Energy and Poverty Reduction: Proceedings from a Multi-Sector and Multi-Stakeholder Workshop

How can Modern Energy Services Contribute to Poverty Reduction?

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Contents

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The workshop was designed in the context of the Global Village Energy Partnership (GVEP). It was made possible thanks to the contribution of the World Bank-UNDP Energy Sector Management Assistance Program (ESMAP), the World Bank Africa Energy Unit (AFTEG), the African Energy Policy Research Network (AFREPREN), the Kumasi Institute of Technology and Environment (KITE), and country delegations from Ethiopia, Ghana, Kenya, Tanzania, Uganda and Zambia.

The role of the supporters, moderators and those who provided the logistical support set out to fulfill the need for a joint review between energy and non-energy specialists, energy users, and members of the public and private sectors, civil society, and other organizations to ensure that future energy services would encompass the specific needs of sectors and help achieve the ultimate goal of poverty reduction.

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AFREPREN/FWD

AFREPREN/FWD - African Energy Policy Research Network/Foundation for Woodstoves Dissemination

AFREPREN is a Programme on Energy, Environment and Sustainable Development.

What is AFREPREN?

The African Energy Policy Research Network, AFREPREN, brings together 106 African energy researchers and policy makers from Africa who have a long-term interest in energy research and the attendant policy-making process. AFREPREN has initiated policy research studies in 19 African countries namely: Angola, Botswana, Burundi, Eritrea, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, South Africa, Sudan, Tanzania, Uganda, Zambia and Zimbabwe. AFREPREN also maintains close collaborative links with energy researchers and policy makers from Cote D'Ivoire, Ghana, Nigeria, Sierra Leone and Senegal.

Foreword

The Energy-Poverty Reduction Workshop held in Addis-Ababa from October 23-25, 2002, was a landmark event. It was the first workshop held in the context of the commitments renewed by the international community at the September 2002 World Summit on Sustainable Development in Johannesburg to scale up efforts to eradicate poverty by 2015, and to bring **energy** to the center of the development agenda. It is now recognized that energy is not only important from an environmental perspective, as was the case at the Rio Earth Summit ten years earlier, but that energy is a key impetus for economic growth, needed to create and sustain economic activities, to provide such social or economic services as education, health, and telecommunications, and to fulfill basic needs, from drawing safe water to cooking food and providing light.

The workshop was the first of a series to be held in Africa and around the world that was specifically focused on how energy services can contribute to achieving the Millennium Development Goals. The selection of Africa was not fortuitous. The intent was to signal to the international community that Africa is one of the two geographical poles in the world, which together with the Indian Subcontinent, suffers most from energy poverty. A key message from the workshop was therefore that Africa deserves the joint efforts of all partners, or it will be difficult to meet the poverty reduction targets set for 2015.

The workshop was designed as a partnership between the six participating countries – Ethiopia, Ghana, Kenya, Tanzania, Uganda, and Zambia – along with AFFREPREN, the World Bank, and the UNDP/WorldBank Energy Sector Management Assistance Program (ESMAP). This was done in the spirit of the **Global Village Energy Partnership,** launched at the Johannesburg Summit, which and aims to accelerate the delivery of clean energy services to the un-served or underserved. The workshop attracted 80 participants, including four Ministers, who dedicated themselves to designing innovative energy policies and programs. The approach was very participatory: Ministers and other participants chaired the sessions, led debates and contributed to working groups, giving everyone chance to express viewpoints and share experience.

As the proceedings illustrate, one of the innovations of the workshop was the participation of non-energy specialists, so that energy professionals could engage in frank dialogue with specialists from other sectors: agriculture, industry, education, health and water. Energy specialists were thus able to learn about the demand for energy services from the perspective of consuming sectors, while participants from other sectors learned how energy could help them to achieve their own sector goals. Another innovative feature was the preparation of frameworks for developing country-level Energy Poverty Action Plans as potential tools to enrich Poverty Reduction Strategies. It was concluded that these plans should be developed further with national consultations with much larger groups of stakeholders.

Learning together and from one another in order to achieve results together was one of the great experiences of the workshop. These proceedings are presented to inspire other countries, partners, and teams to engage in similar processes.

Dominique Lallement
Manager
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Executive Summary

1. Introduction and Background to the Workshop

This workshop, the first in the region designed to foster a multi-sectoral approach to develop energy services for poverty reduction, was held at the Hilton Hotel in Addis Ababa, Ethiopia from the 23rd to the 25th October, 2002. It was co-organised by World Bank-UNDP sponsored Energy Sector Management Assistance Program (ESMAP) and the World Bank Africa Energy Unit, with additional assistance from the African Energy Policy Research Network (AFREPREN) and the Kumasi Institute of Technology and Environment (KITE). Country delegations from Ethiopia, Ghana, Kenya, Tanzania, Uganda and Zambia participated in the workshop.

The workshop was designed in the context of the Global Village Energy Partnership (GVEP- see appendix B) which was launched on 31st August, 2002 during the World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa from 26th August 2002 to 4th September 2002. GVEP brings together developing and industrialized country governments, public and private organizations, multilateral institutions, consumers and others in an effort to ensure access to modern energy services by the poor. This Partnership of partnerships aims to help reduce poverty and enhance economic and social development for millions around the world. The Global Village Energy Partnership builds on existing experience and adds value to the work of its individual partners. It covers renewable energy, energy efficiency, modern biomass, liquefied petroleum gas (LPG) and cleaner fossil fuels. The Partnership will help achieve the internationally recognized Millennium Development Goals.

The participants to the Addis Ababa workshop were drawn from ministries and government departments responsible for energy, finance, health, education, agriculture and water. Representatives from several donor organisations as well as NGOs and the private sector were also present. Since the workshop used country Poverty Reduction Strategy Papers (PRSPs) as the starting point, the selection of participants was done to reflect the multi-sectoral approach to the development and implementation of poverty reduction strategies.

The principal objective of the workshop was to enhance awareness of the role of modern energy services in poverty reduction and to use that knowledge to explicitly define Country Action Plans for appropriate energy interventions in poverty reduction. PRSPs now form the basis of donor financing programs for the low income countries. Therefore by making energy interventions explicit this ensures that donor supported programs include energy projects to achieve growth and poverty reduction targets.

A key aspect of the PRSP process is the monitoring and evaluation of the effectiveness of poverty reduction policies and actions. It was therefore also an objective of the workshop to make participants aware of methodologies for measuring the impact of energy policy and services on poverty reduction. This was achieved through the sharing of experiences from existing programmes and projects in various countries.

The summary of the workshop which follows highlights the key issues raised in the presentations and discussions which were structured around the following three themes:

a) **Understanding the Energy-Poverty situation** in the different countries as reflected in the Poverty Reduction Strategy Papers (PRSPs) of each country and clarified by the Ministers and country delegates;

b) **Understanding the role of Energy in meeting priority objectives** in the social and economic sectors of health, education, water, agriculture and development of small to medium enterprises (SMEs); and

c) **Designing appropriate response initiatives** in the form of draft country action plans outlining the priority energy interventions required to enhance the effectiveness of poverty reduction strategies.

2. Where do we stand today on Energy and Poverty?

Poverty Reduction Strategies

The introductory presentations and discussions in plenary sessions and workgroups highlighted that countries now have a comprehensive understanding of the qualitative link between energy and poverty reduction. This understanding is derived in part from the adoption of the Millennium Development Goals (MDGs) by the international community as well as from experience with the PRSP process of the six countries that participated in the workshop. To date, five have adopted fully-fledged poverty reduction strategies (PRSPs) and one, Kenya, is in the process of developing it.

Most poverty reduction strategies are principally concerned with the need to increase income levels of the poor through improved access to income earning opportunities and to improve quality of life through better access to basic social services such as health, education and clean water and sanitation. While access to modern energy services is not specifically listed as a MDG, governments, donors and other stakeholders nevertheless recognise energy as the essential ingredient for making the poverty reduction strategies more effective and the MDGs more achievable.

Appendix A, which summarises outputs from sectoral workgroups in health, education, agriculture, water and SMEs, shows the clear understanding that exists of the qualitative link between energy and poverty reduction strategies.

The poor are, generally but not exclusively, defined as those people who live on less than US$1 per day. In countries whose economies have registered low or negative growth over the past decade poor people constitute the majority of the population. Where positive growth rates have been sustained the proportion of the population classified as poor has declined. The experiences of Zambia and Uganda help to illustrate the point.

In Zambia, where GDP growth has been negative or at best 1.6% per year instead of the 4.5% target, over 70% of the population is now classified as poor. In Uganda, where the economy has been growing at 6% per year the proportion of the poor dropped from 56% in 1992 to 35% in 2000.

Because the bulk of the population in Africa lives in the rural areas these are the areas of focus for most poverty reduction initiatives. In Uganda 96% of the poor are in the rural areas while 83% of Zambia's rural population is also classified as poor. Rural to urban migration

has created a rapidly growing class of the urban poor. Fifty-six percent of Zambia's urban population is poor.

It is important to recognise the link between urban and rural poverty because the burden of supporting the rural population is generally carried by the urban poor. By contrast, firewood and biomass consumption by the urban poor is at the expense of rural agriculture, deforestation, and land degradation. Therefore solving rural poverty helps the urban poor by lessening the support burden.

Energy Interventions

With rural poverty being dominant, governments have struggled to develop viable rural energy programmes. Until the last decade, when other more visible energy interventions such as grid and off-grid electrification and the promotion of kerosene and LPG as substitute fuels for household lighting and heating have started expanding, sustainable biomass programs have been the most significant interventions as integral components of rural development. Alternative fuels and more efficient wood energy utilisation are strategies for reducing deforestation and lessening the burden and the drudgery of fetching firewood over ever-increasing distances mainly by women and the girl-child.

A brief highlight of the modest objectives of rural electrification programmes in the six countries represented at the workshop helps to illustrate the magnitude of what still needs to be done to alleviate rural poverty.

In *Uganda*, the recently designed Energy for Rural Transformation (ERT) program, which is part of the country's Poverty Eradication Action Plan (PEAP), aims to increase electrification access in rural areas to about 10 to 12% by 2010. Zambia plans to increase the proportion of the rural population with access to electricity from the present 2% to 15% by 2010. Ghana, which has a relatively high level of electrification access of 35 to 40% of the population, plans to increase the proportion of rural communities with access from 15% to 20% by 2004.

Kenya plans to spend about US$13 million every year for its rural electrification programme. *Ethiopia's* electrification program aims to increase the percentage of the population having access to electricity from 13% to 17% by 2004/2005. *Tanzania's* rural electrification master-plan is under preparation and is being done within the context of energy sector reforms whose key objectives are the improvement of sector efficiency and reduction of the high cost of utilities.

Areas of concern

While recognising commitment towards the achievement of the MDGs and implementing PRSPs, the task is inevitably complex and the rate of progress is likely to be too slow for the targets to be realised within the lifetimes of many of the poor. Accelerating access of the unserved or underserved to modern energy services is also most challenging. Some of the reasons highlighted during workshop discussions are as follows:

a) There has been a diminishing appetite for African risk by private investors at a time when most African governments have undertaken reforms of the energy sector with the goal of improving attractiveness to private investment. The private sector has also tended to focus on power generation whereas the greatest impact on poverty would be

at the distribution level. The limitations of the private sector requires the World Bank and other development agencies to recognise the need for a continued role of the public sector in energy services provision;

b) Affordability is vital for ensuring access to modern energy by the poor and yet there are subsidy sources which are not being fully utilised such as the GEF, Kyoto Protocol, Prototype Carbon Fund, and the traditional IDA financing. Both capital and consumption subsidies appear to be necessary as experience had shown that many poor people tend to get disconnected for non-payment once subsidies have been removed;

c) There is a shortage of properly designed projects to access the funds available for poverty reduction projects with the result that funds remain unutilised for several years. This is unacceptable in the face of the poverty levels on the continent.

d) During the implementation of energy reforms short run negative impacts on the poor have been observed. Many reforms have resulted in sharp increases in tariffs, reduced subsidies and missed opportunities for scaling up grid and off-grid electrification. However there is not yet any impact evaluation study that clearly confirms the long term impact of energy reform beyond anecdotal evidences.

e) The focus on poverty alleviation should not be done at the expense of the environment. Explicit attention to the environment as a sector crucial for poverty reduction would enhance the effectiveness of action plans.

f) With rural electrification and other rural energy initiatives requiring several decades to reach 100% of the population it is recognised that the half of the world's population which is now dependent on biomass as the primary energy source will continue to do so for the foreseeable future. Besides the rhetoric, unfortunately many governments do not have active policy and budgetary interventions to achieve sustainable biomass use. Increased efficiency in the production and use of firewood and charcoal will not only enhance environmental protection through better forest management but will also facilitate the achievement of Millennium Development Goals in health through reduced respiratory diseases, improved child and maternal health and increased life expectancy.

Lessons learnt

In implementing energy programmes for poverty alleviation useful lessons have been drawn:

a) National energy policies need to be focused on beneficiaries' priorities and on affordability rather than only on technology. This is also most relevant for donor supported interventions which must recognise the importance of community involvement in project design and implementation.

b) Energy is not an end in itself and therefore the formulation of Energy policy cannot be the business of the energy sector alone. A multi-sectoral approach to policy formulation, project design and implementation will have the greatest positive impact on poverty reduction. All stakeholders now accept the need to restructure interventions in line with the multi-sectoral approach to poverty reduction.

c) Extending energy services to the poor implies the recognition of multiple technical and institutional options, including decentralised energy services and building up partnerships between the government and the private sector. The private sector can bring management and investment resources while the government ensures the proper investment climate and incentive framework. The energy technologies – such as improved methods for biomass production and use, solar-based agro-processing technologies, batteries, micro and small hydro, biogas, wind and ramp pumps – can either be the core business of small and medium enterprises (SMEs) or inputs for their other productive operations.

d) Because of the significant role that the local investor can play in the energy sector, the importance of domestic sources of finance has been recognised. Mobilising domestic financial resources instead of foreign borrowing can contribute to improving the macro-economic situation of a country.

e) Rural Electrification through grid extension is most viable when the principal focus is on facilitating productive applications as opposed to simply providing social services such as street lighting and improved health and education services. Non-grid options can be more appropriate where use is restricted to social services.

f) There is an important difference between the urban and rural poor with respect to access to modern energy services. Often for the urban poor the services are there for them to access, whereas for the rural poor the services are not there in the first place.

g) It is now widely recognised and accepted that energy sector reforms provide long term benefits for poverty reduction and economic growth through efficiency and reliability in service delivery, reduced burden on public sector finances, better targeting of subsidies and increased investments.

3. Understanding the Demand for Energy Services

Measuring energy projects benefits and their impacts on poverty

Besides reflecting on the demand for energy services from a sectoral perspective, one of the highlights of the workshop was that it provided the opportunity for participants to discuss methodologies for measuring energy project benefits and their impacts on poverty and to learn from existing projects and programs in various countries. It also gave an opportunity for participants to ask themselves what energy services could bring to the achievement of the MDGs.

In developing PRSPs most governments recognised the need to set time-bound and measurable targets. The workshop, however, showed that there was a general deficiency in the PRSPs in linking specific sectoral priority targets with quantifiable energy interventions. For example in a study on the impact of energy sector reforms on the poor it was observed that electricity access programmes and power sector reforms were generally being planned separately and as a result there was no synchrony between them.

In order to illustrate the impact of electricity on certain aspects of poverty reduction, a recent study undertaken in the Philippines was discussed. It provides a practical method of assessing the qualitative and quantitative benefits of rural electrification. The method is based on the fact that electricity is a derived demand for light, heat, cooling and power which in turn make

it possible to have improved education (through increased time spent studying), entertainment and communication (time spent listening to or watching radio and TV), health (reduced morbidity rates), comfort and protection (reduced crime statistics), convenience (time saved in household chores) and productivity (improved income or output). The items in brackets are the quantitative measures, which can be used for comparative studies.

Education, health, entertainment and communication, comfort and protection and productivity are designated as final outputs whose attainment is a direct measure of poverty reduction. By comparing the measures for the final outputs between electrified and un-electrified households, the benefits of electrification can be quantified.

Pilot schemes in The Philippines and Bhutan were used to validate the method. In The Philippines it was generally found that the benefits of electrification were much higher than previously thought and the poor have a greater willingness to pay and lesser need for subsidies than is frequently assumed. One reason could lie in the fact that most of the poor without access to modern energy services are already spending more of their income for energy than those who have access.

The data required to apply the Philippines methodology is derived from household and village surveys that is best done as part of a participatory approach to project implementation in which the community plays a central role in the whole project cycle. Participatory assessments to support the preparation, design, implementation and evaluation of energy projects provide another methodology for measuring and evaluating the impacts of energy interventions on poverty.

In this approach a three-step data gathering exercise is carried out to capture stakeholder priorities and benefits at community, institutional and national levels. Using this approach throughout the project cycle, and not at the tail end as is more traditional, may slow the start up of projects but it produces greater sustainability due to higher stakeholder satisfaction and involvement, more equitable benefits if properly managed.

When the approach was used in a Cambodia survey for a Rural Electrification Project design it became clear that while at the policy level solar was the correct energy intervention, at the community level this was not seen as relevant. In fact, except for the few better off villages, more affordable health care and food were seen as the priority before access to power and lighting.

Gaining a further understanding of the demand curve for energy services is still work in progress. It is important to continue to refine our understanding of the demand at various income groups.

Learning from existing projects and programs

All countries are implementing energy projects and programs which are designed for poverty reduction. A number of useful lessons have been learnt which should assist others planning similar interventions.

Price is the major barrier to inter-fuel substitution

Ghana is involved with an ambitious inter-fuel substitution project launched in 1990 whose long-term goal is to use Liquefied Petroleum Gas (LPG) to replace wood-fuel and charcoal for household cooking. So far the majority of the poor are still using wood-fuel and charcoal because of LPG prices. The uptake of LPG has been by medium to high income families. Policy and regulatory intervention is therefore necessary. The project has, however, created a local manufacturing industry in gas cylinders and stoves and has encouraged the private sector to invest in retail outlets and filling stations as well as in the standardisation of cylinders.

Efficient biomass use saves forests

Ethiopia aims to achieve sustainable forest management through the development and wide dissemination of improved wood and charcoal stoves. The wood-fuel stove that has been developed has an efficiency of 19 to 21% compared to less than 10% for traditional stoves. There is, therefore, a 45 to 59% saving on wood-fuel consumption. About 400 000 stoves have been sold to date at prices ranging from US$4.12 to US$5.29 per unit. Sales of the charcoal stove have been higher at 1.5 million units priced at US$3.53 to US$4.12. The charcoal stove uses 25% less fuel than the traditional stove and could be sold at a lower price by encouraging local entrepreneurs to use scrap metal to substitute the imported sheet metal used for cladding.

Successful private-public partnership for off-grid electrification

In Sri Lanka the private sector has been involved in a successful partnership with Government for off-grid electrification of rural areas using solar PV and micro-hydro technologies. In a World Bank-GEF funded Energy Services Delivery Project (ESDP) between 1997 and 2002 US$53 million was spent on a private sector, NGO and community driven off-grid electrification program. The program demonstrated successful private/public sector partnership with community owned projects being financed through commercial banks and village level micro-financing institutions. Project approval and subsidies are provided by Government and technical and management support are provided by private consultants. A major constraint is the regulatory framework, which still maintains the legal monopoly of the national utility for grid networks. Therefore the village hydro schemes are, in strict terms, illegal. The sustainability of the projects without subsidies is another major issue of concern. A new US$133 million project, designated Renewable Energy for Rural Economic Development (RERED), was launched in July 2002 to continue the community electrification programs which includes the progressive reduction of subsidies.

Utility Performance Improvement can accelerate electrification access

A project for utility performance improvement in Zimbabwe has improved technical and operational efficiency as well as increasing electrification access from 20% in 1992 to over 40% of households in 2002. The project was initiated and managed by local management with little external support. Efficient revenue collection made it possible for the rural electrification and development levies to be available for the intended use. The improvement program also demonstrated the willingness of customers to pay for improved quality of service and this made it possible to introduce an automatic tariff adjustment formula to counter political resistance to tariff increases. Cross subsidies have also played a major role in encouraging

those rural and urban households connected to the grid to use electricity for cooking. Further extension of the grid and off-grid services will, however, need changes in the legal, institutional and regulatory framework. Attempts to introduce major private sector investment have so far failed because of the adverse regulatory and macro-economic environment.

Energy project improves household incomes and gender equity

A UNDP/UNIDO project in Mali has had a successful pilot programme of developing multi-functional platforms which target the mechanisation of women and girl-specific tasks thereby empowering women and increasing school attendance for girls. A multi-functional platform is a single diesel engine which drives several end-use devices such as cereal grinding mill, de-husker, oil press, carpentry and joinery tools, water pumping and mini-grid electricity. The engine can be driven by diesel or bio-fuels produced from plants such as the Jatropha Curcas plant. Improved household incomes and better access to social services by women has a direct and positive impact on poverty reduction.

4. Designing appropriate response initiatives – Frameworks for Country Action Plans

Country workgroups, consisting of the multi-sectoral and multi-stakeholder representatives from each country, brainstormed on the key elements of an energy delivery plan for reduction of poverty. The process underlined the need for prioritising energy interventions to facilitate implementation.

In the short time available for this exercise, and starting from the PRSP objectives and existing programs, the country teams were able to highlight the sectors requiring the highest priority and to identify the need, in the short term, to undertake more detailed energy assessments on a the basis of a multi-sectoral approach.

From the frameworks for the country action plans it is clear that most of them place agricultural productivity as the highest priority. It is also clear that a national stakeholder consultation is required to refine the action plans and to reach out to more stakeholders than those represented at the workshop so that they become bankable documents for mobilising political commitment and financial support, including donor support, for the identified policy actions and priority projects.

Ethiopia Action Plan

The country's priority is to increase the area under irrigation because Ethiopia is drought-prone. Accordingly it has an ambitious Water Sector Development Programme (WSDP) which has the objective of expanding the area under irrigation to make a significant impact on food security. The program comprises hydropower development, water resources management, drinking water and sanitation and institutional and capacity building. It also incorporates complimentary agro-processing activities such as grinding, drying, storage and transportation. The most immediate need is a budget for a six-month detailed assessment of a pilot energy project for powering small-scale irrigation and potable water schemes.

Ghana Action Plan

The priority sectoral activities where maximum benefits would result from appropriate energy interventions were identified as small irrigation schemes, agro-processing industries, increased access to sanitation and clean water in peri-urban and rural areas. Other priority areas include technology transfer and development for SME support and development of model institutions to establish quality benchmarks for energy services rendered in health and education. The immediate need is for the Ministries of Energy and Finance to coordinate the development of the required multi-sectoral plan.

Kenya Action Plan

The priority activities identified relate to the energy sector itself. Provision of financial and fiscal incentives to accelerate rural electrification and sustainable biomass use are high priorities. Complementing this would be a multi-sectoral energy needs assessment. Another priority is the improvement of the efficiency of the distribution sector in order to reduce technical and non-technical losses as well as lowering power costs for SMEs.

Tanzania Action Plan

The priority issues for Tanzania also relate to the energy sector itself and involve the maximisation of grid usage, promotion of appropriate off-grid technologies and speeding up of energy sector reforms to improve sector efficiency. What is immediately required is a revised rural energy master-plan, to be developed through multi-sectoral consultations and study tours.

Uganda Action plan

Increasing agricultural production, productivity and market access are the key priorities for Uganda. In this sector, as well as for the education, health and water sectors, the immediate need is to quantify the energy needs and to identify pilot schemes. Another issue is to complete the on-going regulatory reforms. The SMEs sector needs special support through expansion of micro-finance schemes and training and capacity building for energy services.

Zambia Action Plan

Targeted priority sectors are small-scale irrigation, solar electrification of off-grid education and health centres, and water and sanitation and health education (WASHE). The immediate action plan is to adopt a multi-sectoral consultation process that builds upon ideas such as the Global Village Energy Partnership (GVEP) to create a localised Country Village Energy Partnership (CVEP).

5. Conclusion and the Way Forward

This workshop was the first of several such multi-sector and multi-stakeholder workshops planned over the next twelve months in order to catalyse country commitments to achieving energy-poverty reduction targets.

As articulated by the ESMAP Manager, the workshop set out to promote the concept of different sector specialists, governments, donors, NGO's, private sector and other stakeholders working as partners for poverty reduction. This is the GVEP approach. The

workshop succeeded in this objective. The challenge is continuation of this kind of partnership at country level and in project design and implementation.

Most of the countries represented in the workshop committed to follow up on the development of action plans to ensure that the momentum generated during the workshop is sustained through to project implementation. Towards this end several countries recognised the need to strengthen capacity for multi-sectoral coordination. Facilitation for the implementation of such action plan is one of the key services of the Global Village Energy Partnership (GVEP – see appendix B).

The Zambia Action Plan even suggested the need to establish a Country Village Energy Partnership to mobilize the governments, development and financing institutions, NGOs and the private sector. This suggestion is worthy of serious consideration by all the countries and confirms the potential value added for the Partnership.

The workshop also set out to equip participants with knowledge of methodologies to measure impacts of energy policy as well as to provide lessons from existing programs and projects. This objective was also achieved. Above all a network of contacts and a framework were developed for improving upon the contribution of energy interventions to poverty reduction.

A number of pertinent observations and recommendations for future workshops were made by the participants. Some of the most important recommendations that were suggested are highlighted below:

?? There are a lot of people getting into the category of poor people and therefore many poverty assessments and action plans are chasing moving targets. The emphasis must be on simultaneous action and planning.

?? The focus on poverty reduction should not make us lose sight of the goal of economic growth. Positive economic growth rates result in the poor becoming a diminishing proportion of the population.

?? The workshop highlighted sectoral inter-linkages that cannot be ignored in poverty reduction strategies. The role of civil society had however not been sufficiently highlighted. Future workshops of this type need to involve civil society organisations as well as representatives of the target beneficiaries. In particular more women need to be involved and this requires countries to encourage more women to be specialists in energy and other sectors relevant to poverty reduction.

?? Follow up workshops and meetings of this kind are necessary to provide feedback and to share learning experiences as well as to monitor and evaluate the effectiveness of existing policies and programmes for poverty reduction.

1

Introduction and Background to the Workshop

1.1 Introduction

How can modern energy services contribute to poverty reduction? To respond to this challenging question, a regional workshop was held at the Hilton Hotel in Addis Ababa, Ethiopia from the 23rd to the 25th October, 2002. It was co-organised by World Bank-UNDP sponsored Energy Sector Management Assistance Program (ESMAP) and the World Bank Africa Energy Unit, with additional assistance from the African Energy Policy Research Network (AFREPREN) and the Kumasi Institute of Technology and Environment (KITE). Country delegations from Ethiopia, Ghana, Kenya, Tanzania, Uganda and Zambia participated in the workshop.

Invited participants included ministers responsible for economic planning, finance and energy; senior officials from these ministries (permanent secretaries, directors or commissioners) and from the social and productive sectors - health, education, agriculture, water, environment and small, micro and medium enterprises (SMEs). Other participants were drawn from civil society, academia, the private sector and senior representatives from the World Bank and other donor organisations. ***Annex A*** is an outline of the workshop program and ***Annex B*** lists the names of the participants and their contact details.

In recent years, consultation amongst government, civil society and other stakeholders has supported the preparation of country-based Poverty Reduction Strategy Papers (PRSPs). Strategies focus on improving the incomes and quality of life of the poor through appropriate social and economic programs. The PRSPs provide a framework to reinforce public action for combating poverty and to promote progress towards the United Nations Millennium Development Goals (MDGs).

Despite the critical role that energy development plays in achieving these goals, the relevance of energy services has not been consistently recognised. Consequently in the drafting of PRSPs the knowledge, experience and needs of major energy stakeholders have not been sufficiently taken into account. This workshop was designed to fulfil the need for a joint review between energy specialists and energy users to ensure that future energy delivery projects would encompass the specific needs of those sectors where energy services, while being necessary, are not the core activity.

Combining plenary presentations (overview and case studies) and workgroup sessions the workshop was designed to allow a lot of debate and discussions culminating in the preparation of frameworks for country action plans that define the energy interventions necessary to achieve poverty reduction targets. The main objective in the preparation of country action plans was to assist the various country teams to coordinate to ensure follow up after the workshop.

In the process the workshop was also able to raise the awareness of the positive impact of modern energy services on poverty reduction, highlight the benefits of the multi-sector approach to the preparation of poverty reduction strategies and share regional and worldwide best practices for energy delivery projects to meet the needs of poor households.

1.2 Background

The Energy Situation in Africa

The energy sector in Sub-Saharan Africa is characterised by low per capita consumption rates in a continent endowed with extensive but under-developed resources for modern energy services. The bulk of the population depends on biomass (wood-fuel and charcoal) because modern energy fuels such as LPG, kerosene and electricity are either unavailable or unaffordable. Deforestation is therefore a major problem created by the current energy consumption patterns in Africa.

Average per capita consumption of modern energy during the period 1990 to 1997 fell from 248 kg of oil equivalent (kgoe) to 238 kgoe, which is about 50% of the world average.

On average less than 30% of the population has access to electricity. Most people with access live in urban areas. Access levels are extremely low in rural areas, being as low as less than 1% in some countries. Per capita consumption of electricity is 447 kWh including South Africa but only 126 kWh excluding South Africa which generates more than half of the continent's electrical energy.

Sub-Saharan Africa also lags behind in attracting investment resources for energy development. In recent years many countries (over 20 at present) have initiated energy sector reforms in order to make the sector attractive for private sector investment.

Poverty in Africa

Eighty percent of Africa's 800 million people (1999) live in Sub-Saharan Africa (SSA). The vast majority (over 70%) of the population lives in rural areas where poverty levels range from 50% to 77%.

Total GNP for 1999 for SSA was less than that of Korea (47 million) and Netherlands (16 million). GNP per capita for SSA was US$492 (including South Africa) but US$ 306 excluding South Africa. The World Bank estimates that about half the region's population had average incomes of below US$1/day. The number of poor people in Africa has grown 5 times more than the figure for Latin America and twice that for South Asia (World Bank,

2001). The proportion of the population living on less than US$2/day (PPP) is very high (Table 1).

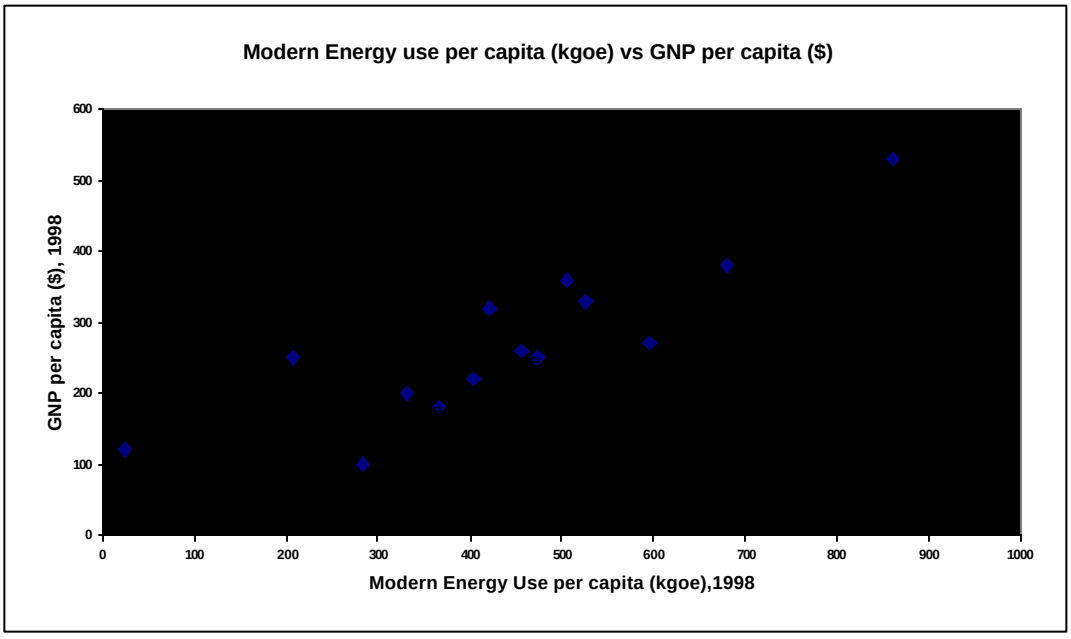
Table 1: Poverty in Selected African Countries

Countries	*Year*	*% of Population with Incomes of Less than PPPUS$ 2/day*
Botswana	1985-86	61.0
Cote d'Ivoire	1988	54.8
Ethiopia	1981-82	89.0
Kenya	1992	78.1
Madagascar	1993	93.2
Niger	1992	92.0
Nigeria	1992-93	59.9
Rwanda	1983-85	88.7
Senegal	1991-92	79.6
South Africa	1993	50.2
Uganda	1989-90	92.2
Zambia	1993	98.1
Zimbabwe	1990-91	68.2

Source: World Bank, 2001

There appears to be a correlation between GNP per capita and modern energy use, as shown in Figure 1. The low incomes that are found in most sub-Saharan African countries imply a very low level of modern energy consumption. Sub-Saharan African countries such as Zimbabwe with relatively high GNP per capita tend to consume more modern energy. Although not conclusive, the graph does suggest that high income can contribute to improved modern energy services.

Figure 1 Modern Energy Use per capita (kgoe) Vs GNP per Capita



Source: AFREPREN/FWD, 2002.

Energy and the Millennium Development Goals

At the United Nations Millennium Summit in September 2000 world leaders agreed on the following Millennium Development Goals (MDGs) to be achieved by 2015:

- **Goal #1: To halve extreme poverty and hunger** - The agreed indicator of extreme poverty is an income of less than US$1 a day.
- **Goal #2: To achieve universal primary education** - More than 100 million children do not attend school. The goal is to ensure that every child of school going age attends school.
- **Goal #3: To empower women and promote gender equality and equity** - Women constitute the majority of the world's illiterate and most of the households headed by women are poor.
- **Goal #4: To reduce under-five mortality by two-thirds** - More than 10 million young children die every year before reaching the age of five.
- **Goal #5: To reduce maternal mortality by three-quarters** - In the developing world one in 48 women die in childbirth.
- **Goal #6: To reverse the spread of killer diseases, especially HIV/AIDS and malaria** - These are diseases that have erased development gains.
- **Goal #7: To ensure environmental sustainability** - More than one billion people still lack access to safe drinking water.
- **Goal #8: To create a global partnership for development, with targets for aid, trade and debt relief** - Too many developing countries are spending more on debt service than on social services.

At the World Summit on Sustainable Development (WSSD), which was held in South Africa from August 26th to September 4th, 2002, consensus was reached that while energy provision was not explicitly stated as one of the Millennium Development Goals, energy played an essential role in their achievement. Some of the obvious examples are summarised below:

- **Poverty reduction goal:** Energy helps to reduce poverty by facilitating the development of new productive enterprises, improvement of the productivity and income from existing ones and improving employment opportunities through enhanced economic growth at the national level.
- **Universal education goal:** Modern energy services create education friendly environments through better lighting, better access to information and communication technologies and improvement of staff facilities for retention of higher quality teachers.
- **Health goals:** Improvement in the child and maternal health and in fighting the killer diseases is made a lot easier by better indoor air quality, lighting of health centres, refrigeration and sterilisation of medicines and equipment, better health information access and improved staff facilities for lower turnover rates. Energy also contributes

indirectly to health improvement by facilitating the provision of clean water and food through more efficient water pumping, sanitation and irrigation works.

?? **Environmental sustainability:** Through improved agricultural productivity and more efficient energy utilisation, modern energy services contribute to preservation of land, forests and other natural resources.

The Millennium Development Goals provide a framework for countries to plan and set budget priorities. In developing countries these priorities are summarised in Poverty Reduction Strategy Papers (PRSPs) that now form the basis of donor financing programs. Making energy interventions explicit within the PRSPs ensures that donor supported programs include the energy projects that are essential for the achievement of growth and poverty reduction targets.

Since energy is necessary, but not sufficient by itself, to enable the attainment of the MDGs it is necessary, during the process of developing PRSPs, for energy experts to work closely with, and for, experts in the social and economic sectors. This multi-sectoral approach was reflected in the selection of participants for this workshop, where delegates were drawn from ministries and government departments responsible for energy, finance, health, education, agriculture and water. Representatives from several donor organisations as well as NGOs and the private sector were also present.

1.3 Opening Session – Speeches and Presentations

The Hon. Philippos Wolde Mariam – State Minister in the Ethiopian Ministry of Infrastructure, welcomed all the delegates and expressed his appreciation for the timing of this workshop which coincides with a renewed global effort to confront the problems of the poor. In his keynote address he highlighted statistics that show the extent of poverty in Sub-Saharan Africa. Poverty is also reflected in the low per capita consumption of modern energy services of just 5% of the world average. With nearly three-quarters of the population being rural this is a reflection of the extent of rural poverty in Africa. The Minister urged participants to come up with mechanisms for the delivery of modern energy services in order to improve agricultural productivity, broaden the small scale enterprise sector and improve access by the poor to health and education.

OPENING SPEECH

Mr. Chairman,
Excellencies,
Distinguished Delegates,
Ladies and Gentlemen

I am greatly honoured to welcome you all to this Regional Workshop on Modern Energy Services and Poverty Reduction. I extend my warm greetings to all the country delegations as well as the staff of the World Bank who have travelled long distances to join us at this important workshop. I am also pleased to welcome you all to Addis Ababa.

Nothing can be more timely and useful than a workshop on poverty reduction and energy for Sub-Saharan Africa at this period of global determination to confront the problems of the

poor. Sub-Saharan Africa's underdevelopment and poverty levels are all well - known to all of us. To cite some indicators, about half of the Sub-Saharan population has average incomes of below one dollar a day. What is more, poverty in Sub-Saharan Africa is particularly acute in rural areas where over 70 % of the population lives.

Per capita electricity consumption for Sub-Saharan Africa (excluding the Republic of South Africa) is about 5% of the world average. Electrification levels are also well below 30% for most Sub-Saharan African countries, and in the range of 15% in some cases.

I understand that the objective of this workshop is linked to the provision of modern energy services to achieve the Millennium Development Goals on poverty reduction. Energy is indeed an essential input for the achievement of the Millennium Development Goals on poverty reduction.

Modern energy services, in particular, would:

- ?? Improve agricultural production, especially in the case of irrigated agriculture,
- ?? Broaden the range of products and services provided by small scale enterprises,
- ?? Improve access to education and information for the rural poor, and
- ?? Facilitate the provision of health services and clean water in the rural areas.

I hope that this workshop will come up with appropriate mechanisms for delivery of modern energy for these purposes. I am also confident that the workshop, in its deliberations, will take into account the vast energy resources of Sub-Saharan Africa. Sub-Saharan Africa's hydropower resources, oil and gas resources and solar energy resources are but a few of the natural resources whose development could alter the economic picture of the region. These resources can be developed at the regional, national or even village levels. We can think in terms of regional power trade, national power grids and stand - alone village energy supply systems. Co-operation among various stake-holders is critical in all cases. Overall development of the region, so achieved, will no doubt alter the lives of the poor for the better.

Ethiopia has recognised the importance of getting modern energy services to the rural areas. Indeed the provision of modern energy services to the rural areas has been the primary focus of our strategy of Agriculture Development - Led Industrialization (ADLI). Improving access of modern energy in the rural areas is also a major goal in our strategy of rural development. Energy is also given a prominent place in the Poverty Reduction Strategy Paper for Ethiopia.

We have already embarked on a five - year rural electrification program to electrify about 160 rural administrative centres. Implementation of the program has so far exceeded planned targets. In this connection, I am pleased to mention that the World Bank and other development partners are helping us significantly in this endeavour. I expect we will be sharing each other's experiences on these lines in the course of the workshop.

I would like to conclude by thanking the World Bank for having taken the initiative to organise and sponsor this workshop, which as I indicated earlier, is timely and extremely useful. Finally, I wish you success in the deliberations ahead and a pleasant stay in Addis Ababa.

Thank you.

OPENING REMARKS BY WORLD BANK REPRESENTATIVES

Ananda Covindassamy, the Energy Sector Manager for the World Bank, in his opening speech noted that the workshop was coming at a time when there are several worrying factors which need to be confronted. Deforestation continues to accelerate almost everywhere in Africa because 90% of the energy needs are derived from wood and charcoal. The rate of access to modern fuels – LPG, kerosene and electricity – is stagnant or very low and this is worsened by the waning interest by private entrepreneurs in the African energy sector. On the positive side, as reflected in the New Partnership for Africa's Development (NEPAD), the Millennium Development Goals (MDGs) and the World Summit for Sustainable Development (WSSD), is the fact that governments, donors and other stakeholders clearly recognise the importance of infrastructure and energy in poverty reduction. What is needed is for energy policy, and energy experts, to harness the input and expertise from other sectors and representatives of civil society in order to improve the efficiency and effectiveness of poverty reduction initiatives.

Madam Chairperson,
Excellencies, Ministers and Mesdames Heads and members of Delegations, ladies and gentlemen,

Please allow me to thank you all for taking three days from your busy schedule to participate in this workshop. This is a clear indication that we all believe that energy can be a major contributor to poverty reduction.

Before looking at the future, let us reflect for a few minutes on recent trends in the energy sector which affect directly or indirectly the capacity of energy to contribute to poverty reduction in Africa.

It is a mixed picture. On the worrying side, we have facts that are falling short of expectations and we have to face them:

?? **Deforestation** due to use of wood and charcoal to cover 90% of energy needs is progressing nearly everywhere in Africa,

?? **Access to modern fuels** such as kerosene and LPG is moving slowly, depriving the population of the health and social benefits attached to them, despite a few bright spots in Senegal or Kenya,

?? **Access to electricity** is at best stagnant, depriving the population of the education, social and economic benefit of electricity, at 8% access rate,

?? **Private sector presence and financing** in energy has been short of expectations and, if anything, private entrepreneurs are withdrawing from the sector in Africa, or are getting increasingly cautious.

On the positive side:

?? The African governments recognize the direct and indirect **importance of infrastructure** and energy for poverty reduction, as they made it clear in NEPAD, the MDGs and WSSD, because many of their objectives for health, access to water, education, higher income and environment involve energy as a key input,

?? Governments and donors have **learned from communities** how to manage the forest and address the woodfuel issue, and they know more about decentralized energy services delivery than a few years ago. A number of donors, and not only the World Bank, have expressed a **renewed and increasing interest** in providing financing for energy, if suitably targeted to poverty reduction. For example, the World Bank in the Africa Region sees at least 40 – 50 % of its activity in rural energy, and energy will represent a good 20 – 25 % of Bank financing in the Africa Region.

What lessons can we draw from the recent experience?

?? Firstly, national energy policies need to **focus on the beneficiaries** rather than on technical aspects. The priority is how to ensure that lower income people benefit from better energy services. To that end, the World Bank projects, for example, are more and more defined based on the population group they target and their contribution to the MDGs for example rather than specific technologies which are left to the decision of the operator,

?? Another lesson is that the best justification for modernizing each step of the energy ladder may be that energy is a **key input for the effective delivery of social services** and for income generating activities. This may prove to be at least as important as direct services provided to end-uses. But the consequence is that energy supply is no longer a self standing business and becomes part of a multi-sector approach. Is it realistic? The World Bank's recent project in Uganda suggests that it is,

?? The focus on the **provision of decentralized** energy services has also contributed to make the debate on private versus public sector approach to energy obsolete : All-public does not work well for isolated areas, and all private does not work as affordable rural energy supply does not meet risk profile and return on invested capital expected by private investors. But well structured PPP may allow the public sector to achieve its social goals at the least cost and faster, and allow the private sector to take the commercial and management risk off the government shoulders. This is how new approaches to PPP have been developed including "Smart subsidies" and "Output based subsidies",

?? Regarding cooperation with the private sector for energy services delivery, another lesson is that for decentralized energy, countries may **rely more on local investors** and local communities with a good understanding of the local context, than on international investors. This has led the Bank to shift from a "retail" approach in project design (financing each large project separately) to a "wholesale" approach of financing such projects through intermediaries such as Rural Energy Funds who can work better with local entrepreneurs and communities and small projects,

?? And lastly, we learned that energy policy formulation is so important for poverty reduction, social development and economic growth that it should not be left to energy experts alone.

This is why energy specialists are a minority in this room today.

As a **conclusion**, let me say that in order to succeed in our fight against poverty we, energy people, need you, experts from other sectors and representatives of civil society as much as

you need quality energy services. I hope that by the end of this workshop we will all know better how to work together to fight poverty with passion and professionalism. Thank you for your attention.

Dominique Lallement, the ESMAP Manager, explained in her opening remarks that the workshop was designed in the context of the Global Village Energy Partnership (GVEP) which was launched on 31st August, 2002 during the World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa from 26th August 2002 to 4th September 2002. At the WSSD consensus was reached that while energy provision was not explicitly stated as one of the internationally recognized Millennium Development Goals (MDGs), energy played an essential role in poverty reduction. The launching of the Global Village Energy Partnership (GVEP) demonstrated commitment to accelerating the delivery of energy services to the poor.

GVEP as outlined in ***Annex C*** brings together developing and industrialized country governments, public and private organizations, multilateral institutions, consumers and others in an effort to ensure access to modern energy services by the poor. This Partnership of partnerships aims to help reduce poverty and enhance economic and social development for millions around the world. The Global Village Energy Partnership builds on existing experience and adds value to the work of its individual partners. It covers renewable energy, energy efficiency, modern biomass, liquefied petroleum gas (LPG) and cleaner fossil fuels.

The Partnership will help achieve the Millennium Development Goals by facilitating the development of country action plans that are consistent with the country Poverty Reduction Strategy Papers (PRSPs), facilitating the funding of projects and programs, capacity building for energy and related service providers, exchange of knowledge among development partners and the monitoring of results and evaluation of the impacts of projects and services on poverty reduction.

Honorable Minister Philipos Walde Mariam, State Minister, Ministry of Infrastrucfure, Ethiopia
Honorable Ministers from Ethiopia, Ghana, Uganda, and Zambia,
Your Excellencies,
Colleagues and Friends,
Ladies and Gentlemen,

On behalf of the Energy Sector Management Assistance Program, it is an honor and a pleasure to welcome you to this workshop which aims to address a very challenging question: How can Modern Energy Services Contribute to Poverty Reduction? We have outstanding delegations from Ethiopia, Ghana, Kenya, Uganda, Tanzania, and Zambia. We are also most pleased to have with us representatives from the ESMAP donors who have made themselves available to engage in a direct dialogue with the country delegations.

This workshop is taking place in a pretty opportune context, that is only a few weeks after the World Summit on Sustainable Development. At the Summit not only did the world leaders recognize the need of moving forward on a new development path that integrates growth, the environment and social equity, but a consensus also emerged that energy is key to

development, and therefore, that energy is key to achieving the Millennium Development Goals. I would say that outside the official summit, an even stronger consensus emerged that the increasing gap between the energy-rich and the energy-poor is untolerable, and waiting even one more day before taking action is unacceptable. The commitment to action was underlined by all those who participated in the Launch of the Global Village Energy Partnership which aims at accelerating the delivery of energy services to the poor.

This workshop is therefore right on target for implementing the outcomes of Johannesburg. It is the first of what we hope will be a series of workshops in Africa, Latin America, and Asia. Africa was chosen for this first workshop, as in many ways, the needs and opportunities for action and rapid progress are the greatest. This workshop is meant to be forward looking. This workshop is meant to be a dialogue.

Let me also say a few words on the Global Village Energy Partnership, and how the workshop fits with the objectives and services of the partnership, although to respond to queries from some delegations, we have planned a more complete presentation of the partnership later this afternoon, just before dinner.

The idea of the Global Village Energy Partnership came out of the recommendations of the Village Power Conference 2000, which challenged the participants to do more, better, and faster on the delivery of energy services to the poor. The market survey identified the need for five types of services: country action plans to provide the framework for scaling up the delivery of energy services; capacity development, in particular to increase the number of energy service providers; funding facilitation to enable entrepreneurs to develop and meet consumer demand; knowledge exchange, and result monitoring. The workshop is therefore one of the ways to test the value of the partnership, and see how the services it proposes to develop would respond to the country needs for investing in energy services.

The concept for the workshop is very simple. It is anchored on three basic questions, addressed in three modules:

- Where do we stand today on energy-poverty programs?
- Do we understand the demand for energy services?
- How can we move forward?

It therefore consists of three modules:

Module 1: Where do we stand today? We could also label it moving forward from the PRSPs?

We started from the Poverty Reduction Strategy Paper – which for all the countries participating in the workshop, is a recognized instrument for dialogue with all the partners in development: governments, financiers, donors, private sector, civil society. Most of them have adopted very concrete targets or measures to achieving the Millennium Development Goals – targets for economic growth, for improvements in health and education services, clean water. Is energy systematically integrated into the PRSPs as a means to achieve the targets? Not always. What is most important is that the PRSPs are extremely positive instruments to engage in a dialogue moving forward, and like all such instruments, they will be revised and improved.

To answer the question of the first Module, we will have

- First, a panel of Ministers and heads of delegations, will provide us the perspective from their respective countries on energy-poverty issues
- Second, three short presentations on analytical work which document the impact on the poor of energy sector reform and of the provision of energy services.
- Third, a presentation on relevant tools to move forward.

Module 2: Understanding Demand

This module will essentially be the Sectoral Workshop.

Module 3: How to move forward?

This module will provide some examples of possible approaches, before moving into country workgroups.

The expected outcome from the workshop is therefore that each of the country delegations would have the framework of a country action plan, as well as the outline of the process you would wish to pursue, including an understanding of the support you might want to seek from the Services to be provided under the Global Village Energy Partnership.

Finally, let me quickly summarize what we see as the expected deliverables for the workshop:

- The most tangible product would be if each of the country delegation is able to prepare the framework for an energy-poverty action plan. But other deliverables are also important:
- Knowledge on methodologies to measure the impact of energy policy on the poor and of the provision of energy services on poverty reduction
- Knowledge of tools to facilitate the design and successful implementation of energy-poverty policies and programs
- Knowledge of a wide-range of experiences and opportunities
- Having engage in an active dialogue with other African and other partners in the building of a network of support services. In this context, let me highlight the fact that we took the approach of capitalizing on Africa's own resources through AFFREPREN and KITE to design and implement the workshop, and we are most pleased that some delegations included participants from their universities.

With this, let me wish you/all of us, a very successful workshop. As sponsors and organizers we will do our best to meet your expectations. Don't hesitate to provide us with feedback as we move along to help us shape the successful outcome of our work together.

1.4 Workshop Structure And Format

Dominique Lallement explained that the workshop was structured into three parts so that presentations and discussions would address the above questions as follows:

a) **The first part of the workshop was designed to establish a clear understanding of the Energy-Poverty situation** in the different countries as outlined in the Poverty Reduction Strategy Papers (PRSPs) of each country and clarified by the Ministers and country delegates in plenary discussions;

b) **The second part of the workshop was designed to establish a clear understanding of the demand for energy services in meeting priority objectives** in the social and economic sectors of health, education, water, agriculture and development of small to medium enterprises (SMEs) based on discussions in sectoral workgroups complimented by plenary discussions; and

c) **The third part of the workshop was focussed on designing appropriate response initiatives** in the form of draft country action plans, developed in country workgroups and complimented by plenary discussions, outlining the priority energy interventions required to enhance the effectiveness of poverty reduction strategies.

This workshop structure would produce the following **deliverables:**

?? A framework for Energy – Poverty country action plans to enable participants to have a strategy for building upon the PRSP process;

?? Knowledge of methodologies to measure the impact of energy policies and services;

?? Knowledge of lessons to be learnt from existing projects and programs;

?? Dialogue among development partners; and

?? A network of support services

2

Where do we Stand on Energy and Poverty?

2.1 Energy, Poverty, Millennium Development Goals and the Link to Poverty Reduction Strategy Papers.

All the six participating countries have extensive experience with the PRSP process. To date, five have adopted fully-fledged poverty reduction strategy papers and one, Kenya, is in the process of developing its own. The following country presentations highlight of the key issues in the PRSP documents. The complementary presentations by the government ministers help to identify the key priorities. In general there is a clear indication that countries now have a comprehensive understanding of the qualitative link between modern energy services and poverty reduction.

2.1.1 Ethiopia's Strategy for Poverty Reduction

Brief Country Profile
?? **Population (million):** 63.5 (2000)
?? **Area (km^2):** 1, 097, 000
?? **Capital City:** Addis Ababa
?? **GDP Growth Rate (%):** 2.3 (1998)
?? **GNP per Capita (US$):** 115 (1998)
?? **Official Exchange Rate:** Birr 8.25 = 1US$ (Feb 2001)
?? **Economic Activities:** Agriculture, forestry, fishing, mining, manufacturing
?? **Energy Sources:** Biomass, natural gas, hydropower, imported oil, dung
?? **Installed Capacity (MW):** 453 (2000)
?? **Electricity Consumption per Capita (kWh):** 23 (2000)
?? **Electricity Generation (GWh**): 1, 670 (2000)
?? **System Losses (%):** 17.3 (2000)

The following is a summary of the key priorities and strategies highlighted in the PRSP for Ethiopia:

?? Agriculture: The main challenges in the agricultural sector in Ethiopia are the provision of education and extension services, the improvement of crop yields and the reduction of hunger. The targets for 2003 are an increase in budget allocation to 12.7% of the total, to have extension services to 60% of the farmers, to increase yields of major food crops to at least 17 quintals per hectare and to reduce food poverty to 47%. (Note: a quintal is 100kg).

?? Water: Ethiopia is a drought-prone country and therefore water supply and development has a prominent position in the country's PRSP. In the short term the strategy is to increase the share of the budget allocated to clean water and to have at least 36% of the population with access to clean water by 2002. For the medium to long-term the country has adopted a 14 year Water Sector Development Programme (WSDP) for the period 2002 to 2016 which is an integrated plan for the development of schemes for irrigation, drinking water and sanitation, hydropower, water resources management and related capacity building.

?? Education: The main thrust in education is to expand enrolment by establishing new primary schools, upgrading and refurbishing existing ones, expanding non-formal and distance education programs to increase access in rural areas and providing enhanced pre-service and in-service training for teachers. Increasing the participation of girls to achieve equality with boys is another major objective. Some of the specific targets of the Education Sector Development programme are an increase in gross enrolment to 65% by 2005, achieve parity between girls and boys in school enrolment by 2002, an increase in the number of primary schools to 12 595 by 2002, a reduction of the primary school drop-out rate to 4.2% by 2002 and an increase in the education budget to 14.5% of total by 2003.

?? Health: The Health program focuses on expansion of services, shifting of resources from curative urban-based services to a rural-based preventive care program, and to prevent the spread of killer diseases such as HIV/AIDS. The target is to expand primary health care service coverage from 45% to 60%, to improve access to health services from 55% in 2002 to 90% by 2017, to achieve 70% immunisation by 2002 contributing to the reduction of the infant mortality rate to 95 per 1000 and to the reduction of the under-five mortality rate to 160 per 1000 by 2005. All this requires the share of the total budget for health to be increased to 7% of total.

?? Small, Medium and Micro Enterprises: The development of this sector requires the removal of regulatory impediments to private sector development, expanding the coverage of micro-financing institutions, enabling the use of land as collateral for financing, and ensuring taxation equity among medium and large scale firms.

The State Minister for Infrastructure, the Honourable Phillipos Wolde Mariam, in his opening speech noted that Energy has a prominent role in the PRSP and the provision of modern energy services in the rural areas is the basis of the Government's Agriculture Development – Led Industrialisation (ADLI) program. There is currently in progress a five-year US$160 Million rural electrification program funded by the ADF, BADEA, World Bank, Government and other donors. The programme aims to electrify 160 rural administrative centres. Another area of focus is the reduction of the heavy workload of women through water supply schemes, flour mills and more efficient stoves that reduce the consumption of firewood. The Government is also expediting reforms to allow for private sector participation in electric power production by 2002/3.

2.1.2 Ghana's Strategy for Poverty Reduction

Brief Country Profile

- **Population (million):** 19 (2000)
- **Area (sq. Km):** 239,000
- **Capital city:** Accra
- **GDP Growth rate (%):** 3.7 (2000)
- **GNP per capita (US$):** 340
- **Official Exchange rates:** 5,456.0 (2000)
- **Parallel Market Exchange rates:** 2,334.8 (1998)
- **Economic activities:** Mining, industry, agriculture.
- **Energy sources:** Biomass (wood fuel, agricultural residues), petroleum products, electricity,
- **Installed Capacity (MW):** 1,187 (1996)
- **Electricity consumption per capita (KWh):** 340.83 (estimates for 2000)
- **Electricity generation (GWh):** 6.105 (1994)
- **System losses (%):** 17.8 (1996)

The key priorities and targets of the Ghana PRSP are summarised below:

- Agriculture: The focus is to improve agricultural productivity, improve storage and processing facilities, and facilitate the marketing of agricultural products. To increase productivity the plan provides for an increase in the total land under agriculture from 25% to 30%; an increase in the total area under irrigation from 0.04% to 0.12%; reducing price volatility and minimising gaps between producer and consumer prices; reduction in dependence on traditional farming techniques that are time intensive and low in productivity for example by increasing extension agents to farmer ratio from 1 in 2500 to 1 in 1600 and improving delivery of service by the Intermediate Technology Transfer Unit (ITTU) by 50%; making it easy to access farming inputs such as finance, fertilizers, insecticides, seed and irrigation equipment; support and incentives for expanded private sector production and reform of land acquisition laws and land administration procedures. To improve storage and processing the plan is to establish 50 agro-processing plants in the northern and coastal savannah, reduction of the degradation of crop and livestock production activities by 20% through support for improvements in storage facilities and reduction of post-harvest losses, support the private sector in adding value to traditional crops such as cocoa, and support agro-processing techniques and equipment that reduces the time burden on women. Marketing and distribution will be made easier through the development of more marketing channels for agricultural produce and increasing the proportion of farmers with access to feeder roads to 40%.
- Water: Besides improving agricultural production through irrigation the major objective of the water sector plan is to increase the proportion of the population with access to clean water and sanitation. The target is to increase access in urban areas from 70% to 78% and in rural areas from 40% to 54%. This requires performance improvement by the Ghana Water Company, improved monitoring by the regulatory

commission and ministry of works and housing, capacity building for environmental health and mobilising financial resources for refurbishment and extension of water and sanitation systems.

?? Health: The health sector plan is driven by a lot of specific targets – increase proportion of people consulting qualified health personnel from 30% to 50%, reduce new HIV infections among the 15 to 45 age group to 24%, increase health facilities for HIV/AIDS patients to 30%, reduce under-five mortality rate from 110 to 95 per 1000, reduce maternal mortality rate from 200 to 160 per 100 000, reduce infant mortality rate from 57 to 50 per 1000, increase immunisation coverage from 75% to 90%, reduce fertility rates from 4.6 in 2000 to 4.2 in 2004, increase prenatal care coverage from 52% to 58% and supervised deliveries from 49% to 55%, increase population with household latrines from 34% to 45% in urban areas and 15% to 25% in rural areas. To achieve these targets requires an increase in the percentage of total government spending on health from 5.7% to 7%, replacing the cash and carry system of financing health with a more equitable system to protect the poor, and capacity building to enhance effectiveness in the management of health delivery services, waste disposal and water and sanitation systems.

?? Education: Increasing access while ensuring quality and gender equity is the main focus of the Education Plan. Targets include an increase in gross enrolment from 77.6% in 2001 to 82% in 2004 for the total population and from 71% to 80% for girls, reduction in primary school drop out rate from 30% to 20% for girls and 20% to 10% for boys, an increase in the share of primary classrooms from 20% to 23% in the three northern regions, an increase in transition rates from primary to junior secondary from 96% to 98%, an increase in gross junior secondary enrolment from 61% to 65% and gross secondary school enrolment from 17% to 25%. The strategies for meeting these targets include an increase in the percentage of total government spending on education from 16.4% in 2000 to 19.5% in 2004, provision of free basic education including provision of school uniforms and meals in the three northern regions and development of model senior secondary schools in every district.

?? Small, Medium and Micro Enterprise Sector: The major objectives for this sector are to generate non-farming employment in rural areas and to facilitate coordination and linkages between the formal and informal sectors of the economy. Provision of support infrastructure and diffusion of appropriate technology and training programmes are the main strategies for facilitating the establishment of small, micro and medium enterprises. Profitable locations for the establishment of small business enterprises have been identified in Tamale, Takoradi and Cape Coast. The Government plans to increase the number of usable vocational training schemes, to reform and strengthen the traditional apprenticeship system and to increase the delivery of advisory services by the Intermediate Technology Transfer Unit (ITTU) by 50% by 2004. There is also need to reform the land administration system to enable those in the informal sector to use land as collateral for financing. Support also needs to be given to organisations that represent the poor and those with disabilities.

The ***Hon. Albert Kan-Dapaah, Minister of Energy*** in ***Ghana***, in his presentation on Ghana's Strategy for Poverty Reduction explained that his Government's focus in the PRSP was on addressing the following MDGs:

- Reduce poverty (proportion of people who live on less than US$1 /day) by 50% by 2015 ;
- Achieve universal primary education:
- Promote gender equality and women empowerment .Reduce maternal health and child mortality;
- Combat HIV / AIDS, malaria and other diseases .Ensure environmental sustainability;
- Develop a Global Partnership for Development

The Minister went on to highlight his Government's awareness of the importance of energy as an essential ingredient for the achievement of poverty reduction targets the different social and economic sectors. The specific target areas in each sector are as follows:

- **Health:** Rural health centres are to be provided with modern forms of energy (grid or solar) in order to improve access to health care. Indeed many remote health centres are run on solar system.
- **Education:** Rural and remote schools are to be given priority to allow for improvement of information and communication technologies (ICT) to facilitate modern forms of education, attraction of teachers and improvement of girl child education (less time for household tasks such as fuel-wood collection).
- **Agriculture:** The priority is to provide energy for cottage industries and for improvement of mechanisation in agriculture.
- **Small Scale industries:** Promotion of productive uses of energy, PUE to be integral component of the delivery of services, provision of financing arrangements and training and capacity building.

Ghana has had many interventions to improve access to modern energy services by the rural folk in order to support socio-economic development. The objective of these interventions has been to create wealth (for example through cottage industries), employment and to alleviate poverty. The key vehicle for improving access to modern energy in the rural areas is the Government's rural electrification program.

Ghana's Rural Electrification Programme is based on a master plan to electrify the whole country over a 30 year period from 1990-2020. At the time of enacting the NES policy, access to electricity in Ghana was less than 20% and 64 out of the 110 district capitals in the country were without electricity supply from the national grid. From 1989 to 2001, about 1,900 towns and villages were connected to the national electricity grid. The on-going phase of the rural electrification programme will result in the extension of electricity supply to a total of 2,200 communities by the end of 2002. Currently, about 40% of Ghanaians have access to electricity.

In areas where it is not economical to extend the grid, solar programmes are being implemented. A major project is in the East Mamprusi area and is funded by the Government of Ghana with support from the UNDP and GEF. This pilot project, which has a catchment area of about 13 communities, is testing the viability of the fee for service concept in the northern region of Ghana. In this concept the solar systems are owned by the service provider and the user pays a fee for their use. About 1,400 home systems as well as a number of

community based systems for heath centres, pumping works and other uses have so far been installed. There are also other externally funded solar programmes that are testing other forms of solar power delivery such as financing the purchase of solar systems by households in rural areas.

Other energy interventions include pilot projects for use of biogas, programmes to rationalise the use of wood fuels in Ghana for sustainability and reduction of the rate of forest depletion and fuel switching such as the programme to promote the use of LPG as a substitute fuel for fire-wood and charcoal.

In summary, Ghana's Rural Energy Strategy is designed to meet Millennium Development Goals. The main objectives are to deliver reliable competitive power in a sustainable manner to support poverty alleviation and wealth creation in the rural areas, to promote multi-sectoral coordination involving health, education, sanitation and other components so that the energy delivery will not be seen as an "energy project" but as part of a composite service.

The programme that has been put in place to increase energy availability relies on sources of energy that are both conventional and renewable. The Rural Electrification Project in form and substance will be maintained and pursued using conventional grid extension and shield wire technology as appropriate. The priority of grid extension will be based on the potential for the productive use of electricity. The next phase of the rural electrification programme will add another 2,000 communities. This will increase access to electricity by about 5 to 10%. The Rural Electrification Programme includes a major thrust on expansion of access and coverage of renewable energy especially solar and biomass. The experience from the RESPRO and REDP projects will form the basis for their expansion. Solar (PV) technology will be expanded to off-grid areas and will be targeted at health centres, telecom including ICT, schools and where appropriate, productive enterprises.

2.1.3 Uganda's Strategy For Poverty Reduction

Brief Country Profile

- **Population (million):** 22 (2000)
- **Area (sq. Km):** 241,000
- **Capital city:** Kampala
- **GDP Growth rate (%):** 3.5 (2000)
- **GNP per capita (US$):** 300
- **Official Exchange rates:** 1880 (27th Jan, 2003)
- **Parallel Market Exchange rates:** 1,333.8 (1998)
- **Economic activities:** Agriculture, mining & quarrying, manufacturing, commerce, community service.
- **Energy sources:** Electricity, oil, others (biomass)
- **Installed Capacity (MW):** 174.4 (1996)
- **Electricity consumption per capita (KWh):** 34.30 (1997)
- **Electricity generation (GWh):** 1,340 (1999)
- **System losses (%):** 34 (1996)

The key priorities and strategies in the Uganda PRSP are as follows:

- Agriculture: The main challenge is to increase the productivity of assets owned by the rural poor and to increase employment opportunities on farms and in agro-processing and agricultural service industries. This will be done by improving agricultural research so that it is demand driven and farmer responsive, establishing national advisory services in the agricultural sector and improving access to markets. Specific targets in the medium term are to fully repair all district roads by 2006 and to achieve 12% rural electrification by 2010.
- Water: Increasing access to clean water is the main challenge. Between 2001 and 2004 the target is to improve access to safe water in rural areas from 53% to 60% and in urban areas from 62% to 65%. In the same period new water connections would increase from 2900 to 3700 in the rural areas and from 6300 to 7000 in the urban areas.
- Education: The three main objectives for the Education Sector are to increase access, improve quality and achieve gender equality. The country aims to achieve 100% primary school enrolment by 2003, increasing enrolment from 25 000 to 50 000 with 40% being females. Also targeted is an increase in the transition of primary to secondary or vocational training to 65% by 2003, an increase in literacy levels to 85% after a five year programme, an increase in school completion rates to 30% and a reduction in school drop out rates. To improve quality it will be necessary to raise the cognitive skills of primary school graduates, increase pupil to classroom ratio from 98:1 to 82:1 by 2004 and to increase pupil to teacher ratio from 54:1 to 45;1 by 2004. Achievement of 90% post qualification employment rate will be a key indicator of poverty reduction.
- Health: The Health program focuses on reducing mortality rates for vulnerable groups by expanding service availability and utilisation and reducing infection rates of the killer diseases. By 2005 the target is to reduce under-five mortality from 152 to 103 per 1000, infant mortality from 88 to 68 per 1000 and maternal mortality from 506 to 354 per 100 000. This requires the DPT immunisation for under-one year old to improve form 47% to 54%, an increase in deliveries attended by skilled workers from 39% to 50%, an increase in deliveries in health units from 23% to 31%. An increased proportion of approved positions will need to be filled by trained health workers and the utilisation rates for outpatient departments would need to increase from 0.43 to 0.47 per capita. The prevalence of HIV/AIDS will be reduced to 25%, the fertility ratio to 5.4 and stunting will drop to 28%.
- Small, Medium and Micro Enterprises: The development of this sector requires supportive policies, particularly with respect to training and the availability of finance. By 2003 the plan is to have 850 polytechnics and to increase the number of trained graduates to 100 000. Promotion of micro-finance and micro-export are other priority targets. The government plans to consolidate government programmes in the micro-finance institutions sub-sector and to promote the involvement of the private sector in credit delivery, increase availability of financial resources to sustainable micro-finance institutions and to expand the outreach of micro finance services to districts and townships.

The ***Hon. Syda Bbumba, Minister of Energy and Minerals Development of Uganda***, in the following presentation entitled "Strategy to Tackle Energy-Poverty Related issues in Uganda" told the meeting that as far back as 1996 the Government of Uganda decided that poverty eradication was to be the policy to drive the country's economic development. An ambitious target of reducing poverty to only 10% of the population by 2017 was adopted in the 1997 Poverty Eradication Action Plan (PEAP). The Energy for Rural Transformation (ERT) component funded by the World Bank is a major element of the PEAP. The ERT emphasises power sector efficiency and the promotion of decentralised energy sources in order to accelerate delivery of energy services for the support of rural health and education services and agricultural productivity improvements.

Strategy to Tackle Energy-Poverty Related Issues in Uganda

A Introduction

In 1996 the government of Uganda resolved to prioritise poverty eradication as the major focus of its overall sustained growth and development strategy .To this effect, a Poverty Eradication Action Plan (PEAP) was formulated and launched in 1997. The PEAP was later revised in 2002 to respond to other emerging challenges. The PEAP commits government to the overriding priority of tackling poverty .The successful implementation of the PEAP is expected to reduce poverty to less than 10% of the population by the year 2017 and to increase the well being of all Ugandans.

Government has set specific targets for poverty reduction. A selected number of indicators will help to illustrate government's commitment to eradicate poverty:

Indicator	*Status*	*Targets (Year)*
Population living in absolute poverty (%), 2000	35	<10(2017)
Infant mortality rate per 1000 live births.	97	78(2002)
Under 5-mortality rate per 2,000 live births.	147	118(2002)
Maternal mortality rate per 100,000 1996-2000	506	400(2002)
Stunted children, below 4 years (%), 1995.	39	34(2002)
Access to safe water (%of rural population), 1998	41	100(2015)
Access to sanitation (%of rural population), 1998	45	100(2015)
Population per doctor, 1997	18700	
Births attended by a trained health personnel (%), 1996	38	
Net primary school enrolment ratio	85	200(2003)
Adult literacy %, 1995	65	

There has so far been marked progress in poverty reduction, attributed to Uganda's impressive economic performance that has stood at a GDP growth of over 6% over the last decade or so. The proportion of people living below the poverty line fell from 56% in 1992 to 35% in 2000. .However, this poverty level is still high and poses serious challenges for the Government.

The PEAP focuses mainly on the rural areas where over 85% of the population lives. It is also recognised that 96% of Uganda's poor live in rural areas. Critical issues in the rural areas that are responsible for the poverty include:

- Marketing of low value cash and food crops and poor access to markets;
- Lack of job opportunities;
- Poor access to the basic needs of health, water supply and sanitation, and education;
- Poor infrastructure (telecommunication and transport); and
- Low productivity and unsuitable cultivation and animal husbandry.

The PEAP has recognised that modern energy, especially electricity, is vital for changing the above issues so that poor Ugandans may be able to participate in the benefits of economic growth, to improve their human capabilities and to meet basic needs. Accordingly rural electrification has been granted priority status by the government. The government, with support from the World Bank, has established a Rural Electrification Strategy and Plan and a programme to implement it called the "Energy for Rural Transformation" (ERT).

The ERT programme is a 10-year public-private partnership, with Government creating an enabling environment for the private sector to invest in rural electrification and energy projects. It is estimated to cost over US$400 million, including a mix of commercial (equity and loans) and grant financing.

B. Energy Policy and Legal Instruments for Supporting Poverty Eradication

The government of Uganda has put in place a number of instruments, which embody measures in support of poverty eradication. These are

(I) Power sector reforms

- The power sector strategic plan as an instrument for a sustainable and efficient power sector emphasises increased access of electricity to rural areas;
- Electricity Act, 1999 provides for:
  - Government's obligation to establish a rural electrification strategy and plan;
  - Setting up a rural electrification fund;
  - Creation of subsidies (smart) to facilitate electricity infrastructure development in rural areas.
  - Light regulation for rural electrification projects to encourage investment; and
  - Ownership in perpetuity of hydropower plants of capacity less than 10MW.

(ii) The rural electrification strategy and plan embodies the following important elements:

- The primary objective of the Rural Electrification strategy is to reduce inequalities in access to electricity and the associated opportunities for increased social welfare, health and income generating opportunities.
- Raising the rural electrification rate from the present 1% to over 10% by 2010.

- Electricity coverage in the country to reach 30% by 2010
- Use of rural electrification fund to achieve equitable regional access.
- Use of private sector initiatives to develop projects.
- Promoting decentralised power supply (mini-grids and PV), especially utilising renewable energy sources in order to electrify remote areas.
- Regulation of small grids using light regulation to remove administrative barriers that could hinder private sector investment in rural areas.

(iii) *The national energy policy's main objectives include*:

- Increasing access to modern affordable and reliable energy services as a contribution to poverty eradication;
- In addition to using subsidies for infrastructure development, the policy advocates the introduction of financing schemes to assist consumers to access affordable energy equipment (e.g. LPG and biomass energy stoves, PV systems. biogas digesters, efficient lighting systems etc).

C. Energy programmes supporting the PEAP

The PEAP was developed on four complementary main goals or "pillars". They are:

a) Rapid and sustainable economic growth and structural transformation.

b) Good governance and security

c) Increased ability of the poor to raise their incomes

d) Enhanced quality of life of the poor.

Energy services are essential in helping each pillar to achieve its objectives as follows:

Pillar 1: *Rapid and sustainable economic growth and structural transformation*

The table below shows the linkage of energy programmes and projects with the attainment of the pillar's objectives.

Necessary conditions for pillar 1	*Contribution of the energy sector*
More activity in the high earning sectors of the economy such as manufacturing and services for redistribution of wealth and job creation.	a) Increased generation capacity to make power supply adequate for production. ?? Owen Falls extension (Kiira)-200MW, underway. ?? IPP projects planned for the next 10years: Bujagali-250MW; Karuma –150MW. b) Rehabilitation and strengthening of the grid network to make it more efficient and provide more reliable electricity. c) Privatisation of electricity utility services for efficiency and to encourage increased industrial production

Necessary conditions for pillar 1	*Contribution of the energy sector*
	d) ERT support to Kakira sugar works to generate electricity thus enabling cane growing expansion and sugar production, implying increased revenues and job opportunities
?? More cash crops and more processing and marketing of food crops.	ERT to provide energy for: ?? Activating agro processing activities in rural areas. The rural electrification fund will provide subsidies for agriculture related investments in energy access; ?? ICT facilities to help rural enterprises access markets and market information.
?? Exports are diversified, so that the economy can cope with the uncertainties of international trade and competition.	Uganda has a comparative advantage in the region of producing relatively cheap electricity from hydro resources. Contracts already exist for export of electricity to neighbouring countries.
?? The nation uses its natural resources wisely	?? Programmes for efficient use of biomass energy resources: ✍ SEUHI: improved rural stoves, efficient charcoal and lime kilns. ✍ ERT: efficient and modernised lime kilns and efficient charcoal production and marketing. ?? EIA mandatory for all energy projects

Pillar 2: Good governance and security

Good governance and security require that an efficient mechanism of information access and dissemination exists at both community and administrative levels. This is required for the purpose of monitoring such issues as human rights, public expenditure and timely and efficient delivery of public information and services.

The ERT will facilitate this pillar by providing electricity for:

a) Installing one public phone per sub-county (154 in total), internet services for at least 30 district headquarters and Tele-centres in 7 districts during the first phase covering 4 years

b) Powering radios and TVs and charging mobile phones at household and community levels countrywide.

Pillar 3: Increasing the ability of the poor to raise their incomes

Electricity supply in rural areas enables the following activities to take place:

?? Agro-processing, other small manufacturing enterprises and cold chains for food storage. Programmes in support of these activities include:

- On-going grid extension –current rate of connection is 10,000 rural consumers per annum

- ERT targeting an average of approximately 40,000 connections per year though the grid and mini-grids.

?? Lighting in households and commercial buildings

- Uganda Photovoltaic Pilot Project for Rural Electrification (UPPPRE)-facilitated dissemination of over 3,000 PV systems. For household supply, women have been able to engage in extra income generating activities at night such as weaving, sewing and knitting. Commercial enterprises like bars are attracting more customers and opening longer hours thus generating more incomes.
- ERT targets an average of 10000 PV systems annually.

Pillar 4: Enhancing the quality of life of the poor

The quality and accessibility of public services directly affect the quality of life of poor people. These services include: health, education, water, supply and sanitation. Relevant energy programmes include the following:

?? Health

- Under the ERT, 36 health centres will be provided with solar PV systems for refrigeration (vaccine preservation sterilisation of surgical and other equipment, blood preservation, etc) lights for health units, wards and staff houses and facilities for information and entertainment (e.g. TV and radio). Others will be grid and mini-grid connected.
- The UPPPRE facilitates PV electrification of health centres including 2 demonstration units and establishment of rural medical laboratories.
- Ministry of Health has provided PV power, especially for vaccine refrigeration and medical equipment sterilisation to numerous health centres

?? Education

- ERT will provide electricity and ICT services to secondary schools in 10 districts in the first phase (4years);
- The UPPPRE facilitated PV electrification in about 20 rural school;

?? Water supply

- ERT will assist the directorate of water development in supplying energy for piped water to the 251 priority water supply growth centres

?? Domestic energy

- Most of the approximately 10,000 PV systems and 40,000 grid and mini-grid connections annually under ERT will be to households;
- The over 3,000 UPPPRE systems were mainly to households;
- A project, known as Sustainable Energy Use in Households and Industries (SEUHI) disseminated about 2,500 improved rural biomass stoves and helped

improve the health of women and children by reducing smoke levels in kitchens.

2.1.4 Zambia's Strategy For Poverty Reduction

Brief Country profile

- **Population (million):** 13 (2000)
- **Area (sq. Km):** 753,000
- **Capital city:** Lusaka
- **GDP Growth rate (%):** 2.9 (2002)
- **GNP per capita (US$):** 300
- **Official Exchange rates:** 4306.9 (2002)
- **Parallel Market Exchange rates:** 2,411.7 (1998)
- **Economic activities:** Agriculture, mining manufacturing, construction, gas & water, services.
- **Energy sources:** Electricity, oil, biomass, coal
- **Installed Capacity (MW):** 1,642.05 (March 2000)
- **Electricity consumption per capita (KWh):** 714.22 (1998)
- **Electricity generation (GWh):** 7,610.5 (1998)
- **System losses (%):** 14.69 (1996)

The key priorities and strategies in the Zambia PRSP are as follows:

- Agriculture: Zambia's program for agriculture is to ensure that the existing agricultural resource base is maintained and improved to achieve national and household food security through dependable annual production of basic foodstuffs at competitive prices. The short term target is to double the nation's annual maize production by 2004 and to increase the agricultural sector's contribution to the national economy. The target is to increase earnings from agricultural exports from US$265 million to US$480 million by 2003 and to increase the number of people employed in the agricultural sector to 800 000 by 2004. Through technology development and dissemination and the development of land and infrastructure the nation expects increased productivity. By 2004 the number of farmers using non-animal power is expected to increase from 291 000 to 360 000 while those using animal power are expected to increase from 229 000 to 290 000.
- Water: Through participatory means, the country plans to establish a comprehensive framework for effective development and management of national water resources to ensure that they are sustainable and equitable. The focus of activities will be on the development and implementation of the Kafue Basin Pilot Integrated Water Sector Management Project and to expand ground water exploration and sanitation to the rural population. Between 1998 and 2015 the target is to increase access to safe drinking water from 89% to 100% in urban areas and from 37% to 75% in rural areas. In the same period access to improved sanitation would be improved from 73% to 100% in urban areas and from 68% to 80% in rural areas.

?? Education: The main thrust in education is to increase access, quality and relevance while reducing gender and other inequities. The target is to increase gross enrolment in basic education to 95% by 2004, increase gross enrolment in high school programmes to 50% by the same year and to increase the national literacy rate to 75% by 2015. There will also be a need for complementary increases in access to relevant skills training and tertiary education.

?? Health: The Government's health programs are intended to encourage lifestyles and foster environments that support health in order to increase life expectance of the population. The target is to reduce under-five mortality by 8% and increase life expectancy to 50 years by 2020. The proportion of children who are stunted is to be reduced to 43%. To achieve these targets there is need to ensure quality policy and technical guidance to health service providers, to ensure that at least 80% of posts in health facilities are filled by trained staff and to ensure that at least 70% of rural households are within 5 kilometres of a health facility.

?? Small, Medium and Micro Enterprises: The development of this sector requires the removal of legal and regulatory barriers to smooth operation of small enterprises. Expediting the acquisition of titles to land will improve access to credit. It will be necessary to repeal or amend laws and regulations that hinder women and youth from accessing and controlling productive resources such as land, credit, information and technology. The enterprises need to be nurtured through entrepreneurship training, provision of business and trade information, construction of industrial estates and encouraging procurement of goods and services by large scale enterprises and social sectors such as health and education. For the rural based enterprises in particular there is a need for the provision of appropriate energy sources. By 2004 the government's target is to have at least 500 entrepreneurs trained in business management and technical skills and to increase the number of enterprises registered with the Small Enterprises Development Board (SEDB) from 150 per annum to 300 per annum.

The ***Hon. Kaunda Lembalemba, Minister of Energy and Water Development, Zambia***, in the following presentation highlights the link between economic growth and poverty which affects 70% of the population. While the majority of the poor are in rural areas the issue of urban poverty is also of great concern as the urban poor form 56% of the country's urban population. The Government plans to improve the efficiency of firewood and charcoal use by the urban poor. This is not only to meet the goal of poverty alleviation in the urban areas but it is also to protect rural agriculture which is presently adversely affected by the inefficient charcoal industry. Complementing the presentation, the ***Hon. F. Mutati, Deputy Minister of Finance***, emphasised the need to improve agricultural productivity in order to reduce pressure on Government finances. The country can no longer rely on rain-red agriculture for food security. It is in part the need to achieve this objective that the Government of Zambia plans to increase the proportion of the rural population with access to electricity from the present 2% to 15% by 2010.

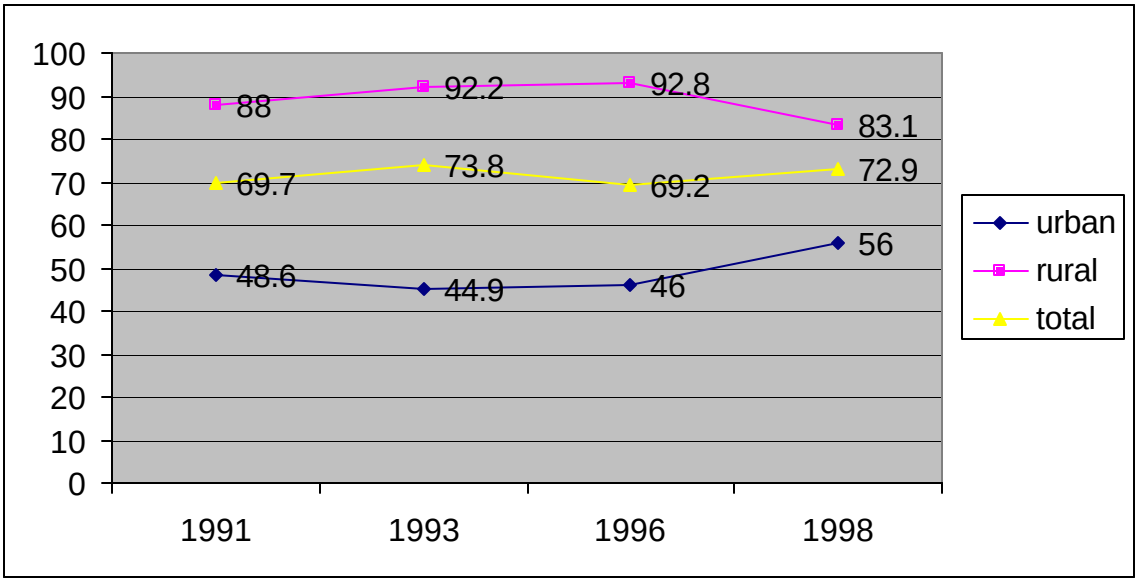
Energy & Poverty In Zambia -a strategy for survival

A. National Context

(i) Poverty and energy in the development context in Zambia

Zambia has one of the highest prevalence of poverty in the world. Currently over 70% of the population is described as poor. Despite the consistent implementation of macroeconomic and structural policies, the levels of poverty continue to rise. In 1998 73% of Zambians were below the poverty line .The proportion of the population that was poor in 1998 was 56 % in urban areas and 83% in rural areas.

Figure 1: Poverty levels in Zambia, 1991-1998

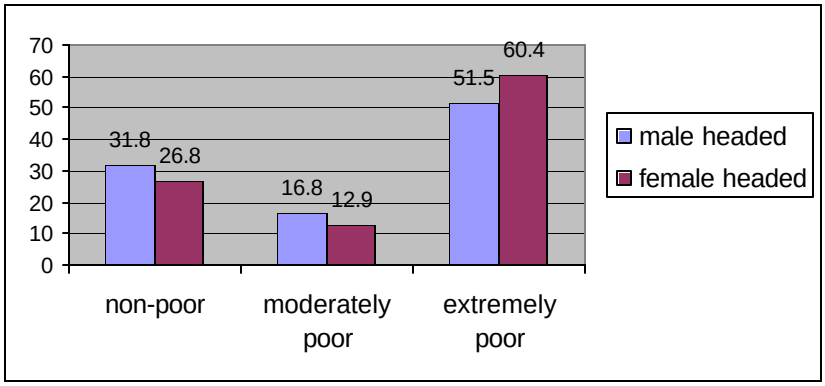


Source: Poverty Reduction Strategy Paper, 2002

Poverty levels are higher in vulnerable sectors of the population. For example female-headed households have higher incidences of poverty than male-headed households (figure 2).

Energy usage and poverty levels are directly related. Low-income households, for example tend to rely on a different set of energy carriers than do the rich. People living in abject poverty depend on wood, dung and other biomass fuels and use less conventional energy sources like electricity. In-door air pollution, which is a major by-product of traditional energy sources, diminishes the quality of life, especially for women and children.

Figure 2: Poverty levels by household head and poverty category



Source: Poverty Reduction Strategy Paper

Traditional energy sources usually have lower energy efficiencies compared to conventional sources. This aspect disadvantages poor households who have to spend more on each unit of energy obtained. Reliance on biomass fuels is however, a factor of income. In terms of household expenditure on energy, rich households spend more money on energy services in terms of money than poor households. The reverse is however true when effort (time, labour) are considered. Poor households spend more time and labour to obtain a unit of energy compared to rich ones.

Patterns of energy consumption among poor people tend to increase their poverty. This is due, among others, to the following reasons:

a) Since poor people pay a large share of income for energy services, they are less likely to accumulate the wealth needed to make investments required to acquire higher quality fuels.

b) In most cases, the use of biomass fuels has negative effect on health.

The standard poverty-alleviation strategies - macroeconomic growth, human capital investment and income re-distribution - do not address poverty as it relates to energy. If patterns of energy use result in adverse effects on nutrition, health, productivity and the environment, for example, benefits in economic growth are likely to be absorbed only very slowly by poor people.

In contrast, programmes that focus directly on creating opportunities for poor people to improve their energy services by increasing use of energy carriers can enable poor households to enjoy both short term and self reinforcing long term improvements in their living standards. In some cases, provision of well targeted subsidies and infrastructural facilities could contribute to achieving these goals.

(ii) Overview of economic developments and indicators

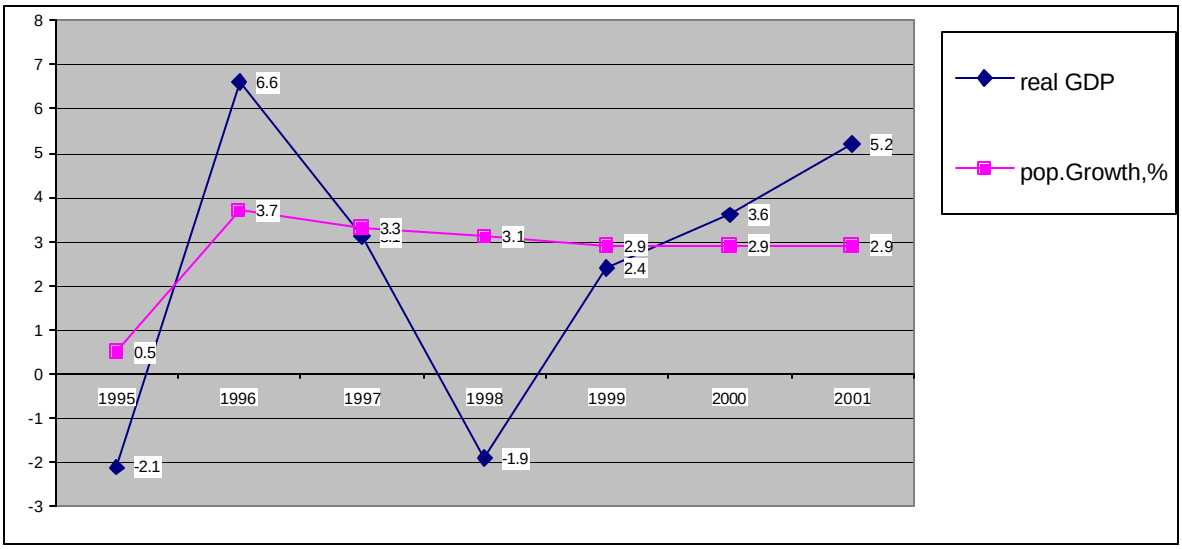
During the period 1995-2000, the government's objectives were set to achieve a sustained growth rate of 4.5% per annum, reduce inflation gradually to 15% or less and to increase the foreign exchange reserves to at least two months of import cover. These objectives were to be achieved through continued implementation of structural reforms aimed at removing bottlenecks to the supply side of the economy as well as pursuance of appropriate fiscal and monetary policies. Of particular importance was the acceleration of structural reforms that principally related to the privatisation programme, reduction of poverty, internal and external liberalisation of the economy and the strengthening of the banking sector and rehabilitation of major infrastructure, especially the road network.

In spite of the positive strides made in implementing economic reforms and improving the policy for private sector led development the economic outturn over the period averaged a meagre 1.6%, compared to the desired 4.5% of the anticipated growth. In1998, for example, Zambia registered a negative increase in GDP. Only the Democratic Republic of Congo (DRC) and Lesotho registered such negative growth in the Southern African Development Community (SADC).

Over the same period the population grew at an average rate of 3.1% per annum (Figure 3). Because rapid economic growth is an essential, though not a sufficient condition of poverty

reduction, the generally weak performance of the economy during the period contributed to an increase in the incidence of poverty from 69.2% in 1996 to 72.9% in 1999. It would therefore be imperative to work out mechanisms of linking economic growth to poverty eradication or alleviation.

Figure 3: Comparison of real GDP growth and population increase



Source: Transitional National Development Plan 2002 and other sources

Although there was contraction in economic activity in most sectors of the economy the greatest pull-down on aggregate output was exerted by the significant decline in the primary sectors of mining and agriculture. Value added in the mining sector fell by 11% as a result of low metal production at the Zambia Consolidated Copper Mines (ZCCM). The fall in metal production was partly due to delays in the privatisation of the mines under ZCCM that led to lack of new investments and capitalisation of the mines, thereby reducing output in subsequent years. Value added in the agricultural sector fell by 6% due to the effects of the El Nino weather phenomenon that characterised most of the years.

Economic activity however picked up slightly in 1999 when a growth rate of 2.4% was recorded. This is largely on account of the favourable weather conditions that affected the agricultural sector positively and also the positive performance of the manufacturing and service sectors. Table 1 below shows the average real GDP annual growth rates from 1998-2001

Table 1: Real overall GDP and sector growth rates

	1995	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
Overall GDP	-2.1	6.6	3.3	-1.9	2.4	3.58	5.2
Agriculture	4.5	-0.12	-0.88	0.28	2.24		
Mining	-4.6	0.35.	0.26	-2.97	-2.24		
Manufacturing	-0.04	0.55	0.50	0.18	0.30		
Construction	-0.17	-0.54	1.19	-0.52	0.53		
Energy	-0.05	-0.18	0.12	-0.08	0.0		
Services	-2.15	6.55	2.11	1.22	4.77		

Source: Transitional National Development Plan 2002

Notwithstanding the above, the services sector made significant contributions to economic growth averaging 2.5% growth per year. This growth in the services sector has generally remained steady, despite, the economic liberalisation and stiff competition that domestic service providers faced from foreign investors and providers of services. Other sectors that positively contributed to overall economic growth were manufacturing and construction.

A notable feature of the composition of domestic output during the period was the transformation of the structure of GDP, with the share of mining sector, which has traditionally been the backbone of the economy falling significantly in 1994 to 6.6% in1999. The wholesale and retail trade sector made important gains with its share rising from 14.8% in 1994 to 19.4% in 1999, making it the biggest contributor to GDP in the period.

Positive developments were also recorded in the area of inflation control as the rate of inflation dropped from 46% in 1994 to 20.6% in 1999. However the rate of inflation, though assuming a downward trend, fluctuated largely due to shock such as drought and falling metal prices .The fall in inflation was facilitated by supportive fiscal and monetary policies.

B. Overall Strategy to Reduce Poverty

Zambia's current macroeconomic framework covers the period 2001-2003 and is supported by the World Bank, IMF, and other bilateral partners. The country is now working on a new programme for the period 2002-2004 with the following envisaged macroeconomic indicators:

a) An annual GDP growth rate of 4.3% in 2002 and 4.0% In 2003 and 2004 and 4.5% in 2005;

b) Improve the country's external sector's viability;

c) Bring down year end inflation to a single digit by 2003;

d) Run a balanced domestic budget by 2003.

Specifically, restoring Zambia's economic growth and macroeconomic stability will entail reducing the overall public sector fiscal deficit caused by losses from Parastatals and other extra budgetary funds and improving fiscal management. Another strategy will be structural reforms in infrastructural arrangements to reduce costs. Further the strengthening of state capacity for poverty reduction programmes is important. This includes issues related to budgeting and planning.

A key component in reviving economic growth is the management of the HIV/AIDS pandemic. Statistics indicate that so far the rate of the new infections is reducing. Further, Government is committed to provide where possible, medicines to infected persons. Development of infrastructure in rural areas will also contribute to providing the poor with opportunities to reduce their poverty status.

Sector specific actions intended to reduce poverty include the following:

a) **Agriculture** –promote self-sustaining export led agriculture which will ensure increased household income and food security

b) **Mining**- revitalise small-scale mining and attract investment for the development of large-scale mining.

c) **Tourism** –ensure that Zambia becomes a major tourist choice with unique features. Thus tourism will become an important source of revenue for the country.

d) **Transport** –reduce transport costs and create wealth for economic development.

e) **Manufacturing** –transform the sector into a competitive export engine so as to create jobs and reduce poverty.

f) **Energy**- increase the population's access to modern energy services.

g) **Environment** –protect the environment while managing and developing natural resources so as to contribute to economic growth and poverty reduction.

h) **Health** –significantly increase the life expectancy in Zambia. This will include the reduction of new HIV infections and mitigation of socio-economic impact of HIV-AIDS.

i) **Education**- provide relevant, equitable, efficient and quality education for all.

j) **Gender**- achieve full participation of both women and men in the development process at all levels.

k) **Water and sanitation**- promote sustainable water resources development, efficient management and utilization of water resources in order to increase accessibility.

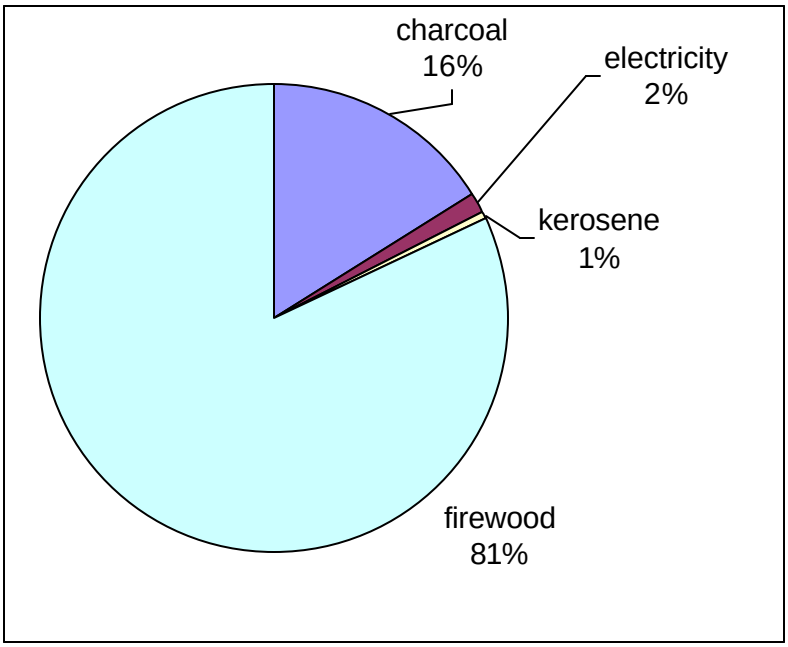
l) **Governance** –promote observance of good governance practice in all private and public institutions as a prerequisite for economic growth and poverty reduction.

C Energy Sector Activities to Reduce Poverty

Zambia's energy sector is dominated by reliance on biomass fuels like firewood and charcoal. As a modern source electricity is the natural choice for the country because there is usually excess production capacity in the order of 450MW. Further the bulk of the electricity production potential, which is mainly, hydro-based, has not been exploited.

The current electricity access nation wide is 20%. In terms of access by residence status, only 48% of the urban population and 2% of the rural population had access to electricity in 1998.

The household sector is dominated by firewood and charcoal as the main sources of energy. The reliance on these traditional fuels arises from the high poverty levels. The poverty levels in turn make it difficult for households to make the transition from traditional to modern energy sources. The following figure shows the percentage contribution to total household energy supply by different energy sources.



The main focus of government programmes between now and 2010 is therefore to increase access to modern energy services. The following are the targets that should be reached:

a) Increase urban electricity access from 48% in 1998 to 70% by 2010.

b) Increase rural electricity access from 2%in 1998 to 15% by 2010.

c) Reduce household charcoal consumption by 30,000 tonnes annually.

d) Increase the number of households with solar home systems from 400 in 2002 to 20,000 by 2010.

e) Promote increased use of solar energy in rural schools and rural health centres.

f) Find a viable alternative to charcoal as an urban household fuel.

A summary of the programmes that Zambia will implement in order to attain the above targets is given in the following table:

Table 2: Summary of expected outputs:

Main programme	*Current status*	*Target status*	*Activities*
Energy policy review	1994 policy inadequate	New policy by end 2003	Energy policy review
Rural electrification	2% of population with access	15% of rural population with access by 2010	✍✍Rural electrification master plan/strategy Establishment of rural electrification authority
Urban electrification	48%of population with access	70% of population with access by 2010	Urban electrification strategy

Main programme	*Current status*	*Target status*	*Activities*
Enhance existing energy infrastructure	✍✍Power rehabilitation project in progress ✍✍Petroleum rehabilitation project on hold	Enhanced infrastructure by 2005	✍✍Monitoring of on going power rehabilitation project ✍✍Securing financing for petroleum rehabilitation.
Create new energy infrastructure	Existing infrastructure inadequate to meet future demand	Implement new infrastructure projects by 2010	✍✍Zambia –Tanzania – Kenya interconnector ✍✍Zambia –DRC interconnector ✍✍Electrification of Mkushi farm block ✍✍Kafue Gorge lower and Itezhi tezhi hydro electric power stations. ✍✍Mini hydro stations in north western province.
National petroleum strategic reserves	No strategic reserves	Have strategic reserves by 2004	✍✍Introduce legislation on strategic reserves ✍✍Create strategy reserves

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Poverty Reduction Strategy Paper, 2002: Ministry of Finance & National Planning Lusaka.

2.1.5 Kenya's Strategy for Poverty Reduction

Brief Country Profile

- **Population (million):** 28.7 (2000)
- **Area (km^2):** 580,000
- **Capital City:** Nairobi
- **GDP Growth Rate (%):** 0.4 (2000)
- **GNP per Capita (US$):** 350 (1998)
- **Official Exchange Rate:** KShs. 78.56 = 1 US$ (Jan 2002)
- **Economic Activities:** Tourism, agriculture, forestry, manufacturing, mining, construction, commerce
- **Energy Sources:** Geothermal, hydro, solar, biomass, imported oil, imported coal

- **Installed Capacity (MW):** 1,173 (2001)
- **Electricity Consumption per Capita (kWh):** 122.1 (2001)
- **Electricity Generation (GWh**): 4,081 (2001)
- **System Losses (%):** 21.5 (2000)

The key priorities and strategies in the draft PRSP for Kenya are as follows:

- Agriculture: While no specific targets are given for the agricultural sector the main thrust is to promote food security and to increase income and employment generation from crops, agro-forestry and other agricultural activities. This requires expansion of land available for agriculture by improving the land tenure system to give the poor access to land and by improving water and electricity supply so that arid and semi-arid areas can be developed. The reduction in the cost of electricity is another essential objective. Complimentary activities include creation of effective agricultural extension services to the small holder farmers, technology transfer and training for peasant farmers with increasing focus on women farmers, establishment of an effective and efficient marketing system, rehabilitation and maintenance of physical infrastructure particularly feeder roads. The government also needs to reinforce the control of crop and livestock pests and diseases, the control of quality of farm inputs through improved legislation and empowerment of farmers' associations.
- Water: The overriding requirement for the development of the water sector is to improve the institutional, legal and policy framework for the development and management of water supply. The development of water supplies is a priority in rural, urban and peri-urban areas. This includes the rehabilitation and construction of water conservation facilities in arid and semi-arid areas. Because of the magnitude of the task it is essential for the government to involve the private sector in financing and management and to strengthen community based catchment management practices and community management of rural water for human and livestock use.
- Education: The priority issue for this sector is increasing access, especially to basic education. The main strategy is increasing primary school enrolment and completion by lowering the cost borne by parents and enabling more poor children to attend secondary school by providing bursaries, loans and scholarships targeted at poor households. Specific targets include an increase in adult literacy from 75% to 80%, an increase in gross primary enrolment from 89% to 92%, an increase in primary school completion rate from 46% to 55%, and an increase in secondary school enrolment from 23% to 40%. To improve quality and relevance there is need for an upward revision of teacher to pupil ratios, a review and rationalisation of the curriculum and decentralisation of the management of schools and teachers.
- Health: The Millennium Development Goals drive the health targets: reduction of under-five mortality rate from 112 to 98 per 1000, under-five wasting rate from 6.3% to 6%, infant mortality rate from 74 to 65 per 1000, incidence of stunting from 37.5% to 35% and the crude death rate from 12 to 10 per 1000. One of the key strategies for achieving these targets is to reduce population growth rates from 2.4% to 2% in the short term by expanding family planning services and improving information and education. There is a need to shift financial, human and other resources from curative to preventive rural health services and to control the spread of HIV/AIDS and other

killer diseases. All public healthcare facilities must be provided with an appropriate and adequate supply of drugs which is affordable by the poor. Access to clean water supply by the poor is essential for the health of the nation. In order to improve efficiency in supplies to urban areas it is necessary to enact legislation for the privatisation of urban water supplies.

?? Small, Medium and Micro Enterprises: This growing sector needs support measures targeted at providing adequate infrastructure and developing technical and business management expertise. Technology development and transfer can be improved through participatory group extension and private sector development. The small enterprise sector can also expand by opening new markets for labour intensive manufacturers, services and agro-products. Some of the specific actions being undertaken are the implementation of an action plan to stabilise street vendors and hawkers, who represent 70% of the SME sector, and to privatise the World Bank-financed SME Training and Development Project to allow it to act as a catalyst for the provision of services to the Jua Kali sector.

Kenya plans to spend about US$13 million every year for its rural electrification programme which is the major energy intervention to support the poverty reduction strategy. Energy reforms are also under way whose aim is to improve efficiency, reliability, security and affordability of power supplies to support the social and economic sectors.

2.1.6 Tanzania's Strategy for Poverty Reduction

Brief Country profile

?? **Population (million):** 32.5 (2000)
?? **Area (km^2):** 945,000
?? **Capital City:** Dar-es-Salaam
?? **GDP Growth Rate (%):** 1.9 (1999)
?? **GNP per Capita (US$):** 260 (1999)
?? **Official Exchange Rate:** TShs. 936.00 = 1 US$ (January 2002)
?? **Economic Activities:** Mining, agriculture, commerce, construction, tourism
?? **Energy Sources:** Hydro, coal, natural gas, biomass, imported petroleum
?? **Installed Capacity (MW):** 655 (1998)
?? **Electricity Consumption per Capita (kWh):** 62.04 (1998)
?? **Electricity Generation (GWh**): 2,164 (1998)
?? **System Losses (%):** 11.7 (1998)

The key priorities and strategies in the Tanzania PRSP are as follows:

?? Agriculture: The government's main objective for the agricultural sector is to reduce food poverty and to improve employment. The target is to ensure growth of the sector by at least 5% by 2003, to reduce the proportion of the population that is food poor by 3.5% by 2003 and to halve the absolute number from 27% to 14% by 2010. The main challenges are to expand and improve irrigated farming, to improve access to demand driven agricultural research and extension services, to support labour intensive agro-processing and to facilitate crop movement within the country and across international borders. To improve prospects for obtaining credit from financial institutions as well as carrying out research and initiatives to bolster output and raise quality, the

government plans to encourage farmers to organise themselves in groups or to revive agricultural cooperatives.

?? Water: The priority is to increase the provision of adequate and safe clean water, particularly in the rural areas. By 2003 the Government hopes to increase the proportion of the rural population with access to clean water to 55% from 48.5% in 2000. To achieve this requires the carrying out of regular water supply quality surveillance and enforcement of water quality laws, regulations and WHO standards, the empowerment of local authorities and communities to protect water resources, the carrying out of hydrological and hydro-geological surveys to strengthen water resource and quality database, to promote rain water harvesting and generally to increase spending in rural water supply.

?? Education: Increasing gross enrolment, gender equity and completion of primary education by all school age children are the key objective of the targets that have been adopted for the education sector. Gross enrolment is to be increased to 85% by 2003 with net primary school enrolment increasing from 57% to 70% and secondary school enrolment increasing from 5% to 7%. The transition rate from primary to secondary level would need to increase from 15% to 21% by 2002 and the drop out rate reduced from 6.6% to 3%. Quality improvement is to be determined by an increase in the number of students passing at a specified mark in standard seven from 20% to 50% by 2003. The target year for achieving gender equality in primary and secondary school is 2005.

?? Health: The health sector programmes aim to improve quality of health service delivery in order to reduce the burden of disease and to restore life expectancy to 52 years by 2010. This requires more effective support for primary health care, the promotion and coordination of private sector, civil society and community activities in the health sector and the rehabilitation and expansion of clean water supply schemes. The specific targets indicate a high degree of focus on strengthening child health and nutrition education and reducing under-five mortality – the overall target being the reduction of the mortality rate from 158 to 127 per 1000 by 2003, the reduction of in-patient case fatality rate for under-five from 12.8% in 1997 to 8% in 2010 and the reduction of malaria fatality for under-five from 12.8 % to 10% by 2003. Other targets include the reduction of maternal mortality rate from 529 per 100 000 to 450 per 100 000 by 2003, infant mortality rate from 99 per 1000 in 1999 to 50 by 2010 and 20 by 2025, prevalence of stunting from 43.4% to 20% and prevalence to wasting from 7.2% to 2%. There is need to increase percentage of children immunised from 71% to 85% by 2003, coverage of births by trained staff from 50% to 80% by 2003 and access to clean water in rural areas from 48.5% to 55% in 2003 and to 85% in 2010. Reduction of HIV/AIDS prevalence is to be achieved by promoting awareness through peer education in schools and increasing district awareness campaigns to 75% by 2003.

?? Small, Medium and Micro Enterprises: To support this sector, the government sees its role being primarily to ensure an enabling environment and to encourage on going efforts by NGOs and local banks to provide credit, training and other forms of support. Primary societies and cooperatives require training in organisational and financial management, labour intensive agro processing need to be promoted and laws and

regulations need to be reviewed to allow land to be used as collateral for commercial transactions.

The major energy intervention to complement the PRSP is the rural electrification master-plan which is under preparation and is being done within the context of energy sector reforms whose key objectives are the improvement of sector efficiency and reduction of the high cost of utilities.

2.2 Biomass – The Energy Used By The Poor – *Koffi Ekouevi*

The following presentation on biomass by ***Koffi Ekouevi, Senior Economist with the World Bank based in Cote D'Ivoire*** brought into focus the reality that most of the rural and urban poor are unlikely to have access to modern energy services in their lifetimes. With half of the world's population dependent on biomass, it is surprising that it is only in recent years that biomass has moved from being an invisible sector to one where governments realise the need for active policy and budgetary interventions to achieve sustainable biomass use. The benefits of this awareness include enhanced protection of the environment through better forest management and increased efficiency in production and use of firewood and charcoal, achievement of Millennium Development Goals in health such as reduced child mortality, improved maternal and child health, increased life expectancy and improved labour force health resulting from significant reduction in respiratory diseases.

A Introduction

In various workshops and conferences on energy there is a bias towards energy services such as electricity, LPG and kerosene. As the challenges of delivering these fuels to the poor are discussed it is important that cognizance is taken of a few facts about the reality on the ground:

- About half of the World's population relies on biomass energy for cooking and heating.
- The use of biomass is still increasing due to population growth, stagnation of incomes and poverty.
- The share of biomass in total energy consumption is considerable in Sub- Saharan Africa (SSA) and South Asia. In SSA countries biomass accounts for at least 70% of energy use. The figure rises to over 85% if the Republic of South Africa, which consumes over 60% of the continent's electrical energy, is excluded.

Dependence on biomass, using polluting and inefficient stoves, has the following adverse consequences on health and the environment:

- **Environment**: at the local level there is depletion of woodland and soil erosion while at the global level there are greenhouse gas emissions and other negative effects of the products of incomplete combustion;
- **Health**: there is a fair amount of evidence of the link between extensive biomass use and such diseases as acute respiratory infections, conjunctivitis, lung cancer, tuberculosis, cataract, asthma, low birth weight and higher rate of still-births;

- **Quality of life**: smoky sooty homes, eye discomforts, inadequate lighting, restricted use of modern appliances, restricted opportunities for study and home based businesses;
- **Gender Issues**: with limited social and economic power to influence investment decisions for fuel change women are the most exposed to indoor air pollution and the hazardous and time-consuming work of collecting wood-fuel.

While biomass constitutes the main energy source for the poor governments have not always given it the attention it deserves. Before the mid seventies biomass was an invisible component of the energy sector. Since then there has been an encouraging trend where many governments now have active projects, programs and budgets for the promotion of efficient biomass production and utilization.

B Benefits of efficient & Sustainable Biomass Production and Use

Some of the projects and programs that can be implemented include better forest management schemes for a sustainable supply of wood-fuels, use of improved wood and charcoal stoves, increased efficiency of kilns for charcoal production, better charcoal packaging and promotion of modern bio-energy applications.

More efficient production and use of biomass provides immediate health, environmental and socio-economic benefits:

- **Health benefits in line with Millennium Development Goals:** reduced child mortality, improved maternal and child health, increased life expectancy and improved health status of the labour force;
- **Environmental benefits in line with the Rio and Kyoto Summits:** help in mitigating climate change, reduction in acid rain and soil erosion, preservation of forests and wildlife habitats and protection of watershed;
- **Social and economic benefits:** rural economic development, employment creation, provision of stable income to farmers, empowerment of women, improvement of balance of trade and contribution to poverty reduction.

C Simultaneous Interventions on Four Main Fronts

To achieve these benefits, biomass schemes must be included as part of broader rural development programs and must involve local communities. It is necessary to remove institutional, technological, legal and financial barriers to implementation. The most effective recognition of the importance of biomass is through explicit budgetary allocations and appropriate policy instruments and incentives (such as fiscal, pricing, etc.).
Essentially there is need for simultaneous intervention on four fronts:

- Reinforcement of Legislation and Taxation dealing with Biomass Energy Issues;
- Promotion of Community Based Social Forestry;
- Encouragement of Demand-Side Inter-fuel Substitution Initiatives;
- Maximisation of synergies between sectors.

There are many opportunities and challenges in these interventions. There is renewed focus on poverty reduction and an increase in awareness of the human impacts on the environment. Full use can be made of innovative climate change financing mechanisms such as the upcoming carbon trade. There are opportunities for enhancing the participation of the local population in development processes and for adopting best practices from existing schemes. Above all there is the challenge of formulating and delivering output-based aid schemes.

2.3 Session Discussions

During discussions participants generally confirmed the priorities identified in the PRSPs and the views expressed in the presentations by the Ministers and the World Bank officials. There was consensus that energy interventions can be more effective in poverty reduction if these are focused on households rather than on general institutions such as rural service centres.

It was clarified that the poor are, generally but not exclusively, defined as those people who live on less than US$1 per day. In countries whose economies have registered low or negative growth over the past decade poor people constitute the majority of the population. Where positive growth rates have been sustained the proportion of the population classified as poor has declined. The experiences of Zambia and Uganda help to illustrate the point. In Zambia, where GDP growth has been negative or at best 1.6% per year instead of the 4.5% target, over 70% of the population is now classified as poor. In Uganda, where the economy has been growing at 6% per year the proportion of the poor dropped from 56% in 1992 to 35% in 2000.

Because the bulk of the population in Africa lives in the rural areas these are the areas of focus for most poverty reduction initiatives and the energy interventions required to support them. In Uganda 96% of the poor are in the rural areas while 83% of Zambia's rural population is also classified as poor.

It was observed that rural to urban migration has created a rapidly growing class of the urban poor. For example fifty-six percent of Zambia's urban population is poor. There were concerns raised regarding the apparent neglect of the urban poor because of the focus on the rural poor and rural energy initiatives. However it was noted that in dealing with the rural poor there would be direct and indirect benefits for the urban poor. It is important to recognise this link between urban and rural poverty because the burden of supporting the rural population is generally carried by the urban poor. That support burden tends to reinforce the poverty cycle. For example firewood and biomass consumption by the urban poor is at the expense of rural agriculture, deforestation, and land degradation.

While recognising commitment towards the achievement of the MDGs and implementing PRSPs, the task is inevitably complex and the rate of progress is very slow. There may be a problem in assuming that rural electrification will transform the poor. Talking about rural electrification with time horizons of decades does not help us now. We need to look at interventions that can make a difference now.

Accelerating access of the un-served or under-served to modern energy services is most challenging. Some of the reasons highlighted during workshop discussions are as follows:

a) There has been a diminishing appetite for African risk by private investors at a time when most African governments have undertaken reforms of the energy sector with the goal of improving attractiveness to private investment. The private sector has also

tended to focus on power generation whereas the greatest impact on poverty would be at the distribution level. The limitations of the private sector requires the World Bank and other development agencies to recognise the need for a continued role of the public sector in energy services provision;

b) Affordability is vital for ensuring access to modern energy by the poor and yet there are subsidy sources which are not being fully utilised such as the GEF, Kyoto Protocol, Prototype Carbon Fund, and the traditional IDA financing. Both capital and consumption subsidies appear to be necessary as experience had shown that many poor people tend to get disconnected for non-payment once subsidies have been removed;

c) There is a shortage of properly designed projects to access the funds available for poverty reduction projects with the result that funds remain unutilised for several years. This is unacceptable in the face of the poverty levels on the continent;

d) During the implementation of energy reforms short run negative impacts on the poor have been observed. Many reforms have resulted in sharp increases in tariffs, reduced subsidies and missed opportunities for scaling up grid and off-grid electrification.

e) The focus on poverty alleviation should not be done at the expense of the environment. Explicit attention to the environment as a sector crucial for poverty reduction would enhance the effectiveness of action plans.

f) With rural electrification and other rural energy initiatives requiring several decades to reach 100% of the population it is recognised that the half of the world's population which is now dependent on biomass as the primary energy source will continue to do so for the foreseeable future. Besides the rhetoric, unfortunately many governments do not have active policy and budgetary interventions to achieve sustainable biomass use. Increased efficiency in the production and use of firewood and charcoal will not only enhance environmental protection through better forest management but will also facilitate the achievement of Millennium Development Goals in health through reduced respiratory diseases, improved child and maternal health and increased life expectancy.

In implementing energy programmes for poverty alleviation useful lessons have been drawn:

a) National energy policies need to be focused on beneficiaries' priorities and on affordability rather than only on technology. This is also most relevant for donor supported interventions which must recognise the importance of community involvement in project design and implementation;

b) Energy is not an end in itself and therefore the formulation of Energy policy cannot be the business of the energy sector alone. A multi-sectoral approach to policy formulation, project design and implementation will have the greatest positive impact on poverty reduction. All stakeholders now accept the need to restructure interventions in line with the multi-sectoral approach to poverty reduction;

c) Extending energy services to the poor implies the recognition of multiple technical and institutional options, including decentralised energy services and building up partnerships between the government and the private sector. The private sector can bring management and investment resources while the government ensures the proper

investment climate and incentive framework. The energy technologies – such as improved methods for biomass production and use, solar-based agro-processing technologies, batteries, micro and small hydro, biogas, wind and ramp pumps – can either be the core business of small and medium enterprises (SMEs) or inputs for their other productive operations;

d) Because of the significant role that the local investor can play in the energy sector, the importance of domestic sources of finance has been recognised. Mobilising domestic financial resources instead of foreign borrowing can contribute to improving the macro-economic situation of a country;

e) Rural Electrification through grid extension is most viable when the principal focus is on facilitating productive applications as opposed to simply providing social services such as street lighting and improved health and education services. Non-grid options can be more appropriate where use is restricted to social services;

f) There is an important difference between the urban and rural poor with respect to access to modern energy services. Often for the urban poor the services are there for them to access, whereas for the rural poor the services are not there in the first place.

g) It is now widely recognised and accepted that energy sector reforms provide long term benefits for poverty reduction and economic growth because of enhanced efficiency and reliability in service delivery, reduced burden on public sector finances, better targeting of subsidies and increased investments.

3

Measuring Energy Project Benefits and their Impacts on Poverty

3.1 Impact of Energy Sector Reforms on the Poor – *Alix Clark*

Alix Clark, an ***energy researcher from South Africa***, shared preliminary findings from the research project on "Expanding the Provision of Energy Public Benefits while Electricity Sectors in Developing Countries are reforming". The project studied the impact of electricity sector reforms on the poor and covered Brazil, Ghana, South Africa, India, Indonesia, Pakistan and Thailand. On balance, at least in the short run, energy sector reforms do not seem to be impacting positively on energy access to the poor because of the reduction of subsidies, increasing tariffs and missed opportunities for scaling up grid and off-grid electrification during reforms. Governments, therefore, need to intervene through better targeted subsidies, promoting end-use efficiency to cushion effects of price increases and power supply constraints and incorporating electrification obligations as part of the reform agenda.

Electricity Reform and the Poor

A Introduction and Research Background

This workshop's objective was to bring together a broad range of energy stakeholders to assess how modern energy can contribute to poverty reduction targets, and to outline mechanisms to scale up direct and indirect delivery of energy services to improve livelihoods and income opportunities of the *poorest* segment of the population. This presentation looked at how electricity reforms can contribute to poverty alleviation in Africa.

From 2000 to early 2003 an International Energy Initiative (IEI) research project had been in progress to assess the impact of electricity reforms on the poor. Operating under the theme "Expanding the Provision of Energy Public Benefits While Electricity Sectors in Developing Countries are Reforming" the project had covered Brazil, Ghana, South Africa (SA), India, Indonesia, Pakistan and Thailand. In the near future another project on "Assessing the Impacts of Electricity Reform on Africa's poor people" sponsored by ESMAP and DFID is to be launched and it will cover about eight African countries.

B Principal research observations on electricity reform impact on the poor

Definitions of "power sector reforms" vary. Huge and widespread change is happening in electricity sectors just about everywhere. Reforms are introducing new players, new sources of finance, new investment opportunities and different rules of the game.

In this project the assumption was made that the general thrust of electricity reforms in the developing countries is to increase the proportion of the population with access to electricity. It was observed, however, that in many cases the access programmes and power reforms were generally being planned separately and as a result there was no synchrony between them. Opportunities to scale up grid and off-grid electrification during reforms are being missed especially in Africa.

The following table summarises the impacts of reform as observed in the different countries. The impact areas that were studied were tariffs, subsidies, grid and off-grid programs, customer services and energy efficiency.

Impact Area	*Positive Impact*	*Negative Or No Impact*
Tariffs	Tariffs likely to drop in Thailand with new IPPs and cheaper energy sources	Tariffs likely to increase in SA, Ghana, Pakistan, India and Indonesia
Subsidies For Energy Consumption	Subsidies for the poor are being maintained in Brazil, India, Indonesia, Ghana, Pakistan, SA, and Thailand	Ghana's subsidy system has not been effective (50kWh lifeline inadequate for communal houses with multiple poor families).
Grid Programs	In Indonesia and Ghana electrification obligations are being incorporated in reforms. In SA and Brazil reforms likely to impact grid extensions only at a later stage	Chile and Brazil initially. In Thailand, Pakistan and SA projects already implemented successfully independent of reform.
Off-Grid Programs	Designed and implemented independently	Designed and implemented independently
Customer Services	Not enough information for impact assessment	Reforms have not progressed enough to judge if private sector does a better job
Energy Efficiency	Energy efficiency helped to alleviate electricity crisis in Brazil. Ghana's promotion of energy efficiency is to cushion effects of price increases.	Energy efficiency is threatened by reforms in SA and Thailand

Based on these observations it is the opinion of the researchers that, on balance, reforms are not impacting positively on access initiatives. Reforms are slowing access initiatives down, they are tending to reduce subsidies and increase tariffs. Reforms are also focusing on mainstream activities, and sometimes the implementers are forgetting about how the various interventions are integrally linked.

C How can the electricity sector contribute to poverty alleviation in Africa?

With specific reference to the poor there is likely to be no short-term electricity reform impact on the poorest of the poor for the simple reason that they are unlikely to have access.

Implementation of electricity reforms presents excellent opportunities for delivering electricity to all of Africa's citizens. The fact that the energy world is changing means that now is the time for action because there is a greater ability to absorb change. Further ways can be considered for encouraging more competition for electricity delivery, promoting sustained private sector participation, establishing independent regulation and decentralised implementation.

Some specific actions which can be implemented to scale up electricity access during reforms are as follows:

- ?? Governments must continue to maintain the objective of extending access to reduce the number of un-served; needed are frameworks that encourage integrated or co-ordinated development of grid and off-grid projects and institutional infrastructure to support an ongoing electrification programmes. South African experience is particularly noteworthy;
- ?? It is important to put in place government policies that recognise energy efficiency as a powerful value adder to access efforts; in particular governments must promote end-use efficiency so electricity is more widely accessible to more poor people.
- ?? Governments must look into better targeted and better designed subsidies to enable achievement of an improved and affordable service.
- ?? Regulatory instruments are essential to provide incentives for private sector participation and encourage competition. Chile and Argentina provide appropriate experience and lessons;
- ?? Financing arrangements which reduce pressure on governments need to be encouraged as in Chile and Argentina. Other innovative approaches include ring-fenced funding for grid and off-grid access programmes as in Ghana, SA, Thailand, Indonesia and Brazil;
- ?? Tariffs should be cost reflective to halt waste, and subsidies must target the poorest electricity users (the range of tariffs depending on context);
- ?? Subsidies that are most recommended are those that focus if possible on once-off payments rather than on going energy consumption;
- ?? Encourage and facilitate an increased role for rural co-operatives and NGOs.

3.2 Measuring The Benefits Of Modern Energy Use – *Aleta Domdom,* Ateneo De Manila University In Philippines

The presentation by ***Aleta Domdom*** was based on a recent study undertaken in the Philippines that provided a practical method of assessing the qualitative and quantitative benefits of rural electrification. The method is based on the fact that electricity is a derived demand for light, heat, cooling and power which in turn make it possible to have improved education (through

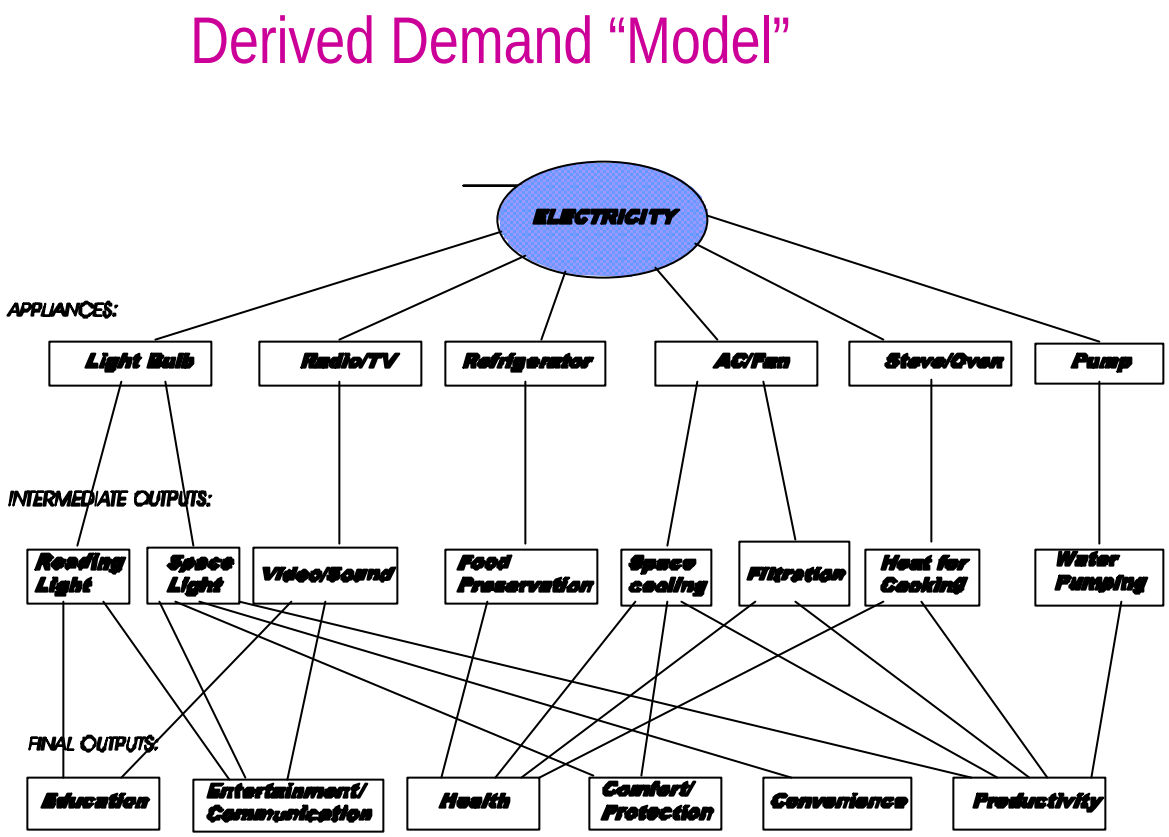
increased time spent studying), entertainment and communication (increased time spent listening to or watching radio and TV), health (reduced morbidity rates), comfort and protection (reduced crime statistics), convenience (time saved in household chores) and productivity (improved income or output). The items in brackets are the quantitative measures that can be used for comparative studies.

A Introduction and Objectives

The main objective of the presentation was to outline a practical method of assessment of benefits from modern energy use and to illustrate the application of the method by examples from the Philippines and Bhutan. The key to this method is the traditional approach that recognizes that electricity is not desired for its own sake but as an input for the production of outputs that contribute to household well-being.

The outputs are at two levels – intermediate and final. Intermediate outputs are the light (lumens), heat and power produced by using electrical appliances. Electricity allows these outputs to be produced at lower costs. Education, entertainment, health, convenience, protection and productivity are designated as final outputs whose attainment is a direct measure of poverty reduction.

The following diagram summarises the relationship between electricity use and the intermediate and final outputs.



B General Method for Evaluating benefits

The first step is to determine a measure for each of the final outputs. The second step is to observe differences between the performance measures for electrified and un-electrified households. The final step is to isolate the effect of electrification on the observed differences.

For this study the following were the measures determined for the final outputs:

- **Education:** time spent studying.
- **Entertainment:** time spent listening to the radio.
- **Health:** morbidity rate.
- **Convenience:** time saved for household chores.
- **Protection:** feeling of security.
- **Productivity:** output or income.

The data requirements are derived from household and village surveys. The Household surveys provide characteristics of household members, details of household energy use, farming characteristics, attitudes and appliance use. Village surveys provide an indication of distance to infrastructure, availability of energy and other services.

C Summary of Results for Philippines and Bhutan

The following is a summary of the results obtained when the method was applied in the Philippines. It provides the potential benefits of electrifying four million households that are currently un-electrified:

Benefit/Gain (HH = Household)	*Benefit per unit Month (US$)*	*Benefits per household per Month (US$)*	*Total Potential benefit for Philippines (US$ Million)*
Cheaper lumens (per HH)	37	37	147
Cheaper Radio & TV (per HH)	19	19	77
Education (per employed adult)	6	20	80
Time savings (per HH)	24	24	97
Productivity (per business)	36	8	30
Total (excl. lumens)			**284**

The following table summarises the potential benefits of providing electricity to 15000 un-electrified households in Bhutan:

Benefit/Gain (HH = Household)	*Benefit per unit Month (US$)*	*Benefit per household per Month (US$)*	*Total Potential benefit for Bhutan (US$ Million)*
Cheaper lumens per HH with access		17	9.02
Cheaper lumens per HH without access		13	2.35
Productivity (per business)		23	1.20
Labour time saved (per employed adult)	0.53	1	0.01

D Implications of Benefit Estimation Results

The assessment techniques from this method can be applied in different energy programmes and are long overdue for use in evaluating social and infrastructure projects. These techniques offer a better understanding of the relationship between social and infrastructure projects and development outcomes.

3.3 Framework For The Design And Assesment Of Social And Poverty Impacts – *Rekha Dayal,* Malikka Consultants

The presentation by ***Rekha Dayal, a social development expert from India,*** entitled "Framework for Design and Assessment of Social and Poverty Impacts in the Energy Sector – Operational Experiences from Asia" outlined a data gathering approach that can be used to obtain inputs for the derived demand model outlined in the previous section. In this approach a three-step exercise is carried out to capture stakeholder priorities and benefits at community, institutional and national levels. Using this approach throughout the project cycle, and not at the tail end as is more traditional, may slow the start up of projects but it produces greater sustainability due to higher stakeholder satisfaction and involvement as well as more equitable benefits if properly managed.

A Introduction

The presentation was based on experiences in using a combined participatory approach and socio-economic impact survey to develop a measurement and evaluation framework for use in a World Bank assisted rural electrification project in Cambodia. Some of the ideas are derived from a World Bank/ASTAE research project on Energy, Poverty and Gender carried out in China, Indonesia and Sri Lanka as well as policy reforms and investments funded by the Asian Development Bank to improve urban electrification in the Indian States of Maharashtra and West Bengal.

There is a persistent myth that use of participatory approaches (PAs) involves more work, more time, more expense and delays in program and project design, implementation and management. Experience, however, shows that;

- ?? Programs and investments prepared and managed using participatory approaches have a higher rate of sustainability,
- ?? Use of PAs contributes to better functioning and sustainability of systems and services,

?? Use of PAs costs less than 2% of outlays,

?? Time spent upfront for consultation and involvement of stakeholders saves time lost in further stages of program development and implementation,

?? Use of PAs helps to build ownership and accountability.

Findings from learning assessments in 15 countries globally also show that services that are more demand responsive and more gender and poverty sensitive result in higher effective use.

B Brief Description of the Cambodia Project

Cambodia is an emerging democracy with a war torn background and high levels of poverty. Only 16% of the population has access to electricity. Supply is supplemented by a network of Rural Energy Entrepreneurs (REEs). The World Bank approved a US$80 million dollar Rural Electrification project for the country which included a US$15 Million renewable energy component. This component included mini hydro, solar and diesel engines and was the focus of this initiative.

A partnership was established between the World Bank, the Cambodian Ministry of Mines and energy, Winrock Foundation and the Malikka Consultants with the objective of producing three outputs:

?? A Monitoring and Evaluation (M&E) framework for use in preparing the World Bank project;

?? Built-in capacity for participatory assessments among local institutions and experts;

?? Sensitised government officials at policy levels.

Two established and complementary methods - Participatory Assessments (PAs) and Socio-economic Impact Surveys (SIS) – were combined for qualitative and quantitative analysis. The design of the M&E framework cost 0.6% of the US$15 million renewable energy component. The recurring costs for socioeconomic impact assessments (SIA) for the further stages of implementation and M&E are negligible being about US$999 per community.

Data gathering involved a three-step process:

a) **Community level:** 5 to 7 days in each community with project implementers;

b) **Institutional level:** stakeholder meetings at district and provincial levels;

c) **Policy level:** policy assessment at national level with sector policy formulators and national project directors.

The framework developed for M&E in the project cycle is summarised in the table below:

Project Stage	*Participatory Approach (Pa)*	*Socio-Economic Impact Survey (Sis)*
Preparation	Extensive assessment to identify priority needs	Pilot surveys design based on needs identified in participatory work
Design	Extensive PA to shape project design	Market survey
Implementation	Less intensive follow up assessments	Base line and follow up survey
Post-project Impact assessment	Analysis and documentation of project impacts	Analysis and documentation of project impacts

C Findings and Design Implications

The following were the principal findings relevant to the design of the renewable component of the Rural Electrification project:

a) Solar systems were found to be irrelevant in the Cambodia situation because they were found to be economically not viable;

b) Only 33% of the population in non-electrified villages had 50 to 150 Ampere-hour batteries for lighting, the rest relied on lamps. There was no disposal of used batteries;

c) Development activity in non-electrified villages was negligible;

d) Power was not the priority need of villagers, the maximum expenditure in the poorest village was on food and health care;

e) In better off villages there was demand for power but supply was limited;

f) Most of the households had low income, and therefore willingness to pay was questionable;

g) Current lighting expenditure was affordable at 1500 to 3000 Riels (US$0.4 to 0.75) per month;

h) There were contradictions in perception of quality of supply between private service provider and consumers;

i) Spare parts and tools could only be available in the capital city, Phnom Penh.

With respect to the participatory and socioeconomic impact surveys it was noted that people enjoyed the consultations and had expectations of future development. They spoke freely and had innovative ideas for the possible project.

However, the level of community participation in focus group discussions in urban and commercial areas was less than in remote rural areas. Women's participation was lower as most managed their own businesses and had no time. A lot of time was also spent in travelling between villages.

It was also difficult to distinguish between the poor and the rich. The criteria for poverty in communities are not always related to incomes. Possession of certain goods and size of house are examples of criteria that influence community perception of poverty.

The following recommendations will improve the effectiveness of future surveys:

a) It is essential to estimate the human resources available in the villages to assist in conducting assessments. A small focus group from 5 to 10 people, with participants randomly selected, was found to be the appropriate number to facilitate the task;

b) It is important to have facilitators who are familiar with technical terms for electricity;

c) It is essential to have an ally or resource person in each village.

D Multiple Uses of Outputs

The outputs from the participatory assessments provide a variety of applications depending on the stakeholder:

?? **Communities:** PAs help communities to have a collective assessment of their situation and to have a transparent process for assessing the quality of rural energy service providers.

?? **Service providers:** have opportunity to better understand the market for their products and services and to gauge customer satisfaction;

?? **Project Staff and Managers:** PAs improve day to day monitoring of projects and facilitate better communication with users. They also improve project planning and implementation by tracking progress and making comparisons on geographic and other criteria;

?? **Sector Policy formulators:** have access to precise data on outcomes and links to policies and impacts on intended population;

?? **Project Designers and Donors:** can identify strategic project interventions to achieve sustainability and equity objectives.

E Conclusion and caveats

The experiences and observations from this and similar projects indicate that participatory approaches can be extremely valuable tools throughout the whole project cycle. It is important however to recognize that PAs are not business as usual and require a considerable amount of commitment and political will to succeed. The level of effort must suit local capacity and resources and explicit budgets for socio-economic impact assessments need to be defined and secured.

Unlike conventional monitoring and evaluation approaches which focus on the project implementation and post implementation impact assessment, participatory approaches require consistent attention throughout the project cycle from preparation to post implementation stage.

Pre-project preparatory activities need to be attended to. A set of priority indicators needs to be identified for consistent use throughout the project cycle. For the people, communities and institutions involved in the assessments there is need for team training and proper public relations. Due to limited resources and time it may be necessary to extrapolate results to areas

with similar geographic and socioeconomic conditions. The systematic dissemination of results to all stakeholders must also be planned at the outset.

Finally it must be remembered that participatory approaches are an essential but not sufficient project tool. These cannot be a substitute for the reforms that must accompany, precede or support efforts to improve social and poverty impacts.

3.4 Session Discussions

While noting the short-run negative impacts of electricity reforms on the poor, such as tariff increases and removal or reduction in subsidies, most participants agreed that the benefits of electricity reforms far outweighed the negative impacts. Many presumed benefits of the status quo were in fact not being enjoyed by the poor. For example subsidies tended to be poorly targeted and did not benefit the poor.

An example of the lifeline tariff in Ghana was highlighted. Because many poor families live in communal compound houses they do not benefit from the 50 kWh lifeline rate because their combined consumption exceeds this threshold level. In Ghana, grid extension was also premised on ongoing economic reforms raising incomes. This had not occurred and disconnections followed. In many instances, urban residents financed connections for their rural relatives but were unwilling or unable to pay the monthly bills.

There was consensus that subsidies were unavoidable and the issue of correct or smart targeting of subsidies was extensively discussed. The general consensus was that subsidies are mainly required for capital rather than for consumption. The Philippines study observed that most rural customers had the willingness and ability to pay for service once the first time upfront costs had been paid for.

There were several observations that were made to illustrate that the poor still benefit from electricity reforms even if they might not have access to electricity for a long time. If reforms improve financial viability and efficiency of the electricity sector then more government resources can be redirected to the social sectors. The poor are also consumers of goods and services, which become more available and competitively priced when producers have a more efficient and reliable power supply.

In developing PRSPs most governments recognised the need to set time-bound and measurable targets. However, as confirmed in the presentations that had so far been made in this workshop, there was a general deficiency in the PRSPs in linking specific sectoral priority targets with quantifiable energy interventions. This was the reason some methodologies were discussed during the workshop.

In discussing the derived demand model of the Philippines study it was noted that some of the final outputs are a result of sources that overlap. For example while it can be assumed that education benefits are largely a result of better lighting which allows more time for studying there is also contribution from improved access to efficient communication, radio and television. Only the major contributory factor, in this case lighting, is used for making comparative analysis.

Non-electrification factors such as income also have an influence on final outputs. In order to isolate the impact of electrification it is necessary to have analysis by such factors, for

example assessing the differences in education between low middle and high income households that are electrified and un-electrified.

Participatory assessments (PAs) are recommended for the data gathering required for the derived demand model.

PAs require three-step data gathering at the community, institutional and policy levels because of the need, respectively, to consult the beneficiaries, to define and secure funding and to get the necessary commitment and political will.

The Cambodia project highlighted that the focus on 'solar' for rural electrification tends to mask the fact that solar modules have very little impact on poverty reduction. The required services seem to be power and heat. Lighting is not a priority. We need to ask ourselves what we are doing to meet the heat and power needs of the poor. Other priorities for the poor are health and food. This important information confirms the value to be derived from participatory assessments.

It was concluded that gaining a further understanding of the demand curve for energy services still requires further investigation and analysis. It is important to continue to refine understanding of the demand by various income groups.

4

Case Studies – Learning from Existing Projects and Programmes

4.1 INTERFUEL SUBSTITUTION – *Emmanuel Quaye-Foli,* Head of Petroleum, Ministry of Energy.

Emmanuel Quaye-Foli provided an outline of an ambitious project launched in 1990 whose long-term goal is to substitute LPG for wood-fuel and charcoal for household cooking. So far the majority of the poor are still using wood-fuel and charcoal because of LPG prices. The uptake of LPG has been by medium to high income families. Policy and regulatory intervention is therefore necessary. The project has, however, created a local manufacturing industry in gas cylinders and stoves and has encouraged the private sector to invest in retail outlets and filling stations as well as in the standardisation of cylinders.

LPG Promotion – The Ghana Experience

A Introduction to the Energy Scene in Ghana

As is the case with all developing countries Ghana, with a population of 19 million, is heavily dependent on biomass. Biomass, in the form of wood-fuel and charcoal, accounts for 69% of energy consumption. The balance is made up of petroleum (18%) and electricity (13%). The following table provides a snapshot of the energy situation in 1983, 1990 and 2000.

Ghana: Energy Consumption By Fuel Source

Type Of Fuel	*1983*	*1990*	*2000*
Gasoline	207000	351000	410000
Kerosene	132000	172000	173000
Diesel	252000	308000	412000
RFO	37000	19000	50000
LPG	3000	7000	26000
Electricity	308000	411000	529000
Wood-fuel	2339000	3745000	4795000
Charcoal	0	414000	674000
Consumption in:	Tonnes of oil equivalent	**Statistics source:**	PETROTECH

Statistics are given for the year 1983 because that was the time when people took note of the large quantities of the gas that was being flared at the Tema Oil Refinery (TOR). The LPG produced from the TOR is a mixture of 70% propane and 30% butane. The country currently requires about 45,000 barrels of crude per day. About 27% of total export earnings were spent on petroleum products in 2000.

To avoid the wastage of a valuable energy resource costing the nation a large proportion of its foreign currency earnings a policy decision was taken to promote the use of Liquefied Petroleum Gas (LPG) as a household cooking fuel. The promotion started in 1990 with the short term aim being to eliminate flaring of LPG at TOR and the long term aim being to ensure that all households that use charcoal and firewood for cooking would adopt use of LPG.

This explains the rapid increase averaging 14% per year in the use of LPG as reflected in the figures in the table below.

Ghana: Growth in Energy Consumption (1990-2000)

Fuel Type	*% Growth Per Year*
Gasoline	1.5 –4.0
Kerosene	0.2
Diesel	1.2 –1.3
RFO	0.6
LPG	14.0
Electricity	10
Woodfuel	2.5 –3.0
Charcoal	3.0 –5.0

The LPG use situation just before the promotion was launched is reflected in the following statistics compiled by the Ghana Living Standards Survey (GLSS) of 1988: Only 4.8% of the population in Accra used LPG.

?? Only 0.8% of the population in other urban areas used LPG.

?? Nobody in the rural areas used LPG.

This situation meant that there were a limited number of cylinders in circulation and insufficient re-filling points for the expanded use that was now envisioned. Other constraints included the non-uniformity in standards among oil companies (Mobil, Shell and Goil) and the preference of the people for the traditional mode of cooking over the Western style cooking stoves.

B The LPG Promotion

To spearhead the promotion an LPG Promotion Unit was set up in the Ministry of Energy. The Ministry was the primary investor and price regulator for the LPG. A promotional levy was raised and used for creating awareness and demand for the increased use of LPG.

Government institutions and commercial food vendors were encouraged to switch to LPG. For households cylinders were given out and door-to-door deliveries were introduced.

Some of the results of these promotional efforts were:

- An increase in the number of cylinders in circulation from 80,000 in 1989 to 600,000 in 1997.
- An increase in overall LPG consumption from 5,267 MT in 1989 to 32,000 MT in 1996.
- Two LPG cylinder Manufacturing Plants are now operational in Ghana with total production capacity in excess of 135,000 pieces of a combination of 5kg and 14.5 kg cylinders.
- The private sector has established many LPG distribution outlets for both cars and domestic cylinders.
- Elements of traditional cook stoves have been used as basis for the design of locally manufactured LPG stoves

According to the Ghana Living Standards Survey (GLSS) of 2000:

- 22.7% of the population in Accra use LPG.
- 5.2% of the population in other urban areas use LPG.
- 0.6% of the population in the rural areas use LPG

While these statistics show impressive growth rates the following table shows that the project is far from reaching its objective of replacing wood-fuel and charcoal:

Fuel	*% growth p.a. (1990-2000)*	*% household using fuel*	*Cost of purchase (US$/kWh)*	*Comparative cost of cooking (US$)-Sept 2002*
LPG	14	4.1	0.022	3.96
Wood-fuel	2.5-3	62.5	0.005	0.18
Charcoal	3-5	30.6	0.014	5.49

The relatively low cost of cooking using wood-fuel has prevented the majority of the poor from switching fuels. Because of price LPG is mainly being used by the medium to high income families.

One other issue that needs to be resolved to expand LPG use is expansion of supply. The TOR was built in 1963 with capacity of 28,000 bpd. Expansion and modernisation work is being carried out in two phases: Phase I – revamping and expansion to process 45,000 bpd and Phase II – installation of secondary conversion plant (RFCC). According to a study by Samsung Revamping Studies and Foster Wheeler (USA) Corporation *w*hen RFCC becomes operational, there will be excess LPG for export as TORs capacity will be increased from 27,713MT to about 166,873MT.

C Lessons learnt and steps being taken

Apart from the relatively high cost that is preventing the poor from benefiting from the program other shortcomings include deficiencies in LPG appliances and accessories, poor handling of appliances, lack of training for personnel and different sets of rules followed by the different manufacturers because there are no National regulations, codes of practice and guidelines for Good Safety Practices in the LPG industry yet.

Recently LPG operations have been monitored by the Energy Commission. In addition to monitoring and enforcing compliance with available regulations, the Commission wishes to ensure Best Operating Procedures (BOPs) and Job Safe Practices (JSPs) in the supply, storage and marketing of LPG.

To ensure safe and sustainable LPG use there are on-going consultations towards the development of a National LPG Code of Practice and Guidelines for Good Safety Practice. The final product is expected to be guidelines not only for safe handling and transportation of LPG cylinders but also of the following: bulk LPG storage facilities at commercial/industrial premises, handling and storage of LPG cylinders and accessories of commercial installations, domestic/commercial/industrial cylinders, LPG retail outlets and filling plants, low pressure regulators and mobile LPG filling plants.

4.2 Improved Stoves And Forest Management – *Asres Wolde Ghiorgis,* Head Of The Ethiopian Rural Energy Development And Promotion Centre (EREDPC), Ministry Of Rural Development

Asres Wolde Ghiorgis shared information on a project to achieve sustainable forest management through the development and wide dissemination of improved wood and charcoal stoves. The wood-fuel stove that has been developed has an efficiency of 19 to 21% compared to less than 10% for traditional stoves. There is, therefore, a 45 to 59% saving on wood-fuel consumption. About 400 000 stoves have been sold to date at prices ranging from US$4.12 to US$5.29 per unit. Sales of the charcoal stove have been higher at 1.5 million units priced at US$3.53 to US$4.12. The charcoal stove uses 25% less fuel than the traditional stove and could be sold at a lower price by encouraging local entrepreneurs to use scrap metal to substitute the imported sheet metal used for cladding.

The Role of Improved Biomass Stoves in Conserving Energy

A Introduction

Despite abundant renewable energy resources the energy sector of Ethiopia is still heavily dependent on biomass (95% of national energy supply). The household sector is the predominant consumer of Gross National Energy Supply. Per capita consumption for 1997, 1998 and 1999 was 263 kgoe, 268 kgoe and 279 kgoe respectively. This indicates that the energy sector of Ethiopia is among the least developed in the world.

The resource is depleting fast as a result of several constraints the most important of which are the use of inefficient three stone open fire devices for cooking and the fast population growth. With fuel-wood requirement per year per head being 560 kg, the rate of deforestation for the country is estimated to be 0.43% per year.

The Government has decided to intervene through demand management strategies that include large-scale dissemination of more efficient fuel wood and charcoal stoves. As a result of the encouraging results obtained it is recommended that the dissemination of the improved stoves be sustained and should be concentrated in rural areas where inefficient cooking practices are employed.

B. Technical and Commercial Aspects of the Improved Stoves

a) Mirt Enclosed Injera Stove

Developed by the EREDPC with financial support from the World Bank, the basic design was adopted from the traditional Ambo & Burayu enclosed injera stoves and optimised to handle different types of biomass fuels. Cement and pumice (volcanic ash) are the main raw materials. Pumice binds well with cement and is a good insulator.

Stove efficiency ranges from 19% to 21% which is significantly better than traditional stove efficiency of about 10.6%. This gives a comparative fuel saving of 45% - 59%. When properly utilized it serves about 8 years.

The whole process of designing and dissemination of the Mirt Stove followed six steps. Large-scale dissemination was supported by media advertisement and cooking demonstrations. Intensive training for the private sector was provided in the process. Since 1995 when dissemination started, over 400, 000 stoves are in use all over the country.

The price in Addis Ababa Whole Sale is US$ 2.94 per unit and the retail price ranges from US$ 4.12 to US$ 5.29 when transport service is provided to customers.

b) Lakech Charcoal Stove

The basic design was adopted from another traditional Bako stove with modifications made by the EREDPC in order to improve the efficiency. The work was also supported financially by the World Bank. The raw materials for the stove are clay, sand, cement and sheet metal for cladding.

Production of the stove requires the skills of a metal artisan and a potter. Tools that are used to produce include tin snips, hammer, anvil (for the cladding), paddle mould, perforated template and puncher. The Lackech stoves use 25% less charcoal than the best traditional charcoal stoves. This means that each stove saves 125 g of charcoal per day per household.

A similar commercialization strategy as for the Mirt stove was adopted. The sales outlets are open markets, shops and supermarkets. By now the total sales of the stove exceed 1.5 million units.

The initial retail price during earlier dissemination was US$ 3.53 and US$ 4.12 for the medium and large sizes respectively. Currently the price has dropped down by US$ 0.88 and US$ 0.65 for the large and medium size stoves respectively. Using old oil cans and scrap metals can reduce the price can to US$ 2.35 and US$ 2.94 for the medium and large stoves respectively.

C Impact of Interventions

The following are the estimated benefits of the improved stoves sold to date:

- About 475.44 Kt of wood has been saved per annum
- 122, 619 ha of forest area has been saved from depletion
- About US$ 47 million has been saved per annum
- Employment opportunities have been created
- Reduction of indoor air pollution, improved health conditions and kitchen hygiene
- Mitigation of greenhouse gas emissions

4.3 Sri Lanka Off-Grid Rural Electrification Project – *Lalith Gunaratne,* Director Of LGA Consultants.

Laith Gunaratne explained how in Sri Lanka the private sector has been involved in a successful partnership with Government for off-grid electrification of rural areas using solar PV and micro-hydro technologies. In a World Bank-GEF funded Energy Services Delivery Project (ESDP) between 1997 and 2002 US$53 million was spent on a private sector, NGO and community driven off-grid electrification program. The program demonstrated successful private/public sector partnership with community owned projects being financed through commercial banks and village level micro-financing institutions. Project approval and subsidies are provided by Government and technical and management support are provided by private consultants. A major constraint is the regulatory framework, which still maintains the legal monopoly of the national utility for grid networks. Therefore the village hydro schemes are, in strict terms, illegal. The sustainability of the projects without subsidies is another major issue of concern. A new US$133 million project, designated Renewable Energy for Rural Economic Development (RERED), was launched in July 2002 to continue the community electrification programs which includes the progressive reduction of subsidies.

Rural Electrification In Sri Lanka

A Background on the country and energy situation

Sri Lanka is a country of 19 million people and 4 million households. The rural/urban mix is 75/25. It has an agro based economy but is moving towards export of labour and manufacturing. The GDP is US $ 1,000 per capita with 20% living below the poverty line. The literacy rate is 95%.

Ceylon Electricity Board is the government owned utility and has a generation capacity of 1,700 MW (60% Hydro). At present the country is experiencing a 10% annual demand growth for electricity. Grid Electricity reaches only 53% of households. Off-Grid Electricity reaches 28,000 households (25,000 Solar PV Systems, 3,000 Micro Hydro). The off-grid systems are private sector and community driven.

The country has 500,000 automotive batteries used for lighting and entertainment (TV/radio). Ninety percent of rural households use biomass for cooking. Off-grid households spend on average over 40% of their income on energy (for kerosene, dry cell batteries, battery charging and some such) as opposed to less than 10% in urban areas.

Health, Education, and other Infrastructure facilities have contributed towards a comparatively high quality of life when considered in relation to the per capita income. The Human Development Index (HDI) for Sri Lanka is substantially above the average HDI value for developing countries. To maintain this trend electricity is considered an important facility.

There is a common notion that electrification brings economic benefits such as productivity growth in Industries, substantial savings in fuel and maintenance costs, and ability to engage in more productive hours.

There are localised benefits to households such as improvement in quality of life with improved access to information and entertainment (TV/Radio), better health from improved indoor air quality, better school performance because children can study longer hours resulting in better performance and better security. These would bring about longer-term benefits to the community leading to future economic growth.

B The country's electrification strategy

Grid and off-grid schemes such as solar PV and micro hydro all play a role in the electrification program in Sri Lanka. The following table gives a summarised assessment of the relative impact of the different programmes based on several criteria that determine the quality of life:

Criteria	*Solar PVHousehold*	*Micro Hydro*	*Grid*
Income	X	XX	XXX
Water			XX
Transport			
Employment	X	X	XX
Energy provision	XX	XX	XX
Education	X	X	X
Food Security		X	XX
Health	XX	XX	XX
Housing			
Crime/ Security/ Peace	X	X	XX
Sanitation			XX
Social Exclusion	X	X	XX

Note: the degree of impact is denoted by the number of "X"s.

The grid extension programme is the responsibility of the national utility, CEB. CEB plans to connect 80% of the households by 2010 through an electrification programme that is based on the following criteria and procedures:

- ?? Identify the electrified and un-electrified villages in rural areas;
- ?? Assess socio-economic situation of the villages,

?? Identify prospective developments of the village,

?? Define the selection criteria (based on a 12% IRR),

?? Identify villages for grid extension based on a feasibility study,

?? Extend power lines to the village

The Solar PV programme is largely private sector driven. It has sold and installed about 28,000 systems to off-grid households using dealers and retail sales centres since 1988. Currently five commercial companies (Shell, Selco, Alpha Thermal, Access, and Energyworks) have 50 sales centres. Sarvodaya SEEDS and one commercial bank (Bank of Ceylon) offers micro financing in partnership with vendors.

There is a new initiative from Uva Provincial Council to subsidize solar PV systems for off-grid homes in the province with Rs. 10,000 (US $ 100). The subsidy is given to the vendor once proof of sale (with the discount) and installation is provided to the provincial government. This partnership is complemented by NGOs providing micro financing.

Micro Hydro (also known as Village Hydro) programme was initiated by ITDG by mobilizing village communities and introducing simple technology. Over 130 such projects exist operated through an Electricity Consumer Society (ECS). These projects are essentially private/public/community partnerships. Each project is owned by the community (ECS), funded by the commercial banks, subsidized by government (provincial council), supported by a private consulting company (technical, business feasibilities and bankable proposals), and approved by district/divisional secretariats (for land use, environmental clearances).

The Government has played a pivotal role in introducing technologies such as solar PV, wind power, biogas and efficient cook stoves. This has enabled private sector and NGOs (with micro financing) to drive the commercial solar PV market in rural areas. Two projects, the Energy Services Delivery Project (ESDP) and the Renewable Energy for Rural Economic Development (RERED) have been the major vehicles for Government support for off-grid programmes. The last 20 Micro Hydro projects were commercially funded through the ESDP.

The ESDP, a five-year US$53 million Sri Lankan government, World Bank and GEF project, has catalysed private public partnerships in rural off-grid and renewable energy developments since 1997. The ESDP provides financing through private banks to companies marketing solar PV systems, developers of off-grid micro hydro systems and grid connected mini hydro. The off-grid projects have a GEF grant of US $ 100 per solar PV system and US $ 400 per kW for micro hydro project.

The ESDP was largely completed in 2002 and a new project, Renewable Energy for Rural Economic Development (RERED), commenced in July 2002.

The RERED project is also a Sri Lankan Government, World Bank and GEF project instituted as a continuation of the ESDP. It will continue to improve quality of life in rural areas by providing electricity access to remote communities through off-grid renewable energy technologies through private sector participation. The target is to provide electricity access to 100,000 households and 1,000 rural small and medium enterprises and public institutions

directly through off-grid solar, community hydro and biomass systems. This 5 year US $ 133 million project commenced in July 2002 as the ESDP ended.

The RERED project will be a real test in the linkage between poverty and rural electrification. This project can be successful only through genuine partnerships between public, private, financing, NGO, donor agency and community based organisations.

D Potential barriers and issues for further development

Ten years of off-grid energy market development has created much awareness of the role of technologies such as solar PV and micro hydro. However there are yet some general barriers at the government level where off-grid energy is not incorporated into mainstream energy policy, which only focuses on large scale generation and grid extension. Politicians tend to offer grid extension for votes.

The Electricity Act allows only the CEB to generate and sell electricity to consumers. As such, the micro hydro projects are strictly not legal. They operate as independent cooperatives and charge a membership fee from consumers. Standards for technical equipment and safety cannot be enforced within the law for these projects.

Funding will be a problem once the World Bank projects end (The ESDP and the new RERED project has technical assistance funds for a project facilitator to assist the community from the start to commissioning). It is accepted that the private sector or communities alone cannot reach the entire market and also have an impact on rural livelihoods. Therefore Public/Private Partnerships are essential.

Micro (village) hydro projects are good examples to work with because they have potential to further develop and improve incomes so that the local areas become independent of the donor aid programmes. Micro Hydro has potential for community based income generation activities such operating a rice mill and battery charging centres.

The Uva Province solar PV project is a good example of private/public/multilateral finance institution partnerships. While solar PV provides for basic lighting and power requirements only, it also provides opportunities for enhancing incomes by extending the hours for a village grocer or a sewing business.

E Concluding Remarks

Energy alone does not contribute to poverty alleviation. The macro economic situation in the country has to be sound. There must be a need and a market for rural produce and services. There must be access (roads, telecommunications). Therefore, energy is only one contributor to enhance rural livelihoods, but it does improve the quality of life.

The Sri Lanka experience shows that there is a new paradigm in energy supply with off-grid technologies where the private sector and NGOs and not government utilities alone are playing a role. There is decentralisation and more end-user participation in the process. The main lesson is that the challenge of improving rural livelihoods requires creative thinking to break old ways of doing things and it is essential to involve all the stakeholders in projects and in making decisions – governments have to play the role of facilitator and promoter to enable this.

4.4 Utility Performance Improvement – *Simbarashe Mangwengwende,* Chief Executive Of The Zimbabwe Electricity Supply Authority

Simbarashe Mangwengwende outlined how a utility performance improvement project in Zimbabwe has improved technical and operational efficiency while at the same time increasing electrification access from 20% in 1992 to over 40% of households in 2002. The project was initiated and managed by local management with little external support. Efficient revenue collection made it possible for the rural electrification and development levies to be available for the intended use. The improvement program also demonstrated the willingness of customers to pay for improved quality of service and this made it possible to introduce an automatic tariff adjustment formula to counter political resistance to tariff increases. Cross subsidies have also played a major role in encouraging those rural and urban households connected to the grid to use electricity for cooking. Further extension of the grid and off-grid services will, however, need changes in the legal, institutional and regulatory framework. Attempts to introduce major private sector investment have so far failed because of the adverse regulatory and macro-economic environment.

Lessons From Zimbabwe's Reforming Power Industry

A Background on the Zimbabwe Power Sector

Most of Zimbabwe's electricity supply is provided by the Zimbabwe Electricity Supply Authority, a vertically integrated monopoly utility created by the Electricity Act of 1985. ZESA is a statutory corporation that reports to the Ministry of Energy and Power Development. With a staff establishment of about 6800 employees the utility serves over 500 000 customers, representing about 40% of the population of 12 million.

There is insignificant private investment in the power sector but strong interconnections to neighbouring utilities in the Southern African Power Pool (SAPP) which provide about 40% of the energy supplied to the grid as indicated in the following table:

Table 1: ZESA - Supply and Demand Statistics

Maximum Demand	*2000 MW*
Energy Sent Out	**GWh**
- Internal gen.	7500 (60%)
- Imports	4800 (40%)
	12300
Energy Sold	**GWh**
- Industry & Commerce	5900 (55%)
- Mining and Agric.	2700 (25%)
- Domestic	2100 (20%)
	10700

Internal generation is from five power stations with a total installed capacity of 1961 MW. Apart from one 666MW hydro-electric plant the rest of the generating units are coal-fired. Due to old age of some of the coal-fired units and on-going refurbishment and upgrade projects the availability of the generating plant is about 65 to 75%. This is the reason for the significantly high import dependence.

Other operational performance indicators are summarised in Table 2 below. System losses have historically been kept within a 10 to 12% range. Due to an acceleration of the rural electrification programme, introducing long feeders to supply remote areas, the technical losses have risen to almost 15%.

In order to accelerate the rate of connection of new customers the processing of applications and implementation of service cable and meter connections was reduced to about one month for customers in areas with reticulation.

Table 2: ZESA – Operating Performance Indicators

Performance Indicator	*1999*	*2000*	*2001*
Total System Losses (% sent out) (target 10-12%)	12.8	13.3	14.6
Generation Plant Availability (%) (Target 90%)	65.8	72.5	75
Days for new connections (target 30 - 45 days)	35	23	32
Electrification Level (%) (target 100% in 2040)	39	40	42

Increasing the connection rate and reducing the revenue collection cycle helped to improve revenue collection as is reflected in the number of debtors' days in Table 3 below. The profit and liquidity performance is not as impressive on account of the high import dependence, which adversely affects the financial performance of ZESA whenever there is devaluation of the local currency. The power imports and major operational requirements are paid for in US$ or other hard currencies.

Table 3: ZESA – Financial Performance Indicators

Financial Indicator	*2001*	*2000*	*1999*
Revenue (US$ million)	510.0 (255.0)	432.7	253.3
Net Profit (US$ million)	89.4 (44.7)	65.2	(44.1)
Ave. Price (USc/kWh)	4.90 (2.45)	3.85	2.26
Current Ratio	0.72	0.62	0.58
Debtors (days)	28	33	32

B Brief outline of power sector reform initiatives since independence

When Zimbabwe attained independence in 1980, it inherited a power sector with six utilities: four municipal electricity departments for the four largest cities, a parastatal for the smaller towns and rural areas and a generation and transmission parastatal jointly owned by the Governments of Zimbabwe and Zambia. ZESA is a result of the amalgamation in of the six pre-independence utilities.

The Electricity Act of 1985 facilitated the amalgamation exercise which was completed in 1987. Amalgamation was designed to streamline electricity sector administration and to achieve efficiency and growth through economies of scale. Unfortunately the exercise was conducted in a manner that resulted in a major brain drain of managerial and skilled staff leading to operational inefficiencies, financial losses, slow growth and abandoned rural electrification.

By the beginning of the 1990's ZESA could not even meet electricity demand by the existing customers. Pressure to take action was brought to bear on the Government by the public and by financing agencies. A two-pronged strategy was adopted – a Performance Improvement Programme (PIP) for the utility and a review and reform of the legal and regulatory framework. The PIP was designed to restore ZESA's operational and financial performance while the legal and regulatory reforms were designed to facilitate the unbundling and privatisation of the electricity supply industry.

The PIP was so successful that it allowed the Government to slow down on the pace of the legislative reform programme. A revised Electricity Act and Rural Electrification Fund Act were only passed in January 2002. The new laws will create an independent Regulatory Commission, a Rural Electrification Agency, and the power generation, transmission and distribution businesses will be unbundled. The Electricity Act of 1985 is to be repealed once the new institutions have all been established and the role of ZESA has been taken over by successor companies to be formed when it is unbundled.

C Performance Improvement Programme

The PIP was launched in 1993 and consisted of a series of time-bound action plans outlined in a directive from Government. The initial action plans were for a two year period to 1995 and were developed by ZESA management with assistance from Electricite de France, the French national utility. Subsequently a five year business plan was produced for the period 1995 to 2000.

The implementation of the PIP was driven by a local management team appointed on the basis of performance contracts linked to PIP and business plan targets. Performance measurement at both corporate and individual level was based on the following strategic objectives:

- **Customer satisfaction:** providing customer driven product and service quality;
- **Liquidity and profitability:** generating sufficient cash and profit to cover all financial obligations without Government support;
- **Growth:** expanding electrification access;
- **Employee satisfaction:** attraction and retention of management and technical skills;
- **Corporate image:** responsible corporate citizenship;
- **Innovation:** continuous improvement to achieve better, faster and cheaper products and services.

The PIP managed to achieve reasonable technical performance improvements and growth as well as a strong focus on remote and low income group electrification. However financial performance remained relatively weak as reflected in chronic cash-flow problems and inconsistent profit performance. The following table summarises the major results of the PIP:

Table 4: Summary of PIP performance results

Strategic Objective	*Performance Summary*
Customer satisfaction	Electricity rationing and load shedding eliminated by enhancing supply capacity through refurbishment and upgrading of the generation, transmission and distribution plant and implementing new interconnection projects to South Africa and Mozambique. Customer charter developed to make product and service standards explicit to customers and front-line staff.
Liquidity and profitability	Cash collection improved by reducing accounts receivable from 99 days in 1993 to about 30 days at present. Profitability enhanced through tariff adjustments and cost minimising programmes such as staff reductions and operational efficiency gains. However regulatory constraints restricted the level of cash generation and profitability to current system requirements, hence major system development programmes such as the construction of new power stations could not be implemented.
Growth	The rate of urban electrification accelerated from an average of 6000 new connections a year in 1993 to over 25000 per year by late 1990's. Rural electrification launched based on a 1% levy and Masterplan. Between 1997 and mid 2001 over 400 rural service centres had been electrified. The Electrification level increased from 20% in 1992 to over 40% at present.
Employee satisfaction	Performance related and market-based remuneration helped to attract and retain skilled managers and technical staff. Only natural wastage was used to reduce the staff establishment from 10 500 to just under 7000 by December 2001.
Corporate Image	Positive visibility for the organisation was achieved through an open door media policy. By keeping the public informed on problems and performance improvement initiatives ZESA was able to obtain Government and customer support for the steep price increases that had to be implemented.
Innovation	Tools used to achieve better, faster and cheaper products and services were IT, R&D and business process re-engineering. Most key ZESA operations have obtained ISO certification.

D Management of constraints to financial performance

The inconsistent profit performance of ZESA is highlighted in Table 5 which provides the net surplus figures from 1990 to 2001.

Table 5: Profitability of ZESA from 1990 to 2001

Year	*Net Surplus (US$mil)*	*Exchange Rate Zim$:US$*	*Year*	*Net Surplus (US$mil)*	*Exchange Rate Zim$:US$*
1990	(0.8)	2.268	1996	10.0	9.400
1991	(24.1)	2.639	1997	9.6	10.963
1992	(14.5)	5.051	1998	(174.1)	37.851
1993	6.7	5.482	1999	(44.1)	38.519
1994	9.9	8.540	2000	65.2	47.230
1995	10.0	8.380	2001	89.4	55.000

There are two periods where ZESA recorded net losses – 1990 to 1992 and 1998 to 1999. In the earlier period the losses were due to the problems emanating from the amalgamation exercise. The brain drain was a consequence of political interference in the filling of the senior posts in the new organisation. The interference extended to refusal by the incumbent Minister to approve any tariff adjustment in line with increases in operating costs.

The losses in the latter period were a result of the slow response of electricity prices following massive devaluation of the Zimbabwe dollar in November 1997. The average exchange rate of the Zimbabwe dollar to the US dollar in 1998 was 37.851 compared to 10.963 a year earlier. Food riots as a result of steep price increases induced by the devaluation led to reluctance by Government to revise electricity prices until late in 1998 when a small 20% adjustment was allowed.

There are also two distinct periods where ZESA operated at a positive net surplus – 1993 to 1997 and since 2000. During the first period the level of profit was barely above breakeven point. This was despite the official tariff policy of using long run marginal costs (LRMC) as the basis. Based on the approved system development programme the LRMC was estimated at US$0.06. The tariff level to cover current operating costs was around half of the LRMC. Despite explanations by ZESA of the link between the LRMC and the proposed power system expansion projects the Ministers responsible for energy had difficulty appreciating the necessity of raising the tariff levels above breakeven levels.

The major casualty of the failure to raise tariffs to LRMC levels was therefore the proposed projects to build new power stations to meet growing demand. In 1996 Government signed an agreement with a private sector company for the privatisation and expansion of the largest power station in the country, the 920MW Hwange Power Station. The required long run marginal cost based tariff of US$0.05 to 0.06 was much higher than the US$ 0.03 prevailing during the negotiation period. The project had to be abandoned in 2000 when it became clear that the Government was reluctant to commit to the necessary tariff increases. The same fate fell on the proposed Gokwe North Power Station, which had been initiated by another private sector consortium in 1997.

The financial losses experienced by ZESA in 1998 and 1999 during the period of negotiations for the proposed power station projects demonstrated to the private sector investors the fact that the country's centrally controlled economy could not sustain a market based power sector reform. The need for a regulatory body and a tariff setting process independent of political control became evident to all stakeholders. The abandoned legal reform process was resumed leading to the drafting of the new Electricity Act of 2002.

The short-term financial recovery of ZESA was achieved by implementing an automatic tariff adjustment formula that was developed by ZESA management in direct consultation with customer representatives. An analysis of the customer base had shown that the non-domestic customers accounted for 12% of the customer population, 80% of the energy sold and 85% of the revenue (as shown in Table 6 below).

Table 6: Revenue and consumption by customer category

Category	*Consumption (% of total)*	*Revenue (% of total)*	*Numbers (% of total)*
Agriculture	10	15	2.3
Mining	15	15	0.2
Domestic	20	15	88.0
Industry	40	35	0.5
Commerce	15	20	9.0
TOTAL	100	100	100.0

Advantage was taken of a provision in the Electricity Act that empowered ZESA to negotiate special tariff agreements directly with customers without seeking prior approval from the Minister. All non domestic customers were classified special and, through their representative bodies, agreement was reached to charge tariffs on the basis of the formula from August 1999. The formula automatically adjusted for changes in exchange rate, inflation rate and fuel costs. To make it acceptable to customers the tariff implementation was implemented in quarterly adjustments and linked to service quality improvements.

Because of its success with the non-domestic customers, early in 2000 the Minister agreed to extend the tariff formula concept to domestic customers. The domestic formula was a simplified one linked to consumer price index and with an inverted block tariff to allow for lifeline tariff rates for the poor.

It is this tariff adjustment approach that accounts for the dramatic financial recovery from a record loss of US$174 million in 1998 to a reduced loss of US$44 million in 1999 and record profits since then.

E. Lessons learnt and impact on the poor

The major lesson learnt was that it was possible to implement very significant performance improvement in ZESA using local management motivated by the increased autonomy of performance-based contracts. Better use of local management resources can achieve efficiency gains at least-cost.

One of the areas of performance improvement with a direct impact on the poor was the growth and expansion of the grid to the un-electrified urban customers and to the rural population.

The failed privatisation attempts demonstrated the need to have customer-focused tariff and regulatory reform precede privatisation. Power sector reform must also be compatible with macro-economic reform.

Customer-focused tariff reform also improves modern energy service delivery to the poor. Correct subsidy policy benefits both the subsidized and subsidizing group. The basic lifeline tariff for the first 50 kWh allows the poor to have affordable lighting and small power applications such as radios. The intermediate lifeline tariff for the next 250 kWh (to 300kWh) provides for lighting, small power and basic heating needs such as hot plate stoves and

ironing. Special agricultural tariff with a cap on unit charges helps farmers to afford irrigation.

While the bulk of the subsidy is carried by low capacity industrial, mining and commercial customers, these in turn are the direct beneficiaries of the large market for electrical products and services by the subsidized groups. The utility benefits from a correctly structured tariff, clearly communicated and negotiated with customers. There are reduced non-technical losses and improved cash collection.

4.5 MULTIFUNCTIONAL PLATFORMS – *Abeeku Brew-Hammond,* Director, Kumasi Institute Of Technology (KITE).

Abeku Brew-Hammond presented a summary of a UNDP/UNIDO project in Mali which has had a successful pilot programme of developing multi-functional platforms. A multi-functional platform is a simple diesel engine which drives several end-use devices such as cereal grinding mill, de-husker, oil press, carpentry and joinery tools, water pumping and mini-grid electricity. The engine can be driven by diesel or bio-fuels produced from plants such as the Jatropha Curcas plant. In this project the platforms target the mechanisation of women and girl-specific tasks thereby empowering women and increasing school attendance for girls. Improved household incomes and better access to social services by women has a direct and positive impact on poverty reduction.

Multi-Functional Platforms & Jatropha Oil As A Biofuel – Case Studies From Mali And Ghana

A Introduction to multi-functional platforms

Multi-functional platforms (MFPs) have proved very popular because of their diverse applications which target the work traditionally done by women such as grain harvesting and processing and household chores involving fetching of wood-fuel and water. The MFPs therefore have a direct contribution to the fulfilment of several of the Millennium Development Goals:

Table 1: Multi-functional Platforms and Millennium Development Goals

MDG	*MFP Contribution*
Goal #1 Eradicate extreme poverty and hunger	Increased and diversified income for women through greater productivity in agro processing. MFP energy services leave more time and energy for women to engage in income generation activities.
Goal #2 Achieve universal primary education	Increased school attendance through MFP energy services substituting child labour and increasing incomes to cover school costs.
Goal #3 Promote gender equality and empower women	Positive impact on girl schooling by reducing girl-specific tasks, which are targeted by MFP energy services.
Goal #7 Ensure environmental sustainability	Provision of clean water and the use of bio-fuels have positive impact on the environment.

MFPs can be driven by bio-fuels derived from the Jatropha Curcas plant. The plant's seeds can produce oil which can be used as fuel for an MFP engine and the engine can then be used as an oil press to provide more fuel to run the MFP. The oil can also be used for soap production. The seed sediment is a good fertilizer. The mechanical energy of the platform provides power for milling and peeling while the electrical energy can provide electricity for battery charging.

A typical platform would require an investment of US$15000 that can be financed through a combination of a $12600 five-year loan and US$ 2400 equity. By the second year the platform can generate a net profit of US$ 2150 and by the fifth year the profit level would be as high as US$13000. MFPs are therefore economically and commercially viable as well as socially acceptable.

B UNDP/UNIDO multi-functional platforms projects in Mali

The UNDP and UNIDO have been facilitating the installation of multifunctional platforms in Mali since 1999 as a programme for the empowerment of women. The request must come from a women's association. When the programme started in 1999 requests that were received were just under 100 and 50 MFP installations were made. By mid 2001, when the use and effectiveness of the MFPs became more appreciated, requests received had grown to 450 and installations to 150.

Impacts of the UNDP multi-functional platform approach can be summarised as follows:

- Income generation for men and women,
- Empowerment of women,
- Increasing school attendance and educational performance of girls,
- Access to electricity,
- Access to potable water,
- Opening up opportunities for environmental sustainability through use of bio-fuels like the Jatropha fuel.

C Jatropha and MFP Activities in Ghana

In Ghana the MFP activities have been centred in research activities at the Institute of Technology (KITE) and at the National University of Science and Technology (KNUST) in Kumasi. The following is a summary of some of the activities in the current research programme:

- Rural Enterprise/Diesel-substitution Project development (KITE/KNUST).
- Experimental analysis of Jatropha Bio-fuel properties and Performance in diesel engines (KNUST Final Year Students' Project).
- Comparative Analysis of MFPs using Petroleum, Diesel and Jatropha oil (KNUST postgraduate students).
- Bio-diesel Production Project Development (Anuanom Industrial Projects Limited).

Other related research activities focused on rural development and empowerment of women include renewable energy development and applications (solar PV, solar water heating, solar crop drying, wind power, micro hydro), charcoal substitution, energy efficiency and productive uses of bio-fuels.

These research activities also contribute to entrepreneurship development and investment facilitation. The diversified energy services create opportunities for decentralised delivery to rural clients by entrepreneurs. Government can help to link up energy services entrepreneurs and rural clients and to provide an enabling environment where financial institutions can provide finance and other enterprise development services to entrepreneurs.

4.6 Session Discussions

General interest issues on the case studies that were raised during discussions were as follows:

- Observations were made that the use of Jatropha Oil for fuel production might not be viable as a standalone venture. It was pointed out that there were no firm figures on the economic merits of using Jatropha oil as fuel in place of diesel. For commercial viability Jatropha oil fuel has to be part of a multiple product project such as the MFP.
- It was noted that while the efficient wood-fuel and charcoal stoves developed by the Ethiopian Government were mainly targeted at rural areas they could have an enhanced environmental benefit if equally focused on the urban poor. Innovation tends to be more readily adaptable in urban than in rural areas. To facilitate further dissemination the private sector is now being encouraged to market the stoves while the Government provides quality control services.
- The dual 50 kWh and 300 kWh lifeline tariff approach in Zimbabwe generated interest in view of the negative experience in Ghana with the single 50 kWh lifeline tariff level. Most of the targeted customers use less than 50 kWh but do not benefit as they live in multiple family compounds where the electricity bills exceed 50 kWh. The second lifeline level of up to 300 kWh would assist in such cases.
- In Zimbabwe, losses in power supply had been mostly technical. The focus on efficient revenue collection reduced those non-technical losses usually associated with meter reading and billing errors, unbilled energy and illegal consumption. There was also merit in adopting a managed load reduction program where the utility is supply-constrained. This would save costs, for example of power imports, and provide the breathing space needed to develop new supply sources.
- With respect to the off-grid rural electrification programme in Sri Lanka concerns were raised regarding the sustainability of the programme without subsidies and without emphasising productive activities since the Government had targeted more on quality of life issues such as indoor air quality, education and entertainment. However experience so far had shown that there was a 95% repayment rate for loans borrowed from microfinance institutions to finance the household off-grid installations. This demonstrated ability and willingness to pay when customers perceive that they are getting a quality product and service. The subsidies were also correctly targeted by creating a partnership between the bank and the vendor, with the latter taking the risk

for the end user. To ensure that the end user pays the vendor would have to pass on the subsidy received for the off-grid schemes to the end-user.

?? LPG was not always mentioned in country presentations. LPG may not be the cheapest option in financial terms, but may be the best option when health and time savings are considered.

5

Integrating Energy Into Poverty Reduction Strategy Papers – A Sectoral Approach

This chapter presents the results of discussions in sectoral workgroups that were set up to define the key energy interventions required to achieve priority objectives in the health, education, agriculture, water and small, medium and micro enterprise sectors based on targets specified in Poverty Reduction Strategy Papers. Other background material for the workgroup discussions were the plenary presentations, World bank/ESMAP publications and the special issue of the Energy Policy Journal on energy services for the poor.

Centred on sector specialists in each workgroup, debates focused on three questions:

- What are the sectoral priorities for reducing poverty?
- How can energy services assist in the realisation of sectoral priorities and targets?
- Based on the above, what are the key energy interventions that should be given priority?

5.1 Health Sector

The approach used by the group was to assess country level priorities in the Health sector, drawing on PRSPs, identifying the MDGs with direct relevance to the Health Sector and then linking the appropriate energy interventions to health sector priorities.

The key MDGs and relevant targets for the Health sector are:

- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Reduce people without access to clean, safe drinking water
- Increase benefits of new technologies, particularly information, communications, technologies and education

The following table links the MDGs and the Health Sector priorities:

MDGs/Targets	*Health Sector Priorities*
Reduce Child Mortality and Improve Maternal Health	- Improve life expectancy - Reduce maternal mortality rate - Improve health service delivery, including staff retention, motivation and training; lab services - Reduce fertility rates - Reduce waste and environmental pollution - Reduce stunted growth - Reduce indoor air pollution - Improve nutrition
Combat HIV/AIDS, malaria, and other diseases	- Increase immunization coverage - Reduce HIV/AIDS and other communicable diseases
Reduce people without sustainable access to safe drinking water	- Increase access to clean water and rehabilitate and protect water points
Increase benefits of new technologies, particularly for information, communications, telecom and education	- Increase access to ICT and communication networks for health data and information

Energy Interventions

The Health Sector needs the full range of services provided by modern energy services such as lighting, heating, cooling and shaft power. Therefore all energy technology options are relevant: renewable energy, energy efficiency, grid extension, diesel, kerosene, LPG, modern biomass, municipal solid waste, batteries, hybrids and inter-fuel substitution.

The main specific energy technology applications in the Health Sector are:

?? Incubation facilities for infants

?? Cold chain for vaccine refrigeration

?? Blood bank refrigeration

?? Lighting in health facilities and staff quarters

?? Laboratory and diagnostic equipment

?? Water heating and pumping

?? Sterilization

?? Computers, radios and other communications

Identification of the specific interventions required for each health priority is dependent on location and the overlap with priorities in other sectors. For example water sector priorities

directly contribute to health in providing clean drinking water and irrigation facilities for improving food production and nutrition.

5.2 Education Sector

The workgroup benefited from presentations by the education sector specialists from Uganda and Ghana that provided a background to their country PRSP priorities in education which can be summarised as follows:

- **Access:** ensuring universal primary education is the priority, complimented by increasing the transition from primary to secondary or vocational school as well as general literacy levels;
- **Quality:** ensuring high standards and relevance of educational programmes;
- **Equity:** gender balance and geographic equity.

Energy Interventions

The following table summarises the energy interventions required to facilitate achievement of access, quality and equity objectives:

Sector priority	*Energy Intervention*
Universal access to primary education	?? Improved modern energy services could tackle the low level of enrolment for girls by reducing household chores such as collecting firewood; ?? Modern energy could reduce the ill-effects of inefficient biomass energy use on the health of children; ?? Energy for productive uses in schools could reduce the cost of education and therefore increase enrolment
Improving the quality of education	?? Modern energy could allow for improvement of facilities in schools which could lead to retention of teachers, e.g. internet access could facilitate distance learning for teachers; ?? Provision of improved energy services in remote areas could reduce the number of teachers in deprived areas due to lack of modern energy (electricity); ?? Improved energy services to schools is important for powering equipment that can improve the quality of education, e.g. provision of LPG could enable schools to undertake laboratory experiments.
Improving equity in education	?? Reducing domestic chores for the girl child by providing improved energy services could increase the enrolment of girls in school

The group's focus on energy intervention for primary education was based on the observation that in most countries secondary schools and other higher institutions of learning had already taken the initiative to provide modern energy services. In Uganda this involved parents/teacher associations and missionaries sometimes backed by financing from village banks.

The following are the recommended specific energy interventions to be given priority:

- ?? Provision of lighting services to ensure extended hours for teachers and students; Energy enhances efficiency of schools through double shift system especially in urban and peri-urban areas;
- ?? Provide alternative energy sources at household level (such as improved stoves), to free children from domestic chores to attend school;
- ?? Where there is no grid, PV systems could be provided, and integrated with ICT;
- ?? Integrate project packages that include, for example, water pumping, grinding, ICT, lighting, heating, etc
- ?? Wherever possible, for new grid extension, use optical fibre cable to reduce costs involved in providing separate infrastructure for communication;
- ?? Link school enrolment to production of food in schools, which could be enhanced by providing energy for irrigation;
- ?? Need to interact with other sectors (water, health, agriculture) in preparation of energy programs for education, to ensure inter-linkages between sectors and minimize overlaps;
- ?? Undertake energy needs assessments for education to get a better understanding of where interventions are needed and to be able to prioritize them. Energy needs assessments for the education sector could also be useful in the following ways: achieving better use of fixed assets such as use of classrooms in the evenings for other activities, teacher training and extra classes for students, quasi replacement of text books by internet.

Other cross cutting issues and challenges identified by the workgroup include the need to facilitate opportunities for energy services entrepreneurs to serve the education sector, the need for capacity building on energy technologies required by education sector planners, the absence of accurate and timely information on existing opportunities and competing demand for finance between the requirements for the basic education infrastructure and the supporting energy services infrastructure.

5.3 Agriculture And Water

Because of the many overlapping needs of the agriculture and water sectors the workgroup discussions on these two sectors were combined. The background presentations for the agricultural sector were provided by sector specialists from Ghana and Zambia while sector specialists from Tanzania and Uganda provided the background presentations for the water sector discussions. These presentations were complimented by additional priorities from the other countries.

PRSP Priorities and Energy Interventions - Agriculture

The poverty reduction actions identified in the PRSPs can be grouped as follows:

?? **Productivity, Technology Development & Dissemination**: the objective is to increase yield per unit (using improved seed, fertilizer, etc.), agricultural mechanisation and quality standards

?? **Irrigation**: this is a means to increase yield per acre, mitigate drought, increase cropping periods, establish sustainable markets, crop diversification for food security and nutrition.

?? **Agro-processing and marketing (Agri-business):** encompassing all activities with value addition, quality control and improvement, preservation and storage

?? **Institutional, legal & regulatory framework** (relating to land reforms): for improved sector management and regulation

?? **Finance**

?? **Cross cutting issues**: agriculture through better nutrition contributes to the achievement of sectoral priorities in education and health; agriculture though agro forestry also contributes to MDGs in environmental safety and gender equity; agriculture through biomass is a major source of energy,

?? **Infrastructure**

The agricultural sector has almost no limit regarding the energy sources that can be used - fossil fuels, hydro, wind, solar PV, solar Thermal, biogas (in kilns), geothermal. To facilitate the priority energy interventions needed there is need for fiscal and financial incentives (smart subsidies, reduction or waiver of taxes on components, credit), transparent regulation, facilities for promotion and information dissemination and incentives for local production of inputs. It is also important to bear in mind the need for transparency in resource allocation for equity and allocative efficiency.

PRSP Priorities and Energy interventions – Water

The poverty reduction actions identified in the PRSPs can be grouped as follows:

?? **Increasing access to safe and clean water & sanitation (affordability issues):** involves all water cycle management activities such as production, treatment, conveyance, distribution, conservation & development and quality monitoring;

?? **Financing water supply & sanitation**

?? **Institutional, legal & regulatory framework (governance issues):** improved regulation and facilitating public/private partnerships, and clarification of the relative roles of role of central and local government.

?? **Cross cutting issues:** water sector issues have overlapping objectives with issues of gender equity, agro-forestry and watershed management; water through hydro power is also a major source of energy

?? **Productive uses:** besides clean water provision water is an essential element in several productive ventures such as fish farming, transportation, livestock production, energy.

The water sector can benefit from various energy sources such as solar, wind, fossil fuels and hydro. As for the agricultural sector, the priority interventions required relate mainly to the financing and regulatory issues needed to attract investment into the sector.

5.4 Small And Micro-Enterprise Sector

The Workgroup noted that the small, micro, medium enterprises and informal (SMEs) sector is an important area for poverty reduction as it is the major off-farm employer of the poor in rural areas as well as in peri-urban zones. Not only does the sector provide enterprise creation opportunities for the rural and urban poor, it is also one of the few sectors that are growing rapidly in Africa.

Typical SME activities include a wide range of businesses involved in agro-processing, the service sector and manufacturing.

As a general consideration for the energy interventions required to support SME priorities, account should be taken of key cultural and gender issues because of the target groups who are largely traditional rural and peri-urban communities. The priority energy Interventions for the SME sector can be summarised as follows:

- ?? Because current energy policies target large enterprises, there is need for specific energy policies that are supportive of (and involve) SMEs.
- ?? The bulk of energy subsidies are captured by large formal sector enterprises. There is therefore a need for smarter energy subsidies that support SMEs through the provision of micro credit finance services, training and capacity building and adaptive R&D that promotes energy technologies appropriate for SMEs
- ?? Preference should be given to energy interventions that involved SMEs associations and related small/micro finance institutions.
- ?? In addition to promoting improved electricity services for SMEs, attention should be given to other forms of energy e.g. bio energy, solar, wind, animate power and fossil fuels.
- ?? Promotion of the involvement of SMEs in energy service provision is another way of economically empowering the sector. Appropriate opportunities include the production, distribution, and maintenance of energy devices and appliances such as improved stoves, solar dryers, solar water pasteurizers, solar water heaters, wind-pumps, hydro rams and solar water heaters.
- ?? Support appropriate institutions that facilitate quality assurance, training and capacity building aimed at SMEs involved in the energy sector.

5.5 Session Discussions

The session on sectoral workgroup was one of the important highlights of the Workshop. At the end of the discussions almost all energy specialists admitted the need to go back home to review their energy master-plans and on-going projects in order to determine their relevance to the social and economic sectors for which they are intended. The sector specialists, for their part, realised the need to explicitly provide for energy services in planning sector priorities.

The next generation of PRSPs should therefore have quantifiable energy interventions required to achieve specific sectoral priority targets.

The following are some of the important observations and clarifications made during discussion:

- The existence of overlapping and cross cutting issues between the sectors confirmed the need for multi-sector coordination during the planning and project implementation phases of poverty reduction programmes. The appropriate energy interventions could only be quantified based on location. For example standalone PV installations may be appropriate if the main use is for enhancing quality of life while grid extension may be the choice if major productive uses are anticipated in the short term.
- In the face of scarce resources Governments are often forced to postpone necessary energy interventions. For example when a village needs a school the priority is to provide for the bricks and mortar infrastructure immediately and to postpone energy infrastructure until all villages have access to a school within a reasonable distance.
- Governance issues for the agriculture and water sectors are important since there is a tendency for politicians to abuse financial resources, inputs and projects intended for the poor. Subsidies intended for the poor end up being enjoyed by the well off. This is the reason why one-off capital subsidies may be better targeted than recurring subsidies for consumption.
- Clean drinking water was also used to wash cars, for construction and similar non-drinking uses. This would not be of great concern if there was 100% access by the population to clean drinking water. Before this is achieved it would be important to separate drinking water and water for the other uses that need not have water of such high quality.
- The SME sector provides opportunities not only for poverty reduction but for poverty elimination. Many SMEs have potential to grow into large enterprises and energy interventions must be made with provision for expansion to avoid stifling growth. SMEs also provide a social safety net if integrated as part of economic and energy reform initiatives. For example many SMEs are successors to unbundled utilities.
- While they are in the formative and growth stages SMEs can be sustained through linkages with anchor industries that source input products and services. The anchor industries can be deliberately located away from large cities in order to bring the benefits of SME developments to remote rural areas.
- Energy efficiency is an important intervention for all sectors as a cost control measure.
- The following tables capture the qualitative linkages between the energy interventions and sectoral priorities as measured by the key performance indicators in the PRSPs. Some of these linkages had not been explicitly highlighted in the workgroup reports but were established and clarified during the discussion session.

Table 1: Health Sector

Sectoral Priority	*Key Performance Indicator (from PRSPs)*	*Appropriate Energy Intervention*
Child and maternal health	Reduction of child and maternal mortality rates; reduced fertility rates; immunisation coverage	Lighting for care and delivery rooms; incubation facilities for infants; vaccine and blood bank refrigeration; heat for sterilisation
HIV/AIDS, malaria, and other diseases	Increased life expectancy; reduced infection rates	Lighting and power for lab/diagnostic equipment; power for information and communication technologies
Expanded and equitable health service delivery	Geographical coverage; range of services; staff development and retention; budgetary allocation	Modern household energy for staff quarters; power for ICT
Quality of life	Access to clean drinking water; reduced indoor air pollution; improved nutrition	Water heating; water pumping and purification; irrigation for improved food production; reduced and/or sustainable biomass use;

Table 2: Education Sector

Sectoral Priority	*Key Performance Indicator (from PRSPs)*	*Appropriate Energy Intervention*
Universal access to primary education	Date for achieving 100% access; reduced school drop out rates; Increased adult literacy levels	Lighting for extended study hours and improved classroom usage; reduced household energy chores for children to improve attendance; improved agricultural productivity for improved nutrition and school attendance;
Quality of education	Staff development and retention; improved teacher/ pupil ratios; school leaver employability	Modern household energy for staff quarters; Lighting and power for scientific and technical training; power for information and communication technologies
Gender Equity	Proportion of girls at all education levels	Reduced household energy chores generally done by the girl child; improved school sanitation facilities to reduce girl drop out rates

Table 3 Agriculture and Water Sector

Sectoral Priority	*Key Performance Indicator (from PRSPs)*	*Appropriate Energy Intervention*
Improved agricultural productivity	Improved yields, quality and income; Area under irrigation; food security in drought periods; budgetary allocation	Power for irrigation; lighting, heating, cooling and power for agro-processing; power for ICT for training, and marketing information;
Improved access to clean Water and Sanitation	% population with access; budgetary allocation	Power for water pumping and purification processes;
Legal, institutional and regulatory reform	Access to financing; private/public partnerships; targeted subsidies	Complementary or combined energy and water utility services

Table 4 Small, Medium and Micro Enterprises (SME) Sector

Sectoral Priority	*Key Performance Indicator (from PRSPs)*	*Appropriate Energy Intervention*
Legal, institutional and regulatory reform	Focus of energy policy on both large and small enterprises; number of SMEs in social and energy sectors with poverty reduction benefits; subsidies captured by SMEs	Financial and market support for investments by local energy entrepreneurs; decentralised energy services
Technology	Maximisation of local material and know-how	Lighting, heating, cooling and Power for SME business operations; power for ICT to enhance training and capacity building, market knowledge and access;
Financing	Access to financing; private/public partnerships; targeted subsidies	Power for ICT applications to facilitate business planning,

6

Designing Appropriate Response Initiatives – Frameworks For Country Action Plans

Based on country delegations, workgroups were formed to prepare frameworks for country action plans specifying an energy delivery programme for poverty reduction. To facilitate implementation the action plan needed to include the following:

- ?? An explanation of the selected actions and their prioritisation,
- ?? A strategy defining the necessary sector reforms, financing modalities, technical choices and measures to facilitate the implementation of the priority actions within the PRSP,
- ?? An outline of tools required to monitor and evaluate objectives and measure the impact of the plan on poverty reduction,
- ?? An indication of the support expected from the World Bank and other donors in the short term (six months) and long term (more than one or more years).

The workgroup discussions were centred on the following three questions:

- ?? Are there sectoral approaches, among those discussed in the sectoral workgroups, relevant to your country? If so why, and under which schedule could they be adopted?
- ?? To this end, what objectives and targets can be set and what are the appropriate monitoring indicators?
- ?? How can the country team coordinate to ensure follow-up of those objectives after this workshop?

Due to the limited time (about three and half hours) available for the workgroups it was not possible for the groups to provide action plans in accordance with the above outline. What the groups managed to produce were frameworks to enable the country teams to coordinate and follow up after the workshop to produce more detailed action programmes.

The plans also tend to be similar due to the fact that the workgroups had similar participants from the same ministries, social and economic sectors. Further the prior work done in the sectoral workgroups had provided a similar framework for defining energy interventions to support objectives in the various sectors.

The differences in the plans relate more to the detail that each country team could provide based on the number and expertise of the delegates in attendance.

6.1 Ethiopia

The country's priority is to increase the area under irrigation because Ethiopia is drought-prone. Accordingly it has an ambitious Water Sector Development Programme (WSDP) which has the objective of expanding the area under irrigation to make a significant impact on food security. The program comprises hydropower development, water resources management, drinking water and sanitation and institutional and capacity building. It also incorporates complimentary agro-processing activities such as grinding, drying, storage and transportation. The most immediate need is a budget for a six-month detailed assessment of a pilot energy project for powering small-scale irrigation and potable water schemes.

A Key Priorities

The Government of Ethiopia's priority areas of focus for poverty reduction are in the Agriculture and Water sectors. Success in these areas will improve health and incomes and this should consequently benefit the education and small, medium and micro enterprise sectors.

The country has developed a Water Sector Development Programme (WSDP) which covers the period 2002 to 2016 and whose components are:

- ?? Irrigation (small, medium and large schemes)
- ?? Drinking Water Supply & Sanitation (urban & rural)
- ?? Hydropower Development (small, medium & large schemes)
- ?? Water Resources Management
- ?? Institutions and Capacity Building.

The irrigation programme is the most important in order to ensure food security in a country that often experiences severe droughts. At present 197250 hectares (ha) are under irrigation, shared equally between small scale and medium to large scale farmers. Under the WSDP it is planned to increase the area under irrigation to 471862 ha. While this is a still a small area compared to the total irrigation potential of 3.7 million ha this should still making a significant impact in reducing food poverty.

The main elements of the country action plan identified by the workgroup are the development and implementation of irrigation and potable water schemes and the promotion of the agro processing industry.

B Irrigation & Provision of Potable Water

At this stage the country needs to carry out detailed assessments of technology options and establish pilot schemes for irrigation and potable water schemes.

Some of the technology options for raising water include wind, PV, diesel, grid electricity, animate power, multi-purpose micro hydro installations for electricity generation and

pumping water for irrigation and potable water purposes. Options for water purification include sand filters, solar pasteurizers, UV light and aeration.

In the short term a budget of US$540 000 would provide for a detailed assessment of six potential sites suitable for pilot schemes. The lead institutions for this exercise would be the Regional Agriculture, Water and Energy Bureaux

And the Ethiopian Rural Energy Development and Promotion Centre (EREDPC).

C Agro processing

The main activities that need to be promoted are:

- ?? Grinding grain using machines driven by diesel, electricity, hydro-mechanical and wind energy;
- ?? Crop drying using solar driers, diesel, electricity and bio-fuels;
- ?? Development of storage facilities
- ?? Transportation of farm produce to markets
- ?? Maintenance of workshop equipment.

6.2 Ghana

The priority sectoral activities where maximum benefits would result from appropriate energy interventions were identified as small irrigation schemes, agro-processing industries, increased access to sanitation and clean water in peri-urban and rural areas. Other priority areas include technology transfer and development for SME support and development of model institutions to establish quality benchmarks for energy services rendered in health and education. The immediate need is for the Ministries of Energy and Finance to coordinate the development of the required multi-sectoral plan.

A Review of Key Sectoral Targets

Representatives from the various sectors assessed the various targets in their specific sectors and prioritized them taking into consideration how the sectors could be involved in attaining the targets. In all six targets were prioritized out of a total of sixty-nine enumerated from five sectors in the summary of the Ghana PRSP provided.

The prioritised targets and relevant sectors are:

- ?? **Irrigation:** Agriculture, SMEs, Water, Health and Education.
- ?? **Agro-processing, preservation and storage:** Agriculture and SMEs.
- ?? **Increased access to safe water**: Water, Health and Education.
- ?? **Sanitation and Waste Management:** Agriculture, Water, Health and Education.
- ?? **Technology development and transfer:** Agriculture, SMEs and Education.
- ?? **Model institutions and facilities to improve quality:** Health and Education.

B Energy Intervention in Achieving Prioritised Targets

- **Establishment of small irrigation schemes**: water pumps may require the following energy interventions - grid power, diesel, bio-fuel, solar and small hydro.
- **Agro-processing, storage and preservation** (activities could involve-milling, grating, drying, grinding, crushing, etc): the mechanical energy requirements can be provided by grid connected motors, diesel, bio-fuels and small hydro; heating energy and storage requirements can be provided by solar, biomass (wood stove) and LPG, grid power, diesel and Multifunctional Platforms (MFPs).
- **Increased access to safe water for rural and peri-urban areas** (involving the following activities –Production, Treatment, Conveyance and Distribution): the energy interventions to be considered are: grid, solar, diesel, bio-fuels, MFPs and small hydro.
- **Sanitation and Waste Management** (improvement in the management of both liquid and solid waste): by-products could be used as input for biogas systems for rural energy.
- **Technology development and transfer** (with emphasis on the development of SMEs to utilise existing electricity infrastructure and dissemination of improved technology for SMEs): energy interventions to include grid, solar facilities. MFPs, diesel, bio-fuels, small hydro.
- **Model institutions to improve quality** (involving the development of model health centres, secondary, vocational and technical schools in every district and extension of ICT to the rural and peri-urban areas): energy interventions to include grid, solar, small hydro and diesel.

C Action Plan

The workgroup recognised the need for further consultations with other stakeholders before a detailed action plan could be developed. The immediate activities requiring technical assistance by the various government ministries and departments are:

- **Ministry of Energy**: quantification of the energy requirements to facilitate the achievement of specified poverty reduction targets in the different sectors; support for the LPG promotion programme.
- **Ministries of Food & Agriculture and Trade & Industry:** support for the multifunctional platform programme in Ghana.
- **Ministry of Food & Agriculture:** support to increase scale of agro-processing activities in the rural areas.
- **Ministry of Works & Housing and the Ghana water company:** support for small water systems (boreholes, etc.) for rural and peri-urban areas.
- **Ministries of Health and Education:** support for provision of modern energy services in rural schools and health centres.
- **Ministries of Energy and Finance:** capacity building for coordinating multi-sectoral energy plans and associated budgets.

6.3 Kenya

The priority activities identified relate to the energy sector itself. Provision of financial and fiscal incentives to accelerate rural electrification and sustainable biomass use are high priorities. Complementing this would be a multi-sectoral energy needs assessment. Another priority is the improvement of the efficiency of the distribution sector in order to reduce technical and non-technical losses as well as lowering power costs for SMEs.

The following table summarises the recommendations of the country workgroup:

Energy Interventions	*Activities*	*Timing*	*Comments*
1. Accelerated access to the rural electrification programme in the country through: ?? Grid extension ?? Off-grid options ?? Mini and Micro hydro	?? Carry out feasibility studies on potential options	?? Immediate	
	?? Include cost of connection in future REP programmes	?? Long term	
	?? Address the legal and regulatory barriers to the entry of new players (including barriers to SMEs operating in the energy sector)	?? Long term	
	?? Provide affordable energy services to rural trade and production centres	?? Long term	
	?? Promote decentralized energy services	?? Immediate	
	?? Promote Research and Development into new and renewable sources of energy	?? Immediate	
	?? Disseminate information on investment opportunities	?? Medium term	
2. Provision of financial and fiscal incentives to promote electrification	?? Introduce smart subsidies	?? Long term	
	?? Reduce/waiver taxes on components	?? Medium term	
	?? Establish credit schemes	?? Long term	
3. Sustainable Management of Biomass Resources	?? Promote agro-forestry	?? Immediate	Cross-cutting issue
	?? Promote the wider adoption and use of efficient energy stoves, charcoal briquette stoves and other biomass energy recovery technologies	?? Immediate	
4. Provision of affordable energy services (LPG, Kerosene) by the private sector to the rural areas	?? Provide the necessary fiscal and financial incentives for the private sector to deliver LPG and kerosene to remote areas	?? Medium term	LPG study has commenced
	?? Set up of needs based filling points for LPG distribution	?? Long term	
	?? Standardize LPG valves and regulators	?? Long term	

5.	Reliability of energy services	?? Create appropriate balance of systems in essential services	?? Immediate	Cross-cutting issue
		?? Build local capacity for O&M of RETs	?? Immediate	
		?? Create appropriate backup services including spare parts for energy technologies	?? Medium term	
6.	Energy needs assessments	?? Undertake institutional needs assessment (health, education institutions in remote areas)	?? Immediate	
		?? Select and adopt appropriate technology options	?? Immediate	
		?? Promote an integrated approach to energy supply	?? medium to long term	

Notes on timing:

Immediate	-	Between now and six months
Medium term	-	Between six and twelve months
Long term	-	More than twelve months

6.4 Tanzania

The priority issues for Tanzania also relate to the energy sector itself and involve the maximisation of grid usage, promotion of appropriate off-grid technologies and speeding up of energy sector reforms to improve sector efficiency. What is immediately required is a revised rural energy master-plan, to be developed through multi-sectoral consultations and study tours.

A Key priorities

The key priorities and targets for each sector have already been identified in the PRSP. What is missing is an understanding of the linkages between the provision of energy services to the prioritised sectors and the fulfilment of the targets identified. Therefore the urgent actions required involve the prioritisation of energy interventions. With African development Bank funding the country is developing a rural energy master-plan. This study provides the opportunity to develop a plan that is explicitly linked to the PRSP targets.

The workgroup identified the following priority energy interventions:

?? Maximisation of grid power usage: many of the existing power lines are in areas that could be used for agricultural development.

?? Development of off-grid power systems where it is not economically feasible to extend the grid: expansion and improvement of rural energy cooperatives can be based on such a programme of decentralised energy delivery.

?? Promotion of appropriate energy technologies: for example the mechanisation of some agricultural activities such as tillage needs efficient distribution networks for diesel fuel rather than grid extension.

?? Speeding up the reforms in the energy sector: one of the major issues of concern is the relatively high price of electricity and other modern energy services when compared to other countries in the region. This is the reason why priority is being given to sectoral reforms to introduce efficiency and therefore competitive prices.

B Key elements of the action plan

Specific actions that should be taken in the short term are:

?? To undertake energy needs assessment in order to meet PRSP targets,

?? To appropriately review the power sector development master plan and formulate rural energy master plan in order to provide for PRSP energy needs,

?? To accordingly review the National Energy Policy and strategies to cater for PRSP energy needs,

?? To put in place appropriate legal and regulatory framework for energy policy implementation,

?? To establish responsive institutional framework to facilitate implementation of rural energy programmes,

?? To enhance the government's capacity for sectoral policy analysis, harmonisation, rationalisation, monitoring and evaluation

C Next steps

Support required in the short term includes financing of workshops, study tours and consultancy services required to develop an action plan that will deliver the poverty reduction targets in the PRSP. A multi-sector stakeholder team will need to be established with the task of facilitating and coordinating the formulation and obtaining approvals of the revised policies, strategies and programmes for the provision of energy services to meet PRSP needs. Consultants will be needed to assist in the harmonisation of sectoral policies with PRSP needs. The stakeholder team will need to learn from the experiences of other countries through undertaking a study tour.

6.5 Uganda

Increasing agricultural production, productivity and market access are the key priorities for Uganda. In this sector, as well as for the education, health and water sectors, the immediate need is to quantify the energy needs and to identify pilot schemes. Another issue is to complete the on-going regulatory reforms. The SMEs sector needs special support through expansion of micro-finance schemes and training and capacity building for energy services.

The following table summarises the recommendations of the country workgroup:

Sector	*Priority Areas*	*Energy Interventions*	*Short-term Action Plan (3-6 months)*
Agriculture	Increasing production and productivity	- Irrigation - Agricultural mechanization - Technology development and dissemination	- Information and education - Energy needs assessment
	Accessing markets	- Agro-processing and marketing - Capacity Building for farmer-based organizations - Market information - Standards and Quality control - Credit fund	- Preservation and Storage
Education	Expanding access Improving Quality Ensuring Equity	- Providing Lighting - Providing energy for water pumping - Providing energy for heating - Providing energy for ICT	- Undertake energy needs assessments in schools - Information, education and communication - Capacity building for headquarter
Health	- Improving maternal and reproductive health - Increase immunization - Control of HIV/AIDS and other communicable diseases - Improved nutrition and child health - Increased health education and promotion - Improved communication - Attraction and retention of skilled manpower	- Energy for lighting - Energy for refrigeration - Set up blood banks - Energy for pumping - Energy for water heating - Improved stoves - Energy for communication	- Develop specifications for energy packages - Selection of beneficiary health units - Capacity building at district level
Water	- Increasing access and affordability to safe and clean water and sanitation	- Energy (electricity and shaft power) for water pumping and treatment	?? Energy needs assessment ?? Establish energy packages ?? Undertake 5 PV pilot schemes for water supply

	- Financing water and sanitation energy packages - Developing adequate institutional, legal and regulatory framework/governance - Handling cross-cutting issues of gender and environment, etc - Highlighting productive uses of water for income generation		?? Undertake 5 windmill pilot schemes for water supply ?? Assessment of fiscal and financial incentives to promote the use of modern energy in water supply
SMEs	- Expand the outreach of micro finance services to districts and locations - Improve training and capacity building - Formulate new energy polices that are supportive of SMEs - Improve credit lines or equity to make sustainable micro finance institutions - Promote micro export	- Energy for heating, lighting, agro-processing, ICTs, cottage industries, mechanization, repair workshops	- Carry out capacity building and sensitization of SMEs on opportunities available for self power generation and distribution - Carry out needs assessment for energy inputs to activate SMEs in rural areas - Assess constraints to energy provision in SMEs

6.6 Zambia

Targeted priority sectors are small-scale irrigation, solar electrification of off-grid education and health centres, and water and sanitation and health education (WASHE). The immediate action plan is to adopt a multi-sectoral consultation process that builds upon ideas such as the Global Village Energy Partnership (GVEP) to create a localised Country Village Energy Partnership (CVEP). The consultation process should deliver the following outputs:

?? An assessment of the capacity to implement a multi-sectoral approach to energy provision,

?? A paradigm shift to a new approach to integrate energy interventions across sectors,

?? Review of current rural electrification programme based on a master-plan,

?? Implementation plan.

A Key Sectoral priorities and energy interventions

The priority activities identified by the workgroup for each sector are:

- ?? Agriculture: small scale irrigation and value adding agro-processing have the most direct and positive impact on poverty reduction,
- ?? Health: solar electrification for remote rural health centres and grid extension to all health centres in areas near existing power lines,
- ?? Education: solar electrification for remote rural schools and grid extension to all schools near existing power lines.
- ?? SME: priority on providing modern energy for all non-farming enterprises,
- ?? Water: focus on resource development, delivery modes and promotion of WASHE (Water, sanitation, health education) programme.

B Cross cutting and other issues

In the use and provision of energy it is essential that best practices are adopted, geographic and gender equity are taken into consideration and environmental sustainability is assured. All plans must be implementation-oriented by having time bound and measurable targets. Monitoring and evaluation of projects and dialogue among cooperating partners make it possible to learn from experience.

Finally the proposed Country Village Action Programme will make it easy for the country to fully participate in the Global Village Energy Partnership.

6.7 Session Discussions

In the short time available for country action plans, and starting from the PRSP objectives and existing programs, the country teams were only able to provide frameworks for subsequent development of the action plans. The frameworks reflect the results of brainstorming exercises that highlight the sectors requiring the highest priority and identify the need, in the short term, to undertake more detailed energy assessments on the basis of a multi-sectoral approach.

Monitoring and evaluation are necessary but had not been clearly highlighted in the country presentations

From the country action plans it was clear that most of them placed agricultural productivity as the highest priority. This also raised the water sector's priority level because of the importance of irrigation to agricultural productivity.

It is also clear that a national stakeholder consultation process is required to refine the action plans and to reach out to more stakeholders than those represented at the workshop. Action plans must become bankable documents for mobilising political commitment and financial support, including donor support, for the identified policy actions and priority projects.

Most of the countries represented in the workshop committed to follow up on the development of action plans to ensure that the momentum generated during the workshop is

sustained through to project implementation. Towards this end several countries recognised the need to strengthen capacity for multi-sectoral coordination. Facilitation for the implementation of such action plan is one of the key services of the Global Village Energy Partnership. The Zambia Action Plan even suggested the need to establish a Country Village Energy Partnership to mobilize the governments, development and financing institutions, NGOs and the private sector. This suggestion is worthy of serious consideration by all the countries and confirms the potential value added for the Partnership.

7

Closing Session – The Way Forward

7.1 Donors, NGOs and Private Sector Perspective

Representatives of donor, NGO and private sector companies generally had positive comments regarding the workshop format, presentations and discussions. The following are some of the general comments made by representatives present:

- Most donor organisations such as CIDA, DFID, USAID, SIDA now favour recipient-driven projects and actions and this workshop had provided helpful input to their own strategy discussions. They accepted that it was important for the donors to restructure their interventions in line with the multi-sectoral approach to poverty reduction;
- The African Development Bank, which is coordinating the energy plan to support the New Partnership for Africa's Development (NEPAD), has replenished its concessionary loan resources in order to finance poverty reduction programs. NEPAD is a continent-wide economic growth and poverty reduction initiative whose promoters have already recognised the role of energy projects, especially regional projects, in realising NEPAD objectives. In the short term the Bank would like to have a special focus on capacity building to facilitate project design and implementation;
- Energy sector reforms that facilitate private investment in electricity distribution are of interest to private entrepreneurs and to utilities with international investment divisions such as Electricite de France; the electricity distribution sector focuses on the end user, the target focus of poverty reduction strategies.
- Concern was raised on the fact that the PRSPs did not have environment as one of the priority sectors together with agriculture, water, health, education and SMEs. Explicit attention to the environment as a sector crucial for poverty alleviation would enhance the effectiveness of action plans;
- NGOs, who work with the people on the ground, feel that the focus on needs assessment in the action plans is misplaced because the needs are known from all past research surveys. The poor are tired of surveys, they want action;
- The World Bank/ESMAP group intends to maintain the momentum generated at the WSSD. Even though decisions have not yet been made regarding the final structure, funding and operational strategy of the GVEP the interim secretariat housed by ESMAP already has a draft action plan that it is implementing. The following is the brief outline of the proposed action plan for the next few months:

Proposed Implementation Plan for CY 2003

GVEP Deliverable or Output	*Proposed Plan*
Action Plans	Regional Workshops and Conferences in Africa (Anglophone-10/02 and Francophone-1/03); Latin America-6/03, Asia/APEC-9/03, COP 9 Meeting-10&11/03
Capacity Building	5 Practitioner Workshops, 5 Training Courses, 3 Business toolkits, Advisory services for Entrepreneur and Consumer organisations
Financing Facilitation	US$5 m Seed capital fund structured and capitalised, over 25 microfinance organisations and over 2500 local bankers trained, business incubation services for 50 firms, guarantee and risk reduction schemes, etc.
Knowledge Management	Catalogue of partners, 3 best practices guides, monthly email newsletters, project profiles established, 3-5 radio/local media campaigns
Monitoring and Evaluation	Develop global and project indicators, collect base line data, publish initial results by 12/03
Technical Secretariat	Secure funding and partners, Develop work-plan and budget, organise Biennial meeting for 2004

7.2 Next Steps and Closing Speeches

A number of pertinent observations and recommendations for the future were made by participants during the closing session. **ANNEX F** provides a summary of the results and analysis of a questionnaire that participants filled in to provide feedback on the workshop. Most of the participants were satisfied that the workshop had met their objectives. Some of the most important recommendations that were suggested are highlighted below:

- There are a lot of people getting into the category of poor people and therefore many poverty assessments and action plans are chasing moving targets. The emphasis must be on simultaneous action and planning.
- The focus on poverty reduction should not make us lose sight of the goal of economic growth. Positive economic growth rates result in the poor becoming a diminishing proportion of the population.
- The workshop highlighted sectoral inter-linkages that cannot be ignored in poverty reduction strategies. The role of civil society had however not been sufficiently highlighted. Future workshops of this type need to involve civil society organisations as well as representatives of the target beneficiaries. In particular more women need to be involved and this requires countries to encourage more women to be specialists in energy and other sectors relevant to poverty reduction.
- Follow up workshops and meetings of this kind are necessary to provide feedback and to share learning experiences as well as to monitor and evaluate the effectiveness of existing policies and programmes for poverty reduction.

CLOSING REMARKS BY WORLD BANK REPRESENTATIVES

Ananda Covindassamy, in his closing speech expressed appreciation for the richness of the workshop debates that had clearly confirmed why energy should feature prominently in poverty reduction strategy papers. Energy provides better social services, more income generating activities and better quality of life for the poor. Experience had shown that energy benefits are greater if focussed on productive uses and if complimentary to other infrastructure such as water, transport and communication. The workshop had also identified work in progress to improve the quantification of how much energy can contribute to specific poverty reduction targets. Country delegates were therefore advised to continue pursuing this work at home. Countries could count on donor support to see this process through to project implementation.

Mr. Chairman, Honourable Ministers, ladies and gentlemen:

Now is the time for some closing remarks. This workshop on How Energy can contribute to Poverty Reduction was **multi-sectoral by design**, and this makes it even more challenging for me to reflect the richness of the discussions of these past three days. I am afraid I may be sometimes inaccurate or incomplete in my summary and I apologise in advance.

I will nevertheless attempt to summarize the debate by answering three questions:

- Why should the energy sector be prominent in a country's Poverty Reduction Strategy?
- How can energy contribute to poverty reduction?
- What are the different country strategies to integrate energy in poverty reduction?

Why should energy be prominent in the PRSP process?

I see two main reasons, one of them is very convivial, and another one, very practical.

- The first reason is that, as several speakers told us, the **attack on poverty has to be multi-sectoral** to be effective. Other sectors such as education, health, SMEs, agriculture and water need better quality energy as a key input to realize effectively their own contribution to poverty reduction as reflected in the PRSP process and to contribute to meeting the MDG goals. More irrigation without energized pumps does not work; schools in rural areas without qualified teachers for lack of electricity to retain them will not provide quality education.
- The practical or selfish reason is that **the potential of energy as a contributor to the national poverty reduction objectives needs to feature explicitly and prominently in the PRSP**, as the PRSP is the gateway to access to bilateral and multilateral financial resources for the sector. For example, the World Bank Country Assistance Strategy (CAS), that sets for a period of five years or so the Bank lending program, is directly derived from the PRSP. If there is no visibility of energy as a contributor to the objectives of the PRSP then energy would not be present in the CAS, implying no World Bank support.

Therefore Energy not only needs to be prominent in the PRSP but it must also have a clear explanation of how it will contribute, together with other sectors, to achieve country poverty reduction goals.

How can energy contribute to poverty reduction (how to make your case)?

A few general conclusions applicable to all energy user sectors emerged from the discussion, as well as several strong cross-sectoral linkages.

Some important contributions of energy to poverty reduction in general are as follows:

?? Most sectors, that use some form of energy, **would benefit from access to a "higher" form of energy on the energy ladder**: Schools that presently use kerosene for lighting would benefit from access to electricity, SMEs in rural areas using wood fuel would benefit from access to LPG; households using wood fuel of charcoal for cooking would benefit from shifting to kerosene or LPG (even if the taste of rice may not be the same when cooked on LPG burners); agriculture using hand pumps would benefit from shifting to electric pumps. The point is that **in general, the benefits from the shift exceed the additional cost**, provided the higher form of energy is readily available and efficiently managed.

?? Better energy can contribute to poverty reduction to various degrees through three main types of uses: (a) **better social services** (education, health) benefiting the poor, (b) more **income generating activities** which may benefit the poor directly (employment generation) or indirectly (income redistribution), (c) **better quality of life** through improved lighting, entertainment… which may affect the poor to a limited extent only.

?? In general, the experience is that the benefits of access to modern energy yield **greater benefits if focused on direct or indirect productive uses and associated to other infrastructure services** (water, transport, communication) **and "facilitating" services** (financing for conversion of energy using business activities, technical assistance services, know-how dissemination).

?? Furthermore, an essential ingredient for energy to effectively contribute to poverty reduction at an affordable cost and in a sustainable manner is **that sector reforms focus on market liberalization**. This applies to traditional fuels as well as petroleum products, kerosene or electricity. These reforms should allow small enterprises to enter the energy supply market and to compete to all extent possible to provide better access at a better price.

?? Looking at other sectors that use energy as an input, the various sector groups identified a number of **specific cross-sectoral synergies** between energy and the social and productive sectors for reaching the poor and contributing to meeting the MDG goals. To mention a few of them (and I will limit myself to two per sector):

- In the **education** sector, a direct contribution of energy is with lighting in the school and at home to improve utilization of school buildings, and to allow children to read in the evening; an indirect contribution would be, for example,

reduction in the time needed for household chores, that in turn allows better school attendance and performance by girls in particular,

- In the **health** sector, better lighting and sterilization in hospitals can contribute to reduce child and maternal mortality. More indirectly, improved stoves and modern fuels can reduce diseases due to in-door pollution and infant and women morbidity and mortality,
- In supporting income generating activities through **SMEs**, *on the energy demand side* access to better energy (and support to facilitate access) can increase competitiveness and allow diversification of activities, generating in particular, income for the poor; and *on the energy supply side*, liberalized energy markets offer business opportunities for employment, creating local SMEs, provided they can access financing and know how,
- In the **agriculture and water** sector, *access to electricity* can contribute to increase productivity through better and more reliable irrigation; *downstream*, energy is important to reduce crop losses and developing higher value added agro-processing activities, from the mechanization of oil mills to refrigeration and brewing.

And these are only a few illustrative examples.

What are the specific country strategies to integrate energy in the poverty reduction programs?

All country strategies presented by the multi-sector Country Delegations emphasize the linkages and synergies between energy, and:

- Agriculture and rural development, with access to energy as an important element to increase productivity and for know-how dissemination,
- Education, where energy is important for better lighting, access to safe drinkable water and for communication technology,
- Health, where better energy is important for refrigeration, lighting of hospitals, reduction of indoor pollution, and control of HIV/AIDS,
- Water, where energy, through renewable sources in particular (wind, PV) is important for access to clean water.

In addition, each national poverty reduction strategy highlighted some specific contribution of better energy, depending on national specificities:

- Uganda emphasized energy for communication technology, reduction of indoor pollution and control of HIV/AIDS,
- Ethiopia prioritised energy for food security (extending irrigation and agro-processing),
- Zambia emphasized the importance of an integrative approach to rural electricity planning, and within this process, of food security (irrigation), of energy for non-agriculture SME as a contribution to the diversification of the national economy away

from mining activities, and the importance of effective energy management for sustainable development and environmental protection,

?? Tanzania highlighted the importance of energy for meeting the national PRSP objectives in general, and the key role of sector reforms, for grid-based and off-grid system extension,

?? Ghana prioritised energy for food security and irrigation, sanitation and waste management (biogas energy systems), and as an enabling factor for the development of SMEs, who should benefit from a know-how transfer for the effective utilization of energy,

?? Kenya insisted on the management of biomass resources (forestry and environment in general), and energy to contribute to food security (irrigation).

Conclusion

Now it is time to answer the question: **Can Energy contribute to poverty reduction and to meeting the MDGs?** I did not hear during this workshop many dissenting voices, so the response was a massive "yes".

Did we find convincing reasons to explain **how energy can contribute to poverty reduction?** The answer is also a "yes", but with a qualification, that energy's most efficient contribution may be as ***input to other activities*** and as an ***enabling factor***.

Did we find out by how much? We made progress there, but it is work in progress and the reflection needs to be pursued at each country's level.

I hope the country working groups, some of which continued working late in the night yesterday will continue their work back home, and I believe I am not misrepresenting the position of my donor colleagues by saying that **they can count on the support of the donor community to further refine their action plans for a multi-sector attack to poverty reduction, and more importantly, they can count on donor's support in the implementation of these plans.**

Thank you very much.

Dominique Lallement, complementing Ananda's speech, commended governments for the high calibre of the country delegations that had contributed to the workshops success. The organisers had taken note of the suggestions for future workshops to have better gender balance and to have more representation from NGOs, beneficiaries and the private sector. The workshop had set out to promote the concept of different sector specialists, governments, donors, NGO's, private sector and other stakeholders working as partners for poverty reduction. This is the GVEP approach. The workshop succeeded in this objective. The challenge is continuation of this kind of partnership at country level and in project design and implementation.

The workshop also set out to equip participants with knowledge of methodologies to measure impacts of energy policy as well as to provide lessons from existing programs and projects. This objective was also achieved. Above all a network of contacts and a framework were developed for improving upon the contribution of energy interventions to poverty reduction.

Finally, in order for this workshop to achieve maximum benefit the following immediate next steps are required:

- The consolidated proceedings of the workshop need to be disseminated widely in disk format and through the GVEP and ESMAP websites; delegates' own networks were other appropriate media to use.
- There is an unfinished agenda to attend to:
  - Project monitoring indicators need to be developed to facilitate implementation and targeting to beneficiaries,
  - The GVEP board and secretariat structures need to be finalised at the earliest possible opportunity in order to get partners to work more effectively – for example partners need to meet every two years to review progress;
  - There is need to undertake further research in order to understand the energy demand curve for various income groups;
  - There is need to deal with the issue of proper or smart targeting of subsidies to ensure that scarce resources are properly allocated.

CLOSING SPEECH BY ETHIOPIAN GOVERNMENT REPRESENTATIVE

Honourable Mekonnen Manyezewal, the *State Minister for Finance and Economic Development for Ethiopia,* in a speech read on his behalf by the State Minister for Infrastructure, closed the workshop with the following remarks:

Mr Chairman, Excellencies,
Distinguished Delegates,
Ladies and Gentlemen,
It is a pleasure for us to have hosted this important workshop on energy and poverty reduction. We hope that the Hilton venue has provided you with adequate facilities to conduct the workshop.

I have learnt that you have had excellent presentations and spirited discussions in the past two and a half days. I am confident that the workshop has explored energy delivery mechanisms for various areas of activities that benefit the poor, namely.

- Agriculture
- Small & medium scale enterprises
- Education, information and communication
- Health-care and clean water supply.

I believe that experiences outside of the Sub-Saharan region have also been taken into account in the deliberations on energy and poverty reduction.

Our colleagues from the World Bank have ably summarized the important lessons learnt from the workshop and the next steps to be taken. I would like to raise two points of particular importance:

?? First it has emerged clearly that energy services are an essential, although not sufficient ingredient for poverty reduction; that we must examine them in the context of the needs of beneficiaries to generate income, improve their access to quality education, health and clean water supply;

?? Second, the workshop has highlighted the need for new approaches for energy service provision, which bring together public and private partnerships to provide energy at affordable prices. The workshop also looked at the use of modern technologies and renewable energy for decentralized power supply.

I am sure that these discussions have assisted us all in the formulation of action plans in priority areas for poverty reduction in our respective countries.

This workshop is only the beginning in our endeavours to formulate concrete strategies and action plans for ensuring energy access to the poor in general and the rural poor in particular. We shall continue to share our experiences at all times.

No doubt, the mechanisms for the delivery of energy to the poor are full of constraints. But they are also full of options. The public sector, the private sector and financing institutions must join hands in exploring and exploiting all options for the delivery of modern energy services for the benefit of the poor.

Finally, I would like to thank the World Bank for organizing this important workshop.

I would also like to thank fellow honourable Ministers from Ghana, Uganda, and Zambia and the Heads of delegations from Kenya and Tanzania, representatives of donor organisations, the private sector and all participants for taking the time to come and participate in this workshop.

Thank you once more for the efforts you have all put in to make this workshop a success.

Thank you.