Indonesia

Banjarmasin Coal Fired Steam Power Plant Project

Field Survey: August 2003

1. Project Profile & Japan's ODA Loan

Banjarmasin area, South Kalimantan

A panorama of the plant

1.1 Background

Indonesia's sixth five-year national development plan (REPELITA VI), which started in 1994, targeted improvements in the reliability of power supplies and the development of alternative electric power sources in line with the government's policy to relinquish dependency on oil-powered generation, and included plans for power source development and transmission / distribution grid infrastructure corresponding to the power situations of individual regions. Power consumption in the now-defunct , which incorporates South Kalimantan Province – the location of this project, was forecast to increase by an average 14.0% per year during the five years of the above plan, and there was a need for committed development of power sources. In addition, whilst this region has abundant available resources of coal, approximately 80% of existing power (on an installed generating capacity base) was fueled by diesel, thus the development of base load[1] power sources utilizing coal resources was also necessary from a perspective of the policy to shift power generation away from oil. Power development in the region was centered on two large power plants, i.e. the Banjarmasin power plant and the Samarinda power plant, and this project had been designated as high priority.

1.2 Objectives

The project's objectives were to respond to increasing demand for power and promote oil-dependency circumvention policies by constructing a coal-fired steam power plant in the

[1] This refers to the primary demand for electric power and gas that is deemed a constant requirement in any given time period.

southeastern part of Kalimantan, thereby contribute to infrastructure developments targeting economic growth and supporting regional development.

1.3 Outputs

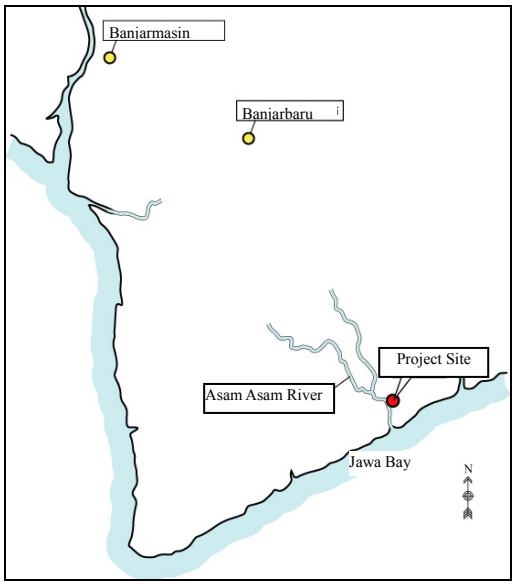
This project was co-financed by the World Bank[2], with total outputs as detailed hereunder. The appraisal performed for the Japanese loan component covered the development of steam generators and related facilities. The power plant is located some 123km to the southeast of Banjarmasin, the capital city in South Kalimantan Province, on the banks of the Asam Asam river (see Figure 1).

- Civil works: construction of access roads, ground leveling, construction of related buildings (World Bank)
- Steam generators[3] **and related facilities: procurement and installation of steam generators and related facilities (JBIC)**
- Turbine generators: procurement and installation of turbine generators (World Bank)
- Electrical equipment: procurement and installation of electrical equipment (World Bank)
- Instrumentation and Control: procurement and installation of instrumentation and control (World Bank)
- Transmission lines: construction of transmission lines (190km) (Australian government)
- Consulting services: detailed design, bidding assistance, work supervision (World Bank)

[2] "Sumatera and Kalimantan Power Project" (Board approval: June 1994; Closing date: June 2001)

[3] Heat generated by burning coal is converted to steam. The steam rotates the turbines, which rotate the generators to which they are directly linked, to generate electricity.

Figure 1: Project Location Map



1.4 Borrower / Executing Agency

Republic of Indonesia / Perusahaan Umum Listrik Negara (P.T. PLN (PERSERO): the State Electricity Corporation)

1.5 Outline of Loan Agreement

Loan Amount Disbursed Amount	6,464 million yen 6,440 million yen
Exchange of Notes Loan Agreement	November 1994 November 1994
Terms & Conditions Interest Rate Repayment Date (Grace Period) Procurement	 2.6% 30 years (10 years) General untied
Final Disbursement Date	December 2001

2. Results & Evaluation

2.1 Relevance

Improving the reliability of power supplies and developing alternative power sources in line

with the official policy to relinquish dependency on oil were defined as the goals of REPELITA VI (1994-1998), which incorporated plans for the development of power resources and transmission / distribution grid infrastructure that were tailored to the power situations in individual regions.

Power consumption in the now-defunct PLN Region VI, which includes South Kalimantan Province – the location of the project, was forecast to increase by an average 14.0% per year between fiscal 1994 and 1998, i.e. the duration of the aforementioned development plan, and there was a need for sure-footed development of power sources (see Table 1). Of the power generation facilities expected to come on stream by the end of fiscal 1998, the Banjarmasin coal-fired steam power plant developed through this project was the biggest, and was designed to bear a major share of the base load required to meet demand in South Kalimantan Province. This region produces abundant quantities of low sulfur coal, but as of 1993 some 80% of existing power (on an installed generating capacity base) was fueled by diesel, thus the development of coal-fired base load power sources was also deemed necessary from the perspective of the policy to relinquish dependency on oil. Given these circumstances, the plans to develop power sources fueled by the region's abundant coal resources, were consistent with Indonesian government policy at the appraisal time point and are thus considered to have been relevant.

Table 1: REPELITA VI Power Demand Forecasts for the Former PLN Region VI: FY94/95-FY98/99

	1994/95	1995/96	1996/97	1997/98	1998/99
Production output (KWh)	1,386.4	1,631.5	1,865.6	2,129.5	2,411.8
Peak load (MW)	230.0	269.1	305.8	346.9	391.5

Source: PLN

Power consumption in the South Kalimantan / Central Kalimantan supply region (part of the now-defunct PLN Region VI) is projected to increase by an average 9.3% annually in the five-year period commencing 2003 and PLN is planning to supply electric power from the Banjarmasin coal-fired steam power plant to transmission grid systems other than the Barito grid to which it belongs. Consequently, the project's objective of meeting increased demand for electric power in the southeast of Kalimantan continues to hold an important position. Furthermore, the Banjarmasin power plant is reducing the ratio of oil-fired power generation in the region, and is thus contributing to the ongoing policy to relinquish dependency on oil set forth by the government of Indonesia in PROPENAS (the national development plan for 2000-2004). Accordingly, the project continued to be highly relevant at the evaluation time point.

Table 2: Demand Forecasts for the South Kalimantan / Central Kalimantan Supply District: 2003-2007

	2003	2004	2005	2006	2007
Production output (KWh)	1,555.6	1,686.4	1,827.2	2,006.3	2,202.6
Peak load (MW)	288.4	312.0	337.3	369.5	404.8

Source: PLN

2.2 Efficiency

2.2.1 Outputs

All outputs, including the components that were financed by the World Bank, were essentially implemented in accordance with the plans. However, with regard to the steam generators and related facilities component that was scheduled under initial plans to be covered by Japan's ODA loan, due to the ongoing depreciation of the yen, the yen to US dollar exchange rate went from US$ 1 = 105 yen in April 1994 to US$ 1 = 119 yen in September 2001, which resulted in the related facilities component being switched from the JBIC portion to the World Bank portion.

2.2.2 Project Period

The original plans cited a project period of 55 months starting November 1994 and ending in June 1999 (i.e. from L/A signing through manufacture, installation and testing); however, the project actually spanned 73 months: from November 1994 through December 2000. This is primarily attributable to: 1) delays in the contract procedures for the civil works and turbine generators; 2) the adjustments needed to switch the funding for the related facilities component (from the Japan's ODA loan to the World Bank); 3) the social and political upheaval that resulted from the Asian currency crisis (rioting in Jakarta, a change in government), and the operational downturn of the executing agency (PLN) contingent upon same.

2.2.3 Project Cost

The Japanese ODA loan portion of project costs amounted to 7,605 million yen, i.e. 24.2% of 31,394 million yen, the total project costs as budgeted under the initial plans.

Project costs ultimately totaled 30,222 million yen (96.3% of the original figure), which was within budget; however, due to the depreciation of the yen against the dollar, the portion to be covered by Japan's ODA loan reached 8,614 million yen (113.3% of the original figure), exceeding the budgeted figure. As a result, the related facilities component of the portion to be financed by the Japan's ODA loan (steam generators and related facilities) was financed by the

World Bank and the actual amount disbursed by the Japan's ODA loan was 6,440 million yen (99.3% of the original figure).

2.2.4 Execution System

As stated above, this project was co-financed by the World Bank, with Japan's ODA loan covering the procurement and installation of the steam generators. In executing this work efforts were made to coordinate the various components with the contractors under the supervision of the consultant employed using World Bank funds.

2.2.5 Resettlement[4]

Fig. 2: A house at the resettlement site

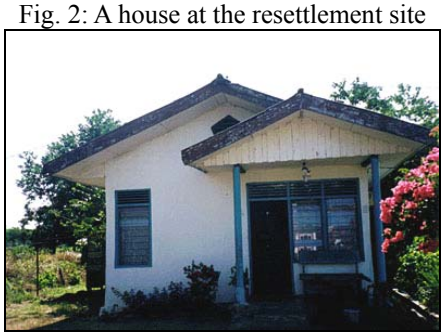
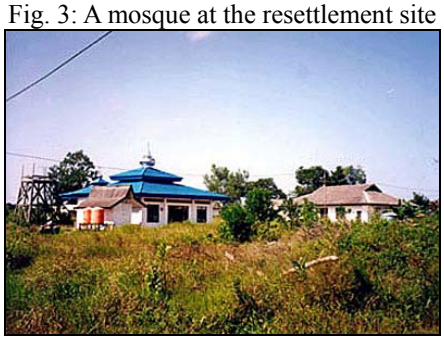


Fig. 3: A mosque at the resettlement site



The acquisition of land necessary for the implementation of this project (part of the project execution area) resulted in the resettlement of 36 households (144 people), which was carried out in 1995 under the supervision of the prefectural government. PLN provided new concrete houses (36m^2) at the relocation site (approx. 4km north of the project site) and developed basic infrastructure, including access roads, water mains, etc. and social amenities, including a mosque. With the cooperation of local universities and NGOs (non-governmental organizations), community development programs were provided for the residents targeted for resettlement, both before and after the relocation took place, which helped them to make a smooth start at the new location. The community development programs consisted of education and training in animal husbandry, agri-business and the fishing industry, as well as cultural and social activities, including religious activities[5].

2.2.6 Environmental Considerations

During the course of project execution, environmental assessments (known locally as AMDAL) were undertaken on the basis of the Environmental Management Law (No. 23 of 1997). An

[4] The resettlement site was visited during the course of this field survey and members of three households interviewed.

[5] This was evaluated as a textbook example of resettlement in the World Bank's project completion report. Although PLN implemented community development programs efficiently in cooperation with local universities and NGOs, some families had moved to other areas in search of work and so on, The JBIC survey mission confirmed that there are 6 households resettled.

environmental management plan (RKL) and an environment monitoring plan (RPL) were drawn up and the monitoring work undertaken by a local university under commission from PLN. No major problems were reported in connection with the implementation of this project.

2.3 Effectiveness

2.3.1 Performance of the Power Plant

According to the plans that were drafted at appraisal, the Banjarmasin coal-fired steam power plant was to have a maximum output of 130MW, a plant load factor of 63.0% and an electricity production capacity of 717.4GWh per year. As shown in Table 3, the power plant has been outperforming the targets for all indices since project completion. Moreover, its availability factor exceeds 80%, which testifies to the fact that the plant is operating smoothly without any consequential problems.

Table 3: Appraisal Plans & Operational Performance

	Annual electricity production (GWh)	Maximum output (MW)	Plant load factor[6] (%)	Availability factor[7] (%)
Planned	717.40	130.00	63.00	—
2001	738.71	130.00	64.87	95.38
2002	865.16	130.00	75.97	82.31

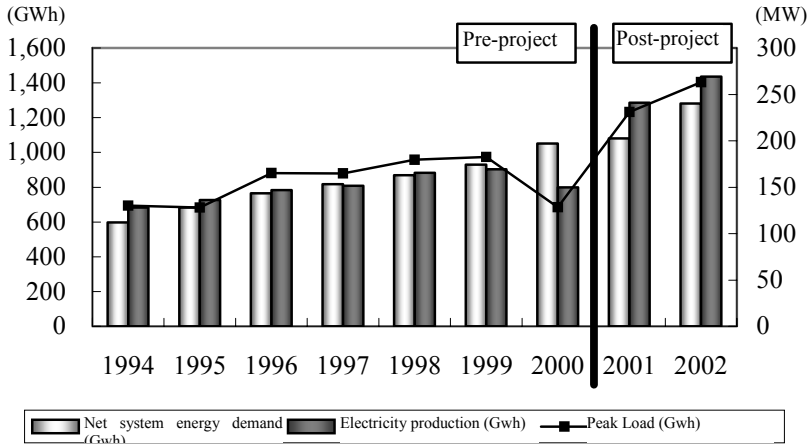
Source: PLN

2.3.2 Power Supplies to the South Kalimantan / Central Kalimantan Service Area

Annual electricity production in 1994 – the year of project appraisal – in the South Kalimantan / Central Kalimantan service area (part of the now-defunct PLN Region VI) was 682.82GWh, net system energy demand was 597.26GWh and peak load 130.08MW. Prior to the implementation of this project, with the exclusion of a few large power plants, the majority of generation facilities in this service area were small-scale diesel-fueled plants, which, as detailed hereunder, meant demand for electric power frequently outstripped supply[8].

[6] Plant load factor = annual electricity production / (rated output × hours per year)
[7] Availability factor = hours of operation per year / hours per year
[8] During power shortages, electricity was supplied from a barge-mounted diesel power plant.

Figure 4: South Kalimantan / Central Kalimantan Supply Status



Source: PLN

By comparison, following project completion, annual electricity production in 2002 in the same service area was 1,436.62GWh (up 210.4%), net system energy demand was 1,281.43GWh (up 214.6%), and peak load was 263.29MW (up 202.4%), all of which represent massive increases. As Figure 4 illustrates, all indices have improved substantially since 2001, which clearly evidences the contribution that the construction of the Banjarmasin power plant has made to the power supply situation in the South Kalimantan / Central Kalimantan service area. Furthermore, the Banjarmasin power plant produced 60.2% of all power generated in the service area during 2002 and is performing a critical function as a base load power source in this area.

2.3.3 Recalculation of the Financial Internal Rate of Return (FIRR)

The FIRR calculation performed at appraisal took costs to be construction costs, fuel costs, and operation costs, and benefits to be the revenue from power sales[9], yielding a figure of 6.3%. The FIRR was recalculated for this evaluation using the same terms, which resulted in a figure of 6.5%, and surpasses the appraisal figure.

2.3.4 Calculation of the Economic Internal Rate of Return (EIRR)

In order to ascertain the socio-economic effects of this project in quantitative terms, the EIRR was calculated to be 33.6% assuming costs to be construction costs, fuel costs, and operation costs, and benefits to be decreases in oil consumption. This suggests that the project is supporting the policy of relinquishing dependency on oil that is being promoted by the Indonesian government and that it has generated powerful socio-economic effects.

[9] Revenues earned from the sale of electric power. At appraisal, the volume of annual electricity production minus the loss rate was assumed to be the volume of power sold and revenues calculated accordingly.

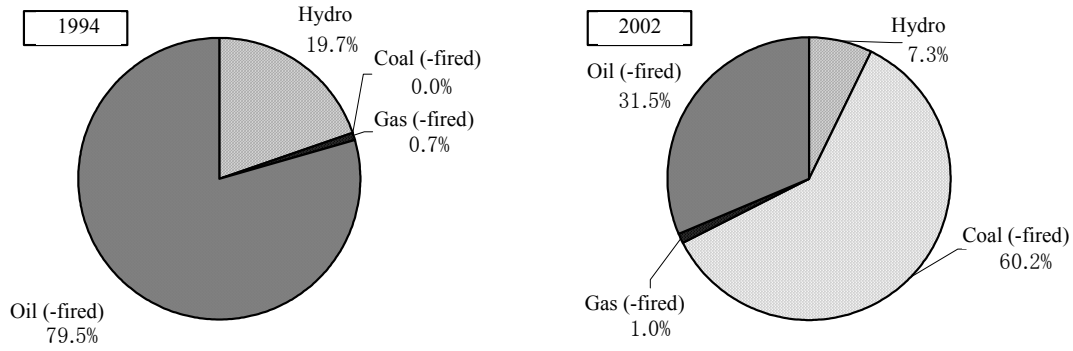
2.4 Impacts

2.4.1 Promoting Policies to Relinquish Oil Dependency

As illustrated in Figure 5, in 1994 – the year of project appraisal – aside from oil-fired generation, which accounted for 79.5% (543,126GWh) of power production in the South Kalimantan / Central Kalimantan service area (part of the now-defunct PLN Region VI) and hydropower, which accounted for 19.7% (134,736GWh), there were virtually no other power facilities in the region. By contrast, in 2002, after the completion of the project, the proportion of oil-fired power had decreased dramatically to 31.5% (452,043GWh) to be replaced by coal-fired power, which now accounted for 60.2% (865,164GWh). All of this coal-fueled power is being produced by the Banjarmasin power plant, confirming the contribution that this project is making to the policy to relinquish oil dependency.

Figure 5: South Kalimantan / Central Kalimantan Service Area

Composition of Electric Power Industry: Pre- & Post-Project Comparison



[All data were received from Banjarmasin power plant]

Source: PLN

2.4.2 Stimulating Local Industries

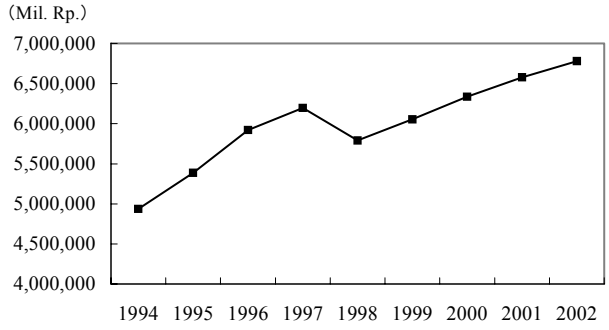
As part of this evaluation, PLN employees cooperated in the execution of a beneficiary opinion survey that was designed to ascertain the extent of the contribution made by this project to stimulating the region's economy and how satisfied the beneficiaries are by its effects. Three wood-processing companies, one fish processing company and one company from the mining industry were selected from among large companies in South Kalimantan Province that receive electricity from the Banjarmasin coal-fired steam power plant, and interviewed on the basis of a questionnaire.

Asked whether the project had improved electricity supplies, all respondents (5 companies)

stated that the situation had “improved substantially” (4 companies) or had “improved” (one company), with four companies expressing “satisfaction” with the current supply situation. Fewer blackouts and the ability to receive a stable supply of electricity since project completion were rated particularly highly by these respondents.

The contributions of the project to improvements in business were highly evaluated by all respondents, with three companies stating that it had “made a major contribution” and two that it had “contributed”. Particularly conspicuous was the emphasis laid on the benefits to business of being able to draft operational plans more easily in consequence of a guaranteed, stable supply of electricity.

Figure 6: GRDP in South Kalimantan Province (Constant 1993 prices)



Source: Central Bureau of Statistics (BPS)

Turning now to gross regional domestic production (GRDP at constant 1994 prices) in South Kalimantan Province; GRDP has increased from the pre-completion level of 6,157 million Rupiah in 1999, to the post-completion level of 6,869 million Rupiah in 2002, and is growing steadily, having overcome the downturn caused by the Asian currency crisis (see Figure 6). While it is difficult to specify what impact this project has had on regional economic development, taken in conjunction with the results of the interview survey, it is suggested that the construction of the Banjarmasin coal-fired steam power plant has helped to stimulate the local industries of the province and that it is underpinning economic growth in the region.

2.4.3 Environmental Impact

In terms of air pollution, as evidenced by the results of the environment monitoring survey executed by PLN in November 2002 (see Table 4), the amounts of atmospheric pollutants in the vicinity of the Banjarmasin coal-fired steam power plant are lower than the standards prescribed by the Indonesian government.

Table 4: Air Pollution (1-hour values) (μg/Nm^3)

Air pollutants	Observatory 1: 3m from stack	Observatory 2: 200m from stack	Observatory 3: Asam Asam[10]	Observatory 4: 500m from stack	Indonesian govn. STD
Dust	55.6	166.7	111.1	166.7	230
Sulfur dioxide (SO_2)	Traces	Traces	Traces	Traces	900
Nitrogen dioxide (NO_2)	33.5	42.4	74.8	68.7	400
Carbon monoxide (CO)	3.23	2.15	1.24	3.05	30,000

Source: PLN

Furthermore, the results of the same environmental monitoring survey (see Table 5) also testify to the fact that the pollutant contents in wastewater are all lower than the standards[11] prescribed by the Indonesian government.

Table 5: Water Pollution (effluent) (mg/l)

Water pollutants	Observatory 1: Outlet	Observatory 2: Ash dump	Observatory 3: Wastewater treatment plant	Indonesian govn. STD I	Indonesian govn. STD II
pH	5.85	5.67	8.89	6～9	－
Iron	1.05	1.05	1.24	5	10
Total Suspended Solids (TSS)	36	47	52	200	400

Source: compiled from data supplied by PLN

At the same time, all the ash that has been produced to date is currently lying untouched in the ash dump. Under appraisal plans, ash was only supposed to be kept in the ash dump for three months, after which it was to be used to fill abandoned coal mines or in the manufacture of cement; however, due to technical problems, no progress has been made on the reuse of this resource. In an interview held after the survey for the evaluation had been completed, PLN explained that a review of the ash handling plan was currently being undertaken.

Air pollutants (flue gas) are monitored round-the-clock by the plant's automatic control system. With water pollutants (effluent), the results of wastewater treatment are checked five times a day by plant personnel, added to which, samples are sent to an environmental laboratory every three months where they are checked by a third party. Furthermore, the plant is required to submit bi-annual reports on the implementation status of its environmental monitoring plan, including details on air and water pollutants, to the South Kalimantan Provincial Environment Management Agency (BAPEDALDA), thus demonstrating that it is conducting effective environmental monitoring.

[10] The distance of the Asam Asam Observatory from the stack was not identified in the materials received from PLN. The village is located 3km west of the project site.

[11] Water emission standards established for factories.

2.5 Sustainability

2.5.1 Executing Agency

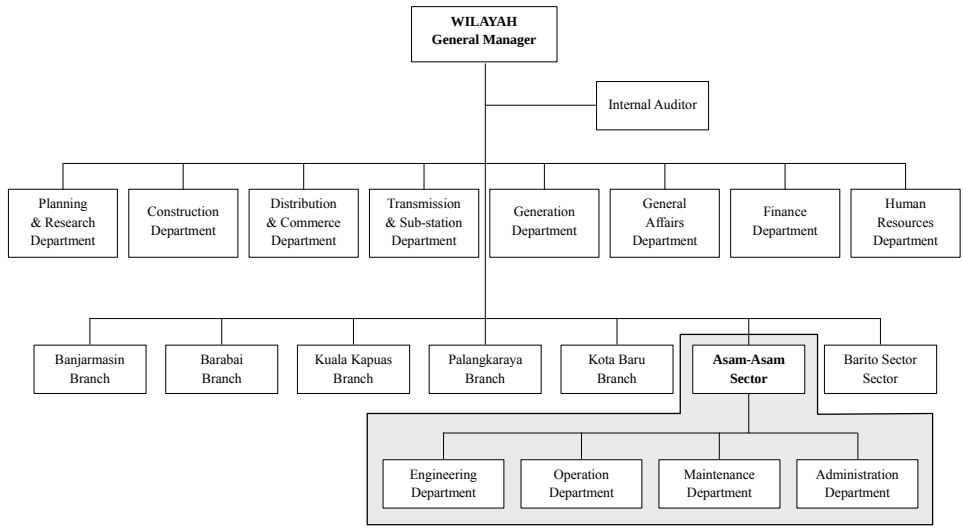
(1) Technical Capacity

Employees from the supply service area office and the power plant office are receiving training on the operation and maintenance (O&M) of the various plant facilities from the contractor; this is enabling them to acquire the necessary technical skills and to undertake the various tasks systematically based on manuals for each of the facilities. PLN reports that it is dispatching personnel to its training division in order to further raise the level of their technical skills.

(2) Operation and Maintenance System

Responsibility for the O&M of the Banjarmasin coal-fired steam power plant (that was constructed through this project) lies with the Asam Asam power plant office (Sektor) under the guidance of PLN South Kalimantan/ Central Kalimantan Regional Office (Wilayah). The Asam Asam power plant office comprises an administrative department, an engineering department, an operations department and a maintenance department, and has a workforce of 101, including the office manager (see Figure 7).

Figure 7: O&M Organizational Chart



Source: PLN

(3) Financial Status

PLN derives (all) its revenues from power tariffs, connection charges and so on. While

operating income has increased every year for the past five years, the increases are insufficient to cover operating expenses, which are likewise growing (see Table 6). In consequence, its operating profit figures have been in the red for four years in succession (1998-2001). Current term profits moved back into the black in 2001, but this can be attributed to reduced financing costs resulting from changes in interest payable and its loan repayment periods, and to government subsidies (6,735,209 million Rp) from the national budget (APBN), and is not indicative of a recovery in the performance of the electric power industry. Return on assets (ROA)[12] percentages, which had been negative since 1997, turned positive in 2001 with the injection of a cash subsidy from the government (see Figure 8). Both the liquidity ratio[13], an indicator of short-term stability, and the equity ratio[14], an indicator of long-term stability, have shown signs of rallying since 2000, but remain low by comparison with their levels in 1997 (see Figure 9).

As these indices testify, PLN's finances remain in a parlous condition and there are concerns that this will adversely impact on the O&M of the facilities procured for this project. The deterioration in the state utility's finances has been caused by: 1) increases in production costs and specifically, the price of fuel; 2) increases in the cost of power purchased from Independent Power Producers (IPP) (which are predominantly dollar-denominated), and 3) insufficient increases in its electricity tariffs by comparison with the above; all of which occurred with the collapse of the local currency (Rupiah) against the dollar caused by the Asian financial crisis[15].

In an attempt to improve its finances, PLN is currently reviewing its tariff structure and its contracts with IPPs, is attempting to bolster the efficiency of it operations and of its transmission business (to reduce technical losses), and to shift generation to gas-powered sources.

Various initiatives are being taken across the sector, including the financial and organizational restructuring of PLN, the introduction of incremental increases in tariffs to bring them up to an acceptable level, and the deregulation of the power market in a bid to promote private-sector investment, and the sector is expected to return to profitability in fiscal 2004. The new electricity law (approved in 2002) will see the introduction of market principles in the generation and retail of power by fiscal 2007, and efforts to address these changes are progressing.

[12] Return on assets (ROA) = profits / gross production (indicates overall profitability)

[13] Liquidity ratio = current assets / current liabilities (indicates solvency)

[14] Equity ratio = equity capital / aggregate capital (indicates the stability of procurement funds)

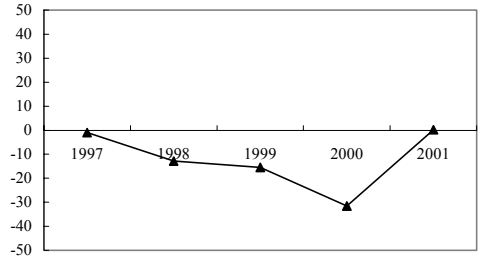
[15] The collapse of the Rupiah against the dollar increased power purchasing costs and fuel costs by 487.3%, i.e. from 4,663,998 million Rp. in 1997 to 22,724,436 million Rp. in 2001, which in turn pushed the percentage of costs to revenue up from 41.9% in 1997 to 79.4% in 2001. By contrast, average electricity tariffs rose by a mere 197.8% during the same period, or from 169.13 Rp. in 1997 to 334.55 Rp. in 2001.

Table 6: Profit & Loss Statements for PLN (company-wide) (1997-2001) (billion Rp.)

	1997	As % of revenue	1998	As % of revenue	1999	As % of revenue	2000	As % of revenue	2001	As % of revenue
Operating income	**11,126**	**100%**	**14,036**	**100%**	**15,997**	**100%**	**22,556**	**100%**	**28,624**	**100%**
Power sales	10,877		13,766		15,670		22,139		28,275	
Other	248		269		326		416		348	
Operating expenses	**9,449**	**85%**	**16,808**	**120%**	**21,502**	**134%**	**27,215**	**121%**	**31,939**	**112%**
Power purchasing	325		1,885		5,082		9,395		8,717	
Fuel expenses	4,338		9,408		9,691		10,375		14,007	
O&M expenses	965		924		1,497		1,610		2,630	
Personnel expenses	1,068		1,018		1,335		1,802		2,086	
Depreciation allowance	2,250		3,074		3,224		3,229		3,404	
Other	501		495		670		802		1,094	
Operating profits	**1,676**	**15%**	**-2,772**	**-20%**	**-5,505**	**-34%**	**-4,659**	**-21%**	**-3,314**	**-12%**
Non-operating profits / expenses	-2,255		-6,382		-5,348		-19,331		3,880	
Ordinary profits	**-579**	**-5%**	**-9,155**	**-65%**	**-10,853**	**-68%**	**-23,990**	**-106%**	**566**	**2%**
Taxes	-		-390		-514		-620		-569	
Extraordinary profits / expenses	-		-		-		-		183	
Current term profits	**-579**	**-5%**	**-9,545**	**-68%**	**-11,368**	**-71%**	**-24,611**	**-109%**	**180**	**1%**

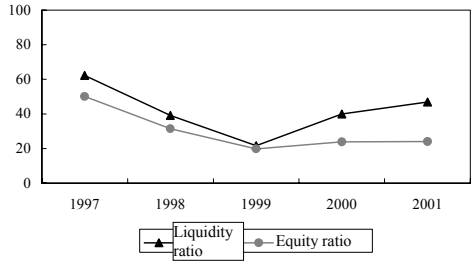
Source: PLN

Figure 8: Return on Assets (ROA) (%)



Source: PLN

Figure 9: Liquidity ratio / Equity ratio (%)



Source: PLN

2.5.2 Operation and Maintenance Status

The O&M status of the facilities that were constructed through this project is generally favorable.

O&M consists of routine maintenance, corrective maintenance and periodic maintenance activities. Periodic maintenance work comprises three stages, i.e. basic inspections, interim inspections and full-scale inspections, which are executed on the basis of operating hours and start-stop frequency. Full-scale periodic maintenance is performed after 32,000 hours (approx. 4 years), with the first full-scale inspection since project completion scheduled to be undertaken 2005. Repairs are performed by PLN's repair service department or are outsourced to private-sector contractors, or alternatively, where necessary, they are commissioned to research institutes such as the Bandung Institute of Technology.

3. Feedback

3.1 Lessons learned

Nothing

3.2 Recommendations

[To the executing agency] Early establishment of a coal ash handling system

The reuse of coal ash is not proceeding in accordance with the plan. The executing agency is in the process of investigating corrective measures, and specific measures must be taken for the reuse of this resource. It is also hoped that the executing agency will establish a comprehensive ash handling mechanism at the earliest possible time in order to handle the coal ash that would be generated hereafter.

Comparison of Original & Actual Scope

Item	Planned	Actual
(1) Outputs 1. Civil works (WB)	- Access roads - Land leveling - Construction of related buildings	- As planned
2. Steam generators (JBIC)	- **Steam generator procurement / installation**	- As planned
3. Steam generator-related facilities (WB)	- Procurement / installation	- As planned
4. Turbine generators (WB)	- Procurement / installation	- As planned
5. Electrical equipment (WB)	- Procurement / installation	- As planned
6. Instrumentation & control equipment (WB)	- Procurement / installation	- As planned
7. Transmission lines (Australian government)	- Construction (190km)	- Construction (228km)
8. Consulting services (WB)	- Detailed design - Bidding assistance - Work supervision -	- As planned -
(2) Project period 1. L/A conclusion 2. Tenders / contracts 3. Manufacture, installation, testing	 Nov. 1994 Apr. 1995 – Feb. 1996 Feb. 1996 – Jun. 1999	 Nov. 1994 Nov. 1995 - Aug. 1997 Aug. 1997 – Dec. 2000
(3) Project costs (Japan's ODA loan component) Foreign currency Local currency Total Japan's ODA loan portion Exchange rate	 5,370 million yen 2,235 million yen 7,605 million yen 6,464 million yen US$1＝105 yen ＝ 2,100 Rp. (April 1994)	 6,074 million yen 2,54 1 million yen 8,614 million yen 6,440 million yen US$1＝119 yen ＝ 8,875 Rp. (September 2001)

Third Party Evaluator's Opinion on
Banjarmasin Coal Fired Steam Power Plant Project

Armida S. Alisjahbana
Associate Professor
Head of Center for Economics and Development Studies
Faculty of Economics, Padjadjaran University

Relevance

The objectives of the project were highly relevant when it was first conceived in the mid 1990s as a source of non-fuel electricity generation to lessen the dependence on oil. The project is consistent with the need to increase supply due to increased demand for energy in South East Kalimantan that had been provided mostly from diesel generation. South Kalimantan is an area abundant with coal reserves, and diversification of energy supply away from oil towards more use of coal for electricity generation is highly appropriate strategy. Demand for electricity in South Kalimantan has been accelerating at a rapid pace due to increased economic activities in the region. It had been forecasted to increase by an average of 14% per year during the 1994-1998 periods. The construction of the Banjarmasin Coal Fired Steam Power Plant Project was meant to provide most of the electricity needs of South Kalimantan Province.

At present and in the future, the project will still be highly relevant to meet South Kalimantan's steady growth in its demand for electricity consumption averaging at 9.3% per year since 2003. As such the project is contributing in a significant manner towards the diversification of the region's and hence Indonesia's dependence on electricity generation from oil resources. The development of the Banjarmasin coal fired steam power plant project has contributed to electricity supply for other grid systems in the region other than the Barito grid system which the project belongs. The project's relevance has been enhanced further in supplying more electricity from steam fired power generation and a reduction in the role of oil electricity generation. At the present time, the project is still highly relevant in supporting government's program in reducing its dependence on oil resources.

Impact

The project has achieved its intended impact on reducing the regions heavy dependence on oil electricity generating capacity. When the project was started in 1994, South Kalimantan and Central Kalimantan's reliance on oil in its electricity generation was as high as 79%, but when the project was finished in 2002 the proportion of electricity generated through coal fired steam power plant had become 60.2%. All of the electricity from coal fired steam generation plant is generated by the Banjarmasin coal fired steam power plant, which confirms its important and strategic role it has played in the region's electricity generating capacity.

The plant has direct economic benefits to the region as it provides stable and reliable electricity supply to industries. The project has taken care of the environment in terms of air and water pollution emitted is far below the allowable threshold. The project, however has to pay attention to the ash produced from the plant which is still left sitting outside without proper discharging mechanism so as not to cause pollution to the area.