

# Technology and Angola's Energy Future

An interview with  
Dr. Ann Eggington, Head of Europe, Middle East and Africa Division,  
International Energy Agency<sup>1</sup>

Dr. Eggington led the IEA team of experts whose findings on Angola's energy sector have recently been published in *Angola: Towards an Energy Strategy*.

## *IEA OPEN Bulletin*

**Oil accounts for a big share in Angola's energy resources; oil export revenues account for 80% of the nation's budget. What constitutes the backbone of domestic energy supplies?**

### *Dr. Eggington*

*While Angola is potentially rich in terms of oil export revenue, much of this revenue is mortgaged through repayment of earlier oil-backed loans and it is not available in the short term. Moreover, the effects of almost three decades of civil war mean that there are huge demands for investment of government funds, for example in health, education and transport infrastructure, as well as the energy sub-sector.*

*As Angola consolidates its successful transition to peace and democracy, the energy sector is essential to meeting the aspirations of all Angolans for higher living standards. The government and industry have substantial developments under way, but this is a tough challenge and there is much to do.*

*Electricity is available to less than 20% of Angolan citizens; and that electricity is not sufficiently reliable. There are problems in providing dependable supplies to populations in the cities, and there is little rural electrification.*

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<sup>1</sup> It was in her former capacity as Director, International and Infrastructure, in the Energy Markets Unit at the United Kingdom Department of Trade Industry that Dr. Eggington led the IEA survey team that visited Angola. Dr. Eggington joined the International Energy Agency in September 2006.

*Some 80% of Angolans rely on biomass for most of their energy needs. Wood fuel is largely used in rural regions, while charcoal is preferred in peri-urban areas.*

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**What issues arise from such widespread use of biomass and charcoal? And what role can technology play in addressing those issues?**

**Dr. Eggington**

*There is a sustainability issue. Most of the unsustainable use of biomass appears to come from cutting down trees for making charcoal to supply domestic use in peri-urban areas. Angola's biomass reserves are substantial but severe local deforestation has occurred around most large cities. For example, deforestation now extends over a radius of 200-300 km around Luanda. Such deforested zones are growing yearly, in turn raising charcoal-transportation costs, which make up the largest part of the price. In addition, smoke from inefficient cook stoves can lead to serious health damage.*

*The situation could be improved through technology to enhance the efficiency of the charcoal production process, for instance by using more efficient kilns. And greater efficiency and safety in end-use would also help, for instance through more efficient and safer stoves. Such steps would reduce the amount of charcoal consumed. But the Angolan government also needs to look in a co-ordinated way at the lack of energy alternatives for most of the country's population and how today's technologies might offer suitable ways of harnessing different sorts of energy.*

*In addition to use of biomass by rural and peri-urban households, rural industry also relies heavily on fuel-wood for fish-smoking, brick-making, ceramics manufacturing and baking. These industries employ tens of thousands of people, and the income they produce frees many rural households from poverty. Here again, enormous potential exists to improve the efficiency of industrial ovens, dryers and bakeries that run on charcoal and other biomass.*

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**As it re-builds its economy, Angola faces major infrastructure difficulties, notably in providing electricity for rural populations. Do you see biomass as a potentially important fuel for power generation? And what about the potential for solar, wind or other renewables for electric-power projects?**

**Dr. Eggington**

*Much of Angola's small-scale industry was destroyed in the war, but the potential for using biomass in the form of forestry and agricultural residues - notably from sugar cane - for heat and power is considered to be very large.*

*So far as solar power potential is concerned, solar irradiation levels are high in Angola, attaining 5kWh/m<sup>2</sup>/day throughout the year in Luanda. So there is clearly potential in the country for using solar energy, particularly to supply electricity to small communities and families in areas with no grid access. Solar could be used, for example, in health clinics for refrigeration of medicines, in schools, in operating pumps for water supply and in telecommunications. Despite high capital costs, an important advantage of solar systems is the lack of fuel requirements. This is significant since diesel fuel, while subsidised, is often in short supply in rural areas. So far, programmes aimed at promoting household use have focused on photovoltaic (PV) systems and have been limited to a few pilot projects. Currently, capacity for exploiting solar-energy is low in private households.*

*Since Angola has numerous rivers, there is also major potential for large-scale hydropower installations. Estimates of economically available hydropower potential vary, but are thought to be around 18 GW, with the possibility for producing some 72 TWh per year, though some sources provide figures as high as 150TWh. This suggests that current installed capacity represents only about 3% of the country's potential. At least seven additional sites on the Kwanza River have been identified as suitable for large-scale hydro-electric plants. The potential for small-scale hydro, however, remains to be explored.*

*Modernising Angola's electricity network is of course among the key priorities. In 2002, the Angolan government, together with the two major electricity companies, published a strategy for the development of the electricity sector. While this did not include a separate strategy for rural electrification, it listed a number of principles on which the eventual strategy should be based. These include the requirement that the development of electricity access should be part of an integrated rural development strategy. Another is that it should include tariffs that reflect real costs at a level that allows for viable financing. A third is that it should feature the right to access electricity but not the right to electricity itself.*

*Significantly, the 2002 strategy called for investigation of the potential for different renewable forms of energy for rural electrification, including solar, mini- and micro-hydro, wind, biomass and hybrid systems such as wind-diesel.*

*In examining recent developments, the IEA review team felt that the government was probably correct to focus on rehabilitation of existing infrastructure in the short term before promoting a major expansion of electricity access in rural areas. At the same time, however, the government could promote an enabling environment that would allow entrepreneurs to pursue rural electrification on a decentralised basis in a manner that makes minimum demands on the government's organisational and financial resources.*

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**How can the international community help Angola create the modern energy systems it needs?**

**Dr. Eggington**

*The Government of Angola recognises that it is facing a key challenge as it strives to bring its people the benefits of reliable, affordable energy. That is why it invited the IEA team to provide an external perspective on the energy sector and to make recommendations on priorities. In our task, we worked closely with experts throughout the government and with the energy companies. In welcoming the report, the government of course accepts that it now has to consider the insights offered by the review and decide how to take its efforts forward.*

*But we also hope that Angola: Towards an Energy Strategy will be useful for actors in the international community, including international financial institutions, donor governments and potential entrepreneurs and investors. Our aim in delivering our findings has also been to provide this wider international audience with an in-depth study of the challenges and opportunities of the energy sector in Angola that will help them to develop their own future strategies and identify worthwhile projects for future investment or aid.*

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