

**15th Congress of the Union of Producers, Transporters and Distributors of
Electric Power in Africa (UPDEA)**

**Accra, Ghana
June 6 to 10, 2005**

Unlocking Rural Energy Access for Poverty Reduction in Africa

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To be presented in Accra on June 7, 2005

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INTRODUCTION

Modern energy access in Africa is the lowest of all world regions, despite a relatively well endowment of the continent in energy resources. Large disparities exist between northern Saharan and sub-Saharan countries. In the former electricity access can be as high as 95%, while in the latter, it averages around 23%. This number drops considerably in rural areas where it reaches an alarming 1% or less in some countries. Sub-Saharan African countries except South Africa depend on biomass (wood, animal dung, agriculture waste, etc.) for more than 80% of their energy use.

It is therefore fair to state that access to modern energy in rural areas in Africa is by far the most pressing challenge facing the continent, and should constitute an overwhelming concern for the accomplishment of any development goal including efforts for poverty reduction, health improvement, water provision, agricultural development, food security, etc.

The rural area presents very specific challenges that are not fully taken into account by policy makers and energy sector managers. Until this is done, most solutions will fail to achieve their objectives in rural Africa.

This paper seeks to review the link between low modern energy access and rural poverty, identify barriers to sustainable energy provision in African rural areas and suggest an institutional tool, based on existing experiences, that can help unlock energy access for rural poverty reduction.

CAN AFRICA DEVELOP WITH THE CURRENT TREND OF BUSINESS IN THE ENERGY SECTOR?

Energy needed to fuel development and reduce poverty

The years 1980s and 1990s were the most sluggish years for Africa's development. The continent is now slowly recovering from those years, and in 2003, Africa had the second highest regional economic growth rate, behind Eastern and Southern Asia. Real GDP grew by 3.8%¹. However, this growth rate was not evenly reached within sub-regions, and countries. Sub-Saharan Africa (SSA) only grew by 3.1%, while North Africa's economy increased by 4.8%. Larger disparities exist among countries, where some even had a negative growth rate.

In spite of these encouraging facts, overall, the continent is not doing well in the fundamentals for development. While between 1981 and 2001 the number of people living in

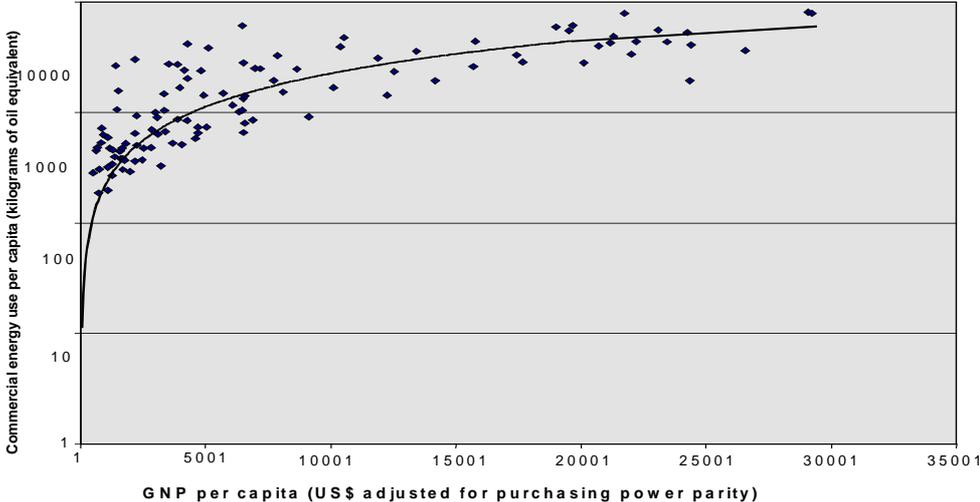
¹ ECA Africa Economic Report 2004

absolute poverty fell in the world from 40 per cent to 21 per cent of the total population, in Sub-Saharan Africa it increased from 42 per cent to 47 per cent. The international community cognizant of these realities adopted, in 2000, the well-publicized UN Millennium Declaration and related Millennium Development Goals (MDGs) that set the most urgent targets for reducing extreme poverty in the developing world.

Though, not specifically referred to by the MDG targets, energy supply is an underlining requirement to achieve most of these goals. According to the World Bank data (see [Figure 1](#)), there is a strong correlation between modern energy consumption and GNP per capita. The GNP tends to rapidly increase as commercial energy use per capita increases, mainly for low-income countries. When the countries reach a level of per capita GNP of around 10,000 TOE, factors such as efficient utilization of energy by industries, energy production and transformation systems and households tend to make the difference for economic growth to continue, so that more energy consumption does no longer imply more income for the country.

Figure 1. Energy consumption versus GNP

Source: World Bank, World Development Indicators database.



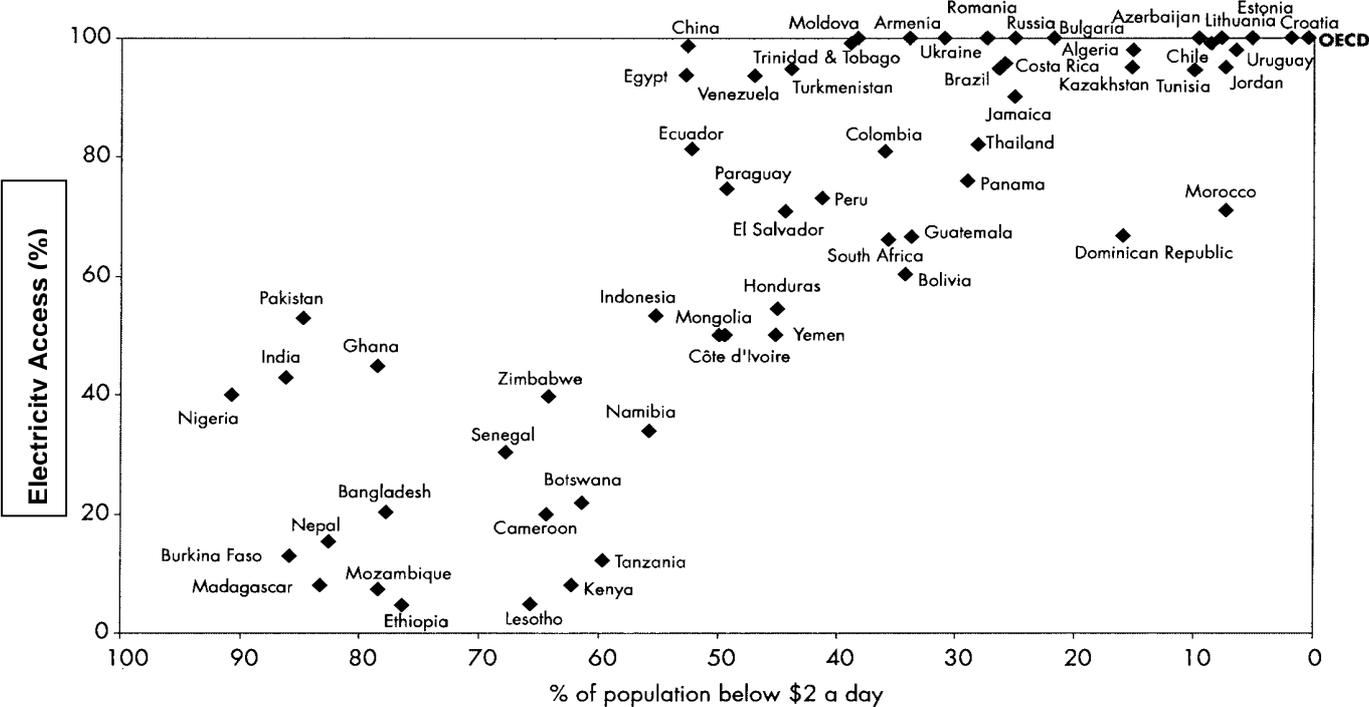
There is also a strong link between energy access and economic poverty. From [Figure 2](#), it appears clearly that the number of people living with less than \$2 per day tends to sharply decrease when access to electricity is ensured. For instance, in Tunisia where the level of electricity access is 94.3% (in 2000), around 10% of the population is poor, while in Mozambique, with a level of electricity access of 7.2%, approximately 84% of the population lives with less than \$2 per day.

Without access to adequate energy services, the majority of African would continue to suffer from deep poverty, since energy is required for most basic household needs, such as cooking and heating. In most African countries, 60% to 90% of the population makes their revenues from Agriculture activities. Without energy for drying and refrigeration, much of the potential revenues to be made from agriculture and fishing are lost to rotting. The impact of energy on hunger, access to safe drinking water, health, education, women empowerment, and the environment are well discussed in many published documents². The issue of energy access is not only the one of supply of one or another form of energy, but also, as it is the case for most

² DFID Report on Energy for the Poor

poverty situation, the one of choice and equity; choice of the form, quality and quantity of the energy needed for subsistence needs, comfort, production and security in present times and equity for future times.

Figure 2: Link between Electricity Access and poverty



Source WEO IEA analysis: income statistics from the World Bank's Development Indicators, 2001

No development without rural development

Africa is by 60% to 70% a rural dominated continent. The rural population should not be dragged along development, but rather be the engine of development in Africa, for development to occur. Services required for industrialization must be tailored to reach the rural sector as well as the urban areas.

It then comes to light that the low progress of the continent towards reducing poverty in general, can arguably be explained by the lingering energy poverty of its population and the limited progress made to provide energy to all, especially to those living in rural zones.

The limitation of current electrification programmes

The energy sector has been often assimilated, by popular perception, to the electricity sector. Hence efforts to improve the performance of the energy sector are often reduced to transformation of the electricity sector. Unfortunately energy programmes through electrification have often failed to bring the economic boost expected, because other important population incapacitation factors were not addressed.

When one compares the current rate at which new electricity connections are made in most African countries, to the growth rate of the population, one easily comes to realize that Africa is involved in a never-ending race to reduce energy poverty, unless dramatically different actions are taken to boost the number of new people having access to electricity. In Sub-Saharan

Africa, the number of people having no access to electricity grew from 434.5 millions in 1990 to 516 millions. This ever-ending race is explained by the fact that while the number of people having access to electricity increased by 19% between 1990 and 2000, the number of people grew by 30% in the same period³. The problem of energy poverty seems thus to worsen in absolute terms.

Finding solutions to this damaging situation should start by ending business as usual and adopting innovative approaches to the electricity deficit problem.

It should further be highlighted that electricity is an important ingredient for development, but is not sufficient to ensure income generation and poverty reduction. According to IEA analysis, China secured electricity for almost 700 million people in the last two decades, pushing the level of access to electricity of its population to a high 98%, comparable to the average access level in OECD countries, however, 56% of Chinese still live with less than \$2 per day. On a different note, a country like Algeria with electricity access of 92% (2005) has only around 20% of its population living in absolute poverty⁴. It therefore cannot be more emphasized that programmes of electrification must be implemented side by side with other development initiatives capable of creating income and address the real energy needs of the population for cooking, harvesting, conservation, heating/drying, grinding, and other productive activities.

WHY IS RURAL ENERGY DIFFERENT FROM URBAN ENERGY?

Close to 63% of African live in rural areas. In some countries, such as Burundi, the number can be as high as 90%⁵. Before a coherent electrification programme or policy can be developed for the rural people, it is important to revisit the fundamental differences between rural and urban populations, and identify the unique challenges of rural energy. It is a misconception to think that rural areas are homogeneous across the continent in their energy needs and development priorities. Indeed rural energy demand varies widely based on the geographical location (forest, savanna, semi-desertic or desertic zones), the climate as well as social economic factors (i.e. main indigenous productive activities). Understanding the constraints associated with development of energy infrastructure in the rural area should help in designing the most pertinent policies to address the problem of rural energy poverty.

In Table 1, we have attempted to compare some key characteristics of rural and urban settlements based on factors that can affect the feasibility of a cost-effective energy service project. We have limited our qualitative analysis to constraints related to centralized power grid extension programmes. The issues raised are by no mean intended to be exhaustive. They seldom highlight some of the barriers to be overcome in order to address the specific energy access problem in rural areas.

Comparison shows the rural areas present formidable challenges that do not prevail in urban areas. These are, inter alia, dispersed settlements, low population density, inadequate technology context, high illiteracy prevalence, difficulty of legal recourse in case of disputes, low and irregular incomes of potential consumers, and low electricity demand.

We will discuss the implication of these challenges on the design of successful energy programmes targeting rural population in the next section.

³ IEA World Energy outlook 2002, and UN Statistics

⁴ World Energy Outlook 2002, IEA

⁵ UN Population Data, 2003

Table 1: Comparison between Urban and Energy Characteristics

Characteristics	Rural	Urban	Implied Constraints for grid extension in Rural zones
Settlements geographical density	Dispersed settlements depending on land and other natural resources availability (i.e. water)	Concentrated around industrial and administrative sites	Centralized electricity production will require long transmission lines to extend the grid to reach each settlements
Population density	Low, composed of a small number of families	High usually because of economic migration	Few potential connections per settlements, and higher relative cost of public lighting
Technology readiness	Rudimentary technologies, little awareness of new technologies. Maintenance services are usually not available	Variety of technologies is available from comfort to productive equipment.	On site-maintenance intervention will require long travel time, and household energy consumption will be impeded by limited penetration of electrical modern appliances
Illiteracy level	Very high, especially among adults	Lower	Unfamiliarity with the risk of electrical accident, and finding a local resident for training on emergency maintenance services will be difficult, especially when technologies become more sophisticated.
Social accountability	High accountability due to inter-family relationships and strong centralized traditional authority	Low	Ease of amiable intermediation in case of dispute
Legal accountability	Low because of long distances to legal offices and law enforcement authorities located in cities	High because of large number of trade transactions, and the proximity of law enforcement mechanisms	Recourse to legal arbitration will be harder to implement and decision more difficult to enforce
Income level	Usually low, with little savings	Higher	Capital cost of first connection, as well as a high tariff could be a deterrent for new connections
Income cycle	Irregular, depends on agriculture harvest seasons, oceans and river species migration/reproduction seasons	Weekly or monthly cycle throughout the year	Collecting regular monthly bills maybe critically constrained by lack of regular income
Income security	Low, depends on climatic and seasons conditions and other external factors such as international commodity market prices	More stable since mostly based on fix employment incomes	The fear of lack of income to pay regular bills may deter connections
Basic household energy use	High demand for cooking (80% to 90%), space heating, lighting from commercial energy such kerosene (2% to 10% of energy use) ⁶	Cooking, heating, cooling and high energy consuming electrical appliances for high income customers	Rural energy demand is dominated by cooking needs not addressed by electricity access. Electricity can only target less than 10% of energy demand.
Productive energy use	Mostly agriculture (around 2% to 8% of total energy use) Small rural industries (less than 10%) using mostly woodfuel and agriculture residues Generally no capacity for cooling and mechanical shaft	Various industrial and entrepreneurship activities using heating, cooling and shafting	Electricity has limited impact on productive uses in rural areas, affecting around 10% of demand, unless there is rapid development of supporting infrastructures such as roads and agro industrial transformation units

⁶ numbers adapted from WEC, "The challenge of Rural Energy Poverty in developing Countries:, 1999

CAN RURAL ENERGY ACCESS BE UNLOCKED?

Unlocking African rural energy access entails taking into account the rural characteristics discussed above, and incorporate them in strategies and sector development models. Fortunately, there are enough experiences that can provide useful lessons to this end. Practice and experiences dictate that three main approaches must converge to break the lock of rural poverty:

- Integrated rural energy-rural development approach
- Off-grid decentralized or centralized energy system approach
- Private and public/private partnerships for rural energy infrastructure development

Integrated rural energy-rural development approach

One should reaffirm that energy does not have an interest in itself but gains its value from the services that it renders. The mythical thinking that electrification will automatically induce poverty reduction and development is exaggerated and should be renounced. Example exist of countries where high access rates to electricity were achieved without significant increase in income for the population, and where the number of people living in absolute poverty remain high. Conversely, when combined with other key development requirements such as roads, water, health, education and credit facilities benefiting from the availability of energy, energy becomes a major booster for development. The failure of the electric power sector in rural Africa can largely be explained by the lack of a holistic approach to rural development planning. No one buys gasoline without a car; instead in purchasing a car, one projects the cost of fuel and maintenance in ones daily expenses. This wisdom does not often come to bear in planning rural energy development. Energy development should be part of an integrated rural development programme, with, in the case of Africa, poverty eradication objectives.

Assessing real rural energy demand

The starting point for an integrated energy planning approach is the assessment of the real energy demand in the rural community, in a non-generic manner. Rural energy demand is generally more complex than can be imagined, because of the wide range of activities undertaken in various rural areas. The relatively small energy consumption of the rural consumers makes the accounting for a total demand quite detailed. Many times the demand is seasonal and influenced by external factors such as temporary migration in out of the rural area.

The rural energy demand can be clustered in the following categories⁷:

- Household basic non-productive needs: These include cooking, space heating and lighting.
- Agriculture and fishing products conservation and transformation needs: Crop drying, greenhouse, irrigation/water pumping, storage, packaging, canning, crop grinding, cooler and refrigeration.
- Manufacture and services: Tailor, carpenter, electrical shop, telephone, business centers, mechanical shops, restaurant, water purification, TV viewing room, etc.

⁷ E+Co, "Productive use kits: developing modern energy productive use options for the Zambian and the Tanzanian markets"

The sources of energy required are mostly woodfuel or other available biomass resources (animal dung, agriculture waste, etc.), solar heating, electricity and kerosene or diesel (see [Table 2](#)). In adopting an integrated approach, one must plan for the accessibility to or availability of related technologies and machines such as improved stoves, oven, hotplate, fryer, pasteurizer, sewing machines, saw, sanders, glass, fasteners, soldering tools, electrical regulators, cellular phone, telephone, computers, copiers fax machine, etc. Access, in an affordable manner to these tools and technologies will leverage the cost of providing modern energy in the rural area, and prop up income generation activities and the development of the rural areas.

Table 2: Energy use in rural areas

	Percent of total rural energy use	Sources of energy
Households	85%	Woodfuel, kerosene
Cooking	80% to 90%	Woodfuel, dung
Other households	10% to 20%	Woodfuel, kerosene, dry cells, electricity, paraffin
Agriculture activities	2% to 8%	Woodfuel, agriculture residues, electricity
Lighting	2% to 10%	Electricity, dry cells, paraffin, kerosene
Manufacture and service	Less than 10%	Woodfuel, agriculture waste, electricity, diesel

Data compiled from WEC, 1999

Off-Grid decentralize or centralize energy system approach

There are basically three modes of electrification of rural areas:

- Grid-connected rural electrification
- Off-grid centralized rural electrification
- Off-grid decentralized rural electrification

Grid connected rural electrification

Grid-connected electrification based on centralized power generation is the mode adopted initially by all African governments. Except for countries of the Maghreb, this approach of extending the grid to rural areas has failed to meet expectations. Thus only less than 8% of rural Africans have access to electricity. The reasons of this failure include *low power generating capacity* that has caused power utilities to concentrate on cities with higher population densities; *high cost of transmission and of medium to low voltage transformation* that makes rural electrifications programmes so public budget greedy that most governments can no longer afford them and international donors are reluctant to support them. The essence of this failure is often found in the existing policy and regulatory measures that are outdated and out of touch with the current challenges of the sector. These policies resulted in serious mismanagement of the sector leading to frequent bankruptcies in many countries. It falls to sense that relying **solely** on this model of centralized generation grid extension can only worsen the current situation of energy distress in rural Africa. While

governments must remain accountable for providing electricity to rural populations, they must give much more attention to new approaches using off-grid electrification modes.

The second option is off-grid electrification. Two modes are possible:

Off-grid centralized electrification mode

In this mode mini to micro electrical grids are built around a small size power plant, generating in the order of 20kW to 2.0 MW of electric power from renewable energy sources such wind turbine, mini-hydro power, co-generation based on agriculture industrial waste, and sometimes diesel thermal generators. In many rural areas in Asia⁸, mini-hydro power plants are a prominent technology option. A large number of such systems operate successfully in rural areas of Nepal and Sri Lanka. The important features of the Asian experience are that a rural community organized in cooperative is provided the required project facilitation from experts in technology, project management and even sociologists. In Sri Lanka, about 110-village hydro projects exist, and more than 950 in Nepal. Not all have electric generators components. These successful approaches came about with an initial phase supported by donor projects, and strong technical support from experts groups. The projects are demand-driven, based on available local

BOX 1: First Grid Connected Solar PV System in Sri Lanka

(NEXANT, "Rural Energy Services- Best practices: May 2002 www.sari-energy.org)

The first ever grid connected solar PV system was inaugurated in Sri Lanka in January 2002. The Honorable Minister of Energy, Karu Jayasuriya, opened the project. This 25 kW system supplies the Ceylon Electricity Board (CEB) Grid during the day. The system is owned by Worldview Global Media based in the suburbs of Colombo and was funded through NORAD. The linking up of the system to the CEB grid is a significant achievement as it has resisted linking small suppliers even though there is a private power purchase process in place. So far 20 MW of privately developed mini hydro projects have been linked to the CEB through this process. The smallest system installed is a 750 kW unit.

This particular system has 185 Eurosolare solar PV modules (120 Wp) arranged in 9 arrays and feeding 9 Sunny Boy (Ecotec) 2.5 kW inverters. The grid connection system has protection from islanding in the event of grid failure. There is also a set of digital meters that reads the kWh (units of electricity) produced and delivered to the CEB at a given moment, the power produced (kW) and the tons of carbon emissions mitigated from the energy produced from the Sun.

As there is no provision in the CEB's power purchase agreement to purchase solar electricity, the project was passed by deeming it a mini hydro project. Therefore, in the power purchase agreement, it is referred to as a mini hydro project. This is an anomaly that has to be rectified in the power purchase agreement if more of such projects are to come in stream.

Worldview has plans to expand the system to 100 kW. At the total system cost of US \$ 125,000 (which included design, hardware, installation, grid interconnection and commissioning), this project is not commercially viable at the moment, given that the CEB pays only Rs. 4.10 (US \$ 0.04) per kWh produced.

However, the project has received publicity in the media and this will certainly help in the marketing of rural solar PV systems, as people get more of an assurance that the technology works. It has also set a precedent for the CEB to purchase power from very small producers.

⁸ NEXANT, "Rural Energy Services- Best practices:, may 2002 www.sari-energy.org

energy natural resources. **Box 1** presents an interesting experience in Sri Lanka, where the power utilities (CEB) purchase power from small independent producers using PV and mini-hydro power sources. However, experiences in Africa show that PV technology is most cost-effective for stand alone Single Home Systems or off-grid small-scale centralized systems applications.

Off-grid decentralized electrification mode

When population are widely dispersed in remote areas, the minimum population density required to develop a cost effective mini grid is not met. Off grid decentralized electrification schemes appear as the only feasible option. Technologies available to implement these schemes are stand-alone electricity systems based on photovoltaics, simple batteries to be recharged periodically or diesel generators. Small and medium size entrepreneurs and NGOs have played a key role in developing this market. One of the distinctive features of this approach is the close proximity that is developed between entrepreneurs and local population. Building such relationships is crucial! Also, project developers must establish the necessary selling, maintenance, finance and marketing infrastructure. Operations are highly decentralized and involve the participation of the villagers. Flexible finance is an important issue in this model both for the entrepreneurs and the customers. Special financial schemes and facilities are often required. In Asia, people based network such Grameen Shakti includes a financing facility that helps develop electrification projects

Off grid approaches have the advantages over grid extension to reduce technical losses due to transmission and transformers, limit capital investments in developing rural electrification, ease management burden and cost, and increase financial viability of investments. Further, off grid models entails a substantive participation of served communities, which increases the sense of ownership by the population and ensures in most cases the success and sustainability of the project.

Some noteworthy experiences exist in Africa. For example the UNEP/E+Co initiative entitled “African Rural Energy Enterprise Development (AREED) focuses on small and medium size energy enterprise development in Africa. The approach used in this project is to provide basic business development technical services to entrepreneurs with promising business concepts, and help them develop bankable projects. The entrepreneurs can then apply for and received a seed fund that will help them start activities. At a later stage, the small enterprise can turn to more commercial funds for sustainable growth of the business. Five African countries participated in the AREED project, and initial results hold promises for the establishment of an off-grid energy market in Africa.

MAKING IT HAPPEN!

Examples in Asia and elsewhere reveal that successful rural electrification programmes exist. Though no scheme is perfect, and suitable for all rural and country contexts, analysis leads to highlight some important lessons for success. These includes:

- Adopting a demand-driven and integrated approach to energy planning in rural areas. In order to reduce poverty and promote growth, energy development programmes must be integrated with the development of other key infrastructure including financial facilities required to boost production and income generation for the rural population
- Increasing the role of private and community actors through the establishment of a policy and regulatory environment conducive to the promotion of small and medium size

enterprises and community-based organizations. Assist in the development of these activities.

- Emphasizing off-grid decentralized and off-grid centralized (mini-grid) systems as the most cost effective way to increase electricity access in rural areas
- Seeking to substantially mobilize increased investments in the sector. Finance must be diversified to serve the needs of both the energy service providers and the rural customers, through the development of consumers finance schemes.

For these guidelines to be effectively mainstreamed in the energy sector planning and development, policy makers must pay much more attention to the specific challenges of rural energy. It is very unlikely that addressing the problem of energy access, or the problem of energy security in general will provide the necessary means to overcome the barriers of rural energy.

Rural electrification deserves specific and vigorous actions at multiple levels (community, national and regional) and by all energy stakeholders. Though there is an increasing trend to establish dedicated rural electrification agencies in recent national power sector reforms, a review of the status of these agencies shows that the good intention that caused their creation was not followed by appropriate means to make them operational. Most are new, under-equipped, understaffed and lack of the administrative and operational tools (functional decree after laws are passed in parliaments) to be fully functional. In most cases, though they are legally established, they have no mean to achieve their mission.

At regional level, there is no concerted strategy to address the rural energy problem. The NEPAD energy initiatives, makes no mention of rural energy, and Regional Economic Communities are mostly focused on large power generation and electricity trade. Even though increasing generation and integration of Africa's electric power sector is a much pertinent effort, indications are that the rural population will remain largely ignored. There is hence an institutional weakness at national levels, and an institutional gap at regional level to address the problem of rural energy. Unless such a regional concerted framework is designed and adopted, major international partners will be without guidance to properly focus their assistance to rural people; instead the complexity of the problem will inhibit most isolated initiatives.

ECA, in accordance to its mandate, is advocating a shift in policy in this area, and seeks to draw more attention to this major barrier to the fight for poverty alleviation and sustainable development. In partnership with other UN and non-UN organizations within UN-Energy/Africa⁹, ECA will focus on identifying the means to unlock rural energy as a prerequisite to rural poverty reduction and step forward for the achievement of the MDGs in Africa.

At the world conference on Renewable Energy held in Bonn, in June 2004, ECA made a commitment to build the necessary partnership to facilitate the establishment of an African Rural Energy Development Facility (AREDF). This facility will be composed of the following building blocs:

- ***The Renewable Energy and Energy Efficiency Capacity Development Facility (REECDF)***: This facility will aim at raising awareness of policy makers on the specificities of rural energy. It will reinforce the capacities of entrepreneurs in the development of decentralized energy plants and the provision of Renewable Energy

⁹UN-Energy/Africa is a collaborative mechanism to ensure coherence and efficiency in UN and non-UN organizations actions for energy development in Africa. UNE/Africa serves as the UN sub-cluster in support of NEPAD energy initiatives.

services to rural populations. Specific technical services will be provided to small and medium size enterprises to assist them to develop promising business ideas into investment ready document.

- ***The RE/EE investment funds (REEIF):*** It is estimated that Africa will require important investments of the order of US\$210 billions in new power generation over the next three decades¹⁰. The requirements for decentralized energy services are more modest, but must be flexible and more in tune with the context of rural areas. Combination of various forms of financing from grant, soft loans to venture capital must be used to support projects with established positive impact on energy access of the rural population of Africa
- ***The Rural Capacity Fund for Energy (RCFE):*** The low financial capacity of rural population must be addressed, in order to increase connections, and accessibility to services. Without any strategy for promoting income-generating activities, most rural energy programmes will have a limited impact on poverty reduction and development. Successful schemes such as specialized energy cooperatives, decentralized micro-credit services can be adapted in the African rural zones. An important success factor is the full participation of local populations to any project related to the development of their region.

AREDF will require a strong partnership between all stakeholders from public decision-makers to the private sector. The implementation strategy includes two phases:

Phase one:

Undertake a study to review current and past experiences of initiatives to improve rural energy access, including public, private, non-governmental and development agencies efforts, so as to design an innovative model for rural energy development in Africa, based on the best practices identified.

Phase two:

Mainstream the best practices through the design the Rural Energy Development Facility (AREDF) as a sub-regional institutional tool for the development of rural energy. This phase would require a strong advocacy and awareness-raising role by the partners to gather the proper political and financial commitments necessary for its implementation.

AREDF will be an important regional tool to raise funds and awareness, as well as a practical framework to address the issues of rural energy. It will help reduce the investment risks linked with funding rural energy projects, through technical services and financial intermediation provided by experts.

¹⁰ World Outlook 2002, IEA

CONCLUSIONS

Africa is lagging behind other developing regions in the progress to achieve the goal of reducing extreme poverty in the world. This situation is not merely a statistical assessment. It translates in more deaths to diseases, more suffering from hunger, poor quality of life for the majority, short life expectancy and increased number of conflicts and social turmoil all over Africa. In the coming years, as more dynamic efforts will converge to move Africa on the track to achieve the MDGs¹¹, there is no doubt that energy access for the disadvantaged population should come into sharper focus. It is imperative that more attention be drawn on this important barrier to development. Over the past years, rural electrification was dealt with traditional models and development approaches that failed to recognize its specificities, thus the number of people living without clean and affordable energy is alarmingly high. The need take into account the final usage of energy at the planning stage is important to make energy projects cost effective and capable of meeting the legitimate expectations of the rural populations for development.

Unlocking energy access in Africa requires new paradigms, innovative models that can bring together all major stakeholders, within a framework that addresses the barriers of lack of awareness, weak technical capacities of major actors, and appropriate financing schemes. A rural energy development facility, based on promoting off-grid decentralized or off-grid centralized systems driven by private or public-private partnerships and involving community participation appears to be a most promising institutional tool for Africa.

¹¹ MDGs imply the goal of halving extreme poverty, hunger, etc. by 2015.

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