

Table 1
Oil and Gas Projects Approved in FY77-79

Country	Project	US$M. Project Cost	Loan/ Credit
FY1977			
India	Bombay High Offshore Development	571	150
FY1979			
Egypt	Gulf of Suez Gas Project	167	75
Pakistan	Toot Oil and Gas Development Project	73	30
Turkey	Bati Raman Enhanced Oil Recovery Energy Project	3	2.5
Thailand	Natural Gas Development Energy Project	(5.7)	(4.9)1/

1/ Refinanced under FY1980 Thailand project and included in those figures.

Summary of Lending Operations, FY80

Region/Project	Loan/ Credit Amount (US$ million)	Total Project Cost (US$ million)	Financing as % of Total Project Cost
EAST AFRICA			
Madagascar Petr. Expl. Prom.	12.5 (IDA)	14.6	86
Somalia Petr. Expl. Prom.	6.0 (IDA)	7.2	83
Tanzania Songo Songo Petr. Expl.	30.0 (IDA)	33.0	91
WEST AFRICA			
Congo	5.0 (IDA)	5.6	89
EAST ASIA/PACIFIC			
Thailand Natural Gas Pipe.1/	106.9	514.02/	21
EMENA			
Morocco Petr. Expl. I	50.0	90.0	55
Yemen, PDR Petr. Dev. Asst.	9.0 (IDA)	10.0	90
Egypt II Cairo Gas Distr.	50.0 (IDA)	155.4	32
Tunisia 2nd Natural Gas Pipe.	37.0	91.7	40
LAC			
Argentina Petr. Eng.	27.0	49.6	54
Bolivia Gas & Oil Eng.	16.0 (IDA)	41.8	38
Honduras Petr. Expl. Prom.	3.0	3.65	82
Peru Petr. Prod. Rehab.	32.5	50.7	64
TOTAL	384.9	1,083.75	35

1/ This includes the refinancing of Thailand I ($4.9 million).
2/ This represents the cost of Phase I. The total cost including Phase II is $736.0 million dollars.

FY81 PROJECT APPRAISAL SCHEDULE (FIRST HALF FY81)

	Appraised by end FY80		Appraised by end First Quarter FY81		Appraised by end Second Quarter FY81	
EAST AFRICA					Kenya I	(5.0)
WEST AFRICA	*Liberia Petroleum Exploration Promotion	(5.0)	**Mali Petroleum Exploration Promotion	(8.0)	Benin Petroleum Exploration Promotion	(3.0)
			**Mauritania Petroleum Exploration Promotion	(2.5)	Senegal Dome Flore Appraisal Drilling	(5.0)
			*Guinea Bissau Petroleum Exploration Promotion	(5.0)	Gambia Petroleum Exploration Promotion	(1.0)
EMENA	*Syria White Products Pipeline Engineering and Confirmation of Gas Reserves Project	(5.0-8.0)	Yemen AR Oil and Gas Exploration Engineering	(2.0)		
	Egypt Exploration Drilling	(25.0) 1/	Portugal Energy Engineering	(13.0) 2/		
	**Turkey Petroleum Exploration	(15.0)				
	**Turkey Bati Raman Enhanced Oil Recovery Project	(45.0)				
EAST ASIA					Thailand III	(70.1)
SOUTH ASIA	**Bangladesh Gas Development	(85.0)	Pakistan Oil and Gas II	(45.0)		
	**India Oil and Gas II	(200.0)				
LAC	*Colombia I	(80.0)	Bolivia Vuelte Grande Gas Recycling	(45.0)	Argentina Hydrocarbon Credit--Private	(90.0)
			Panama Petroleum Exploration Promotion	(2.5-4.0)	Peru II 3/	(80.0)
			**Jamaica Energy Exploration	(5.0-6.0)	Colombia II	(70.0)

1/ Programmed as FY82/82S projects;
2/ Programmed as an 82R;
3/ Programmed as an FY83 project.

* Will have reached loan committee;
** Will have reached loan committee by the end of the following quarter.

June 13, 1980

Record Removal Notice

The World Bank Group Archives & Records Management

File Title	Barcode No.
Masood Ahmed - Chronological File - June to December 1980	30450189

Document Date	Document Type
11 September, 1979	Memorandum

Correspondents / Participants
To: E. R. Fried, EDA
From: Y. Rovani, EGYDR

Subject / Title
Bank lending for Oil Production

Exception(s)

Additional Comments
Declassification review of this record may be initiated upon request.

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.

Withdrawn by	Date
Sherrine M. Thompson	November 08, 2022

Mr. Ernest Stern, VPO

May 28, 1980

Yves Rovani, MGY

Cofinancing of FY80 Hydrocarbons Projects

1. As per your request of May 21, I am attaching in Annex I a table showing FY80 hydrocarbons projects lending and cofinancing amounts. Out of project costs totalling some $1,360 million, about 28% were financed by the Bank and IDA, close to 50% were cofinanced, and the balance was provided locally. More than 90% of all cofinancing, however, was accounted for by a single project, Thailand Offshore Gas, which met all the criteria for attracting private cofinancing: country creditworthiness, offshore production financed by a private company, large size of project, eligibility of pipeline infrastructure items for cofinancing.

2. Tunisia Gas Distribution, the next best, attracted $30 million from suppliers and banks (about 34% of cost). Neither Egypt Gas Distribution (IDA country; single contract which the British, to whom it was awarded, would not finance), nor Peru's project for field's rehabilitation and predevelopment would elicit any cofinancing.

3. All loans and credits were to national oil companies, with only Thailand involving, indirectly, a private oil company (Union Oil's investment of $300 million in production facilities). Nine out of thirteen operations (assuming that Somalia obtains a board slot, and that neither Colombia nor Liberia will make it this FY) were for predevelopment, and eligible only for public cofinancing: by IDB in Bolivia ($16 million) and by EIB in Tanzania ($0.5 million).

4. It is only recently that public sources have shown any interest in financing petroleum projects. This is now definitely the case for IDB, though with limited means, and for EIB, which is awaiting ratification of the LOME II convention to participate in a number of our future projects, about which they are kept informed. The OPEC Fund has not been very forthcoming, some of the OPEC members clearly preferring the UNDP route over the Bank. They have, however, participated in the past and we continue to try out new projects on them (Turkey, Bangladesh, Tanzania II).

5. The picture is, however, not as poor as it may appear: the higher initial priority, in most countries (half of them IDA countries), was for domestic or predevelopment projects, unattractive to foreign oil companies, and for building up national institutions and their capability to attract more foreign investment in future.

(a) other activities, by private companies, are going on in most countries, as shown in the following table of private and public hydrocarbons investments in five countries:

Five-year Investment Programs
(Petroleum)
US$ million

		Private	Public	Total
Thailand	(80/85)	1090	770	1,860
Egypt	(70/82)	3450	1250	4,700
Argentina	(80/85)	6525	6825	13,350
Colombia	(80/84)	1050	1875	2,925
Peru	(80/85)	675	1000	1,675

(b) our own involvement has probably helped stimulate the return of oil companies in other areas of Somalia and Madagascar;

(c) gas projects, by providing a market outlet justify more private exploration in adjacent areas as is already the case with Texas Pacific (Gulf of Thailand), which may lead to an extension of the pipeline to their fields, and with Occidental and Exxon (Bolivia) which have approached us for loans which they would cover with a commercial guarantee; it is also one of the purposes of our operations in Argentina and Tanzania;

(d) ten out of the thirteen projects are specifically designed or include components for opening up new acreage for exploratory drilling by private companies;

(e) the Gulf/Pakistan letter of intent may lead to a large cofinancing project if the oil show identified proves to be commercial; more letters of intent are being considered actively in Pakistan (BP, Shell), Bangladesh (BP), Colombia (Gulf) and Tanzania (Shell).

(f) Texaco has indicated interest in cofinancing a secondary project in Ecuador and Elf Aquitaine wants Bank participation in an offshore gas project in Egypt.

YRovani:pa/ams.-

Attachment.-

cc: Messrs. W. C. Baum, (CFSVP)
P. Bourdier, (EGYDR)
E. Alejalde, (EGYD2)
E. McCarthy (EGYD1)

FY80 HYDROCARBONS PROJECTS LENDING

AND COFINANCING AMOUNTS

(in $ millions)

	L/C Amount	Project Cost	Cofinancing
Predevelopment			
Exploration promotion/surveys			
Congo	5.0*	5.6	
Madagascar	12.5*	14.6	
Honduras	3.0	3.6	
Argentina	27.0	47.4	
Yemen PDR	9.0	10.0	
Somalia	6.0*	7.0	
Subtotal: 6 L/C	62.5	88.8	-
(of which 4 IDA*:	32.5*)		
Appraisal/exploratory drilling			
Tanzania	30*	32.5	0.5 (EIB)
Bolivia	16*	41.8	16.0 (IDB)
Morocco	50	90.0	0.0 "
Subtotal: 3 L/C	96	164.3	16.5
(of which 2 IDA*:	46*)		
Development			
Thailand II Offshore Gas Dev. 1/	107	814.0	630.0 (Privat
Peru I Fields rehab., etc.	32.5	50.7	
Egypt, Cairo Gas Distrib.	50.0*	155.0	
Tunisia Gas Distrib.	37.0	88.0	30.0 (12 ex.cr (18 banks
Subtotal: 4 L/C	226.5	1107.7	660.0
(of which IDA*:	50.0*)		
Total	385.0	1360.2	676.5

1/ The cost of the pipeline project was $514 million, of which $180 million were cofinanced by export credits and $150 million by commercial banks. The estimated cost of the production facilities, about $300 million, entirely financed by Union Oil, has been added.

Progress of Bank Activities in Energy, Oil and Gas

4.15 The Bank's decision to consider financing petroleum development projects dates back to 1977,[1] but it was not until January 1979 that an 'accelerated program' was approved; this included provision for financing exploration as well as production.[2] Thus far, reconnaissance activities have been carried out in 49 countries, and in 38 of these countries one or more projects have been identified. By the end of FY1980, the Bank had financed 18 petroleum projects in 16 developing countries. Of these 16 countries, the potential of 10 was described as high to very high, and the potential of six low to fair in the 1978 report.[3] A comparison of the 'accelerated program' with the FY1979-80 (actual) and FY1981 (planned) oil and gas programs is summarized below.

Table 19: COMPARISON OF 'ACCELERATED' AND ACTUAL OR PLANNED OIL AND GAS PROGRAMS FY79 -- 81

	FY1979-80		FY81	
	Actual	'Accel. Program'	Planned	'Accel. Program'
Surveys**	12	5	16	8
Exploration Promotion	5	*	13	*
Exploratory Drilling	2	3	3	5
Appraisal Drilling	2	3	1	6
Production	8	15	8	9
Loans/Credits ($M)	493	765	705	785
Professional Staff	32	25	38	35

** - Also includes those surveys which are components of other projects in the table.
* - Not a category in the 'Accelerated Program'.

1/ Board decision based on the report "Minerals and Energy in Developing Countries" 1588 dated May 4, 1977.
2/ "A Program to Accelerate Petroleum Production in the Developing Countries", November 30, 1978, referred to hereafter as the 1978 report.
3/ 1978 Report -- para 58 and Annex Table 1.

4.16 There are two major reasons for the differences between the 'accelerated program' and what has been achieved so far. First, there was clearly a much greater need than anticipated for geological and geophysical work as well as for technical assistance for pre-development activities; second, the start-up period required to reach a level of about nine production projects a year was somewhat longer than expected. This is why although the total number of activities has (and will) exceed the 'accelerated program', total loan/credit amounts are less than the amounts anticipated. (The investment requirements for pre-development activities are almost always substantially lower than for production projects.) As the additional exploration promotion work leads to greater amounts of exploratory drilling and, in 2-3 years, to greater numbers of production projects, the average lending amounts per project will certainly increase substantially.

4.17 Surveys and Pre-development Activities: Twelve of the 18 loans/credits approved so far include provision for financing geological or geophysical surveys. This strong effort to reduce the risks of exploratory drilling by ensuring that adequate data are available must continue, and finance for surveys is planned for 16 countries in FY1981. Nine of the 18 loans/credits have been mainly for pre-development activities. These comprise:

(i) a project for technical assistance and initial reconnaissance of remote areas (Congo);

(ii) four projects for exploration promotion, involving data gathering and reinterpretation, additional geophysical surveys, technical assistance to institutions, legal and contractual advice, and the preparation of bidding documents (Yemen PDR, Madagascar, Somalia, Honduras);

(iii) two projects for the evaluation of discovered reserves, involving geophysical surveys, appraisal drilling, reservoir evaluation and the opening up of new acreage to private oil companies (Argentina, Bolivia); and

(iv) two projects designed to stimulate further exploration by private companies involving the first Bank finance for exploratory drilling, as well as finance for geophysical surveys, appraisal drilling, and technical assistance to the national oil company (Morocco, Tanzania).

4.18 Development Activities: The nine development projects comprise two engineering credits, three production projects, including one with a component for the rehabilitation of producing fields (Peru), and one with finance for heavy oil engineering (Turkey), and four projects for the transport and distribution of gas. In addition, one letter of intent was issued in FY1978 to the Government of Pakistan at the joint request of the Government and Gulf Oil as an incentive for the latter to invest in a program of exploratory drilling. Gulf and BP have since agreed to implement this program jointly.

To give an indication of the impact of the Bank's program, the results expected from five development projects currently under implementation are summarized below.

Table ___ : SUMMARY OF RESULTS EXPECTED FROM FIVE DEVELOPMENT PROJECTS

	Output on Project Completion '000 b/d	Share of Internal Demand %	Estimated Rate of Return %
East Asia			
Thailand	130,000	10 - 16	53
South Asia			
India (Bombay High)	102,000	14	66
Pakistan	11,250	8	10
EMENA			
Egypt	3,800	1.4	32
LAC			
Peru	20,000	14.3	over 100

Source: IBRD Appraisal and Supervision Reports.

4.19 Most of the pre-development projects have been in the poorer developing countries of Africa, the Middle East and the Caribbean; the development projects have been concentrated in middle-income countries which already produce some petroleum or which possess an important resource

(usually natural gas) which can supply an important part of their energy requirements but which is of little interest to the international oil companies. A major element of both types of projects is the strengthening of petroleum subsector institutions and methods. The Bank has incorporated in its loans/credits measures to ensure the financial viability of national oil companies, to train managers or otherwise improve organizations, as well as finance for the evaluation of petroleum reserves or the potential market for natural gas. Wherever possible, broader energy sector issues have also been tackled; projects have included, for example, finance for studies of energy pricing (Pakistan, Egypt), renewables (Honduras, Somalia), the impact of gas development on the structure and growth of refineries (Thailand, Argentina) and the potential development of indigenous energy resources (Congo, Madagascar).

4.20 The 'accelerated program' recognized the need of many developing countries for drawing up and implementing comprehensive national energy plans. To this end, the Bank has (in addition to the various forms of technical assistance provided as components of energy projects) launched a much-expanded series of country energy sector reviews to identify policy issues and priorities for action. Fourteen of these reviews were substantially completed in FY1980. These help provide government officials with impartial advice and, in addition, assist in identifying energy sector projects for finance by the Bank or other donor agencies.

4.21 To implement these various energy activities, the Bank's Energy, Water and Telecommunications Department was relieved of its non-energy responsibilities in July 1979. By July 1980, the new Energy Department had 32 staff working on petroleum projects and 21 staff working on policy, research and planning in all aspects of energy, including renewable energy resources. The Energy Department also carries out the technical, financial and economic review of all energy projects, including electric power projects managed by the regional offices.

Table 1
Oil and Gas Projects Approved in FY77-79

Country	Project	US$M. Project Cost	Loan/ Credit
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FY1979			
Egypt	Gulf of Suez Gas Project	167	75
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1/ Refinanced under FY1980 Thailand project and included in those figures.

Summary of Lending Operations, FY80

Region/Project	Loan/ Credit Amount (US$ million)	Total Project Cost (US$ million)	Financing as % of Total Project Cost
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Yemen, PDR Petr. Dev. Asst.	9.0 (IDA)	10.0	90
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Peru Petr. Prod. Rehab.	32.5	50.7	64
TOTAL	384.9	1,083.75	35

1/ This includes the refinancing of Thailand I ($4.9 million).
2/ This represents the cost of Phase I. The total cost including Phase II is $736.0 million dollars.

Ms. Marianne Haug, Deputy Chief, IPD-DI June 10, 1980

Masood Ahmed, EGY

Pakistan: Development of Indigenous Coal Resources

1. During my recent mission to Pakistan to discuss with the Government the draft Energy Sector Memorandum, I discussed with the Chairman and other officials of the Pakistan Mineral Development Corporation (PMDC) their plans for the development of indigenous coal resources and the potential for Bank assistance in this area.

2. Following these discussions, PMDC provided me with useful additional information on:

(i) current estimates of the nature and extent of Pakistan's coal reserves;
(ii) the status and plans for the development of the Lakhra coal field; and
(iii) PMDC's own organizational structure and operational plans.

Copies of these documents are attached for your information.

3. As you will note from these documents, the Government is now devoting more attention and resources to the development of the coal sector than has been the case in the past. Public sector coal production is projected to rise rapidly from its current level of 230,000 tons to 1.63 million tons by the middle of the decade. One million tons of this will come from the proposed development of the Lakhra coal field which will supply a 250 MW thermal power plant near Jamshoro. The remainder will come from increased production at the four mines PMDC is already operating. As far as I could ascertain, there are no firm plans for increasing coal production in the private sector, which currently accounts for 80% of the country's total coal production of 1.4 million tons.

4. Clearly, the largest coal project in the 1980s will be the development of the coalfield and associated power plant at Lakhra which will require substantial external financing. Prefeasibility work on the project, done with CIDA and more recently JICA assistance, appears to have confirmed its viability, and the Government seems committed to going ahead with it. However, even though the Japanese have apparently indicated an interest in providing financial assistance for the

project,[1/] PMDC officials believed that this would only cover part of the project's total cost and financial assistance might be required from other international agencies, including the Bank.

5. My preliminary judgement is that this possibility merits further investigation. It would help the Government to finance what will be an expensive but important project in its strategy to develop indigenous energy resources. It will also provide an opportunity for the Bank to assist the Government in developing an integrated national coal development strategy. At the moment such a strategy does not exist and questions such as the future role envisaged for the public and private sectors; the provision of extension services and technical assistance to modernize private sector mines and improve their productivity; and the impact of the Government's supply and pricing policy for competing fuels, have only been addressed in an ad hoc manner. This latter form of assistance would have a crucial impact on the medium term development perspective for Pakistan's coal sector and PMDC officials themselves brought up the need for it. They also felt that Bank assistance would be useful in hardening up their coal reserves figure.

6. Since my return to Washington, I have revised the energy sector memorandum to take account of this additional information. The grey cover version of this report now has a more detailed and somewhat more optimistic treatment of the coal sector in Pakistan, and it also refers to the need for developing a national coal policy. A copy of that report is being sent to you separately.

MAhmed/rhc

cc and cleared by: Mr. Julian Bharier, EGY

cc (with attachment): Mr. J. Strongman, IPD

cc (without attachment): Mr. R. Clements, ASA
Mr. W. Siebeck, Resident Mission, Islamabad

1/ A team of experts from JICA was expected to arrive in Pakistan in mid-May to prepare a detailed project feasibility study.

[illegible] DEVELOPMENT CORPORATION

COAL RESOURCES OF PAKISTAN.

RESERVE POTENTIAL:

1. The major coal fields of Pakistan and their reserve potential as assessed by various agencies in 1969 are as under:-

NAME OF COAL FIELD	RESERVES - (IN MILLION TONS)			
	PROVED	INDICATED	POSSIBLE	TOTAL
PUNJAB:				
Makerwal/Gullakhel coal field.	10	9	Considerable.	19
Salt Range coal field.	30	45	"	75
BALUCHISTAN:				
Sor Range, Degari, Sinjidi.	25	30	"	55
Khost-Kharigh-Harnai	15	30	"	45
Mach	8	10	"	18
SIND:				
Lakhra coal field.	62	178	"	240
Jhampir Meting.	10	18	"	28
TOTAL:-	160	320	"	480

2. Besides, there are other coal fieldswhich are in operation but have not yet been subjected to detailed geological investigations. Since no detailed geological information/data is available and the coal deposits have not been evaluated the total reserves in the following coal fields have been classified as possible reserves:-

NAME OF THE COAL FIELD	RESERVES - (IN MILLION TONS)			
	PROVED	INDICATED	POSSIBLE	TOTAL
Sor-Range-Kutch, Baluchistan.	-	-	30	30
Dukki, Baluchistan.	-	-	40	40
Pir Ismail Ziarat, Baluchistan.	-	-	100	100
Thatta, Sind.	-	-	200	200
Total:-	-	-	370	370

...p/2....

3. The Geological Survey of Pakistan has recently reviewed the coal resources and have estimated the total deposits at 508 million tonnes against 480 million tonnes estimated in 1969. The details are as under:-

NAME OF COAL FIELD	RESERVES (IN MILLION TONNE)			
	PROVED	INDICATED	POSSIBLE	TOTAL
PUNJAB:				
Makerwal/Gullakhel.	1	5	10	16
Salt Range.	6	60	20	86
BALUCHISTAN:				
Sor Range-Degari.	12	33	-	45
Khost-Sharigh-Harnai	10	50	-	60
Mach.	6	15	-	21
S I N D:				
Lakhra	62	44	134	240
Jhamipr-Meting.	5	10	25	40
Total:-	102	217	189	508

4. The Geological Survey of Pakistan have however not taken into consideration the reserves available in the operating coal fields indicated in para 2 above because of non-availability of adequate geological data.

5. The above estimates are tentative or rather conservative which is evident from the fact in Lakhra coal field proved reserves have been estimated at 62 million tonnes whereas PMDC has established 62 million tonnes in its own leased area measuring 53 sq. kilometers. The Lakhra coal field covers an area of 142.5 sq. miles out of which only 80 sq. miles has been explored in which the total reserves have been currently estimated at 240 million tonnes. The total available reserves of 508 million tonnes exist in the areas which are presently in operation. The coal bearing formation extend over a large area in Salt Range, North-eastern Baluchistan, Dadu and Thatta districts of Sind which have not been properly investigated and evaluated so far. The exploration and evaluation of the coal field would make significant additions to the presently estimated reserves. The demonstrated reserves are likely to be atleast twice as much as the currently indicated reserves.

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QUALITY OF COAL AND USES:

6. Following is the range of chemical composition of coal found in various parts of Pakistan:-

Name of Coal Field.	Moisture (%)	Volatile matter. (%)	Fixed Carbon (%)	Ash (%)	Sulphur (%)	Calorific value (BTU/lb.
1. PUNJAB:						
Makerwal/ Gullakhel.	4.2 to 6.00	37.1 to 44.9	36.0 to 46.9	7.0 to 21.0	4.0 to 5.6	9,500 to 11,850
Salt Range.	3.2 to 7.6	26.3 to 38.8	29.8 to 44.8	12.3 to 37.7	3.5 to 10.7	7,100 to 11,100
2. BALUCHISTAN:						
Sor-Range-Degari.	15.9 to 18.7	33.5 to 39.8	36.0 to 42.0	2.0 to 13.0	0.5 to 5.6	9,000 to 11,000
Khost-Sharigh-Harnai.	4.0 to 11.4	34.8 to 45.3	25.5 to 43.8	9.3 to 34.0	5.00 to 7.1	8,500 to 12,400
Mach.	7.1 to 12.1	34.5 to 39.4	32.4 to 41.5	9.6 to 20.3	3.2 to 7.4	9,200 to 10,300
3. SIND:						
Lakhra	31.8 to 35.7	28.0 to 30.8	26.8 to 30.00	7.4 to 11.5	3.3 to 6.0	7,000 to 10,000
Jhimpir Meting	15.4 to 29.8	29.8 to 39.8	31.0 to 36.3	8.2 to 14.6	3.4 to 7.4	7,400 to 9,800

7. The coals are lignite to bitumenous in rank. They are high in ash and sulphur content and liaable to spontaneous combustion. The coals deteriorate in quality and appearance due to prolonged exposure to the atmosphere. For the most part the coals are non-coking and as such not suitable for industrial and metallurgical purposes. These are particularly suitable for large scale power generation, cement industry, cotton ginning and brick burning. However, the coals found in Khost-Sharigh coal field possess medium coking characteristics. The beneficiation and utilization studies carried out on these coals have revealed that the coals are not suitable for making metallurgical coke but can be used as a blend with high grade imported cool for manufacture of metallurgical coke. PIDC has set up a coal washing plant at Sharigh in conjuction with the expansion of its Sharigh Collieries in order to supply 75,000 tonnes of medium coking coals to Karachi Steel Mills.

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8. The current use of coal is restricted to brick kilns which account for over 90% of the total coal production in the country. The remaining 10% is used for power generation and domestic heatings. With the growing use of natural gas the coal market has considerably shrunk. The Cement, fertilizers and ginning factories as well as some of the power plants which were originally based on coal have been gradually switched over to natural gas because of cost benefits. According to a recent survey the share of coal in the energy mix has declined from 35.1% in 1958 to about 5% in 1977-78 whereas the share of gas has increased from 8.5 to over 33.5% during the same period. The present production of coal is sufficient to cater for the existing market and it can conveniently be increased by 5% without any capital investment.

PRESENT PRODUCTION:

9. The reported coal production in the country is 1.2 million tonnes per annum whereas according to an estimate the total consumption in brick kilns alone stands at 1.6 million tonnes. If the remaining 10% consumed in other sectors is taken into consideration the actual consumption of indigenous coal would not be less than 1.80 million tonnes per annum. The difference represents the unreported production from the private sector which is used in brick kilns.

The present medium and short term production plans are demand related. The level of coal production has gone down in recent years because of easy availability of cheaper fuel.

The coal mining industry is stagnent at present because of restricted market and lack of clear cut energy policy for balanced development and utilization of indigenous energy resources. Apart from the low prices of natural gas the kerosine and High speed diesel oil prices are subsidized by the Government which is an impediment against the use of coal for domestic purposes and power generation.

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PRESENT LEVEL OF CONSUMPTION OF COAL:

The sector-wise consumption of coal indicated in Table 1.4(annex.1.2) of the World Bank Report on Pakistan energy sector is based on the reported production of coal in the country. However, as mentioned earlier nearly 30% of the total coal production is not being reported which is used in the brick kilns. The consumption of coal in brick kilns, therefore stand around 1.6 million tonnes per annum instead of an average of 1.141 million tonnes during the last 5 years.

PAKISTAN MINERAL DEVELOPMENT CORPORATION

Pakistan Mineral Development Corporation(PMDC) was formed in July, 1974 as a specialized public sector agency under the Ministry of Petroleum and Natural Resources with the exclusive responsibility of undertaking mineral exploration and development on national basis. It has been set up as a private limited company under the Companies Act 1913 with an authorized capital of Rs. 1000 million. The present issued and paid up capital of PMDC Limited is Rs. 10.00 million divided into one million shares of Rs. 10/- each. The entire share capital has been provided by the Federal Government.

The management of the Corporation vests in the Board of Directors consisting of a Chairman who is also the Chief Executive and two whole time Directors namely Director(Technical) and Director(Finance). In addition, there are six Ex-officio Directors who are all nominated by the Government.

PMDC is the employer of the largest number of Mining Engineers, Geologists and other connected technical staff. It has got 40 qualified Mining Engineers, 30 Geologists apart from Civil, Electrical and Mechanical Engineers, Drillers and Chemists. The total number of technically qualified staff is 263 and other supporting staff in various categories is 872. In addition, piece rated and daily waged workers are 7696 including 3913 miners.

PMDC's functions are:-

(i) To bridge the gap between mineral discovery and development by detailed exploration and in depth measurement of mineral reserves.

(ii) To successfully operate coal and salt mines as well as open new mines.

(iii) To develop mining industry as a whole on scientific lines including upgradation and beneficiation of minerals.

(iv) To develop expertise in mining engineering, exploration, processing, upgradation/ beneficiation of minerals.

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(vi) To increase share of mineral sector in the G.N.P. from 1% at present to a higher figure to compare with developed countries.

PMDC's long-term development plans:

PMDC has formulated a 5th Five Year Plan comprising of 47 mineral exploration and developing projects involving a total capital outlay of Rs. 700.90 million. The main objectives of the 5th Five Year Plan are:-

(i) Increase production of coal from 0.23 million tonnes at present to 1.725 million tonnes per annum through modernization of existing mines and development of new coal field in Sind.

(ii) High value uses of indigenous coal.

(iii) Increase in production of rock salt from 0.330 million to one million tonnes per annum through the expansion of existing mines and development of new deposits including Salt Solution Mining Projects.

(iv) Exploration, development of minerals for steel industry like iron, dolomite, lime stone and fire clay etc.

(v) Exploration and development of minerals for mineral based industries. These are gypsum, Flourite, Celestile, Lead, Zinc, manganese, Pegmatite and sulphide minerals.

(vi) Exploration and development of minerals for import substitution. These include China clay talc, abrasive etc.

(vii) Exploration and development of minerals which have export potential e.g. Chromite, Salt etc.

Development of energy resources:

The world wide energy crisis and ever-escalating prices of oil have highlighted need, more than ever before, for the optimum utilization of coal. PMDC has therefore accorded highest priority to the development of coal deposits in Pakistan. It has been proposed to increase the production from its mines to 1.725 million tonnes of which one million tonnes would be raised from Lakhra coal field in Sind to cater for the requirements of the

proposed 250 M.W. power plant to be set up near the coal field.

PMDC is presently operating 4 coal mines, 3 in Baluchistan and 1 in the Punjab. The present production from these 4 mines is 0.230 million tonnes which is about 18% of the total coal production in the country. The rest of the 82% is produced by public sector. PMDC has formulated a plan for increasing the production from these mines to 0.625 million tonnes of which 0.100 million tonnes would be produced from Sharigh collieries in Baluchistan. The coal found in Sharigh coal field possesses medium coking characteristics and has been found suitable for use as a blend with high grade imported coking coals for making metallurgical coke. The entire production from Sharigh coal mines, after mechanical washing will be supplied to Karachi Steel Mills for making metallurgical coke. PMDC has set up a coal washing plant of 50 tonnes per hour capacity which with an input of 100,000 tonnes of R.O.M. coal will produce 0.075 tonnes of medium coking coal for use in Karachi Steel Mills. PMDC has also formulated a plan for the development of Jhampir Meting coal field in Sind with a production capacity of 0.100 million tonnes per annum.

Development of Rock Salt Mines:

PMDC has monopoly of salt. It is presently operating 3 salt mines in the Punjab and two quarries in NWFP. The workings of these mines have been re-organized and streamlined as a result of which the production of salt has increased from less than 0.300 million tonnes in 1973-74 to 0.450 million tonnes in 1978-79. PMDC is executing a scheme for the development of the three salt Mines in the Punjab which is aimed at increasing the production capacity of the mines to 0.550 million tonnes per annum. It is also proposed to enhance the production capacity of the two Salt quarries in NWFP to 0.140 million tonnes per annum. PMDC is also carrying out feasibility study for the development of new salt mines in Salt Range with an annual production capacity of 0.200 million tonnes. Besides a techno-economic feasibility is also being carried out for the development of salt solution Mining project. If it is found feasible the project will be developed for a production of 0.300 million tonnes of salt per annum.

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[illegible]:

PMDC is actively engaged in exploration of minerals in various parts of the country. It has recently completed detailed geological investigations in Nagar Parkar area of Sind and has established 3.50 million tonnes good quality china clay. Beneficiation and utilization studies on china clay are being carried out in the Institute of Geo-sciences, London and PCSIR Laboratories, Lahore. A detailed feasibility and planning and designing of the mining project and elutriation plant will be conducted during 1980-81.

PMDC is carrying out geological investigations to evaluate chromite deposits in Malakand, N.W.F.P. The ore is of inferior grade and cannot be utilized unless upgraded. The beneficiation studies conducted by PCSIR have revealed that this can be upgraded to 45% Cr_2O_3 suitable for use in chemicals and refractories.

Besides, PMDC has also completed mineral exploration projects as per details below:-

(a) Exploration of Bauxite.	0.300 million tonnes of refractory grade bauxite was established.
(b) Hunza Ruby. (c) Lapidary Project.	The project was found feasible and transferred to the newly formed Gemstone Corporation for development.
(d) Lakhra Coal Exploration Project.	60 million tonnes of coal reserves were proved in an area of 0.53 sq. kilometer Indicated reserves estimated.
(e) Exploration of Talc in N.W.F.P.	1,13,000 tonnes proved.
(f) Fire Clay in Sind.	1.37 million tonnes proved.

LAKHRA COAL MINING PROJECT
(DISTT. DADU, SIND)

1- BACKGROUND INFORMATION

While drilling for oil in 1956 at Lakhra, district Dadu which is situated about 125 miles North-east of Karachi and 38 miles North-west of Hyderabad a coal horizon was encountered. The coal field, however, remained unattended till the early sixties when Geological Survey of Pakistan started investigations to prove the extent of the coal field. These investigations indicated the presence of the largest coal field covering on areas of 142.5 sq. miles with reserves estimated at 240 million tons. The coal deposits have been subjected to detailed geological/mining studies and industrial tests as summarized below:-

	AGENCY	WORK ACCOMPLISHED	R E S U L T S
(i)	Geological Survey of Pakistan, U.S.Bureau of Mines (1966).	Drilling of 28 bore holes in an area of 80 sq. miles.	a) Coal is high quality lignite containing irregularly distributed pyrite and resin.
			b) Average thickness of lalian coal seam 3.60 ft. overburden varies from 76 ft. to 483 ft.
		Analysis of coal samples.	Average proximate analysis: moisture 31.8% volatile matter 30% fixed carbon 29.6% calorific value 7000 to 10,000 BTU/Lb.
			c) Total reserves 240 million tons of which 21.9 million tons were proved.
(ii)	West Pakistan Industrial Development Corporation (1974)	a) Geological mapping on 1:50,000 scales.	
		b) Measurement of sections to determine overburden.	
		c) Preparation of Isopach maps.	

	D) Drilling of one bore hole.	a) Coal is good quality lignite with high sulphur.
		b) Calorific value 7530 to 11230 BTU/Lb.
		c) Reserves in an area of 60 sq. miles 240 million tons including 19.5 million tons proved reserves.
(iii)	M/s. Lurgi, West Germany & Japan Consulting Institute.	Industrial tests to determine commercial uses of this coal.
		a) The coal cannot be used for manufacture of hard coke. Gassification and further processing in petrochemical and fertilizer industries is not economically feasible due to availability of low priced gas.
		b) It is suitable for large scale power generation.

Considering the limited utilization as compared with the magnitude of the deposits the coal was also subjected to industrial tests to determine its large scale commercial uses. As a result of these studies it was established that the best uses to which the coal can be put is large scale power generation near the mine site. A team of Polish experts was commissioned in 1967 to carry out mining and power plant feasibility studies. The studies revealed that the coal field could be developed expeditiously to produce 3,000/4,000 tons of coal per day. The Polish experts recommended a 250 MW coal based power plant as economically viable. Based on these findings and in view of the sharply increasing demand for power in the country, a proposal was submitted to WAPDA for setting up a coal based power plant near the coal field. The project, however, was not considered viable due to availability of cheaper fuels. However, the interest in it was revived as a result of steep rise in oil prices in the latter part of 1973.

Subsequently the world wide energy crisis, phenomenal rise in the prices of oil and limited energy resources in the country, highlighted more than ever before the need for immediate development of indigenous coal resources. Recognizing the need

the Government of Pakistan attached high priority to the development of these extensive coal deposits. It was also decided to set up initially a 250 MW coal based power plant raising to 1000 MW to meet the power requirements of the industries and agricultural sectors in lower Sind. The Pakistan Mineral Development Corporation was entrusted with the systematic exploration and scientific development of this coal field. PMDC was directed to prove atleast 40 million tons of coal deposits in this area in order to justify the setting up of the thermal power plant.

2- EXPLORATION SCHEME

Since the proved coal reserves of 21.9 million tons were considered to be too small for the proposed power plant it was considered necessary to carryout detailed exploration in the area to establish adequate workable coal reserves over a compact block measuring 51 sq. kilometer. Accordingly PMDC prepared an exploration scheme which was approved by the Central Development Working Party in March, 1975.

The salient features of the scheme were:-

1- Objectives — Proving of 40 million tons of workable reserves of coal.

2- Scope of work.

i) Reconnaissance survey.
ii) Regional mapping on 1:50,000 scale covering an area of 690 sq. km.
iii) Updating of survey of Pakistan quardrangle 40 C/2.
iv) Mapping on photogrammetric base maps on 1:12,000 and 1:6,000 covering an area of 43 and 46.83 sq. km.
v) Topogeological mapping on 1:5000 scale with contour interval of 3 meters.
vi) Topographic survey of an area measuring 70 sq. miles.
vii) Measurement of geological section in 25 mines to decipher overburden on coal seam for proposed drilling.
viii) Drilling of 19 bore holes.

ix) Determination of the quality of coal.

x) Determination of lithology and mechanical characteristics of roof and floor strata.

xi) Determination of hydrological conditions.

xii) Survey of water pipe line and service roads from River Indus to the mine site.

3- RESULTS

The scheme has been successfully completed and all the targets achieved. As a result of these investigations and systamatic drilling 60 million tons of economically workable coal reserves have been proved which are sufficient to sustain the proposed 250 MW power plant for about 60 years. The indicated reserves in FMDC's property have been estimated at 172 million tons.

(b) GEOLOGY

The area consists of crestal part of doubly plunging anticline with axis running north-south and strata dipping gently towards all sides. Crestal part of the anticline around apex is eroded where the oldest rocks belonging to Rani Kot formations are exposed. The lower Ranikot formations of Eocene age were deposited under lagoonal conditions. The upper part of these formations consists of sand stones inter bedded with shales, siltstones and claystones which are mostly unfossiliferrous. It exhibits lateral variations in lithology. Clays, clay stone, sandstone and silt stones generally form roof and floor of the coal seam. At places there are corbonaceous shales in floor and roof which are massive and thick.

The area is affected by as many as 46 faults which are more frequent and closely spaced near the fold axis. They generally trend north-south with dips varying from 52° to nearly vertical. Movement alongwith fault planes is mostly pivotal and consequently their throw increased/decreased gradually. These are mostly parallel and some of the small faults terminate along the major faults or branch out from them. Their throw does not exceed 43 meter and the displacement caused is usually smaller.

(c) COAL SEAMS

Coal seams have been encountered at different horizons in the bore holes. Lalian coal seam and the one below it known as Kath seam are fairly persistent. Lalian seem is the most important due to its persistance and thickness which is upto 3.5 meters with an average of 1.09 meter. The seam as determined from isopach map persists in an area of 47.57 km.

(d) QUALITY OF COAL

The coal is dark brown to dull black in colour. It is soft and brittle containing irregularly distributed flakes and films of pyrites and resin. In all 26 samples of coal were collected during these investigations and analysed. The results are as follows:-

Lalian seam (Proximate analysis)

Moisture %	Volatile matter. %	Fixed carbon %	Ash %	Total Sulphur %	Calorific value
31.8	48.5	34.5	15.5	7.4	7530 to 11,050 BTY/Lb.

Ultimate analysis

Hydrogen %	Carbon %	Nitrogen %	Oxygen %	Sulphur %
6.8	42.1	0.8	38.0	3.3

Sulphur

Total %	Sulphate Sulphur %	Combustible Sulphur %	Pyritic Sulphur %	Orgenic Sulphur %	Ash Sulphur %
7.4	0.18	6.9	1.3	5.9	0.3

(e) RESERVES

Over 60 million tons of workable coal reserves have been proved which are sufficient to sustain 250 MW power plant for 60 years.

(f) FEASIBILITY STUDY FOR UPGRADATION

Considering the limited utilization as compared with the magnitude of the deposits PMDC got a feasibility study conducted in U.S.A. for upgradation and utilization of low grade coal. These studies have revealed that Lakhra coal could be converted into

high carbon solid smokeless fuel suitable for domestic and industrial purposes.

4- SCHEME FOR THE DEVELOPMENT OF THE COAL FIELD.

On the basis of the data obtained as a result of the geological investigation, PMDC has drawn up a plan which envisages the development of a modern mechanized mines for a sustained production of one million tons of coal per annum to feed the proposed power plant. The salient features of the development scheme are as follows:

(Rs. in million)

	Total	Foreign exchange
i) Cost of the scheme	155.059	47.735
ii) Period of implementation.	36 months from the date of approval of the scheme.	

iii) Annual phasing of capital expenditure.

1st year		2nd year		3rd year	
F	L	F	L	F	L
20.385	35.871	9.141	40.418	18.209	31.035

iv) Objectives. To develop a modern mechanized coal mine for a sustained production of one million tons of coal per annum, to cater for the requirement of the proposed thermal power plant to be set up by WAPDA near Jamshoro. The production capacity will be generated as under:-

1st year	2nd year
500,000 tons	10,00,000 tons.

v) Benefits of the project:

i) The project will provide cheaper fuel for generation of 250 MW electricity which is needed for the industrial and agricultural development of lower Sind.

ii) Better and timely utilization of indigenous coal resources during the present energy crisis.

iii) The project will accelarate the pace of agriculture and industrial development in an under-developed area.

iv) The project will save foreign exchange to the tune of Rs.250 million per annum in terms of elimination of the import of oil for power generation and Rs.40.00 million per annum through conservation of natural gas.

v) Provide jobs to over 3000 persons directly and to many more indirectly in an under-developed region.

vi) Increase in the direct and indirect tax revenues of the Federal and Provincial Governments.

5- IMPLEMENTATION OF THE PROJECT

The Mining Project is essentially linked with the power plant project to be set up by WAPDA. For better and efficient working of the two capital intensive projects it has been decided to form a separate company under aegis of WAPDA to take up and execute the integrated projects of coal mining and the power plant. FFDC will be the share holder in the company and will look after the mining development operations within the joint venture project.

6- PRE-FEASIBILITY STUDY

CIDA Reconnaissance Mission conducted pre-feasibility study with a view to proposing a strategy for CIDA involvement in this project. According to the findings the available coal reserves are sufficient to sustain the 250 MW power plant and

justify the [illegible] involved. The Mission however, suggested [illegible] holes in the area earmarked for development [illegible] first phase in order to collect additional [illegible] information for detailed planning and designing [illegible] project. Accordingly WAPDA has prepared a scheme [illegible] with PMDC for detailed feasibility, planning and [illegible] of the integrated project of coal mining and [illegible] plant which has been approved by CDWP.

In [illegible] Japan International Consulting Agency (JICA) showed interest in the project and a high Powered team visited Pakistan in November 1978 and held discussions with PMDC & WAPDA to conduct Profeasibility studies for detailed planning & designing of the integrated project of coal mining and power plant.

Accordingly the JICA team started drilling work in Lakhra from [illegible] July 1979 in collaboration with PMDC and WAPDA and completed [illegible] bore holes at the end of November 1979.

The final report from JICA is expected by the Middle of May 1980. The JICA experts are visiting Pakistan again in May 1980 to conduct detailed feasibility study of the Coal Mining Project.

MA
Chron

CHAPTER I: INTRODUCTION - THE SETTTING

1.1 Eighteen months ago the Board considered and approved an accelerated program to help the Bank's developing member countries reduce their dependence on imported oil. 1/ Since then, the price of oil has doubled and accelerating inflation has greatly increased the cost of other LDC imports. Slower growth of the industrialized countries and the recent onset of recession, partly induced by attempts to bring down the rate of inflation, have caused a weakening of commodity prices and restricted the market for exports of manufactures from the developing countries. In consequence, it has become increasingly difficult for developing countries to meet the higher cost of imports. The deficit on current account of the oil importing developing countries (OIDCs) has risen sharply, from $25 billion in 1977 to an estimated $61 billion in 1980. Oil import costs in each year were larger than the deficit--$29 billion net in 1977 and $67 billion in 1980.

1.2 The post World War II period had been characterized by the availability of and a growing trade in "inexpensive oil". Consequently, the share of oil in global commercial energy supply grew from 30% in 1950 to 51% in 1973. In most developed and developing countries the availability of "cheap" fuel on the world market displaced or prevented the development of domestic sources and has encouraged energy intensive ways of life. The oil price increase of 1973/74 and the doubling of oil prices again in 1979 have made the "oil import alternative" much more costly and have led to a

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1/ Presented in "A Program to Accelerate Petroleum Production in the Developing Countries" (R78-2-262, dated Nov. 30, 1978). Referred to hereafter as the 1978 Report.

greater awareness that the energy problem of the 70s was not a passing phenomenon but marked the end of cheap coal and oil, and the transition to an era of high cost energy. But while the growth of energy consumption in many of the main uses has begun to slow down as its price increases, energy has not yet been accorded the important place it deserves in economic planning and management.

1.3 Except in traditional societies, where animal and human energy is still dominant, the burning of mineral fuels provides most of the motive power for all organized human activities. Now that energy is no longer cheap, it ranks in importance with the classical factors of production--land, labor and capital--and its supply and cost must be given due weight in the plans of economic managers at all levels. These considerations apply not only to forms of energy that are traded internationally, but also, because of inevitable interrelationships between different energy forms, to energy that is produced domestically, and to non-commercial as well as commercial fuels.

1.4 There are few models of well-articulated energy policies in the more mature economies, which are themselves having difficulty in adapting to the rising costs of imported oil. Indeed, some developing countries have shown greater readines to adjust to the new conditions than many of the industrialized countries. While the potential for more efficient use of energy is greatest in the advanced countries, it is even more important for the developing countries to use energy efficiently, because they are poorer and because their energy requirements are growing more

rapidly. In industrialized countries the ratio of the growth in the demand for energy to GDP growth has traditionally been one to one and is now falling. In most developing countries energy demand grows faster than the economy and in some much faster. Furthermore, the low income countries must be concerned with the energy efficiency of their development programs, because investments made today will determine their energy requirements as their modernization accelerates. These considerations will have an important bearing on planned investments both within and outside the energy sector.

World Energy Demand and Supply

1.5 Global commercial energy consumption is projected to increase at an annual rate of 3.75% to about 200 mbdoe by 1990. This growth in demand will be met by only moderate increases in the supply of petroleum and its share in global energy supply will decline, while the shares of other energy sources - coal, gas, nuclear and hydropower - rise to reflect their more rapidly increasing supply.

Table 1

Global Energy Supply By Source

1977 and 1990

(In Million Barrels per Day of Oil Equivalent)

	1977		1990	
	mbdoe	%	mbdoe	%
Oil	65.5	49	77.2	38
Coal	51.7	30	62.1	31
Hydro	2.8	2	6.8	4
Nuclear	0.9	1	4.2	2
Gas and Other	13.3	18	50.7	25
Total	134.2	100	201.1	100

1.6 Within this global picture, a variety of energy supply and demand scenarios will evolve for different groups of countries. For the majority of developing countries, the most important aspect of the energy problem is their present and projected heavy reliance on imported petroleum to meet their commercial energy needs. The reliance of these oil importing developing countries (OIDC's) on imported commercial energy (primarily oil) is projected to increase in absolute terms by the end of the decade. This despite the fact that their production of commercial energy is likely to grow faster than demand, and that demand is itself projected to grow at a slower rate than in the past because of a lower GNP growth rate and the effect of substantially higher prices for petroleum.

Table 2

Energy Production and Consumption for the Developing Countries

1977 and 1990

(In mbdoe)

	1977				1990			
	OIDC		LDC		OIDC		LDC	
	Prod.	Cons.	Prod.	Cons.	Prod.	Cons.	Prod.	Cons.
Oil	1.2	7.1	11.8		3.3	12.1	18.6	
Coal	2.2		2.3		3.9		4.3	
Hydro	1.6		1.7		3.5		4.3	
Nuclear	0.1		0.1		2.0		2.4	
Gas & Other	1.9		3.0		5.8		8.3	
Total	7.0	13.2	18.9	17.1	18.5	26.0	37.9	34.3

1.7 The costs of this heavy reliance on petroleum are exacerbated by the uncertainty surrounding the price and availability of petroleum on world markets in the future. It would be prudent to assume that, while conditions of supply and demand may lead to wide swings in the price of oil, the long-term trend in the real price of oil and coal imports will be upwards. In these circumstances, it behooves

all countries to economize oil by shifting it from low-value to higher-value uses, by improving efficiency in energy production and utilization in order to minimize the impact of the cost of energy on their development objectives and their rates of growth and to look for domestic alternatives which could be developed at a lower cost than imports. Developing countries are in a sense better placed to do this than the industrialized countries in that they are not yet fully committed to a capital stock and life styles evolved in an era of cheap coal and oil. They therefore have the opportunity to plan the modernization of their societies with due regard for the high cost of energy. But they are hampered by inadequate information about resources and uses and, in most cases, by lack of experience in commercial fuel production. The large majority have not yet tapped their own resources to any considerable degree and there is great scope for reducing dependence on imports. A principal aim of this paper is to suggest the elements of an integrated energy policy for developing countries, and how the international community and the Bank can help them to acquire the necessary knowledge, skill and institutional tools.

An Energy Classification of Developing Countries

1.08 The appropriate policy mix will not be the same for all countries. Every developing country faces a unique set of conditions in designing policies to help resolve its energy problems, including its level of income and degree of industrialization, its energy resource endowment, the relative importance of commercial and traditional fuels, its degree of dependence on oil imports, and other factors. Since the rise in the price of oil, the degree of dependence on petroleum imports has become the most important single factor. Table 3 lists countries according to the share of imported oil in total commercial energy consumption.

Table 3: AN ENERGY CLASSIFICATION OF DEVELOPING COUNTRIES

Oil Exporting Developing Countries		Oil-Importing Developing Countries — Net Petroleum Imports (1978) as Percent of Commercial Energy Demand			
OPEC Members	Non-OPEC	0-25%	26-50%	51-75%	76-100%
ALGERIA	BAHRAIN	ARGENTINA	CHILE	ALBANIA	Bahamas
GABON	BOLIVIA	COLOMBIA	Mongolia	BRAZIL	BARBADOS
IRAN	MALAYSIA	Korea, Dem. Rep.	YUGOSLAVIA	Greece	Costa Rica
IRAQ	MEXICO	South Africa*		Korea, Rep. of	CUBA
KUWAIT	OMAN			Lebanon	Cyprus
LIBYA	PERU			Spain	Dominican Rep.
QATAR	ROMANIA			Taiwan	Fiji
SAUDI ARABIA	SYRIAN ARAB REP.			TURKEY	GUATEMALA
UNITED ARAB EMIRATES	TRINIDAD AND TOBAGO				Guyana
VENEZUELA	TUNISIA				Hong Kong
					ISRAEL
					Ivory Coast
					Jamaica
					Jordan
					Malta
					Mauritius
					Nicaragua
					Panama
					Papua New Guinea
					Paraguay
					Portugal
					Seychelles
					Singapore
					Suriname
					Uruguay
Countries with Actual or Potential Fuelwood Shortage +					
ECUADOR	ANGOLA	Botswana*	BANGLADESH	AFGHANISTAN	Benin
INDONESIA	BURMA	INDIA	Mozambique	Burundi	Bhutan*
NIGERIA	CHINA	Lesotho*	PAKISTAN	GHANA	CAMEROON
	CONGO, PEOPLE'S REP.	Swaziland*	Zambia	Malawi	Cape Verde Is.
	EGYPT	Viet Nam		Rwanda	Central African Rep.
	ZAIRE	Zimbabwe			Chad
					Comoros
					Djibouti
					El Salvador
					Eq. Guinea
					Ethiopia
					Gambia, The
					Grenada
					Guinea
					Guinea-Bissau
					Haiti
					Honduras
					Kampuchea, Dem.
					Kenya
					Lao PDR
					Liberia
					Madagascar
					Maldives
					Mali
					Mauritania
					MOROCCO
					Nepal
					Niger
					PHILIPPINES
					Sao Tome and Principe
					Senegal
					Sierra Leone
					Solomon Is.
					Somalia
					Sri Lanka
					Sudan
					Tanzania
					THAILAND
					Togo
					Uganda
					Upper Volta
					Western Samoa
					Yemen Arab Rep.
					Yemen PDR
Population (mid-1978) (in millions)					
320 (Indonesia 135)	1,200 (China 950)	800 (India 645)	210	310 (Brazil 120)	405

Countries shown in CAPITALS are oil and/or gas producers.

Table based on UN World Energy Statistics, 1978 and staff estimates of fuelwood situation. The position of individual countries can change dramatically and rapidly. As of 1980, Guatemala and Cameroon are net exporters, Bolivia has become net importer, and Peru and Argentina are very close to the margin. Tunisia may soon become a net importer, while Pakistan may soon become a net exporter. Population data from World Development Report, 1980 and rounded to nearest 5 million.

* **Bhutan is not included in UN World Energy Statistics; its place in the table is estimated. Botswana, Lesotho, South Africa, and Swaziland are grouped together in UN World Energy Statistics as "Customs Union of South Africa;" their place in the table reflects the energy balance of the group rather than the countries individually.**

\+ **Grouping based on country-level data. Many countries not included in this group have or will have less severe or localized problems not apparent from country-level data. Brazil, Bolivia, Tunisia and Costa Rica are examples.**

As the table shows, over half of the population of the developing world lives in 99 countries which depend in varying degrees on imported oil. Outside of the OPEC countries, only 16 LDCs currently export oil and some of these (Egypt, Bolivia, Peru, Romania, Tunisia and Burma) could see their exportable surplus reduced and possibly become net oil importers unless significant new discoveries are made and developed. Among the OIDCs, some countries whose potential is high, and whose internal needs are currently low and are not expected to grow significantly could become self-sufficient in net exports (Pakistan, Ivory Coast, Ghana, Chad). Other countries (Brazil, Turkey, Korea) have a considerable absorptive capacity for oil and are likely to remain net importers or to see their import dependence increase over the next 10 years unless they develop alternative resources (coal, natural gas, hydro/nuclear). The energy potential of the vast majority of countries which are most dependent on oil imports (75-100%) is currently not well known, and a considerable effort is required in exploration and predevelopment to assess their potential, realizing that in most cases even small discoveries (20,000-50,000 b/d) could go a long way towards bringing them in the self-sufficient category.

1.09 A second classification of developing countries in Table 2 relates to the dependence of their populations on fuel-wood and other traditional sources of energy. One of the difficult choices faced by these countries is how to stop the rapid depletion of forests and soil fertility without unduly stimulating the use, and therefore the import, of petroleum. An essential element in this solution is afforestation and the more efficient design of cooking stoves. A large majority of the low income countries are in this category, including most of those which are almost totally dependent on oil imports for their supply of commercial energy. These are the countries which face a double enrgy crisis.

1.10 Countries also differ in their capacity to design and carry out programs for the exploitation of their domestic energy resources:

(a) The large majority have relatively weak energy sector institutions outside of the power subsector. They are for the most part countries that have little or no production of fossil fuels and stand in the greatest need of external assistance in formulating and executing appropriate energy policies and investment programs;

(b) Some countries have stronger and more experienced institutions, mostly those with experienced national oil companies that have been involved in exploration and production, either alone or jointly with foreign oil companies. They may need technical or financial help in particular areas of energy development.

1.11 Clearly, an energy policy must be based on the specific circumstances of each country. The alternative sources of supply and associated investment must be assessed and the energy implications of alternative development policies for the key sectors have to be appraised. The applicability of renewable forms of energy must be assessed. An assessment must also be made of the incentives needed to

promote development of indigenous energy resources and the disincentives to consumption, as well as of the role of Government in production and regulation.

Structural Outline

1.12 The three remaining parts of this paper deal in greater detail with (i) the prospects for energy production in the developing countries, (ii) the potential savings that might accrue from the more efficient management of energy demand, and (iii) the investment needs of the developing countries in implementing appropriate programs to exploit their indigenous energy resources and the way in which the Bank and other agencies can assist them in meeting these needs. This analysis is based upon a series of background papers on different energy sources that have been prepared for this report and on additional information gathered during the course of the Bank's operational work. A paper has been issued on coal and lignite and one on the prospects for the development of alcohol. Additional papers will be issued shortly on natural gas and retrofitting. In the petroleum sector, since the completion of the studies on the petroleum potential of 70 developing countries summarized in the 1978 Report, the Bank has been enlarging its own information on LDC resources in the course of project and survey missions to some fifty countries. In the renewable energy sector, a special study has been undertaken within the Bank by a task force on traditional and renewable energy sources and their applicability to developing countries.1/

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1.13 Within this framework, Chapter II discusses the prospects for accelerating energy production in the developing countries. A brief account is given of the present state of knowledge about the resources of conventional fuels in developing countries, and to assess the likelihood that the so-called unconventional fuels and renewable sources -- synthetic liquid fuels, biomass, solar energy, etc. -- will make a significant contribution to the energy needs of the LDCs during the 1980s. Many developing countries have potential sources of commercial energy that could substitute for imports. These include petroleum and coal, as well as large resources of hydropower. Investment in indigenous energy sources almost invariably offers high economic returns, but import substitution is not a simple matter. Thus coal, natural gas and hydropower can substitute for imported fuel oil in electric power generation or industrial and household uses, but not yet on a significant scale for automotive fuels. Even where such substitution is possible, care must be taken to integrate import substitution measures with other elements of a national energy policy. For example, the replacement of imported fuel oil by other indigenous sources may require the installation of secondary refining facilities to crack the replaced fuel oil into lighter fractions.

1.14 An attempt is also made to judge the relative priority of the newer technologies, taking into account both technical and economic feasibility, and to suggest where investment in research could most fruitfully be directed. This includes a discussion of the local applications of solar bio-mass and other renewable forms of energy which hold out considerable promise for the 1990s and beyond. The present dependence of developing countries on wood

and other traditional fuels is examined, and the means of reversing the potentially disastrous depletion of the world's forests. Finally, Chapter II also estimates the investment needs of developing countries in the exploration and development of conventional energy sources. It concludes that these needs are large, but that if they could be met, the production of energy (and particularly oil) in the LDCs could increase rapidly and substantially alleviate the strains that would otherwise be placed on their balance of payments situation.

1.15 Chapter III discusses the management of energy demand and the potential savings that might arise from a series of energy conservation measures in the major energy consuming sectors -- industry, transport, agriculture and household use. It concludes that the potential for such savings is large, particularly in industry, transport and electric power generation. Through careful planning, better management and operating procedures, investment in energy-saving devices and other similar measures, the oil importing developing countries could hope to reduce their projected oil import bill in 1990 by 25-30%.

1.16 However, bringing about these changes in the efficiency of energy utilization will not be an easy task. Energy consumption patterns established over a long period when energy, and particularly oil, was cheap will only be altered gradually. Furthermore, the freedom to maneuver for many governments is restricted by the political and social sensitivity of energy prices, which are the central tool of demand management. Nevertheless, many developing countries have already taken bold steps to realign the structure of domestic prices to reflect the changed international energy situation. In these countries there are already some encouraging signs of moderation in the rate of growth of energy demand and a rationalization of the structure of that

demand. However, many other countries have yet to tackle adequately the demand aspects of their energy situation and some of the measures discussed in Chapter III warrant their consideration.

1.17 Chapter IV, the last chapter of the paper, discusses the investment needs of the developing countries in implementing appropriate energy programs to exploit their indigenous resources. A brief account is given of the assistance by aid agencies for energy development. Most of the aid has been and continues to be for electric power. Total aid falls far short of the need. The progress of the Bank's own work in energy since the accelerated program for petroleum was adopted in early 1979 is reviewed. A program of further technical and economic work is proposed, together with a lending program in energy for the period FY81-85. The case for new initiatives to enhance the capability of developing countries to plan and manage their energy programs is considered, and ways in which the Bank can help coordinate the growing international effort to assist them.