936570300490 1
936570300580 1 (attached) PD-AAG-855-A1 936-5703

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: C (A = ADD, C = CHANGE, D = DELETE)

PAF 28p

2. DOCUMENT CODE: 5

(1)

3. COUNTRY/ENTITY: Worldwide

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 936-5703

6. BUREAU/OFFICE: A. SYMBOL: DS; B. CODE: EY

7. PROJECT TITLE (Maximum 40 characters): Energy Policy and Planning

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION: YRS. 0 3 QTRS.

10. APPROVED BUDGET AID APPROPRIATED FUNDS $000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY 80 I. GRANT	H. 2ND FY 80 J. LOAN	K. 3RD FY 81 L. GRANT	K. 3RD FY 81 M. LOAN
(1)				1,000		1,000		950	
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY ___ O. GRANT	N. 4TH FY ___ P. LOAN	O. 5TH FY ___ Q. GRANT	O. 5TH FY ___ R. LOAN	LIFE OF PROJECT S. GRANT	LIFE OF PROJECT T. LOAN
(1)						
(2)						
(3)						
(4)						
TOTALS						

PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE (S)) 1 = LIFE OF PROJECT, 2 = INCREMENTAL LIFE OF PROJECT: A. GRANT 2; B. LOAN

C. PROJECT FUNDING AUTHORIZED THRU FY 8 1

12. ~~XXXXXX~~ Additional PROJECT FUNDING ALLOTMENT REQUESTED $000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. ___ C. GRANT	D. LOAN
(1) SDP	950	
(2)		
(3)		
(4)		
TOTALS	950	

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: ☐ 000 ☐ 941 ☐ LOCAL ☐ OTHER ___

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

Extension of project for one additional year (FY 1981), with grant funding of $950,000.

BEST AVAILABLE DOCUMENT

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-6 (7-76)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS
Part II

COUNTRY: Worldwide

PROJECT: Energy Policy and Planning

PROJECT NUMBER: 936-5703

FY 1981 AID grant funding is approved in the amount of $950,000 and is authorized for the extension of this project, which originated in FY 1979. An evaluation will take place on completion of the project, which will not be extended beyond FY 1981.

Bernard Chapnick
Acting Assistant Administrator
Bureau for Development Support

Clearances:
DS/PO:BChapnick _____ Date 5/15/81
AFR/DR, LHeilman _____ Date phone 5/6/81
ASIA/TR, TArndt _____ Date 5/29/81
LA/DR, TCauterucci _____ Date 5/18/81
NE/TECH, LReade _____ Date 5/8/81
PPC/PDPR, JEriksson _____ Date 5/7/81

Drafted by: DS/EY:PBaldwin:cld

ACTION MEMORANDUM FOR THE ACTING ASSISTANT ADMINISTRATOR

DATE: April 9, 1981

FROM: DS/EY, Alan B. Jacobs

Problem: Your approval is requested for a one year extension of the Energy Policy and Planning Project (936-5703) and authorization of funds in the amount of $950,000 in FY 1981. The project would continue to provide analyses of energy and development issues through a subproject implemented by a Cooperative Agreement with Resources for the Future, and would provide country-level energy policy and planning assessments to several AID-assisted countries through a second subproject. This will be the last phase of the Energy Policy and Planning Project, which is expected to be superseded by a new but related project in FY 1982

Discussion: The Energy Policy and Planning Project, initiated in June 1979, has enjoyed a successful beginning. Experience to date includes:

(1) A program of research on issues relating to energy and economic development, made possible by a two-year, $800,000 Cooperative Agreement between AID and the non-profit research organization Resources for the Future (RFF). RFF has operated with a staff of professional analysts, an advisory committee, and a network of research institutions and individual researchers in developing countries. From a list of 10 candidate issues for concentrated analysis, RFF chose (in consultation with DS/EY and its advisory committee) three areas: a) the costs and benefits of rural electrification programs; b) the potential for energy demand management and interfuel substitution; and c) the potential contribution of biomass to energy supply. RFF has carried out preliminary in-house analyses of these issues and has awarded contracts to researchers in developing countries to conduct specific studies within the broad issue areas. These studies are at varying points of progress, with the rural electrification studies generally closest to completion and the demand management and biomass studies generally still in early stages.

(2) An International Workshop on Energy Survey Methodologies for Developing Countries managed by the Board on Science and Technology for International Development of the National Academy of Sciences-National Research Council and held in Jekyll Island, Georgia on January 21-25, 1980. As originally envisioned in the Project Paper, this workshop was to facilitate the development of energy survey methodologies appropriate to developing countries that would be "nationally representative, internationally comparable and scientifically designed and conducted." In planning for the Workshop under a $200,000 grant from AID, NAS quickly found that the complexity of energy issues and the diversity of resources, capabilities

and needs among different developing countries precluded the development and application of general survey (or assessment) methodologies that are universally applicable. As the Workshop proceedings state, "Generally...surveys must be designed for local situations and for the specific policy needs of a country." (NAS Procedings, p. 11.) Furthermore, Workshop participants concluded, "/Surveys/ should be designed and directed by the government agency that eventually needs the information," and "the ultimate effectiveness of a survey depends on the existence of an institution that can absorb the results of the survey and use those results to formulate and carry out energy decisions." (NAS Proceedings, p. 10.) The NAS Workshop was viewed by its diverse participants (energy analysts and other social scientists, government policy-makers from LDCs, and representatives of USG and bilateral donor agencies) as highly successful in clarifying the role of country-level energy assessments as tools, rather than as ends in themselves. As a result of the Workshop and of preliminary planning for a number of country-level activities undertaken within this project (see below), DS/EY has reoriented its focus within the project away from surveys, or "assessments," to the broader and more important concept of "energy planning assistance." The goal of this assistance is to build an energy planning capability within the governmental policy-making structure of the countries assisted.

(3) Country-level energy planning assistance and studies, implemented in Morocco, Sudan, Tunisia and Guyana. During FY 80, four country-level activities were funded and initiated. With the exception of the Guyuana activity, all country-level efforts are still in the initial stages of implementation. A summary description of each activity follows:

(a) Morocco. Under a $440,000 contract with Energy and Environmental Engineering, Inc. and Development Sciences, Inc., AID is sponsoring a national energy planning study for Morocco. The four principal areas of activity for the study team (comprised of Moroccan counterparts as well as the American team, as is also the case with the other country-level activities) include the establishment of an energy information system, an analysis of energy demand management opportunities (especially for industry), an assessment of alternative energy supply technologies, and an analysis of investments required by various energy supply/demand scenarios.

(b) Sudan. Essentially the same as the Morocco study in its focus, the Sudan national energy planning study will be implemented through a $650,000 contract to International Science & Technology, Inc. (ISTI) and Energy Development International (EDI). The study's three main objectives are to develop an information base which can be used to address national energy issues, to evaluate various supply and demand strategies, and to strengthen the capability of the Ministry of Energy and Mining to carry out energy planning and policy-making.

(c) Tunisia. As part of a series of Tunisian sectoral energy studies funded by AID, DS/EY is contracting with Ferguson-Bryan Associates and Energy Development International for $293,000 to carry out a study of energy demand and management in the industrial sector of the Tunisian economy. In addition, studies of the transportation and agriculture sector are projected for FY 81 funding, assuming approval of project extension.

(d) Guyana. Under a $53,000 contract, International Science & Technology, Inc. (ISTI) is providing to the Guyanese government the services of a field expert for a period of four months to assist in the developing of an energy data gathering system and an energy planning process.

When the Energy Policy and Planning Project was approved in June 1979, the project approval documents called for an evaluation of FY 79 and 80 activities at the end of FY 80. Because the period required to implement project activities -- particularly at the country level -- has proven longer than originally anticipated, a full-scale evaluation is not possible or appropriate at this time. A management review has, however, been carried out, with activities under the RFF Cooperative Agreement receiving a particularly close scrutiny. RFF was asked to submit information about the status of its research program as of the end of FY 80 (attached as Appendix II). A review meeting was held on October 29, 1980, with representatives of DS/EY, DS/PO, the four Regional Bureaus and PPC in attendance. Following the meeting, written comments were invited from all participants and were actually received from the Asia Bureau and the Latin America Bureau. In addition, DS/EY has carried out a series of discussions with RFF regarding current and projected research activities, funding and overall management of the RFF subproject. General conclusions reached by DS/EY as a result of these management review activities can be summarized as follows:

(a) In general, RFF's research activities appear to be well-formulated, relevant to AID's energy policies, and useful in terms of their original purpose, i.e., to promote better understanding of energy issues as they affect economic development.

(b) While RFF appears to be developing a sound network of cooperation with developing-area research institutions, there is some concern about the concentration of contracts in relatively few countries, most notably India, and the percentage of research contracts awarded to institutions in countries outside the AID "family." (Some 37% of RFF contract funds have been spent or are in negotiation for research by institutions in non-AID countries, including Colombia, Malaysia, Brazil and Korea.) This allocation of funds has given rise to some concern about the linkage between RFF research and AID's assistance programs. In the future, RFF has agreed to effectively limit its new subproject grants to AID-assisted countries.

(c) The RFF subproject presents an example of a generic problem with AID research-oriented activities, i.e., the difficulty of documenting the impact of the research. DS/EY believes, however, that judgment on this question must be deferred until the research results are in from a significant number of RFF contracts. (To date, no RFF contract studies have been completed, but most of those underway are scheduled for completion by September 1981.)

(d) While the Cooperative Agreement provided for $800,000 allocated to RFF over a two-year period (September 1979 through August 1981), RFF's proposal to AID at that time projected that that level of funding would only last for 18 months. Documents on file in the Contracts Office noted that discrepancy and recorded an expectation that additional funds would be sought during FY 1981. RFF has been spending at a rate that will result in exhaustion of funds by the end of May 1981.

(e) At this point, DS/EY believes it is of paramount importance for RFF to concentrate on producing output from contract studies and in-house efforts currently in progress, and to limit new subcontracts to only those few already identified, designed, approved and ready to go. They include community forestry studies in Tanzania and Upper Volta, and an industrial conservation study in India. Full evaluation of the RFF subproject should be undertaken at the end of the FY 81 extension.

(f) DS/EY also believes that RFF should focus during the remainder of FY 81 on the development of mechanisms for dissemination of its research results. RFF has begun planning for publication of several books and for seminars at which policy-makers can discuss RFF research results as they pertain to energy/development problems such as rural electrification programs. DS/EY would encourage these efforts and proposes to direct RFF to expand part of its supplementary FY 81 funding for that purpose.

In light of the above conclusions, DS/EY is proposing to amend the RFF Cooperative Agreement to add $275,000 for activities this year.

DS/EY has received a large number of requests from AID Missions for energy planning assistance studies (assessments) under this project during FY 81. Those requests include:

(a) Tunisia. USAID/Tunisia has requested (and DS/EY has agreed, assuming approval of this project extension) that DS/EY expand its support for Tunisian energy demand analysis to include the transportation and agriculture sectors as well as industry. This would round out AID's sectoral demand studies to include all sectors of the Tunisian economy. (The Near East Bureau is funding studies of energy use in rural and urban households and the commercial/institutional sector.) The major focus of these sectoral studies is institution-building. As requested by the Ministry of National Economy of the Government of Tunisia, the studies will be carried out jointly by Tunisian and American researchers and will have as

their primary goal the development of energy planning capability within the Tunisian government. DS/EY funding of the transportation and agriculture studies would cost approximately $325,000 in FY 81 funds, with about $25,000 of that to be used for statistical support services to be provided by the U.S. Bureau of the Census under an AID/BUCEN RSSA.

(b) Liberia. The Government of Liberia has requested AID participation and partial funding of an energy planning assistance program. The full program would be implemented cooperatively by DS/EY, USAID/Liberia, the World Bank and the Government of Liberia. DS/EY's contribution would be approximately $150,000 in FY 81 funds, and would provide technical assistance for the development of a national energy plan. DS/EY provided the Mission with the services of Development Sciences, Inc. in July 1979 under an IQC to survey the Liberian energy situation and make recommendations regarding possible AID energy assistance in Liberia. The planning assistance now being requested by USAID/Liberia would implement some of those recommendations.

(c) Togo. The Ministry of Planning of the Government of Togo, in cooperation with the Ministry of Public Works and Energy, has requested AID assistance for a two-part national energy study to be carried out jointly by U.S. and Togolese researchers and energy policy planners. The first phase would be a broad study of energy resources, needs and policies in Togo. The second phase would concentrate on renewable resources as future sources of energy supply. The proposed study has been strongly endorsed by REDSO/WA, and the AID Mission in Lome has requested DS/EY funding for the effort, which it estimates would cost between $250,000 and $300,000. A visit by DS/EY staff in February has resulted in a preliminary study design, but a final decision on DS/EY funding is not expected before June.

(d) Malawi. The Malawi government has recently created an energy task force within the Office of President and Cabinet, and has requested AID assistance in developing the energy planning capability of that task force. A preliminary trip to Malawi by a consultant resulted in the identification of specific tasks that might be undertaken by AID, including the establishment of an energy data system, and an inventory of energy needs and resources. Data would be gathered to serve the purpose of energy planning and policy making. The World Bank is also considering energy assistance to Malawi, and both USAID and the GOM are committed to a cooperative AID/IBRD approach. In FY 1981, this effort is expected to be relatively small, and similar in scope to the FY 80 effort in Guyana; estimated commitment level is $20,000.

(e) Morocco - The Government of Morocco and the USAID Mission in Rabat have requested the statistical services of the Bureau of the Census in support of a household energy survey to be included in the existing national energy planning study. This effort, to be funded through the AID/BUCEN RSSA, is expected to cost about $30,000.

A budget for this project in FY 81 and FY 82 follows. It is understood that authorization of project extension and approval of FY 81 and FY 82 funding does not necessarily imply approval of the candidate country-level activities, which will be reviewed further on a case-by-case basis.

ESTIMATED BUDGET

FY 1981

Resources for the Future	$275,000
Tunisia	325,000
Liberia	150,000
Togo	150,000
Malawi	20,000
Morocco	30,000
TOTAL	$950,000

Recommendation: That you signify your approval of an extension and funding of $950,000 in FY 1981.for the Energy Policy and Planning Project (936-5703) by signing the PAF (attached as Appendix I).

Attachment:
Project Authorization and Request for Allotment of Funds

W. Ramsay
Revised Draft
March 19, 1981

DRAFT

Proposal

EXTENSION OF THE ARDEN (AID-RFF DEVELOPMENT AND ENERGY) COOPERATIVE AGREEMENT WITH AID FOR AN ENERGY POLICY AND PLANNING STUDIES PROGRAM

Introduction

Resources for the Future proposes here to extend an existing ARDEN cooperative agreement with AID to carry out a program of policy and planning studies on energy issues in developing countries. The original cooperative agreement, entered into September 1, 1979, is due to expire August 31, 1981. In addition, the original funding for the cooperative agreement, according to the proposal submitted by Resources for the Future and accepted by the AID Office of Contract Management, was to cover only the 18 months of operation from September 1, 1979 through February 28, 1981.

This proposal therefore seeks to extend the cooperative agreement through September 30, 1982, and to secure incremental supplementary funding for the balance of FY 81.

This proposal is made by RFF in the belief that the existing agreement for cooperation has served its original main purpose of advancing the goals of AID in developing a better energy assistance

program while helping RFF consolidate and extend its existing capabilities for analyzing developing country energy issues. In addition, it is clear that the existing program has succeeded in gaining the active participation of research institutions in LDC's and that an extension of the program would continue to help develop expertise within the developing areas themselves to improve national energy planning and policymaking. Finally, the interaction of RFF with a number of LDC institutions and governments and with A.I.D. headquarters and field missions has helped and should continue to help develop new avenues for the exchange of energy data, analytic methods and other relevant information among world energy analysts.

Goals of the ARDEN Program

The research done under this project has been aimed at providing new data and analyses of specific energy concerns, thus contributing to a greater understanding of energy and development issues in general. It has also sought to improve the background information available to LDC energy policy planners and to the staff of AID, other government agencies, and international donor institutions. It has also, as noted above, been designed to develop the capabilities of LDC energy analysts and has contributed to data and idea exchanges among analysts and planners in various developing countries. Among the specific issues treated in the ARDEN work are the role of renewable resources in satisfying LDC energy supply needs, the nature of energy demand and conservation possibilities,

and the interaction of energy sector plans with broader economic development strategies.

Review of ARDEN Activities Carried Out with FY 79-80 Funds

The operations to date, funded by FY 79-80 appropriations, have supported an RFF study team comprising two (originally three) senior researchers, one economist and one sociologist at the doctoral level, and research and clerical staff. Numerous subgrants have also been made to LDC researchers. The work has centered on three project areas: (1) rural electrification evaluation, (2) energy conservation, inter-fuel substitution, and other energy demand areas, and (3) selected problems in biomass energy policy research.

The level of effort on the project has built up gradually. A key part of the ARDEN effort lies in grants and contracts to institutions and consultants in developing areas. Negotiation of these efforts at long distance inevitably takes a good deal of time, and it has been necessary to coordinate the build-up of in-house efforts with our outside contracts in LDC's. Current indicated levels of effort have reached about 1200 man-hours monthly.

Progress has been fastest in the field of rural electrification, where pre-existing RFF research had identified promising areas of study and likely collaborators. Substantial progress has also been made in the field of energy demand, where advantage has been taken of the keen interest already existing in many developing areas in studying conservation

possibilities in industries and other sectors. In the field of biomass, efforts have been made to identify key research gaps in this field, and RFF staff have proceeded carefully in trying to select useful problems that can be studied on as rigorous a scientific basis as possible.

Dissemination of ARDEN Results

The ARDEN studies and their results will be disseminated by the formal and informal publication of papers and books, informal contact with other researchers and with policymakers around the world, and--perhaps at a later stage, resources permitting--the holding of formal seminars or workshops.

The analytic and methodological studies produced by the RFF staff or the ARDEN project will normally first be circulated by informal means. However, a good many of them will also be treated to a more formal process of dissemination through the new RFF working paper series. This series will use informal reproduction processes, but a standardized format and list of subscribers. The case studies produced by developing area institutions and other consultants for the project will also normally come out as working papers. However, some of them will probably be published also as RFF research papers. RFF research papers are printed by offset from typescript, but are otherwise treated by libraries and other research institutions as books.

The final ARDEN studies will normally be submitted for publication as RFF research reports or as RFF books. RFF books, which are published for Resources for the Future by the Johns Hopkins Press, have a well-established reputation in the field of resource economics as standard references in the field of resource policy research.

In practice, RFF will in effect carry out an informal communication of RFF research results all over the world through its wide network of contacts throughout the world, and its participation in such programs as the International Communication Agency tours, the Visitors Program Service, and other government agencies. Should resources permit, at a later stage of the program, it might be desirable to hold formal seminars and workshops to acquaint LDC policymakers and researchers with the ARDEN research results and to explore research topics of interest to all developing nations.

Progress on Institution-building Aspects

Although most of the studies subcontracted to LDC institutions under this program are still in early or intermediate stages, the results already appear promising with respect to institution building and development of a collaborative network of researchers overseas. In particular, the ARDEN project has helped the Administrative College of India in Hyderabad expand its considerable potential in the field of energy analysis. Furthermore, other valuable contributions to energy planning in India should result--through, for instance, the retention as a consultant on this project of Dr. Lalit Sen, on leave from his post as Chief Evaluation Research Officer of the Rural Electrification Corporation (India).

The ARDEN program has also helped solidify information contacts between the Instituto SER ("SER" is not an acronym) and CEDE (Centro de Estudios sobre Desarrollo Economico) groups in Colombia where our studies on rural electrification and on conservation promise to benefit from related efforts we have brought together. Furthermore, in Ecuador, a rather modest ARDEN subcontract has made it possible for a very able analytic group at the National Energy Institute to realize more of its potential for theoretical analysis by making possible a survey of industrial energy use and conservation possibilities. Similarly, in Costa Rica, an ARDEN subgrant has given support to researchers at the University of Costa Rica in helping them to make solid analytical contributions to the ongoing debate there on the effects on the Costa Rican agricultural sector of the present extensive national program of alcohol fuels.

Review of Work on ARDEN Subprojects

The ARDEN subprojects are briefly described here. Expenditures by subprojects are reviewed in the "Costs" section below.

Rural Electrification Subproject

Nature of Subproject and Expected Output. Past research on the impact of rural electrification on development has led to contradictory conclusions. Critics claim that rural electrification, given current weak electricity demand in developing countries, is often too expensive, does not benefit all social classes equitably, and has no significant impact on agricultural or industrial development. By contrast, advocates of rural electrification argue that investments in electricity infrastructure

rural-urban migration, increasing agricultural production, and generally improving the quality of life in rural areas.

The RFF ARDEN team is examining the effects of rural electrification in India in 96 village-level studies, supplemented by selected household surveys in 24 villages. Among the main questions addressed in the surveys is the long-term consequences of rural electrification in increasing agricultural production and stimulating growth of rural industries. A further very important goal of the study is to examine the social effects of rural electrification on the community--for example, on income distribution and tendencies toward rural out-migration. The research will also evaluate complementary inputs to rural electrification, including roads and access to change agents such as extension services. Finally, the question of the real opportunity costs of rural electrification, apart from subsidy measures, is being investigated in the context of a limited comparison of rural electrification with alternative energy sources.

The reports on individual studies that are part of the subproject will be given distribution as working papers and will be synthesized in the form of an RFF research report or book. This would give guidance to energy planners in developing areas and to AID and other donors by delineating as clearly as possible the type of economic and social results that can be expected from rural electrification projects.

Status. RFF has been exceedingly fortunate in gaining access to existing earlier surveys of villages in India, and has contracted with

two outstanding research organizations in India, the Operations Research Group at Baroda and the Administrative Staff College in Hyderabad, to resurvey villages previously surveyed in 1966 to try to trace the effects of subsequent rural electrification.

A comparable study has been undertaken under an ARDEN subgrant with the Instituto SER in Colombia.

Reports on the Indian case studies, "Benefit-Cost Problems in Rural Electrification", by R. K. Pachauri and others, and "Socio-Economic Impacts of Rural Electrification in India", by B. B. Samanta and others, should be available, respectively, in May 1981 and in July 1981. The report on the Colombia study, "Rural Electrification Impacts in Colombia", by Eduardo Velez and others, should be delivered by November 1981.

These case studies of course will also be utilized as part of the overall in-house analysis of this problem (see "Plans for the Remaining Part of FY 81" below).

Energy Demand Subproject

Nature of Subproject and Expected Output. The need for data on energy demand in developing countries is critical if energy policymakers are to be able to plan for future energy supply needs. The RFF team has picked out several areas where it believes that maximum payoffs can be obtained for policymaking in the near future. For example, as part of developing a general understanding of how energy demand may or may not change as development proceeds, studies of interfuel substitution have already been carried out. In addition, studies of energy demand in specific sectors

of the economy have been undertaken. The initial emphasis has been on the industrial sector, with some study now also being directed to the transport sector.

The outputs from this study will be geared to understanding industrial (and transport) energy use in developing areas in such a way that opportunities for energy conservation can be identified. It is believed that timely efforts at increasing energy efficiency in developing areas can be by far the most cost-effective way of meeting energy demand at the margin. The RFF reports will be directed toward giving guidance to AID and other donors as to what kind of technical assistance can be of most use in conserving energy in developing areas.

Status. RFF has taken advantage of several general demand studies to be carried out in developing areas by funding the parts of these studies of relevance to the RFF program. In at least one case this partial contribution by RFF has made possible the implementation of the entire study. Studies have been completed in Kenya and are well underway in Colombia and in Ecuador. The report on Kenya is now available in a very rough draft form (see "Documentation"); the report should be available in a final draft in May 1981. The report on Ecuador "Industrial Energy Use in Ecuador" by Eduardo Moran F., Pedro Vernet, and others, will be available also in May. "Energy Use Patterns in Colombia" by Jose Eddy Torres and others, the report on the Colombia study (which includes work financed by other agencies on energy demand in general), will be available in October 1981.

An RFF analytic study (see "Documentation" heading below) of inter-fuel substitution used available data to document the changing relative usage patterns between fuels such as coal and oil on the one hand, and between commercial and traditional fuels on the other. A related case study contracted with Professor Ashok V. Desai of Trivandrum explored the Indian experience in this area. An in-house RFF analytic study has also been carried out on energy conservation in the industrial sector in developing countries. These studies are available now (see "Documentation" below).

A beginning has also been made in the study of energy conservation in transportation. A report from a consultant on energy transportation in Brazil is now available (see "Documentation" below).

The various case studies mentioned will also be used as inputs to in-house analyses (see "Plans for the Remaining Period in FY 81" below).

Biomass Subproject

Nature of Subproject and Expected Output. The biomass program subproject deals with three main study areas. First of all, the RFF team has been investigating the macroeconomic aspects of alcohol fuel programs, especially with regard to Brazil. In particular, the food versus fuel problem is being studied to trace the effects of diverting agricultural production to energy crops both on food prices and on energy prices themselves.

The alcohol studies will produce reports describing a methodology for analyzing the effect of an alcohol fuel program on national agricultural sectors in general and on key national macroeconomic variables. While a definitive quantitative analysis of these issues is beyond the scope of the ARDEN effort--and may indeed be beyond the power of any present economic models--the ARDEN staff believes it is essential that countries now planning to invest in the alcohol option should have the best information available. This information would then be of critical importance to AID in considering technical assistance in the field of alcohol fuels. The effect of fuel alcohol industries on balance of payments is now being studied; an analysis of employment effects is scheduled for the near future.

The other two study areas deal with afforestation. The possibility of combining conventional saw timber and pulp production with fuelwood or charcoal production for local or distant fuels markets is being considered for commercial plantations in developing areas. The other study area deals with the organizational aspects of community forestry programs, and is an attempt to identify the causes of their failures and successes as related to local social factors and to national forestry policies.

The forestry-related studies will lead to reports on the critical economic and non-economic factors in both commercial and community or individual afforestation schemes. These factors should be of use to AID in designing technical assistance projects for afforestation. As this study area progresses, it is planned to draw comparisons between

commercial and community schemes so that donor agencies can better assess the advantages and drawbacks of these two alternative ways of dealing with biomass energy opportunities--and with the overall problem of deforestation in LDC's.

Status. Support has been given to researchers at the University of Costa Rica to model the effects of alcohol policy options on the agricultural sector in the northeast portion of that country. A report on this work "La Politica del Alcohol Carburante y sus Efectos en el Sector Agricola", by R. Celis U. and J. M. Villasuso, will be available in August 1981. In addition, some limited consultancies have been contracted for in this area in order to devise simple analytic methods for the general treatment of these complex problems.

Several in-house studies have been prepared on the alcohol question and on the forestry study areas (see "Documentation" below). Several LDC case studies in these areas have also been proposed under incremental FY 81 funding (see below).

Documentation of ARDEN Project

The following are the titles of completed documents on ARDEN problem areas. They are of four types, as explained below.

Study Design Documents

The study design document outlines the plan of action for the investigations in ARDEN subproject areas. It normally will incorporate by reference relevant analytic and methodological studies and will describe planned and ongoing case studies.

Biomass Area:

1. Charcoal Transport Networks and Charcoal Kilns

2. The Environmental Impact of Forest Management in Selected Watersheds

3. Macroeconomic Effects of Alcohol Fuels Industry

Energy Demand and Conservation Area:

1. General Energy Demand and Conservation Studies

2. Industrial Energy Conservation Studies

3. Transportation Energy Conservation Studies

Rural Electrification Area:

1. Rural Electrification and Socioeconomic Development

Analytic Studies

Analytic studies are in-house reviews and analyses of existing data. They may be designed to explore the possibility of a more detailed investigation—that is, they may constitute a "mini-study." Alternately, they may provide contributions to a full-fledged ARDEN study.

Biomass Area:

1. Oil Imports, Foreign Exchange and the Brazilian Alcohol Program: Some Preliminary Observations by Shafiqul Islam

2. Sugar or Alcohol? A Billion Dollar Brazilian Question by Shafiqul Islam

Energy Demand and Conservation Area:

1. Factors Affecting the Composition of Energy Supplies in Developing Countries by Joy Dunkerley and Gunnar Knapp with Sandra Glatt

2. Industrial Energy Conservation in Developing Countries by John E. Jankowski, Jr.

Methodological Studies

Methodological studies are developments of methodologies or other theoretical formulations that will be used in ARDEN subproject investigations.

Biomass Area:

1. Charcoal Industry Location and Transport Study by Julia C. Allen
2. Modeling the Environmental Effects of Forest Management in a Watershed: A Multiobjective Approach to Forest Management for Developing Countries by Julia C. Allen
3. A Simple Analytic Model for Agricultural Price Impacts Due to Alcohol Fuels Programs by Donald Hertzmark, William Ramsay and Stephen Polasky
4. Social Forestry in Developing Countries by Julia C. Allen and Douglas F. Barnes

Rural Electrification Area:

1. Specification of Rural Electrification Analysis by Douglas F. Barnes

Case Studies

Case studies are investigations carried out in specific developing areas by consultants or developing area institutions. They will normally contribute heavily to the final reports on ARDEN studies.

Energy Demand and Conservation Area:

1. The Brazilian Transport Sector: Historical Background and Assessment of Conservation Possibilities by Alan Poole
2. Energy Conservation in Kenya by Lee Schipper et al.
3. Inter-fuel Substitution in the Indian Economy by Ashok V. Desai

Candidate Project Papers

Candidate project papers are brief—or sometimes longer--reviews of a potential study area with suggestions for a possible future ARDEN subproject. They are intended primarily as briefing material for the ARDEN Advisory Committee.

1. Direct Biomass Combustion Potentials for Industrial and Electric Generation Applications in LDCs by Scott Noll

2. LDC Coal Production, Importation, and Use--Issues and Strategies by Scott Noll

Summary of Existing LDC Subprojects and Principal Consultants Funded Under ARDEN

The attached charts detail existing ARDEN subcontracts in rural electrification, energy demand and conservation, and alcohol fuels. (Proposed forestry studies are discussed below.)

	INSTITUTION	CONTACT/PRINCIPAL INVESTIGATOR	AMOUNT	DATES	STATUS: Exploratory	Proposal Received	Contract Signed	Government Clearance	REMARKS
...a	Instituto SEM de Investigación (SEM)	Eduardo Velez	$40,000	Jan. 1, 1981-Sept. 1981	X			N.A.	Socio economic impact survey of 90 "villages"; economic supply studies.
	Administrative Staff College of India (ASCI)	R. K. Pachauri	$16,500	Sept. 1, 1980-March 1981	X	X	X	X	Examination of benefit cost ratios of rural electrification in financial and social terms.
	Operations Research Group (ORG)	B.N. Gosaain	$27,000	Sept. 1, 1980-May 1981	X	X	X	X	Socio economic impact survey of 96 villages.
	Harvard Institute for International Development (HIID)	Lalit Sen (Consultant)	$ 4,400	Jan. 21, 1980-July 1981	X	X	X	N.A.	Long-term consultant for India. Rural electrification project.
	HIID	Lalit Sen	$15,000	Jan. 1, 1981-July 1981	X	X	X	N.A.	Will analyze household survey from 24 villages in the larger ARDEB project
...ia	HIID	Glenn Jenkins	$ 5,000	May 5, 1980-Nov. 1980	X	X	X	X	Grant in part of a larger study to evaluate the microeconomics of rural electrification in Malaysia.

not applicable

[illegible]NT	[illegible]	CONTACT/PRINCIPAL INVESTIGATOR	AMOUNT	DATES	STATUS				REMARKS
					Exploratory	Proposal Received	Contract Signed	Government Clearance	
[illegible]711	(Consultant)	Alan Poole	$ 9,000	June 1, 1980-Aug. 1981	X	X	X	N.A.	Conservation possibilities in Brazilian transport sector.
[illegible]ndia	Centro de Estudios Sobre Desarrollo Economico (CEDE)	José Eduardo Torres	$19,714	Sept. 1, 1980-Aug. 1981	X	X	X	X	Rural industry and energy producers.
[illegible]ndes	Instituto Nacional de Energia (INE)	Eduardo Borán	$ 7,000	Sept. 1, 1980-Feb. 1981	X	X	X	X	Summary of energy use and related output of 800 industrial enterprises.
[illegible]ya	Lawrence Berkeley Laboratory	Lee Schipper	$71,700	July 1, 1980-June 30, 1981	X	X	X	X	Study of industrial energy demand and conservation in Kenya.

[illegible] not applicable

[illegible]	[illegible]	Contract/Principal Investigator	Amount	Dates	Status: Exploratory	Status: Proposal Received	Status: Contract Signed	Status: Government Clearance	Remarks
[illegible]	(Consultant)	Donald Hertzmark	$ 6,000	Jan. 1980-Aug. 1981	x	x	x	N.A.	Agricultural sector modeling.
[illegible]	(Consultant)	Alan Poole	$ 4,700	June, 1980-Aug. 1981	x	x	x	N.A.	Agricultural impacts.
	(Consultant)	Pierre Jacques Hellich	$ 1,600	Dec. 15, 1980-Dec. 15, 1980	x	x	x	N.A.	Balance of payments aspects.
[illegible] Rica	Instituto de Investigaciones en Ciencias Económicas (IICE), Universidad de Costa Rica	Juan Manuel Villasuso	$21,500	Jan. 1, 1981-June 30, 1981	x	x	x	N.A.	Collections of data and analysis on the effects of an alcohol fuel program on balance of payments in Costa Rica.
[illegible]	(Consultant)	Ramesh Bhatia	$ 5,000	Jan. 29, 1981-Aug. 11, 1981					Fuel alcohol from agro products in India.

[illegible] - not applicable

Plans for the Remaining Period in FY 81

Supplementary support is requested in this proposal for the remainder of FY 81. The original funding, from the FY 79-FY 80 budget, was projected in the RFF proposal to last eighteen months. Current projections indicate that these funds can actually cover twenty months, so that support for approximately 6100 man-hours more for the five months remaining, through September 30, 1981, is requested (see "Costs" below).

The activities planned for the remainder of FY 81, to be supported by these supplementary funds, are summarized below for the various ARDEN study areas. The budgets for each subproject are given in more detail in the "Costs" section, showing plans for spending existing funds and for requested supplemental funds.

Rural Electrification

An analysis of the baseline data from the 1966 survey is proceeding, and will form a large part of in-house work for the remainder of the fiscal year. In addition, results from the studies in India and preliminary results from Colombia are expected to arrive during this period and will require extensive in-house analysis. A continuous level of effort involving ten percent of the time of a Senior Fellow and eighty percent of the time of a Fellow is anticipated during the remainder of FY 81.

In addition to in-house expenses, $10,000 is requested to add the state of West Bengal to the existing Indian analysis. This addition should help to satisfy some of the concerns of members of the Advisory Committee as to data adequacy and is therefore strongly recommended.

A preliminary report on the rural electrification problem, "A Preliminary Analysis of the Effects of Rural Electrification in India" by Douglas Barnes, William Ramsay, and others, will be finished in September 1981.

Energy Demand

The industrial energy conservation effort will be continued during this period. The results of the Kenya and Ecuador studies will be combined, together with the existing in-house analytic study, to produce a document in September 1981: "Preliminary Analysis of Industrial Energy Use Patterns and Conservation Possibilities in Developing Areas", by Joy Dunkerley, John Jankowski and others.

As far as additional grants during FY 81 are concerned, a proposal from the Administrative Staff College of India, currently before the Indian government for approval, would add an important new dimension to our industrial conservation work. It would examine trade-offs between capital, labor and energy factors in the Indian context. This case study, with the provisional title "Conservation Possibilities in Manufacturing Industries in India", by R. K. Pachauri and others, could be completed in FY 81 if started promptly, producing a draft report by the end of the fiscal year. Therefore, $12,000 for this study is included in the cost requests below.

In addition, through no technical fault of the subcontractor, the report on the Kenya investigation has been delayed and some overruns have occured. Due to the groundbreaking nature of this study of the details of industrial and commercial energy structure in a developing country, we are requesting new FY funds of $5,500 to cover this overrun.

Additional work has begun in exploring the consequences and possibilities for energy conservation in the transport sector. Analyses of potential changes in the auto fleet, observed modal switching, (e.g., auto to bus), etc. are being made. This work, carried out through consultants, will also be followed up during the rest of FY 81. A case study will be finished on this problem by July 1981: "Freight and Urban Passenger Transport in Brazil: Development and Conservation Possibilities" by Alan Poole. In addition, an in-house analytic study will be completed by August 1981: "Energy Use and Conservation in Transportation in Developing Countries", by Scott Noll.

An estimated level of effort of about 40 percent of the time of a Senior Fellow and about 100 percent of the time of a Fellow (equivalent) plus necessary research assistant time, will be devoted to this area during the rest of FY 81.

In-house work on the connection between energy and development will also be undertaken. Efforts will be made to connect type of export and domestic-goods strategies with type and quantity of energy use. A report on this work, "Energy Implications of Development Strategies", by John E. Jankowski, Jr. would be available in August 1981.

Biomass

In-house work will continue in three areas: alcohol, community forestry and plantation forestry.

For the alcohol work, we anticipate shortly receiving some data on macroeconomic effects of alcohol programs from our subproject in

Costa Rica. This information will supplement earlier in-house work and reports from consultants in Brazil on balance of payments aspects. When the results of agricultural sector calculations are received later in the fiscal year, these will also be subjected to in-house analysis.

The community forestry work will deal with information supplied, we propose, by two new projects, one in Tanzania for $26,000, now before AID for approval, and another one in Upper Volta for abour $20,000. (The Upper Volta project will replace a project proposed earlier for Korea.)

On the basis on these projects, we believe that an interim report on how and why community forestry projects do or do not work can be prepared during early FY 82. We therefore suggest an allotment of $46,000 from new FY 81 funds for these projects.

In the field of plantation forestry, work will be mainly restricted to in-house efforts plus possibly some small consultant contracts. However, some beginning will be made on establishing a documented methodology for treating the critical environmental question of the effects of intensive harvesting of forestry plantations for wood fuels.

The level of effort in this area will be about 40 percent of the time of a Senior Fellow, about 80 percent of the time of a Fellow (equivalent) for the remainder of the year, plus extensive research assistant effort.

The FY 81 products of this work should be a draft final report, "Macroeconomic Consequences of Alcohol Fuels" by W. Ramsay, Scott Noll, and others, on the alcohol problem, a draft of key sections of a study on community forestry, and a preliminary study, "Preliminary Analysis of Environmental Impacts of Energy Forestry Management" by J. C. Allen,

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Project Structure

The general nature of the studies to be carried out will, as in the existing cooperative agreement, be determined cooperatively by RFF and AID. RFF will have the responsibility for drafting the design of individual study areas. An existing Advisory Committee includes, in addition to AID and RFF representation, representatives of foundations interested in international energy issues, representatives of international organizations, and scholars from the academic world. This committee will be consulted at semi-annual meetings on project selection and design. Preliminary in-house studies will be prepared analyzing and reviewing key policy areas, as a guide to final study design. RFF will continue to establish collaborative relationships with institutions and individuals in developing areas to carry out studies or parts of studies in tandem with the RFF staff. RFF will submit proposals for such subgrants or subcontracts to the AID Office of Energy for its approval before final implementation.

RFF Capabilities

RFF has done substantial innovative research and analysis in both conventional and non-conventional energy. Its Center for Energy Policy Research (CEPR), directed by Milton Russell, examines all aspects of energy policy, as spelled out in more detail in the attached RFF annual report for FY 80. The Center can also call for support on the other divisions of RFF: Quality of the Environment and Renewable Resources.

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RFF has been a pioneer in every aspect of energy research, ranging from initial efforts during the 1950's to the recent Energy in America's Future. It has also done extensive research on developing country energy use, work which has been supported by the World Bank, State Department and Ford and Rockefeller Foundations, in addition to AID. Some especially relevant publications are:

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Books:

Cecelski, E., J. Dunkerley and W. Ramsay, Household Energy and the Poor in the Developing World, Research Paper R-15 (Washington, D.C., Resources for the Future, 1979).

Dunkerley, J., W. Ramsay, L. Gordon and E. Cecelski, Energy Strategies for Developing Nations, (Baltimore: Johns Hopkins University Press for Resources for the Future), April 1981.

Ramsay, W., Unpaid Costs of Electrical Energy: Health and Environmental Impacts from Coal and Nuclear Power (Baltimore, Johns Hopkins University Press for Resources for the Future, Inc., 1979).

Schurr, S., J. Darmstadter, H. Perry, W. Ramsay, and M. Russell, Energy in America's Future: The Choices Before Us (Baltimore, MD, Johns Hopkins University Press for Resources for the Future) August 1979.

Dunkerley, J., Trends in Energy Use in Industrial Societies: An Overview (Resources for the Future, Washington, D.C., 1980).

Darmstadter, J., J. Dunkerley and J. Alterman, How Industrial Societies Use Energy: A Comparative Analysis, published for Resources for the Future by the Johns Hopkins University Press, 1977.

Ramsay, W., Alcohol Fuels and Developing Countries, Research Paper X (Resources for the Future, Washington, D.C., submitted 1981).

Articles and Chapters:

Cecelski, E. and W. Ramsay, "Proespects for Fuel Alcohols from Biomass in Developing Countries", paper presented at the United Nations Conference on Long Term Energy Resources, Montreal, 26 November - 8 December 1979.

Ramsay, W., "The Alcohol Fuels Option in the Third World", Energy Journal, vol. 2, no. 1 (1981) pp 99-103.

Dunkerley, J. and Andrew Steinfeld, "Adjustment to Higher Oil Prices in Oil Importing Developing Countries", Journal of Energy and Development, Spring 1980.

Cecelski, E. and J. Dunkerley, "Energy Use in the Rural and Urban Household Sectors of Developing Countries" in Proceedings of an International Workshop on Energy Survey Methodologies for Developing Countries, National Academy of Sciences, 1980.

Dunkerley, J., "International Energy Data and Information," in Energy Information: Description, Diagnosis, and Design edited by William W. Hogan.

Darmstadter, J., J. Dunkerley and J. Alterman, "International Variations in Energy Use," in Annual Review of Energy, vol. 3, 1978.

Dunkerley, J., "Estimation of Energy Demand and Conservation in the Developing Countries" Paper to be published in forthcoming Proceedings of IAEE Conference on International Energy Issues--the Next Ten Years.

Dunkerley, J., "Energy Conservation: potential and policies" published in Proceedings of Second Workshop of Western Hemisphere Energy, pp 125-132, sponsored by the Banco de Bogota and Universidad de los Andes in co-operation with the MITRE Corporation September 1979.

Dunkerley, J. and J. E. Jankowski, Jr., "The Real Price of Imported Oil", The Energy Journal, July 1980, pp 113-118.

Jankowski, J. E., Jr., "Future Energy Requirements for Implementing Basic Human Needs", University of Oklahoma's Review of Regional Economics and Business, October 1980, pp 28-33.

Noll, S., "A Minimum Benefits Analysis of Residential Passive Solar Sunspace Designs", technical paper, 5th National Passive Solar Energy Conference Proceedings, Amherst, MA, October 1980.

Noll, S., "Economic Analysis", Chapter H of the DOE Passive Solar Design Handbook, Volume 2: Passive Solar Design Analysis, Department of Energy Report DOE/CS-0127/2, January 1980.

Noll, S., J. F. Roach and L. Palmiter, "Energy Planning with Solar and Conservation: Individual Values and Community Choice", Proceedings, ISES Silver Jubilee Congress, Atlanta, Georgia, June 1979.

This expertise has of course been greatly expanded in the area of LDC energy and policy analysis by the existing AID ARDEN Cooperative Agreement. ARDEN activities and reports are detailed elsewhere in this proposal. Also, as a result of this Cooperative Agreement, important working relationships have been established between RFF and institutions in developing areas. The institutions specifically involved in current RFF studies are indicated elsewhere in this proposal. In addition to such LDC institutions, RFF has established relationships with important international budies in the field of energy, such as the Latin American regional energy institution OLADE, the Science Policy Research Institute at the University of Sussex (U.K.), the International Institute for Applies Systems Analysis (Laxenburg, Austria), the International Energy Agency (Paris), the Food and Agricultural Organization (Rome), among others.

Project Staff

The principal investigators on the project will continue to be Joy Dunkerley and William Ramsay. Their resumes are appended. Other RFF senior staff members may be utilized if and when appropriate.

Dr. Ramsay will be the RFF project officer and AID point of contact for the Cooperative Agreement.

Supplemental FY 81 Costs and Levels of Effort

The estimated project costs for the 5 months remaining funding requested for FY 81 are given in detail in table 1 below. These requests include an additional level of effort of approximately 3.9 man-years for FY 81. In addition, they call for a supplementary requests of $73,500 for additional subgrants during FY 81.

The costs are also broken down by project sub-area: Rural Electrification, Energy Demand and Conservation, Biomass, and General Support.

Details of some of the cost estimates are given in footnotes.

Table 2a gives an account of existing funds expended by subproject area through December 31, 1980, the last period for which full accounting is available. Estimated monthly in-house costs during the second and third quarters of FY 81 are also shown. Finally, a reconciliation of total funds spent and those still available are compared to outstanding subgrant obligations, giving the total available to defray costs in FY 81. According to these projections, funding will last through about May 1981.

Table 2b projects the usage of supplemental FY 81 funds requested.

Table 3 recaps ARDEN expenditures so far and projected total costs for FY 79 through FY 81.

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Table 1. Supplemental FY 81 Budget, By Subproject Area

Staff Member[a] and Other Expense Categories	FY 81 Rate per Person Month	Rural Electrification % time	Rural Electrification Person[c] Months	Rural Electrification $	Energy Demand and Conservation % time	Energy Demand and Conservation Person[c] Months	Energy Demand and Conservation $	Biomass % time	Biomass Person[c] Months	Biomass $	General Support % time	General Support Person[c] Months	General Support $	ARDEN Totals[b] % time	ARDEN Totals[b] Person[c] Months	ARDEN Totals[b] $
Senior Fellows:																
William Ramsay	4,865[d]	10	0.4326	2,105				40	1.7304	8,418	25	1.0815	5,262	75	3.2445	15,785
Joy Dunkerley	3,641	40	1.7304	6,300							10	0.4326	1,575	50	2.1630	7,875
Fellows:																
Douglas Barnes	2,136	80	3.4608	7,392				20	0.8652	1,848				100	4.3260	9,240
Gunnar Knapp	1,942				70	3.0282	5,881	30	1.2978	2,520				100	4.3260	8,401
Scott Noll	2,913				20	0.8652	2,520	20	0.8652	2,520	10	0.4326	1,260	50	2.1630	6,300
Harvey Broadman	2,330				80	1.3734	3,200	20	0.3433	800				100[e]	1.7167	4,000
Research (and Administrative) Assistants:																
Marilyn Heding	1,561										100	4.326	6,762	100	4.326	6,762
John Jankowski	1,680				50	2.163	3,634							50	2.163	3,634
Stephen Polasky	1,481	40	1.7304	2,563	20	0.8652	1,281	20	0.8652	1,281	20	0.8652	1,281	100	4.326	6,406
Elizabeth Shue	1,359	10	0.4326	588	10	0.4326	588	10	0.4326	588	3	0.1298	176	33	1.428	1,940
Julia Allen	1,553							85	3.677	5,710				85	3.677	5,710
Secretaries: (2)	1,286	34	1.471	1,892	33	1.428	1,836	33	1.428	1,836	50	2.1630	2,782	150[f]	6.489	8,346
Total Divisional Labor			9.2578	20,840		10.1556	18,940		11.5047	25,521		9.4307	19,098		40.3482	84,399
Editorial Labor[g]				425			1,275			850						2,550
Total Divisional & Editorial Labor				21,265			20,215			26,371			19,098			86,949
Total Benefits (23.1%)				4,912			4,670			6,092			4,412			20,086
Total Labor plus Benefits				26,177			24,885			32,463			23,510			107,035
Overhead (60.2%)				15,759			14,981			19,543			14,154			64,437
Rent (8%)				2,094			1,991			2,597			1,881			8,563
Computer Services				6,500			500			1,000						8,000
Outside Consultants													2,000			2,000
Conferences and Meetings[h]													1,500			1,500
Travel[i]				2,324			2,386			1,100						5,810
Publications[g]				500			1,500			1,000						3,000
Subcontracts[j]				10,000			17,500			46,000						71,500
Miscellaneous				100			300			300			900			1,800
Total Costs				61,654			64,043			104,003			43,945			275,645

Footnotes to Table 1

[a]Staff member names are given here to show planned allocations of personnel, but this list does not guarantee exact personnel assignments or (except for Ms. Dunkerley and Dr. Ramsay) that specific staff members will be available for the project.

[b]The total dollar amounts are derived by addition from the sub-project amounts, and may differ somewhat from amounts derivable by direct multiplication in the "Totals" column because of rounding errors.

[c]Person months are figured on 10.30 billable months per year, i.e., in the 0.42 year supplemental FY 81 period, there are 4.326 billable person months.

[d]Billed at the rate prescribed by the A.I.D. maximum, equivalent to the Federal Ceiling of $50,112 p. a.

[e]This staff member will not be available until later in FY 81, so his time is "100%" of a smaller total of months.

[f]"150%" means 75% of the time of each of two secretaries.

[g]Editorial and publications costs are based on 600 pages, and are costed at $425 editorial labor per 100 pages and $500 publications costs per 100 pages.

[h]Conferences and Meetings expenses are for Advisory Committee meetings, at about $750 per meeting.

[i]Additional travel for FY 81 is anticipated for necessary consultation with ongoing projects. Estimated expenses are as follows:

Travel:		
Foreign		
2 airfares @ $1500	3,000	
20 days per diem @ 80	1,600	
100 miles ground transportation @ 22.5c	225	
Domestic		
2 airfares @ 200	400	
6 days per diem @ 60	360	
100 miles ground transportation @ 22.5c	225	35,310

[j] The list of subcontracts for which funds are asked are as follows:

FY 81

Tanzania--community forestry (A. Temu, M. Skutsch)	$26,000
Upper Volta--community forestry (R. Winterbottom)	20,000
India--conservation (R. K. Pachauri)	12,000
India--rural electrification supplementary (Samanta)	10,000
Kenya--energy demand supplementary (L. Schipper)	5,500
	73,500

Table 2a. ARDEN Expenditures, Actual and Estimated, From Existing FY 79-80 Funding

Period	Category	Subproject: Rural Electrification	Energy Demand and Conservation	Biomass	General Support	Total
Actual, Sept 1, 1979 – Dec 31, 1980:	Salaries, incl. Benefits	44,834.57	51,010.22	72,442.81	82,951.39	251,239.01
	Overhead, incl. Rent	19,959.94	22,711.50	32,116.02	37,013.15	112,000.61[a]
	Travel	5,530.10	6,279.69	8,608.55	9,811.22	30,229.56
	Other	2,957.60	3,345.88	4,218.07	4,749.19	15,270.74
	Total In-House	73,282.21	83,347.29	117,585.47	134,524.95	408,739.92
	Subgrants	20,298.83	20,914.30	13,000.00	--	54,211.13
	Total	93,581.04	104,261.59	130,585.47	134,524.95	462,951.05
Projection of in-house costs only, for typical month in second and third quarters of FY 81:	Salaries, incl. Benefits	3,210	4,280	6,420	7,490	21,400
	Overhead, incl. Rent	1,444	1,926	2,889	3,371	9,630[b]
	Travel	800	900	500	--	2,200
	Other	330	440	660	770	2,200
	Total Monthly In-House Costs	5,784	7,546	10,469	11,631	34,430

Reconciliation

Original Grant	800,000.00
Spent through Dec 31, 1980	462,951.05
	337,046.95
Subgrants obligated	159,000.00
Remaining for in house costs after Dec 31, 1980	178,046.95

Table 2b. Projection of FY 81 Expenditures From Supplemental (FY 81) Funds Requested

Category	Subproject: Rural Electrification	Energy Demand and Conservation	Biomass	General Support	Total
Salaries, incl. Benefits	26,177	24,885	32,463	23,510	107,035
Overhead, incl. Rent	17,853[c]	16,972[c]	22,140[c]	16,035[c]	73,000[c]
Travel	2,324	2,386	1,100	--	5,810
Other	7,300	2,300	2,300	4,400	16,300
Subgrants	10,000	17,500	46,000	--	73,500
Total	63,654	64,043	104,003	43,945	275,645

Footnotes to Table 2a and 2b

[a]Overhead shown does not include the new RFF overhead rate for FY 81. For Oct 1 - Dec 31, 1981, additional overhead over that bid in the original ARDEN proposal was absorbed from RFF general funds. For the ARDEN project for Oct - Dec 1980, this additional amount totaled $13,787.21.

[b]At the old overhead rate. The new rate would be $4,960 more, making total typical monthly costs $39,360.

[c]Including the new RFF overhead rate (see footnote "a").

Table 1. ARDEN Recap: Total Subproject Costs Projected
(In $ thousand, rounded)

Period	Type of Cost	Rural Electrification	Energy Demand and Conservation	Biomass	General Support	Total
FY 79-80, Actual as of September 30, 1980 (see table 2)	In-house	64.3	72.5	84.5	91.9	315.2
	Subcontracts	16.3	18.3	10.5	--	45.1
	Total	80.6	90.8	95.0	91.9	360.3
All Costs, Projected from Sept 1, 1979 - Sept 30, 1981 (see table 2)	In-house	159.2	174.1	225.1	234.2	792.6
	Subcontracts	110.3	77.8	89.5	--	277.6
	Total	269.5	251.9	314.6	234.2	1,070.2