

Strategies to Scale-up Renewable Energy Market in Africa

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Preamble

Energy is essential for socio-economic, human and technological development. Although there is no MDG on energy, access to energy is a fundamental ingredient to achieve the MDGs. Access to clean modern energy services is an enormous challenge facing the African continent. Africa accounts for about 3% of world energy consumption, the lowest per capita modern energy consumption in the world. On the other hand, in terms of biomass energy consumption, the African continent has the highest share in the world (59% of total energy consumed is biomass)¹. The energy-deprived people are the world's most impoverished, living on less than \$2 per day with majority living in sub-Sahara Africa.

Africa's electricity consumption remains low, about 8% of global electricity consumption. The majority of the African population does not have access to electricity. In the year 2000, only 22.6% of the population in sub-Sahara Africa had access to electricity, compared with Asia – 40.8%, Latin America – 86.6% and Middle East – 91.1%¹. Lack of access to electricity inflates production cost and makes competition in the global market difficult for developing countries. On the supply side, Africa's energy profile shows low production and huge untapped potential. The continent has one of the highest levels of average annual solar radiation; 95% of the daily global sunshine above 6.5kWh/m² falls on Africa during winter. The African energy situation is characterized by a high rate of demand driven mainly by demographic factors, while supply lags significantly behind. About 11.3% of the electricity generated in Africa is wasted compared with world's average of 9.2%¹.

There is significant variation in energy consumption among the different regions and countries in Africa. For example, electricity consumption in Sub-Saharan Africa amounts to only 2.9% of total energy consumption, while in North Africa is 15.1% and in South Africa is 25.9%. The reliance on biomass is highest in Sub-Sahara Africa (81.2%). North Africa and South Africa consume 4.1% and 16.5% of biomass respectively of their total energy budget². Thus sub-Sahara Africa continues to rely heavily on biomass. More worrisome is the use of biomass in an unsustainable and inefficient way. This over-reliance and unsustainable use of traditional biomass fuel leads to low levels of energy efficiency and ability to mitigate climate change and high levels of deforestation, biodiversity loss, and health hazards due to indoor air pollution.

In the energy crisis, women and children are the most affected. In many African societies, women and children are responsible for fetching firewood to meet domestic energy needs. Women make up 70% of the 1.3 billion poor people and women's livelihood can only be sustained by access to energy. Women and children become vulnerable to respiratory disorders and other adverse health conditions. Worldwide, 1.6 million people die each year due to the health and respiratory effects from indoor air pollution³. During the time of fuel scarcity, female children over male children are withdrawn from school to support family energy needs. Illiterate women have more children, larger and poorer families and this reinforces the cycle of poverty and under development. The provision of accessible energy options will therefore save them time and hard labour. Time previously used for wood collection and related tasks can then be applied in other productive activities such as adult literacy and skills training.

The challenge before the continent is enormous. Solving the energy crisis will require that the following be done:

- Shift from traditional to modern sources of energy and upgrade the unsustainable supply of biomass (mainly wood) energy to a sustainable provision of wood energy

1. Mersie Ejigu (2005). An African Perspective. In: *Rethinking the Energy Paradigm: Global Opportunities for Trade, Development and Sustainability*. The proceedings of the public symposium of the World Trade Organization (WTO) held on 21st April, 2005 in Geneva.

2. Karkezi, Stephen, Jennifer Wangechi and Ezkiel Manyara (2004). *Sustainable Energy Consumption in Africa*. UNDESA Report, 14th May 2004

3. Gerald Scholz (2006). *Modern Energy Services and the MDGs in East Africa*. In: *Renewable Energy for Development*: Stockholm Environmental Institute – Newsletter of the Energy Programme. May 2006 Edition, Vol 19. No. 2.

- Meet the demand for energy as a result of industrialization and population increase
- Develop/improve energy efficiency practices
- Harness untapped renewable energy potential
- Reduce dependency on fossil fuels
- Deemphasize investment in large hydro and increase investment in sustainable, decentralized renewable sources

Promotion of renewable energy and energy efficiency in Africa will address the challenges highlighted above. Renewable energies are cleaner sources of energy, and therefore are sustainable form of energy. Renewable energies can continuously be harvested because they are inexhaustible in supply and have been considered by most developing countries as an essential component of extending access to affordable energy. Small-scale distributed renewable energy systems can help to alleviate energy poverty in many communities cut off from centralized grid electricity. In many countries, it will help to reduce the importation of oil bringing benefit to local and national economies.

Though the cost associated with renewable energy technologies are not quite on the low side, they are less expensive than conventional fossil fuel. Another factor responsible for the relatively high cost in Africa is that most of the real costs of renewable energy systems are externalized. For this reason, governments in Africa should no longer delay the development of local manufacturing capacity of renewable energy technologies. This will not only serve domestic needs but have the potential to generate significant foreign exchange from exports. The transition to sustainable energy is possible, the sooner governments in Africa take the decisive steps, and the less damage will be done.

Obstacles to Renewable Energy and Energy Efficiency Development in Africa

- Inadequate policy and lack of implementation of existing policy. In African countries, policy formulation is usually left in the hands of government officials and consultants without consultation with the civil society. In other instances, policies are not given adequate publicity and thus rot away on the shelves of government officials. Such policies do not adequately reflect the needs of civil society. One key area of improvement would be to have more transparency on energy policy, and to engage civil society in the planning process. The African continent should adopt policies that encourage greater efficiency in energy use across all users; policies that encourage the development of local manufacturing capacity of renewable energy technologies; policy that encourages the prioritization of bringing modern energy services to those now without any access; policies that encourage the improvement of public utilities; policies that integrate climate change and energy programmes; policies that mainstream energy in other sectors of the economy.
- Inadequate funding of government agencies responsible for generation and supply of electricity. Funds are often allocated to procurement of military facilities and equipment by many governments in Africa, so there is less to spend on the energy sector
- Inadequate access by installers and end-users to funds or financial services necessary to buy, install and operate renewable energy and energy efficiency systems.
- Misappropriation of funds allocated to the energy sector.
- Poor market for renewable energy products in Africa. Some parts of Africa lack the right policies to develop an efficient market for renewable energy technologies.

- Lack of skilled man-power and skilled local labour to develop the energy sector in Africa. Agencies responsible for the generation and supply of electricity often do not have the necessary qualified staff and in many cases rely on expatriates from the developed countries to run some of their operations. This will usually mean higher operational costs than if local man-power was used.
- Lack of exchange of information and experience on what works and what does not within and between countries, given differences in cultural and marketing contexts.
- Minimal supporting infrastructure for these energy systems including businesses that manufacture components and whole equipment, others that stock and sell the supplies and materials, others that maintain systems in operation and businesses that provide appropriate financing.
- There are no adequate and efficient policies and legislatures that will regulate the activities of the private sector in providing energy services; private companies could capitalize on social, political and environmental circumstances for exploitation.
- Lack of awareness of renewable energy technology's advances. Renewable energy technologies have not been given adequate publicity in the continent especially among policy makers, business community and the civil society. If potential end-users do not know what energy systems are available and what they are capable of doing, there will be no demand and therefore no market for the energy system. Without adequate exposure to renewable energy and energy efficiency technologies and the services they can provide, policy makers, the business community and civil society will have limited bases upon which to make decisions and will be apprehensive to commit resources to the technology.
- The reluctance of policy makers to change from old ways of thinking and to embrace new ways of doing things. Resistance to change is usually rooted in many things, some of which may include vested interests, or cultural conservatism, or simply lack of credible information about alternatives. Lack of sensibility on the side of decision makers concerning the renewable energy potentialities could also be an obstacle to renewable energy development in Africa.
- Very little understanding of or emphasis on promoting energy efficiency from within government or industry.
- Insufficient international cooperation (e.g. signing of technological protocols) on technological transfer from developed to African economies.
- Insufficient financial resources and expertise knowledge with regard to the implementation of modern renewable energy technologies on the African continent that would be not only efficient, but also cost effective (from an emissions perspective) and equitable (from a social perspective).
- Renewable energy technologies are not affordable by many people in Africa. This has been seen as a key barrier to the development of renewable energy in Africa. This can be overcome by developing economic empower programmes.
- Existing energy policies are gender neutral and do not consider the genderised nature of energy uses and energy access. As a consequence they neglect to address the most urgent energy needs affecting the most vulnerable especially women and children.
- Vested interest of governments, development banks and large (foreign) utilities to develop large scale centralised power plants rather than consider small scale renewable based decentralised power production.
- In many countries in Africa, there are no agencies responsible to promote energy efficiency. Even in places where such agencies are present, they often have little funding and are scarcely known
- No linkage between renewable energy potentialities (including biomass) and sectoral policies (health, agriculture, etc.); it's very important to mainstream energy needs in sectoral policies.

- Lack of enforceable property rights. This comes from a lack of the rule of law, corrupt practices and poor governance.

Strategies to scale-up renewable energy market

1. Use of informal market instrument

By informal markets, we mean a system whereby end consumers of a product can pay for a product in several instalments. Because of the low-income status of the African society, many people are unable to fully pay for a solar water heater or photovoltaic or other renewable energy facilities in a single instalment. Allowing them to spread the payment over a period of time (6 months to 1 year or even longer) will help to broaden access to renewable energy systems. The government, NGOs, the private sector and financial institutions can use the informal market instrument to scale-up renewable energy markets, which will consequently help to increase access to these facilities and consequently more modern energy services. For large scale electricity generation using renewable technology, a hire-purchase type of agreement, underwritten by development bank(s) or similar institutions, but with interest of no more than 3% per annum may help.

2. Priority investment on renewable energy

Since access to energy is fundamental for development and achieving the MDGs, African governments should increase investment in sustainable energy. Yet few countries in Africa have given priority attention to investment in renewable energy technology for the majority of people now without access to modern energy services. There is need for African government to invest more on sustainable renewable energies such as solar, wind, geothermal instead of large hydro and thermal stations which have taken much of the investment on energy in the continent. A huge amount of money is usually spent constructing dams and accompanying power generation facilities and the benefits from them in many cases are not commensurate with the cost. It has sapped a huge amount of money to construct Africa's dams. If some of this money could be used to subsidize or otherwise provide renewable energy technologies, more people will benefit. Moreover, large dams have been found to contribute to the emission of greenhouse gases⁴. Since access to energy is fundamental for development and achieving the MDGs, African governments should increase investment in sustainable energy. Moreover, large dams have been found to contribute to the emission of greenhouse gases⁴.

3. Removal of import tariffs and other trade barriers

On short-term bases, the reduction or as appropriate elimination of tariffs and non-tariff barriers on renewable energy facilities may help to stimulate the nascent renewable energy industry in Africa. This should be done in a way to protect local industries. More importantly, emphasis should be laid on strengthening the production capacity of renewable energy facilities; putting in place measures to reduce the burden of high cost of energy and promoting investments on renewable energies.

4. Policy formulation

In African countries, there is need to develop a comprehensive strategy, policy and investment program for a transition to the use of sustainable energy. Considering the most urgent energy needs and existing capacities of the majority of their population, countries in Africa should develop targets for improving access to modern energy services and develop national renewable energy goals. Such a system should be anchored on the use of renewable energy and energy efficiency. Such policies should be driven by the state in partnership with private sector and active civil society participation. There should be the formulation of comprehensive sustainable energy and trade policy for renewable energy technologies and

African governments should put in place strategies for the implementation of energy policies. Civil society participation should be an integral aspect of the formulation and implementation of these strategies.

Although many African countries have formulated energy policies, the policies are too often consultant driven and lack inputs from the wider civil society and many policies in the past have passed their implementation life in the shelves of senior government officials. New policies should address all issues such as trade, production, distribution, consumption, investment in renewable energy and end-use and demand-side energy efficiency. There is need for a paradigm shift in energy development.

Policy consideration should involve:

- putting in place market and fiscal policies that promote renewable energy
- promote open energy markets to remove legislative and commercial barriers to entry and promote transparent competition in supply
- Promote non-electricity producing renewables. Cooking is the main energy need of the poor and this will not change even when electricity becomes available. Promotion of improved cook stoves, small scale biogas for cooking, solar thermal technologies for sterilisation in health centres, etc. should be considered alongside electricity producing technologies, if not in priority.
- Focus on energy end-uses. Energy policy and programmes in developing countries focus only on the provision of energy (usually electricity) to a certain number of households. One has to go beyond this paradigm and look at who uses energy and for what purpose. Linking energy access to productive and social uses of energy is a prerequisite to ensure that energy has a true impact on the socio-economic development of developing countries and really contributes to the achievement of the MDGs. For decentralised energy systems, a minimum load has to be ensured in order to guarantee proper use and maintenance of the system. Residential use alone is usually not enough to ensure this minimum load is achieved.
- Before involving the private sector to provide energy services, strong policies, legislation and institutions should be put in place to regulate their activities.

5. Improve governance on the energy sector

There is need to improve governance of the energy sector. Since electricity generation and supply require huge investments in the development and maintenance of infrastructure (e.g. transmission technologies), it is important to build upon the existing experience of government agencies in supplying electricity. African government should provide better funding for state owned utilities. Countries could establish a government-run utility that is compelled to implement energy efficiency. Policy that encouraged a public-private partnership could be developed. However, the involvement of the private sector should be preceded by policies and legislations that will regulate their activities; private companies could capitalize on social, political and environmental circumstances for exploitation. Regulations for very small power producers (below 100 kW) could be simplified, thereby allowing small companies or communities to produce energy for their own needs without being burdened under tons of paperwork and expensive application processes. Community ownership of power projects will help to break the monopolistic practices of electricity utilities and multinational oil companies.

4. The World Commission on Dams, 2000. Dams and Development A New Framework for Decision Making. Earthscan Publications Ltd, London and Sterling, VA.

6. Training of African personnel

Training of African personnel on renewable energy technologies is an important factor that will help to scale-up renewable energy market in the continent. This will help to minimize the over reliance on foreign experts in the installations and maintenance of renewable energy technologies, consequently helping to reduce the cost of renewable energy services.

7. Awareness creation

Lack of awareness of renewable energy technologies has caused major setbacks to development in Africa. Until recently, most of our policy makers and government officials were not knowledgeable on the technology, thus policy could not be formulated in favour of the technology. On the side of the potential end users, creating awareness of the technology will go a long way to help Africans start to integrate the technology into their thinking and acting. The media personnel if adequately trained on these issues can help to create awareness. The government commit adequate funds to train media personnel as well as to run jingles and advertorials in national dailies to project the importance and benefits of renewable energy. This will facilitate market growth for renewable energy in Africa. Awareness generation about energy efficiency practices, technologies and techniques will go a long way to help reduce unnecessary waste of energy.

8. Elaborate regional perspective in renewable energy development

There are sub-regional organizations in Africa that command the political support of their members. Such organizations include the Economic Community of West African State (ECOWAS), the Southern Africa Development Community (SADC) and others. These organizations have the means to promote renewable energy and integrate energy policies in development policies and expand the market for renewable energy.

Africa Energy Commission (AEC), an agency of the African Union, which came into effect in 2006 (upon ratification of establishing documents by fifteenth members) could be a platform to advocate for renewable energy particularly as we have not seen much on renewable energy coming through SADC and ECOWAS. The Dakar conference could be an avenue to try to modify and influence its agenda.

Internationally, we recommend the establishment of an International Sustainable Energy Agency which would be funded with some of the \$250 billion committed annually for subsidies currently going to fossil, nuclear and industrial biomass fuels to provide clean and safe energy from the sun, wind, tides, geothermal, and can be stored using hydrogen fuel cell technology. This would have an enormous impact on poverty since once the technology is available to developing countries, i.e., solar panels, wind mills, etc., the energy source is all free from the abundant plenty of mother earth.

9. Creation of special agency responsible for renewable energy and energy efficiency

It may be necessary for governments in Africa to create special ministries responsible for the promotion of the use of renewable energy technologies and energy efficiency. This can help to scale up the market for renewable energy if the agencies are well structured and mandated. Such agencies will be instruments to implement government policies on renewable energy and energy efficiency. Ideally these agencies will work closely with the private sector, NGOs and other stakeholders to advance national use of renewable energy and energy efficiency technologies in a coordinated manner.

10. International cooperation and negotiation on raising funds for technological transfer and channelling investments in renewable technologies operating on the African continent.

The failure of the CDM mechanism to channel more significant sums of investments into low-carbon technologies on African soil is increasingly acknowledged. Such failure needs to be understood and addressed. The international community needs to be made more systematically aware of the immense potential for renewables available on the African continent. This may be achieved through international cooperation, discussions and negotiations (particularly within the UNFCCC and IPCC framework and their side events), so that international agreements and technological protocols are agreed upon and adopted inducing the diffusion and widespread adoption of low-carbon technologies on the African continent (particularly in Sub-Sahara Africa).

For instance, we advocate for the establishment of an international fund that African economies may tap in order to promote / subsidise such investments (and research). The proceeds of such a fund may be sourced either through a levy on global CDM investments or through recycling part of the revenue obtained from auctioning trading permits (if a global carbon trading system is set up post-2012 and emissions allowances are auctioned instead of grandfathered). Alternatively, if global development and equity are indeed at the heart of the international community, developed countries committed to emission reductions (e.g. those part of the European Trading Scheme) may be obliged to meet a share of their commitments through achieving emission reductions in African economies (i.e. a CDM type of mechanism specialised on renewable technologies, particularly solar, in African countries). Furthermore, it is worth emphasising that in the long run Africa may become (if adequately supported) an important exporter of renewable energy to the European continent (e.g. UK), as the potential of the latter is much more limited.

11. Gender mainstreaming in the energy sector

Gender mainstreaming is fundamental if we must develop an energy policy that promotes even development of men and women. A gender sensitive energy programme can ease the double burden of lack of energy and poverty on women and provide opportunity for education, income generation and improve the social and economic status of families in Africa. There is need to have a gender analysis framework aimed at understanding gender issues. The capacity of decision makers, policy makers, women, planners, implementers and researchers should be built to integrate gender issues in sustainable development especially in the energy policy, and that there should be a shift from the government-only approach to an approach that embraces partnership amongst government, private and the civil society.

12. Financing

International finance institutions such as the World Bank should give priority investment to renewable energy instead of investing in fossil fuel. The developed countries of the world are responsible for most of the emissions leading to climate change and should sincerely invest in renewable energy. Organs of the United Nations such as UNEP, UNICEP and others commit huge amount of money on health care, education etc. The fact is that all these are essential, but some of these will not be achieved even if money is spent without adequate energy, and one way of ensuring adequate energy is by encouraging renewable energy. Just like African governments will need to reconsider their budget allocation to energy, so also will these international organisations. The new Climate Investment Funds proposed by the World Bank need to ensure support for renewable energies and technologies that do not impact the environment or the livelihoods of the people negatively and whose impact on poverty eradication can be measured.

13. Promote energy sovereignty and energy security

Renewable energy technologies have the ability give self reliance to local communities, where they can utilise the excellent renewable energy resources available for their own good. It will allow local people to have control over their energy resources and determine the type of energy to use for their daily needs. In Africa, this issue of energy sovereignty needs to be scaled up and this can only be possible by the use of renewable energy. Renewable energy can also help to limit the insecurity in terms of supply of energy and promote access to more vulnerable populations. We therefore advocate that renewable energy should be integrated into local development plan while focusing action on the development of rural enterprise (including local production).

14. Develop and enforce sustainability criteria for bioenergy

We advocate for the urgent development and application of sustainability criteria for biofuels, at regional and global level, that includes the entire life-cycle. While sustainable and efficient use of biomass energy holds great potential for local development, commercially driven biofuels production could devastate the natural resources base in huge areas of Africa if there is not stringent regulation, as well as great caution regarding promises of foreign exchange earnings. Wood and charcoal are renewable energy sources as long as they are produced sustainably (which normally is not the case). Therefore one of the major challenges should also be to upgrade the unsustainable (traditional) supply of biomass (mainly wood) energy to a sustainable provision of wood energy. For example, in Madagascar the three largest cities are provided with sustainably produced charcoal for cooking which is the major household energy need.

15. Financial viability

The sustainable introduction of renewable energy into Africa must be founded on commercial viability. This means that the users of renewable energy technologies, and the suppliers of these systems, must all see some form of financial benefits. This will enable the optimum growth of renewable energy market otherwise the use of renewable energy will always be dependent upon external finance, grants and short-term policy obligations.

We therefore advocate for the establishment appropriate supply chains for renewable energy into Africa. Most important is the distribution of the systems, fuels and appliances – this incurs the greatest cost and presents the greatest barrier (physical and economic) to energy access. Up-front finance to enable local businesses to purchase renewable energy supplies is a requirement that could be met through government or through external donor finance. An instrument – perhaps part of an energy agency or Government energy department – to facilitate the development of business plans by local entrepreneurs or co-operatives, could be a good first step to establish the commercial infrastructure required to supply and maintain renewable energy services in Africa.