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OUTLINE OF A STUDY OF THE ENERGY NEEDS,
USES, AND RESOURCES OF DEVELOPING COUNTRIES AND THE
IMPLICATIONS FOR AID PROGRAMS

August 24, 1977

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DEVELOPING COUNTRY ENERGY PROJECT
POLICY ANALYSIS DIVISION
NATIONAL CENTER FOR ANALYSIS OF ENERGY SYSTEMS
BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK 11973

MASTER

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Abstract

A study is outlined which will satisfy the requirement in the International Development and Food Assistance Act of 1977 for the President to carry out "studies to identify the energy needs, uses, and resources which exist in developing countries." The study will also consider those policies and programs in the energy area which can most effectively carry out the intent of the Act and AID's overall mandate.

BACKGROUND

The International Development and Food Assistance Act of 1977 calls for "cooperative programs with the developing countries in energy production and conservation, with particular emphasis on programs in research, development, and use of small-scale, decentralized, renewable energy sources for rural areas..... These programs shall be directed toward the earliest practicable development and use of energy technologies which are environmentally acceptable, require minimum capital investment, are most acceptable to and affordable by the people using them, are simple and inexpensive to use and maintain, and are transferable from one region of the world to another".⁽¹⁾

The Act also authorizes the President to carry out "studies to identify the energy needs, uses, and resources which exist in developing countries," and to report the results of those studies to the Congress by March 1, 1978. The Agency for International Development (AID) has suggested that those studies should be extended to a consideration of those policies and programs in the energy area which can most effectively carry out the intent of the Act. In this paper we present an outline of such a study.⁽²⁾ Because of legislative mandates, AID must concern itself particularly with the plight of the rural poor in the poorest developing countries and in renewable energy technologies. Nevertheless, these concerns must be viewed in the larger context of the world energy supply-demand situation that confronts all LDCs and in the context of the total energy requirements for national economic and social growth.

A number of recent studies have documented the problems that many of the poorer developing countries have encountered in coping over the past several years with the higher prices of petroleum and petroleum-based products.⁽³⁾ With the possibility that the latter parts of the 1980's will witness further energy price increases, these problems may become even more severe. In most of these countries a variety of actions to reduce oil imports will have to be taken. To achieve those reductions and at the same time minimize economic and social disruptions, aid to these countries will have to take a number of forms. Some will be directed toward better management of existing energy resources, others toward effecting near-term fuel substitutions, and still others toward planning for greater long-term utilization of indigenous and renewable resources.

The organization of the study, and the report to be produced recognizes both these immediate energy needs and the longer-term requirements. It is

divided into two parts. The first seeks to place the current and projected needs of these countries within the larger context of projected world-wide energy supplies, prices and demands. It also is intended to identify generic characteristics of energy needs and supplies in those more severely impacted LDCs as they relate to their existing economies, their targeted growth, and their abilities to satisfy minimal human needs for all their population. There is a particular stress on energy needs in the rural sector with some consideration of the role of energy in relationship to such areas as food production, rural development and urbanization. Some consideration is given in Part I to the potential for changing traditional patterns of energy development to more efficient modes and modes more dependent on indigenous and renewable resources. Part I satisfies the requirements for the report to be submitted to Congress by March 1. In the second part of the report, specific areas of potential programmatic activity are considered in terms of their ability to effect relief in both the short and long term. These programmatic areas are based on a consideration of central development issues and functional uses of energy, particularly in the rural sector. The potential activities could include technical and financial assistance, demonstration, training, analysis, information exchange, etc. This part concludes with the specification of a tentative set of AID programs and the actions required to initiate those programs.

Part I

A. This section is designed to place the aggregate energy needs of the poorer oil-importing developing countries over the next 3-4 decades within the context of world energy supplies and likely demand. More specifically it

- . establishes a range of projected total energy and petroleum needs for these LDCs
- . compares these values to equivalent values for the other LDCs and those of the advanced developing countries
- . determines the overall "gaps" between total annual petroleum demands and production using a number of assumptions for future oil finding rates
- . discusses "gaps" for the poor LDC group on the basis of several possible allocational mechanisms for distributing non-communist world oil production

. estimates supply available to these countries from other indigenous resources, renewable and non-renewable, and other countries (e.g., coal)

B. Using specific countries as examples, LDC energy needs are characterized in terms of the end use sectors being served, the coupling between fuels and distributional infrastructure, the production of exportable commodities and food, and energy consumed in domestic consumption. Similarly, aspects of their energy supply are discussed with particular regard to the resources which might be utilized within each country. An integrated supply-demand framework is used to describe current and possible future prototypical national energy systems. A review is made of the institutional capabilities of these countries with regard to 1) energy planning, 2) technical research, adaptation and support, 3) extension services, 4) financing and 5) marketing.

The time available to complete Part I precludes the acquisition of new primary data. We will thus depend on existing information sources such as the UN and the World Bank and recent studies, particularly those of the Workshop on Alternative Energy Strategies, the Federal Energy Administration and Brookhaven National Laboratory.

Part II

The intent of Part I of the report is to identify a set of AID energy program areas and activities which can be effective in overcoming energy-related barriers to economic and social development, particularly among the rural poor. There are a number of steps in this planning process. First, the scope of current programs in AID and elsewhere (UN, World Bank, Regional Development Banks, ERDA, other countries) must be reviewed. Second, the energy aspects of developmental goals and issues must be identified. Third, based on that identification, and the kind of factual information assembled in Part I of the study, potential programs must be designed. Fourth, priorities must be established between programs based on a set of criteria of evaluation. These criteria must include impacts on target groups or economic indicators, existing AID mandates, and any aid restrictions.

Program recommendations will be arrived at through a series of analyses contained in issue papers and a small number of workshops. A workshop in each of the following areas is proposed:

1. Energy and the Food System
including consideration of agriculture, transport, processing and nutritional aspects
2. Rural and Domestic Energy Use
cooking, lighting and heating, integrated energy systems, and small scale industry, and services (e.g., health and communication)
3. Natural Resource Management
deforestation, water management
4. Energy Resource Management

For each workshop a background paper will be prepared. In addition a number of issue papers will be prepared as input to both sections of the report. Issue papers are anticipated in the following areas:

1. Transportation and Liquid Fuels
2. Urbanization
3. Energy/Economics Planning and Infrastructure Needs.

Each workshop could be designed to

1. Identify, and if possible quantify, the important energy related aspects of particular development issues and to specify the initial energy-related constraints or problems associated with that issue.
2. Identify general methods of approaching a solution to the problem.
3. Identify mechanisms, or program areas for AID (or other agencies) to carry out.

As an example, the workshop considering natural resource management should address the particular issue of deforestation arising out of demand for fuelwood (for cooking and space heating). The analysis should proceed as follows:

. Issue: Deforestation

↓
: Modes of Solution:

1. Reforestation,
2. Technical: a) increase efficiency of wood burning devices
b) replace wood by alternate fuels.

↓
: Mechanisms:

1. Demonstrations
2. Information Transfer
3. Regional Conferences
4. Idea Solicitation, etc.

In each case specific mechanisms and, if possible, programs will be recommended. Each workshop will thereby arrive at a set of programs which may be roughly ranked in terms of high and low priority. The results of all workshops must then be combined to achieve a final listing of priority areas to the overall program. To the degree possible, the targeted group or groups to benefit from the assistance will be specified as will be the likely duration of the required support, the minimal levels required to establish viable programs, the implied long-term commitments, and the benefits to be obtained.

A description of actions required to initiate each programmatic area of activity will also be included. Finally, priorities will be established on the basis of criteria noted above. While it is anticipated that most of the programs outlined will not vary substantially from the traditional form of AID assistance, the recommendations included in the report cannot be considered as anything but preliminary in nature. It is more important in this study to identify areas of programmatic concentration on the basis of a broad but quantitative analysis of the problem than it is to select a few specific projects.

The schedule for completion of the study is summarized in Table 1.

TABLE 1

SCHEDULE OF REPORT PREPARATION

	1977					1978	
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	
Section I			△			▲	
Issue Papers and Work-shops			↓	△	↑		
Section II				↓	↑	▲	
AID Submission							●

△ Preliminary or draft section.

▲ Final Section

● Final Report

NOTES

1. Section 114, Chapter 1 of Part I of the Foreign Assistance Act of 1961 as amended by Section 119, "Renewable and Unconventional Energy Technologies" of the International Development and Food Assistance Act of 1971.
2. An earlier draft of this study plan was reviewed at a meeting organized at Associated Universities Inc. by AID on August 23, 1977. The current study plan profited considerably from the discussions at that meeting which included representatives of ERDA, FEA, the Interamerican Development Bank, the Overseas Development Council, Resources for the Future, the Institute for Energy Analysis, and universities and consulting firms active in appropriate areas.
3. See, for example, Committee for Economic Development, "International Economic Consequences of High-Priced Energy", New York, 1975; OECD, "Development Corporation, 1974 and 1976, Revised, Paris, 1975 and 1977; U.S. Central Intelligence Agency, "Non OPEC LDC's: Diversions of Growth and Payments Dilemma," March, 1977, Washington, DC; UN Economic Commission for Asia and the Far East, "Report of the Intragovernmental Meeting on the Impact of the Current Energy Crisis on the Economy of the ECAFE Region; AID, "Balance of Payments of Developing Countries 1974-1975, April, 1975, Washington, DC.
4. The type of planning activity discussed in this report should, in principal, be a continuing process. In that case, other steps should be involved in the process, particularly related to program evaluation. The results of program analysis and evaluation can then also be used for issue and policy analysis.