

**Vietnam: Rehabilitation of Dray H'Linh Hydropower Plant and Distribution Network**
**Ex-post evaluation**

<b>OECD sector</b>	Electricity transmission and distribution /23040	
<b>BMZ project ID</b>	1993 65 974	
<b>Project-executing agency</b>	Power Company N° 3 (PC 3)	
<b>Consultant</b>	DECON GmbH, Bad Homburg	
<b>Year of ex-post evaluation</b>	<b>2005</b>	
	<b>Project appraisal (planned)</b>	<b>Ex-post evaluation (actual)</b>
<b>Start of implementation</b>	Q 1 1995	Q 4 1998
<b>Period of implementation</b>	13 months	37months
<b>Investment costs</b>	EUR 8.69 million	EUR 10.31 million
<b>Counterpart contribution</b>	EUR 0.51 million	EUR 3.68 million
<b>Financing, of which Financial Cooperation (FC) funds</b>	EUR 8.18 million	EUR 6.63 million
<b>Other institutions/donors involved</b>	-	-
<b>Performance (overall rating)</b>	4	
• <b>Significance / relevance</b>	4	
• <b>Effectiveness</b>	4	
• <b>Efficiency</b>	4	

**Brief Description, Overall Objective and Project Objectives with Indicators**

The project comprised complementary measures for the 3 x 4 MW hydropower plant Dray H'Linh and the 35/22 kV substation Eatam, as well as the rehabilitation of the distribution grid of the town of Buon Me Thuot (Dak Lak province). The overall objective of the project was to contribute to the economic development of the project region. The project objective was to make use of the power plant capacity created under the former GDR project Dray H'Linh. The project target group primarily consisted of productive electricity consumers in the town of Buon Me Thuot. Users of electricity for consumptive purposes benefited as well. A share of at least 60% of power consumption for productive purposes in 2000 was defined as indicator for the achievement of the overall objective. The indicators for the achievement of the project objective were defined as (i) the reduction of total grid breakdowns from around 200 p.a. to around 60 p.a. from the year 2000 and (ii) the reduction of distribution losses to 15% from the year 2000. Taking account of the delays in implementation we took the year 2003 as basis for assessing the degree to which the objectives were achieved (second year after completion of the main project components).

### **Programme Design / Major Deviations from the original Programme Planning and their main Causes**

The project measures comprised the rehabilitation of the Dray H'Linh hydropower plant, the Eatam substation and the grid of the town of Buon Me Thuot. In the course of the project major changes emerged against the design agreed at the time of appraisal as the Buon Me Thuot town grid was connected to the national integrated network prior to the beginning of project implementation. While the capacity of the hydropower plant was originally made available in accordance with the demand in the isolated grid, it has operated in base load in accordance with water availability since it was connected to the integrated network. This meant higher capacity utilisation, which led to the decision to implement additional rehabilitation measures as against the design planned at the time of project appraisal. Given the system modifications in the medium voltage network the originally planned rehabilitation measures in the Hoa Binh substation were cancelled and those planned in the Eatam sub-station were reduced. Distribution clearly represented the greatest cost item of all measures.

### **Key Results of the Impact Analysis and Performance Rating**

At the time of project appraisal a lack of electricity for productive consumers in the project area of Buon Me Thuot was assumed as the distribution grid was overloaded and the Dray H'Linh power plant operating capacity was inadequate. Connection to the nationwide integrated power grid was not expected until the year 2000.

Actually, however, power was already being drawn from the national integrated network and, conversely, electricity was already being fed into this grid in the project area since 1995. As a result the power generated by the Dray H'Linh power plant, now running in base load, rose to a level that clearly exceeded the average target expected at the time of project appraisal for the years 1996 to 1999, that is, even prior to its rehabilitation. The rehabilitation of the power plant did not increase the amount of electricity but ensured that it was sustainably fed into the integrated grid.

In the same way the project-executing agency PC 3 succeeded already before rehabilitation of the grid in drastically reducing the technical and non-technical losses in the distribution network. They were thus between 10% and 12.5% in the years 1996 to 1999 already and have not significantly decreased further since the rehabilitation of the grid. PC 3 has no reliable data on the number of power cuts in the project area for this period, which were in the vicinity of the project objective indicator following rehabilitation. Given the positive development of the power generation by the Dray H'Linh power plant and the grid losses, however, it must be assumed that the power cuts in the project area fell significantly already prior to rehabilitation. This is also suggested by the sharp leap in electricity sales prior to rehabilitation, whereas after rehabilitation the sales merely proceeded to reflect the demand growth rate over several years, growing at 13% annually.

We estimate the technical risks to the operation of the hydropower plant and the Buon Me Thuot town grid plant to be minimal. We believe a medium-term risk to sustainability lies in the possibility of the financial situation of PC 3 deteriorating if the national integrated grid operator Electricity of Vietnam (EVN) reduces the current cross-subsidisation or consumer tariffs in the course of a planned electricity trade liberalisation.

In summary, we have arrived at the following rating of the project's developmental effectiveness:

#### **a) Effectivity**

The project objective was to make use of the power plant capacity created under the former GDR project Dray H'Linh. The project objective indicators were expressed as an acceptable rate

of power cuts and system power losses in the distribution network of the project area. However, even prior to the implementation of the FC project the executing agency succeeded in eliminating the main bottlenecks in the distribution grid through measures financed with limited funds of its own. Therefore, in retrospect the fundamental rehabilitation of the grid and hydropower plant that followed was not a priority although it certainly did contribute to improving the technical substance and increasing its useful life. The indicator expressed as power loss reductions in the distribution grid (investment priority) was already clearly fulfilled prior to rehabilitation. The same can be assumed to have been the case for the indicator that referred to power cuts, even if this cannot be documented for lack of reliable data. As a result the contribution of the project to the project objectives was very limited. We expect the project at least to have had an overall positive effect on sustainability. This future effect, however, is subject to the risk of the financial situation of PC 3 deteriorating if EVN lowers the cross-subsidisation or reduces consumer tariffs in the course of liberalisation of the electricity trade. We rate the overall effectiveness of the programme as slightly insufficient (**sub-rating 4**).

#### b) Significance / relevance

The overall objective was to contribute to the economic development of the project region. The indicator of the overall objective was a productive share of 60% in power consumption in the project area. From today's perspective, however, the indicator for the overall objective also must be applied to the integrated network in general as the town grid was previously connected to the national grid. The share of electricity used for productive purposes in the project area is clearly too low, at 31%. In the integrated network this objective has been reached, at 64%. Nonetheless it must be stated, the same as for project objective achievement, that the project contributed to achieving the overall objectives only in an indirect manner at best. We rate the project's relevance/ significance as slightly insufficient overall (**sub-rating: 4**).

#### c) Efficiency

The specific investment costs (production efficiency) of the implemented measures are largely reasonable; from today's perspective the urgency of the measures must be called into question, at least with regard to the grid rehabilitation component, which accounted for 75% of the investment cost. From the aspect of allocation efficiency the fact that the current average electricity tariff of 5.1 US cents per kilowatt hour covers only 70% of the long-term marginal costs or, taking into account system power losses and collection efficiency, only 57%, weighs negatively. This is compounded by the fact that the Vietnamese government is not giving any priority to raising the degree of cost recovery through appropriate tariff increases. In view of the changes in the overall initial situation, from today's perspective we no longer consider the target of full cost recovery to be secondary, as was the case at the time of project appraisal. We rate the overall efficiency of the programme as slightly insufficient (**sub-rating 4**).

Based on the criteria of significance/relevance, effectiveness and efficiency we rate this project, which resulted from the financial cooperation of the former GDR, as having a **slightly insufficient degree of developmental effectiveness overall (rating 4)**.

### **Conclusions and Recommendations**

The experience gathered in this project shows that, irrespective of the sector in question, the option of awarding a turnkey contract should be given closer consideration in the framework of FC projects as this may provide a significant potential to save time and costs against the award of contracts separated by individual lots or sub lots.

It has become evident that when the overall conditions in the project environment have undergone major changes it will always be necessary to perform a new economic appraisal of the project approach and, where necessary, a modification of the project conception. In the present case this reappraisal should have been carried out even before the start of implementation. It might have led to the complete cancellation or a significant postponement of the project.

## Legend

Developmentally successful: Ratings 1 to 3	
Rating 1	Very high or high degree of developmental effectiveness
Rating 2	Satisfactory degree of developmental effectiveness:
Rating 3	Overall sufficient degree of developmental effectiveness
Developmental failures: Ratings 4 to 6	
Rating 4	Overall slightly insufficient degree of developmental effectiveness
Rating 5	Clearly insufficient degree of developmental effectiveness
Rating 6	The project is a total failure

### Criteria for the Evaluation of Project Success

The evaluation of the "developmental effectiveness" of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- Are the **project objectives** reached to a sufficient degree (aspect of project **effectiveness**)?
- Does the project generate sufficient significant **developmental effects** (project **relevance** and **significance** measured by the achievement of the overall development-policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the **funds/expenses** that were and are being employed/incurred to reach the objectives **appropriate** and how can the project's microeconomic and macroeconomic impact be measured (aspect of **efficiency** of the project conception)?
- To the extent that undesired (**side**) **effects** occur, are these tolerable?

We do not treat **sustainability**, a key aspect to consider for project evaluation, as a separate category of evaluation but instead as a cross-cutting element of all four fundamental questions on project success. A project is sustainable if the project-executing agency and/or the target group are able to continue to use the project facilities that have been built for a period of time that is, overall, adequate in economic terms, or to carry on with the project activities on their own and generate positive results after the financial, organisational and/or technical support has come to an end.