Energising africa

'Leapfrogging' energy technologies can help, and so can more investment and partnerships for developing Africa's abundant resources.

by Ogunlade Davidson

The importance of modern energy provision in African development cannot be over-emphasised, as it is the nucleus of socio-economic development worldwide. However, large numbers of Africans depend instead on firewood and charcoal, reflecting the comparatively low level of industrialisation on the continent. Moving out of this stage requires a substantial increase in cost-effective and affordable energy sources, while minimising environmental hazards and ensuring social equitability and sustainability.

For Africa to be competitive, its per capita primary energy needs to be increased. In comparison with the rest of the world, Africans are among the smallest consumers of primary energy. In addition, Africa has multiple energy technologies to satisfy the needs of 30% of the population, in urban areas. The rural areas, where the remaining 70% live, have limited energy choices. It must be a priority for African governments to ensure that the rural majority has access to the same choices as those who live in urban areas.

Natural resources

Africa's shares of proven reserves of coal, gas and oil at the end of 2000 were 5.7%, 7.4% and 7.1% respectively, according to British Petroleum data. Exploiting these reserves at current rates, they will be depleted in 266, 82 and 27 years respectively *(see graph, next page)*. These are above the world average for coal and gas (227 and 61 years respectively), and below for oil (39.9 years). It is worth noting that Africa's share of non-renewable resources will rise as a result of recent oil and gas finds.

Africa's huge supply of fossil fuels, presently exploited for exports, has to be used within the continent because as commodity prices continue to either fluctuate or decline, returns from such exports either dwindle or become unpredictable. Developing the downstream end of such resources so as to boost industrialisation on the continent is crucial.

Developing Africa's fossil resources requires a strategy that reflects the skewed distribution of these sources, hence different approaches for the different regions. Northern

Africa, with a large share of oil and gas, will need to exploit these resources, as will western Africa. Central and eastern Africa will need to include geothermal systems (as in Kenya and Ethiopia) and major hydropower systems (as in Uganda), as these are abundant there. Similarly, coal should be included in southern Africa's sustainable energy system — especially in South Africa, which has over 90% of the continent's coal deposits. Fortunately, significant technological progress is being made in developing these resources, resulting in both improved energy and environmental efficiency.

Renewable energy

Africa has significant renewable energy options. Being mainly in the tropics, solar energy is quite pervasive. In addition, agricultural production can lead to large quantities of biomass, as in Mauritius where these practices already contribute significantly to their electricity. Wind is available in selected areas, such as Egypt, Mauritania and Mozambique, but the most available resource in nearly all countries is hydropower. However, the technologies for renewable energy are not ideal.

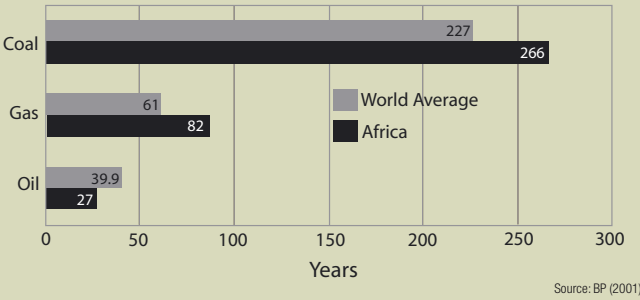
> African governments need to act collectively in approaching critical energy issues

Solar energy devices are generally yet to be cost effective while wind — where the resource is available — compares well with more conventional systems. Solar water heaters can prove useful in certain niches such as rural areas that are far from the national grid. The use of modern biomass in the industrial, power production and transport industries is supported, as waste products from agricultural processing are good feedstock for such systems.

But it is worth noting that fossil fuels have dominated the global energy scene for more than a century and will continue doing so for at least another generation. Any new energy system will require substantial changes to the entire energy infrastructure and huge capital requirements, as will the costs involved in overcoming the obstacles posed by vested interests.

Financing energy investments is particularly challenging because of limited domestic capacity, which has led to the dominance of foreign financing and continued influence by donors and multilateral institutions. In recent years, the most notable prescription from these institutions has been for Africa to liberalise and privatise the energy sector, as in the cases of Senegal, Côte d'Ivoire and Uganda. While there are advantages in reforming the sector's management,

Africa's Fossil Fuels to Production Ratio



Source: BP (2001)

increasing access to affordable, modern energy for poorer communities has been ignored; so has maximising indigenous energy resources. As a result, higher energy prices and energy scarcity have characterised such reforms. A departure from this vicious cycle is advisable.

The search for solutions

Effective transfer of technologies will require partnerships among major stakeholders. African governments will have to formulate and implement measures that will improve the capacities of these countries to better receive technologies, while governments of technology suppliers will need to formulate policies that provide incentives for technology suppliers to find such transfers attractive.

Energy technology "leapfrogging" can have a positive impact on African countries as they move towards a more sustainable development. Leapfrogging involves moving from one technology to another without going through the certain intermediate stages, such as moving from a traditional firewood stove to one using liquefied petroleum gas, while ignoring improved charcoal and kerosene stoves.

But past experience has shown that African governments need to act collectively in approaching critical energy issues and must introduce institutional reforms to facilitate regional joint ventures. Africa's fossil fuels and renewable energy alternatives are abundant but most of these reserves are yet to be exploited due to the lack of capital resources, infrastructure and institutions.

African countries can contribute their abundant energy resources, provided the technological and financial support systems are available, which will require significant external assistance.

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