ADB FINESSE Africa newsletter

Financing Energy Services for Small-Scale Energy Users-ADB FINESSE AFRICA NEWSLETTER 1.5, AUGUST 2004

contents

The FINESSE Africa program is funded by the Royal Dutch Government through its Ministry of Development Co-operation and executed by the Sustainable Development and Poverty Reduction Unit of the African Development Bank

The FINESSE Africa program can be reached at:
African Development Bank, PSDU
Temporary Relocation Agency
BP 323, 1002 Tunis Belvedere
Tunisia.
E-mail: finesse@afdb.org

From the Editor's desk

We welcome our readers to the debut edition of our thematic newsletter, which focuses on wind energy in Africa. The focus on wind energy comes in the wake of a strategic study, commissioned by African Development Bank (ADB), on the development of wind energy in Africa. Given the positive results of this study, various initiatives from different parts of the continent and the global momentum to promote renewable energy, the ADB will organised the 'First African Wind Energy Investors Conference' to be held in Tunis, Tunisia, on 28-29 October 2004. This conference will be supported by the FINESSE program. The conference seeks to bring together all stakeholders, present the results of the study by ADB, and mobilise interest in the development of wind energy technologies in the target countries.

Unlike our 4 previous newsletters, this edition is much bigger as it carries 5 articles from various parts of the continent. The article on the Darling wind farm in South Africa summarises experiences in implementing a wind energy project in a country that generates most of its power from coal. Various lessons can be learnt on how wind energy market can be developed even under such circumstances. Besides large-scale applications, wind energy can have positive effects on small-scale users such as villages and community services. You will also find an article on the development of small-scale wind energy turbines in Africa as well as some experiences on a project already implemented.

Articles carried in this edition, once again, reinforce the fact that the target of energising the African continent must include renewable energy technologies at both large and small-scale levels. While large-scale wind energy projects do support current electricity grids, it must be noted that small-scale decentralised wind energy projects can have a higher impact on the lives of the majority poor in Africa who have no access to the grid and at business as usual scenario will not be reached by the grid in the foreseeable future. Given such a background a two pronged approach that seeks to develop the requisite supportive regulatory frameworks on one hand and on the other hand consider strategies of up-scaling current initiatives, for both large-scale grid connected and small-scale decentralised projects, can ensure improved access to sustainable energy in Africa.

Forthcoming FINESSE Activity

Event : **FIRST AFRICAN WIND ENERGY INVETSORS CONFERENCE.**
Venue : Hotel Africa, Tunis, Tunisia.
Dates : 28-29 October 2004.
Contact : Mr. Youssef Arfaoui, African Development Bank
Email : y.arfaoui@afdb.org / o.nicol@afdb.org
Tel: (216) 71102308 Fax: (216) 71834178

Development of wind energy in Africa

By. Y.Arfaoui

The African continent has the world's lowest energy consumption rate and the quality of energy consumed continues to be very poor. This lack of access to energy to meet basic human needs manifests itself in various poverty related dimensions such as poor social services like water, health, education etc. The socio-economic development of African countries should therefore be largely based on the satisfaction of energy needs without increasing pressure on natural resources and this could be done through the exploitation of renewable energy resources.

Africa has huge renewable energy resources such as wind energy whose potential is estimated at 20% of the world's wind energy sources. Additionally, wind energy is a source of electricity production suitable for electrical grids and isolated sites in rural areas. The African Development Bank (ADB)'s sectoral Energy Policy encourages African countries to develop renewable energy resources. In the early 90s, ADB funded the African Energy Program, which was created in consultation with African countries, international and sub-regional organizations. The goal of the Program was to carry out in-depth analyses of the African energy situation. A comprehensive study on renewable energy sources was also completed in the exercise.

Within the broad renewable energy sector, the ADB has been studying approaches to support development of wind energy projects, a field that is the fastest growing renewable energy source in the world today. Being aware of the gain that could be obtained from using wind energy, the ADB has carried out a *Strategic Study of the Deployment of the Wind Energy in Africa*. The main objectives of the study were to:

a) Evaluate the wind energy potential of Africa;

b) Analyze the main technical, environmental and economic features of countries with a high wind potential;

c) Analyze the legislative, regulatory and institutional framework of those countries with a view to determine their enabling policy/regulatory environment for wind project development;

d) Elaborate a strategic plan for the development of wind energy investment in Africa within 2004-2012.

The study includes a quantitative map of average wind speeds on the African continent which allows instant identification of the best African countries in terms of wind resource. The map is as on page 3.

Even though many African countries have immense wind resources, the development of their potential requires the support of an appropriate framework for the energy sector, particularly the electricity sector. For example some countries like India and China have improved their electricity production by exploiting renewable energy sources. The main conditions reunited for these success stories include:

- a market liberalization and the authorizing of independent power producers (IPPs) to participate in the generation of electricity;
- the guarantee of the purchase of electricity from renewable energy through a simple, attractive and adapted system; and
- access to the grid by independent power producers through a transparent and equitable technical tariff system.

Countries like South Africa, Algeria, Cape Verde, Egypt, Morocco, Mauritania and Tunisia have shown some interest in the development of wind energy. However, it seems that no country in Africa has developed such a framework for the deployment of wind energy.

On one hand, regarding the deployment, on a commercial scale, of the production of electricity from wind energy, Morocco and Tunisia seem to be the most committed to translating their declared objectives into action, particularly by granting concessions to independent power producers through competitive bidding. On the other hand, South Africa, Algeria and Egypt are yet to develop the requisite frameworks . In fact, these countries own important fossil fuel and conventional energy resources allowing them to produce electricity at very competitive prices. As for Cape Verde and Mauritania, they seem to presently have a fairly favorable energy context for small-scale wind projects for small grids in remote locations.

The study recommended that full advantage be taken of wind energy project opportunities in four countries, namely South Africa, Morocco, Mauritania and Tunisia, with a view to develop wind energy projects on the African continent as an integral part of a medium-term strategy for the development of Africa.

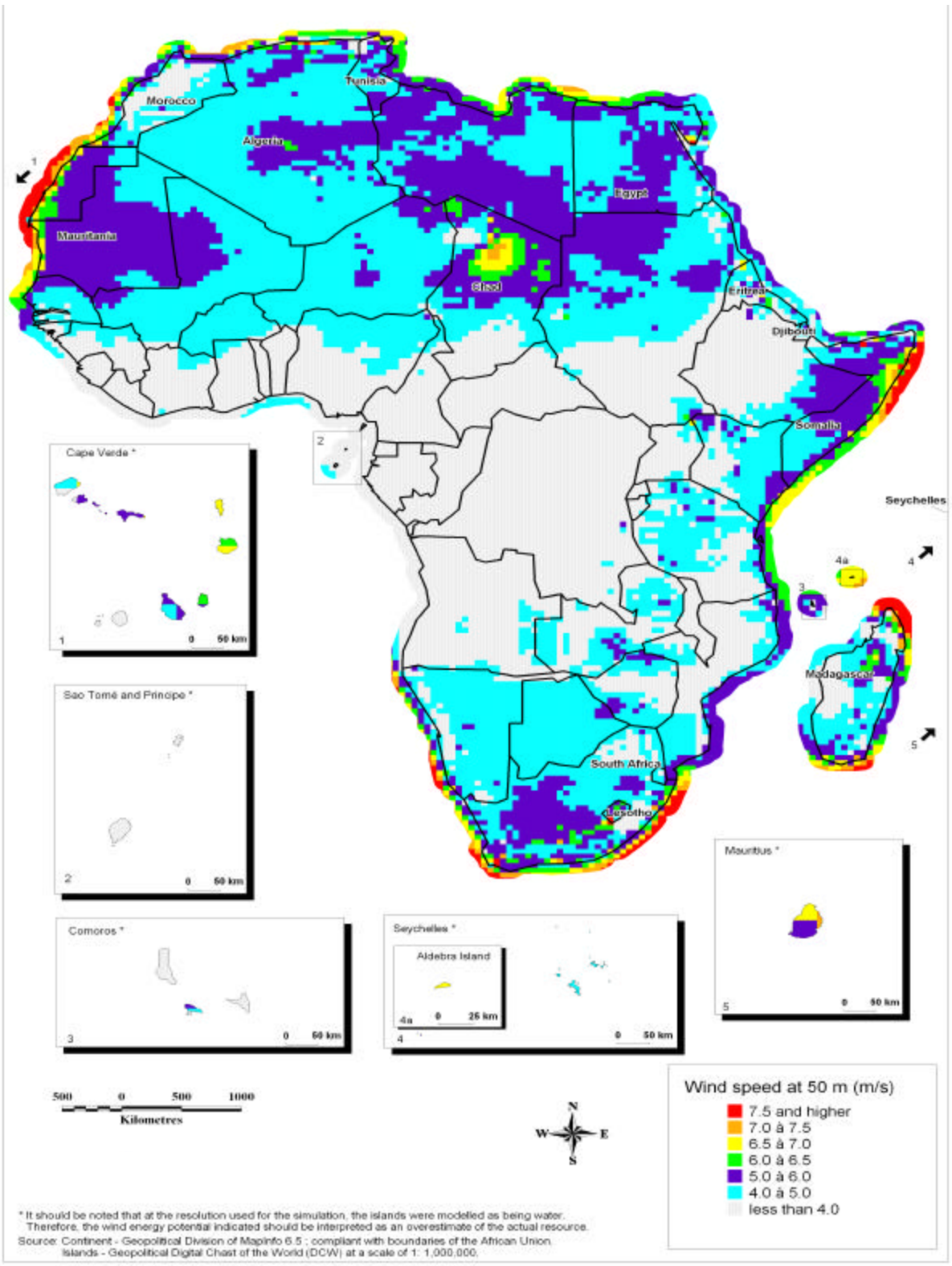
One of the main suggestions of the study is for the ADB to adopt a step-by-step approach to the development of wind energy in Africa, where countries, which have significant wind energy resources and appropriate legislative frameworks already in place, will be targeted initially. The rest of the continent could be attended to at a later stage.

The ADB plans to start implementing the findings of the study by organizing an investors conference in Tunis on the **28th-29th October 2004**. The convention will attract delegates from eight selected countries with the highest prospects for developing wind-based energy projects, i.e. Cape Verde, Eritrea, Madagascar, Mauritania, Mauritius, Morocco, South Africa and Tunisia. Financial institutions, multi-lateral banks, bi-lateral development banks and potential developers, investors and technology suppliers will also participate at the conference.

Continued on page 4

Development of wind energy in Africa (cont.)

Map showing wind speed simulated at a resolution of 50km



Development of wind energy in Africa (cont.)

The conference intend to present and discuss the results and conclusions of the study; illustrate successful case studies; and mobilize stakeholders interested in the development of wind energy projects in those countries.

Participants of the Conference will discuss the bottleneck issues of policy, institutional capacity and human resources. They will assist the selected African countries to generate ideas on how to generate a pipeline of investment projects in wind energy in order to accelerate the provision of reliable energy supply to urban and rural areas.

After the workshop, participants will collaborate to implement the recommendations of the study in their respective countries, and keep involving the ADB in the progress. The role of the financial institutions is to device mechanisms for providing adequate lending facilities to private developers in order to encourage and speed-up the implementation of wind technology in Africa.

It is envisaged that the workshop will result in the Bank being increasingly approached for investments in wind energy projects in Africa. For many African countries, renewable energy presents a substantial advantage compared to other forms of energy. For more information, contact Mr. Yousef Arfaoui at : y.arfaoui@afdb.org .

African Wind Energy Association

by K. Davidson

It is a geographical fact that much of Africa lies within the equatorial belt which, due to the effects of atmospheric heating and the earth's rotation, has a lower wind resource compared to countries in more extreme latitudes. In the past this has been seen as a barrier to the development of a wind power industry across the continent. Experts now agree that there is considerable potential for large scale development in the north and south of the continent, and in light of the rapid growth of the wind power industry around the world it would be foolish to rule out the possibility of further development in the central region. One only needs to look at the example of India, which had a 6% share in the global market in 2002, to see how equatorial regions can still use wind energy successfully.

In 2002 there was 148MW of installed capacity for wind power generation on the African continent, a mere 0.5% of the global total. A study on global markets for wind energy expects this figure to reach between 620 and 1000MW by 2007, depending on market conditions.

Factors that boost the prospects of the wind market in Africa include a high future demand for electricity generating capacity, and the enthusiasm of international donors to invest in clean energy schemes. However, the political priorities of governments, their policies on energy, electricity and climate change, as well as their ability to act on such policies remain a huge issue for wind energy projects in all African countries.

The African Wind Energy Association (AfriWEA) was founded in 2002 in order to encourage manufacturers, developers, governments, renewable energy owners and individuals to promote and support wind energy development on the African continent. In November 2003 they organised the 2nd Annual World Wind Energy Association conference in Cape Town, attended by over 1000 delegates from over 50 countries. Today, the membership exceeds 90 people in 19 different countries.

AfriWEA aims to become an influential umbrella organisation representing the wind energy sector in Africa and thus assisting interaction and co-operation between all energy players. It will be a network through which support around the world will be obtained or given on wind energy matters. In this way it shall promote the development of and investment in wind energy on the continent. All its activities are based on principles of finding alternatives to fossil fuelled power because of the threat it imposes to our global climate, and that national and local governments have a responsibility (and should be encouraged at every opportunity) to incorporate strategies for renewable energy schemes into their policies.

The Associations goals for the future include, the organisation of local, national and international conferences, workshops and training courses to spread valuable knowledge, information and experiences throughout the membership, to provide a more educated, coherent and united voice of support for wind energy. The Association also wishes to facilitate consultation between all sorts of parties: the energy industry, local and national governments, academic institutions, other industries that could benefit from investment in wind energy, not to mention the general public and other institutions such as those concerned with conservation of the environment. Raising awareness of the wind power industry, sometimes dispelling the myths that surround wind turbines, and highlighting the practical changes they can bring to communities remains one of the Associations highest objectives.

AfriWEA also recognises the importance of delivering technology in an appropriate manner, and provides equal support to large grid connected projects and smaller stand alone systems. In this early phase the Association is looking to increase its membership so that it has a broader knowledge, experience and resource base. For more information, K. Davidson (oelsnergrp@wcaccess.co.za) or visit http://www.afriwea.org

The Darling Wind Farm – A Kick Start for Wind Power in South Africa?

By K. Davidson

In South Africa's West Coast region, an hour North of Cape Town you will find the sleepy village of Darling. Darling is set to become the birthplace of a revolution in South Africa's energy industry and set precedence for other developing countries.

The South African energy industry is characterised by a single utility, ESKOM, that is responsible for supplying electricity throughout the country. Other countries in the region like Swaziland, Botswana, Zimbabwe have part of their electricity supplied by ESKOM. The utility makes use of generous deposits of coal that lie deep underground, to fuel conventional power stations that provide electricity at a bargain price for most South Africans. With such a low cost and plentiful energy supply, the incentive to invest in alternative power sources is low.

But as the effect of Carbon Dioxide emissions from fossil fuel combustion on our climate became more well known across the globe, changes are afoot. All over the world, governments almost became obliged to issue statements and measures that promised to take global climate into account when formulating their policies, and proceeded to adhere to them with varying degrees of success.

Following the global trend, the Department of Minerals and Energy in South Africa published its White Paper on Energy Policy in 1998 expressing support for renewable energy with eloquent proclamations like: "Government will work towards the establishment and acceptance of broad national targets for the reduction of energy-related emissions that are harmful to the environment and to human health" and "Government will ensure a balance between exploiting fossil fuels and maintenance of acceptable environmental requirements."

Shortly afterwards, the World Summit for Sustainable Development 2002 was entrusted to the South African Government by the UN – a chance to win a whole host of environmental gold stars, and investment, from visiting delegations.

All this excitement over renewable energy came at exactly the right time for Hermann Oelsner. Having moved to Darling from Johannesburg in the early '90s, he was immediately struck by the ferocity and consistency of the wind over the rolling hills of the Swartland landscape. The idea of building a wind farm to generate electricity for the local people turned into a mission. The Council for Scientific and Industrial Research (CSIR) did the initial wind resource assessment and identified a suitable site 10km North of the village. In 1997, AN Windenergie GmbH Germany and Bonus Energy from Denmark provided technical input, the latter is one of the largest wind turbine manufacturers in the world. The expert opinion from all concerned was that is was a near-ideal site for a wind farm. In 2000 the Minister of Minerals and Energy declared it a national demonstration project for the WSSD 2002, stating that the wind farm would "test and or inform decisions around replicable and or novel approaches to recognised energy and environmental problems and act as a platform for replication by the public." So far everything was going according to plan.

4 of the 10 wind turbines at Darling Wind Farm

The Oelsner Group, founded and remains the main shareholder of Darling Independent Power Producer (DarlIPP), which will sell the energy from the wind farm when it is completed. Financial modelling undertaken in 1999 showed that based on a total contract value of R40million for a 5 MW wind farm and an IRR of 8%, cost of electricity generated would be R0.38 per kWh. Doubling up to 10MW would reduce the cost to R0.33 per kWh. To sell electricity to the local municipality at the current market price of R0.20, the project would need a reduction in capital cost through grant funding of R20million.

There were some initial delays in the project in developing a Power Purchase Agreement between DarlIPP and ESKOM. However, a favourable agreement has been reached with Cape Town municipality, who has agreed to buy the power, paying a little extra for it in their efforts to reach their self-imposed target of 20% of their electricity to come from renewable sources by 2020.

This target is higher than the national government's, and illustrates the way in which local governments can sometimes have just as much influence on the future of renewable energy schemes as the national government.

"Think globally, act locally" are the words of Rene Dubos and are a mantra for all sustainable development implementers. In order for a project to succeed, the local community must be involved and consulted at every stage of development, but at the same time the global implications of the development should be taken into consideration. Global warming and its cause, the emissions of Carbon Dioxide and other greenhouse gases is a global problem that is caused, and therefore can only be solved, by local action. The 13MW windfarm is only a part of the 'Sustainable Environment and Employment Scheme', or Darling SEES.

Continued on page 6

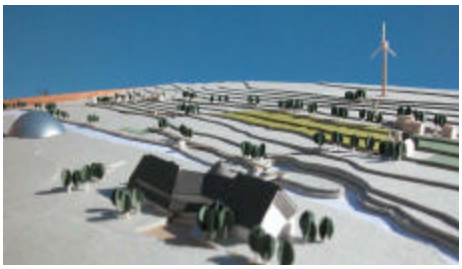
The Darling Wind Farm – A Kick Start for Wind Power in South Africa? (cont.)

Besides employment opportunities the construction of the wind farm will bring, there are plans to boost the local economy further by building a visitors centre, showcasing the benefits of sustainable development and ecologically sound living, on land adjacent to the wind farm.

A permanent exhibition will explain the practicalities of alternatives to South Africa's current Carbon based energy supply to visitors. A variety of educational facilities including a library and lecture theatre is planned, as well as accommodation facilities for conferences or visiting students. The buildings are to be an example of low energy construction, using thatched roofing, which provide excellent insulation, walls and flooring made from compressed earth, and a ventilation system powered by solar energy. Materials are to be sourced locally wherever possible.

Facilities continue outside the buildings with a reed bed drainage system, which purifies waste water from basins and toilets before being discharged into the river. Examples of renewable energy technologies include a 250KW wind turbine which provides the electricity for the centre. This turbine is 5 times smaller than the ones on the main farm, situated high up on the hill. Water conservation methodologies, examples of organic agriculture and restored wetland habitat will be on display. The visitors centre is based on the principle of 'thinking big', there is something for every visitor.

The visitors centre is only the beginning of what is planned in Darling SEES. The West Coast is a region of South Africa blessed with consistently high wind speeds, and open space ripe for the development of further wind projects. The deep sea port and steel works at Saldanha would be a prime location for the importation and manufacture of wind turbine components. An eco-industrial park is being planned as a place to provide local employment in industries that will benefit, not destroy our environment.



A model for the Darling SEES Centre

Projects such as this illustrate the huge economic benefits building a wind farm can bring to all sorts of sectors of local economies. Treating wind farms as tourist attractions and building up an economy around them has been done time and time again in Europe and elsewhere, with great success.

Discussions towards the end of 1999 let to an agreement that DANIDA, the UNDP and Global Environmental Facility (GEF) would jointly provide assistance to further the development of an on-grid wind energy programme in South Africa. Almost 5 years later, it is hoped that the lessons learned at Darling can pave the way for the expansion of many more wind farms in the near future to make this goal a reality for Africa. For more information contact K. Davidson (oelsnergrp@wcaccess.co.za) or visit http://www.afriwea.org

Small wind energy turbine manufacture in Africa. by Hugh Piggott

Electricity is something that most of the people in the industrialized world take for granted, just as they do clean tap water and a stable government. For most people in rural Africa, electricity is a luxury that they can only hope to have one day. The mains electricity grid is spreading painfully slowly. The grid can offer electrical energy at a low unit cost compared to small wind and solar systems, but most rural communities would struggle to pay the normal electricity bills required to justify the cost of the poles and wires.

A small amount of electricity for radio, TV and minimal lighting has quite disproportionately high value per unit, compared to the larger amounts of electrical energy used by most urban dwellers. I have learned this lesson myself, living beyond the mains electricity grid on the Scottish coastline and gradually building up my home power system as time and money allowed. Off-grid battery power systems do not compete on unit cost with mains electricity but with small engine driven generators. Energy from engines is much less attractive and much more expensive per kilowatt-hour than the grid. And it is noisy, polluting and wasteful.

In Africa, a small amount of electricity at the local school or clinic can make all the difference when recruiting staff and providing adequate services. Villages with no power become marginalised by a process of migration of talented and entrepreneurial members of the community to the nearest electrified settlements. Many rural households rely on car batteries to run black and white TV sets or to charge mobile phones. A renewable energy source in the village could be used to provide battery charging services. This would avoid the need to carry batteries long distances to have them charged elsewhere.

A battery charging station serving households with no power

Continued on page 7

Small wind energy turbine manufacture in Africa (cont)

African weather conditions are more typically sunny than windy, so the obvious source for off-grid systems is photovoltaic (PV) solar electricity. Solar home systems are a widely recognised phenomenon making inroads into the huge off-grid market. A small PV panel and battery can be an affordable solution for basic electrical loads. The battery is used to store the energy until it is needed. But the cost is still high. The fact that PV manufacture takes place largely in the developed world is an obstacle. Foreign exchange is required to import PV technology.

Suitable sites for small wind turbines are localised, but in a continent the size of Africa they are still plentiful. Coastal zones and some highlands have very suitable wind regimes. Where the windspeed at 10 metre height averages more than 4.5 metres/second (10 mph), windpower can be a good option for electricity generation. Better still, wind and PV combined into larger systems can offer a much more regular source of energy to keep batteries charged than PV or wind alone. PV can be relied on to produce energy daily, but the wind also blows at night. Often doudy periods will have higher windspeeds. A 'hybrid' supply that uses both wind and sun will provide more reliable energy, and will reduce dependence on expensive battery storage.

One big advantage of small wind turbines over PV panels is the fact that they can be manufactured locally. Imported wind turbines cost foreign currency. Small wind turbines do also have a poor track record for reliability. When things go wrong the imported machines require expensive foreign support. The lack of local expertise and spare parts may very easily result in premature failure and disappointment. Many brands of wind turbine are now made cheaply using Chinese labour, but they are marketed by westerners with high operating costs due to western salaries and global logistics. A local industry on the other hand could offer efficient, low-cost support. Local employment and empowerment are some of the other attractive spin-offs of local manufacture.

Against this background there have been a number of initiatives to stimulate local small-scale windpower manufacture. I have been invited to contribute to several. My experience is with hands-on research into what works and what doesn't in the small wind industry. I have designed and built many wind generators and worked with most manufactured brands.

In 1996 I helped Zimbabwe Energy Research Organisation (ZERO) and Powervision of Harare to build a prototype machine for low-windspeed battery charging. The target output was only 250 watts, but we chose a large 3.6 metre diameter for the rotor blades. The big rotor produced full power in 6 m/s (13 mph) winds. Most commercial wind turbines are designed to give full output in much higher and less common windspeeds. These smaller machines are cheaper and therefore sell well. Customers normally just look at the maximum power rating and the price. But small machines that offer more 'watts per dollar' often need a 14 m/s (31 mph) wind to produce full power. A wind machine that sweeps a larger area delivers better value because it produces more units of energy each day. It produces useful output in the more common, lower windspeeds. These smaller machines are cheaper and therefore sell well.

The prototype installed in Eastern Zimbabwe was trouble-free, and also proved to be capable of delivering higher power in higher windspeeds although this did not result in very much greater energy production on sites with low average windspeeds. A new company, African Windpower (AWP), was set up to manufacture the machine with some cosmetic changes. For marketing reasons the rated power was upgraded to 1000 watts. Hundreds of AWP 3.6 wind turbines have been sold in South Africa and the USA. Not so many have gone to provide electricity to the rural poor. But AWP has earned foreign exchange in Zimbabwe and avoided some carbon emissions from diesel generator sets. n 1999 I worked for Intermediate Technology Development Group (ITDG) to launch small scale manufacture in Sr Lanka and Peru. My contribution was a simple but efficient permanent magnet alternator - easier to manufacture than the AWP type. As magnets have become cheaper and more powerful, I have refined this design to achieve a higher power density. I now give frequent workshop courses at which a cross-section of enthusiasts, engineers and developers learn the basic skills of small wind turbine construction. The design is ideal for developing-world applications because tooling costs are so low.

Prototype wind turbine powering a clinic

An AWP wind turbine providing village electrification

Continued on page 8

Small wind energy turbine manufacture in Africa (cont)

This year I was privileged to work with EnterpriseWorks Ghana (and local partners REES), training a select group of 18 craftsmen and technicians in the basics of small wind turbine manufacture. I was impressed by the sophistication of the project. Apart from training for manufacture, the project will support demonstration installations and then focus on marketing and quality control. The emphasis is on creating a self-sustaining commercial process. EnterpriseWorks believe that sustainable development comes from profitable private enterprises. There is a lot more to starting a small-scale wind industry than just building a subsdised prototype. EnterpriseWorks envisage a place for small wind turbines in situations where the consumer wants more than the very minimal energy offered by PV panels. Unlike PV, wind has economies of scale.

Ghanaian technicians prepare to erect a 2.4 metre diameter machine (Photo by Senyo Dake)

"Whereas multiple, expensive, photovoltaic solar panels are required for anything other than low-wattage lighting or low-power battery charging; wind-powered generators have a much higher output per unit cost and therefore, given a site with good wind speeds, are more suited to significantly enhancing the income or service provided by a small business. "Examples include:

- Internet cafés, video cinemas, business and communications centers that bring remote communities into the information age.
- Hotels and enhanced tourism facilities
- Health centers: sterilizing, lighting, refrigeration, laboratories
- Processing machinery, packaging and sealing to add value to local produce, sewing machines
- Schools: video, computer, lighting for evening classes and libraries
- Repair shops: drilling machines, grinders, etc.
- Rural banks: computers and lighting
- Fishing communities: packaging and early fish preparation for external markets
- Security: often one of the first community decisions on connection to the grid is to install street lighting in key areas."

The concept of local manufacture bringing off-grid power to the poor in Africa has not been properly tested yet, but the pace is beginning to pick up. That's a good thing because we need to do something about poverty and carbon emissions now, before it's too late. Small wind turbines have their place as one piece of the solution. But there is plenty of work to do before we have locally produced wind turbines that are both reliable and economical. For more information, contact Hugh Piggott on (http://www.scoraigwind.co.uk) (hugh@scoraigwind.co.uk)

Improving rural livelihoods through renewable energy provision By. J. Chigwada

The thrust on renewable energy, (WIND in particular) and rural development is key to poverty eradication, which enables access to health care, provision to education and wealth creation in Zimbabwe as demonstrated by a project carried out by ZERO(Regional Environment Organisation) between 1990 and 2001. Gender issues must not be overlooked when linking energy and sustainable development.

The role of energy in sustainable development is also to provide services that allow for efficient development that is environmentally friendly, economically sound and ushers in social equity, which are the essential pillars of sustainable development.

Many rural areas in Zimbabwe, except for some rural service centers, are not connected to the main electricity grid. Rural communities are mainly dependent on fuel wood and paraffin. About 70 % of rural households use firewood as a source of energy. Although paraffin is a subsdised commodity, not many rural households can afford to buy it if it is available. In early 1990s the Department of Energy proposed the need for expanded rural electrification program. Due to limited government finances the program has been very slow and has mainly concentrated on providing electricity to rural hospitals and clinics and government secondary schools. Renewable energy use has been rather limited with NGOs being the main drivers in experimenting with solar, wind and biogas.

The “Power from Wind" Project arose out of the growing need for and focus on renewable sources of energy. The project involved a three-year wind monitoring exercise conducted in the country in the late 80s and early 90s, which found that there was potential for the development of a low wind speed turbines that could generate useful amounts of electricity. Through the efforts of its research staff, ZERO initiated this project mainly to prove that wind energy is a viable source of renewable energy in Zimbabwe and can be successfully used to provide electrical power.

Continued on page 9

Small wind energy turbine manufacture in Africa (cont)

Monitoring sites were established in other areas to assess wind resources and 4 pilot wind generators were installed.

The use of wind power is highly site specific, but following the initial results of the resource monitoring programme, it appears that as much as 33% of Zimbabwe has sufficient wind which can be used for a viable wind power generation. Mechanical windpumps have been in limited use in Zimbabwe for over fifty years. The use of wind turbines to generate electricity has been virtually unknown until recently. The relatively low windspeeds that occur in most of Zimbabwe were considered insufficient to allow the cost effective use of wind generators. In 1996, ZERO initiated a project with funding from the Netherlands government to examine the potential for wind power in Zimbabwe. Experienced British wind power consultants joined forces with ZERO and local electronics company, Powervision, to undertake a resource monitoring programme and the development of a locally manufactured wind turbine optimized for local conditions. The resulting prototype was tested at Dumbamwe, near Rusape, and showed that wind could provide a cost effective to alternative solar PV. Following the initial success of this project, Powervision continued to develop the turbine until it was ready for commercial production. 90% of the material used to construct the turbines is made locally. In contrast to imported solar PV modules, the wind turbine represents an African solution for an African need.

Wind turbine providing power to a community service centre

Comparatively wind energy systems are cost effective to photovoltaics, which would require a larger array of panels with every increase in the number of consumers. In this regard wind turbines are more suitable for larger institutional and community loads. On a suitable site, the system can provide power to clinics and schools for the use of:

- projector,
- TV and video;
- vaccine refrigerator;
- room lights;
- operating light;
- staff housing lights;
- radios;
- computer and printer;
- lights after hours for study;
- science equipment;
- sewing machine.

Other applications include;

- water pumping for safe water supplies or irrigation;
- small workshop tools for small enterprises;
- portable battery charging.

Roughly 90% of wind turbines cost is for local components and combined with Power Vision's three KW sine wave inverter and locally made deep cycle traction batteries creates a sophisticated system comparable to any European Installation without the need for high import costs. Keeping expenditure local stimulates the local industry. Backup service is available direct from the manufactures.

For more information please visit: http://www.zero.org.zw or E-mail: johannes@zero.org.zw.

Energy Events

MAKING RENEWABLE ENERGY A REALITY—NIGERIA

Venue : Port Harcourt / Obudu Plateau—Nigeria
Dates : 21—28 November 2004
Contact : Nikki Skuce
Energetic Solutions
Box 3352
Smithers, B.C.
Canada VOJ 2NO
E-mail: nikki@onesky.ca
Tel : (250) 877 6030

FIRST AFRICAN WIND ENERGY INVETSORS CONFERENCE.

Venue : Hotel Africa, Tunis, Tunisia.
Dates : 28-29 October 2004.
Contact : Mr. Youssef Arfaoui,
African Development Bank
Email : y.arfaoui@afdb.org / o.nicol@afdb.org
Tel: (216) 71102308
Fax: (216) 71834178

Energy News from Africa

Uganda: EADB Gives Kakira $8m Loans

In one of its biggest advances to the private sector, East African Development Bank (EADB) has given loans totalling $8.5m to Kakira Sugar Works (KSW). The funds will be used to facilitate KSW's power co-generation expansion. EADB's director general, Godfrey Tumusiime, KSW's chairman Dr. Jack Luyombya and director James Kahooza signed the agreement on Friday at the bank's head office in Kampala. Dr. Luyombya said the loans would augment Kakira's co-generation facilities and help it acquire new power generation equipment and distribution lines to interconnect to the national grid. "The expanded co-generation project will increase power output from 4.5MW to over 14MW. When the project is completed, KSW will be self-reliant and supply 6MW to the national grid during peak hours," he said. http://allafrica.com/stories/200408090885.html

Sénégal/Commune de Thiès: plus de 189 millions décaissés pour que l'électricité revienne

Pour n'avoir pas honoré ses engagements relatifs au paiement des arriérés de factures dus à la Sénélec, certains services municipaux de la commune avaient été privés d'électricité, sans passer sous silence l'arrêt de la plupart des ordinateurs. Tous ces agréments qui avaient momentanément perturbé le bon fonctionnement de l'administration municipale sont à classer depuis quelques jours au passé. En effet, la
commune a décaissé tout récemment un pactole de plus de 189 millions de francs à la Sénélec, en attendant de compléter le reste dans le court terme. Cette somme, selon l'adjoint au maire de la commune chargé de l'eau et de l'énergie, est estimée à 171 millions. Omar Diagne poursuit : «cette décision de la Sénélec est tombée au moment où nous recevions le fonds de dotation allouée par l'Etat et qui se chiffre à 144.122.480 francs. Nous ne sommes jamais restés les bras croisés. C'est pourquoi, nous avons fait preuve d'imagination pour décaisser un montant de plus de 45 millions que nous avons ajoutés à celui octroyé par l'Etat pour faire un premier geste" Au niveau de l'administration municipale, "il ne s'agit nullement d'une mauvaise volonté des autorités municipales
d'honorer ses engagements vis-à-vis de la Sénélec, mais tout simplement de contraintes liées à un problème d'ordre financier qui va bientôt être résolu». http://fr.allafrica.com/stories/200408190356.html

Public Participation Capacity Building Program launched in SADC.

The use of Public Participation (PP) in energy projects faces many challenges that limit the full benefits of Public Participation from being realized in the SADC region. The Southern African Institute for Environmental Assessment (SAIEA) has designed a World Bank and Canadian CIDA funded project that will increase the capacity of southern African countries in involving the public and civil society in decision-making in projects that affect them. This project is being called the "Calabash Project". The focus of this project is to develop a capacity building and research program at the community and government level so that communities, private sector and Government ministries involved in project approvals have the capacity to use PP more effectively. An electronic library of the most practical and relevant PP information that could be used in the SADC region has been launched on the Calabash website. There are over 250 web based PP resources grouped under SADC, Africa and International. Detailed ex-post analyses of case studies where PP was used successfully in 6 projects in the SADC region are almost complete, and the findings will also soon available on the Calabash site. This research is also forming the basis for the methodology for PP, which is appropriate to the SADC cultural and social situation. Workshops will be planned to bring stakeholders together to discuss information and knowledge generated through Calabash, as well as the lessons learned in the 6 case studies. This will be the embryo for forming the SADC PP methodology, and PP training programs etc. Work is also underway to develop template terms of reference for different types of public participation programmes. And, all international, regional and SADC country rights to participation are being compiled into one reference guide that will be accessible through the Calabash website. Calabash welcomes all news, information, opinions and ideas about this initiative as well as matters related to and public participation. For more information please visit : http://www.saiea.com and clicking on **Calabash :** E-mail: Peter.croal@saiea.com.

Editorial Committee

Web Resources

ADB FINESSE Africa newsletters : http://www.afdb.org/about_adb/finesse_newsletter.htm
African Wind Energy Association : http://www.afriwea.org/
World Wind Energy Association : http://www.wwindea.org

Subscribing to the ADB FINESSE Africa newsletter? Please ask to be added to our mailing list!
Send your request to finesse@afdb.org

To unsubscribe;
Sent a blank email to finesse@afdb.org with the following subject 'unsubscribe'