

Energy for Poverty Alleviation in Sahel

Intelligent Energy Project

Project Newsletter , 02/A, Lisbon, , October 2005



Introduction

In the first issue of the IE4Sahel Project's newsletter we pointed out that energy is a crucial aspect for addressing poverty reduction and we described the project "Intelligent Energy for Sahel", a research and cooperation project on this subject. In this second issue of the IE4Sahel Newsletter we are going to discuss more in detail the Energy - Poverty nexus, and its significance in terms of the development of policies, both at the international and at the local level. The main topics to be highlighted in the articles developed here are:

1. Energy in the international agenda
2. Energy, Poverty and Gender nexus
3. The energy Power Sector reforms and the Poverty Reduction Strategies
4. African Overview on the possible paths to be chosen

1. Energy in the international agenda

Energy was one of the main themes at the World Summit on Sustainable Development (WSSD), held in South Africa in 2002. The Johannesburg Plan of Implementation highlighted the role of energy services to promote sustainable development and to facilitate the achievement of the Millennium Development Goals. The Plan called for maximum efforts from the international community to promote a) Increased energy access to all population, b) Implementation of modern biomass technologies, c) Management programs for sustainable use of biomass, d) Implementation of actions plans focused on the transition to the cleaner use of liquid and gaseous fossil fuels, e) Development of sound national energy policies and regulatory frameworks, f) Enhancement of international and regional cooperation, g) Developing mechanisms to provide financial and technical assistance for the poor to access to these programs.

In the past, the importance of energy for sustainable development has not been always fully recognised. For example, in 1992, ten years before Johannesburg, energy was not mentioned in the Rio declaration, and none of the Millennium Development Goals directly refer to energy.

In Rio 92 energy was principally discussed for its role in climate change and environment (and played a great

role in the subsequent Kyoto protocol and in the United Nations Convention on Climate Change). Five years later, the ninth session of the Commission on Sustainable Development (CSD9) extensively worked on energy in all of its aspects. Nevertheless during CSD9 and WSSD no specific quantitative targets, action plans and financing supporting instruments were decided on the energy aspects related to poverty. There was a tentative approach by some African countries to set a target to "provide modern affordable energy services to half of the two billion people who currently do not have access to them by 2015" (Africa Group 2002, WEHAB working Group 2002). The target-setting strategy was also advocated by UNDP (United Nations Development Program) however, the necessary international consensus was not reached.

After WSSD, energy began to play a more and more important role in the international debate on poverty and development actions, and a large number of projects, initiatives, networks, studies and publications have been developed (an overview of the more important energy-poverty initiatives will be soon published in the newsletter and on the project website). In 2004, the UN created a dedicated interagency - UN Energy - whose first publication was "The Energy Challenge for Achieving the Millennium Development Goals". The General Secretary of the UN, Mr. Kofi Annan, emphasising this change in focus, declared in a report to the General As-



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Box 1; energy and the Millenium Development goals (UN-Energy, 2005)

Millennium Development Goals	Energy linkages
1. Eradicate extreme Poverty and hunger	Energy inputs such as electricity are essential to generate jobs, industrial activities, transportation, commerce, micro-enterprises, and agriculture outputs. Most stable foods must be processed, coserved, and cooled, requiring energy from various fuels.
2. Achieve universe primary education	To attract teachers to rural areas electricity is needed for homes and schools. After dusk study requires illumination. Many children, specially girls, do not attend primary schools in order to carry wood and water to meet family subsistence needs.
3. Promote gender equality and empowerment women	Lack of access to modern fuels and electricity contributes to gender inequality. Women are responsible for most household cooking and water-boiling activities. This takes time away from other productive activities as well as from educational and social participation. Access to modern fuels easy women's domestic burden and allows them to pursue educational, economic and other opportunities.
4. Reduce child mortality.	Diseases caused by unboiled water, and respiratory illness caused by the effects of indoor air pollution from traditional fuels and stoves, directly contribute to infant and child disease and mortality.
5. improve maternal health	Women are disproportionately affected by indoor air pollution and water – and food-bore illness. Lack of electricity in health clinics, lack of illumination for nigh time
6. Combat HIV/AIDS malaria, and other diseases	Electricity for communication such as radio and television can spread important public health information to combat deadly diseases. Health care facilities, doctors and nurses, all require electricity and the services that it provides (illumination, refrigeration, sterilization, etc) to deliver effective health services.achieve the MDGs in various ways.
7. Ensure environmental sustainability	Energy production, distribution and consumption has many adverse effects on the local, regional and global environment including indoor, local and regional air pollution, local particulates, land degradation, acidification of land and water, and climate change. Cleaner energy systems are needed to address all of these effects and to contribute to environmental sustainability.
8. Develop a global partnership for Development	The World Summit for Sustainable Development called for partnerships between public entities, development agencies, civil society and the private sector to support sustainable development, including the delivery of affordable, reliable and environmentally sustainable energy services.

sembly on promoting new and renewable energy sources:

“One of the growing concerns of the international community is the persistent energy poverty that is seriously impeding socio-economic development, particularly in sub-Saharan Africa and in countries of South Asia, but also in many other developing countries, including many of the small island developing States. In the developing countries, some 1.6 billion people still lack access to electricity and about 2.4 billion continue to rely on traditional biomass for cooking and heating, mainly in the rural areas. Achievement of the Millennium Development Goal of halving, by 2015, the proportion of the world's population whose income is less than \$1 per day will depend on providing these people with access to modern energy services for their basic needs and for income generation. Decentralized renewable energy systems can contribute to poverty eradication efforts, in particular in areas with widely dispersed rural populations”. (Kofi Annan, 19 August 2005, UN News service).

2. The energy, poverty and gender nexus.

Energy in this context is not a question of technology (that is well developed, yet not available to all), it is by far a reflection of the present status of the social and economic development and interaction of the local communities with thier environment and the potential optimization of its local resources. By simple analysis of the day by day conditions, it is also clear that the poorest people on the planet live without access to modern

energy services. The energy-poverty relationship has several components, from which we would like to highlight the following:

- 1) Access to energy services
- 2) Affordability of the energy vectors
- 3) Empowerment of women and community engagement.

Access: in the past this has been the principal (if not the only), aspect of energy and poverty that national governments have tried to tackle (e.g. electrical grid extensions projects, or initiatives to create market infrastructures for modern energy fuels).

Access is the primary problem in rural areas; the infrastructure needed to transport electrical energy is highly capital intensive, and transporting fossil fuels to remote areas, not served by a reliable transport infrastructure is expensive and difficult. The level of consumption may be small and consumers are not able to pay the related costs. The WorldBank suggests the opportunity of subsidizing capital costs (but not operating costs) to improve energy access (Saghir 2005). For isolated areas with the right environmental conditions the use of local renewable energy resources is often a good and economically viable alternative, as many renewable technologies, such as wind, biomass, mini-hydro have low operating costs.

Affordability: the possibility to make use of modern energy services is irrelevant if the people cannot afford

them. This case is very common, for example with urban and peri-urban populations that live relatively close to energy infrastructures, but still do not have access due to connection costs. The poor can often choose only more expensive forms of energy (such as kerosene) despite other cheaper options being available; due to their low initial capital costs for stoves etc and availability in small quantities. So, they often pay a higher cost for energy not only in relative terms (the share is higher compared to their incomes) but also in absolute terms, because they are obliged to use highly inefficient technologies; they can only afford to buy small quantitative of fuels or electrical energy re-sold by someone that can afford the fixed cost of connection to the grid. Once one takes into account efficiency and transaction costs, energy for the poor is much more expensive than for non-poor.

Empowerment of Women: in the very same way that gender is a key factor in the analysis of poverty status, it is also a factor in energy (even if this aspect has long been undervalued). Within the poorest groups of the population, women are often the more exposed and endangered persons and generally have the burden to gather energy for cooking and heating for the whole family (fuel, wood/biomass). This is not only an extremely time (and energy) consuming activity that could better be used for income generating activities or in improving the quality of life, but also has serious health impacts. In poor households, fuel wood is frequently burned in highly inefficient cook stoves, that generate smoke and indoor pollution, which is responsible for numerous respiratory diseases in women and children¹. While fuel wood is collected mostly with no direct monetary costs, its magnitude is not fully addressed in energy statistics, also due to difficulty of measurement, its importance can be under valued by policy makers and this is reflected in national energy plans (Clancy et al., 2002). In regions where there is a huge pressure from the population on the environment (or in delicate ecosystems like in the Sahel), the utilisation of biomass in a non sustainable way of the biomass stock for heating and cooking, leads to serious impacts on both the environment and the poorer households, resulting in an increase of desertification potential and in the necessity

to spend even more time and energy to collect fuelwood every day further from home (and in some cases implies in shift to even more inefficient fuels).

This opens the theme of productive uses of energy and seeking innovative ways of financing the use of more efficient technologies. It is clear that to escape the vicious circle of poverty, energy should also be used for productive activities, in a way that enables generation of additional incomes, which are able to re-pay the energy system's cost and create a surplus, establishing a so-called "virtuous circle of energy". There are differing opi-

nions between development and energy experts on the possibility that poor rural communities may self-finance the shift to modern energies using the income generated by the productive uses of energy. For example electricity is often used for lighting, refrigerators or entertainment appliances (radio, TV) and not for productive uses. There are a lot of local factors that have to be taken into account, generalisation is particularly difficult, as this is one of the many times where the phrase 'Think globally, act locally' applies. The availability and affordability of modern energy are the essential pre-requisite for the development of any productive activities which are essential to escape from poverty's vicious circle.

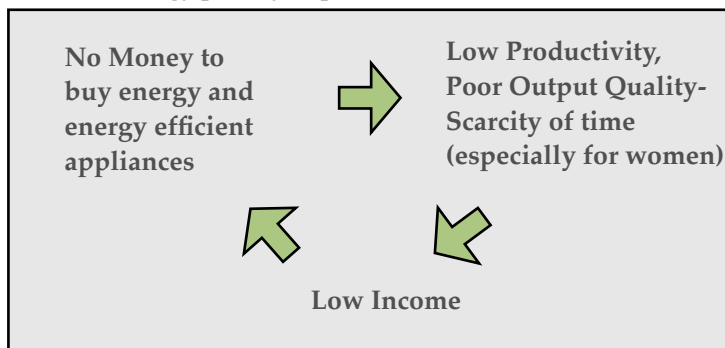
Energy is necessary, but not sufficient, for development.

The under evaluation of the poverty-energy link may be responsible for two opposite policy issues. On one side, poverty reduction strategies (or economic development plans) that do not take sufficiently into account the energy component of poverty and, on the other side, energy reforms plans that do not fully consider the consequences of reforms on the poor.

3. Energy Sector Reforms and Poverty Reduction Strategies

Every developing country has its own history, challenges and achievements, but in recent decades many faced similar problems of poverty, the ravages of HIV/AIDS, economical and political instability (if not war), inefficiency of the state, weakness of the private sector, large variations in the trade balances, high external debt, high

Box 2: the energy poverty trap



(Source: elaboration from Ramani and Heijndermas, 2004)

¹ See for example www.who.int/indoorair/eng/

dependence on the donors (and also high inflation rates, volatility of national currencies, financial insecurity etc). Under pressure from the international community and the Bretton Wood institutions, many have adopted policy and institutional reforms to correct these imbalances, with various degrees of success.

The reforms have been supported by the World Bank and the International Monetary Fund (IMF) through two policy instruments: the Structural Adjustment Plans and, later, the Poverty Reduction Strategy Papers.

The rationale under the SAPs is the belief that a free Market is the most efficient environment to address the scarce resources for productive use. To be efficient the market has to be competitive, unbiased and prices must reflect the economic costs of goods and services. State owned enterprises are often considered less efficient than private-led ones and so large privatisations programs have been put in place, subsidies and trade barriers have been removed (as they distort price signals). A sound market environment (with its proper legal framework) is considered the natural field on which private economic initiative might grow, leading to economic development and so, to better living conditions..

SAPs have been criticised for their effects on the poor. In particular the application of the same model to many different countries (one-fits-all policy) is now considered inadequate, and the belief that economic development by itself would be able to reach the lower levels of the population, has been unfortunately proved erroneous in many cases (trickle-down effect). Moreover, the policies adopted to correct external imbalances (and re-pay the external debt) have often seriously worsened the economic situations, and therefore the life of many people. A relevant part of the SAPs policy package have been the privatization of public utilities (energy, water, telecommunications, transport) that has been adopted in various degrees by many developing countries, also in the Sahel.

More specifically in the energy sector, the adopted reforms followed the direction towards an open competitive market where the vertical structure of the energy industry is fragmented (different enterprises provide generation, transport and distribution of electric energy) and the property of the enterprises a monopoly of the state but, totally or partially they are owned by private companies, mainly from foreign states. In this scheme, the rules of the game are decisive, and they are set by an independent regulatory body, most of the times to be created ex-novo. The shift from a State that produce the electricity and the rules to a State that buy electricity and appoint the board of an independent regulatory body is drastic and it has been adopted with different

degrees of implementation in several developing countries.

SAPs have been replaced by Poverty Reduction Strategy Papers, whose objective is significantly changed and that, in addition, are much more tailored to the different national situation (they have to be written by national governments through a participative method). Besides that, the successful implementation of a PRSP is the prerequisite to access to the Highly Indebted Poor Countries (HIPC) initiative, whose aim is to reduce the unsustainable external debt of poor counties.

What is not changed, between SAPs and PRSPs, is the confidence that a private owned enterprise is better managed than a state owned one, so it can deliver a better service at a lower cost; this has been also considered the case of the energy sector and so privatisation of the state owned energy enterprises has continued, where possible. The relief for the state budget of the huge costs to maintain large and inefficient national energy enterprises has been considered an additional incentive.

The possible conflict between poverty reduction strategies and public energy utility privatisation, is that often PRSPs do not deal with energy in a substantial manner (if at all), and that energy utility privatisation objectives are not aimed at expanding access to the poorest, but improved management, efficiency and viability of the organisation.

As a matter of fact less than half of all national PRSPs in Sub-Saharan Africa include explicit targets and timetables to meet the energy priorities of the poor. Only one third of PRSPs actually allocate budgetary resources to national energy priorities in their Mid Term Expenditure Frameworks (MTEFs). Energy issues are also understated in national monitoring and reporting processes such as those found in MDG country reports. Out of 80 MDG country reports only 10 mention energy outside of discussions pertaining environmental sustainability (UNDP, Energizing the Millennium Development Goals, 2005).

Regarding power sector reforms, the World Bank clearly affirms that *it is vital to protect the interest of the poor during energy reforms* (Saghil, World Bank 2005). It is therefore necessary to know the extent of how far this has been achieved.

African overview and the possible paths to be chosen.

Modern energy service provision is crucial for overall social and economic development. In many of the poorest countries, a large percentage of the population does not have access to modern energy services, but still has

a significant part of the family budget committed to energy utilization, and not always within the expected quality.

An estimated 57% of the world's poor (about 1.6 billion people), about a quarter of the world's population, do not have access to electricity and a significant portion have limited or no access to clean modern fuels (such as kerosene, LPG and natural gas). Progress towards providing access to modern forms of energy has been slow, due to a combination of interrelated factors, such as income poverty, lack of internal resources to build the necessary infrastructure and reduce initial-cost barriers to access, **weakness of the private sector, institutional, legal and financial barriers**. It is projected that without strong policy changes and increase in investment in the electricity sector, by 2030, 1.4 billion people will still lack electricity. A significant proportion of this number is expected to be in sub-Saharan Africa (Modi 2005).

Africa is also aware of the challenges, and the action is already at field level, as one example, on 13-14 July 2005, the African Regional Workshop on Electricity and Development, was held in Kenya, sponsored by GNESD, UNEP, UNDP, IEA and AFREPREN. The workshop's main objective was to explore policy and regulatory options for increasing electricity access in Africa and identify the options and regulatory measures for improving electricity access to the poor especially in rural areas. From this event, a number of actions were formulated, along with indications of urgent measures to be taken by national governments:

- Legislative creation of master plan for rural electrification and making it public.
- Open the generation, transmission and distribution sector by putting in place institutional and legal frameworks.
- Regulations that recognize the low economic purchasing power of the rural population, and hence the need to be flexible in licensing fees but with minimum safety standards that must be maintained.
- Market Regulation to delegate duties to agents near the communities and be able to judge each power situation on case by case basis.

So far, most sub-Saharan reforms target the restructuring of the electricity sector to improve performance and attract private sector investment, therefore the changes are of a structural and ownership character. Although local private investors, particularly SMEs could be effective most reforms have not attempted to involve them. The involvement of SMEs could strengt-

hen local support for power sector reforms, for this purpose, some measures were indicated:

- Provide models for contracts/agreements
- Employ alternative delivery mechanisms e.g. electricity co-ops, community projects
- Develop flexible, technical and environmental standards without compromising safety
- Promote pre-payment options for energy services
- Facilitate vending of electricity and sub-retailing
- Introduce flat rate tariffs e.g. India
- Bundle electricity supply and other commercial services for viability e.g. Kenya with micro-hydro
- Explore alternative funding arrangements for non-conventional electrification.

The workshop proposed the following policy options to ensure the involvement of SMEs in the electrification of the poor:

1. Encourage large investors and SMEs to invest privately or through Public Private Partnerships (PPP) in electrification (this has already been attempted in Mauritius, Tanzania, South Africa and India). In this sense, the main actions would target: co-generation projects, building co-operative arrangements and merging of smaller projects to bring economies of scale;
2. Create an enabling environment for private investment (this has been successfully implemented in Senegal, Mauritius, Uganda, Ghana and South Africa) by providing: Legal and institutional framework; access to adequate and accurate information; and security;
3. Promote electrification of specific areas (difficult rural) through: Smart subsidies; Ring fencing of electrification funds; and Differential tariffs;

Most of the above mentioned "urgent" measures relate to national major power sector reforms, in the electricity sector in particular, and the institutional, legal and financial framework that are absent or weak in most Sahelian countries. However there are other more immediate regulatory steps that Sahelian countries can take, along with the encouragement of SMEs involvement, on regional level, in order to up scale the provision of modern energy services to the poor and this is probably of greater importance as it will alleviate more directly and quickly the demands in the household, health, and agricultural sector. These regulatory steps are reflected, for example, in the Millenium Project.

Strategic Options - The Millennium project

A recently released paper commissioned by the Millennium Project (Modi, 2005), whose focus is on the role of energy in the poorest of poor countries and the Sahel being a part of these, recommends energy targets to be achieved by 2015:

1. Enable the use of modern fuels for 50% of those who at present use traditional biomass for cooking. Support efforts to develop and adopt the use of improved cook-stoves, means to reduce indoor air-pollution and measures to increase sustainable biomass production.
2. Access to reliable modern energy services for all urban and peri-urban poor.
3. Electricity (for services such as lighting, refrigeration, ICT, water pumping and/or purification) for all schools, clinics, hospitals and community centers.
4. Access to mechanical power within the community for all communities

The underlying assumption is that these targets can be met with an approach that has **High Impact, Low Cost and is Scaleable**, or simply **HILCS**. The elements of this approach serve as the analytical framework for the regional scale up strategy.



Figure 02: West Africa's Possible Future Transmission Grid (ECOWAS 2005)

Existing international lines 2001-2002- - -
Proposed new lines -----

Kenya, Uganda, Rwanda and Tanzania have formed a cooperation framework under the East African Community (EAC) Treaty and are exploring their HILCS energy options. Some first analyses have shown that if the EAC meet the 4 energy targets by 2015, improved energy access will be provided for about 48 million people in the region. By concentrating on high impact, low cost options, this can be achieved at investments of USD 1.4 billion, which is low compared to conventional supply-side investments.

Sahelian countries can follow the example of the EAC, to implement the HILCS approach, especially since they have already established cooperation frameworks and agreements, either via the Economic Community of West African States (ECOWAS) which works on major energy issues via the West African Power Pool (WAPP), or via committees such as the CILSS. The constraints, but also the opportunities for up-scaling and some successful examples to follow are analyzed further below:

Scaling Up Constraints & Opportunities

The major constraints to scaling up energy services include:

- Insufficient institutional capacity to develop clear, cost effective and feasible implementation strategies targeting poverty reduction, including inadequate capacity for analyses, planning, implementation, monitoring and evaluation of energy supply and end use.
- Lack of general awareness about energy issues, lack of planning mechanisms and lack of a strategy to effectively address MDG goals through better delivery of modern services for health, water and education.
- Inadequate available financing at several levels, including the necessary allocations from national budgets (as reflected in the PRSPs); non engagement of the private sector due to high risk, inadequate micro-credit and consumer financing for individuals and institutions.
- Poor donor coordination resulting in lack of strategic interventions to fill the gap between financing needs and availability for investments in energy supply capacity.

There are many opportunities but also experiences and structures to build on and they include:

- Study and estimation of the demand for modern energy services, i.e. most people in the Sahel still use traditional biomass stoves, which has resulted in a fuel wood crisis.
- There is a high potential of locally available renewable energy sources, such as hydro, solar, geothermal and wind, and this must be indicated to the local market, as potentials to be explored.
- Ongoing political initiatives, such as the restructuring of the power sector, mainly via the WAPP that is trying to and has to achieve the following:

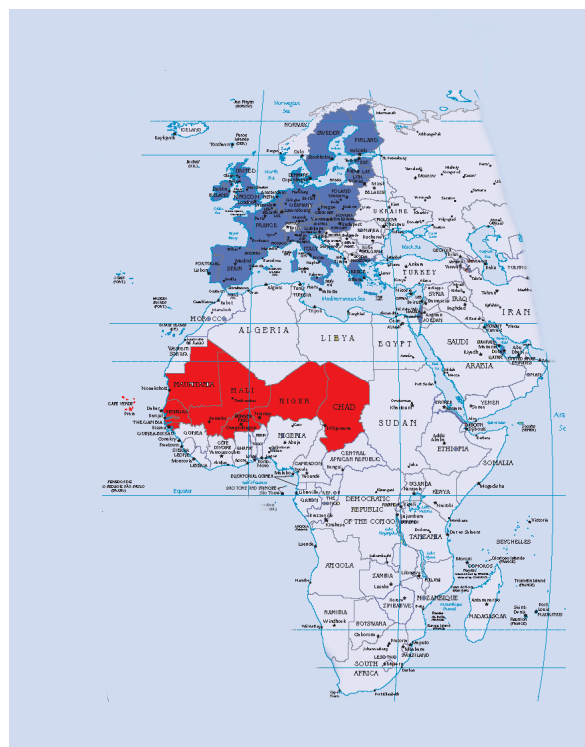
1. agreements on legal, regulatory, and institution rules governing trade in electricity among members
 2. technical cooperation for grid stability and grid extension (see figure below)
 3. rules and objectives designed to encourage investment
 4. a mechanism for dispute resolution
- Success stories showing that there are proven and cost effective methods of increasing access to energy services. These include the distribution of LPG in Senegal, electrification programmes in Tunisia and South Africa, the Multifunctional Platform project in Mali.
 - Donor support for rural energy projects has to continue, from institutions such as the World Bank, the European Union Energy Initiative and UNDP.

In conclusions, despite the potential to bring about multiple and immediate development benefits for the poor, scaling up energy services remains a challenge. Strengthening policies and regulatory systems, increasing investment, promoting local energy entrepreneurs and building capacity among rural communities which address decentralized energy needs remain the Sahelian countries most important challenges and to tackle them more needs to be done to link micro-scale experiences with policy formulation at the macro level.

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Project Schedule

The IE4Sahel project is scheduled to be developed until mid-2007, with the realisation of two main Workshops, from where the project team already ask for interested parties to mark in your agenda.

1st Workshop - Between March & April 2006 – Niger

2nd Workshop - March 2007 - Niger

Besides these two Workshops the project is also committed to involved institutions to build a permanent network between the professionals

The Project Team

			
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Long experienced research team in the field of energy planning and renewable energy systems.	Consultant firm with experience in energy policy and regulation.	The Greek national centre for Renewable Energy Sources, Rational Use of Energy and Energy Saving.	Specialised institution committed with the food security and to help the management of natural resources in the CILSS region..

How to contact the Project Team

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