OBApproaches

January 2005 | Note Number 003

Output-based aid in Mozambique

Private electricity operator connects rural households

By Mark Cockburn and Caroline Low

Mozambique's first privately operated concession to generate, distribute, and sell electricity is now up and running in a rural area of Inhambane Province isolated from the country's main transmission grid. The contract was won through competitive bidding by a Mozambican and South African consortium and leaves the private operator free to develop the power system in the concession area in the way most cost-effective. Designed to tackle the extremely low levels of connectivity, the concession uses output-based aid subsidies to close the gap between what new infrastructure costs and what households are willing and able to contribute. Payment of the subsidies, made available through an International Development Association credit, is contingent on physical verification of households being connected. Encouraged by early success with the concession arrangement, the government is identifying areas for similar schemes.

With per capita income of $210 and an estimated 55 percent of the population below the poverty line in 2002, Mozambique is one of the world's poorest countries. In recent years, with strong growth in the economy, poverty levels are believed to have fallen sharply. Yet enormous deprivation remains in infrastructure, with the country needing to rebuild what was destroyed during years of civil war (1977–92) and to provide those living outside the urban centers with access to modern energy services. Although Mozambique generates more than 7 billion kilowatt-hours (kWh) of electricity annually, much of it from the Cahora Bassa hydro station in the western province of Tete, about 80 percent of this production is exported to South Africa. Fewer than 6 percent of Mozambican households are connected to the main grid operated by the national utility, Electricidade de Moçambique (EdM), or to isolated mini grids run by local municipalities. The country's low population density makes it costly to connect new customers.

EdM has focused much of its recent investment on extending the grid, which will provide northern provinces and other outlying areas, now powered by standalone diesel generators, with cheaper and more reliable power purchased from Cahora Bassa or South African generators. But this focus on grid expansion leaves fewer resources for building local distribution networks and for improving the performance of isolated systems while they await the grid.

Meanwhile households without access to electricity typically pay as much as 40¢ per kWh for energy from alternative sources such as kerosene or batteries—far more than the 7¢ per kWh charged by EdM (which nearly covers costs) or the 15–20¢ in areas relying on diesel-generated power. That suggests that, once connected, these households would be willing and able to pay for their electricity use. But the up-front cost of connection is out of reach for the typical household. Nor is it realistic to assume that an investor might finance new distribution assets with the idea of recovering the full investment through tariffs over time, since many households, at least initially, would probably consume only enough electricity to power a radio and one or two lightbulbs.

Thus financial viability ultimately depends on higher levels of demand from commercial customers and richer households. But output-based aid (OBA) offers a way to connect households that otherwise would not be, without undermining the economics of the system as a whole.

Mark Cockburn *and* ***Caroline Low*** *of Cambridge Economic Policy Associates (www.cepa.co.uk) are advising the government of Mozambique on four more rural electricity transactions.*

Special thanks for comments and contributions by ***Wendy Hughes****, Task Team Leader on the Mozambique Energy Reform and Access Project.*

The government of Mozambique, committed to private participation in infrastructure provision as a means of securing the investment needed for economic and social development, has sought to combine concessions with output-based aid to expand access to electricity. The Electricity Law of 1997 lays the foundations for privately operated electricity concessions, authorizing the minister of mineral resources and energy to award such contracts and setting out some of the terms of concessions. An energy fund, set up to finance rural electrification schemes, has been given responsibility for monitoring the payments of OBA subsidies. So far, output-based aid in the Mozambican electricity sector has been targeted at all households, not just the poor, in part for simplicity and also because of the need to establish a sustainable base business in areas with low connectivity.

Choosing a pilot site

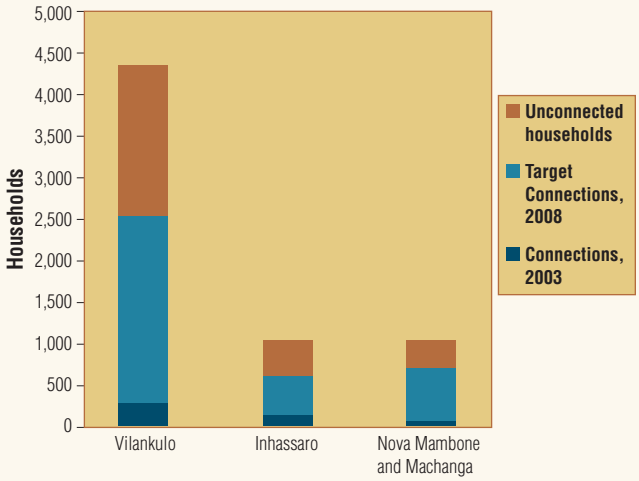
The government chose to pilot its concession approach to electricity supply in Inhambane Province, an attractive site for several reasons. A key factor is the local economy. The unspoiled islands of the Bazaruto archipelago, which lie in the Indian Ocean off the coast of the province, have become an international destination for luxury ecotourism, and the high-end tourism has spurred economic growth that has spread to the nearby mainland. The concession area was initially designed to include the three district capitals along this stretch of coast: Vilankulo, Inhassaro, and Nova Mambone. Following detailed studies of the project economics, including aerial surveys of household density, the area was extended to include Machanga, in the neighboring province of Sofala. The increasing economic activity in the area, particularly in Vilankulo, promises strong demand from hotels and other businesses as well as wealthier households, providing assurance that potential bidders would be able to sell enough electricity to create a viable business.

Lying beyond the reach of the EdM grid, these towns have generated their own electricity using diesel or gas from the nearby Pande gas field. The existing set-up offered an advantage in designing a concession that would interest private investors: the distribution assets were relatively new and, since they were owned by the Ministry of Mineral Resources and Energy, could be transferred to a concession without charge and without the need for complex negotiations with EdM.

The towns' power systems had been operated by a private company under a management contract. While the contract allowed some adjustments to the monthly management fee to penalize or reward performance, these provided too little incentive for the contractor to improve collection rates, connect new customers, or communicate and coordinate with customers and the local authorities (figure 1). Responsibility for investment remained with the central government, leading to delays in providing new generating capacity so that demand exceeded supply.

By transferring payment and investment risks to the private sector, a concession contract will considerably sharpen incentives to expand the system and improve its operation. That outcome would have been more difficult to achieve under a management contract, even if performance-related payments had been increased.

Figure 1: Household connection rates extremely low under the management contract in 2003



Source: World Bank. 2004.

Designing the contract

The concession agreement gives the concessionaire the right to generate, distribute, and sell electricity throughout the concession area. The contract is relatively simple, reflecting the government's intention to regulate with a light hand, but it sets out clearly the rights and responsibilities of each party and allocates risks appropriately. The concessionaire is not exposed to unreasonable business risk; for example, no rival company can sell electricity within the concession area. Nor is the concessionaire rewarded for poor performance; it will bear the full costs of technical and administrative losses and receive subsidy payments for new household connections only after they have been verified.

The concession contract and supporting agreements have the following key provisions:

- The base *tariff* and indexation rules are fixed for five years, after which they may be amended according to agreed principles.
- The *role of the local authority* in managing and monitoring the concession contract is clearly recognized through the inclusion of the municipality of Vilankulo as a signatory.
- *State ownership* is limited to 25 percent of the issued share capital of the concession company.
- The *contract term* is 20 years—shorter than the 25-year maximum allowable under the Electricity Law but judged sufficient to allow the concessionaire to make an acceptable return on its investment.
- The concessionaire has *exclusive generation rights* for 10 years and *exclusive distribution rights* for 20. But if cheaper electricity becomes available—such as through the EdM grid—the concessionaire is obligated to pass some benefits on to consumers.
- The concessionaire must pay *penalties* if supply is interrupted or if it responds to problems more slowly than the agreed standards.
- The *concession area may be extended* by agreement of the parties to the contract.
- The concessionaire must pay the government a *concession fee* of 2.5 percent of gross revenue billed.
- A *subsidy agreement* between the concessionaire and the government provides for payment of a $400 subsidy for each new residential connection made. No subsidy is paid for business connections.

To protect the concessionaire from late payment or nonpayment of subsidies, claims for subsidy are made through a local commercial bank, one of the country's largest. The bank, whose services were competitively procured, administers a letter of credit, guaranteed by a special commitment from the International Development Association, to be drawn on as subsidy payments become due.

This mechanism assures the concessionaire of being paid the subsidy following verification of connections by an independent engineer, whose services are now being competitively procured. The subsidy agreement provides remedies for material breach by the concessionaire (for example, claiming subsidies for connections not made). But it is structured with "tolerance limits" relating to the cumulative number of qualifying connections that can be in dispute at any one time—to avoid contractual breach procedures being called for trivial reasons.

Bidding the project

The first stage of the bidding was a prequalification round, designed to ensure that the consortia invited to submit full proposals had the financial and technical capacity to operate the concession. Most consortia combined the local expertise of a Mozambican company with the experience of a company from elsewhere in Sub-Saharan Africa—such as Namibia or South Africa—in delivering new investment and operating concession contracts.

In the second and final round two bidders submitted fully priced bids against a fixed concession contract, ensuring competitive pricing and limited renegotiation of the contract terms after selection of the preferred bidder.

Bidders were required to state the tariff at which they would supply electricity given a fixed subsidy payable for each new residential connection. This structure gave bidders a strong incentive to design a distribution system allowing the connection of the largest number of households possible. Apart from this incentive and the service requirements of the contract, bidders had complete freedom to decide how to develop the power system most cost-effectively. The winning bidder has chosen to connect the major towns in the concession area and build a large central generator to replace the existing decentralized arrangement. Its bid assumed that all residential customers would be switched to prepaid metering, with the aim of significantly improving collection rates.

The winning consortium of ElectroTec (Mozambique) and Rural Maintenance and Siemens (South Africa) bid an average tariff of 18¢ per kWh. Although this tariff is higher than the previous tariffs, commu-

nity members agreed that they were willing to accept higher charges in return for much better service. The tariff, though quoted here in U.S. cents, is set in Mozambican meticais, with a formula for adjustments following changes in fuel costs or exchange rates.

Next steps and lessons learned

The pilot scheme promises about 3,000 new connections (see figure 1). That represents 50 percent connectivity in the four towns in the concession area—but a mere drop in the ocean given the more than 3 million households still to be connected countrywide. As might be expected for a pilot scheme, the transaction costs per connection are high. To deliver real benefits, the concession model, once proven, needs to be rolled out rapidly to other parts of the country. The challenge is to identify other rural areas with a household density and strong local economy like those in Vilankulo—factors that, along with cheap local gas for generation, were vital in attracting private sector interest. Future concessions may need to include grid-connected periurban areas, to allow the use of cheap hydropower delivered through the grid and ensure sufficient demand to create a sustainable business.

Future concessions are likely to be bid on the basis of the proposed subsidy per connection, with the tariff fixed—in contrast with the Inhambane pilot project, where the subsidy payments were fixed by the government and bids were based on an average tariff.

While the winning bidder's proposed tariff has now been accepted by the community, concern about the increase over the EdM tariff, especially among local businesses, led the concessionaire to attempt to renegotiate the tariff. Fixing the tariff rather than the subsidy should avoid such pressure. It would also allow greater equity in tariffs across the country and the inclusion of a lifeline tariff, with very low charges at low levels of use.

How successful will the Inhambane concession be? It remains too early to judge: the contract was signed in mid-2004, and operational control has only recently been transferred to the new operator. But for Mozambique to have reached this point—with a signed contract awarded through real international competition and giving the private operator strong incentives to deliver—represents an enormous achievement. The country is ready to build on this success.

References

Tobich, Ralf. 2002. "Concession Approach for Private Participation in Electricity Supply: Mozambique Case Study." Paper presented at Global Forum on Sustainable Energy, Third Meeting, Graz, Austria, November 27–29. EMCON Consulting Group, Windhoek, Namibia.

World Bank. 2004. World Development Indicators 2004. Washington, D.C.

About OBApproaches

OBApproaches is a forum for discussing and disseminating recent experiences and innovations for supporting the delivery of basic services to the poor. The series will focus on the provision of water, energy, telecommunications, transport, health and education in developing countries, in particular through output, or performance,-based approaches.

The case studies have been chosen and presented by the authors in agreement with the GPOBA management team, and are not to be attributed to GPOBA's donors, the World Bank or any other affiliated organizations. Nor do any of the conclusions represent official policy of the GPOBA, World Bank, or the countries they represent.

Global Partnership on Output Based Aid
World Bank
Mailstop: H2-202
600 19th Street, NW
Washington, DC 20433, USA

To find out more, visit
www.gpoba.org

GPOBA
The Global Partnership on Output-Based Aid