

21 May 2002

Policy Dialogue and Sustainable Energy in Kenya
Sustainable Energy in Kenya: An Overview – The Good, The Bad & The....

Ladies and Gentlemen,

It gives me great pleasure to open this session and present at this, the first of several sessions of this DFID-supported programme for sustainable energy in Kenya. My presentation consists really of a series of “facts” regarding Kenya’s sustainable energy environment, intended primarily to stimulate and provoke discussion, and a few issues which I would like to suggest need careful attention as we move along in our efforts to promote sustainable energy development.

In the beginning....



I would like for us to cast our eyes backwards to one of the most important events in the world that marked a new era for sustainable energy international – the event was the United Nations Conference on New and Renewable Energy, August 1981, held right here in Nairobi. I made my first visit to Kenya as a delegate from the Sudan to that conference, along with over 2,000 other official delegates and over 10,000 other people. It was the world’s largest energy conference at a time of high oil prices, at a time when the whole world was looking for alternatives to fossil fuels. There was excitement in the air, a feeling that the world was embarking upon a new path towards sustainable development, and that was not very far from the truth!

Those were heady days in Kenya. I was amazed to see the displays of new efficient cook stoves, of solar photovoltaic lighting systems, of wind pumps and wind generators, of solar water heaters, wood biomass ovens, and an array of “alternative” devices and forms of energy that would take Kenya and the entire world into another era, away from reliance on fossil fuels and unsustainable uses of energy. I was even more amazed to see how many of these new and strange devices were produced in Kenya, and to find so many Kenyan companies displaying their work and their wares at the KICC. For someone coming from another part of the developing world, Kenya was undoubtedly at that time the world’s leader in new and renewable energy development and commercialisation.

I came to live in Kenya in 1982 for what turned from a planned two year period to over 12 years. I ran an international energy project covering all of sub-Saharan Africa, nearly every country EXCEPT Kenya, for the next four years, then set up my own company. Today my company, ESD, has a joint venture with EAA, one of Africa’s most active and successful

sustainable energy companies. What I quickly learned, that reinforced the images of my first visit to Kenya in 1981, was that Kenya led Africa, indeed the world in renewable energy and energy efficiency. While others talked about these things, Kenyans did them. Today, when I give examples of sustainable energy development – commercially, technically and socially sustainable – I cite Kenya more than any country in the world, and with good reason.

The Good

In the 1960s a large company in Western Kenya produced annually over 70,000 tonnes of charcoal on a sustainable basis, exporting 35,000 tonnes to the Tororo Cement Factory in Uganda and selling the remainder in the markets of Nakuru, Kisumu and Nairobi. Based upon this company's experience, an additional 50,000 tonnes of charcoal was sustainably produced primarily from black wattle (*acacia mearnsii*) in the Rift and Central Provinces by well over a thousand small scale, well-organised, well-trained producers.

In 1983 a new improved stove called the Kenya Ceramic Jiko or KCJ was commercially introduced into Kenya's urban markets. The KCJ wedded Far Eastern ceramic technology with jua kali metalworking; today over 85% of all Kenyan urban households use the KCJ and this "new" stove has saved tens of thousands of hectares of dryland savannah in Kenya. Today, throughout Kenya, the KCJ is a "traditional" stove, and the technology has been disseminated commercially to other countries in the region, from Ethiopia (over 2 million commercially produced) to Malawi. Over a thousand Kenyans produce the KCJ full-time.

Improved institutional (school, hospital, commercial) wood stoves were first introduced in Kenya in the mid-1980s. Today, thousands of primary and secondary schools throughout Kenya utilise this sustainable fuel technology, and, as with the KCJ, Kenyans have successfully exported this technology on a commercial basis to Ethiopia, Uganda, Tanzania and Rwanda. This technology saves schools and parents (both rural and urban) hundreds of millions of Shillings each year. Its production generates hundreds of jobs each year.

Dozens of bilateral and multilateral donor and NGO projects cropped up in the 1980s and 1990s to promote the dissemination of photovoltaic (PV) technologies for rural lighting, health and entertainment. With the exception of the health sector, no such programme of any size has ever been undertaken in Kenya. Yet, more PV systems have been commercially sold, with no subsidies, with no donor support, than almost any country in the world, certainly in Africa. Well over 100,000 solar home systems (SHS) are operational throughout rural and peri-urban Kenya. The industry employs hundreds of technicians, and hundreds more are engaged in assembling or producing various components for the systems.

Simultaneously, hundreds of thousands of Kenyans have stopped waiting for the grid to be extended to their rural and peri-urban areas, and they have purchased lead acid (car and lorry) batteries both used and new to power their television sets, video machines, radio cassettes and lights. Collectively they spend tens of millions of Shillings each month to charge those sets, whilst spending hundreds of millions to purchase the batteries.

Kenya's two largest battery manufacturers sold over 100,000 specially designed household batteries in Kenya in 2001, with perhaps 40,000 for solar home systems, and the rest to be used directly for powering household appliances. Perhaps as many as a million rural Kenyans use car batteries in this manner.

While the electricity grid reaches probably not many more than 5% of Kenya's urban population (estimates vary from 3% to 10%), rural and peri-urban Kenyans have voted with their pocketbooks to purchase and utilise "modern" electricity at an expense that can hardly be imagined in most parts of the world; rural Kenyans spend more than 200 Kenyan Shillings per kilowatt hours to charge and operate these batteries, while those connected to the grid spend less than a tenth of this.

In the same vein, tens of thousands of generating sets, petrol and diesel, are used in rural and peri-urban Kenya. Again, no donors or national programmes have encouraged this. Again, people have voted with their pocket books to provide their own modern energy primarily to provide primary energy for productive uses (grain milling, coffee milling, oil extraction, dairy processing, welding, among many other uses).

In 1979, Kenya's first solar water heaters were built and installed in Nairobi, later on the Kenyan Coast and in safari camps throughout the country. Since that time at least 50,000 systems (over 100,000 square metres) of Kenyan-made solar water heaters have been in produced and sold commercially, without any donor or government support.

Kenya is Africa's leader in the use of geothermal resources to generate electricity, and over 70% of Kenya's total electricity generated comes from renewable energy resources (hydropower, geothermal and wind).

In 1995, Kenya had fewer than 50,000 household lpg (liquefied petroleum gas) cylinders in use, almost entirely in the four largest urban areas. By March 2002, over 700,000 cylinders were in use throughout Kenya, without any donor or government promotion. Industry analysts believe this figure could exceed one million within the year, particularly if government import duties are eliminated. By contrast, Senegal began a programme, with strong donor and government support and subsidies to promote lpg use starting in the 1970s. Today, approximately 1 million cylinders are in distribution after donor and government subsidies of tens of millions of dollars!

There was a time not so long ago when Kenya was Africa's first producer of ethanol, where ethanol substituted for nearly 20% of all petrol consumed in cars. There was a time when sugar bagasse substituted for a large amount of electricity. All Kenya's large tea companies rely on sustainably produced wood to meet their heat energy needs, while almost no tea is processed in Kenya's smallholder tea factories using wood – rather fuel oil is imported and transported to over 45 smallholder factories at a cost of hundreds of millions of Shillings a year, raising the cost of smallholder tea production, and lower the returns they get...

And, the list goes on....

The bad...

And now the not-so-good news.

Despite a **rural electrification** programme for nearly 20 years, probably no more than 5% of Kenya's rural households are connected to the grid. The primary reason tens of thousands of diesel and petrol generators have been purchased in rural and peri-urban areas is to provide power, at well over five times the grid electricity price, to use productively. Concern continues to be expressed over rural to urban migration, the lack of employment opportunities in rural Kenya, yet very little has been done by anyone other than the farmers and merchants

themselves to provide the energy necessary to keep money in rural areas, hence provide incentives for young people to stay.

Rather, the bulk of Kenya's rural production gets exported to urban centres at a massive cost in transport (unsustainable petroleum use) to be processed on the main grid. Today, as a proportion of rural population and businesses, fewer rural Kenyans have access to grid electricity than they had 30 years ago when Kenya had less than half the rural population of today.

Over 80% of Kenya's households meet the bulk of their energy needs on an unsustainable basis, relying almost entirely **on woody biomass**. Small scale charcoal is one of rural Kenya's major cash crops, accounting perhaps for as much rural income as tea or coffee, providing essential incomes to meet cash needs, to pay school fees, to offer opportunities in poor rural areas.

Charcoal production for urban households reduces Kenya's dryland savannah by over 50,000 ha per year. Most urban households rely on charcoal for their cooking, although the rapid increase in lpg distribution has slowed this process. Nonetheless, well over 90% of Kenya's rural and peri-urban population depend upon woody biomass for almost all of their energy, and that woody biomass resource base is diminishing by the year...There are policies that affect the wood energy sectors, but they lack coherence and co-ordination, and they do not reflect the needs and realities of today. Policy related to the sustainable production and transformation of Kenya's woody biomass sector is one of the most pressing issues today.

In 1985, nearly 100% of Kenya's electricity was generated from renewable energy resources. Today, even with two years of good rainfall, less than 70% of our electricity is generated from renewable energy resources. Kenya has abundant wind, geothermal and solar resources, and many hydropower resources, particularly small hydropower sources, have yet to be exploited. The cost to Kenya of importing petroleum products to meet its grid electricity demands, and the demand of generators from users who are not connected to the grid costs hundreds of millions of Shillings. Things could be different....

The issues...

I would like to close this brief presentation by posing several questions that relate to the urgent need for Kenya to develop a coherent set of policies to support the sector. It is the objective of this project to promote dialogue in this area, and the questions I pose are:

- How can we meet Kenya's rural energy needs sustainably – how do we ensure sustainable biomass?
- How do we electrify rural and peri-urban Kenya, particularly electricity for productive uses, energy that accelerates Kenya's economic development?
- How do we maximise **efficient** use of Kenya's renewable energy resources **and** use imported resources to optimally accelerate development? And,
- How do we accomplish all of this within a linked, co-ordinated policy framework that maximises the use of Kenya's dynamic human, business and other resources?

I would like to say that if all the successes highlighted in the first part of my presentation could have occurred with little or no co-ordinated national energy policy, just imagine how many more success stories could be told were such a policy framework in place. These are the

challenges that Kenya faces in this new millennium, in this new century. Can we rekindle the hope and excitement of Kenya in 1981, can we harness and channel all of Kenya's dynamic commercial and social energy to harness Kenya's energy resources sustainably to accelerate economic growth and improve all Kenyans' livelihoods over the next years? I would argue that the answer to these questions is most assuredly yes, as has been demonstrated by the phenomenal and dynamic efforts by thousands of Kenyans over the past two decades. But, this can only happen within a policy framework that has been developed with the active participation of Kenya's key stakeholders and stakeholder groups.

I wish you all good luck in your endeavours throughout the next several months in this vein. Thank you very much!