

Tanzania: Programme to Boost Energy Efficiency

Ex post evaluation report

OECD sector	23040 / power transmission/distribution	
BMZ project ID	1998 65 254	
Programme executing agency	Tanzanian Electric Supply Company (TANESCO)	
Consultant	DECON, Bad Homburg	
Year of ex post evaluation	2010 (sample 2010)	
	Project appraisal (planned)	Ex post evaluation report (actual)
Start of implementation	January 2000	April 2000
Period of implementation	30 months	56 months
Investment costs	EUR 7.4 million	EUR 7.8 million
Counterpart contribution	EUR 1.2 million	EUR 0.6 million
Financing, of which Financial Cooperation (FC) funds	EUR 6.2 million	EUR 7.2 million
Other institutions/donors involved	-	-
Performance rating	4	
• Relevance	3	
• Effectiveness	4	
• Efficiency	4	
• Overarching developmental impact	4	
• Sustainability	3	

Brief description, overall objective and project objective with indicators

The Programme to Improve Energy Efficiency in the power transmission and distribution system of the state-owned Tanzanian Electric Supply Company (TANESCO) was designed as an open programme with two components:

- Repair of transformers and switching gear in substations of the (nationwide) grid
- Measures to raise power availability and reduce technical losses in the distribution systems in the regions of Dar es Salaam and Mwanza.

The overall objective of the programme was to make a contribution to ensuring the economically efficient, secure and reliable transmission of electrical power in the TANESCO grid. Two indicators were identified to this end:

- Productive electricity consumption accounts for more than 60 % of the total electricity consumption in TANESCO's grid
- Average tariff of US cents 11/kWh (real average tariff in 1998).

The two indicators were to be achieved one year after the programme's completion. The first of the two indicators is today no longer relevant for the success of the programme. The second indicator (average tariff) by contrast is important in terms of its macroeconomic steering function (allocation efficiency) partly for achieving the overall objective and partly because it influences the survival of TANESCO as a business and its need for subsidies.

The programme objectives were to reduce disruptions to electricity transmission, as well as reducing technical losses. The following indicators were identified to gauge to what extent the programme objectives had been reached:

- The availability of plant and components in the transformer stations that have been rehabilitated using FC funds is over 95% for a period of at least three years after completion of the programme.
- Total losses in the TANESCO grid are under 15%.

Design of the development intervention / major deviations from the original project planning and the main reasons for these

As of April 2000 TANESCO drew up the components of the open programme in detail with the support of the consultant DECON, Bad Homburg, and in consultation and agreement with KfW, taking into account the volume of funding available. The programme realised consisted of various components, which were contracted out in eight separate packages, designed as follows:

- Nationwide, to repair transformers and switching gear in transformer stations belonging to the grid
- In the distribution systems of the regions of Dar es Salaam and Mwanza, to increase the availability of electrical power and reduce technical losses.

Consulting services were also financed within the framework of the programme.

The total costs of the programme were EUR 7.8 million, of which EUR 7.1 million were accounted for by the 8 lots and EUR 0.7 million by the consulting services. Some 92% of the overall costs were foreign exchange costs (EUR 7.2 million). The FC funds were made available to Tanzania as a grant and passed on to TANESCO as a contribution to its equity.

The total costs of the programme were slightly (EUR 0.4 million) higher than the estimate laid out in the appraisal report and the period of implementation was almost twice as long, at 56 months rather than the originally planned 30 months.

Major findings of the impact analysis and performance rating

In terms of achieving the still relevant indicator for the overall objective, the average tariff was well below the minimum of US cent 11/kWh laid down during the programme appraisal in 1999, with tariffs of US cent 7.8/kWh recorded during the in-country final monitoring mission in 2007. Since then the average real tariff has declined further to US cent 7.2/kWh (2009). The programme not only failed to achieve the absolute value of the indicator (US cent 11/kWh). It was also off target if we take into account the collection rate. The collection rate has improved since the programme appraisal was conducted but this positive impact has been more than offset by the increased cost of generating power, which is due to the increasing share of electricity generated by thermal power stations.

The availability of the transmission infrastructure (programme objective indicator) was 99 % when the final monitoring mission was conducted in 2007, meaning that the indicator had been achieved. It was, however, noted that in the medium and long term there were doubts over TANESCO's ability to uphold this level of availability because of the inadequate repair and maintenance work conducted by the implementing agency, which in turn is the consequence of a lack of funding. We do not have any up-to-date information about the state of repair of the infrastructure, but in view of the generally inadequate repair and maintenance work on electricity transmission and distribution grids it must be assumed that the figure has since dropped. The programme also fell a long way short of achieving the indicator for the second programme objective (total losses in the grid). While losses were put at 20% of the power fed into the grid in 1998, this figure had risen to 25% by 2006, and by 2009 had only decreased slightly to 24%.

It does, however, seem safe to assume that the programme had a positive impact on the earnings and liquidity of TANESCO. Without the programme, the technical losses in the grid would have been even higher, and TANESCO was only required to shoulder a very small share of the costs of the programme. The impact on the financial situation of the programme executing agency was low, however, in line with the limited scope of the FC programme.

The 1999 appraisal report deemed that the situation of the electricity sector as a whole and the financial situation of TANESCO in particular represented a high risk to the success of the programme. It is now clear that the risk identified has materialised, at least in that tariffs charged are still a long way from covering costs. The continued high losses are also primarily the result of the lack of funding available to the programme executing agency, which makes it impossible to maintain the state of repair of the transmission network and the distribution systems, and to undertake necessary repairs swiftly. The discrepancy between the capacities of the grid and power generation capacities on the one hand and the demand for power on the other has been further aggravated by the push to expand demand, especially by connecting more households to the grid.

The programme measures themselves, which primarily involved repairing existing plant, had a minimal impact on the environment. By reducing technical losses the programme has made a small contribution, that cannot be quantified, to cutting CO₂ emissions. The programme operated at a level far removed from the target group and had a general development-policy alignment. It was not geared directly to reducing poverty, changing gender relations or promoting good governance in Tanzania.

Our final assessment of the development impact of the programme is as follows:

Relevance: The lack of a reliable electricity supply is still a major obstacle to development. The impact chain on which the programme appraisal was based, according to which measures to strengthen the grid would reduce technical losses and make supplies more secure, is still valid. The fact that the FC funds to finance the programme were passed on to TANESCO to boost its equity capital, however, was partly responsible for ensuring that electricity consumers did not have to pay the full cost of grid maintenance. This subsidy benefitted wealthy households disproportionately, in spite of the low lifeline tariffs for extremely low electricity consumption, because more prosperous households are significantly more likely to have an electricity connection and because they use considerably more electricity than poorer households (rating 3).

Effectiveness: We are not aware of whether the availability of the plant is still above the minimum of 95%. The programme was a long way off achieving the important indicator for maximum grid losses (15 %) with recorded losses of 24 % (rating 4).

Efficiency: We consider the production efficiency of the measures at programme level to be good, although no cost effectiveness analysis has been conducted here in keeping with the nature of the various measures. By contrast, the production efficiency at system level in the Tanzanian electricity sector is inadequate in view of the grid losses of 24%. The allocation efficiency in Tanzania's electricity sector is unsatisfactory, partly because of the tariffs charged, which are well below the macroeconomic costs of generating and supplying the power, and partly because of the frequent power cuts which result in significant additional costs for electricity users. If we weigh up the assessments of the production efficiency and the allocation efficiency we get an overall performance rating of 4 for efficiency.

Overarching development impact: The major overarching development concern of this programme, which operated at a level far removed from the target group, was to promote economic growth in Tanzania. This concern shaped the overall objective of making a contribution to the economically efficient, secure and reliable transmission of electricity in the TANESCO grid. The focus was not on making a contribution to climate change mitigation or environmental protection by boosting energy efficiency. In general the overall objective of the programme was not achieved. Although electricity supply in Tanzania is doubtless an important factor, economic growth has been high since the project appraisal, not because of a good electricity supply but in spite of an entirely inadequate supply that cannot be said to have improved tangibly since. The development of the electricity sector in Tanzania was marked by the political requirement to connect as many consumers as possible to the grid for the first time, and to keep the costs to electricity users apparently low. The main result was power rationing and high costs incurred by the need for major consumers to have back-up generators, thus in fact inhibiting economic growth. Moreover the subsidising of electricity consumption in Tanzania has a negative impact on income distribution (rating 4).

Sustainability: The sustainability of the direct, extremely limited impacts of the programme on technical transmission losses and the stability of the grid will depend largely on maintenance and repair work being conducted on the rehabilitated and renewed infrastructure. The crucial factor is the financial capacity of the programme executing agency, which is limited because of the excessively low tariffs charged, which do not cover costs (rating 3).

Overall assessment: All in all we consider the development impacts of the programme to be unsatisfactory as a result of the problems in the sector, which have proved to be significantly more serious than expected at the time of the appraisal (drop in tariffs and rise in grid losses) (rating 4).

General conclusions

The conclusions drawn in the ex post evaluation report dated 27 February 2006 on the Lower Kihansi Hydro-Power Plant Project (BMZ project ID 1996 66 108), that the necessary sectoral reforms (e.g. tariff reform) should be pursued as a precondition for an initial disbursement of funds rather than a medium-term objective, can only be confirmed by this ex post evaluation.

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness (outcome), “overarching developmental impact” and efficiency. The ratings are also used to arrive at a final assessment of a project’s overall developmental efficacy. The scale is as follows:

- 1 Very good rating that clearly exceeds expectations
- 2 Good rating fully in line with expectations and without any significant shortcomings
- 3 Satisfactory rating – project falls short of expectations but the positive results dominate
- 4 Unsatisfactory rating – significantly below expectations, with negative results dominating despite discernible positive results
- 5 Clearly inadequate rating – despite some positive partial results the negative results clearly dominate
- 6 The project has no positive results or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability)

The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected.)

Sustainability level 3 (satisfactory sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability)

The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The overall rating on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. A rating of 1 to 3 indicates a “successful” project while a rating of 4 to 6 indicates an “unsuccessful” project. In using (with a project-specific weighting) the five key factors to form an overall rating, it should be noted that a project can generally only be considered developmentally “successful” if the achievement of the project objective (“effectiveness”), the impact on the overall objective (“overarching developmental impact”) and the sustainability are considered at least “satisfactory” (rating 3).