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Sida-Supported Programme within the African Energy Policy Research Network, AFREPREN

Frede Hvelplund
Ernst Worrell

Department for Research Cooperation, SAREC

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Evaluation Reports may be ordered from:

Infocenter, Sida
S-105 25 Stockholm
Telephone: (+46) (0)8 795 23 44
Telefax: (+46) (0)8 760 58 95
E-mail: info@sida.se, Homepage http://www.sida.se

Authors: Frede Hvelplund, Ernst Worrell.

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SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
Address: S-105 25 Stockholm, Sweden. Office: Sveavägen 20, Stockholm
Telephone: +46 (0)8-698 50 00. Telefax: +46 (0)8-20 88 64
Telegram: sida stockholm. Postgiro: 1 56 34–9
E-mail: info@sida.se. Homepage: http://www.sida.se

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Executive Summary

Launched in 1989, AFREPREN brings together over 100 African energy researchers and policy makers who have a long-term interest in energy research and the policy-making process. AFREPREN is a collective regional response to the widespread concern over the weak link between energy research and formulation and implementation of energy policy in Africa. AFREPREN has initiated and/or participated in energy programmes in 18 African countries mainly in eastern and southern Africa. AFREPREN was conceived on the premise that the countries in Eastern and Southern Africa display many common features in the availability and use of natural resources, environment, demography, land use, economy and trade, and are faced with similar challenges with respect to energy use and supply. The key objective of AFREPREN is to strengthen local research capacity and to harness it in the service of energy policy making and planning. The regional coverage, and participation from various backgrounds, as well as size of the programme makes AFREPREN unique among energy networks in the world.

AFREPREN is since 1994 coordinated by the secretariat based in Nairobi, Kenya. It is run by a lean staff, under the leadership of one director. The Programme of activities, including finances, is supervised by a Steering Committee, consisting of seven members of the region who are elected by AFREPREN's General Assembly. The General Assembly meets annually to review and to evaluate the programme, as well as discuss strategic issues.

The evaluation covers AFREPREN's second Programme. An evaluation is needed to assess the accomplishments of the second programme, set out in the 1994 proposal to SAREC, as well as to assess the new draft proposal to Sida for continued support for the period 1999-2002. The evaluation was primarily aimed at assessing the relevance, appropriateness and performance of the AFREPREN programme, as well as assessing the policy impact, research output and capacity strengthening in the region. The evaluation aimed also to review the sustainability of the network, its coordination and dissemination, and the cost-effectiveness. The evaluation was conducted by an international team consisting of Prof. Frede Hvelplund (Aalborg University, Aalborg, Denmark) and Dr. Ernst Worrell (Lawrence Berkeley National Laboratory, Berkeley, USA).

The core of the second programme of the 1994-1999 AFREPREN Programme consists of six theme groups. Within each theme group several country teams participate in executing studies, varying between regional studies to case-studies. The theme groups are: Institutions, Management and Efficiency, Local and Regional Environmental Impact of Energy, Energy and Climate Change, Capacity Building and Technology, Finance and Markets.

Relevance and Performance

The second programme should be seen in the context of AFREPRENs work in the first programme, which dealt extensively with rural energy problems. This work was continued in a major ongoing AFREPREN research study on renewable energy technologies also funded by Sida. The work performed in all theme groups and of AFREPREN is relevant to the energy problems facing the region. The analysis is generally linked to supply problems in cities. The mainly supply-side-oriented focus of the theme groups is justifiable as a necessary step to establish equal access to energy services. The next steps are more end-user oriented analyses, supporting a process to improve access to sustainable energy services in the rural and urban poor areas. The

theme groups have produced results that can lead to practical policies. The research results are disseminated, especially to policy-makers at the national level. Altogether, the work has fulfilled an important first step in the analysis of regional energy problems in an impressive way. As a result it has become clear that many questions, e.g. the specific political situation and the situation of end users, need further examination to understand the institutional preconditions that determine the success of policies.

AFREPREN is unique in its composition, representation and strong collaboration between the natural and social sciences, and between academic and policy making communities. It is difficult to find an equivalent anywhere in the world. The participation of women reflects the international standard, but needs, as elsewhere in the energy analysis field, increased attention in the future expansion of the network. A balanced approach in the selection of research areas is also key to the future success of AFREPREN. The second Programme already changed focus from supply-side to a more demand side approach. Despite this shift we feel that a strong emphasis on demand side issues in the next research programme, including the various uses of traditional energy, is key in understanding and developing the energy sector in Sub-Saharan Africa, where 80-90% of the population does not have access to modern energy sources, leading to many social and economic problems.

Research Output

The AFREPREN network has succeeded in producing an impressive number of country and regional studies. The quality of these studies is unique, due to the combination of natural- and social sciences, and due to the well documented policy recommendations. The studies are submitted to a peer review process by an international expert panel. The Programme is important in building up and strengthening capacity in energy policy research in the region. In general around 40% of the researchers are affiliated with universities, and 60% with governmental agencies, utilities and private companies.

The variety of subjects and backgrounds of the participating researchers provides a challenge for determining the scope of research themes, as well as management of the network activities. A common framework is currently missing. The wide variety within AFREPREN is the strength of the network, but also poses a challenge to find common ground. This common ground could be an AFREPREN procedure for a systematic description of research aims, theoretical framework and system borders, and data and information collection methodology. We recommend the development and use of a methodological framework within the AFREPREN research activities. It should include a model for policy intervention, and defining the audience of the AFREPREN research activities, as well as the concept of the 'Critical Mass Theory' which is a promising attempt to assess the regional developments in energy policy.

The Programme is important in building up and strengthening of regional capacity in energy policy research. In general the second programme has resulted in considerable build-up and strengthening of the energy policy research capacity in the region. In some of the theme groups this has taken place within governmental and utility institutions in particular, and in one group primarily within the university. The capacity building can be strengthened by increasing the number of Master's and PhD students linked to the programme, especially within the theme groups, which have so far had relatively few university based researchers.

Policy Impact
The policy impact of an individual research programme is always difficult to assess. When looking at the modes of dissemination, the channels used to make an impact on the process of energy policy making, are highly appropriate seen in relation to the aims of the second Programme. Nevertheless it might be useful to include more stakeholders in the policy discussions, by inviting them to seminars and other parts of the programme activities. In this way a necessary educational process could be established both for the participating policymakers and participating researchers. It might also be useful to include more people from the end user level, employees in the energy sector and local and regional governmental officials as well as planners to impact national policies.

Network Sustainability
The AFREPREN network has been established in 1989, and exists now for almost 10 years. The various countries in the region seem to be well represented. Despite the broad regional coverage, the regional coverage may be broadened further, which is dependent on the financial means of the network, as well as the administrative burden associated with such an expansion. The wide distribution of disciplines and affiliations of the people involved in the network is also key to the sustainability of the AFREPREN network. Nevertheless, we recommend strengthening of the collaboration with other regional (academic) institutes. Recent forms of cooperation with institutes outside the region, such as scholarships with UNEP, IEA and Princeton University, are a very good extension of the Programme, and demonstrate the sustainability of the network as a serious partner for these institutes.

Development of a methodological framework will require the use of academically trained participants in the network. We recommend to strengthen the integration of AFREPREN research activities with that of universities and research institutes. Such an integration will help to develop a methodological framework and analytical tools. It could give a strong impetus to capacity building for energy analysis in Sub-Saharan Africa. Already a large number of academics participate in AFREPREN, and already AFREPREN has initiated the integration of efforts with various institutes.

Budget and Cost-Effectiveness
The second Programme (1994-1997; extended to July 1999) was sponsored by Sida for a total amount of SEK 38 Million. Considering the output of the network, and the wide dissemination of research, and broad participation, as well as long term sustainability, the funding is relatively modest. This is partially based on the "formula" of using part-time researchers, and using existing infrastructure where available. Comparison of funding levels to that of other projects is always difficult, as the character, region, and work-load of the projects may differ widely. The sheer volume of reports produced in a timely fashion and number of books published with an international publisher is impressive. Considering the challenge of communication in Eastern and Southern Africa, we suggest that future funding allocates some additional capital investment to streamline the access to E-mail and other electronic communication tools to maintain the sustainability of the AFREPREN network. The budget of a new proposal should also consider the collection and use of primary data, needed when changing focus to demand side issues.

Network Coordination and Administration
AFREPREN is now centrally coordinated and administered from a central office in Nairobi, Kenya. Besides the administrative staff, the Programme is run by so-called "backstopping officers" which are the prime coordinators of the information exchange and management of the research projects. The coordinators manage the country teams working in the theme groups, and also oversee the review process, as well as the financial process. The "backstopping officers" also perform other tasks within the secretariat, e.g. the important collection of documents and library, automatisation, construction of a website, energy statistics collection and system development.

We are impressed by the enthusiasm and quality of the staff at the secretariat. The office is run in a "lean" fashion, with highly capable people. The director and the two managers of the AFREPREN network should be congratulated in organising such a high quality group of people. The office is run in a decentralized way, which is also the consequence of the relatively low number of senior people in the secretariat. The efficient way the secretariat is run, results in low overhead costs. In this way AFREPREN does not fall in the same traps as other development programmes with excessive investments in infrastructure.

Dissemination Activities
Communication is key to the success of any network. Improved communication is essential in building an integrated network, and key to the success in assuring quality of the research activities of the AFREPREN network. The dissemination process of the second Programme has been well designed to the aims of this programme with its supply-side focus. Linked to the need to increasingly deal with the social, institutional, economic and policy aspects, and undertaking an end-user oriented approach, this would also encompass dialogue-oriented seminars with the different stakeholders, including end-user representatives. Communication and dissemination of research results to the main stakeholders is a major part of the work of AFREPREN. An approach more dedicated to end-users of energy (services) would enlarge the potential users of the research results. We recommend the investigation of the possibility to establish an "end-user panel" consisting of representatives of the main stakeholders.

Proposed New Energy Policy Research Programme of AFREPREN, 1999-2001
The draft research proposal encompasses 5 theme groups, Renewable Energy and Rural Development, Energy Services for the Urban Poor, Energy Sector Reform, Energy Efficiency, Environment and Climate Change, and Special Studies of Strategic Significance. The contents of the five theme groups are *relevant and important* for the regional energy problems, and represent a follow-up to the Second AFREPREN Programme, as discussed in this evaluation and on the 1998 AFREPREN General Assembly in Nairobi. Successful implementation of the programme will *strengthen (research) capacity* to establish knowledge on the situation of the rural- and urban poor energy end-user, with regard to households as well as small and medium size businesses. The programme *design* is innovative in several ways. Especially the links between income generation, technological innovation and energy services is interesting, as well as the intention of to analyze the institutional conditions of the end-users in detail. The description of the *methodological framework* and approach still need some elaboration. There is a need to establish a common methodological framework for this program along the lines described in this evaluation report.

The idea of a four year programme workplan, with two 2-year projects is good, considering the special characteristics and demands of this programme. The need for collection of more primary data, increased communication with policy makers and end-users, training courses, seminars and the increased contacts to University MSc and MA level programs, benefits from a longer programme period than three years. At the same time, it is important to assure that the programme is proceeding, which makes the introduction of 2-years project periods useful. The two year period also allows an internal review and evaluation of the progress of the programme, and re-directing if necessary. Consequently we recommend a four year programme with 2-year project periods, as outlined in the AFREPREN proposal.

1. Introduction

The African Energy Policy Research Network (AFREPREN) was formally established in 1989 and brings together around 100 researchers from from 12 member countries in the Eastern and Southern African region. The purposes of the research network are to undertake energy policy research, strengthen the research capacity and to disseminate the research results to energy policy making organs in particular.

The network represents a unique concept with its interdisciplinary composition of the research groups, and with research group members from administration as well as the energy sector.

This evaluation report deals with the The Second AFREPREN Programme where six theme groups have studied Management- , Capacity Building-, and Reforms in the Power Sector, Energy and Climate, Energy from Municipal Waste, and Finance and Markets in the Petroleum Sector.

The purpose of this evaluation is to assess the Second AFREPREN Programme, and to give recommendations for future work within the AFREPREN network. This double purpose has made the evaluation work interesting as we have had many stimulating discussions regarding which direction the AFREPREN work should take in the future. At the same time it is of course difficult to come from outside, and give constructive advice for the future work within a relatively short period of time. It is our hope that some of our suggestions will be of use for the important and necessary work within the AFREPREN network.

This report has six chapters, with chapter 2 dealing with the evaluation methodology, chapter 3 with an assessment of each of the six theme groups and chapter 4 as a synthesis of the assessments in chapter 3.

Chapter 5 contains the general conclusions and recommendations from the assessment in chapters 3 and 4 .

In Chapter 6, we evaluate the proposed New Energy Policy Research Programme of AFREPREN (1999-2001).

Finally we would like to thank the participants of the network, and the AFREPREN Secretariate, and the Sida representative for interesting discussions and helpful collaboration during the evaluation process.

2. Evaluation Methodology

In this chapter we will outline the goal of the evaluation, the research questions, the boundaries and limitations of the analysis, as well as methods used.

2.1 The African Energy Policy Research Network

The African Energy Policy Research Network (AFREPREN) finds its roots in a workshop held in Gabarone, Botswana, in May 1987, which lead to the formal establishment of the network in 1989 (Bhagavan,1990). Originally administered by the National Institute of Development Research and Documentation at the University of Botswana, since 1994 AFREPREN is administered by the AFREPREN secretariat in Nairobi, Kenya. AFREPREN was conceived on the premise that the countries in Eastern and Southern Africa display many common features in the availability and use of natural resources, environment, demography, land use, economy and trade, and are faced with similar challenges with respect to energy use and supply. AFREPREN's primary objectives (ToR, 1998) are:

- To undertake policy-research work that can lead to practical policies for sustainable energy development;
- To strengthen research capacity in energy policy in the Eastern and Southern African region;
- To effectively disseminate its research results, in particular to energy policy making organs, with the aim of making a policy impact.

AFREPREN tries to achieve this by bring together African the prime stakeholders in energy policy (policy makers, utility employees, and researchers), so that they can collaborate on energy issues and problems facing the region. AFREPREN now constitutes 12 participating countries (i.e. Botswana, Ethiopia, Eritrea, Lesotho, Kenya, Malawi, Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe), with various principal researchers participating from each country. Approximately 30 principal researchers (being almost equally divided in academic and policy making background), supported by almost 60 research assistants. The regional coverage, and participation from various backgrounds, as well as size of the programme make AFREPREN unique among similar energy networks in the world.

AFREPREN is (since 1994) coordinated by the secretariat based in Nairobi, Kenya. It's run by a lean staff, under the leadership of one director. The Programme of Activities, including finances, is supervised by a Steering Committee, consisting of seven members of the region who are elected by AFREPREN's General Assembly. The General Assembly meets annually to review and to evaluate the programme, as well as discuss strategic issues.

AFREPREN is supported by various financial donor organisations for support of the Network, as well as specific projects. Since 1987 the Swedish Agency for Research Cooperation with Developing Countries (SAREC) has supported the AFREPREN programme. The first programme (1987-1993) was financially supported with SEK 33 Million (ToR,1998), and evaluated positively in 1993. The 1993 evaluation recommended support at higher funding levels, while also recommending specific changes in the scope

and execution of the programme (ToR,1998). Based on this report the second cycle of the AFREPREN programme (1994-1997; extended to July 1999 in November 1997) was sponsored by SAREC for a total amount of SEK 38 Million. In 1995 SAREC was merged with the Swedish International Development Cooperation Agency (SIDA), and formed the Department for Research Cooperation/SAREC within SIDA.

The core of the second programme of the 1994-1999 AFREPREN Programme consists of six theme groups, as described in chapter 3. Within each theme group several country teams participate in executing studies, varying between regional and continental studies to case-studies.

2.2 Evaluation of the Second AFREPREN Programme

This report describes the results of the evaluation of the second programme (1994-1997, extended to July 1999). An evaluation is needed to assess the accomplishments of the second programme, set out in the 1994 proposal to SAREC, as well as to assess the new draft proposal to Sida for continued support for the period 1999-2002. The evaluation is conduced by an international team consisting of Prof. Frede Hvelplund (Institute of Development and Planning, Aalborg University, Aalborg, Denmark) and Dr. Ernst Worrell (Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, USA).

The aims of the evaluation are described in the Terms of Reference for the Evaluation of the Sida-supported Programme activities within the African Energy Policy Research Network (AFREPREN) of August 26th, 1998 by Sida. It covers the activities of the six theme groups (see above) within the second AFREPREN Programme over the period January 1995 – August 1998, and the activities of the AFREPREN network, sponsored under the 1994 proposal (and revised outline of 1996). In evaluating the Programme AFREPREN's overall and project-wise objectives are considered (as described in the 1994 proposal) under the research conditions in Eastern and Southern Africa..The evaluation covers the following aspects (ToR,1998):

Relevance, Appropriateness and Performance
Relevance of the Programme to the energy problems facing the region;
Appropriateness of the design of the network, the composition and function of the network, the composition of the research theme groups and the scope and range of associated activities, in the context of AFREPREN's primary activities;
The degree of success in achieving the overall objectives and the specific project-wise objectives stated in the Programme

Research Output, Research Capacity Strengthening and Dissemination of Research Results
The quantity and quality of the Programme's written research output, and the extent to which peer review has been employed to ensure quality;

- The contribution of the Programme to the build-up and strengthening of capacity in energy policy research in the region;
- The modes of dissemination of the Programme's output and their appropriateness, including the relevance and range of targeted recipients.

Policy Impact
The appropriateness and effectiveness of the channels and methods used by AFREPREN to make an impact on the process of energy policy making at the national level in the region;
The approaches adopted by the network to sustain the process of making a policy impact.

Network Sustainability
A broad qualitative assessment of the sustainability of the network, in terms of the accumulation and use of the indigenous energy policy research capacity that has been and is being created, as well as the anchoring of the network I national energy institutions.

Budget and Cost-Effectiveness
The structure an purpose of the major components of the programme budget, and how these affected the performance of the Programme as a whole and the achievement of project specific objectives;
A broad qualitative appraisal of the relative cost-effectiveness of the Programme in comparison with other regional programmes in Africa or elsewhere, to the extent that information is readily available to the evaluators through published or unpublished sources.

Network Coordination and Administration
The magnitude and quality of the back-up service provided by the AFREPREN secretariat to the network members;
The perception of the network members on the performance of the secretariat in discharging its coordinating and administrative responsibilities

Dissemination Activities
The diversity, scope and outreach of AFREPREN's activities in disseminating the material it produces to destimations inside and outside Africa

The New Draft Proposal by AFREPREN
Assess the new draft proposal to be submitted by AFREPREN to Sida for continued support over the three period July 1999 – June 2002, with particular reference to relevance, importance, quality, capacity strengthening, programme design, feasibility, and the magnitude, structure and appropriateness of the proposed budget.
The analysis will end with conclusions and recommendations on the assessment of the second Programme, as well as recommendations with respect to suggested changes and improvements required in the structure and function of the network, as well as the approach and execution of AFREPREN's proposed programme for 1999-2002.

2.3 Methodology

The evaluation is based on books and reports published by AFREPREN, the new draft proposal 1999-2002, a survey under principal researchers, discussions with members of the secretariat and network, around and during AFREPREN's General Assembly and African Energy Congress, held in Nairobi, Kenya, in November 1998. The material on AFREPREN is extended with information on energy issues in Africa and information on other networks, collected by the evaluators or provided by Sida.

Literature. AFREPREN has published an impressive number of books and research papers during its existence. For the evaluation we have received and reviewed all major books published by AFREPREN and Zed Books, as well as all research papers published during the second Research Programme. The research publications were accompanied by the recent annual reports of AFREPREN, the 1994 proposal and 1996 description of the research themes, and copies of the various AFREPREN Newsletters and Updates.

Survey. A survey was prepared by the evaluators with two aims. Firstly, to collect information as input to the evaluation and secondly to be used as preparation for discussion during the General Assembly meeting held in Nairobi. The survey consisted of general questions on the background and activities of the respondents, general questions on the performance of the network and secretariat and specific questions on the theme groups in which the respondents participated. The survey was send by E-mail and fax (to those that did not have access to E-mail) to the principal investigators in early October. Of the 24 surveys send out, 10 were returned, corresponding to a response rate of 42%, relatively high considering the limited response period, and the communication problems in Africa. Appendix Y contains the survey, as well as a summary of the main results.

Draft proposal. A draft of the proposal for the Third Programme (1999 – 2002) was forwarded in Mid December to the evaluators. Discussions with the AFREPREN Secretariat during the meeting of the General Assembly and the draft proposal were used to evaluate the new proposal, and compare it to the 1994 proposal, and the results of the evaluation of the 1994-1999 programme.

General Assembly/African Energy Congress. The week-long meeting of the AFREPREN General Assembly and African Energy Congress held in Nairobi, Kenya from November 2nd till November 6th, 1998, was attended by both evaluators. During the meeting all theme groups presented the results of the past programme, followed by intensive discussions by all participants. Observation of the presentations and discussions were essential in the evaluation process, and provided much information on the high quality of the researchers involved in the AFREPREN network.

Discussions with secretariat. Before and during the General Assembly meeting the evaluators had meetings with the AFREPREN secretariat and director. An extensive full-day briefing of the full secretariat on the various theme groups and the organisation of the network (including library, communication, organisational structure, and functioning of the secretariat and network). Before and during there was ample opportunity to discuss observations and preliminary results of the evaluation with the director and various 'backstopping officers' of each theme group.

Discussions with AFREPREN members. The General Assembly provided an excellent opportunity to discuss observations from the research papers studied, as well as survey results, with the various theme groups and individual (principal) researchers. During the General Assembly luncheons were held between each theme group and one of the evaluators. The discussions also helped to gain insight in the research conditions under which the various AFREPREN members have to work, and the role of the secretariat in supporting the work of the theme groups.

Site visits. Before the meeting of the General Assembly site visits were made to Uganda (Frede Hvelplund only) and in the surroundings of Nairobi, to understand the context of energy supply and use in Eastern and Southern Africa. The site visits were very instructive, and helped the evaluators to consider the African context in energy policy research and analysis. Appendix 2 describes the itinerary of the evaluators, and the sites visited.
Other material. For the evaluation also other material was collected on African energy policy, and the background of energy use in Sub-Saharan Africa, as well as information on other research networks (in developing countries), and information provided by Sida on its Programme for Global Development. Discussions with the responsible officer within Sida/SAREC were also very helpful and instructive in performing the evaluation.

2.4 Boundaries and Limitations of the Evaluation

The evaluation presented in this report is limited to those activities of AFREPREN funded by Sida under the 1994 (1996) proposal, and subsequent Second Programme Cycle. It is important to note that AFREPREN also manages other activities, e.g. on renewable energy technologies, which are co-funded by Sida and other agencies (e.g. NORAD), but which are not part of this evaluation. It is also important to note that the participants in the AFREPREN network all work in her or his own environment, and that the AFREPREN activities are subsequently and necessarily a part-time activity. This may be the strength and the weakness of the network, but is essential to consider in evaluating the AFREPREN network's activities.

Last but not least, it is important to stress the limitations from the evaluators. Both are from countries with a well developed research and data infrastructure. Although both have some experience in working in developing countries and working with researchers from many different backgrounds and also from developing countries, an understanding of the conditions in Eastern and Southern Africa had to develop during the evaluation process. It is important to understand the evaluation results and recommendations taking the probably biased perception in to consideration. Each of the evaluators come from a different professional background and discipline, although both have a strong academic background. Both have experiences in working in international teams and developing research networks and have extensive experience in the field of energy and environmental policy analysis (see Appendix 1 for CV's of the evaluators). The different backgrounds helped to evaluate the AFREPREN programme from different perspectives, and have helped to develop a better understanding. The collaboration among inter-disciplinary lines provides rewarding challenges, but may also lead to differences in emphasis and insights. We hope the evaluation report gives a balanced view of the evaluative process and of the AFREPREN activities.

3. Theme Groups

The AFREPREN research programme 1995-1997 was established to put more emphasis on energy policy research on institutional issues, capacity building and environmental dimensions of the region's energy sector. Six theme groups were proposed within the programme and have been working over the past three to four years. The goals of the theme groups were originally described in the "Energy Policy Research Programme Proposal for 1995-1997" (September 1994) as:

Institutions. Formulation of innovative institutional initiatives that promote equitable access to energy services. Special attention was to be focused on the opportunities and pitfalls inherent of the current emphasis on privatisation and deregulation of the energy industry in the region.

Management and Efficiency. Design and assessment of techniques for improved management and increased efficiency of existing energy assets with specific reference to the power sector and stimulation of power exports and imports in the region.

Local and Regional Environmental Impact of Energy. Examining both existing and **projected** impact of the energy sector on the local and regional environments and designing cost-effective measures of mitigating potentially negative impacts of energy production, transformation and use.

Energy and Climate Change. Assessing the policy implications of the United Nations Framework Convention on Climate Change and developing realistic and practical negotiating as well as implementation options for the African energy community.

Capacity Building and Technology. Addressing the challenge of capacity building for effective energy policy formulation, analysis and implementation with specific reference to the development of appropriate human resource development, training and technology acquisition programmes for the energy sector

Finance and Markets. Financing energy investments in sub-Saharan Africa through the identification of practical ways of securing external financial resources and mobilizing local savings and markets on terms that are not inimical to the interests and equity aspirations of the region

The wide research themes have been made operational through specifying specific topics within each theme. For example, the theme groups on Institutions and Management and Efficiency focused on the power sector, whereas the Climate Change group focused on transport issues, as one of the important contributors to greenhouse gas emissions in the region. The theme groups consisted of various country research teams (each consisting of a principal researcher and various assistant researchers), and teams preparing a regional and continental study. The secretariat supports the coordination among the theme group members, and manages the process of report preparation, review, and dissemination of the results.

Table 3.1 presents the participation of the AFREPREN member countries to the various theme groups, as well as the number of reports prepared within each theme group. Table 3.2 presents the background of the participants.

Table 3.1 *Participation and regional coverage of studies in the AFREPREN programme 1995-1998.*

Theme Group	1	2	3	4	5	6	Total
Botswana			1	1			2
Ethiopia	1				1	1	3
Eritrea			1				1
Lesotho		1					1
Kenya						1	1
Malawi							-
Mauritius					1		1
Mozambique							-
South Africa					1		1
Tanzania	1	1	1				3
Uganda	1			2			3
Zambia		1					1
Zimbabwe	1			1	1		3
Regional	1	1	1	1	1	1	6
Continental	1	1	1	1	1	1	6
Total	6	5	5	6	6	4	32

Theme Groups: 1. Institutions; 2. Management and Efficiency; 3. Environment; 4. Climate and Energy; 5. Capacity Building, and 6. Finance and Markets. Note: researchers from Malawi have contributed to the regional studies in theme groups 1 and 4.

Table 3.2 *Participation and background of participants in the theme groups in the AFREPREN programme 1995-1998.*

Theme Group	1	2	3	4	5	6	Total
Participants (#)	18	17	15	16	16	12	97
Discipline							
Natural Science	50%	50%	72%	81%	61%	15%	55%
Social Science	50%	50%	28%	19%	39%	85%	45%
Affiliation							
Academic/Research	35%	22%	72%	63%	56%	46%	48%
Government/Utility	60%	78%	22%	25%	33%	31%	41%
Private	5%	-	6%	12%	11%	23%	10%
Qualification							
BSc/BA	40%	38%	22%	31%	22%	62%	37%
MSc/MA	45%	56%	39%	50%	67%	23%	49%
Dip	-	6%	11%	6%	-	-	4%
PhD	15%	-	28%	13%	11%	15%	10%
Gender							
Female	17%	24%	6%	13%	19%	17%	16%
Male	83%	76%	94%	87%	81%	83%	84%

Theme Groups: 1. Institutions; 2. Management and Efficiency; 3. Environment; 4. Climate and Energy; 5. Capacity Building, and 6. Finance and Markets. Note: researchers from Malawi have contributed to the regional studies in theme groups 1 and 4.

3.1 Institutions - Reform and Restructuring of the Power Sector

Introduction and Relevance

The power systems in some countries of the region are characterised by increasing inability to provide adequate levels of electricity services as well as increasing problems with the financial performance. The existing power system is an important factor and prerequisite for the future electrification of the poor rural and urban areas. Therefore there is a need to stop the decay of the power sector, and to analyse institutional reforms to improve the performance of the existing power sector. As stated in the 1996 research outlines, the tasks of the theme group have been to:

- Assess the performance and efficiency of the power sector
- Assess the impact of the past and current institutional structure on the performance of the power sector
- Analyse the various reform options and assess their impact on the power sector
- Recommend the most appropriate policy reform options for the different categories of African countries.

Research and research output

The research theme groups consist of 20 members, divided upon 6 countries, consisting of 10 members from social sciences and 10 members from natural sciences. The work of the theme group has resulted in 4 case studies, i.e. Tanzania, Uganda, Ethiopia and Zambia, (Marandu et al.,1998), (Mugyenzi et al.,1998), (Eshetu and Bogale,1996), (Dube,1998), one study on power trading in the restructuring environment (Chiwaya, 1998), and one regional study (Karekezi an Mutiso,1998). The theoretical approach is inter-disciplinary, mainly between economics and engineering, and the analyses are mainly based on secondary data combined with the extensive practical experience of the theme group members.

A unique assessment has been established of the performance and efficiency of the power sector in the selected countries. Valuable cross-country comparisons of the power sector in the region have also been established. The conclusion of the analysis is that a combination of public ownership of the power companies, absence of clear economic motivation, lack of managerial freedom and responsibility and too much direct governmental interference have led to an increasing inefficiency in the performance of the companies. Following these conclusions, the institutional analyses have pointed out some important areas for institutional reforms of the power sector. The studies generally propose that the power companies should be organised as modern firms to an increasing extent. In one study it is said, in a statement which is representative for the conclusions in the theme group "..that is, operate it like any other modern enterprise which must make profits, pay taxes and dividends.." and later "Since the utility is still a monopoly, government commitment to reform may be demonstrated by allowing the utility to charge cost-covering tariffs" (Marandu et al., 1998). At a general level, the proposals might be useful in solving the efficiency problems of the power sector. Nevertheless some of the reform proposals are not ready for implementation. Whether reform proposals at this level of generality will be successful when implemented, depends on an array of institutional preconditions which still need to be analysed and discussed.

It is also found that unpaid electricity bills are one of the most serious problems in the power sector. Often, the biggest debtors are state-owned firms or users. In one country, the state owned Water Supply Company is the largest debtor to the power company. The question remains if these problems are solved by establishing institutional reforms

to motivate power companies to behave more like modern firms. This will depend on *why* the state owned water supply company does not pay the bills, and on *how* the political regulation of the public sector functions. Even a privately owned power company cannot easily turn off the power supply for the water company, and it is questionable if a public power regulatory commission would allow a disruption of the water supply. Hence, a more in-depth investigation of the consequences of the proposals is needed in future assessments.

A very important part of the dissemination process is an extensive publication programme implemented by the AFREPREN office in Nairobi. Another important element of the dissemination process is linked to the composition of the theme working groups, with 60% of the participants linked to government and utilities. This means that the results are disseminated to important decision makers instantly. Two policy seminars on power sector reforms were held in Accra (Ghana) and Mauritius, organised in collaboration with the Ministries of Energy and public utilities of the two countries. The dissemination process of this second programme has been well designed to match the aims of the programme with respect to the power sector.

Policy Impact, Conclusions and Recommendations

As already mentioned, the rather high number of scientists affiliated to governmental institutions and the utilities, has had important implications considering the policy impact of research results from the second programme. The quantity and quality of the research output in this theme group is impressive. This indicates, that despite difficulties regarding research infrastructure in Eastern and Southern Africa, it has been possible to establish the required country studies, to co-ordinate the work around regional studies, and to publish unique regional studies regarding the utilities in Eastern and Southern Africa. From a qualitative point of view, the strength of the studies is particularly due to the combination of technical, economic and organisational analyses and the specific policy recommendations. We can conclude that this result of the AFREPREN research concept and composition of the theme group, has given concrete results in the research output. Many could learn from this effort.

The work has fulfilled a necessary and important *first step* in this analysis in a very satisfactory way. As a result of the performed analysis, however, it also has become clear, that a limit has been reached. The *next step* should include important issues related to rural electrification, electrification of the poor urban areas, and the design of independent public regulation processes.

Recommendations

The scientific methodology of the theme group is unique, with its interdisciplinary approach. Nevertheless it should be further developed by the establishment of a more thorough discussion of the strengths and weaknesses of the theoretical frameworks and analytical tools used in the studies.

It is characteristic for the submitted reports that they are mainly made by means of desk research and secondary data in combination with the "primary data" linked to extensive practical experience of the administrative and power sector members of the theme group. When changing to a more end-user oriented focus, the members of the theme group do not have the same systematic extensive knowledge regarding the end-user situation, as they have within administration and the power sector. Further progress in the studies therefore requires systematic collection of primary data and information,

where detailed knowledge regarding the economical and sociological end-user situation, and the political processes behind public regulation is needed.

Although the inter-disciplinary scientific background of the theme groups in AFREPREN is unique, and should be maintained, the supply-oriented viewpoints of the second programme cycle have reached their limits. The social scientists should be able to apply knowledge from sociology, social anthropology, industrial sociology and innovation theory, and both social scientists and natural scientists should increase their ability to analyse end user oriented solutions. Regarding the need for a household/end-user approach, for example more women in the research groups might improve the ability to deal with these matters.

Establishment of deeper analyses of the regulatory abilities of the government and the administrative system. In general the conclusion of the reports are that there is a need for establishing a process of making the utilities function more like private companies. But if the public regulation regimes do not function in a privatisation process, the countries risk going from inefficient state owned systems to inefficient end expensive private owned power systems. Therefore, it is necessary to analyse in detail how a public regulatory body can be designed in order to be independent and efficient.

The change of focus from the supply orientation of the second programme to a more end-user orientation might require an increased capacity building at research units, i.e. universities, which could be enabled to develop an approach, where the end-user approach is combined with the supply-oriented approach. In future capacity strengthening at the university level could consist of more master degree students and PhD students.

It might be useful to include more people from the end-user level, as well as local and regional governmental officials and planners, and to include more national and regional politicians in the reform discussion, by inviting them to seminars and conferences. In this way a necessary educational process might be established both for the participating politicians and the participating researchers.

3.2 Management and efficiency in the Power Sector

Introduction and Relevance

Some power systems in the region are characterised by increasingly unreliable power supplies, considerable losses at transmission and distribution levels, deficient maintenance and poor procurement of spare parts, poor revenue collection and inadequate financial performance, over-staffing of unskilled labour and shortage of skilled manpower. There are, however, also some power systems in the region, whose performance is improving. Therefore it is of interest to compare the power systems with bad performance with the ones improving their performance, in order to spot the potential managerial causes of such differences in performance. At the same time it is of importance, also for the electrification of the rural and urban poor areas that the existing power system improves its efficiency, as this seems to be a necessary precondition for the electrification of these areas.

As stated in the 1996 research outline, the Management and Efficiency theme group will assess the following issues:

- Impact of enhanced management of power utilities on the provision of electricity to a larger proportion of Africa's population,
- Improvement of the technical performance of power utilities in areas of standardisation, acquisition of spare parts and reduction of transmission and distribution losses on the supply side
- Demand side management vis-à-vis price and non-price incentives
- Improvements in metering, billing and debt collection.

Research and research output

The research theme groups consist of 18 members, with 9 members from social sciences and 9 members from natural Sciences. The composition is adequate for the research purposes, and also corresponds to the objectives of dissemination of suggested proposals. Compared with international standards, the interdisciplinary compositions, as well as the high percentage of researchers close to the policy making level is unique. The work consists of three country studies, Tanzania, Lesotho and Zambia (Sefeane and Phakoe, 1998), (Redeby et al., 1998), (Mbewe, July 1998), (Mbewe and Sampa,1996), and two regional studies (Karekezi et al., 1996), (Mbewe, Sept 1998).

The theoretical framework is interdisciplinary (mainly economics and engineering) and the analyses are based on secondary data in combination with the extensive experience and practical knowledge within the field of the participants. The studies conclude that it is necessary to establish more direct economic responsibility and managerial freedom, to establish tariffs based upon the real cost of power production, and to establish improved education programmes for the employees. These conclusions are well documented and in principle justifiable. It also seems worthwhile to focus more on the interplay between the efficiency of the company and the (national) economic, social and political system in which the company is embedded. It is easy to state that there are too many employees in a specific power company, and to conclude, that a given (often very high) percentage could be dismissed. But, as pointed out by participants in the 1998 AFREPREN conference, it is not so easy to tell how this should be done in an economic situation, where it means unemployment with severe consequences for the affected groups. When this is known to people it might be neither socially acceptable, nor politically advisable to propose dismissing of excess staff.

Likewise, it is easy to say that tariffs should be equal to the long term marginal costs of power production, in order to assure a decent economy of a given power company. But often it is politically very difficult to implement this type of reforms, in situations where the consumers are not able to pay such increased tariffs. In order to reach a level of understanding that may help explain the problems, in a manner that may lead to solutions, to be implemented without serious social and political problems, it is necessary to look in depth at the above mentioned problems. This means that the researchers have to establish concrete analyses of the political and social effects of their proposals, and to indicate ways of solving such problems. The research teams therefore have to include knowledge from political science and sociology and to combine this with concrete primary data analysis of the political and social systems in their countries.

When comparing the outcome of this theme group with the results of the "Power Reform" theme group, it is visible, that there are links between ways of restructuring the power sector, and the ways management efficiency should be improved. This is espe-

cially clear, when looking at the question of provision of electricity to a larger proportion of Africa's population. The provision of electricity for the rural areas will not be improved by strengthening the managerial efficiency of the existing town centred power companies if the "power reforms" end up with a privatised "market" for rural electrification, as indicated in the Tanzanian report on market reforms (Marandu et al.,1998).

In research reports, it is generally important to include a thorough discussion of the theoretical framework and methodology. This is particularly so in the African context, where it is not sufficient to apply a technical and economical approach in a way, which is applicable in a European context. In the African context there is a relatively closer and politically more sensitive interrelationship between the efficiency of the power company, and the socio-economic and political situation in which the company is embedded. Naturally, it is acceptable even in analyses of African power systems to focus on the internal efficiency characteristics of a power company; and to suggest that the overstaffing problems should be solved by dismissing a certain percentage of the unskilled workers. In making such suggestions, it is important to be aware, both methodologically and theoretically, of the limitations of the analysis. The reader should be told, that before it is possible to implement rationalization reforms, it might be necessary to analyse their socio-economic and political consequences, and to take measures of precaution against socio-economic consequences.

The *dissemination* process of the second programme has been well designed to the aims of this programme. But a limit has been reached, where a more sophisticated process of dissemination should be implemented, oriented towards dialogues with different stakeholders, i.e. employees, end-users and policymakers.

Policy Impact, Conclusions and Recommendations

A very important part of the policy impact is linked to the composition of the theme group, with around 50% affiliated with government and utilities. This means that the channels of dissemination are open to important decision makers within the power sector, and within the administrative system. With regard to the quantity and quality, the research output in this theme group is clearly satisfactory. When looking at the quality of the studies, it should be pointed out, that the studies in general have a high quality. Especially with regard to combining technical, economic and organisational analyses and to giving specific policy recommendations. An array of well-documented proposals concerning the implementation of management efficiency measures have been put forward. But the second programme's studies of management and efficiency of the utilities have come to a limit, where it is increasingly necessary to study the close links between the efficiency of the utilities and the society around the utilities.

Recommendations:

This theme group has reached a level, where the next step will be to increase the understanding of the link between managerial efficiency, utility reforms and the socio-economic and political situation of the society in which the utilities are working. This might require a higher proportion of primary data and information in the next period.

Successful rationalization processes need closer analyses of the socio-economic situation of the employees, and a dialogue process between the employees at the utilities. This is not an easy process, but not to enter into this process would not be wise either, as it might result in resistance against any change of the present situation.

Successful implementation also depends on further dialogue/communication with the responsible politicians in order to foresee political problems of changes and to take precautions against such problems. Such precautions might be ways of establishing education and job creation schemes for the dismissed employees.

When looking at managerial efficiency with regard to a goal of electrification in the rural and urban poor areas, specified studies must be established, which transcend the borders of internal managerial efficiency within the existing utilities.

3.3 Local Environmental Impact: Bio-energy from Municipal Waste

Introduction and relevance

Energy and environment are closely related themes. This theme group approaches the energy problem from an environmental perspective focusing on the potential role of municipal solid waste (MSW) in the regional energy supply. In the current global development paths a developing society increases the generation of waste, through the increased use of resources. Waste can not only pose a resource problem, but also an environmental and health problem. Disposing of waste may lead to contamination of soil, water and air. As such, and through providing a perfect environment for the spread of diseases, waste poses also a human health problem. MSW generated in urban areas is an important part of the total waste issue, and increasing with growing urbanisation. MSW also offers a potential resource through recycling and energy recovery. The theme group focuses on the technical opportunities for energy recovery from MSW. The theme group consisted of three country studies, i.e. Botswana (Khupe et al.,1998), Eritrea (Habtetsion et al., 1998), and Tanzania (Kishimba and Shechambo, 1998), a regional (Kgathi and Mmopelwa, 1996) and a continental study (Karakezi et al., 1996). The working papers give an overview of the general energy and MSW situation, before studying the specific technologies. The studies show that there is a large regional potential for energy supply based on MSW. The reports conclude that gas recovery from landfills is the least costly alternative, considering the MSW composition and collection characteristics. The studies are also very successful in describing the challenges faced in the various cities, while the choice of case studies also shows positive responses to the issues (i.e. in Eritrea).

Research and research output

The subject has been approached from a technical perspective, although issues regarding policies and implementation problems are touched upon. The economics and policy issues are not investigated in depth. The studies focus on the energy aspects, and not much attention is given to other aspects than energy (e.g. human health, methane emissions). More attention for the role of energy as an aspect and driver of (environmental and social) sustainability may help to achieve implementation of recommendations. The potential large contribution of MSW to energy supply and the social problems associated with waste collection and disposal warrant a thorough investigation to use MSW as a potential energy source, and need more attention for policy and implementation aspects. The implementation issues were part of the research questions but were not fully investigated in the reports. Although a general outline for the reports was prepared as a helpful guideline, it would help to define the goal and system boundaries well. The reports could do well without a description of the energy supply situation in the country, or general discussions, but should concentrate on the specifics and important information. The quality and comparison of the reports could be enhanced by the use of clear definitions and use of units (e.g. is the composition given as percentage of wet or dry MSW).

There are differences in quality between the working papers, which could be due to data availability and access. For example the Botswana study was commissioned in December 1997, reducing the time for data collection. In Tanzania studies were executed as preparation of a GEF project. There are striking results in the composition of waste in the different working papers, and an understanding of this important. The authors seem to have had access to different sources. Better data exchange between country teams would be good way to enhance the understanding and cooperation. Most material and communication has originated from the secretariat, and not from individual team members. This study is a good example where improved communication would benefit the consistency and the various aspects of the assessment. Where local teams are needed to assess the MSW composition and implementation issues, technology assessment could well have been executed in coordination. The regional or continental study would be the place to compare and assess the local differences and solutions, and highlight the role of regional coordination. The regional working paper has been prepared before the country studies as a literature review. A final paper or book highlighting the local information and regional consequences would be very welcome, and would easify access to the important findings, as well as highlight the importance of a regional network as AFREPREN.

Finally, this study is a prime candidate for South-South cooperation, with e.g. Brazil, India, and China. In these and other countries experience with MSW management and anaerobic digestion exists, which may help to assess the technology and economics under comparable conditions.

Policy Impact, Conclusions and Recommendations

Management

Most researchers and the back stopping officer went through a steep learning curve during this project, and not all were involved from the start. The resulting reports are excellent results considering the knowledge gap, the time available for the study (often next to a full time job), and the difficulty to access data. All communication has gone through the back-stopping officer, limiting the exchange of information to an one-way process (distribution of packages every two months). More active interaction between the team members, using various means, could be a tool to disseminate the knowledge among team members, and contribute to one of AFREPREN's goals of regional capacity building. In some extent, this could also reduce the quality differences between the reports.

Conclusions

It is encouraging to see that in Botswana the attention has shifted to MSW as a potential energy source as a result of the study. In other countries policy attention is less focused on MSW and landfill gas recovery does not receive the attention it would need, also limiting the availability of data. Positive experiences in other developing countries could well shift the balance. The AFREPREN assessment is therefore very important, and the network approach is important as a research tool, but also as a dissemination tool. A future focus on implementation issues and policy aspects would strengthen the role of AFREPREN research activities.

Recommendations

- Improved communication and exchange of information and data sources among the theme participants would help to focus on the important aspects of the study.
- South-South cooperation would enhance the development of suitable solutions, while strengthening the message of the study.

3.4 Global Environmental impact: The Transport Sector and the Mitigation of Green House Gases

Introduction and relevance

Africa contributes only for a very small part to the global greenhouse gas (GHG) emissions. Relying heavily on agriculture, Africa's economy is very vulnerable to climate change. The climate convention and Kyoto protocol offer also opportunities for developing countries to reduce emission intensities while securing sustainable paths to economic growth. Energy use in the transport sector is linked to very complex environmental and societal problems, including air pollution, lost productivity due to traffic congestion, death and disabilities due to accidents, water pollution caused by spilled petroleum, and global warming. Since 1971, global transport energy use has grown at a rate faster than total world primary energy use and has nearly doubled, jumping from 37 EJ to 63 EJ in 1992. The rate of growth in consumption for developing countries was extremely rapid over this time period (4.7%). Africa's economy still relies heavily on the (inefficient) use of biomass. In many African countries (except South Africa and Zimbabwe) the transport sector is largest user of fossil fuels, and spend a large share of export earnings on importing oil. At the same time Africa's economies are developing an infrastructure. Due to its long lifespan infrastructure has the danger of lock-in in energy intensive modes, but also the window of opportunity to change this as the infrastructure is still being developed. Transport energy use can be reduced by improving the efficiency of transportation technology (e.g. improving automobile fuel economy), shifting to less energy-intensive transport modes to achieve the same or similar transport service (e.g. substitution from passenger cars to mass transit), changing the mix of fuels used in the transportation system, and improving the quality of the transportation infrastructure (roads, railways). Activities under the UNFCCC and Kyoto Protocol may well help to provide funds to invest in a non-GHG intensive transport infrastructure. The study consists of four country reports, i.e. Botswana (Ramaphane, 1996), Uganda (2) (Magezi, 1998; Otiti, 1996) and Zimbabwe (Batidzarai, 1998), a regional study (Zhou, 1998) and a continental study. In 1998 also a regional seminar was organised (Karekezi and Ewagata-Muya, 1998). AFREPREN has also published one of the few books (Baguant and Teferra, 1996) on energy issues in the African transport sector.

Research and research output

Globally, the transport sector is one of the fastest growing GHG emission sources, and also one of the hardest to manage. To make things worse, detailed data on transport patterns are often difficult to find, even in industrialized nations. The AFREPREN activities represent a very important contribution from a developing country perspective, and may as such not only contribute to the global climate change debate, but also to regional development. The studies assessed the energy needs for land transport, assessed GHG mitigation options in the transport sector, as well as identified financing opportunities. A multitude of options has been identified in the various studies. This multitude makes it also difficult to assess the opportunities in detail. For example, urban planning is not discussed in all reports. In some cities urban planning is not possible anymore, as it is driven by land prices (e.g. in Nairobi), locking in future transport needs. Hence, there is a window of opportunity that should not be missed, otherwise problems as in some Asian cities may develop. The example also shows that the AFREPREN methodology partially based on regional and international comparisons of experiences is key in identifying management opportunities and policies. Exchange of information with Singapore at one of the AFREPREN seminars is an example of learning from other countries. Deepening of the South-South cooperation would be important to find suitable options in urban planning as presented by the unique example of Curitiba in Brazil. This theme group is an excellent case for better integration and

cooperation with other countries (South-South) to learn and also to enhance the international role and visibility of AFREPREN. We acknowledge that South-South cooperation is also difficult, as the bulk of the literature describes experiences in industrialized countries. The studies represent a sound and in-depth start of assessing the opportunities to reduce the environmental impact of the transport sector, but would need more emphasis on social, regulatory, policy and economic issues to evaluate the practical implementation of the study results.

The studies demonstrate the problems and show the (technical) options for reducing GHG emissions form the transport sector. This has also been used to develop scenarios for future energy demand and GHG emissions from the transport sector. The studies are rather weak in investigating the policy opportunities given by the international agreements on climate change, making it difficult to draw strong conclusions. Hence some of the conclusions are not clearly based on the research findings reported in the reports. One of the critical issues in most financing schemes under the UNFCCC or the Kyoto Protocol, the so-called additionality of measures, has been less clearly investigated. It should be stated that the project allowed the cooperation with GEF. The theme group is hence a good example, where seed funding by SIDA enabled AFREPREN to make an important contribution to a global process, which would have been impossible without the opportunity given by SIDA to built the capacity.

Policy Impact, Conclusions and Recommendations

Management

Managing a diverse group of researchers in a very diverse subject is difficult under any condition, let alone under the conditions under which AFREPREN and its staff and researchers work. The studies show a diversity in the way the issues were treated, while some options were not discussed in most studies. This might be the consequence of insufficient communication in the earlier phases of the study, as well as during execution of the studies. The research team meets only once a year, which may be insufficient to resolve all the issues in such a complex field. This underlines the need for a strong coordination role for and management by the backstopping officer, the secretariat, as well as the researchers and reviewers. Improved communication between the researchers may be a way to reduce the burden for the secretariat, and should be strongly encouraged to improve uniformity, comparability, and completeness of the individual studies. The workshop established a strong means to exchange insights with stakeholders and influence the decision making process, and hence a strong platform for AFREPREN. Replication of such events in other theme groups could become an important dissemination tool for AFREPREN and it's activities.

Conclusions

This theme group presents a difficult but challenging research area, due to it's wide diversity and the size of the problems in the transport sector in Africa. The studies represent a sound and in-depth start of assessing the opportunities to reduce the environmental impact of the transport sector, but may need more emphasis on social, policy and economic issues to evaluate the practical implementation of the study results. There is a strong need for improved international collaboration within the region and with other developing countries to assess opportunities in this sector. At the same time the theme group and AFREPREN have been able to attract major interest from other parties, including regional decision makers and donors, stressing the importance of the AFREPREN and SIDA approach.

Recommendations

- Improved collaboration with other developing countries would strengthen the results and focus on major opportunities;
- The social, institutional, economic and policy aspects, both regionally and globally, need a stronger emphasis to be able to draw practical conclusions;
- Improved coordination between the principal researchers would enhance the uniformity, the coverage and the depth of the studies.

3.5 Capacity Building in the Power sector

Introduction and relevance

The Capacity Building theme group focuses on human capital and capacity building in the power utility sector. Assessment of the problems in the power sector identified management as the main problem (see also the theme groups on Institutions and Management and Efficiency). Statistics learn that Africa has a very low share of technically trained people. This is partially due to the state of the development process, but is also at the heart of the slow pace of the development process. The study aims to examine staffing and training issues at the utilities, looking at training at universities and other educational institutes and in-house training programmes by the utilities. For this study four country reports; Ethiopia (Teferra, 1998), Mauritius (Baguant and Beehary, 1998), South Africa (Ngobese and Ntsaba, 1998) and Zimbabwe (Mapako, 1998) were prepared, as well as a continental study (Karekezi and Ewagata, 1996), besides various earlier reports. The selection of countries is instructive, as all countries are in different economic and regulatory situations, and are facing different challenges.

While some utilities (e.g. Mauritius, South Africa) performed better, others are poorly managed (e.g. Zambia). Utilities that are not involved in distribution seem to do better (although the conclusion has to be drawn carefully, as available data is a little skewed. A more in-depth analysis would be needed to evaluate if this is a determining factor. From several case-studies it is clear that companies that spend more on training have a much better performance with respect to system losses. This is one of the strongest conclusions of the work, but is not found in the regional or the continental study. The continental study (Karekezi and Ewagata, 1996) was finished before many of the country studies were finished. The continental study (or the regional study) would be an excellent place to put the country studies in context, and use the strength of cross-country comparisons fully. This result also underlines the importance of the AFREPREN activities and research method of cross-country comparisons.

Research and research output

A common set of research tools was developed and used by the study teams. The studies provide a good introduction into the power sector, and an overview of training programmes, there is a need for the studies to look more in depth. This may be a consequence of the formulation of the research questions, and stresses the need for a methodological framework to assess the many aspects of the problem. A survey of training needs (e.g. technical, managerial) would strengthen the results. The country studies vary in the way that not all reports make clear what the needs are and what the real problem is. From the country studies it seems that there is a wide variety in the problems encountered. The studies fail to enlighten the reason for these differences (e.g. the low retention of staff in Ethiopia vs. a good retention in Zimbabwe), as the differences are not studied in more detail. Capacity building is one of the key answers to the problems encountered by many

utilities in the region, and at the heart of many energy problems in the region, and in many developing countries. The importance of this subject warrants the need for a more in-depth assessments of the needs and ways to supply and retain the needed skills and people. The study on South Africa (Ngobese and Ntsaba,1998) shows a need for technical skills, while the study on Ethiopia (Teferra, 1998), Mauritius (Baguant and Beehary, 1998) and Zimbabwe (Mapako,1998) do not provide details on the specific needs, and hence give very broad conclusions.

Training is a long-term issue. Training touches also on one of the recurring concepts in the AFREPREN work: the 'Critical Mass Concept', as developed in the analysis of dissemination of renewable energy technologies. An assessment of the applicability of this concept would be fruitful, to make recommendations that may help to build a sustainable system for education and capacity building, rather than provide a solution to short-term problems. Finding a solution to short term problems is in itself very important, but maybe less relevant for a mid-term research programme.

The studies performed within the theme group on Management and Efficiency do provide some information on management training needs, and underline the need for capacity building. For example utilities that encompass a higher degree of strategic planning, seem to be more successful. To avoid such problems in practice, there seems to be a need to improve the exchange of information as well as discussion between the various theme groups for closely related themes or topics. The discussions at the 1998 African Energy Conference were enlightening, as many of the issues not assessed in the reports, were clearly at the forefront of attention of the researchers, and participants in the discussion.

The studies would gain in importance and possible policy impact if the needs would be investigated in more detail. The study underlines the need for more attention to improved collection of primary data. This would enable to not only study the problem in a quantitative way, but also in a qualitative way. The link between AFREPREN and many universities and polytechnics in the region may be the key to the collection of more detailed primary data, while not underestimating the amount of work already done in data collection, as well as to implementation of some of the recommendations of the studies.[1]

Policy Impact, Conclusions and Recommendations

Management
Managing a network of researchers is a full-time task, and should not be underestimated. The AFREPREN office, and the backstop officer, are key in the success of a network comprising researchers of so many backgrounds. After an initial discussion on the research questions and methodology, the team meets only once a year. Information exchange and flows are managed through the secretariat. The central role of the secretariat is a marriage of strengths and weaknesses. The strength is the close control on progress and quality, while a more informal discussion (as well as with the researchers in related themes) on important questions like methodology is more difficult. A decentralized mode of discussion and inviting input from related theme groups could be a positive contribution to a more in-depth analysis.

[1] It should be realized that AFREPREN is not involved in implementation of policies, and has no mandate to do so, nor the capabilities. However, AFREPREN is a (research) capacity building and as such a key player in the development of capacity building programmes.

Conclusions
Human resources and capacity building are at the heart of developing a sustainable energy system. By selecting this research theme, AFREPREN fully acknowledged the importance of this issue. The researchers are qualified and highly motivated. The selected countries are unique and hence contribute to a better understanding of the issue. The reports present a good introduction to the issues. The quality of the work and reports could have been better, if a more thorough assessment of the research questions was performed at the beginning of the study, and if communication between the theme members, and those of related utility oriented research themes, could be improved.

Recommendations
- Spend sufficient time and resources at defining the research questions, system boundaries and methodological framework of the analysis.
- Nurture discussion, access and exchange of information and viewpoints between all AFREPREN members active and interested in the subject. This can be achieved through several means (see also Chapter 4) including list-servers, meetings and discussion groups.

3.6 Finance and markets - Investment and Financing in Petroleum Marketing

Introduction and Relevance
In Africa where many areas are threatened by deforestation, it is important to substitute use of firewood with kerosene for food preparation. Due to inefficient procurement, refining and distribution activities there is a potential of saving around 15% of the oil bills of the Sub Saharan countries, by implementing an array of efficiency improvement measures. When problems with a stable supply of oil products are added to these, we may conclude that the studies in this theme group are relevant in relation to the energy problems facing the region. As stated in the 1996 research outline, the major tasks of this theme group have been to:
- Assess the prevailing policies in the downstream petroleum sector
- Assess the impact of liberalisation in the downstream petroleum sector
- Assess policies that can ensure efficient and secure supply of petroleum products
- Assess policies that can increase domestic and foreign investments in the downstream petroleum sector
- Identify appropriate pricing mechanisms for petroleum products.

Research and Research output
The theme group consists of 15 members, with 11 members from social sciences and 4 members from natural sciences (see Table 3.2). The theme group focuses on the analysis of the links between pricing and taxation and the private sector/end-user level. The written material consists of twocountry reports, Kenya and Ethiopia (Okech and Nyoke, 1998), (Tadesse et al., 1998), (Kebede et al., 1998) and two regional reports, (Karekezi et al., Oct. 1998), (Karekezi and Ranja, 1998), (Kebede et al., 1998). Regarding quantity and quality, the research output is satisfactory.

The data and information background is desk research and secondary data, and seen from the technocratic viewpoint of the central planner and university researcher it has its roots in an economist tradition. Therefore, the study is a good analysis of development in consumption, tax structure, price structure, financial options, macro-economic

development. Studies at this level and with this data and information background are necessary, and supply unique information about the energy situation in the region. However, from the reports it is clear that there is a need for exact data regarding the social and economic situation of the consumers. The researchers are aware of this problem, and in one of the studies it is recommended, that "the Government should undertake a nation-wide survey which would generate information necessary for establishing the extent and demand characteristic of small urban centres and rural areas" (Karekezi et al.,1998). In the discussions at the 1998 General Assembly the need for further knowledge regarding the consumer situation was clearly expressed and underlined. In these discussions it was put forward, that the need for demand side/consumer situation information not only encompasses economic and consumption pattern data, but also a methodological analysis of the links between fuel wood, employment and agriculture, and the more general cultural embedding of the fuel wood utilisation. The type of information needed would require methodologies including systematic person to person interviews of an array of representative consumers. We agree to the viewpoints of the conference participants, and stress that this need does not only encompass general economy oriented surveys of general energy consumption patterns and habits, but also includes information from in-depth interviews regarding the "total" life situation of the consumers.

Although we find the quality of the research good within its justifiable limitations, due to the allocated resources and working conditions, we would like to put forward two points, which we think worthwhile to consider:

1. There seems to be a tendency to believe that it is very time consuming to achieve primary data regarding the consumer situation. We agree that it is time consuming to establish a general survey regarding energy consumption patterns in different regions, in different households and in different types of agriculture. Collection of this type of general primary data has not been possible within the research budgets under which the theme group has been working. We would like to propose that more information on the 'micro-level' of various households is collected. We argue that even in depth interviews with 10-30 consumers would give information, which might improve the level of knowledge considerably, and could be undertaken within the research budget allocated to the theme group.

2. When looking at the reports, and the research outlines from 1996, there seems to be a need for a more systematic description of the aims, theoretical approach and used research methods in the studies. The theme groups aim to assess the "the impact of liberalisation in the downstream petroleum sector", which needs a good description of the system boundaries of the analysis. It is a very important exercise, especially when many researchers are working together to discuss why a given assessment should be performed. Regarding the theoretical approach, many different approaches can be selected. They all have their strong and weak sides, seen in relation to the research objectives. In this theme group the theoretical approach is not systematically discussed. The approach is characterised by the limitations given by binding the analyses to desk research. This results in analyses which regard the consumers as parts of a market, and to some extend excludes detailed analyses of the political processes which underlie the supply systems and control them. Such an economist world view has its strong features, and the result of these is shown in interesting reports. But it also has its weak points, which are that the consumer situation is not described in detail, and that the political processes behind the control of the supply companies in a privatisation process are not analysed. It is suggested,

that the theoretical framework should be discussed systematically in the projects, both at the beginning of the report, and when the usefulness of the conclusions is discussed.

Policy Impact, Conclusions and Recommendations

The channels of policy impact are useful, when looking at the type of analysis performed in the second programme. In the short run the major impact seems to come through the Governmental/Utility employees. The long run impact could come through the connection to the Universities, and the education at these. The connection to policymakers and end-user representatives is relatively weak according to our information. It might be worthwhile to develop systematic procedures for establishing this connection.

The overall objectives with regard to performing the assessments have been fulfilled to an acceptable degree within the given research resources. The theme group produces well-documented analyses leading to proposals, which are of use in the policy formulation process. All the areas mentioned in the 1996 research outline are covered. The theme group has produced results, which may lead to practical policies and strengthen the research capacity in the region. These research results are disseminated, especially to policy-making organs at the national level. The Second programme has mainly based its studies on secondary data , and has come to a stage, where further analysis will require first hand information regarding the concrete situation in detail of the end-user. This will require interviews of different representative end-user groups and some of the scientific methods used by sociologists and social anthropologists will have to be applied. And last but not least, it will require a shift in perspective, from the supply side orientation of the Second programme to an end-user-oriented perspective.

Recommendations

- The establishment of an "End-user" panel linked to each theme group. Linked to the above comments with regard to the need for a more end-user oriented approach, this would also encompass the design and implementation of dialogue-oriented seminars with end user representatives. The present dissemination target groups are mainly researchers, public administration employees, to a minor extent politicians, and only very fragmentarily end-user representatives. It should be mentioned that this systematic policy of dissemination is in itself something unique. But as dissemination is within the core element of the AFREPREN concept, it is a must for AFREPREN to continuously develop its expertise within this area. At the same time it might be worthwhile to replace the word dissemination with the words dissemination/communication. Such change of dissemination strategy is very closely linked to the change from supply side orientation to a combined supply side/end user orientation.

One way of supporting this shift might be by establishing a more equal gender balance in the research group. It is our impression from the discussions at the 1998 General Assembly that the women often took a very concrete end-user approach, when dealing with e.g. the questions linked to replacing the use of firewood for food preparation with kerosene.

4. The Second AFREPREN Programme

Here we will synthesize the analysis of the single theme groups into a general analysis of the complete second AFREPREN programme. In the discussion we follow the research questions as outlined in Chapter 2. For discussion of the theme groups research we refer the reader to Chapter 3.

4.1 Relevance, appropriateness and performance

The work performed in all theme groups and the AFREPREN secretariat, may be considered as clearly relevant in relation to the energy problems facing the region. The analysis is generally linked to problems presently located in the cities. The three Power Sector theme groups, and the Oil and Finance theme group are linked to the existing energy organisations, and the Traffic and Environment theme groups are dealing with problems and opportunities in the cities.

The first AFREPREN research programme dealt extensively with rural energy problems. This work has been continued in an ongoing Sida supported, AFREPREN research study on renewable energy technologies. Seen in this context, the rather city and supply-oriented focus in the theme groups is justifiable as a necessary step in a process of establishing equal access to energy services. The next step would be to deal with more end-user oriented analyses more directly supporting a process of improving the access to sustainable energy services in the rural and urban poor areas.

In general the composition of the theme groups is unique, with its mixture of people from research institutions and administration/public utilities, and with people rooted in natural sciences working closely together with social scientists. This enabled studies which combine technical, organisational and economic analyses, and to develop proposals which are almost ready for implementation. Nevertheless the groups have reached a limit, where to an increasing extent it is necessary to increase the factually based knowledge within sociology as well as political science.

Although the gender balance does correspond with the usual international standard within the area of energy, the need for a closer analysis of the household/end-user situation indicates the necessity for a higher percentage of women and their points of view in future theme groups. It should be emphasized that the relevant categories, when evaluating the appropriateness of research groups are not only linked to the above mentioned divisions. When dealing with problems of improving the energy services for the rural areas, and the urban poor, a very important dimension is the ability and willingness to take a concrete end-user position in the analysis.

The degree of success in achieving the overall objectives and the specific project-wise objectives stated in the Programme is acceptable. The theme group produces well-documented analyses leading to proposals, which are of use in the policy formulation process. All the areas mentioned in the 1996 research outline are covered. Regarding the fulfilment of the overall objectives, the theme groups have produced results, which can lead to practical policies. The research capacity has been strengthened in the region. The research results are disseminated, especially to policy-making organs at the national level. Altogether, the work has fulfilled a necessary and important step in the

analysis of regional energy problems in a very impressive way. However, as a result of the performed analysis it has also become clear that many questions, particularly those related to the specific political situation, as well as those relating to the specific situation of the end users still have to be examined in order to obtain the necessary knowledge concerning the detailed institutional preconditions, on which the success of a specific policy proposal depends.

4.2 Research output, research capacity strengthening and dissemination of research results

The AFREPREN network and the theme groups have succeeded in producing an impressive amount of country and regional studies. The quality of these studies is unique, due to the combination of natural science and social science, and due to the well documented policy recommendations. The studies are submitted to a peer review process by an international expert panel, and the reports can only be published after this process, which is performed at the final stages of the report writing process. The research process could be improved by:

a. Systematic discussions of the *theoretical and methodological framework* within the AFREPREN network, at an initial phase of the research process. This should be linked to a systematic discussion of the theoretical and methodological framework. In this way a theoretical guidance for the data and information collection process is established.
b. Collection of *more primary data and information*. This might be increasingly necessary when the analysis becomes more end-user oriented. This includes collection of general data for a country or region and in-depth interviews with important stakeholders, e.g. poor urban consumers, rural households, employees at the energy companies, small rural business firms, policymakers. The establishment of an *end-user panel*, including the above mentioned stakeholders, could increase the involvement of the stakeholders, and help bring end-user viewpoints into the research process. In depth interview schemes with end-users, should not, from a money resource point of view, be outside the reach of the AFREPREN theme groups.
c. Detailed studies of the social and political *preconditions for and consequences of policy proposals.* This might further increase the usefulness of the policy recommendations.
d. Improved *communication and exchange of information* and data and information sources among the theme group participants.
e. Nurture discussion, access and exchange of information and viewpoints between all AFREPREN members active and interested in the subject.
f. Improved *collaboration with other developing* countries and regions would strengthen the results and focus on major opportunities.

The Programme is important in the building up and strengthening of *capacity in energy policy research* in the region. In general, of the 6 theme groups, around 40% of the researchers are affiliated with universities, and 60% with governmental agencies, public utilities and private companies. The share of affiliations vary from theme group to theme group. For instance, the Institutions- and Management and Efficiency theme group has only around 25% of its participants affiliated with universities, whereas the Environment theme group has 70% university employees. In general the second programme has resulted in considerable build-up and strengthening of the energy policy research capacity in the region. In some of the theme groups this has taken place within governmental and public utility institutions in particular, and in one theme group pri-

marily within the university. The capacity building can be strengthened by increasing the number of Masters and PhD students linked to the programme, especially within the theme groups, which have so far had relatively few university based researchers. This could be carried out by means of masters and PhD theses dealing with the above areas.

An important part of the *dissemination process* is linked to an extensive publication programme implemented by the AFREPREN office in Nairobi, including a newsletter, electronic outputs, books and working papers. This represents an important medium for the dissemination of AFREPREN's research results, as well as a means to maintain its presence in the energy policy arena. Another important aspect of the dissemination process is linked to the composition of the theme work groups. With around 50% of the participants linked to Government and Public Utilities, the research results and lessons learned may be expected to be used in the daily practice. This means that the results are instantly disseminated to important decision makers. Policy seminars, organised in collaboration with the national Ministries and regional and international organisations have also been important in the dissemination process, as proved in y workshops organised in the transport sector, as well as by deregulation processes in the public utility sector. The present target groups for dissemination are mainly researchers, public administration employees, and to a minor extent policymakers, and only very fragmentarily end-user representatives or other stakeholders. The main AFREPREN publications (e.g. books, articles in international journals) have also reached the international research and policy making community and are seen as prime information sources on African energy policy issues (e.g. on renewable energy technologies). This also stresses the quality of the work performed.

The *dissemination process* of the second programme has been well designed to the aims of this programme, with its rather supply oriented and administrative level focus. But linked to the need for an approach increasingly dealing with the social, institutional, economic and policy aspects, and undertaking an end-user oriented approach, this would also encompass dialogue-oriented seminars with the different stakeholders, including end-user representatives. It should be mentioned that the systematic policy of dissemination in itself is unique. However, as dissemination is within the core element of the AFREPREN concept, it is a must for AFREPREN continuously to develop its expertise within this area. As a part of this innovation process with regard to methods of dissemination, it is worthwhile considering, whether it is possible to establish an "end-user panel" linked to the various theme groups, consisting of representatives of the main stakeholders for each theme group. At the same time it might be worthwhile to replace the word dissemination with the words dissemination/communication. This change of dissemination strategy is closely linked to a change from supply-side oriented to a more end-user oriented focus.

4.3 Policy Impact

The policy impact of an individual research programme is always difficult to assess. When looking at the above mentioned modes of dissemination, the channels used to make an impact on the process of energy policy making, are highly appropriate seen in relation to the aims of the second programme. Nevertheless it might be useful to include more national and regional policymakers, and end-user representatives in the policy discussions, by inviting them to seminars, conferences and other parts of the programme activities. In this way a necessary educational process could be established both for the

participating policymakers and the participating researchers. It might also be useful to include more people from the end-user level, and local and regional governmental officials as well as planners in the channels for making an impact on the national policy.

4.4 Network Sustainability

The AFREPREN network was established in 1989, and has been in existence now for almost 10 years. There are not many network programmes that can show such a long track record, with such a high output volume. The various countries in the region seem to be well represented in the current programme, and during the General Assembly various participants from non-member countries participated. Despite the broad regional coverage, the regional coverage may be broadened further. However, this depends on the financial means of the network, as well as the administrative burden associated with such an expansion. The wide distribution of disciplines and affiliations of the people involved in the network may also prove to be a key to the sustainability of the AFREPREN network. Nevertheless, we also recommend strengthening of the collaboration in one form or the other with other regional (academic) institutes currently not fully involved in AFREPREN, such as CEEST in Tanzania and EDRC in South Africa. Recent forms of co-operation with institutes outside the region, such as scholarships with UNEP, IEA and Princeton University, are very good ways of extending the Programme, and demonstrate the sustainability of the network as a serious partner for these institutes. This is the result of the SIDA sponsored projects over the past years, and is a sign of success, both for the quality of the research performed and for future sustainability.

4.5 Budget and Cost-Effectiveness

AFREPREN is supported by various financial donor organisations for support of the Network, as well as specific projects. Since 1987 the Swedish Agency for Research Cooperation with Developing Countries (SAREC) has supported the AFREPREN programme. The first programme (1987-1993) was financially supported with SEK 33 Million (ToR,1998), and evaluated positively in 1993. The 1993 evaluation recommended support at higher funding levels, while also recommending specific changes in the scope and execution of the programme (ToR,1998). Based on this report the second cycle of the AFREPREN programme (1994-1997; extended to July 1999 in November 1997) was sponsored by SAREC for a total amount of SEK 38 Million. In 1995 SAREC was merged with the Swedish International Development Cooperation Agency (SIDA), and formed the Department for Research Cooperation/SAREC within SIDA. Considering the output of the network, and the wide dissemination of research, and broad participation, as well as long term sustainability, the funding is relatively modest. The successfulness of this is partially based on the "formula" of using part-time researchers, and using existing infrastructure where available.

Comparison of funding levels to that of other projects is always difficult, as the character, region, and work-load of the projects may differ widely. SIDA/SAREC has funded other network projects in Africa, i.e. the Regional Dryland Programme in Eastern Africa (REDPA), and the Regional Programme in Marine Science, which allow some comparison. However, the character of the various networks varies, the number of participating organisations and countries, as well as participation of Swedish partners. We did not have information to compare the research output, neither in quantity nor qual-

ity. The budget of AFREPREN is comparable to the proposed budget of REDPA, while the total budget of the Marine Science Programme is much smaller. The cost-breakdown of REDPA can not clearly be broken down to similar cost factors (e.g. research, dissemination, administration) or compared (in REDPA a Swedish institute participates). REDPA is more a "pure" research network, with less of a policy aim, when compared to AFREPREN. Compared to the sheer volume of reports produced in a timely fashion, the books published with an international publisher, and the way the programme is administered (see section 4.6), we feel that the budget is very modest. Considering the challenge of communication in Eastern and Southern Africa, we suggest that future funding allocates some additional capital investment to streamline the access to E-mail and other electronic communication tools to maintain the sustainability of the AFREPREN network.

4.6 Network Coordination and Administration

Started at the University of Botswana, AFREPREN is now centrally co-ordinated and administered from a central office in Nairobi, Kenya. The office is shared with the Foundation for Woodstove Dissemination. Besides the administrative staff, the Programme is run by so-called "backstopping officers" which are the prime coordinators of the information exchange and management of the research projects. The coordinators manage the country teams working in the theme groups, and also supervise the review process, as well as the financial process. The "backstopping officers" also perform other tasks within the secretariat, e.g. the important collection of documents and library, automatization, construction of a website, energy statistics collection and system development.

We were impressed by the enthusiasm and quality of the staff at the secretariat. The office is run in a "lean and mean" fashion, with highly capable people. The director and the two managers of the AFREPREN network should be congratulated in organising such a high quality group of people. The office is run with a relatively low number of senior people in the secretariat, and the efficient way in which the secretariat is run, results in low overhead costs. In this way the AFREPREN programme does not fall in the same traps as other development programmes with excessive investments in infrastructure (e.g. office space, transport). The AFREPREN secretariat staff and participants should be congratulated for the efficient way the programme is managed, which is no doubt due to the enthusiasm and quality of the people involved.

5. Conclusions and Recommendations

The AFREPREN network is unique among developed and developing countries in its character, scope and geographical variety. It is difficult to find examples of similar networks in other developed and developing regions. It is unique in its character, as it provides a platform for scientists and social scientists for collaboration and joint studies, using multi-disciplinary teams. The AFREPREN work spans a wide variety of subjects, ranging from technology assessment to policy evaluation. The network now covers most of sub-Saharan Africa, with 12 active member countries in the region and observers from many other countries. The unique character and background makes it difficult to evaluate the network against others, and also provides a challenge for a balanced evaluation.

We have been asked by SIDA/SAREC to evaluate the research programme 1995 – 1997 of AFREPREN. In this section we discuss the main conclusions, and formulate recommendations, both for SIDA/SAREC and for AFREPREN to incorporate in preparation of the next research programme. In section 5.1 we will discuss methodological issues, followed by a discussion of topics related to the subjects and focus points of the AFREPREN network. In section 5.3 we will summarize the main recommendations with respect to methodological issues and subject areas.
Before this, we will would like to emphasize the following conclusion:

- The work performed in all theme groups and the AFREPREN secretariat, may be considered as clearly relevant with relation to the energy problems facing the region.
- The AFREPREN network and the theme groups have succeeded in producing an impressive amount of country and regional studies. Generally, the quality of these studies is of a high level.
- The degree of success in achieving the overall objectives and the specific project-wise objectives stated in the Programme is clearly acceptable. All the areas mentioned in the 1996 research outline are covered. With respect to the overall objectives, the theme groups have produced results, which can lead to practical policies.
- We are impressed by the enthusiasm and quality of the staff at the secretariat. The management group of the AFREPREN network should be congratulated in organising such a high quality group of people.

5.1 Methodological Evaluation

In this section we will draw conclusions on methodological and operational issues of the AFREPREN network.

The wide variety of subjects and backgrounds (disciplinary as well as professional) of the participating researchers provides a challenge for determining the scope of research themes, as well as management of the network activities. A common framework is currently missing. Recognizing that the wide variety within AFREPREN is one the strengths of the network, it also poses a challenge to find common ground. A common methodological framework might be a systematic way of:

a. Describing the core problems which should be analysed in a specific research project. The "simple" questions, *what* should be studied, *why* should it be studied and *for whom* should it be studied, should be addressed systematically.

b. Describing, for the chosen research problem, the chosen theoretical framework with regard to system components, system borders, and theories to describe the relationships among the components.
c. Describing and discussing the selected methods for collecting data and information, and their connection to the theoretical framework.
d. Discussing the conclusion in relation to the selected theoretical framework and data collection method.

It should be emphasized, that a common methodological framework of the above type does not represent theoretical uniformity, but rather reinforces the ability to benefit from different theoretical and methodological approaches, as it establishes consciousness regarding the system borders and the assumptions built into a research project.

A methodological framework for the analysis might help to focus the research and activities of the network, decrease the danger of 'wandering off in side alleys', and help to identify critical elements in energy policy for the region. We encourage the network members to spend considerable effort at the start of the next programme to develop a common framework, and apply such a framework to assess the research questions and issues.

The methodological framework might not only provide a common vehicle to assess the energy policy issues, it might also help to establish systematic methods for the provision of answers to the questions posed. Most of the AFREPREN work is now based on secondary data and literature. This limits the value of the research results, or makes it difficult to draw conclusions appropriate for regional energy policy formulation. A methodological framework might keep the research in the framework of the selected research questions. In that way the research aims and the theoretical framework of the research will be guiding which data and information should be collected. We all know the story of the driver who lost his keys somewhere, but only searches underneath the street light, because there is light, and not because he thinks he has lost the keys there. So if a systematic methodological framework keeps the research on track in the direction of the research aims, the process of collecting data and information will often necessarily include the use of primary data. The use of secondary data is also the consequence of the lack of primary data in the region, and the difficulty and, hence, high costs associated with collecting such data. Nevertheless the data and information collection procedure should be guided by the research aims and theoretical framework, not by the "easiest information" solution of using secondary data. We are aware that primary data collection may be difficult to combine with the available resources and time for the researchers. However, we feel that AFREPREN would be able to strengthen its role as an unique resource for data and policy analysis in the region, by emphasizing methods that are based on current primary and secondary data and, most importantly, the appropriate data to answer to the challenges of regional energy policy in Africa. This need for primary data and information is getting even more pressing, with the entry into the next research programme with its emphasis upon analysing the end-user situation.

The above conclusions stress the need for the development of a set of common methodological tools and framework. Application of such a framework stresses the need for communication among the participants, and ways to share data and information already available or generated within the network. Ways have to be found to improve communication and discussion in the network. Modern communication tools such as E-mail are now more and more used by the participants and may provide a way to enable

discussion among participants on common themes (e.g. dedicated list-servers), as well as ways to provide access to data (e.g. WWW-based databases for members), and exchange data. Communication is not only a technical problem, but would need the active participation of all AFREPREN network members. Based on the quality of the discussion and the wide participation in the discussions at the 1998 African Energy Congress we feel confident that the AFREPREN members are very capable and more than willing to exchange views and data, and that improved communication is a way to increase the current frequency of interactions. Interactions are needed within the theme groups but are not limited to the theme groups in order to capture common issues, such as research methodology or cross-cutting issues.

5.2 Subject and Focus

As discussed in chapter 3 the 1995-1997 AFREPREN programme consisted of six theme groups, covering a wide variety of subjects. When evaluating these theme groups, it should be pointed out, that AFREPREN has dealt extensively with rural energy questions in the first programme, and that this work has been continued in a major parallel ongoing AFREPREN study on renewable energy technologies and rural electrification, both financed by Sida. The conclusions in this section for the theme groups, should be seen in this context. We will concentrate on common issues, rather than on the individual themes. In chapter 3 recommendations for each of the theme groups are discussed.
Despite the wide variety of themes in the AFREPREN programme all themes have (still) a strong supply-side orientation. Compared to previous AFREPREN research programme the current programme has already focused more on demand side issues. However, the theme groups do not assess the demand side issues related to the investigated themes. Recognizing that there is a huge under-supply of modern energy services in sub-Saharan Africa, a strong focus on the supply side can be understood. The current theme groups all study the supply of modern energy services. By doing so, they concentrate on a small part of the population, as less than 10-20% of the population in most countries in the region have access to electricity. Hence the urban "rich" are the major focus of the AFREPREN research theme groups. Focusing on energy demand issues would help to balance the research interests better with the social and energy issues, and would lead to different priorities in research themes. High quality data on energy demand and use are difficult to find in industrialized countries, let alone developing countries. Hence a demand side focus would strongly encourage research methodologies based on primary data collection and analysis (see above).

The strong focus on supply-side issues makes the current AFREPREN programme less suitable for assessing all social, political and institutional aspects of energy supply and demand, including gender issues. The largest part of the population (80-90%) still has no access to modern energy services, resulting in a heavy burden on these population groups, and most notably women who collect the fuel wood, and feel the consequences of indoor air pollution in the form of respiratory diseases (the most common health problem in the region). At the same time there are few programmes (except for South Africa) aimed to provide modern energy services to the majority of the population, and current developments in the power supply sector will not tackle these problems. While the background of the researchers makes the network extremely suitable for tackling these important issues, the theme selection hides these important issues. We strongly recommend a stronger focus on energy demand patterns and energy needs as part of future AFREPREN programmes.

The current research programme (1995-1997) is very wide, and addresses a large set of problems in the supply of modern energy services. All research themes react to problems, which were current at the time of conception of the programme, and still are. Reacting to problems gives the opportunity to contribute to solutions of the problems, entice the interests of policy makers and researchers. However, a multiple-year research programme may not be the most suitable vehicle to assess all aspects of current problems, as developments in the 'real world' might surpass the ability of the network to adapt to the new developments. The analysis of the reforms in the power sector are examples of rapid developments. Analysis of current problems are of great importance both because of the political need for advice regarding current problems, and because the solutions on current problems always have considerable impact upon the strategic long term possibilities. But analysis of current problems also might lead into a research trap, where only current short term problems are analysed. This can be avoided by implementing a systematic research methodology, empowering the researchers to trancend the theoretical framework of the day to day discussion. By implementing a systematic research methodology as described in 5.1, it is possible both to make analysis which can give proposals linked to current problems, and to link these proposals to more strategic analysis of the energy systems. Such an approach, combining the analysis of current problems with strategic issues (in the energy sector) might be more suitable for a multi-year research programme. We therefore encourage focusing on a methodological framework which can combine analysis of current problems with strategic issues along the lines discussed above for future AFREPREN activities.

5.3 Recommendations

In this section we summarize the main recommendations drawn from the previous chapters. Recognizing the diversity of the activities and members in AFREPREN it is difficult to formulate recommendations for all parts and participants of the network. This section tries to summarize the major issues, and more details can be found elsewhere in the report.

We recommend the development and use of a methodological framework within the AFREPREN research activities. The AFREPREN network should develop and agree up on a methodological framework, which encompasses a description in each research report of research aims, theoretical approach, data and information linked to this approach and a conclusion which considers and discusses the limits of the used approach. Additionally the development of a methodological framework, should include a model for policy intervention (involving not only policy makers, but also major stakeholders, e.g. unions, industries, newspapers), and defining the audience of the AFREPREN research activities and reports. The concept of the 'Critical Mass Theory' is a very serious and promising attempt to assess the developments in energy policy in the region, and should be applauded as a step in developing a methodological framework.

The development of a methodological framework for the assessment of energy issues will not only make it easier to focus the research activities, help to determine the key factors, but also help to provide common analytical tools. It will also help to establish a training and capacity building in combining analysis of current day to day energy problems with long term strategic issues. This is very important for AFREPREN, which at the one hand has to be able to give suggestions for policies linked to the current energy debate, and at the other hand to develop improved long term strategic analyses. We recom-

mend that AFREPREN gives more attention to the development and training of research methods and tools. Currently, participants use their professional training and background and expand their knowledge through on-the-job training. Development of research tools may be helpful to improve the quality of the reports, as well as balance the various country studies. The common tools may encompass instructions on reporting, primary data collection, discussion of key issues, and key references in the field. We acknowledge that the development of a common methodological framework and analytical tools may place a burden on the secretariat. Hence, models should be found that utilize the active members of AFREPREN in this development.

Development of a methodological framework will require the participation of the academically trained participants in the network. We recommend the integration of the AFREPREN research activities with those of universities and research institutes, e.g. M.Sc. and Ph.D. programmes. Such an integration will help the development of a methodological framework and use of analytical tools, and will also enlarge the (research) capacity of the programme. It could also give a strong impetus to capacity building for energy analysis in Sub-Saharan Africa. Already a large number of academics participate in AFREPREN, and already AFREPREN has initiated the integration of efforts with University of Mauritius, which unfortunately ended in an early stage due to the sudden death of a key person. AFREPREN clearly recognizes the importance of this integration, and we recommend the intensification of the relations between AFREPREN and leading university programmes in the region, through current AFREPREN participants and also key institutes not yet members of AFREPREN.

Communication among the members is the key to the success of any network programme, trying to organize people, build capacity, and conduct joint research activities. The knowledge of the participants and discussions among the participants are of a very high level, demonstrating the capabilities and commitment of the AFREPREN participants. We recommend the improvement of communication among network participants, by increasing the frequency of interactions through meetings, and modern tools like E-mail, dedicated list-servers, WWW. Providing and managing improved ways of communication require an investment of time and funds from AFREPREN and funding agencies (Sida/SAREC). We feel that improved communication is essential for building an integrated network, and the key to success in assuring quality and currency of the research activities of the AFREPREN network.

Communication among the network members, and the interest groups linked to specific research programmes is essential in many cases. This is the case especially when the research project moves to a more end-user oriented focus. Many different models could be brought into use in order to establish such communication. One example is the establishment of end-user panels which may have to be paid, lasting for the research period. In that way a bottom up primary data and information flow might be established. Members of an end-user panel could be addressed in in-depth interviews and in communication sessions with more end-users gathered at regional seminars.

Last but not least, we recommend a balanced approach in the selection of research areas and subjects and participation of network members (e.g. disciplinary and professional background, gender). AFREPREN is unique in its composition, representation and strong collaboration between the natural and social sciences, and between academic and policy making communities. It is difficult to find an equivalent anywhere in the world. The participation of women reflects the international standard, and needs, as elsewhere in the energy analysis field, increased attention in the future expansion of the network. A

balanced approach in the selection of research areas is also the key to the future success of AFREPREN. The second research programme already changed focus from supply side to a more demand side approach. Despite this shift we feel that a strong emphasis on demand side issues in the next research programme, including the various uses of traditional fuels, is key for understanding and developing the energy sector in Sub-Saharan Africa, where 80-90% of the population do not have access to modern energy sources, a state of affairs which leads to many social and economic problems.

6. The proposed New Energy Policy Research Programme of AFREPREN (1999-2001)

At the 1998 Africa Energy Conference and AFREPREN General Assembly, the Conference recommended that AFREPREN should focus on the following broad concerns:

i) Renewable Energy and Rural Development
ii) Energy Services for the Urban Poor
iii) Energy Sector Reform
iv) Energy Efficiency, Environment and Climate Change
v) Special Studies of Strategic Significance

These broad concerns have been elaborated into 5 research proposals described in the new 1999-2001 AFREPREN research proposal (AFREPREN Research Program Proposal, 1998 (ARP,1998).

6.1 Renewable Energy and Rural Development

Background, rationale and motivation
This research programme is aimed at improving the conditions related to energy in the rural areas of Africa in a sustainable way. 75% of inhabitants of Africa reside in rural areas, where electrification percentages of rural households typically range between 0.3% and 5%, dependant on country. For instance, large problems are linked to indoor air pollution from stoves, deforestation due to extensive use of biomass, and low incomes due to lack of electricity supply for processing industries.

Major research questions and issues
The research questions are:

- to assess current rural energy options and the potential for renewable energy. This is done by focusing heavily upon the end-user situation, and the end-user needs.
- to analyse the appropriate institutional structure and regulatory framework, to facilitate the provision and expansion of modern rural energy services. This is a consequence of from this proposal (ARP, 1998), that very little research exists on the institutional infrastructure, that will be needed for effective delivery of modern energy services to the rural poor.
- to analyse the opportunities for integration of renewable energy technologies in existing conventional rural energy systems.
- to analyse the socio-economic effects of the development of renewable energy technologies, especially with regard to technological innovation, employment effects and generation of rural income.

These research questions represent an elaborated and specified version of the research questions that were presented by the theme group on the 1998 AFREPREN General Assembly. The elaboration focuses on the interrelations between conventional energy and renewable energy and the end-user approach, which is in accordance with the needs for taking a next step after the town-, and supply- side oriented second Programme. The research programme is also in accordance with the SIDA "Policy for SIDA's Assistance to a Sustainable Energy Sector", (SIDA 1996). The research ques-

tions show an intention and ambition of establishing a new approach to the implementation of renewable energy technologies in Africa, where the interrelations between these technologies and the established technical and socio-political-economical setting are analysed. We find this an original and important research ambition, which might help bring the discussion regarding the implementation of sustainable energy in rural Africa a step further.

Analytical Framework and Approach/ Research activities
The description of the analytical framework and approach and the research activities still need some elaboration. In our evaluation of the second Programme we pointed out that there was a need for working more systematically on the theoretical approach. This is also the case with the present research proposal. Working systematically with the theoretical approach is something very useful for practical research purposes. Before collecting primary and secondary data and information, one should be aware of the theoretical framework which guides the collection of data and information. This can only be done in a systematic way, by having a theory regarding who the key actors and key institutions are, and the character of the relations among these. Such theories regarding "system boundaries", and "relations" within the system, are important, and essential as a tool to establish focused collaboration in a research network like AFREPREN. It is also necessary to elaborate on the description of the research activities, particularly with regard to the question of end-user approach, where the collection and interpretation of primary data and information is particularly crucial. The second Programme was supply-oriented and town centred, and the "primary data" were part of the background experiences of the researchers. In the context of the end-user focus of the present research programme this will not be the case. Therefore, the research methodology will require specific attention and "new ideas" for the research methodology. One approach might be the establishing of "end- user" panels as part of the research methodology. Other approaches are possible. We wish to stress that this question needs a very thorough discussion.

6.2 Energy Services for the Urban Poor

Background, rationale and motivation
The average African growth rate for urban areas is twice that of the national population growth rate. The energy services for the urban poor are often forgotten, and appear to have fallen off the development agenda. Electrification in nine African countries (ARP,1998) has only reached an average of 26% of the urban households. The long term goals of this proposal is to contribute towards increased awareness of the pressing energy needs of the urban poor on the part of the key decision makers in Government, the research community, international and local development agencies as well as the local and international private sector (ARP,1998).

Major research questions and issues
Research questions to be analysed are:

- the modern and productive uses of energy in low-income urban areas in Africa. This is in response of an observed "research gap" within this area, and it is motivated by the hypothesis that the lack of modern energy services in poor urban areas appears to be an important barrier to informal sector entrepreneurial activities (ARP, 1998)
- the interventions needed to facilitate the availability of affordable, modern and non-polluting energy services for the low-income urban areas of Africa (ARP, 1998),

- the distribution and impact of existing energy subsidies. This is motivated by the hypothesis that subsidies are not reaching the urban poor, but benefit the high income households and established modern and industrial firms (ARP, 1998),
- the policy options necessary for bringing modern energy services to the low income urban households as well as urban based small and medium modern and productive enterprises of Africa (ARP, 1998).

In general the research questions represent an elaboration of the research questions that were put forward by the theme group at the 1998 AFREPREN General Assembly. However, it should be pointed out, that there might be a tendency in the ARP98 to not sufficiently stress the Assembly's request to analyse "political will and community participation" in the energy development process in the urban poor areas. Although this was not thoroughly discussed at the 1998 AFREPREN General Assembly, a study of "political will and community participation" can hardly be done with a top-down quantitative statistical analysis of the end-user situation. Such a study would require in-depth studies of quantitative as well as qualitative aspects of the situation of the end-user. This will has consequences for the research methodology as a part of the research methodology (see below regarding "end-user" panels). The end-user approach, i.e. a focus on the urban poor and on the income generation dimension of modern energy services, is a necessary next step after the second Programme. This research programme is also in accordance with the SIDA's overall aim of improving the living standards of the poorest groups of people.

The research questions show an intention of handling questions which have had low priority and attention so far, namely the modern and productive uses of energy in low-income urban areas. The results of this research may lead to a deeper understanding of the need for a modern energy infrastructure in the poor urban areas, which may when applied support income generation as well.

Analytical Framework and Approach/Research activities
Like in section 6.1 we find further elaboration of the research questions necessary. It is particularly important to work concretely with descriptions of the theoretical approaches. When dealing with urban poor and income generation, it is necessary to establish a description of the situation of the urban poor. What are the institutions, which are the barriers for development and income generation, and what significance does lack of a modern energy infrastructure have in the context of the growing poverty? Indeed, this is not an easy job, but with the above research ambitions it is indispensable to have some "theory of urban poverty", even if only fragmentary. However fragmentary, this theory will play a very practical part when the data and information collection methods are established. "No theory" is just an "unconscious theory", which then simply results in an unguided process for the collection of data and information.

The research activities are more closely linked to the analytical framework, and with a sharper definition of the type of data needed, especially the primary data and information. From the proposal it is difficult to see, to which extent the primary data are figures concerning income, energy consumption, or data and information describing the total life situation of household members as well as owners and workers in small firms. We believe it is important to collect data and information very close to concrete cases, even when one might be afraid of loosing a general overview. Such "in depth" data and information could be collected in in-depth interviews with members of an "end-user" panel, for example.

6.3 Energy Sector Reform

Background, rationale and motivation
In Africa an array of energy reforms within the fossil fuel as well as the electricity sector has been implemented during the last years. These reforms include privatisation of former state owned firms, vertical unbundling of national electricity utilities, and modernisation of national power companies. Partly due to the recent implementation of energy sector reforms and, partly, due to the absence of accurate monitoring mechanisms, the impact and implications of the energy sector are still largely unknown. While there are studies from other regions of the developing world that provide some useful information, studies that analyse and track the impact of the energy sector reform in Africa are virtually non-existent. This lack of concrete knowledge regarding the consequences of recent energy reforms, "undermines the possibility of developing more differentiated alternatives that may generate a wider range of options to reflect the region characteristics and institutional/management capacity" (ARP, 1998).

Major research questions and issues
"In brief, there is a dearth of research and information on the impact of energy sector reform in Africa. As mentioned earlier, decision makers are effectively undertaking far-reaching structural changes to Africa's energy sector in an environment that is largely devoid of reliable and verifiable guidance, information and data" (ARP,1998). "The proposed program is designed to address this worrisome shortfall by assessing the impact of existing and planned energy sector reform measures on the following":

- Performance of key energy sector institutions. Is for instance cost efficiency improved after the reforms?
- Have reforms resulted in increased competition ? Or has the result been a mere change from public to private monopoly?
- What has happened to the prices of energy after reform implementation?
- What has been the effect of energy reforms upon the implementation of renewable energy- and energy efficiency measures?
- Which effects have the energy reforms had upon the regional technological development?

These research themes are a logical continuation of the second Programme. They also fill out a need to analyse the effects of energy reforms, at the stage of energy reform implementation in Africa, where there are still possibilities of reform improvements adapted to regional conditions. Furthermore the proposals show a willingness to critical analyse questions, which at present are often regarded as being the reform "trend", and therefore often placed outside the scope of scientific analysis. The research themes are in accordance with the Sida's premises as put forward in "Policy for SIDA´s Assistance to a Sustainable Energy Sector" (SIDA, 1996)

Analytical Framework and Approach
This description is relatively elaborated, probably due to its close connection to analyses performed during the Second Programme. Nevertheless it is important to develop a theoretical framework, which can guide the analysis and the collection of data and information. Which actors and institutions are regarded as important, when performing the analysis ? What are the relations between these stakeholders? It is necessary to establish a discussion around such questions, in order to establish practical guidelines for the collection of data and information. Many of the participants of the research group have first hand experience as governmental administrators and/or employees in the

energy companies. From that position they have excellent primary information, but from a top-down perspective. When dealing with questions which have had and may have the utmost importance for the employees, it might be of use to establish a data collection/communication process which utilises primary date from the factory floor perspective.

6.4 Efficiency, Environment and Climate

Background, Rationale and Motivation
This theme group is the follow-up of two theme groups, on climate change and the environment, merged into one theme. Africa contributes only a small part to the build-up of greenhouse gases (GHGs) in the atmosphere. However, the economies in Southern and Eastern Africa may be very vulnerable to climate change, as they rely heavily on agriculture. This makes climate change, and the mitigation thereof an important issue. This has to be seen in the context of sustainable development patterns, considering the local environmental impact and the wish for economic growth and job generation. Efficient use of energy resources, recovery of energy from wastes and other mitigation strategies are part of the broad scope of this theme group.

Major Research Questions
- examine viability of energy efficiency and DSM (demand side management) options, and assess the societal and environmental benefits;
- assess the potential for energy recovery from fluid wastes, and assess the economics and environmental impact of energy recovery from wastes in Africa;
- assess the economics of potential GHG emission reduction in the transport sector in Africa.

The last two research questions build on the interesting work, performed under the second AFREPREN Programme, while the first question did arise at the 1998 General Assembly, due to the strong focus on supply side issues in the second Programme. The three research questions are linked by the potential energy savings that can be achieved., as well as the potential environmental benefits, including local environmental problems and GHG emissions. Despite the common characteristics, the three research questions also cover very different areas, which is partially the consequence of the activities in the second programme. A common approach and methodology to the three issues might help to retrieve part of the wide differences that may be found (see below). The broad theme of the group fits very well in the goals of the Sida's policy for assistance in the energy sector (Sida,1996). Efficient use of resources is key to the development of a sustainable energy system and society. This working group should try to address the issues from a demand-side perspective, and would help to strengthen the AFREPREN programme. The only concern may be the distribution of resources over the three research questions, which may be insufficient to solve any of the three questions in detail. If the resources do not allow addressing all three research questions, it would be better to make a further selection, and use the strengths of the AFREPREN programme (i.e. various country studies) to come up with better recommendations. Limitation of the research questions to items as discussed at the 1998 General Assembly, i.e. cost and benefit analysis of waste management, urban planning and mass transit, and efficient power use in appliances (HVAC, lighting, motors) could help to use the budget adequately.

Analytical Framework and Approach
The proposed approach sets out the basic steps, and takes a 'engineering' approach to the issues, by using a technical analysis, followed by an economic and a institutional analysis of the potentials for energy savings. The order of analyses proposed is a classical and proven 'engineering' approach, but may need input of social scientists to address the links between the three aspects, and to rank the barriers to implementation. The first tier in the proposed programme is very general, and may be needed to prepare a selection of the three research questions (see above), although it has the danger to focus too much on supply side issues, instead of taking a demand side approach. It would be very worthwhile to develop the methodology for the technical, economic and institutional analysis further in the proposal or in an early stage of the study, to reduce the danger of producing very diverse (case) studies and (country) reports. Hence, it would be worthwhile to change the second tier of the programme to an evaluation of analysis methods used, and development of a common methodology for all studies, which can be confronted with a selection of options (tier 3). The final report (tier 6) may improve strongly if build on a common framework for analysis, showing a clear and detailed understanding of all issues.

6.5 Special Studies of Strategic Significance

Background, Rationale and Motivation
The African energy sector is changing rapidly, and these changes pose many questions. For example the privatization of power supply has enormous impacts on the power sector in Africa and the future of electrification and development. The theme groups working on the power industries in the second AFREPREN programme, were 'surprised' by the rapid changes and the impact it may have on the study. The Strategic Studies initiative will help to identify emerging issues in energy demand and supply in Africa, and study those developments. In this way, AFREPREN will be able to provide policy makers with views and recommendations on these developments. At the same time it gives AFREPREN flexibility to study emerging issues, not identified at the time of preparing the proposal for the third programme. The need for such a group emerged from the 1998 General Assembly.

Major Research Questions
Due to the character of this group the research questions are, by definition, less clear and need to be seen as a selection of possible research questions. Some of the emerging issues that were identified as possible research question are:
- what is the future role of natural gas in Eastern and Southern Africa, as natural gas exploration and exploitation is increasing in Africa;
- what lessons can be learned from innovative institutional changes in the power sector in other developing countries (Africa, Asia, Americas);
- what may be the consequences of the deregulation of the power industry in industrialized countries and the emerging role of independent power producers for privatization in Africa;
- what are the potential impacts of technology developments in energy technologies, including renewables, in Africa.

The central focus of the theme group is proposed to be finance, as this is likely to play a key role in the development of the energy sector in Africa. This also defines the first step in the research, where current and future investment trends of investment banks will be

investigated to select the first issues for detailed study (see below). Such an approach emerged from the 1998 General Assembly, although describing investment policies or "regional bodies". It is necessary to use some tools to help to identify the important issues, and this approach may help to find them. This approach is an example of a strong supply side view on the energy issues, and may be the consequence of the activities deployed under the second Programme. This has the danger of pre-selection of strategic issues, while missing a set of questions related to future development of energy services demand. For example, the World Bank has abolished it's industrial programme. Hence, looking at the investment policy of the World Bank may neglect the potential impact of industrial energy consumption on regional supply and demand, while industries are the largest electricity consumers in most countries in the region. A few of the proposed topics may not fit within Sida's Policy for Assistance (Sida,1996), so need to be re-evaluated in close collaboration with Sida, e.g. the use of coal in some countries in the region.

Analytical Framework and Approach
The character of this theme group makes it difficult to develop a suitable methodology at this stage in the proposal, and is, therefore, not comparable to the other theme groups. Despite this handicap, the team has tried to develop a methodology, starting with selection of the problems based on investment policies, followed by a study of implications for the region of these policies and identification of emerging issues. This is an exercise which can only be welcomed and applauded. The strong focus on investment policies in the energy sector has the danger of 'forgetting' important factors and developments in the energy future in Eastern and Southern Africa. The goals (tier 5) of the theme group could be more ambitious, as it would also be good to develop, on the basis of literature and case-studies, recommendations for policymakers how to react to the emerging issues, or showing preferred development directions. The participants in AFREPREN are well equipped to prioritize the emerging issues, based on their experience. This common experience could be better reflected in the selection of issues and proposed methodology.

6.6 The Budget

The idea of a four year programme workplan, with two 2-year projects is good, considering the special characteristics and demands of this programme. The need for collection of more primary data, increased communication with policy makers and end-users, training courses, seminars and the increased contacts to University MSc and MA level programs, benefits from a longer programme period than three years. At the same time, it is important to assure that the programme is proceeding, which makes the introduction of 2-years project periods useful. The two year period also allows an internal review and evaluation of the progress of the programme, and re-directing if necessary. Consequently we recommend a four year programme with 2-year project periods, as outlined in the AFREPREN proposal.

The discription of the distribution of the budget among the group activities, in the 2nd Draft, of February 1999 is not very detailed. The theme groups on Renewables and Energy for Rural Development, and Energy Services for the Urban Poor have a relatively high annual budget, which is in line with the research needs as described in this evaluation, and in the programme description. The group "Training courses and seminars" has a relatively high budget, which is justifiable, considering the need for seminars with policy makers, end-user panels, training and education of the network

participants. Given the level of budget specification in the second draft, we find the budget to correspond to the programme needs as described in the Programme Proposal (second draft), and the future research needs and recommendations described in this evaluation report.

6.7 Conclusion and recommendation

We agree with the AFREPREN assembly, that the 5 concerns are important, that they are in line with research need in the region, and that they represent an important "next steps" for the AFREPREN network. With regard to *major research questions and issues*, the proposal is dealing with important research questions in an innovative way. The 5 research areas also are in accordance with the "Policy for SIDA´s Assistance to a Sustainable Energy Sector" (SIDA, 1996). With regard to the major research questions and issues, we have found a willingness to approach questions, which so far have not been thoroughly analysed. For instance, there have been extensive studies of renewable energy in the rural areas, but the specific approach in this proposal includes new elements of looking at the rural energy question in connection with the institutional setting and as a part of a potential generation of income and technological innovation process. The ambition to look at modern energy for the urban poor in a perspective of development and income generation is also innovative from a research point of view. Furthermore the general intention of changing from the rather supply-side oriented approach of the second Programme to an end-user orientation in this proposal might represent a research innovation, when implemented in a collaborative and communicative process with the end-user.

The *analytical framework and approach* in the proposal still requires further elaboration. This is particularly relevant to establish a systematic discussion of the theoretical approaches in each of the proposals. The actors and institutions which are regarded as important for the research questions as well as the relations among these actors and institutions need to be described systematically, in order to establish a systematic structure and procedure for collecting data and information. Such a description of the theoretical framework is always necessary, but essential when co-ordinating research in a network collaboration like AFREPREN. When looking at the willingness to apply an end-user approach, it still is not easy to see from AFREPREN Research Program Proposal (1999-2001), to what extent this will include innovative ways of bottom-up dialogue with the end-users. The second Programme was relatively supply-side oriented. Its research group members were people with a first hand knowledge at the energy company and administration level. When establishing the end-user orientation of the new proposal, the knowledge regarding the end-user level is not part of the professional knowledge within the research group. This makes it necessary to discuss the difference between an end-user approach characterised by top-down sociological quantitative studies of the end-user situation and a more dialogue oriented bottom-up study of the economic and total situation of the end-users, as a part of the research process.

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Appendix 1: Curriculum vitae of evaluators

Frede Hvelplund's background is within International Economy and Social Anthropology. He works as an associate professor at Aalborg University. FH's main working area has been analysing the socio-economic consequences of, and institutional preconditions for different technical energy scenarios. His has worked extensively with analysing energy planning possibilities, and participated in a network of researchers, which has published several energy plans and energy scenarios for Denmark within the last 20 years, and an energy plan for eastern Germany in 1993. FH has been an advisor for rural energy planning, and a member of governmental advisory commissions, as well as of the Danish Ecological Council. In 1998 he participated in PROCEED, an educational project for Baltic energy planners, for which he developed a course and wrote a book on socio-economic feasibility studies. FH's extensive participation in research concerning socio-economy and energy planning has resulted in many books and articles on these subjects.

Ernst Worrell (Ph.D.) received his Ph.D. in 1994. He has worked with the Energy Science Project at Utrecht University in 1988-1989. From 1989 till 1998 he worked at the Department of Science, Technology and Society of Utrecht University, The Netherlands. In the period 1994-1995 he was a visiting scientist at the Center for Energy and Environmental Studies at Princeton University (USA). He was a visiting professor at the Universidade de Sao Paulo, Brazil, in 1996. He joined the Environmental Energy Technologies Division of Lawrence Berkeley National Laboratory, USA, in 1998. His work includes research and evaluation projects in energy efficiency improvement, energy policy, energy and materials, and waste processing. He has experience in multinational research teams and has lead studies for various governments, European Commission, World Energy Council and the United Nations. He is lead-author of two IPCC special reports. He is (co-) author of 100 publications in the mentioned fields. He is Editor-in-Chief of *Resources, Conservation and Recycling* and associate editor of *Energy, the International Journal.*

Appendix 2: Site Visits and Travel Itinerary

As part of the evaluation of the AFREPREN Programme the evaluators participated in the African Energy Conference and General Assembly meeting in Nairobi, Kenya from November 1st till November 6th, 1998. Before the meeting site visits were made to Uganda (Prof. Hvelplund only) and to energy projects in and around Nairobi. The site visits and meetings were very instructive in understanding the context of energy use and supply, as well as of energy research in the region. Below the travel itinerary is given.

Day	**Time**	**Activity**	**Location**
Sun 25th Oct	Afternoon	Arrival in Nairobi	JKIA Airport,Nairobi
Mon 26th Oct	Afternoon	Meet AFREPREN Secretariat Staff Members	Nairobi
Tue 27th Oct	Morning	Depart for Uganda	JKIA/Entebbe Airports
Tue 27th Oct	Afternoon	Visit Messrs. S. Magezi and T. Otiti's offices and meet their assistant researchers. Visit taxi & bus parks as well as observe the operations of a new private company in charge of parking in Kampala.	Kampala
Wed 28th Oct	Morning	Visit a typical rural village en route to Jinja, which is 1 1/2 hours drive from Kampala, Uganda.	Jinja
Wed 28th Oct	Afternoon	Visit Mr. Mugyenzi's office and meet his assistant researchers as well as visit the Owen Falls Power station then travel back to Kampala.	Jinja
Thur 29th Oct	Morning	Visit an improved stove production unit and finally visit two petrol stations; a small one serving low-income customers and a large modern one serving high income customers.	Kampala
Thur 29th Oct	Afternoon	Travel back to Nairobi and meet Ernst Worrell.	Nairobi
Fri 30th Oct	Morning	Visit AFREPREN Secretariat	Nairobi
Fri 30th Oct	Afternoon	Visit the Kenya Power and Lighting Wind generators at the Ngong Hills in the outskirts of Nairobi.	Nairobi
Sat 31st Oct	Morning	Visit Solagen Ltd - dealers in solar PV panels	Nairobi
Sat 31st Oct	Afternoon	Visit low-income and high-income housing areas en route to Shauri Moyo Improved Stove Production Unit.	Nairobi
Sun 1st Nov	Afternoon	Start General Assembly and African Energy Conference, Safari Park Hotel, Nairobi, Kenya	Nairobi
Fri 6th Nov		General Assembly/African Energy Conference (through Friday, November 6th)	Nairobi

Appendix 3: Evaluation of the AFREPREN Programme

- QUESTIONNAIRE -

The Swedish International Development Agency (SIDA) is evaluating the past four years of the AFREPREN programme, and is interested in considering recommendations for the next phase of funding for the programme. This questionnaire is part of the evaluation process. The questionnaire is send to a number of participants in the AFREPREN network. The results of the questionnaire will be used in the evaluation process as a basis for in-depth discussion with selected members, and in the report to SIDA, next to the results of other evaluation results. This is a critical step in the evaluation process, and we would like to request you to take the time to respond fully to the questions. We have also reserved room for your comments at the end of the questionnaire. Please feel free to add any remarks you think are important in the evaluation process.

We apologize up-front for the length of the questionnaire. We hope you will find some time in your busy schedule to answer this questionnaire. We appreciate your cooperation very much in this evaluation, important for the future activities of SIDA and AFREPREN.

Your individual responses on the questionnaire are strictly confidential, and individual results will not be used in the report to SIDA. We ask for your name, and address in case we would like to discuss specific items in depth. We hope to be able to talk to most of you during the annual AFREPEN conference in Nairobi, Kenya (November 1-6, 1998). To be able to survey the results and select the appropriate items for in-depth analysis we request you to send us the results by E-mail as soon as possible, and preferably before October 17th, 1998. Please send the filled in electronic questionnaire to the following E-mail addresses: EWorrell@lbl.gov and hvelplund@i4.auc.dk

In this questionnaire we will start with some general questions on the AFREPREN programme, followed by questions on the specific studies you have been working on. The last part is a short section on your background, as well as room for specific comments.

We wish to thank you in advance for your cooperation, and we look forward to meeting you in November in Kenya.

Frede Hvelplund
Ernst Worrell

The Evaluation Questionnaire: An Analysis of the Responses

In answering the questions please use the following scale:
1. Bad 2. Poor 3. Fair 4. Good 5. Excellent

PART 1: AFREPREN - GENERAL OPERATION

1.1 How would you characterize the relevance of AFREPRENs Second Programme Cycle (herafter referred to as the Programme) in relation to the energy problems facing the region?

1.2 Does AFREPREN play a constructive role in the region within the following areas (please rate your answer using 1 to 5, see above, and specify your answer)
A. Research Capacity building
B. Placing the research in a regional perspective
C. Performing policy analysis, that can be used in the political decision making process
D. Supporting the process of Policy implementation
E. Dissemination of research results to relevant target groups
F. International visibility of regional energy analysis

1.3 How would you rate the role of the AFREPREN programme (1 to 5, see above) for:
A. Research Capacity building:
B. Quality of the regional energy studies.
C. Ability to perform Policy analysis, which can be used in the political process
D. Ability to support the process of Policy implementation:
E. Ability to disseminate research results to relevant target groups?
F. Ability to establish an international visibility of the energy analysis:

1.4 What do you regard as the most important criteria of scientific quality, regarding energy studies in your region?

1.5 In relation to the criteria from 1.4, how would you rate the scientific quality of AFREPREN publications (1 to 5, see above) ?

1.6. Within which areas does AFREPREN activities have policy relevance ?

1.7 How would you rate the policy relevance of AFREPREN activities (1 to 5, please specify your answer) ?
A. National:
B. Regional:
C. International (outside the region):

1.8 What are the strengths of the AFREPREN programme (please use 1 to 5), please specify your answer?
A. Research:
B. Training:
C. Publishing and Outreach:
D. Regional visibility and role:
E. International visibility and role:
F. Management:
G. Other:

1.9 What are the weaknesses of the AFREPREN programme (please use 1 to 5) please specify your answer?,
A. Research:
B. Training:
C. Publishing and Outreach:
D. Regional visibility and role:
E. International visibility and role:
F. Management:
G. Other:

1.10 Is the design of the AFREPREN network appropriate, in relation to the context of AFREPRENs primary objectives?

A. With regard to connections to projects, target groups within politics, adminstration and end-users in each country?

B. With regard to collaboration between the participants from the member countries?

C. With regard to connection to the international research- and policy community?

1.11 What are the greatest constraints of the work of AFREPREN ?

1.12 What, if any, opportunities is AFREPREN missing ?

1.13 How do you rate the overall impact of AFREPREN (1 to 5, see above) ?

1.14 Which improvements could be suggested/implemented for the organisation of the AFREPREN network?

PART 2: SPECIFIC PROJECTS

2.1 In what projects did you participate in the last 4 years (Y/N):

1. Reform and Restructuring of the Power Sector
2. Investment and Financing in Petroleum Marketing
3. Management and Efficiency in the Power Sector
4. Capacity Building in the Power Sector
5. Local Environmental Impact: Bioenergy from Municipal Waste
6. Global Environmental Impact: The Transport Sector and the Mitigation of Greenhouse Gases
7. Renewable Energy Technologies

2.2 For each project in which you collaborated (please use the above numbers), could you please, where possible rate the project (1 to 5, see above. Do not hesitate to give specified comments) for the following criteria:

A. Research quality:
B. Training of researchers:
C. Regional cooperation
D. Possibilities of getting the necessary information and data:
E. Data collection and analysis:
F. Publishing and Outreach:
G. Dissemination to the public
H. Regional visibility and role:
I. International visibility and role:
J. Management:
K. Collaboration with organisations within your country:
L. Other:

2.3 For each project in which you collaborated (please use the above 1-5 numbers), could you identify the strengths:

2.4 For each project in which you collaborated (please use the above 1-5 numbers), could you identify the weaknesses:

2.5 How would you rate the overall impact of the project in which you collaborated (please use the above 1-5 numbers):

2.6 Can you identify one or more projects, of regional importance, that you recommend for future attention of AFREPREN:

3. INFORMATION AND COMMENTS

INDIVIDUAL INFORMATION:

Name:
Organisation:
Address/P.O.Box:
City:
Zip-code:
Country:
Tel.:
Fax:
E-mail:

Please describe your professional background and current role with respect to energy research and policy:

COMMENTS:
Please provide any comments that you think are important for the evaluation of the AFREPREN program, and have not been discussed above. Please feel free to elaborate on points made above.

NEW DIRECTIONS:
Please provide any suggestions for new programs and directions that might be useful for future AFREPREN activities. Please feel free to elaborate here on specific project suggestions made above, or you may want to discuss any of the following items:
- project identification, planning, implementation and evaluation
- general management and allocation of funding
- future directions for regional and international communication and collaboration

THANK YOU:
Thank you very much for your time to respond to this questionnaire. Your answers are essential in the evaluation process and we appreciate your help.

Results of the Questionnaire

We summarize the results of the general part of the questionnaire. 24 questionnaires have been send out to principal researchers in early October. The questionnaires have been send out by electronic mail and by fax. Of the 24 questionnaires send out 10 were returned, corresponding to a respondent rate of 42%. The results of the part on specific theme groups is not reported as only a few respondents have responded for each of the theme groups (2 or less). This could lead to a wrong picture of the work of the theme groups. The individual answers (for the general and the theme group specific part) have been used in the discussions with the theme groups during the General Assembly meeting and as background information in the writing of the evaluation report.

No.	Question	Mean Score
1.1	How would you characterize the relevance of AFREPRENs Second Programme Cycle in relation to the energy problems facing the region?	4.7
1.2	Does AFREPREN play a constructive role in the region within the following areas	
	A. Research Capacity building	4.7
	B. Placing the research in a regional perspective	4.6
	C. Performing policy analysis, that can be used in the political decision making process	4.3 3.6
	D. Supporting the process of Policy implementation	3.6
	E. Dissemination of research results to relevant target groups	4.4
	F. International visibility of regional energy analysis	
1.3	**How would you rate the role of the AFREPREN programme for:**	4.6
	A. Research Capacity building	4.1
	B. Quality of the regional energy studies	3.9
	C. Ability to perform Policy analysis, which can be used in the political Process	3.4
	D. Ability to support the process of Policy implementation	3.9
	E. Ability to disseminate research results to relevant target groups	4.4
	F. Ability to establish an international visibility of the energy analysis	
1.4	What do you regard as the most important criteria of scientific quality, regarding energy studies in your region?	No Value
1.5	In relation to the criterions from 1.4, how would you rate the scientific quality of AFREPREN publications ?	No Value
1.6	Within which areas does AFREPREN activities have policy relevance ?	No Value
1.7	How would you rate the policy relevance of AFREPREN ?	
	A. National	4.4
	B. Regional	4.4
	C. International (outside the region)	3.4
1.8	What are the strengths of the AFREPREN ?	
	A. Research	4.6
	B. Training	3.6
	C. Publishing and Outreach	4.6
	D. Regional visibility and role	4.3
	E. International visibility and role	3.9
	F. Management	4.1
	G. Other	No Value

1.9	What are the weaknesses of the AFREPREN ?	No Values [1]
1.10	Is the design of the AFREPREN network appropriate, in relation to the context of AFREPRENs primary objectives ? A. With regard to connections to projects, target groups withinpolitics, administration and end-users in each country B. With regard to collaboration between the participants from the member countries C. With regard to connection to the international research- and policy community?	 5.0 4.2 4.3
1.11	What are the greatest constraints of the work of AFREPREN ?	No Value
1.12	What, if any, opportunities is AFREPREN missing ?	No Value
1.13	How do you rate the overall impact of AFREPREN	4.6
1.14	Which improvements could be suggested/implemented for the organisation of the AFREPREN network?	No Value

Notes:

1. Different respondents had difficulty in understanding the use of the rating system in question 1.9. Hence, the answers do not qualify as valid.

Appendix 4.

Sida

TERMS OF REFERENCE

Dept for Research Cooperation, SAREC
M R Bhagavan

26 August 1998

Ref. No.

SAREC-1995-0093

Terms of Reference for the Evaluation of the Sida-supported Programme within the African Energy Policy Research Network (AFREPREN)

1. Background

Countries in Eastern and Southern Africa display many common features in their natural resources, environment, demography, land-usage, economy and trade, all of which have a strong bearing on the character of the energy crises affecting these nations. This commonality makes it meaningful to address some of the most important energy issues from a regional perspective and on a regional basis. The African Energy Policy Research Network (AFREPREN) was conceived on this regional premise.

AFREPREN's primary stated objectives are:

* To undertake policy-research work that can lead to practical policies for sustainable energy development;

* To strengthen research capacity in energy policy in the Eastern and Southern African region;

* To effectively disseminate its research results, in particular to energy policy making organs, with the aim of making a policy impact.

Central to AFREPREN's approach is the bringing together of African energy policy makers and researchers, so that they can work together on problems which they jointly identify as being important.

1.1 *AFREPREN's structure, management and scope of research and associated activities*

The process of setting up the network took place during 1987-88, which included planning meetings, workshops and minor studies. AFREPREN was formally launched in the Spring of 1989. The core of its First Programme Cycle, which stretched over the period 1989-1994, encompassed the following seven research themes:

1. Renewable Energy Technologies
2. Biomass and Bio-energy
3. Rural Electrification
4. Planning and Management in the Power Sector
5. Substitution of Coal in the Household Sector
6. Transport Energy
7. Energy Management in the Manufacturing and Power Sectors
8. Energy Utilities and Institutions

AFREPREN is structured and organised as a research network encompassing, at present, twelve countries in Eastern and Southern Africa: Botswana, Ethiopia, Eritrea, Lesotho, Kenya, Malawi, Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. The network comprises, at present, some 30 principal researchers (made up, in roughly equal measure, of energy professionals and energy policy-makers), with a supporting corp of some 60 research assistants. In addition to this core programme, AFREPREN commissions short-term specialist studies by energy professionals and policy makers, who are not yet inducted into the network.

Until August 1994, the network was coordinated and administered by a secretariat based in the National Institute of Development Research and Documentation (NIR) in the University of Botswana in Gaborone, with the energy-professional aspects handled by a Network Facilitator based in Nairobi, Kenya. The General Assembly of AFREPREN, at its August 1994 meeting in Lusaka, Zambia, decided to move the administrative and coordinating functions from Botswana to Kenya, and create a single centralised secretariat in Nairobi. This secretariat is run by a small number of professionals and support staff, under the leadership of a Director.

A Steering Committee is responsible for the formulation, execution and supervision of AFREPREN's Programme of Activities, including its finance. It comprises seven members, all of whom are from Eastern and Southern Africa. They are drawn from both the energy policy-making and research communities in the region. The Director of the AFREPREN secretariat is also the Executive Secretary of the Steering Committee. The present Steering Committee was nominated by AFREPREN's General Assembly in August 1994. It meets once a year to review the running of the Programme, discuss strategic issues

and annual work plans, and scrutinise and approve the externally audited accounts.

AFREPREN complements its central mission of conducting research and the building up of research capacity with a range of associated activities, e.g. publication and dissemination of research output, research meetings, training workshops, regional and national policy seminars, policy consultations for national governments, library and documentation service, compilation of energy databases for sub-Saharan Africa, etc.

1.2 *Sida's support to AFREPREN*

Over the period 1987-1993, AFREPREN received a total of about SEK 33 million from the former Swedish Agency for Research Cooperation with Developing Countries / SAREC. (As of July 1995, the earlier SIDA and SAREC were merged, together with three other Swedish development assistance agencies, into one new organization, the **Swedish International Development Cooperation Agency /Sida**. Within the new **Sida**, the earlier SAREC became the Department for Research Cooperation/**SAREC**).

The above-mentioned First Programme Cycle of AFREPREN was evaluated in 1993 by two international experts. Their report was positive and recommended continued support at a higher funding level, while also recommending certain changes and improvements in the design and execution of future programmes.

In September 1994, AFREPREN submitted a proposal to the former SAREC for support for the Second Programme Cycle for the three year period 1994/95-1997, in which due attention had been paid to the evaluators recommendations. In late 1994, the former SAREC decided to continue its support to AFREPREN by making a grant of SEK 28,5 million for the three year period 1 January 1995 - 31 December 1997, allocating SEK 9.5 million per year. Following a request by AFREPREN's secretariat in November 1997, Sida/SAREC approved an extension of the agreement covering this support until 1 July 1999.

The core of the Second Programme Cycle is made up of the following six research programmes, undertaken by six theme groups, in the context of Eastern and Southern Africa:

1. Reform and Restructuring of the Power Sector
2. Investment and Financing in Petroleum Marketing
3. Management and Efficiency in the Power Sector
4. Capacity Building in the Power Sector
5. Local Environmental Impact: Bio-energy from Municipal Waste
6. Global Environmental Impact: The Transport Sector and the Mitigation of Green House Gases

2. The purpose of the evaluation

There are two main reasons for the evaluation: first, to assess how far AFREPREN has been able to fulfill the research, dissemination, capacity-strengthening and policy-impact objectives set out in its September 1994 proposal; second, in the light of the network's performance so far, to assess the new draft application by AFREPREN to Sida for continued support over the three year period, July 1999 - June 2002.

3. The Assignment

The assignment covers the activities of AFREPREN's Second Programme Cycle (hereafter referred to as the **Programme**) over the period 1 January 1995 - August 1998, in particular the activities of the above-mentioned six theme groups. In conducting the evaluation, the evaluators will bear in mind, firstly, both the overall objectives, as well as the specific project-wise objectives, as stated in AFREPREN's September 1994 proposal, and secondly, the logistical and infrastructural constraints in Eastern and Southern Africa that AFREPREN has to contend with in its regional networking activities.

The assessment of the output and performance of the above-mentioned six research programmes should be based on the revised research outlines which were finalized in the Spring of 1996.

The evaluation should cover the following aspects.

3.1 Relevance, appropriateness and performance

* Relevance of the Programme to the energy problems facing the region;

* Appropriateness of the design of the network, the composition and function of the research theme groups and the scope and range of associated activities, in the context of AFREPREN's primary objectives;

* The degree of success in achieving the overall objectives and the specific project-wise objectives stated in the Programme.

3.2 Research output, research capacity strengthening and dissemination of research results

* The quantity and quality of the Programme's written research output, and the extent to which peer reviewing has been employed to ensure quality;

* The contribution of the Programme to the building up and strengthening of capacity in energy policy research in the region;

* The modes of dissemination of the Programme's output and their appropriateness, including the relevance and range of targeted recipients.

3.3 Policy impact

* The appropriateness and effectiveness of the channels and methods used by AFREPREN to make an impact on the process of energy policy making at the national level in the region.

* The approaches adopted by the network to sustain the process of making a policy impact.

3.4 Network sustainability

* A broad qualitative assessment of the sustainability of the network, in terms of the accumulation and use of the indigenous energy policy research capacity that has been and is being created, as well as the anchoring of the network in national energy institutions.

3.5 Budget and cost-effectiveness

* The structure and purpose of the major components of the Programme budget, and how these have affected the performance of the Programme as a whole and the achievement of project-specific objectives;

* A broad qualitative appraisal of the relative cost-effectiveness of the Programme in comparison with other regional programmes in Africa or elsewhere, to the extent that information is readily available to the evaluators through published or unpublished sources.

3.6 Network coordination and administration

* The magnitude and quality of the back-up service provided by the AFREPREN secretariat to the network members;

* The perception of the network members on the performance of the secretariat in discharging its coordinating and administrative responsibilities.

3.7 Dissemination activities

* The diversity, scope and outreach of AFREPREN's activities in disseminating the material it produces to destinations inside and outside Africa.

4. The new draft proposal by AFREPREN

The evaluators shall also assess the new draft proposal due to be submitted by AFREPREN to Sida in November 1998 for continued support over the three year period July 1999 - June 2002, paying particular attention to the following aspects: relevance, importance, quality, capacity strengthening, programme design, feasibility, and the magnitude, structure and appropriateness of the proposed budget.

5. Recommendations by the Evaluators

In addition to their detailed and in-depth assessment of the performance of the Programme so far and the recommendations ensuing therefrom, the evaluators should also present their recommendations on the changes and improvements required in the structure and function of the network, as well as in the approach, design and execution of AFREPREN's proposed programme over the period July 1999 - June 2002.

6. Evaluation Team, Methodology and Time Schedule

The Evaluation Team

The team comprises two international experts:

Professor Frede Hvelplund
Institute of Development and Planning
Aalborg University
DK-9220 Aalborg
Denmark
Tel: +45 96 358380
Fax: +45 98 153788
E-mail: HVELPLUND@i4.auc.dk

Dr Ernst Worrell
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory
1, Cyclotron Road
Berkeley
CA 94720
U S A
Tel: +1 510 486 6794
Fax: +1 510 486 6996
E-mail: e_wged@dante.lbl.gov

Professor Hvelplund will act as the team leader.

The Methodology

The evaluators will study the background material, the written research output produced by the Programme over the period January 1995 - August 1998, and AFREPREN's new draft proposal for continued support which will be submitted to Sida and the evaluators in November 1998.

The evaluators will attend AFREPREN's General Assembly Meeting scheduled for the week beginning 2 November 1998 in Nairobi and conduct in-depth interviews with a representative cross-section of the network membership, including the network's secretariat. Subject to the evaluators other work and time commitments, the evaluators may spend one more week in East Africa, making field visits in Kenya and and one other East African country.

The Time Schedule

The evaluation will entail a total of 5 weeks per evaluator, spread over the period 1 October 1998 - 26 February 1999. The evaluators will spend about one week in Nairobi (31 October - 7 November 1998).

The evaluators will submit a single, joint draft report in English to Sida not later than 11 January 1999. The draft report will be sent by Sida to the AFREPREN secretariat in Nairobi for their comments. Those comments, together with Sida's, will be sent by Sida to reach the evaluators not later than 8 February 1999. Taking these comments into account, the evaluators will produce the final version of their report and submit it to Sida not later than 26 February 1999.

7. Reporting and Publication

The length of the final report will be at least 20 single-spaced typed pages (approximately 8000 words), but should not exceed 40 pages (16,000 words), excluding annexes. It should lead with a List of Contents (including pagination) and an Executive Summary of not more than four pages (single-spaced, about 1600 words)

Further, the evaluators will submit the following:

(i) An Abstract of about 200 words covering the subject matter being evaluated, the purpose, approach and methodology of the evaluation, and the major findings of the evaluation;

(ii) A four page (single spaced, about 1600 words) summary of the evaluation for publication in Sida's "Evaluation Newsletter", according to the enclosed Guidelines;

(iii) A brief curriculum vitae of each evaluator, not exceeding 150 words per evaluator.

The final version of the single joint report shall be submitted, together with the above-mentioned Abstract, Evaluation Newsletter Summary, and the CVs, on paper and on disk in Word for Windows or WordPerfect for Windows or a compatible format. **All these should be presented in a form that enables publication without further editing.** Subject to decision by Sida, the report will be published and distributed as a publication within the Sida Evaluation Series.

The final responsibility for submitting the evaluation report according to the criteria and format mentioned above rests with the team leader, Professor Frede Hvelplund.

Enclosures:

1. List of documentation to be sent by the AFREPREN secretariat to the two evaluators

2. Sida's Guidelines for Evaluation Newsletter Summary

Sida Evaluations - 1999

99/1 Renewable Energy Technologies in Asia: A Regional Research and dissemination Programme. Smail Khennas and Teresa Andersson
Department for Research Cooperation, SAREC

99/2 Strengthening Publishing in Africa An evaluation of APNET. Lars P Christensen, Cecilia Magnusson Ljungman, John Robert Ikoja Odongo, Maira Sow, Bodil Folke Frederiksen.
Department for Democracy and Social Development

99/3 Paper, Prices and Politics. An evaluation of the Swedish support to the Bai Bang project in Vietna,m. David Vincent, Nguyen Quoc, Ngo Minh Hang, Allan Jamieson, Nicholas Blower, Mandy Thomas, Pham Quang Hoan, Do Thi Binh, Adam McCarty, Hoang Van Hoa, David Pearce, Derek Quirke, Bob Warner.
Department for Evaluation and Internal Audit

99/4 A leap of Faith. A story of Swedish aid and paper production in Vietnam - the Bai Bang project, 1969-1996. Alf Morten Jerve, Irene Nörlund, Astri Suhrke, Nguyen Thanh Ha
Department for Evaluation and Internal Audit

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S-105 25 Stockholm, Sweden
Tel: +46 (0)8-698 50 00. Fax: +46 (0)8-20 88 64
Telegram: sida stockholm. Postgiro: 1 56 34–9
E-mail: info@sida.se. Homepage: http://www.sida.se