

Philippines: Sucat – Balintawak transmission line

Ex post evaluation report

OECD sector	23040 / Electricity transmission / distribution	
BMZ project ID	1991 65 861	
Project executing agency	National Power Corporation	
Consultant	Fichtner, Stuttgart	
Year of ex post evaluation	2007	
	Project appraisal (planned)	Ex post evaluation (actual)
Start of implementation	Q4 1991	Q4 1991
Period of implementation	3.6 years	8.6 years
Investment cost	EUR 87.4 million	EUR 106.9 million
Counterpart contribution	EUR 27 million	EUR 27 million
Financing, of which FC funds	EUR 74.1 million, of which EUR 46.2 million in FC funds	EUR 81.8 million, of which EUR 46,2 million in FC funds
Other institutions/donors involved	./.	./.
Performance rating	2	
• Relevance	2	
• Effectiveness	2	
• Efficiency	3	
• Overarching developmental impact	2	
• Sustainability	2	

Brief description, overall objective and project objectives with indicators

The project covered the construction of a 34 km-long 230 kV single circuit transmission line (completed in 2000) from Sucat via Araneta to Balintawak through the urban district of Metro Manila, the construction of a new 230/115 kV substation building in Araneta and the extension of two existing outdoor substations in Sucat and Balintawak. This was to increase the transmission output in the urban grid in Metro Manila to cover the increasing demand for electricity (project objective) and a contribution was to be made to ensuring a continuous supply of electricity and to the macroeconomic objectives of growth and employment (overall objective). The indicators of the achievement of the project objective were capacity utilisation of the transmission line of around 500 MW on the section from Sucat to Araneta and of around 190 MW on the section from Araneta to Balintawak one year after the start of operation. The intention was for the Araneta substation (230/115 kV) to contribute 35% (105 MVA or 90 MW) of the installed transformer output one year after the start of operation and subsequently to increase it further. The achievement of the overall objective was to be measured in terms of the increase of the transmission output in the Metro Manila urban grid for the purpose of covering the demand for electricity by the consumers (mostly industrial) and hence to avoid power cuts for consumers caused by grid overload. The share of the demand for electricity from industrial users was to be above 65%.

Achievement of the project objective was as follows:

- At 114 MW, utilisation between Sucat and Araneta had not reached full capacity in 2001. It increased steadily, however, and in 2006 reached a maximum of 578 MW. By contrast, on the Araneta – Balintawak section it fell from an unexpectedly high 468 MW at first in 2001 to 137 MW between Araneta and Balintawak. This load development on the two sections is a consequence of the power flow, which, contrary to expectations at project appraisal, initially tended to go from north to south following the start of operation, although it reversed in the period from 2002 to 2004 in accordance with expectations. As the transmission line completed the network ring around the centre of Metro Manila, the intention being to enable electric power to be transported both from the south and from the north, this indicator can be considered as having been largely fulfilled.
- At 207 to 247 MW (i.e. 80% to 95% of the installed output at a load factor of 85%), the maximum utilisation of the three transformers in Araneta was from the outset far higher than expected. This high utilisation continued and in 2005 it was between 214 and 240 MW. At 75% – 80%, the utilisation rate for the transformers financed at the Sucat substation was also very good.

With regard to the achievement of the overall objective, the share of the demand for electricity for industrial purposes in the concession area covered by Meralco was determined as being 66% in 2005 (2004: 65%). The target value of 65% set at project appraisal was achieved.

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

The project covered the construction of a 34 km-long 230-kV transmission line from Sucat via Araneta to Balintawak through the central urban area of Metro Manila, the construction or upgrading of the three corresponding substations, and consulting services. During implementation, only minor design changes were made which, in particular, related to fitting the lightning protection cable with a fibre optic cable for the purpose of transmitting signals and to increasing the nominal transmission capacity from 720 to 1200 MVA in order to comply with the NPC standards for network redundancy. However, substantial changes were made to the planned transmission line route as purchasing the mast locations in densely populated Manila proved to be very difficult. The problems relating to rights of way and the difficulties in purchasing plots of land at the mast locations led to considerable delays. The investment implementation period was five years longer than the 43 months from November 1991 estimated at project appraisal and was hence more than twice as long as planned. The resettlement which was also partly needed was carried out with the support of the NGO Quezon City People's Bureau, which is close to the target population, and the National Urban Poor Coordinating Council. The families affected by the resettlement were allocated to new housing areas and were given appropriate financial compensation. According to information from the NGO, the families made no known complaints. A KfW condition regarding appropriate compensation was thus fulfilled.

Following the start of operation, the plants were transferred to the sphere of responsibility of the National Transmission Corporation (TransCo), which was hived off from the National Power Corporation (NPC) at the start of 1999; it has since been responsible for operation, maintenance and correcting disruptions to service. TransCo has a sufficient number of qualified assembly staff and has enough motor vehicles and tools for maintenance work. In the seven years during which the project has been in operation, no technical disruptions worth mentioning have occurred. Unplanned, short disruptions to transmission – no more than two a year – were mainly caused by external interference and were quickly and expertly put right by TransCo. Overall, the implementation and operational concept proved to be appropriate. From the technical point of view there are no risks regarding the sustainability of the project.

Key results of the impact analysis and performance rating

At project appraisal the commercial electricity users in the centre of Metro Manila were named as the primary project target group. From today's perspective all electricity consumers in the greater Metro Manila area are to be considered the target group as the greater supply reliability resulting from the avoidance of cascading grid failures affects the entire, densely meshed urban network. In 2005 Meralco had in all just

over 4.3 million customers in its concession area, including 3.9 million private customers. Most of them are electricity users from Metro Manila. Given the structure of the settlement areas in Metro Manila, a large percentage of the household connections supply the poorer sections of the population with electricity. The percentage of household connections benefiting from Meralco's social tariff, which is 20-50% below the standard price, because they use less than 100 kWh a month is a suitable supplementary indicator of the share of poor people concerned. Around 40% of Meralco's household connections pay this reduced social tariff; these families are thus among the poor sections of the population.

At the time of project appraisal, manufacturing in Manila was affected by considerable deficiencies in the electricity supply, which disrupted production and led to additional costs as a result of damage to sensitive technical equipment and machines. Trade and industry therefore set up their own electricity supply systems, which were generally inefficient and (because many small diesel-driven generators were used) ecologically unfriendly. The cost and reliability of the electricity supply are also decisive factors for foreign direct investment in a country. A reliable supply of electricity is thus an essential criterion for competitive industrial and commercial development which creates jobs and income. This chain of impact is plausible (especially for a country's economic centre).

At project appraisal the proposed plan of action was compared with two alternatives at the microeconomic level. From today's perspective the first alternative of three parallel 115 kV lines is considered completely unrealistic (given the problem of rights of way) because even more space would be required. The second alternative of a 230 kV underground cable would obviously have cost several times more and, even today, would be chosen, if at all, only for reasons relating to urban planning or to improve disaster safety (tornadoes) in case of totally underground electricity transmission and distribution in Manila. Only a few privileged housing areas in the centre of Metro Manila have so far taken that costly step. For the megacity as a whole it would still not be affordable. Given the objectives (including the completion of the 230 kV transmission ring around Metro Manila), despite the increase in cost there was therefore no technical/economic alternative (less costly extension route) to the transmission line.

At project appraisal, the NPC had implemented the project by an approximate cost-benefit analysis based on the possible reduction in transmission losses and down times to be achieved by the transmission lines and calculated a macroeconomic real internal interest rate of around 11%, which was deemed to be sufficient even if the costs were 20% higher or net proceeds were 30% less. From today's perspective the transmission line was, however, only one factor in a total package of investment and operational measures (including the construction of new power plants and the splitting of the distribution network by Meralco), which generally ensured that supply reliability in Metro Manila was satisfactory. The macroeconomic advantage of the transmission cable was illustrated in an approximate calculation. The investment and maintenance costs are set against the benefit of greater supply reliability (avoidance of manufacturing stoppages in companies, no need to invest in private back-up generators with corresponding costs and a negative impact on the environment). With an acceptable amount of time and effort, only the minor network losses can be quantified. By contrast, numerous uncertainties are involved in putting a figure on the beneficial effects of the greater supply reliability and the result can only be approximate. Taking a very conservative observation as the basis, a real positive microeconomic internal interest rate of around 6% is calculated. The minimum level required for the rate of interest was thus achieved.

The project had no potential to contribute to gender equality. It was not geared to the protection of natural resources. Negative environmental effects did not occur. The project was not geared to participatory development / good governance. We attribute a general developmental orientation to it.

In summary, the developmental efficacy of the project was evaluated as follows:

Relevance

In the early 1990s the lack of a production and transmission infrastructure in the electricity sector, and particularly in the country's economic centre, was generally a key bottleneck for the economy in the Philippines, having a negative impact on growth and employment. That bottleneck has since been removed, with the project having played a role. The project design was appropriate. The chain of impact of more reliable electricity supply in Manila on the economic and social development is plausible. Important

topics in the political dialogue (particularly regarding the economic situation of the executing agency) were addressed jointly by the largest donors and the IMF. Subrating: good result, fully in line with the expectations, no major defects (subrating 2).

Effectiveness

The project objectives were basically achieved. The capacities of the transmission line and the substations were well utilised. Only on the shorter Araneta-Balintawak sub-section is utilisation currently lower than expected. However, the reversing of the power flow during the operating period to date shows that the transmission line can function as a ring that has now been completed around Metro Manila and will thus be able to react to changes in the sphere of electricity generation or to shortages by channelling electricity from the south or the north. The electricity supply for the whole of Manila has thus been made more reliable; in Metro Manila there have been no further blackouts since May 2002 (with the exception of major blackouts during typhoons, e.g. in September 2006). Subrating: good result, fully in line with the expectations, no major defects (subrating 2).

Efficiency

Although the timely acquisition of the rights of way for the transmission line was recognised as a risk at project appraisal and an attempt was made to limit that risk by implementation agreements, the extent of the risk and its impact on implementation were still underestimated. The implementation concept (turnkey contract) was not appropriate to allow a flexible response to the delay of five years which occurred as a result of the problems relating to rights of way, which meant that the delay led to an increase in costs. The compensation proceedings associated with the project took a long time but, by involving NGOs close to the target group, were essentially appropriate for the largest group of poor families to be protected. This does not alter the fact that in 13 cases involving a particularly high individual sum the compensation proceedings are still sub judice. The project's production efficiency is satisfactory. Since the tariffs meanwhile largely cover costs, the allocation efficiency has been achieved. The operational assessment criteria have been fulfilled overall. The minimum requirement of a real microeconomic internal interest rate of 6% was achieved. Subrating: Satisfactory result (subrating 3).

Overarching developmental impact

The original project objectives were appropriate. Given the far-reaching sector reform, the underlying sectoral conditions have improved, although this reform is taking longer to implement in some sub-sectors than expected. By contributing to more reliable and less costly electricity in Metro Manila, the project provides support for the economic and social development of more than 11 million people in one of the most important industrial regions of the Philippines, which accounts for more than one-third of gross domestic product. There were no negative side-effects. Subrating: good result, fully in line with the expectations, no major defects (subrating 2).

Sustainability

The fact that the executing agent was slow in upgrading the transmission line indicated a weakness in NPC/TransCo's ability to actively tackle problems. Nonetheless, there were no noteworthy technical and/or economic risks for the sustainability of the project. In our opinion, this also applies to the successful granting of a licence for the transmission infrastructure. We see minor risks in the sluggish progress being made in sector reform with its core component of the privatisation of the transmission and transport infrastructure. However, the reform efforts are basically to be considered positive in terms of sustainability. Overall, the risks for sustainability are only minor. Subrating: good sustainability (subrating 2).

To summarise, taking account of the above-mentioned sub-criteria, we assess the developmental efficacy of the project as good (**overall evaluation: rating 2**).

General conclusions and recommendations

- The involvement of NGOs in the process of resettling and providing compensation for underprivileged sections of the population proved its worth and can provide a certain counterweight to the otherwise still very bureaucratic procedures of a large state enterprise. Consideration should be given at project appraisal to ways of simplifying such procedures (e.g. by the ex ante provision of disposition funds).

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 outcome that clearly exceeds expectations
2	Good outcome fully in line with expectations and without any significant shortcomings
3	Satisfactory outcome – project falls short of expectations but the positive results dominate
4	Unsatisfactory outcome – significantly below expectations, with negative results dominating despite discernible positive results
5	Clearly inadequate outcome – 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 meets the level 3 criteria.

The overall evaluation on the six-point scale is derived from a weighting of the five individual criteria which is appropriate for the specific project in question. A rating of 1 to 3 in the overall evaluation indicates a “successful project”, while a rating of 4 to 6 indicates an “unsuccessful” project. Account also needs to be taken of the fact that, as a rule, a project is only given a developmentally “successful” rating if the achievement of the project objective (effectiveness) and the impact at the level of the overall objective (“overarching developmental impact”) as well as sustainability are assessed at least as “satisfactory” (subrating 3).