Indonesia: Diesel Stations V

Ex-post evaluation

OECD sector	23061 / Oil-fired power plants	
BMZ project ID	1995 65 136	
Project-executing agency	P.T. PLN (state-owned power utility)	
Consultant	Lahmeyer International, Bad Vilbel	
Year of ex-post evaluation	2004	
	Programme appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation	Q 1 1995	Q 1 1995
Period of implementation	40 months	70 months
Investment costs	EUR 85.97 million	EUR 67.90 million
Counterpart contribution	EUR 27.67 million	EUR 21.24 million
Mixed financing: Financial Cooperation (FC) funds or financial loan	FC: EUR 26.55 million FI: EUR 31.74 million	FC: EUR 21.61 million FI: EUR 25.05 million
Other institutions/donors involved	-	-
Performance rating	4	
• Significance/relevance	4	
• Effectiveness	2	
• Efficiency	5	

Brief Description, Overall Objective and Programme Purpose with Indicators

The project is part of a 5-phase programme on the islands outside of Java. The programme Diesel Stations V comprises the turn-key expansion of ten diesel power plants on the outside islands of Nias, Kalimantan, Sulawesi, Papua (formerly Irian Jaya) and the construction of a new diesel station on Sumbawa. Overall, 59.60 MW were installed at 11 locations in the form of 26 diesel generators of between 1.5 and 2.8 MW each. The total project cost was EUR 67.90 million, of which EUR 46.66 million were for foreign exchange costs financed through a mixed loan.

The overall objective of the project is to contribute to economically efficient power supply primarily for producing consumers at the programme locations on the outside islands. The indicators for this are:

1. Achievement of a macroeconomic cost recovery ratio of at least 85% (measured against the long-term incremental costs) three years after the generators start operating;
2. Power sales and peak loads corresponding to the projected demand in the first three years after the generators start operating;
3. Share of productive demand of the increase in demand at the locations is at least 50% three years after the diesel generators start operating.

The programme purpose was to generate reliable, cost-efficient and environmentally sound electricity at the locations. Indicators of achievement of the programme purpose are:

1. Utilization of capacity of the diesel generators is at least 50% as of their third year of operation,
2. Environmentally sound disposal of used oil.

Project Design / Major Deviations from the original Project Planning and their main Causes

With regard to the selection of the locations, the design, acquisition and turn-key installation of the diesel generators and to the management of operations, the project followed the same concept applied to the implementation of previous phases also financed through Financial Cooperation (FC). Compared to the original planning, only minimal changes were made to adjust to the respective situation at each site. Overall, at the 11 locations 26 diesel generators were installed: 14 à 2.8 MW, 2 à 2.7 MW and 10 à 1.5 MW. However, at 70 months altogether the period of implementation was nearly twice as long as planned. The delays were brought about by difficult contractual negotiations, the late delivery of used oil combustion installations and by the payment difficulties of the project-executing agency caused by the Asian financial crisis.

The development of the electricity sector in Indonesia, i.e. of the project-executing agency PLN, must be considered problematic: PLN is still afflicted by the financial problems we described in our last ex-post evaluation (Diesel Stations IV – 1992 65 042 dated August 20, 2002). Although the company generated a positive operating result in 2001 of IDR 180 billion thanks to state subsidies (IDR 6.735 billion) and the conversion of outstanding state receivables into equity (IDR 28.781 billion) – its first positive result since 1996 – just one year later, in 2002, it was back in the red with a loss of IDR 6.060 billion, even though the Indonesian government again provided subsidies amounting to IDR 4.739 billion. The main reason for its poor earnings situation was insufficient tariff revenues. Despite the fact that the average final user tariffs increased by 53 % (adjusted for inflation) between 1999 and 2002, in the year 2002 the full cost coverage ratio of PLN recovered only temporarily to 72.4% before dropping back down to its level in 1998. Although the government approved – as planned – quarterly tariff increased of 6% in the year 2002, it changed course in early 2003 in favor of a slower adjustment strategy after simultaneous price increases for power, telephone and fuel sparked social unrest. Net grid losses are currently at 13.5%. Combined with the non-technical losses estimated at about 5%, the total grid losses are just under 20% and are therefore acceptable.

Following the currency and financial crisis (1997/98) power sales increased during the period 1999-2001 by an average of 9% p.a., yet in 2002 their growth was down to 2.4% owing to supply bottlenecks. Private consumption increased the fastest – by approx. 10% p.a. on average – so that nationwide the share of power for consumption climbed from 35.5% in the year 1997 to 39.5% in the year 2001. Since PLN, owing to its insufficient investment capacity, has been practically unable to build up generation capacity since the year 1998, it has been up to private investors to construct new power plants. Altogether 27 private projects with a total installed capacity of 10,835 MW were carried out. Approx. 14% of the gross power generated is now the result of privately funded power plants. However, this success was belittled by extensive arguments over the supply agreement between PLN and the project developers. The out-of-court negotiations for 26 cases were not concluded until mid-2003.

The adoption of a new Electricity Law in September 2002 eliminated another major obstacle for the sector reforms. Among other things, the law provides for the creation of a wholesale market and the free selection of suppliers for the Java-Bali system (by the year 2008). It also requires the establishment of an independent regulatory board. In addition, it calls for the progressive decentralization of PLN and the transformation of its power plants into joint stock companies, to

be followed by privatization. How to reorganize the power supply for the outside islands remains unclear. The conversion of the PLN provincial administrations into independent power utilities is being discussed, as is the creation of a board to handle fiscal equalization between the outside islands. This requires a financing concept to replace the former cross-subsidies arranged by PLN between Java-Bali and the outside islands. Apart from a general increase in efficiency, at the time of the programme appraisal the cost recovery ratio was expected to improve after the introduction of a tariff system that differentiates between regions. Neither has occurred, however.

Key Results of the Impact Analysis and Performance Rating

Several medium risks were identified during the programme appraisal. They involved an incorrect projection of demand, the early connection of individual programme regions to planned steam generating power plants (followed by the installation of diesel generators) and a system of used oil disposal that was not environmentally friendly. In retrospect, these risks did not arise. The one risk that did actually arise – that of a general, significant deterioration of the financial status of PLN owing to revenues insufficient to cover costs – was not identified during the appraisal.

Due to the good quality of the equipment installed and the satisfactory technical qualification of the local power plant staff as well as the competent maintenance of the diesel generators, from a technical point of view thus far no noticeable risks to the proper operation of the diesel generators installed under the project have arisen. Nevertheless, in view of the persistent financial problems plaguing PLN, problems are likely to arise in the medium term in connection with the procurement of spare parts, the payment of the staff and therefore the maintenance of the diesel generators (see also our previous ex-post evaluation report on Phase IV).

The poor financial situation of PLN described above caused the supply situation for the outside islands – where approx. 34% of PLN's customers live who buy 22% of the electricity - to deteriorate. In terms of power supply, the outside islands need to catch up. This is indicated by comparatively low per-capita consumption (212 kWh/year compared to 540 kWh/year on Java), a low electrification rate (45.5% compared to 56.2% on Java), long waiting lists for new connections, high increases in consumption, a low load factor and a high share of power for consumption. As was already the case in Phases I-IV of the overall programme, Phase V was also meant to counteract existing or pending supply bottlenecks at the programme locations and to support socio-economic development.

The overall positive growth in demand clearly illustrates that the project was justified in terms of the sector, yet it also shows that the supply gaps which the project helped to bridge cannot be eliminated without additional investments in plant capacity - for which PLN lacks the funds.

In analyzing the success of the project it can be said that the overall objective was realized only in terms of improvement in demand: Demand and consumption rose at every location, in some cases much faster than expected. In contrast, the programme's macroeconomic cost recovery ratio remained below the target of at least 85% since the current tariff revenues cover only 57.3% of the (macroeconomic) costs tied to the project. Further, its project cost recovery ratio of 79% is clearly too low. The contribution of productive energy consumption to the increase in demand was to be increased under the project. Owing to the lack of industrial infrastructure in the primarily rural programme areas, the share of power for consumption increased, however, and could not be counteracted by PLN. The share of productive energy consumption of the increase in demand at the various locations is only 32%. Thus, it is far below the indicator of 50%. This result resembles that of the preceding project, indicating that the targets set for

Phase V were too optimistic. Overall we consider the fulfilment of the requirements for achieving the overall objective to be insufficient.

The project was more successful in terms of achievement of the programme purpose: The average utilization of capacity of the diesel generators in the third year of operation slightly exceeded the cut-off figure of 50%, even though the capacity utilization of nine of the 26 generators installed was below 50%. The used oil was disposed of as required and in an environmentally friendly manner.

During the appraisal it was assumed that the subsidization of the project was justified because it compensated for regional disparities. Since the project fell far short of the required minimum cost recovery ratio, in retrospect this can no longer be considered acceptable. The relatively low productive share of the increase in demand at the programme locations also gives rise to speculation that the project's contribution to economic development is insufficient. On the other hand, the project had important positive impacts as well: it is beyond dispute that the project helped to improve the living conditions at the programme locations, even if the generated energy is only put to private use, leading to a welfare gain. It is irrelevant whether this private use takes the form of semi-commercial activities or crafts for which no qualification is required that are carried out in the home (e.g. repairs) or whether it derives from better quality of life (e.g. electric light).

No project impacts can be identified that would benefit the poor people living in the respective programme region to any significant degree. Since the financial support for the outside islands must be seen from a long-term perspective, it has to be assumed that the project will place a long-lasting financial burden on PLN (or its future legal successor) or the state budget (if it covers the losses). In consequence, the project cannot be said to have extensive poverty-reducing effects on the macro and sector levels. Therefore, it is reclassified to having no specific poverty orientation. The concept does not include the promotion of gender equality as a target; no effects of this type could be identified in the narrowly defined programme area.

The project takes concrete steps to protect the environment and to eliminate environmental problems. According to the state of technology, standard environmental protection measures such as adherence to emission and noise limits prescribed by law and the installation of oil collection vats and sound absorbers were included in the planning, and PLN fulfilled the requirement of ensuring proper disposal of used oil at all locations.

In terms of the subcategories for assessing project performance, the situation is as follows: The project's relevance is given. In contrast, the project's significance is no longer sufficient (rating 4), due mainly to inadequate recovery of macroeconomic costs and the low share of energy being used for productive purposes. In spite of the cross-subsidies to PLN that have already been granted, the project is not financially viable of its own accord. In view of the clear inability to recover the individual and macroeconomic costs, the project's efficiency is judged to be clearly insufficient (rating 5). In contrast, its effectiveness is satisfactory (rating 2) because the required utilization of the capacity of the diesel generators after two years of operation averages over 50% despite the fact that the minimum utilization of 50% has not yet been achieved at some of the locations. On account of serious deficiencies regarding the subcriteria of efficiency and significance, the project is judged to have a slightly insufficient degree of developmental effectiveness overall (rating 4).

Compared to the preceding programme Diesel Stations IV (see our ex-post evaluation report dated August 20, 2002) progress with the operation of the generators (satisfactory utilization of capacity of the diesel generators and better maintenance) can be observed. In view of the difficult development that Indonesia had to go through in the past few years (political, financial

and economic crises, ethnic unrest) the overall conditions for the electricity sector were anything but favourable. As a result, the relevant criteria that are usually applied to such projects could no longer be achieved, and a positive assessment of the total result was not possible, either.

General Conclusions for all Projects

No new, general conclusions could be drawn for all projects. However, a decision had already been taken several years ago to withdraw from the sector.

Abbreviations

GWh	Gigawatt hour
IDR	Indonesian Rupiah
kWh	Kilowatt hour
MW	Megawatt
PLN or P.T. PLN	Project-executing agency (Perseroan Terbatas Perusahaan LIstrik Negara)

Exchange rate

EUR 1 = IDR 9,560 (2003)

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 a project's "developmental effectiveness" and its classification during the final 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, organizational and/or technical support has come to an end.