

Nicaragua: Rehabilitation and Expansion of Power Distribution Systems III

Ex-post evaluation report

OECD sector	2304000 / Electricity transmission and distribution	
BMZ project ID	199665621	
Project-executing agency	Empresa Nacional de Transmisión Eléctrica (ENATREL)	
Consultant	Deutsche Energie Consult Ingenieurgesellschaft mbH (Decon)	
Year of ex-post evaluation	2009	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	3 rd quarter 1997	1 st quarter 2000
Period of implementation	Until end of 3 rd quarter 1998	Until end of 2 nd quarter 2002
Investment costs	EUR 10.2 million	EUR 10.4 million
Counterpart contribution	EUR 2.6 million	EUR 2.5 million
Financing, of which FC (Financial Cooperation) funds	FC funds: EUR 7.6 million	FC funds: EUR 7.9 million
Other institutions/donors involved	none	none
Performance rating	unsatisfactory (rating 4)	
• Relevance	satisfactory (sub-rating 3)	
• Effectiveness	unsatisfactory (sub-rating 4)	
• Efficiency	unsatisfactory (sub-rating 4)	
• Overarching developmental impact	satisfactory (sub-rating 3)	
• Sustainability	inadequate (sub-rating 4)	

Brief description, overall objective and project objectives with indicators

In the context of the project, power transmission and distribution was modernised in Nicaragua's capital city of Managua, with particular emphasis on the rehabilitation of the 138/13.8 kV transformer station „Héroes de Batahola“. Moreover, the new 138/13.8 kV transformer station “Portezuelo” was constructed and connected with the existing 138 kV power line between the power plant of Managua and the transformer station Oriental.

The project was aimed at contributing to a reliable and macro-economically efficient energy supply, in particular for industrial electricity consumers in the project region. The reduction of technical and non-technical losses in the electricity distribution grid, the grid-related power failure rate, the energy not supplied due to power failures, the increase in electricity consumer satisfaction and a positive macro-economic cost-cover ratio were defined as indicators for the project's success. The project was intended to

promote the sustainable economic development of Nicaragua, in order to achieve positive effects on the employment and income situation (overall objective). An increase in the amount of industrial electricity consumers and in the number of employees in the project region after modernisation of the plants served as indicators for the achievement of this overall objective.

Project-executing agency is the national power transmission company Empresa Nacional de Transmisión Eléctrica (ENATREL, formerly Empresa Nicaragüense de Energía, ENEL). Today, the power distribution grids financed in the context of the project are no longer the property of ENATREL, but are owned by the private power distribution company Disnorte/Dissur.

Project design / major deviations from the original project planning and their main causes

For the project, the Republic of Nicaragua was granted an FC-loan to the amount of EUR 7,669,378.22 (DEM 15.0 million), to be transferred to the project-executing agency ENEL (today ENATREL). The funds were earmarked for the modernisation of the 138/13.8 kV transformer station “Héroes de Batahola”, for the construction of the 138/13.8 kV transformer station “Maestro Gabriel” and for the rehabilitation and/or installation of low- and medium-voltage power lines of an overall length of 233 km. With the aid of an implementation consultant, separate calls for tender were to be issued for the required supply of the stations on the one hand and for the local construction and installation services on the other hand. The stations were to be built and/or modernised by the end of the third quarter 1999.

The measures were essentially carried out as planned. The following deviations from the project design need to be mentioned: Due to a lack of space on the proposed site, the newly constructed transformer station was not built at the location “Maestro Gabriel” as indicated in the project design, but at the nearby location “Portezuelo”, and was re-named accordingly. Due to increased material costs and additionally required household connections, only 80 % of the proposed distribution grids were modernised. The stations were put into operation almost four years later than planned. Amongst others, the reasons for this delay were the belated ratification of the loan contract by the Nicaraguan parliament and temporary uncertainties with regard to the responsibility for individual plants because of a vertical restructuring of the national electricity utility into several companies.

Key results of the impact analysis and performance rating

The project undoubtedly had a positive impact with regard to the objective “reliable energy supply” by technically improving the electricity transmission and distribution in various areas of Managua. When the decision on the financing of the project was taken in 1997, the installations were in a bad condition, particularly because of the previous civil war. Moreover, their limited capacity was not sufficient to provide for economic growth. Against this background it had to be expected that electricity supply reliability would decrease substantially over the following years (increase in power failures, voltage variations etc.). These expected negative developments could be avoided owing to the project measures, which contributed to a reliable electricity supply as a precondition for economic development.

However, the objective “contribution to a macro-economically efficient electricity supply” was barely achieved. Hardly any improvements are discernable in Nicaragua’s electricity sector regarding the relevant aspects for this objective, i.e. the proposed decrease of the non-technical losses and the covering of macroeconomic marginal costs. Although Nicaragua’s electricity tariffs are the highest in Central America, they do not cover the costs for the electricity supply system. Grid losses continue to be very high. The project hardly contributed to achieving the intended objective of efficient

energy supply. The project measures were not sufficiently geared to obtaining this objective. In order to do so, a complementary improvement of the Nicaraguan sector policy would have been required. In particular, it would be necessary to introduce measures to decrease non-technical losses and to improve the cost-cover ratio, i.e. to decrease electricity production costs.

Regarding the overall objective it may be pointed out that the number of employees and of industrial electricity consumers has clearly increased in Managua since 1997. Leaving aside the fact that the installed plants supply only a part of Managua, and that the project measures could therefore only have a limited effect on this positive development, the overall objective seems to have been achieved. Especially at the Portezuelo location, the plants financed by means of FC funds contributed considerably to the development of an industrial area, and therefore to the creation of jobs. This indirectly helped to reduce poverty. The transformer station Batahola, however, mainly supplies private, poorer households. In this area, the project directly contributed to improving the electricity supply for the poorer population, but not to increasing the utilisation of electricity for production purposes or to creating employment.

In a power supply system, power transmission and distribution are only components of the system, and without a well-functioning electricity production are not sufficient to guarantee an efficient and reliable electricity supply. Yet there are problems regarding electricity production in Nicaragua. At the outset of the project it was proposed to have the power stations revamped and modernised by private companies. This did not happen. Moreover, the country's power stations are mainly fuelled with oil. Today, many plants are therefore not only dilapidated, but also depend on the relatively expensive fuel oil. These problems lead to a shortage of funds and to a weak reliability of the system. The insufficient energy production therefore also poses a risk for the impact and the sustainability of the project under review.

By dealing with the defects of the power transmission and distribution grid, a crucial problem of Nicaragua's energy sector was addressed. But without the necessary complementary measures, the technical improvement of the plants under the project only had a satisfactory relevance for the sustainability and reliability of electricity supply in Nicaragua.

By improving the reliability and the capacity of the electricity supply, the project contributed to eradicating a major impediment to development (electricity supply reliability). Due to the fact that the efficiency aspects, i.e. cost-coverage and reduction of non-technical grid losses, could not be achieved, the project's overall effectiveness is rated as unsatisfactory.

Especially the great non-technical grid losses and the oil-based electricity production lead to high set-up costs for electricity in Nicaragua. Moreover, the fact that electricity theft has been tolerated for years causes an increase in electricity demand that is inefficient from a macro-economic perspective. Even if the project measures helped to decrease the set-up costs for electricity, the efficiency of the energy supply overall is unsatisfactory from a systemic point of view.

The project contributed to a reliable electricity supply. However, the macro-economic efficiency of the supply improved only marginally. The overarching developmental impact of the project is altogether satisfactory.

The project-executing agencies are well-qualified from a technical perspective to manage the plants in the long-term. However, the financial problems in the electricity supply system as well as the oil-based electricity generation, combined with high grid losses, are contrary to the project's sustainability. The project's sustainability is therefore rated as inadequate.

Taking into account the various aspects, the project is given the overall rating “unsatisfactory” (rating 4).

Details on performance assessment can be found in the technical information sheet “Criteria and rating system for ex-post evaluation reports on German bilateral FCs” (14th September, 2006).

General conclusions and recommendations

In the partner countries of Financial Cooperation, problems in the area of power transmission and distribution typically are crucial energy sector problems. In retrospect, the example of Nicaragua makes it clear that in order to achieve the desired objectives it would have been useful, in addition to the proposed design, to implement complementary measures to reduce non-technical losses and to raise electricity tariffs. Such measures may be waived only if progress in sector policy is feasible; but an improvement of the political environment in Nicaragua is unlikely in the next few years.

Moreover, it might have been worth considering to expand at least one of the four project to electricity production, instead of focusing exclusively on the area of power transmission and distribution, because this lead to neglecting electricity production and thus to bottlenecks in the electricity supply.

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 an improvement is very unlikely. 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).