



Completion Report

Project Number: 28187
Loan Number: 1585
July 2006

Viet Nam: Central and Southern Viet Nam Power Distribution Project

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – dong (D)

		At Appraisal	At Project Completion
		12–20 Aug 1997	May 2005
D1.00	=	\$0.0000855	\$0.0000629
\$1.00	=	D11,700	D15,880

ABBREVIATIONS

ADB	–	Asian Development Bank
BTOR	–	back-to-office report
EIRR	–	economic internal rate of return
EVN	–	Electricity of Vietnam
FIRR	–	financial internal rate of return
LV	–	low-voltage
MOI	–	Ministry of Industry
MV	–	medium-voltage
PC2	–	Power Company No. 2
PC3	–	Power Company No. 3
PCB	–	polychlorinated biphenyl
PECC1	–	Power Engineering Consulting Company No. 1
PCR	–	project completion report
SCADA	–	supervisory control and data acquisition

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour (1,000,000 kWh)
kVA	–	kilovolt-ampere (1,000 volt-amperes)
km	–	kilometer
kV	–	kilovolt (1,000 volts)
kWh	–	kilowatt-hour (1,000 watt-hours)
MW	–	megawatt (1,000,000 watts)
MVA	–	megavolt-ampere (1,000 kVA)

NOTE

In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Viet Nam
2.	Loan Number	1585-VIE
3.	Project Title	Central and Southern Viet Nam Power Distribution Project
4.	Borrower	The Government of Viet Nam
5.	Executing Agency	The Electricity of Vietnam
6.	Amount of Loan	SDR 73,007,000 (\$100 million)
7.	Project Completion Report Number	952

B. Loan Data

1.	Appraisal	
	– Date Started	12 August 1997
	– Date Completed	20 August 1997
2.	Loan Negotiations	
	– Date Started	24 October 1997
	– Date Completed	24 October 1997
3.	Date of Board Approval	27 November 1997
4.	Date of Loan Agreement	25 November 1998
5.	Date of Loan Effectiveness	
	– In Loan Agreement	25 February 1999
	– Actual	25 February 1999
	– Number of Extensions	0
6.	Closing Date	
	– In Loan Agreement	31 December 2002
	– Actual	30 May 2005
	– Number of Extensions	One (1)
7.	Terms of Loan	
	– Interest Rate	1%
	– Maturity (number of years)	40 years
	– Grace Period (number of years)	10 years
8.	Terms of Relending (if any)	
	– Interest Rate	pool-based variable
	– Maturity (number of years)	20 years
	– Grace Period (number of years)	5 years
	– Second-Step Borrower	Power Companies No. 2 and No. 3

9. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
05 July 1999 (PC2)	30 May 2005 (PC2)	70 months (PC2)
19 July 1999 (PC3)	31 March 2005 (PC3)	68 months (PC3)
Effective Date	Original Closing Date	Time Interval
25 February 1999 (PC2)	31 December 2002 (PC2)	34 months (PC2)

b. Amount (\$ million)

Category	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
PC2						
Equipment	40.41	27.61	12.80	27.61	27.21	0.41
Consulting	1.74	1.40	0.31	1.43	1.00	0.43
Service charge	0.91	0.95	0.06	0.85	0.79	0.06
Contingencies	6.95	0.00	6.95	0.00	0.00	0.00
Subtotal	50.00	29.96	20.11	29.90	28.99	0.91
PC3						
Equipment	40.41	18.99	21.42	18.99	18.99	0.00
Consulting	1.74	1.04	0.72	1.03	0.74	0.29
Service charge	0.91	0.69	0.22	0.69	0.53	0.17
Contingencies	6.95	0.00	6.95	0.00	0.00	0.00
Subtotal	50.00	20.73	29.30	20.70	20.25	0.45
Total	100.00	50.68	49.41	50.60	49.24	1.36

10. Local Costs (Financed by ADB)

– Amount (\$)	0.0
– Percent of Local Costs	0
– Percent of Total Cost	0

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
PC2		
Foreign Exchange Cost	50.00	30.05
Local Currency Cost	20.00	16.66
Total	70.00	46.71
PC3		
Foreign Exchange Cost	50.00	24.53
Local Currency Cost	20.00	19.02
Total	70.00	43.54

2. Financing Plan (\$ million)

Cost	Appraisal Estimate		Actual	
	Foreign	Local	Foreign	Local
PC2				
Borrower Financed	0.00	20.00	1.06	16.66
ADB Financed	50.00	0.00	28.99	0.00
Total	50.00	20.00	30.05	16.66
PC3				
Borrower Financed	0.00	20.00	4.28	19.02
ADB Financed	50.00	0.00	20.25	0.00
Total	50.00	20.00	24.53	19.02

ADB = Asian Development Bank

3. Cost Breakdown by Project Component (\$ million)

Component	Appraisal			Actual		
	Foreign	Local	Total	Foreign	Local	Total
PC2						
MV Cable and Overhead Lines	13.53	1.08	14.61	5.24	1.19	6.43
UG Cables				5.21	2.11	7.32
MV Substations	6.88	2.35	9.23	6.23	0.79	7.02
LV/Lines	13.94	2.89	16.82	6.62	2.52	9.14
Meters	3.21	1.50	4.71	0.16		0.16
Vehicles, Tools	2.84	0.28	3.13	1.37		1.37
SCADA				3.43		3.43
Social Impacts Mitigation Costs		0.80	0.80		1.10	1.10
Consulting Services	1.74	0.12	1.86	1.00	1.31	2.31
Base Costs	42.42	9.01	51.16	29.26	9.02	38.29
Taxes and Duties		4.22	4.22		3.16	3.16
Physical	2.11	0.63	2.64			
Contingencies						
Price Contingencies	4.84	0.85	5.69			
IDC and Services Charge	0.90	5.38	6.28	0.79	4.48	5.26
Subtotal	50.00	20.00	70.00	30.05	16.66	46.71
PC3						
MV Overhead Lines	11.79	0.76	12.15	9.84	5.42	15.27
MV Substations	7.12	2.20	9.32	2.34	1.29	3.63
MV Equipment	1.19	0.24	1.43	1.38	0.76	2.14
LV Network/Lines	11.93	3.03	14.96	8.61	0.47	13.36
Meters	3.79	1.30	5.09			
Vehicles, Tools	4.99	0.44	5.43	1.09		1.09
Social Impacts Mitigation Costs		0.20	0.20		0.17	0.17

Component	Appraisal			Actual		
	Foreign	Local	Total	Foreign	Local	Total
Consulting Services	1.74	0.12	1.86	0.74	1.01	1.75
Base Costs	42.15	8.30	50.44	24.00	13.40	37.40
Taxes and Duties		4.25	4.25		2.77	2.77
Physical Contingencies	2.11	0.63	2.73			
Price Contingencies	4.84	0.95	5.79			
IDC and Services Charge	0.90	5.88	6.78	0.52	3.02	3.55
Subtotal	50.00	20.00	70.00	24.52	19.19	43.18
Total						

IDC = interest during construction, LV = low-voltage, MV = medium-voltage, SCADA = supervisory control and data acquisition, UG = underground

4. Project Schedule

Item	Appraisal		Actual		
			PC2 Original Scope	Thu Dau Mot	PC3
1. Loan Approval	Dec 97		Nov 97		
2. Loan Effectiveness	May 98		Feb 99		
3. Selection of Consultant	Jun 98		Mar 99		Apr 99
4. Detailed Design	Sep 98		May 98–Sep 99	Sep 01–Mar 03	Sep 99–Dec 00
5. Preparation of Bids	Oct 98		Jun 99–May 00	Apr 03–Jun 03	Jun 00–Mar 01
6. Review of Bid Docs	Dec 98		Sep 99–Jun 00	May 03–Jun 03	Apr 01–May 01
7. Tendering Period	Jan–Apr 99		Nov 99–Jun 00	Jun 03–Jul 03	Jun 01–Jul 01
8. Bid Evaluation and Approval	May–Aug 99		Jan 00–Apr 01	Jul 03–Oct 03	Aug 01–Mar 02
9. Contract Award	Sep–Dec 99		Apr 00–Jul 01	May 03 - Nov 03	Dec 01–May 02
10. Delivery of Equip. & Materials	Jun 00–Jun 01		Apr 00–Jul 02	Nov 03–Dec 03	May 02–Dec 02
11. Bidding for civil works	Sep 99–Dec 99		Jun 00–Dec 01	Jul 03–Aug 03	Jul 01–Dec 01
12. Award of civil works	Jun 00		Aug 00–Mar 02	Nov 03	Jan 02
13. Installation	Jul 00–Jun 02		Nov 01–May 05	Dec 03–Dec 05	Mar 02–Apr 06

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 01 January 1997 to 31 December 1997	S	S
From 01 January 1998 to 31 December 1998	S	S
From 01 January 1999 to 31 December 1999	S	PS
From 01 January 2000 to 31 December 2000	S	PS
From 01 January 2001 to 31 December 2001	S	U
From 01 January 2002 to 31 December 2002	S	S
From 01 January 2003 to 31 December 2003	S	S
From 01 January 2004 to 31 December 2004	S	S
From 01 January 2005 to 31 December 2005	S	S

D. Data on Asian Development Bank Missions

Name of Mission^a	Date	No. of Persons	No. of Person-Days^a	Specialization of Members^b
Fact-finding	28 Apr–14 May 1997	3	51	a, b, b,
Appraisal	12–20 Aug 1997	4	36	a, a, b, e
Inception	24 Mar–2 Apr 1998	2	20	a, b
Review 1	7–11 Sep 1998	1	4	b
Name of Mission^a	Date	No. of Persons	No. of Person-Days^a	Specialization of Members^b
Review 2	22 Nov–1 Dec	2	22	a, b
Review 3	29 Nov–9 Dec 1999	2	22	a, d
Review 4	21–22 Dec 2000	3	4	a, d, f
Review 5	1–4 Jul 2001	2	8	a, d
Review 6 (Midterm)	4–13 Dec 2001	4	10	a, a, b, d
Review 7	10–25 Jun 2002	6	38	a, a, b, d, f, g
Review 8	1–11 Dec 2002	2	11	a, d
Review 9	4–11 Aug 2003	2	16	a, d
Review 10	9–15 Dec 2004	1	7	b
Project Completion Review	20 Feb–9 Mar 2006	2	28	b, d

Sources: Back-to-office reports.

^a Missions were fielded to review progress of various projects, and the person-days shown were the actual days spent reviewing the Project

^b The specialization of the mission leader and members: a – project engineer/specialist, b – financial analyst, c – project implementation officer from Viet Nam Resident Mission (VRM), d – project analyst, e – administrative assistant, f – VRM implementation officer, g – economist.



I. PROJECT DESCRIPTION

1. The Project's primary objective was to support economic growth by increasing the capacity and improving the efficiency and reliability of the power distribution system in urban areas. The Project would also contribute to poverty reduction by supplying electricity to selected rural communes and by providing direct connections to poor consumers in the cities it covered. The Project covered the franchise areas of Power Company No. 2 (PC2) in southern Viet Nam and Power Company No. 3 (PC3) in central Viet Nam. Its objectives included (i) expanding and reinforcing the distribution system to meet existing suppressed demand and future load growth in urban areas; and (ii) providing electricity to selected rural communes with a high incidence of poverty.

2. The original scope of the Project covered the following.

- (i) **PC2 franchise area.** Rehabilitation and augmentation of the electricity distribution system in three cities (Bien Hoa, Da Lat and Can Tho) and electrification of two rural communes (Phuoc Khang and Ninh Thanh Loi).
- (ii) **PC3 franchise area.** Rehabilitation and augmentation of the electricity distribution system in nine towns (Tam Ky, Quang Ngai, Hoa Khanh–Lien Chieu, Kon Tum, Dong Ha, Quang Tri, Dong Hoi, Dien Khanh, and Pleiku) and electrification of four rural communes (Bien Ho, Vinh Thinh, Tinh Khe and Yama).

3. In March 2002, an extra town (Thu Dau Mot) in the PC2 area was included in the Project so that anticipated loan savings could be used.

4. The rehabilitation of urban networks included converting the many medium-voltage (MV) levels in the project cities to 22 kilovolts (kV), replacing the overhead MV networks in densely populated areas with underground cables, expanding the conductor sizes in both MV and low-voltage (LV) networks, installing additional transformers to meet demand growth (including compact substations), installing MV switching equipment to improve the reliability of the system, installing supervisory control and data acquisition (SCADA) systems in three cities in the PC2 area to facilitate automated distribution, installing new consumer meters, and converting consumers supplied through electricity wholesalers into direct consumers. The rural electrification included extending the MV network to communes and installing MV and LV transformers and an LV network within communes.

5. The Project also addressed the governance and the financial viability of the sector through several covenants aimed at policy tariff reforms. ADB provided two technical assistance (TA) grants aimed at introducing a new electricity law that clearly delineated the regulation and operation of the power sector, and sought to commercialize the power distribution companies.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. The Project was consistent with the Government's focus on increasing access to electricity; improving the operations, technical efficiency, and quality of the electricity supply; and raising finances of about \$1 billion per year to finance power sector expansion. It was also relevant to ADB's sector strategy for Viet Nam to rehabilitate and develop critical power sector infrastructure to support economic growth. During appraisal, the urban electricity distribution networks in Viet Nam were found to be too old, dilapidated, overloaded, and inadequate to

service customers satisfactorily. The lines were often too long for the small conductors. Line losses were high and the voltage drop at the extremities of the system could be as much as 25%. ADB assistance was needed because of the difficulties of attracting private sector investments and foreign commercial cofinancing to improve the distribution system.

7. The Project improved the reliability and quality of urban distribution networks (as indicated by the reduction in distribution losses and network outages). It enabled 70%–100% of the demand growth in the urban areas of Viet Nam during 1999–2005 to be met. The unprecedented growth in power demand in certain cities in the PC2 area had not been anticipated during the design phase, mainly because there was a sudden drop in demand growth during the preparatory phase of the Project in 1997 as a result of the Asian financial crisis. Because demand growth was underestimated at appraisal, some of the substations installed under the Project are already overloaded. The Project's scope could have been easily expanded to cope with the increased demand during the implementation phase. The cost estimates prepared during the project preparation phase turned out to be excessive, leading to substantial cost savings in the ADB-financed contracts.

8. The policy conditions and covenants attached to the Project were found to be too ambitious. The tariff covenant requiring the Government to increase the average tariff to \$0.07/kWh delayed the signing of the Loan Agreement by about 12 months. The policy conditions relating to the enactment of the electricity law were fulfilled only in 2004 and those on the establishment of the electricity regulator only in 2005. The delays were caused by the extensive consensus building required for major policy changes. However, the Project has contributed to these belated policy reforms by compelling policy makers to pay attention to the governance issues of the sector.

B. Project Outputs

9. The original report and recommendation of the President¹ specified that the project outputs would be the upgrading and rehabilitation of the power distribution network in 12 cities or towns, and the electrification of six rural communes. The physical quantities of work to be carried out during the Project were not quantified in the RRP. The prefeasibility study undertaken during project preparation was substantially revised during the feasibility study, which was undertaken by PC2 and PC3 in parallel with the processing of ADB loan, and which resulted in a reduction in the scope of work and project cost. The technical designs undertaken during 1999–2001 did not introduce significant changes to the project outputs. The major changes related to the increase in substation capacities in the PC2 area to respond to rapid growth in electricity demand. The project output quantities at the completion of the project were broadly similar to those estimated at the technical design. The project outputs by project site are described in Appendix 1 and summarized in Table 1.

¹ Asian Development Bank. 1997. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Viet Nam for the Central and Southern Viet Nam Power Distribution Project*. Manila.

Table 1: Comparison of Project Outputs at Technical Design and at Project Completion

Item	Unit	Technical Design	Project Completion
PC2			
MV Overhead	km	486	432
MV Underground Cables	km	149	152
Number of substations	no.	1,212	982
Substation capacity	kVA	292,281	238,335
LV lines	km	1,288	1,187
SCADA	no.	3	3
Meters	no.	54,110	46,355
PC3			
Overhead MV line	km	910	902
Underground cables	km	11	11
Distribution substation	no.	1,316	1,270
Substation capacity	kVA	259,725	254,920
LV line	km	1,346	1,401
Meters	pcs	139,088	129,577

km = kilometer, kVA = kilovolt-ampere, LV = low-voltage, MV = medium-voltage, no. = number, pcs = pieces, SCADA = supervisory control and data acquisition.

Source: Information provided by PC2 and PC3.

10. During implementation, the rehabilitation of the power distribution network of Thu Dau Mot town in the PC2 area was added to the Project and this is included in the project outputs under the “technical design” and “actual” categories in Table 1. In Bien Hoa city in the PC2 component and Tam Ky town in PC3 component, several project outputs that were designed to be undertaken under the Project were financed by the city authorities because of delays in project implementation.

11. As a result of the conversion of the MV network in the project cities from 6, 10 and 15 kV to a standard voltage of 22 kV, a reduction in the LV feeder length, and installation of additional transformers, energy losses in the distribution system and outages were considerably reduced. Without the Project, the rapid growth in electricity demand for the project towns/cities could not have been met. The expanded system in most parts of the cities covered by the Project will be able to meet the forecast demand growth until 2010 without significant new investments.

C. Project Costs

12. At appraisal in 1997, the estimated overall project cost was \$140 million, comprising \$100 million foreign cost (71%) and \$40 million local currency cost (29%). This cost was divided equally, with \$70 million for each PC with \$50 million foreign cost to be financed by ADB and \$20 million local cost to be financed by the borrower. The actual project cost was \$90.43 million (64.6% of the appraisal estimate), comprising \$54.6 million (54.6% of the appraisal estimate) in foreign cost, and \$35.8 million (89.6% of the appraisal estimate) in local currency cost. However, the base cost was 74% of the appraisal estimates, as the contingencies included in the appraisal estimates were not utilized. The breakdown of project cost by project site is provided in Appendix 2 and summarized in Table 2 below.

Table 2: Comparison of Project Cost at Appraisal and Completion

Item	Appraisal			Actual		
	Foreign	Local	Total	Foreign	Local	Total
PC2						
Base Cost	42.15	9.01	51.16	29.26	9.02	38.29
Total Cost	50.00	20.00	70.00	30.05	16.66	46.71
PC3						
Base Cost	42.15	8.30	50.45	24.00	13.40	37.40
Total Cost	50.00	20.00	70.00	24.53	19.19	43.72

Sources: PC2 and PC3.

13. There were significant cost underruns in the foreign exchange cost at both project sites (the actual cost is 65% of the appraisal estimate and actual foreign exchange cost is 55% of the appraisal estimate). There would have been further cost savings if not for the additional town added to the PC2 component of the Project. The local cost estimates were broadly in line with the appraisal estimates (approximately 90%). The main reason for the cost underruns was the low prices offered for the equipment and material procured under international competitive bidding (ICB) procedures as a result of excess supply in the aftermath of the Asian financial crisis. The appraisal cost estimates were based on the prices offered by the suppliers from developed countries, but most contracts were awarded to Vietnamese suppliers, who belonged to consortia with manufacturers from East Asian countries. The ADB-financed contracts are listed in Appendix 3.

D. Disbursements

14. The disbursements were made directly to the successful bidders for contracts financed by ADB. ADB did not finance local currency expenses, so an imprest account was not required. The proceeds of the loan were relented to PC2 and PC3 by the Ministry of Finance through Electricity of Vietnam (EVN) at a market-based interest rate. Project and actual disbursements are compared in Appendix 4.

15. Because of delays in finalizing technical documents and submitting bid documents and bid evaluations, most contracts were awarded by PC2 during October 2000–March 2001 and by PC3 during December 2001–May 2002. The contract award by PC2 for the main cities was delayed by 12 months and the award by PC3 by over 20 months. The disbursements made during 2003–2004 mainly relate to the procurement of goods for Thu Dau Mot town, which was added to the project during the midterm review in 2001. This meant that most of the disbursements were during 2001–2003, compared with the appraisal estimates of 1999–2001. ADB also did not finance a bid package worth approximately \$4.5 million in the PC3 component because of the disagreement over the bid evaluation between EA/IA and the supervisory consultants. This further reduced the actual disbursements (\$49.24 million) compared with the appraisal estimates (\$100 million). Because of the cost underruns in the ADB-financed contracts, the uncommitted amounts were cancelled (\$40 million in August 2003, \$9.38 million in January 2005 and \$0.9 million at the time of loan closure in May 2005).

16. The main reasons for the deviation in the disbursement schedule from the appraisal estimates were (i) the one-year delay in loan effectiveness; (ii) the delay in the contract award because of the delays in finalizing the technical design in the case of PC3, and finalizing bid documents and bid evaluation in the case of PC2 (described in detail under the procurement

section); (iii) low contract prices compared with the appraisal and technical design estimates; and (iv) the ADB decision not to finance a bid package.

E. Project Schedule

17. The loan was approved in November 1997 and it was assumed that implementation would be completed in 54 months (i.e., by June 2002). This was based on the assumption that the technical designs would be completed by September 1998, the tenders would be issued by January 1999, the procurement contracts awarded by December 1999, civil work contracts awarded by June 2000, and installation completed in 24 months. However, the Project suffered significant delays at different stages for reasons that were not fully anticipated at appraisal, so the loan closing date was extended from 31 December 2002 to 31 December 2004 in November 2002. The loan account was kept open until 30 May 2005 so payments could be made for outstanding invoices for expenses incurred before loan closing. The chronology of major events is in Appendix 4 and the actual project implementation schedule compared with the project implementation schedule at appraisal is in Appendix 6.

18. The signing of the loan was delayed by more than 12 months because of the Government's reluctance to commit to achieving an average retail tariff of \$0.07/kWh by 31 March 1999, as required by the Loan Agreement (see para. 30). After protracted discussions, the loan was signed in December 1998 and declared effective in February 1999. The consultants were selected shortly afterwards and fielded in May 1999 in the case of PC2 and in September 1999 in the case of PC3. This was possible because advance action procedures were adopted for consultant selection before the signing of the Loan Agreement.

19. The technical designs for the PC2 component were approved by the Ministry of Industry (MOI) in September 1999, i.e., after a 12-month delay. Finalization of the technical designs for PC3 component was significantly delayed for several reasons. The original feasibility studies were done in 1997 by PC3 staff, based on the prefeasibility study prepared by the ADB project preparatory technical assistance (PPTA) consultants and based on 1996 data. These studies had to be significantly revised to take into account the new urban development plans of the project cities. PC3 also recruited several domestic consulting firms to prepare the technical designs for the 13 project sites. Difficulties in coordinating their work and in reaching agreement on a common set of technical specifications resulted in delays. The initial set of technical designs submitted in August 2000 was rejected by EVN, and the revised technical designs, together with the revised feasibility study, were approved in March 2001.

20. The bidding documents for the equipment for rural communes and cities in the PC2 component were prepared during August–November 1999 and August 1999 to May 2000. This took more time than expected at appraisal because of a lack of familiarity with ICB bidding procedures in spite of the presence of international consultants and the revision of ADB's procurement guidelines that took place during this time. The preparation of bidding documents for the PC3 component was faster as the documents prepared by PC2 were used as a guide. PC3 staff, together with the international consultants, started working on the bidding documents before approval of final technical design. The PC3 bidding documents finalized in March 2001 were issued to the bidders in May 2001, i.e., after a delay of more than 28 months compared with the appraisal estimates.

21. The bid evaluation for equipment in rural communes in the PC2 area was undertaken during November 1999–April 2000 and for equipment in cities the evaluation was undertaken during February 2000–April 2001. The contract award for the PC2 component was completed in

July 2001. Delays were caused by clarifications on technical issues raised by the successful bidders for the mini SCADA and compact substations. The tendering for the PC3 components was carried out during June–July 2001 and the bid evaluation was during August 2001–March 2002. Contracts were awarded by May 2002. The civil work contracts for rural communes in the PC2 area financed by the executing or implementing agencies were awarded in August 2000 and the installation work in the communes was completed in December 2000. The civil work contracts for the cities in the PC2 area were awarded during November 2001–March 2002 and the civil work contracts for all the sites in PC3 area were awarded during January–March 2002.

22. By December 2000 it was evident that there was going to be a large cost overrun in the ADB-funded procurement contracts in the PC2 component. It was therefore agreed that a feasibility study on the possible inclusion of Thu Dau Mot town would be conducted. This was completed in November 2001 and PC2 sought formal approval for the inclusion of Thu Dau Mot in the Project in March 2002. ADB and Government approval was granted in October–November 2002. The bidding plan for Thu Dau Mot was approved in April 2003 and the procurement of goods for Thu Dau Mot were undertaken from June–October 2003

23. Except in Da Lat city, where the installation work was completed by December 2003, the installation work in the cities was significantly delayed. The most common reason in both PC2 and PC3 areas was the delay in approving the network routes and pole foundations by the city authorities. This was usually due to urban development planning and preparation of road-widening projects. Civil works were held up for long periods and contractors suffered financial losses as prices rose. Most of the cities in PC2 were completed by December 2004 and those in PC3 by May 2005 (the exceptions were Thu Dau Mot in the PC2 area and Dien Khanh and Quang Tri cities in the PC3 area). Installation of the MV and LV networks in Thu Dau Mot was completed in December 2005 and the transferring of consumers to the new network and energizing of transformers was completed in April 2006. The delays in Dien Khanh and Quang Tri were mainly due to difficulties in obtaining planning approvals from the city authorities and the poor performance of civil work contractors. These two towns were completed in April 2006 and December 2005 respectively.

F. Implementation Arrangements

24. The implementation of the Project in the southern region (i.e., the original 3 cities and 2 rural communes, with Thu Dau Mot added in 2003) was carried out by PC2. The director of PC2 as the head of the project management unit (PMU) was responsible for the overall implementation of the Project. The provincial power departments responsible for project sites assigned staff to the PMU to maintain close coordination with the local authorities, prepare technical designs, and supervise installation work. The international cooperation department of PC3 was responsible for international procurement financed by ADB and for coordinating with ADB. There was a minor change in PC2, as Dong Nai Provincial Power Distribution Department (PDD) became an independent subsidiary (Dong Nai Power Company [DNPC]) directly under EVN in June 1999. PC2, nevertheless remained the executing agency (EA) in southern Viet Nam, and DNPC had responsibility for coordinating the installation of the Bien Hoa city network. With the active participation of DNPC, the PMU at PC2 maintained overall oversight of the implementation of the Project, including the Bien Hoa network.

25. Although PC3 did not establish a PMU exclusively to manage the Project, Power Network Project Management Board (PNPMB), a unit of PC3 responsible for managing all foreign-funded projects, was responsible for implementation in the PC3 area. PNPMB had direct responsibility for the technical design, recruitment, and supervision of local consultants and for

coordinating with the international consultants, awarding civil work contracts, and supervising contractors during installation. With the active participation of the provincial power departments, PNPMB coordinated with local authorities to obtain planning approvals and pay compensation for pole foundations in the project cities. The Construction Department of PC3 maintained oversight and control over the performance of PNPMB in managing the project on behalf of PC3. The International Cooperation Department of PC3 was responsible for international procurement of goods under ADB financing and for coordinating with ADB during implementation of the Project.

26. The implementation arrangements established by PC2 and PC3 led to the completion of the Project with significant cost savings, although with considerable delay. The delays were mainly due to reasons beyond the control of PC2 and PC3, except in the case of delays in finalizing the technical designs for PC3 component.

G. Conditions and Covenants

27. The loan and project agreements contained (i) three sector reform covenants, (ii) four covenants related to tariff reforms, (iii) one covenant with three separate conditions on ensuring the financial viability of PC2 and PC3, (iv) three covenants on improving the operational efficiency of PC2 and PC3, (v) six covenants on project implementation, (vi) three covenants on environmental and social compliance, (vii) four covenants on reporting of project progress to ADB, and (viii) three covenants on procurement of goods under ADB financing and selection of consultants. Compliance with the loan covenants is described in Appendix 7.

28. The covenants for which PC2 and PC3 were directly responsible (17 out of 20) were fully complied with. The remaining three covenants were partially complied with.

- (i) The covenant on testing and disposal of replaced transformers was partially complied with. PC2 has tested the old transformers withdrawn from the network and the contaminated transformers were then safely stored awaiting disposal. PC3 has not tested the old transformer.
- (ii) The covenant on financial ratios of PC2 and PC3 was partially complied with. Although the minimum self-financing ratio of 30% and the debt service coverage ratio of 1.5 have been achieved, the 12% minimum rate of return on assets (ROA) has not been achieved. This is because PC2 and PC3 had to take over a large number of transmission networks of up to 110kV from EVN and MV networks in rural areas from local entities. This increased the asset base without a corresponding increase in revenues and profitability.
- (iii) The covenant on the provision of right-of-way and planning approval in a timely manner has not been fully complied with, as there have been considerable delays in obtaining approvals.

29. The covenants relating to sector reforms were not met during the time frame stipulated in the Loan Agreement. This was mainly due to the extensive consensus building process undertaken before enactment of the new electricity law in November 2004, which became effective in July 2005 (compared with the December 1998 deadline in the Loan Agreement). The secondary decree to make the law operational was issued in July 2005 and the Electricity Regulating Agency was established in October 2005 (compared with the December 1998 deadline in the Loan Agreement). Although the targets set in the Loan Agreement for sector reforms were too ambitious, the covenants compelled policy makers to take the initial steps toward sector reforms. The sector reform agenda achieved considerable progress during the

implementation of the Project and one of provincial power departments (Khanh Hoa Power Department) was equitized (divestiture of a minority stakes) in 2005. Recently, the Government has decided to equitize PC1, PC2 and PC3 together with non-strategic power plants owned by EVN and other non-core entities of EVN. The transmission and strategic multipurpose power plants and the power companies serving the main cities such as Hanoi, Ho Chi Minh and Haiphong will remain as fully-owned subsidiaries of EVN.

30. The covenant relating to increasing the average tariff to \$0.07/kWh by March 1999 has not been complied with and the average tariff as of December 2005 remains at \$0.051/kWh. Because of the Government's reluctance to sign the Loan Agreement with this covenant, ADB agreed to waive the covenant, with the provision that this would be achieved by January 2001 through staggered tariff increases to be implemented in May 1999 and January 2000 and January 2001. However, these tariff increases were not implemented and in 2001, a tripartite meeting to discuss appropriate retail tariff was held between the World Bank, ADB, and the Government. A new schedule of tariff increases was agreed by the Government, i.e., to raise the average retailed tariff to \$0.07/ kWh in July 2005. The first step of the tariff increase, i.e., to raise the average tariff including VAT to 800 D/kWh (\$0.51 cent/kWh) was implemented in October 2002, but the schedule was not maintained thereafter. As EVN is in compliance with prudential financial ratios of a minimum self-financing ratio (SFR) of 30% and DCSR of 1.5 at the much lower average tariff level of \$0.051/kWh, the ADB loan approved in 2004 and 2005 did not contain covenants on average tariffs levels. Instead, the covenants covered financial ratios, with the provision that the tariffs would be raised if this was necessary to comply with the ratio covenants.

H. Related Technical Assistance

31. Two stand-alone technical assistance grants were approved by ADB shortly before the approval of the Project to support the sector and tariff reforms. The performance of these two TA projects was assessed by the Operations Evaluation Department, as part of ADB's performance audit of TA to the Viet Nam power sector. Hence, the performance of these TA projects was not assessed by this project completion report.

I. Consultant Recruitment and Procurement

32. PC2 and PC3 recruited consultants separately in accordance with ADB's *Guidelines on the Use of Consultants*. The EDF-DECON² consortium and EDF were selected by PC2 and PC3 respectively as the project implementation consultant. The consultants were responsible for reviewing engineering design, undertaking detailed distribution planning, preparing the bid documents, evaluating the bids, conducting training in equipment installation, supervising network erection, and preparing various reports. The selection of consultants was undertaken before the signing of the Loan Agreement and the consulting contracts were signed soon after the signing. The consulting contract EDF-DECON for PC3 component was extended by 5.5 person-months because of delays in finalizing the feasibility study. The international consultants for the PC3 component recruited Power Design Centre as the local consultant.

33. Appendix 8 presents summary data on procurement of goods and services by each PC, using ADB procurement guidelines for ADB-financed contracts. PC2 processed 15 different bid packages in 2000 and took more than 10 months from bid signing to contract signing. PC3 processed 10 packages for 20 bid lots over a 7-month period in 2001. A bid package for MV

² Electricité de France (EDF). Deutsche Energie-Consult Ingenieurgesellschaft mbH (DECON).

conductors, amounting to \$4.5 million, was financed by EVN, as ADB did not approve the bid evaluation for this package. The contract prices were significantly less than the estimates made prior to the tendering. This was due to the intense price competition among bidders in the aftermath of the Asian financial crisis. There were delays in awarding contracts because of the technical clarifications sought by the successful bidders for SCADA systems and compact substations. The equipment and material for Thu Dau Mot was procured through a mix of repeat orders and international competitive bidding in 2003. The SCADA system for Thu Dau Mot was cancelled because agreement could not be reached with the supplier (who had been selected on the basis of a repeat order). The locally-financed civil work contracts were awarded on a competitive basis by PC2 and PC3. As these contracts were not financed by ADB, the Government's and EVN's procurement guidelines were applied.

J. Performance of Consultants, Contractors, and Suppliers

34. The international consultants performed reasonably well. However, they could have played a more proactive role in finalizing the technical designs and the bid documents for the PC3 component. Their performance improved after the approval of bid documents and the bid evaluation was undertaken without significant delays. The consultants also trained PC3 staff on equipment installation and supervision. Although the consultants recruited by PC2 performed well during the initial stages, they were not able to mobilize staff to design the SCADA system for Thu Dau Mot town or to write the borrower's project completion report. This resulted in Thu Dau Mot SCADA system being removed from the Project and PC2 staff preparing the PCR report.

35. The suppliers of equipment and material under the Project performed as expected. The SCADA systems for PC2 were the most complicated pieces of equipment procured under the Project and these are performing to the satisfaction of PC2 staff. Few discrepancies or defects were noted between delivered equipment and contract specifications. All the equipment was supplied by Vietnamese manufacturers, who overcame any problems adequately. Most of the civil work contractors employed by PC2 and PC3 performed reasonably well. However, the performance of one of the contractors employed by PC2 for Can Tho city and two of the contractors employed by PC3 for Dien Khanh and Quang Tri cities was not satisfactory and PC2 pre-terminated the contract with the contractor for Can Tho. The poor performance of the two contractors in Dien Khanh and Quang Tri caused delays to the project completion.

K. Performance of the Borrower and the Executing Agency

36. The Project was implemented by two subsidiary units of Electricity of Vietnam (PC2 and PC3) on behalf of the borrower. The role of the Executing Agency (EVN) was limited to approving the technical designs and bidding documents and bid evaluations prepared by the two implementing agencies. EVN acted in a timely manner in approving the technical designs and bid documents in most cases. However, it could have acted with more urgency in preparing additional subprojects to utilize the loan savings. The borrower, the Government of Viet Nam, was mainly responsible for meeting the sector reform and tariff reform covenants. The sector reforms mentioned in the Loan Agreement were implemented by the borrower with considerable delays and the tariff adjustments were not implemented as required. However, the tariffs were adequate to maintain the financial viability of the sector.

37. During the early stages of the Project, the performance of PC3 was not satisfactory, as the finalization of the technical design was considerably delayed. However, once the technical designs had been finalized and the bid documents issued, the performance of PC3 improved.

The delays encountered during the construction stage were due to the unprecedented urban development work carried out in the project cities. The capacity of PC2 and PC3 staff to manage projects financed by international agencies improved because of their exposure to international consultants. They are now fully familiar with ICB procurement procedures and no longer require the assistance of international consultants. Despite the considerable delays, the Project was completed with an additional city (Thu Dau Mot) at a cost significantly below the appraisal estimates. PC2 and PC3 maintained accurate progress reports and ensured that the project was implemented as intended. The overall performance of PC2 and PC3 was satisfactory.

L. Performance of the Asian Development Bank

38. ADB staff undertook a loan fact-finding mission in May 1997, an appraisal mission in August 1997, six review missions between 1999 and 2004, and one project completion review mission in 2006. During these missions, ADB staff undertook monitoring visits to subprojects and consulted with stakeholders. ADB carefully reviewed the contract packages and bidding documents and provided no objection to contract awards that followed ADB's standards. ADB approved the inclusion of an additional subproject (Thu Dau Mot) to utilize the loan savings and acted innovatively to expedite the procurement of goods for the additional subprojects. ADB also acted with flexibility to waive some of the covenants related to sector and tariff reforms that were difficult to comply with. ADB acted in a timely manner to cancel the loan savings when it became evident that the Government was not going to expand the scope of the Project. Overall, ADB performance was satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

39. The Project was considered relevant to the Government's strategic objectives and to ADB's strategy for improving the quality of urban infrastructure in the secondary cities of Viet Nam to promote broad-based economic growth. The overall design of the Project, including the implementation arrangements, has contributed to the Project being implemented for less than estimated cost. The delays encountered during the implementation were outside the control of the project implementation arrangements. However, the project cost estimates should have been revised at an early stage of project implementation to enable the Project to be expanded so loan savings could be utilized.

40. The Project significantly improved the power distribution network in three cities and two rural communes under PC2 and nine cities and four communes under PC3. The cities and rural communes now enjoy reliable, expandable, safe, and well-designed power distribution systems. Based on the revised studies in 2000, the distribution networks will be able to meet the potential increased load to 2010 without additional investment. They will contribute to economic growth. The targets set for institutional and policy reforms were too ambitious, but all the reforms have been accepted by policy makers and implemented, although with significant delay.

B. Effectiveness in Achievement of Purpose

41. The Project was considered effective as it achieved most of its objectives: the expansion of distribution systems to meet estimated growth in demand, improvements to voltage levels and exchange system reliability, a reduction in electricity losses, standardization of the voltage of the MV supply, and enforcement of time-of-day metering. The achievement of quantitative

targets is presented in Table 5. During implementation (from 2001 to 2005) the demand in the four cities/towns of PC2 area grew from 1,117 GWh to 2,371 GWh (120% increase) and in the nine towns in PC3 area from 621 GWh to 1,015 GWh (63% increase). Distribution losses have been maintained below 6% in PC2 cities/town and 7.5% in PC3 towns. The reliability of the electricity supply has improved considerably in all the project cities.

42. "Indirect consumers" (i.e., households who receive electricity from their neighbors) have been virtually eliminated in all the project cities and towns. The total number of households with direct connections in PC2 areas increased from 131,000 in 2000 to 232,399 in 2005 and in PC3 areas from 96,600 in 2000 to 203,000 in 2004. The Project has electrified six rural communes by providing electricity to over 15,000 households. However, many of the households in the communes are indirect consumers, with only 7,850 households having direct connections to the PC2 and PC3 networks.

C. Efficiency in Achievement of Outputs and Purpose

43. The Project is considered efficient in the achievement of outputs and purpose, despite the delays. These were mainly attributable to the many layers of approval for procurement under the Project, delays in finalizing technical designs, and resettlement and approval problems during implementation. Although the number of substations and the length of power transmission and distribution lines installed under the Project exceeded the quantities estimated at appraisal, the total project cost at completion was substantially less than that estimated at appraisal (\$90.2 million compared with \$140 million). This was because of savings in the procurement of equipment, which resulted cost reductions as a result of the Asian financial crisis and the highly competitive prices the EA managed to obtain for construction and installation work carried out by domestic contractors.

44. Because of the difficulty in identifying the benefit and revenue streams attributable to the specific subprojects financed by the Project, the financial and economic viability of the entire investment in power distribution in the project towns/cities during 1999–2004 was assessed. The methodology and the assumptions used are explained in detail in Appendix 8, and the results are summarized in Table 3. The economic internal rate of return (EIRR) and the financial internal rate of return (FIRR) for the cities and towns in the PC2 and PC3 areas and the rural communes are above the opportunity cost of capital (i.e., 12.0%) and weighted average cost of capital (4.6%), respectively. The Project's contribution to the improvement in the performance of the distribution systems in the project cities, as demonstrated by the high EIRR (compared with the opportunity cost of capital) and the high FIRR (compared with the weighted average cost of capital) is substantial. The significant difference between the EIRR and FIRR is because economic benefits were valued according to willingness to pay for electricity, which is significantly higher than the prevailing tariffs used to value the financial benefits. Although the economic rate of return for rural electrification is high, the corresponding financial rate of return is very low because of the low tariff for rural consumers.

Table 3: Summary of Economic and Financial Analyses
(1999–2004)

Item	EIRR (%)	FIRR (%)
4 cities/town in PC2 Area	13.7	10.1
9 towns in PC3 Area	20.2	10.2
6 rural communes	18.8	1.7

EIRR = economic internal rate of return, FIRR = financial internal rate of return.

Source: Asian Development Bank estimates, Appendix 8.

D. Preliminary Assessment of Sustainability

45. The Project's facilities were designed and constructed according to international standards, and the project completion review (PCR) mission observed that the facilities constructed under the Project were very well maintained and staffed. Rapid urbanization and industrialization and the consequent increase in the demand for electricity will require continuous investment in the power distribution systems of the project towns/cities. The power companies have made significant investments, using domestic resources, to maintain the growth momentum and the quality of supply. This is reflected in the continuous drop in distribution losses, despite the high growth in demand.

46. The long-term sustainability of the investments made under the Project depends on the financial viability of EVN, the parent company of the power companies. The financial performance of EVN and the power companies is summarized in Appendix 9. Despite its ambitious capital expansion program, EVN can maintain its financial viability if tariff increases are implemented as proposed and if additional financial income from equity is realized. The proposed power sector reforms are aimed at creating a wholesale power market and other measures proposed under the electricity law enacted in 2005. These reforms should also improve the sustainability of the sector, by improving the transparency of transfer prices among sector entities. Given Viet Nam's rapid economic and the improvement in the financial and operational performance of the sector, the Project's benefits are highly sustainable through continuous investments financed by internally-generated resources.

E. Environmental, Sociocultural, and Other Impacts

47. **Environmental.** The environmental impacts of the Project were not significant, as the Project involved rehabilitating existing electricity distribution networks in urban areas. The main environmental issue was the replacement of old equipment that could be contaminated by polychlorinated biphenyls (PCBs). The new transformers were purchased free from PCBs as certified by the manufacturers. To mitigate the impacts of PCBs in old equipment, both PC2 and PC3 have issued regulations on safe handling, storage, transportation of PCB-contaminated equipment. PC2 has installed a testing laboratory for PCB, financed through another project. All the transformers manufactured before 1995 that were removed under the Project were tested for PCBs. Twenty six transformers/capacitors were contaminated with PCBs (>50 ppm) and these are being safely stored pending a nationwide program to dispose of PCB-contaminated transformers. PC3 has not tested the old transformers for PCBs, but the PCR mission was informed that most of the transformers that were replaced under the Project have been reused in different locations.

48. **Sociocultural.** There were no major sociocultural impacts as the Project involved the rehabilitation of medium and low voltage networks in urban areas and the electrification of rural communes, some of which were inhabited by ethnic minorities. There were no adverse impacts on the ethnic minorities and other vulnerable groups as a result of the Project. However, the poorer people in the rural communes were unlikely to benefit directly from the Project because of the high connection costs and they have resorted to indirect connections through their more affluent neighbors. The Government has abolished connection fees from June 2005 and this is expected to result in more poor households obtaining getting direct connections.

49. The main resettlement issue encountered during project Implementation was the acquisition of land for installation of compact substations in the city centers in the PC2 area, each of which requires about 5 square meters. In Bien Hoa city, 19 compact substations were converted to pole-mounted substations because of difficulties with regard to compensation payment for land acquisition. There were no compact substations in the PC3 area and all the substations were pole-mounted. Most of the poles were planted along the pavements of city streets and the rights of way for road expansion already acquired by the city authorities. Whenever the poles were planted on private property or on a right of way that had not been acquired, the owners were compensated according to market rates based on recommendations of local authorities.

50. Resettlement action plans were prepared by both PC2 and PC3 during the technical design stage for their respective areas and the resettlement costs were estimated to be D21.7 billion and D6.7 billion respectively. During implementation, the actual resettlement payments were D12.2 billion for 6,960 households in the PC2 area and D2.4 billion for 8,100 households in PC3 area. The reduction in the resettlement cost was due to a change in the network routes to avoid private properties and the acquisition of land for road expansion by the city authorities before implementation of the Project. Most of the compensation payments were for pole foundations and location of compact substations located in private properties. Affected people have been extensively consulted and their views taken into account, especially in Bien Hoa where over 19 transformers were converted to the pole-mounted type because of opposition from land owners. The PCR mission was informed that the rate of compensation for land was set by the city authorities and based on the market price. The environmental and social aspects of the Project are described in Appendix 10.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

51. Although completion was delayed for more than 2 years, the Project's components were implemented as conceived at appraisal. Designs of several subprojects were modified to incorporate the changes required during implementation. However, the delays and variations did not adversely affect the project's overall performance. It not only achieved most of its intended targets, but one additional subproject was completed, with total project costs much lower than the appraisal estimates. Based on a review of the relevance, efficacy, efficiency, sustainability, environmental, sociocultural and other aspects, overall the Project was assessed successful.

B. Lessons Learned

52. The key lesson learned during project implementation was the need for more flexibility with regard to project scope. The Project could have been expanded to include additional cities to utilize the loan savings had it been structured as a sector project. However, this was not an

option during project preparation because of the difficulties involved with finalizing the feasibility studies/technical designs for additional towns/cities in a timely manner. It was also noted that some of the delays could have been avoided had the approval process for technical designs and the bidding documents been more streamlined. The procurement documents had to be approved by many layers at the PCs, EVN, and MOI.

53. Lack of coordination between urban planning and the electricity network rehabilitation and extension also contributed to delays especially in the PC3 area. For example, local authorities required changes in transmission line routes after changes in urban plans, even after the issuance of construction authorization and the near completion of pole foundations. These delays could have been avoided if the rehabilitation of the electricity distribution had been undertaken in parallel with urban planning. Lack of a standard national policy about the type of equipment to be installed on EVN networks proved a source of significant delay. Numerous technical specifications were drafted, corrected, amended, cancelled, and redrafted to satisfy many different designers. There were also numerous revisions to the detailed designs and delays in finalizing cost estimates and bills of quantity.

54. Both PCs significantly revised some targets in the project components. However, ADB staff who conducted six review missions (between 1999 and 2004) never updated the framework in their back-to-office reports (BTOR) and in the project performance report (PPR). The progress of each target in the framework was not properly monitored. Consequently, ADB and both PCs used different indicators in monitoring the Project's progress.

C. Recommendations

55. **Project Implementation.** The recommendations are as follows.

- (i) To avoid problems associated with rural and urban planning, close coordination with local authorities should be established from the initial stages of the Project.
- (ii) A national standard for detailed network design and equipment installation.
- (iii) ADB should closely monitor resettlement and land acquisition activities during preparation and implementation of a project
- (iv) There should be more flexible procedures to facilitate variations in project scope because of changes caused by local circumstances
- (v) The Project Performance Monitoring Framework should have been updated during implementation, updated to more accurately monitor the project.
- (vi) The appraisal cost estimates should have been updated at an early stage of the implementation and corrective action should have been taken to expand the scope of the Project to minimize the cost underruns.

56. **Project Covenants.** The recommendations are as follows.

- (i) There should have been more flexibility with regard to covenants on sector and tariff reforms as these were determined by the Government and beyond the control of executing agencies.
- (ii) There should not be specific tariff covenants to increase tariffs to predetermined levels. The power sector in Viet Nam has performed adequately without increasing the tariff to \$0.07/kWh as required under the loan agreement.

57. **Recommendation for Timing of the Project Performance Audit Report (PPAR).** Most works under the Project have been satisfactorily finished, and there is no supplemental

assistance proposed for the Project. Two years after circulation of this PCR would be an appropriate time to prepare the project performance audit report (PPAR), as most of the project construction was completed in the second half of 2005.

COMPARISON OF PROJECT OUTPUTS AT APPRAISAL, DESIGN AND COMPLETION

Table A1.1: PC3 Component

Description	Unit	Feasibility Study in 1997	Technical Design in 2001	Actual Performance
Dong Hoi City				
Overhead MV Line	km	86	90	92
Underground cables	km		1	1
Distribution substation	no.	110	120	123
Substation capacity	kVA	25,8350	27,850	28,150
LV line	km	78	171	171
Meters	pcs	5,375	15,612	17,124
Dong Ha Town				
Overhead MV Line	km	130	72	74
Underground cables	km		2	2
Distribution substation	no.	137	137	139
Substation capacity	kVA	25,490	21,305	21,405
LV line	km	135	156	160
Meters	pcs	10,560	15,471	16,404
Quang Tri Town				
Overhead MV Line	km	106	115	118
Distribution substation	s/s	114	129	133
Substation capacity	kVA	23,290	18,350	18,750
LV line	km	149	140	149
Meters	pcs	9,410	12,885	9,200
Hoa Khanh-Lien Chieu Area				
Overhead MV Line	km	66	54	61
Underground cables	km		2	2
Distribution substation	no.	123	120	163
Substation capacity	kVA	29,230	32,570	35,920
LV line	km	71	83	88
Meters	pcs	8,612	8,214	4,305
Tam Ky Town				
Overhead MV Line	km	102	111	111
Underground cables	km		1	1
Distribution substation	no.	107	104	101
Substation capacity	kVA	25,690	24,400	31,350
LV line	km	140	133	122
Meters	pcs	8,612	8,214	4,305
Quang Ngai Town				
Overhead MV Line	km	101	93	82
Underground cables	km		3	2
Distribution substation	no.	166	166	164

Description	Unit	Feasibility Study in 1997	Technical Design in 2001	Actual Performance
Substation capacity	kVA	37,650	38,070	37,160
LV line	km	122	123	125
Meters	pcs	8,850	20,843	25,037
Dien Khanh Town				
Overhead MV Line	km	123	95	79
Underground cables	km			
Distribution substation	no.	134	187	110
Substation capacity	kVA	36,770	35,975	21,200
LV line	km	113	110	107
Meters	pcs	10,627	8,394	6,126
Pleiku Town				
Overhead MV Line	km	163	158	154
Underground cables	km		1	1
Distribution substation	no.	187	198	172
Substation capacity	kVA	37,500	39,640	37,970
LV line	km	145	160	188
Meters	pcs	15,930	22,739	18,921
Kon Tum Town				
Overhead MV Line	km	68	86	96
Underground cables	km		1	1
Distribution substation	no.	107	119	129
Substation capacity	kVA	16,980	18,045	19,495
LV line	km	166	197	218
Meters	pcs	9,225	16,083	15,861
Tinh Khe Commune				
Overhead MV Line	km	10	4	3
Distribution substation	s/s	9	9	9
Substation capacity	kVA	1,070	900	900
LV line	km	21	29	27
Meters	pcs	2,677	2,729	2,686
Vinh Thinh Commune				
Overhead MV Line	km	13	11	11
Distribution substation	s/s	8	8	8
Substation capacity	kVA	670	600	600
LV line	km	21	15	17
Meters	pcs	1,102	765	947
Bien Ho Commune				
Overhead MV Line	km	15	14	14
Distribution substation	s/s	14	14	14
Substation capacity	kVA	1,460	1,460	1,460
LV line	km	25	25	24

Description	Unit	Feasibility Study in 1997	Technical Design in 2001	Actual Performance
Meters	pcs	2,900	2,044	2,469
Overhead MV Line	km	8	8	8
Distribution substation	s/s	5	5	5
Substation capacity	kVA	560	560	560
LV line	km	9	5	5
Meters	pcs	310	300	300

km = kilometer, kVA = kilovolt-ampere, no. = number, pcs = pieces, SCADA = supervisory control and data acquisition.

Source: PC3

Table A1.2: PC2 Component

Description	Unit	Feasibility Study in 1997	Tech Design in 2001	Actual Performance
Bien Hoa				
MV Overhead	km	120	112	56
MV UG cables	km	82	82	82
Number of substations	no.	428	301	233
Substation capacity	kVA	46,420	101,420	80,595
LV lines	km	244	263	222
SCADA	no.		1	1
Meters	pcs	3,900	3,900	24,966
Can Tho				
MV Overhead	km	208	151	120
MV UG cables	km	19	24	24
Number of substations	no.	245	421	315
Substation capacity	kVA	56,850	89,328	66,280
LV lines	km	434	436	399
SCADA	no.	1	1	1
Meters	pcs	30,950	8,350	8,499
Dalat				
MV Overhead	km	80	85	120
MV UG cables	km	35	31	33
Number of substations	no.	199	252	238
Substation capacity	kVA	31,505	60,798	56,780
LV lines	km	231	232	213
SCADA	no.	1	1	1
Meters	pcs	14,680	5,100	7,834
Phuoc Khang				
MV Overhead	km	19	6	6
Number of substations	no.	16	7	4
Substation capacity		625	525	300
LV lines	km	7	16	16
Meters	pcs	1,380		
Ninh Thanh Loi				
MV Overhead	km	47	45	45
Number of substations	no.	39	34	33
Substation capacity	kVA	975	975	900
LV lines	km	36	36	36
Meters		3,200		
Thu Dau Mot				
MV Overhead	km		87	85
MV UG cables	km		12	13
Number of substations	no.		197	159

Description	Unit	Feasibility Study in 1997	Tech Design in 2001	Actual Performance
Substation capacity	kVA		39,235	33,480
LV lines	km		305	300
SCADA	no.		1	—
Meters	pcs		5,000	5,056

km = kilometer, kVA = kilovolt-ampere, no. = number, pcs = pieces, SCADA = supervisory control and data acquisition.

Source: PC2

PROJECTED AND ACTUAL COST COMPARISON

Item	Appraisal Estimates			Actual		
	Foreign	Local	Total	Foreign	Local	Total
PC2						
Bien Hoa City	14,264	3,843	18,107	10,416	2,155	12,571
Can Tho City	16,302	3,248	19,550	8,014	2,738	10,752
Da Lat City	8,457	1,483	9,940	5,660	1,318	6,978
Thu Dau Mot Town				3,761	1,345	5,106
Phuoc Khang Commune	421	90	511	127	47	174
Ninh Thanh Loi Commune	964	230	1,194	289	111	400
Subtotal	40,408	8,894	49,302	28,267	7,714	35,981
Consulting Services	1,740	120	1,860	998	1,310	2,308
Base Cost	42,148	9,014	51,162	29,265	9,024	38,289
Taxes and Duties		4,223	4,223		3,161	3,161
Physical Contingencies	2,107	532	2,639			—
Price Contingencies	4,840	854	5,694			—
IDC	905	5,377	6,282	787	4,476	5,263
Total Cost	50,000	20,000	70,000	30,052	16,661	46,713
PC3						
Dong Hoi	4,361	792	5,153	2,820	1,745	4,565
Dong Ha	3,912	1,032	4,944	2,469	1,399	3,868
Quang Tri	3,397	620	4,017	2,021	984	3,005
Hoa Khanh Liem Chieu (Da Nang City)	3,703	655	4,358	1,467	619	2,086
Tam Ky	4,708	870	5,578	2,317	1,012	3,329
Quang Ngai	3,434	623	4,057	2,998	1,377	4,375
Plei Ku	5,721	1,053	6,774	3,524	1,957	5,481
Dien Khanh (Nha Trang city)	4,616	1,105	5,721	2,364	835	3,199
Kom Tun	4,241	891	5,132	2,143	1,841	3,984
Tinh Khe Commune	882	154	1,036	485	200	685
Vinh Thinh Commune	576	117	693	244	109	353
Bien Ho Commune	660	187	847	326	246	572
Ya Ma Commune	197	78	275	83	66	149
Subtotal	40,408	8,177	48,585	23,261	12,390	35,651
Consulting Services	1,740	120	1,860	740	1,008	1,748
Base Cost	42,148	8,297	50,445	24,001	13,398	37,399
Taxes and Duties		4,246	4,246		2,769	2,769
Physical Contingencies	2,107	626	2,733			—
Price Contingencies	4,840	954	5,794			—
IDC	905	5,877	6,782	525	3,025	3,550
Total Cost	50,000	20,000	70,000	24,526	19,192	43,718

— = not available, IDC = interest during Construction.

Sources: PC2 and PC3.

SUMMARY OF ASIAN DEVELOPMENT BANK-FUNDED CONTRACTS

PCSS No.		Contract Amount	Amount Disbursed PC2 (\$)	Amount Disbursed PC3 (\$)
0001	Consultant	1,331,726.00	997,699.00	
0002	Consultant			739,568.00
0003	Package 2: Medium and Low Voltage Cables and Accessories	158,363.31	158,363.31	
0004	Package 3: Poles, Foundations and Cross-Arms	94,575.41	94,575.41	
0005	Package 1: Medium and Low Voltage Equipment and single-phase transformers	164,012.00	164,012.00	
0006	Package 4.1: Meters and Low Voltage switchboards	980,762.00	980,762.00	
0007	Package 11.1: Single-phase distribution transformers	237,677.00	237,677.00	
0008	Package 11.2: Three-phase distribution transformers	2,642,770.80	2,642,770.00	
0009	Package 8.1: Cable test van, maintenance truck	916,322.74	817,154.00	
0010	Package 8.2: Digger trucks and derricks	456,300.00	456,300.00	
0011	Package 10.1: Medium voltage switching station equipment and battery charger	790,703.00	790,703.00	
0012	Package 13: Medium voltage overhead switching and protection equipment	1,126,306.13	1,126,306.13	
0013	Package 5.2: Insulators and Cross-Arms	339,041.36	303,081.06	
0014	Package 6.1: Medium and low voltage underground cables and accessories	5,017,930.18	4,995,513.21	
0015	Package 4.2: Service lines and accessories	1,031,184.00	1,031,184.00	
0016	Package 5.1: Concrete Poles and foundations	2,231,622.87	2,054,157.44	

PCSS No.		Contract Amount	Amount Disbursed PC2 (\$)	Amount Disbursed PC3 (\$)
0017	Package 7.1: Bare ACSR conductors and accessories	1,265,094.86	1,265,083.00	
0018	Package 7.2: Low voltage ABC cables & accessories	3,353,091.31	3,259,367.00	
0019	Package 12.1: Compact switching substations	1,946,189.47	1,946,189.47	
0020	Package 9.1: Mini scada system	3,392,236.28	3,392,236.28	
0021	Lot 3.1: Pin insulators and fittings	194,514.00		194,514.00
0022	Lot 8.1: Concrete poles for Dong Hoi, Dong Ha and Quang Tri	994,589.31		994,589.31
0023	Lot 8.2: Concrete poles for Hoa Khanh, Tam Ky Quang Ngai, Tinh Khe	692,303.00		692,303.00
0024	Lot 8.3: Concrete poles for Pleiku, Kontum, Vinh Thinh, Bien Ho, Yama	891,227.68		891,227.68
0025	Lot 8.4: Concrete poles for Dien Khanh	232,978.62		232,978.62
0026	Lot 10.2: Vehicles	567,531.12		567,531.12
0027	Lot 6.1: Low-voltage switchboards	783,917.40		783,917.40
0028	Lot 1.1: Three-phase distribution transformers up to 200 kVA	910,775.00		910,775.00
0029	Lot 1.2: Three-phase distribution transformers to 200 kVA and step-up transformers	1,426,938.00		1,426,938.00
0030	Lot 2.1: Medium voltage equipment	1,376,904.20		1,376,904.20
0031	Lot 3.2: String Insulators and Fittings	242,112.00		242,112.00
0032	Lot 5.1: Low voltage overhead cables and accessories for Dong Hoi, Dong Ha and Quang Tri	1,562,583.47		1,562,583.47
0033	Lot 5.2: Low voltage overhead cables and accessories for Hoa Khanh, Tam Ky, Quang Ngai, Tinh Khe	1,197,793.80		1,197,793.80

PCSS No.	Contract Amount	Amount Disbursed PC2 (\$)	Amount Disbursed PC3 (\$)
0034	Lot 5.3: Overhead cables and accessories for Kontum, Pleiku, Dien Khanh, Vinh Thinh, Bien Ho and Yama	1,745,422.85	1,745,422.85
0035	Lot 7.1: Low voltage switchboard	1,207,910.70	1,207,910.70
0036	Lot 7.2: ABC Cables for service lines for South Section	1,506,634.40	1,506,634.40
0037	Lot 9.1: Steel tower poles and steel pipe poles	2,927,933.16	2,927,933.16
0038	Lot 10.1: Electrical testing equipment and tools	522,807.72	522,807.72
0039	Package 5.2: Insulators and Cross-Arms - replacement	33,072.98	33,073.00
0040	Package 8.1: Cable test van, maintenance truck (replacement)	99,148.00	99,148.00
0041	Package 15.1X-TDM: Low voltage covered conductors	515,376.20	507,419.00
0042	Package 7.1X-TDM: Bare conductors	345,709.03	339,898.03
0043	Package 10.1X-TDM: Medium voltage switching station equipment and battery charger	121,164.71	121,044.30
0044	Package 15.2X-TDM: Low-voltage hardware and multi-service boxes	283,185.74	283,185.74
0045	Package 5.2X1-TDM: Medium voltage insulators and steel cross-arms	80,574.21	80,590.00
0046	Package 5.2X2-TDM: Medium voltage insulators and steel cross-arms	24,840.13	25,210.62
Total		28,202,702.00	19,724,444.43

ABC = Aerial Bundled Conductors, ACSR = Aluminium Core/Steel Reinforced Conductors, kVA = kilovolt-ampere, no. = number, PCSS = Procurement Control Summary Sheet, TDM = Thu Dau Mot.
Source: PCSS.

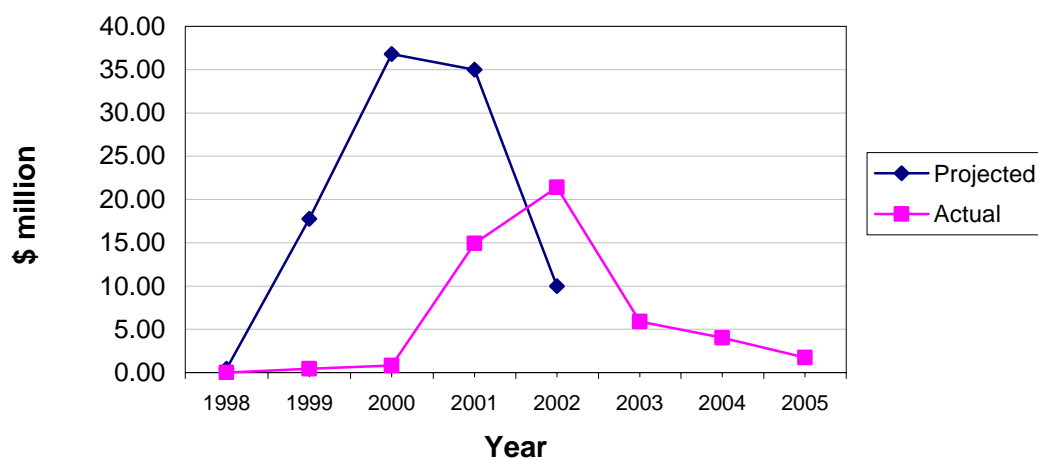
PROJECTED AND ACTUAL DISBURSEMENTS

Table A4: Projected and Actual Disbursements 1997–2005
(\$ million)

Year	Projected	Cumulative	Actual	Cumulative
1997				
1998	0.45	0.45	0.00	0.00
1999	17.75	18.20	0.45	0.49
2000	36.80	55.00	0.83	1.28
2001	35.00	90.00	14.93	16.21
2002	10.00	100.00	21.41	37.61
2003			5.89	43.51
2004			4.01	47.51
2005			1.73	49.24
Total	100.00		49.24	

Source: Asian Development Bank.

Figure A4: Annual Disbursement



CHRONOLOGY OF MAIN EVENTS

Date	Event
1997	
28 April–15 May	Fact-finding mission fielded.
14 May	Memorandum of Understanding (MOU) signed between the Asian Development Bank (ADB) and the Government of Viet Nam. Government agreed to submit an action plan for Power Company No. 2 (PC2) and Power Company No. 3 (PC3) on how to achieve a reduction in losses in the systems, improve the consumer–employee ratio, and improve the load factor.
26 June	Management review meeting approved fielding the appraisal mission, advance procurement of equipment and recruitment of consultants, and strengthening of policy and institutional reforms.
26 June	Electricity of Vietnam (EVN) advised ADB of an approved retail tariff increase of \$0.59 which would come into effect on 15 May 1997.
27 June	ADB received action plans from PC2 and PC3 (requested at the time of fact finding).
12–20 August	ADB appraisal mission was fielded.
23 September	Staff review committee meeting approved loan negotiations.
3 October	The Government agreed to increase the nationwide average retail tariff to \$0.07 from March 2000 and to maintain a self-financing ratio of at least 30%
22–24 October	Loan negotiations held in Manila with representatives from the Government.
3 November	President approved circulation of board documents.
14 November	ADB received the long list of consultants from PC2.
27 November	Loan approved by the Board of Directors of ADB.
1998	
13 January	Ministry of Industry (MOI) approved feasibility studies for the PC3 component.
27 January	ADB received the draft letter of invitation and evaluation criteria for the selection of consulting services.
8 February	ADB received the proposed shortlist of consulting firms from PC2. The list was approved by both MOI and EVN
27 February	Consultant selection committee meeting held to review the proposed shortlist and draft invitation documents submitted by PC2.
27 Februa	Invitations sent to the shortlisted consulting firms by PC2.
10 April	Invitations sent to the shortlisted consulting firms by PC3.
20 May	Opening of technical proposals from the shortlisted consulting firms by PC2.
10 June	Receipt of consultants' proposals by PC3

Date	Event
25 August	Because of the regional financial crisis, the Government of Viet Nam requested reconsideration of the covenant on tariff increase. It made a counter proposal to increase the national overall average retail tariff to at least \$0.07/kilowatt-hour (kWh) from the beginning of 2001 (as opposed to the first quarter of 1999 stipulated under the Project).
6 October	ADB accepted the Government proposal to amend the loan agreement and requested confirmation of the amendments to be made to the power tariff covenant of the loan agreement.
8 October	PC2 submitted to ADB the approved evaluation of the technical proposals from shortlisted consultants.
13 October	State Bank of Viet Nam (SBV) confirmed agreement to the amendments to the Loan Agreement.
14 October	The President approved SBV's request for the signing of the Loan Agreement in Hanoi.
9 November	ADB approved the bid evaluation for consulting services by PC2.
20 November	ADB approved the bid evaluation for consulting services by PC3.
25 November	Loan and project agreements were signed.
12 December	ADB requested coordinated PC2 and PC3 contract negotiations with the selected consulting firm.
4 – 14 December	Contract negotiations held between PC2 and PC3 and the first-ranked consulting firms (Electricité de France [EDF]/Deutsche Energie-Consult Ingenieurgesellschaft mbH [DECON] consortium for PC2 and EDF for PC3).
1999	
14 January	Subloan agreements between Ministry of Finance and PC2 and PC3 signed.
23 February	PC2 advised ADB of completed contract negotiations.
25 February	ADB declared the loan effective.
26–31 March	PC2 and PC3 finalized and signed contracts with the selected consulting firms.
April	ADB approved the signed consulting service contracts for PC2 and PC3.
5 May	Kick-off meeting between the consultants and PC2 was held
31 May	General procurement notice advertised in the ADB <i>Business Opportunities</i> .
24 June	Notice to proceed issued PC3 to the consultants.
6 September	Consulting services for PC3 commenced.
October	Translated feasibility study (FS) provided to consultant by PC3
3 November	ADB received the consultant's inception report for PC2
15 November	Bid Documents for rural communes in PC2 area

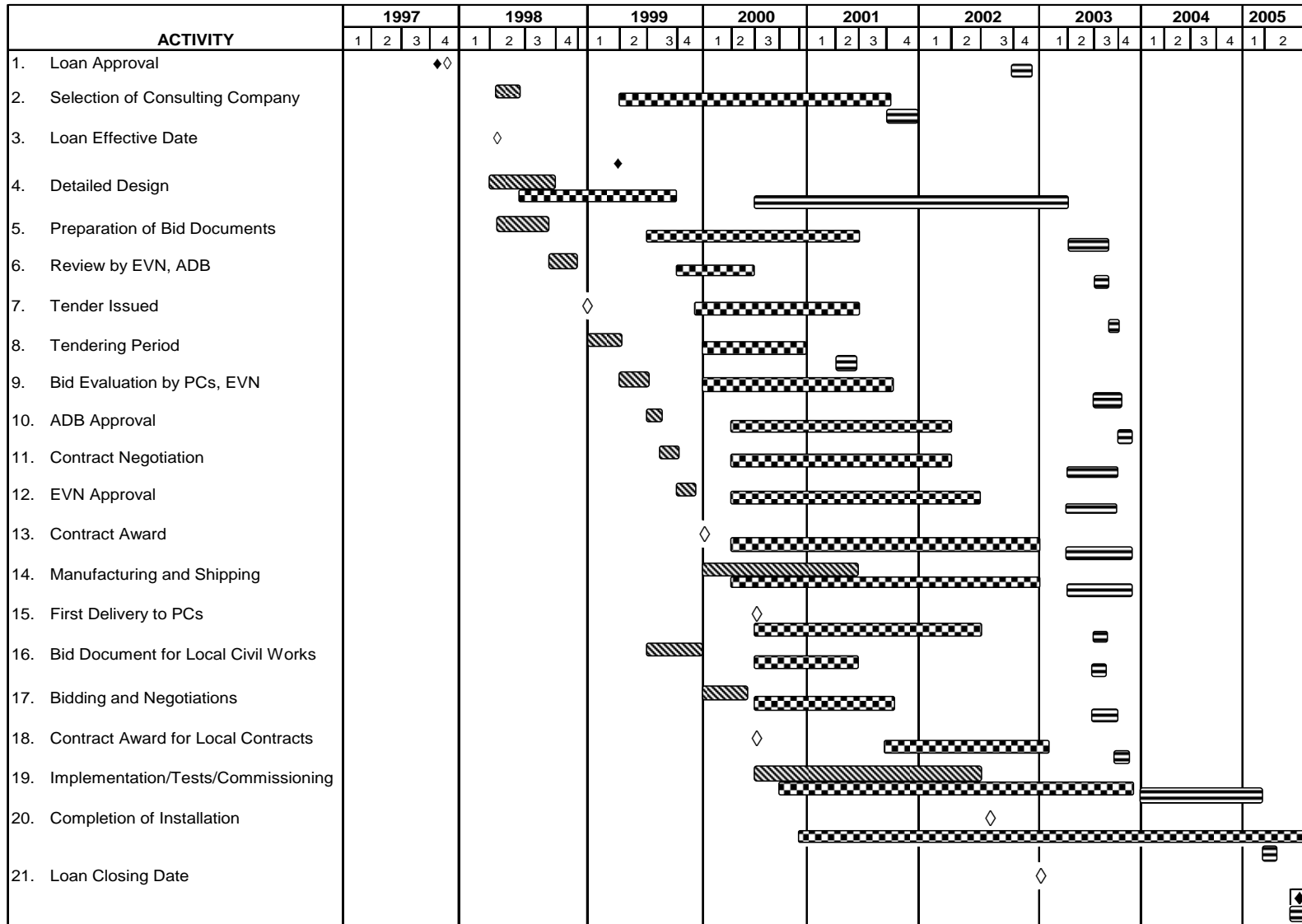
Date	Event
December	ADB review mission
2000	
17 January	Opening of bids for rural communes in PC2 area.
February	ADB, EVN approval of bidding documents and issuance of bid documents for three cities in PC2 area.
30 September	ADB received sociological report from PC3.
March	ADB approved bid evaluation for two rural communes in PC2 area.
10 April	Amendment No. 1 to consulting services contract signed with PC2
17 April	Opening of bid for three cities in PC2 area
15 June	Bid packages issued for Supervisory Control and Data Acquisition (SCADA) system in the three cities in PC2 area
26 June	ADB requested PC3 for the bid packaging and cost estimates due to delays in finalizing bill of quantities and designs for PC3 area.
16 August	Technical design for PC3 component submitted to EVN but rejected because of lack of adequate information
14 September	Amendment No. 2 to consulting services contract signed by PC2 and the consultants.
October–November	ADB no-objection to bid evaluation by PC2 for equipment for three cities.
November–December	Finalization of the technical designs and bidding documents for PC3 component.
22 December	PC2 requested reallocation of unutilized loan amount to expand the coverage of the rehabilitation works to nearby town such as Thu Dau Mot in Binh Duong province.
December	Contract signing for supply of goods by PC2.
18–22 December	ADB Review Mission fielded.
2001	
10 April	ADB approved bid evaluation by PC2 for SCADA system.
19 April	Revised FS and technical design for PC3 component approved by EVN and MOI.
30 May	Bid documents for all 10 packages issued for the PC3 component 15 months after the issuance of bid documents for PC2 component.
July–August	Closing of bids for PC3 component.
September–October	Bid evaluation for PC3 component.
16–21 October	Submission of bid evaluation reports to ADB and EVN by PC3.
October	ADB, the World Bank and the Government entered into a MOU regarding the future tariff increases.

Date	Event
2 November	EVN approved the FS for Thu Dau Mot town in PC2 area for inclusion in the Project.
Nov–December	ADB approved bid evaluation reports by PC3.
November	Contract signing for civil works in Da Lat city in PC2 area.
4–13 December	ADB fielded midterm review mission.
2002	
9 January	ADB reiterated to PC2 and PC3 and EVN the need to comply with loan covenants regarding bulk and retail tariffs.
January	Civil work contracts awarded for all PC3 towns.
15 January	Contract signing for civil works in Bien Hoa city in the PC2 area.
30 January	ADB's disapproved the bid evaluation of package 4 by PC3.
Feb–March	Contract signing by PC3 for procurement under the loan.
15 March	Contract signing for civil works in Bien Hoa, Can Tho and Da Lat cities in PC2 area
April	Construction work for the PC3 component began.
May	Delivery of the PC3 ADB-funded equipment began.
13 August	ADB asked SBV to request cancellation of unutilized loan funds.
20 September	The Prime Minister announced a tariff increase from \$0.051 to \$0.056 (inclusive of VAT), effective 1 October 2002.
9 October	SBV requested an extension of loan closing from 31 December 2002 to 31 December 2004.
19 November	ADB approved the (i) extension of the loan closing date to 31 December 2004 and (ii) financing of the foreign exchange costs for the rehabilitation and expansion of the Thu Dau Mot town electrical network for an estimated amount of approximately \$5.2 million.
December	ADB review mission fielded.
2003	
January	Completion of delivery of goods to PC3.
28 March	EVN approved the engineering design of rehabilitation and expansion network for Thu Dau Mot.
March	Consultant trained PC3 staff on equipment installation.
1 April	ADB approved the procurement plans for Thu Dau Mot.
25 April	Inauguration ceremony for Da Lat city network
May	Procurement of goods for Thu Dau Mot town using repeat order procedures.
June–July	Issuance of bids goods for Thu Dau Mot using ICB procedures
27 August	SBV requested and ADB approved partial cancellation of loan funds amounting to \$40 million.

Date	Event
August–October	Commissioning of rural communes in PC3 area
1–23 October	ADB concurred with amendment nos. 3 and 4 to the consultancy contract to cover the international consulting services for Thu Dau Mot
October–November	Contract signing for procurement of goods under ICB for Thu Dau Mot.
2004	
3 March	PC2 requested EVN to cancel the SCADA under Thu Dau Mot.
23 March	Commissioning of Da Lat mini SCADA system.
1 April	EVN approved cancellation of the SCADA package under Thu Dau Mot.
22 April	ADB approved cancellation of the SCADA package under Thu Dau Mot.
July	PC2 procured polychlorinated biphenyl (PCB) testing equipment and tested 188 transformers and 18 capacitors. PCB concentrations greater than 50 ppm were detected in 18 transformers and 6 capacitors. These were properly labeled and stored and are now in safe storage awaiting further instructions from EVN regarding disposal.
29 September	ADB requested SBV to cancel loan savings that would not be utilized.
5 November	Commissioning of Can Tho SCADA system
10–15 December	ADB review mission
17 December	Inauguration of Can Tho city network rehabilitated under the Project.
2005	
13 January	ADB notified EVN and the Government of partial cancellation of loan funds amounting to \$9.38 million.
April	Submission of project completion report by PC3
May	Completion of Bien Hoa city network in PC2 area
May	Completion of networks in all the cities in PC3 area except Dien Khanh and Quang Tri towns
30 May	ADB declared the loan financially closed and cancelled the remaining unutilized loan amount of \$1,355,961.
July	Submission of project completion report by PC2.
December	Completion of the Quang Tri town network in PC3 area
2006	
20 February–8 March	ADB fielded the PCR mission.
April	Completion of Thu Dau Mot town in PC2 area and Dien Khanh town in PC3 area.

Sources: Records maintained at ADB and Information provided by PC2 and PC3.

PROJECT IMPLEMENTATION SCHEDULE



ADB = Asian Development Bank, EVN = Electricity of Vietnam, PCs = Power Companies

Legend: Projected – ◇ Actual – ◆ Thu Dau Mot Extension –

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference	Status of Compliance
Sector Covenants		
1. The Borrower shall ensure that all necessary steps are taken by 31 December 1998 for adoption of the draft Electricity Law	Loan Agreement (LA), Schedule 6, para 19	Partly complied with. Although it was delayed for 72 months, the new Electricity Law was enacted at the beginning of July 2005
2. The Borrower shall take all necessary steps by 31 December 1998 to prepare secondary laws or decrees or regulations to facilitate the implementation of the Electricity Law	LA, Schedule 6, para. 20	Partly complied with. The secondary decree guidelines was enacted in 2005
3. The Borrower shall take necessary steps by 31 December 1998 to set up an independent Electricity Regulatory Authority as envisaged under the Electricity Law	LA, Schedule 6, para. 21	Partly complied with. The Electricity Regulatory Authority was established in October 2005.
Tariff Covenants		
1. Retail Tariffs. The Borrower, Ministry of Industry (MOI) and Electricity of Vietnam (EVN) shall ensure that a nationwide retail tariffs in stages to achieve a tariff of 7 US-cents equivalent per kilowatt-hour (kWh) by 01 March 2001. The first tariff increase shall be implemented not later than 01 July 1999, a second increase not later than 01 July 2000, and a third not later than 01 March 2001 (tariff increases). This covenant was modified in October 1999 to achieve the 7 cents/kWh tariff by October 2001 and Asian Development Bank (ADB) together with the World Bank agreed with Government of Viet Nam (GOV) in 2001 that this would be achieved in 2005.	LA, Schedule 6, para. 8	Not complied with. The average national retail tariff was increased from D703/kWh to D728/kWh in October 1999, and to D800/kWh in October 2002. No tariff increases have been approved since then.
2. The Borrower & EVN shall ensure that (i) the weighted average retail tariff per kWh supplied to the residential consumer category as a percentage of the total average retail tariff will not decline from the level in 1996 & (ii) that proposed annual action plans on increases from that level are provided to the Bank.	LA, Schedule 6 para. 9	Complied with.
3. Bulk Tariffs. The Borrower and EVN shall ensure that (i) the average nationwide bulk tariff, as a percentage of average	LA, Schedule 6 para. 10	Complied with

Covenant	Reference	Status of Compliance
nationwide retail tariff, will not decline below the 1996 level of 60% and (ii) that proposed annual action plans on increases from that level are provided to the Bank.		
4. The Borrower and EVN shall ensure regular consultations on the bulk tariff to achieve EVN's financial viability and shall submit annual reports on such consultations to the Bank.	LA, Schedule 6, para. 11	Partly complied with.
Project Implementation		
1. The Borrower shall make available to the Power Companies, promptly as needed, and on terms and conditions acceptable to the Bank, the funds, facilities, services, land and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project	LA, Article IV, Section 4.02. Project Agreement (PA) Article II, Section 2.02.	Complied with.
2. Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the Project are conducted and coordinated in accordance with sound administrative policies and procedures.	LA, Article IV, Section 4.03	Complied with.
3. The Power Companies shall carry out the Project in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to the Bank.	PA, Article II, Section 2.04	Complied with.
4. PC2 and PC3 shall each, throughout the implementation period of the Project, maintain a Project Office under the direct supervision of their respective Project Directors and Project Managers from the Subproject Evaluation Boards for each of their respective franchises.	LA, Schedule 6, para. 2.	Complied with.
5. All goods and services financed out of the proceeds of the loan shall be exclusively used in carrying out of the Project.	LA Section 3.04	Complied with however project scope amended to include Thu Dau Mot extensions.
6. Each of the Power Companies agrees to take out and maintain with responsible insurers insurance of Project facilities against risk and in such amounts consisted with sound practice.	PA, Article II, Section 2.05	Complied with.

Covenant	Reference	Status of Compliance
Reporting		
<p>1. The Borrower shall furnish, or cause to be furnished, to the Bank all such reports and information as the Bank shall reasonably request concerning (i) the Loan, and the expenditure of the proceeds and maintenance of the service thereof; (ii) the goods and services and other items of expenditure financed out of the proceeds of the Loan; (iii) the Project; (iv) the administration, operations and financial condition of the Power Companies and any other agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof; (v) financial and economic conditions in the territory of the Borrower and the international balance-of-payments position of the Borrower; and (vi) any other matters relating to the purposes of the Loan to the carrying out the Project</p>	<p>LA, Article IV, Section 4.04</p>	<p>Complied with.</p>
<p>2. Each of the Power Companies shall maintain separate accounts for the Project and for its overall operations; (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to the Bank; and (iii) furnish to the Bank, promptly after their preparation but in any event not later than 9 months after the close of the fiscal year to which they relate, certified copies of such audited accounts and financial statement and the report to the auditors, all in the English language</p>	<p>PA, Article II, Section 2.09(a).</p>	<p>Complied with.</p>
<p>3. Each of the Power Companies shall furnish to the Bank quarterly reports on the execution of the Project promptly after physical completion of the Project but in any event not later than three months after or such later date as the Bank may agree for this purpose, each of the Power Companies shall prepare and furnish to</p>	<p>PA, Article II, Section 2.08(b).</p>	<p>Complied with. The PCR report was submitted within 3 months of loan closing, but not all equipment was installed by the time the project completion report was submitted to ADB.</p>

Covenant	Reference	Status of Compliance
<p>the Bank a report on the execution and initial operation of the Project, including its cost, the performance by each of the Power Companies under this Project Agreement and the accomplishment of the purposes of the Loan.</p>		
Procurement		
<p>1. All goods and services to be financed out of the Loan proceeds shall be procured in accordance with the provisions of Schedules 4 and 5 to the Loan Agreement.</p>	PA, Article II, Section 2.03(b).	Complied with.
<p>2. Procurement of goods and services shall be subject to the provisions of the <i>Guidelines for Procurement under Asian Development Bank Loans</i>.</p>	LA, Schedule 4, para. 2	Complied with.
<p>3. The selection, engagement, and services of the consultants shall be subject to the provisions of the <i>Guidelines on the Use of Consultants by Asian Development Bank and its Borrowers</i>.</p>	LA, Schedule 5, para. 2.	Complied with.
Operational Matters		
<p>1. By 1 January 2002, PC2 and PC3 shall each reduce distribution losses to not more than 9 percent of the energy sent in.</p>	LA, Schedule 6, para. 4.	Complied with by 2002.
<p>2. Commencing 1999, PC2 shall ensure that the consumer-to-employee ratio will be improved by at least 10 per cent annually for a period of 5 years, and at least 15 percent for a period of five years.</p>	LA, Schedule 6, paras. 5 and 6.	Complied with.
<p>3. The Borrower shall ensure that EVN and the five power companies undertake steps to commercialize in line with the recommendations made under Part B of the Bank's Technical Assistance No. 2345-Vie.</p>	LA, Schedule 6, para. 5.	Complied with. The borrower has also started partial privatization of the provincial power distribution departments.
Financial Matters		
<p>Commencing 1999, PC2 and PC3 shall ensure that (i) self-financing ratio (SFR) will be at least 30% (ii) the rate-of-return (ROR) will be at least 12% of the book value of net fixed assets and (iii) the debt service coverage ratio (DSCR) will be at least 1.5 times.</p>	LA, Schedule 6, IV, para. 12.	Partly complied with. The specified SFR was achieved (except in 2000 for PC2 and 1999 by PC3). The specified DSCR has been achieved each year since 1999 by both PC2 and PC3.

Covenant	Reference	Status of Compliance
Other Matters		
Land Acquisition		
The Borrower, EVN and the Power Companies shall ensure that all necessary actions are taken so that all land, rights-of-way, easements, licenses and other rights in land or privileges required for the Project are made available on a timely basis.	LA, Schedule 6, para. 15.	Partly complied with, with significant delays in some areas.
Environmental and Social Considerations		
1. In the design, implementation and operation of the Project facilities, the Borrower, EVN and the Power Companies shall ensure strict compliance with (i) of all environmental and social mitigation and compensation measures indicated in the other Initial Environmental Assessment and Initial Social Assessment; and (ii) such other measures as may be required under the environmental and social laws and regulations of the Borrower.	LA, Schedule 6, para. 17.	Complied with.
2. The Borrower, EVN and the Power Companies shall ensure that (i) equipment procured under the Project will not contain any polychlorinated biphenyls (PCBs); and (ii) that the equipment replaced under the Project is tested for PCBs and appropriate measures to be taken to ensure safe collection, transportation and disposal of PCBs-contaminated oils.	LA, Schedule 6, para. 18.	PC2 has tested the transformers. The contaminated transformers have been labeled and are safely stored awaiting instructions from EVN. PC3 has not yet tested its old transformers and is waiting for instructions from EVN for testing.

ECONOMIC AND FINANCIAL ANALYSES

A. Introduction

1. The Project consisted of a number of subprojects aimed at rehabilitating the distribution systems (i.e., 22 kV and lower voltages) of four cities/town in southern Viet Nam and nine towns in central Viet Nam and the electrification of six rural communes. The economic and financial analyses of these components were undertaken separately and two different methodologies were used to identify the economic benefits and cash flows of the rehabilitation of urban power distribution systems and the electrification of rural communes.

2. The weighted average cost of capital has also been calculated for the overall investment program of Electricity of Vietnam (EVN). This was compared with the financial internal rate of return to ascertain the financial viability of the investments made under the Project. The financial analysis was consistent with the economic analysis. The cash flows were adjusted to compute the economic benefits and costs of the investment program, and the economic internal rate of return was computed to ascertain the economic viability of the investment program of the three cities.

B. Analysis of Rehabilitation of Urban Power Distribution Systems

3. The analysis was carried out by comparing the financial and economic costs and benefits under the “with” and “without” project scenarios. Under the “without” scenario, there would not have been any investments in the distribution system during 1999–2004. It is further assumed that the capacity of the distribution systems would have been fully exhausted by 2002 in the absence of new investments. Under the “with” scenario, the investments undertaken during 1999–2004 were considered, and the reduction in distribution losses compared with the “without” scenario was attributed to these investments. It is further assumed that there would not be any new investments after 2004, and it is conservatively assumed, based on the demand forecast, that the newly installed capacity would be fully exhausted by 2010.

4. Although the expansion of the capacity in the distribution system would have improved the quality and reliability of supply, these benefits were not taken into account in the financial and economic analysis. It is also conservatively assumed that there would not have been new electrification as a result of the rehabilitation of the urban power system or additional sales. It was noted that almost all of the urban areas had been fully electrified before the Project, although many households did not have a direct connection to PC2/PC3 network and were purchasing electricity from their neighbours. The financial and economic benefits considered for the financial and economic analysis were only the reduction in distribution losses as a result of the rehabilitation of the Project.

5. As the improvements under the Project were made from 2002, the distribution losses “with” and “without” the Project were computed and the difference in distribution losses was considered for estimating the financial cash flows and economic benefits due to the Project. The distribution losses for the “without” case were computed for the period 2002–2010 by assuming that the technical distribution losses are proportional to the total energy sales and by using the energy sales of 2001 as the base year. The distribution losses for the “with” case were computed based on actual values for the period 2002–2004 and for the period 2005–2010 using 2004 as the base year. The benefits and cash flows due to differences in distribution losses after 2010 were not considered, as the installed capacity in the distribution system under the Project was conservatively assumed to be fully exhausted by 2010.

6. The economic and financial benefit streams due to consumption of electricity under the “with” and “without” cases were assumed to be the same, as it was assumed that there would not be any curtailment of demand under the “without” case. However, because of higher distribution losses under “without” scenario, the cost of supplying electricity is higher. The higher maintenance cost of the distribution network under the “without” case was not considered in the analysis. The additional losses under the “without” case were valued at the average bulk supply tariff (BST) for PC2 (D493/kWh) and PC3 (D436/kWh) to evaluate the FIRR from the perspective of PC2 and PC3. As there is a cross subsidy between different power distribution units, these losses were also valued at the average bulk supply tariff (D543 /kWh) to calculate the FIRR from the point of view of EVN.

Table A8.1: Financial Analysis of Investment in PC3 Cities/Towns
(D million)

Year	Additional Losses in (GWh)	Cost of Ad Losses at PC3 BST	Cost of ad. Losses at average BST	Investment Cost	Net Cash Flows at PC3 BST	Net Cash Flows at average BST
2001				115,251	(115,261)	(152,261)
2002	18.2	7,193	8,959	187,627	(180,434)	(178,668)
2003	41.6	18,127	22,575	46,138	(28,011)	(23,563)
2004	75.3	32,914	40,992	93,479	(60,565)	(23,563)
2005	98.3	43,861	54,626	32,695	11,166	21,931
2006	131.9	59,631	74,265		59,631	74,265
2007	179.3	90,607	112,844		90,607	112,844
2008	247.6	126,792	157,908		126,792	157,908
2009	348.7	180,848	225,231		180,848	225,231
2010	503.5	264,532	329,451		264,532	329,451
FIRR					10.46%	15.11%

BST = bulk supply tariff, FIRR = financial internal rate of return, GWh = gigawatt-hour.

Source: .ADB staff estimates

Table A8.2: Financial Analysis of Investment in PC2 Cities/Towns
(D million)

Year	Additional Losses in (GWh)	Cost of Ad Losses at PC2 BST	Cost of Ad Losses at Average BST	Investment Cost	Net Cash Flows at PC2 BST	Net Cash Flows at Average BST
2001				149,690	(149,690)	(149,690)
2002	(12.6)	(5,634)	(6,206)	223,026	(228,660)	(229,232)
2003	29.6	14,750	16,246	57,591	(42,841)	(41,346)
2004	78.3	38,685	42,609	85,244	(46,558)	(42,635)
2005	109.2	55,100	60,688	32,132	22,969	28,557
2006	142.8	72,982	80,384		72,982	80,384
2007	186.2	106,381	117,170		106,381	117,170
2008	243.4	140,905	155,195		140,905	155,195
2009	319.9	187,598	206,624		187,598	206,624
2010	418.6	248,677	273,898		248,677	273,898
FIRR					8.25%	10.14%

BST = bulk supply tariff, FIRR = financial internal rate of return, GWh = Gigawatt-hour.

Source: ADB staff estimates.

7. The methodology for the economic analysis was consistent with that used for the financial analysis. Constant 2005 prices and a domestic price numeraire were used. The capital investment was adjusted for taxes, and the cost of imported capital goods (i.e., assumed to be 65% of the capital cost) was further adjusted using a shadow exchange rate factor of 1.1. The additional losses under the “without” case were valued at the long-run marginal cost (LRMC) of supplying electricity to PC2 (797 VND/ kWh) and PC3 (853 VND/kWh).

Table A8.3: Economic Analysis of Investment in PC3 Cities/Towns
(D million)

Year	Additional Losses (GWh)	Cost of Ad Losses at PC3 LRMC	Investment Cost	Net Benefits
2001			126,776	(126,776)
2002	18.2	15,524	202,644	(187,121)
2003	41.6	35,464	50,329	(14,865)
2004	75.3	64,243	96,273	(32,030)
2005	98.3	83,840	34,092	49,478
2006	131.9	112,519		112,519
2007	179.3	152,979		152,972
2008	247.6	211,246		211,246
2009	348.7	297,449		297,449
2010	503.5	429,500		429,500
EIRR				21.20%

GWh = Gigawatt-hour, LRMC = long-run marginal cost, EIRR = economic internal rate of return.
Source: ADB staff estimates.

Table A8.4: Economic Analysis of Investment in PC2 Cities/Town
(D million)

Year	Additional Losses (GWh)	Cost of Ad Losses at PC2 LRMC	Investment Cost	Net Benefits
2001			164,660	(164,660)
2002	(12.6)	(10,048)	242,531	(252,578)
2003	29.6	23,845	63,035	(39,190)
2004	78.3	62,393	88,873	(26,480)
2005	109.2	87,030	33,946	53,084
2006	142.8	113,794		113,794
2007	186.2	148,408		148,408
2008	243.4	193,986		193,986
2009	319.9	254,962		254,962
2010	418.6	333,634		333,634
EIRR				13.72%

EIRR = economic internal rate of return, GWh= Gigawatt-hour, LRMC = long-run marginal cost.
Source: ADB staff estimates.

C. Analysis of Electrification of Rural Communes

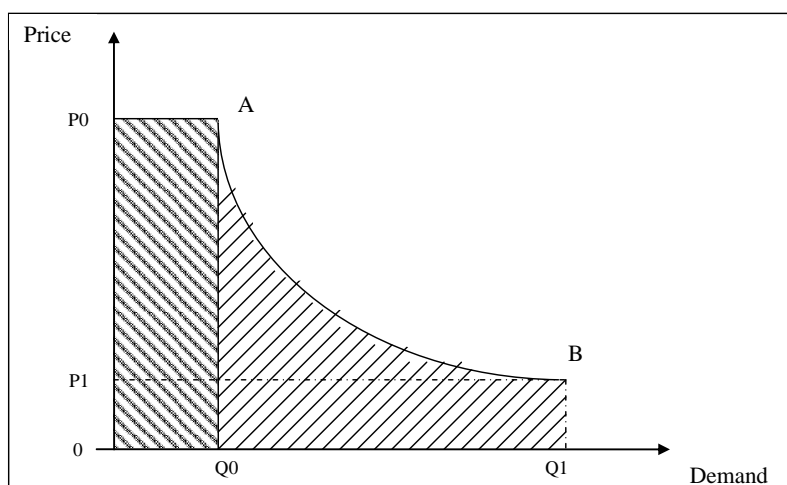
8. The financial analysis of the electrification of the rural communes was carried out by valuing the sales at the applicable tariff. The result of the analysis is shown in table below and shows a very low financial rate of return.

Year	Consumption	Investment		O&M Cost	Net Cash Flow
	(GWh)	Revenues	Cost		
2001	0.29	147	8,897	22	(8772)
2002	0.98	527	12,586	54	(12,121)
2003	1.31	776	5,813	68	(5,105)
2004	2.32	1,375		68	1,307
2005	3.04	1,837		68	1,769
2006	3.43	2,104		68	2,035
2007	3.98	2,725		68	2,657
2008	5.08	3,522		68	3,454
2009	5.68	3,994		68	3,926
2010	6.22	4,426		68	4,358
2011	6.74	4,798		68	4,729
2012	7.26	5,161		68	5,093
FIRR					1.71%

FIRR = financial internal rate of return, GWh = Gigawatt-hour, O&M = operations and maintenance.
Source: ADB staff estimates.

9. The economic benefits of rural electrification are due to the substitution of non-incremental energy consumption with electricity and the incremental energy consumption caused by the availability of cheaper energy source. These are illustrated in Figure A8.1.

Figure A8.1: Demand Curve for Additional Residential Consumers



P₁: Electricity Tariff on real terms
P₀: Resource cost of in the absence of electricity.
Q₀: Energy consumption per household in the absence of electricity
Q₁: Energy Consumption per household at the prevailing tariff.

10. The economic benefits due to non-incremental consumption are the area OP_0AQ_0 . The economic benefits due to incremental consumption are the area Q_0ABQ_1 . Using consumer surveys for residential consumers in Viet Nam, it has been estimated³ that $P_0=2,769$ VND/kWh and $Q_0=110$ kWh per household, resulting in an economic benefit of D304,590 per household per year.

11. The incremental benefits of new consumers are the area Q_0ABQ_1 . This can be computed by integrating the area under the demand curve and is shown⁴ to be equal to $Q_1 * (P_1 - 1/b) - Q_0 * (P_0 - 1/b)$, where "b" is the coefficient for the demand curve for the relevant year.

12. Although P_0 (D2,769/ kWh) and Q_0 (110 kWh) can be assumed to be constant during the study period, P_1 and Q_1 vary during the period under consideration. This is because of the change in the residential consumers in real terms during 2008–2015 and the change in consumption per household.

Table A8.6: Economic Analysis of Rural Communes

Year	Number of Consumers	Consumers per household	Tariff D/kWh	Non-Incremental Benefits	Incremental Benefits	Investment	Net Benefits
2001	1,418	205	506	432	205	9,542	(8,927)
2002	3,965	248	535	1,208	825	13,845	(11,866)
2003	5,373	245	591	1,637	1,111	5,813	(3,134)
2004	6,088	382	592	1,854	2,415		4,201
2005	6,841	444	604	2,084	3,299		5,314
2006	7,516	457	612	2,289	3,764		5,985
2007	8,104	491	684	2,468	4,560		6,961
2008	8,721	582	694	2,656	5,665		8,583
2009	9,239	615	703	2,814	6,784		9,530
2010	9,781	636	712	2,979	7,478		10,389
2011	10,347	652	711	3,151	8,129		11,212
2012	10,937	663	711	3,331	8,760		12,024
EIRR							18.83%

EIRR = economic internal rate of return, kWh = kilowatt-hour.

Source: ADB staff estimates.

³ Economic Consulting Associates, Robert Vernstorm Associates. 2003. *EVN Tariffs: Interim Report*. (September).

⁴ Measuring Willingness to Pay for Electricity : ERD Technical Note Series No. 3 : Peter Choynowski, July 2002

FINANCIAL ANALYSIS OF EXECUTING AGENCY

1. Although the financial covenants refer to the financial performance of Power Company 2 (PC2) and Power Company 3 (PC3), PC2 and PC3 are affiliated units of Electricity of Vietnam (EVN). The bulk tariff at which the power companies purchased electricity from EVN at the 110-kilovolt level was administratively set by EVN to ensure the financial viability of each power company. Hence, it is pertinent to assess the financial performance of EVN together with the two power companies (PC2 and PC3).

2. Since its creation in 1995, EVN—a vertically integrated entity responsible for the electricity sector—has been profitable and financed the rapid expansion of the electricity sector without resorting to significant fiscal subsidies. The key financial performance indicators such as debt service cover ratio, self-finance ratio, and receivables have been maintained at prudential limits, and the average end-user tariff at about D794 /kWh (\$0.5/kWh). Although the average tariff level is less than the estimated long-run marginal cost of D1,142 /kWh (\$0.7/kWh), the prevailing tariffs are adequate to maintain the financial viability of the sector at present. However, to satisfy future demand resulting from rapid economic growth, EVN will need to invest considerably in generation, transmission, and distribution. A substantial portion of these investments will be debt financed, and sustained tariff increases are required to maintain adequate levels of debt service and self-financing of new investments.

B. Financial Performance of EVN

3. EVN's electricity sales doubled in 1999–2004, representing an annual growth rate of 15.2% (Table A9.1). Although the average tariffs net of sales taxes increased only marginally from D660/kWh (\$0.0047/kWh) in 1999 to D800/kWh (\$0.051/kWh) by 2004, the cash flow from operating activities increased from D5,882 billion (\$427 million) to D13,454 billion (\$857 million), and net profit reached D3,576 billion (\$227 million) in 2004 compared with D1,088 billion (\$79 million) in 1999. The cumulative financial performance of EVN during 1998–2003 and the key financial ratios are summarized in Table A9.1.

Table A9.1: Financial Performance of EVN, 1999–2004
(D billion)

Item	1999	2000	2001	2002	2003	2004
Total Revenue	14,124	16,513	19,209	23,566	30,245	34,530
Revenue from Electricity Sales	12,934	15,135	17,540	21,474	27,480	31,504
Electricity Sales (GWh)	19,592	22,405	25,752	30,228	34,841	39,200
Average Tariff D/kWh	660	675	681	710	789	794
Profit before Interest and Tax	2,618	2,100	2,127	3,110	2,881	4,942
Net Profit	1,088	883	999	1,650	1,828	3,331
Cash Flow from Operations	5,882	7,311	6,739	8,412	10,904	10,654
New Borrowings	6,201	8,866	6,131	6,507	6,337	8,185
Net Capital Injections	(287)	371	518	174	31	(40)
Investments	11,666	13,697	9,218	9,923	13,347	16,298
Debt Service	1,254	2,036	3,811	2,823	2,719	4,503

Item	1999	2000	2001	2002	2003	2004
Self-Financing Ratio (%)	22.7	32.9	36.0	60.4	83.4	37.9
Debt Service Coverage Ratio	4.8	3.0	1.8	3.5	5.7	3.1
Debt–Equity Ratio	41:59	47:53	50:50	50:50	53:47	55:45

EVN = Electricity of Vietnam, GWh = Gigawatt-hour, kWh = kilowatt-hour.

Source: Audited financial statements of EVN and ADB staff estimates.

4. The cumulative capital investments and the debt service of EVN during 1999–2004 amounted to D74.1 trillion (\$4.9 billion) and D17.1 trillion (\$1.1 billion), respectively. These investments had been financed through cash flows from operations amounting to D49.9 trillion (\$3.3 billion), borrowings of D42.2 trillion (\$2.8 billion), and capital injections of D1.3 trillion (\$90 million). Although these increased borrowings have increased EVN's debt–equity ratio from 41:59 in 1999 to 55:45 by 2004, and reduced the debt service cover ratio from 4.8 to 3.1, EVN still retains the capacity to absorb further borrowings to finance its investments in the context of strong growth in future cash flows and low initial gearing.

C. Financial Performance of PC2 and PC3

5. The financial performance of PC2 and PC3 during 1999–2004 is summarized in Tables A9.2 and A9.3. The sales turnover of PC2 and PC3 grew by 2.9 and 2.5 times, mainly because of growth in electricity consumption, which averaged 15%. The average tariff grew by only 20%. However, the cost of sales, comprising mainly the cost of electricity purchased by PC2 and PC3 from EVN at bulk supply tariff, has increased 3.00 and 2.65 times, indicating a rate of increase in the bulk supply tariff slightly higher than the average tariff. The net profit of the two power companies remained virtually stagnant.

Table A9.2: Financial Performance of PC2

Item	1999	2000	2001	2002	2003	2004
Net Sales	2,479	2,975	3,503	4,483	6,065	7,206
Cost of Sales	2,148	2,689	3,067	4,009	5,480	6,509
Sales and Administrative Expenses	148	185	220	263	361	462
Other Income (net)	(1)	(18)	9	19	25	31
Tax	69	49	76	82	77	71
Net Profit	114	34	132	127	148	142
Fixed Assets	1,409	1,832	2,943	3,615	4,857	5,874
Current Assets	647	767	765	1,031	1,225	1,531
Long-Term Liabilities	335	468	942	1,219	1,422	1,708
Current Liabilities	347	453	605	728	94	1,675
Equity	1,375	1,678	2,162	2,698	3,666	4,023
Capital Expenses	369	561	337	669	1,216	1,273
New Borrowings	123	180	290	361	242	337
Debt Repayment	9	34	104	36	54	193
Capital Injections	6	336	76	67	250	48
SFR (%)	39.4	38.8	32.2	49.4	77.2	90.5
DSCR	27.8	6.4	4.2	15.1	14.2	4.3
ROA (%)	13.0	4.5	7.1	5.8	4.6	3.6

DSCR = debt service coverage ratio, PC2 = Power Company No. 2, ROA = return on assets, SFR = self-financing ratio.

Source: **Audited** financial statements of PC2 and ADB staff estimates.

Table A9.3: Financial Performance of PC3

Item	1999	2000	2001	2002	2003	2004
Net Sales	1,274	1,540	1,812	2,201	2,799	3,179
Cost of Sales	1,089	1,376	1,592	1,947	2,495	2,881
Sales and Administrative Expenses	84	86	110	136	167	188
Other Income (net)	10	19	(2)	10	(43)	(27)
Tax	47	32	42	44	26	28
Net Profit	63	65	66	58	42	29
Fixed Assets	1,136	1,466	1,844	2,615	3,209	3,675
Current Assets	740	642	738	908	1,173	1,488
Long-Term Liabilities	426	494	563	1,096	1,554	1,844
Current Liabilities	363	396	445	588	861	1,079
Equity	1,087	1,217	1,564	1,838	1,968	2,240
Capital Expenses 119	345	360	376	560	755	500
New Borrowings	89	87	111	497	390	350
Debt Repayment	9	32	49	51	68	90
Capital Injections	210	142	151	125	124	100
SFR (%)	21.1	77.7	72.9	56.9	91.6	73.0
DSCR	20.6	6.8	5.6	6.4	5.4	4.7
ROA (%)	9.7	6.6	5.9	3.9	2.1	1.6

DSCR = debt service coverage ratio, PC3 = Power Company no. 3, ROA = return on assets, SFR = self-financing ratio.

Sources: Audited financial statements of PC3 and ADB staff estimates.

ENVIRONMENTAL AND RESETTLEMENT IMPACTS

A. Resettlement and Compensation Monitoring

1. The Project rehabilitated the electricity distribution network in 13 secondary cities/towns in Central and Southern Viet Nam, including the suburban areas in the outskirts of the project cities/towns. The city/town centers are densely populated and have a high land value, which suburban areas are mainly rural. The Project electrified six rural communes, some of which are inhabited by ethnic minorities.

2. During project implementation, a resettlement plan was prepared as part of the Project's technical design. The resettlement cost of the PC2 area was estimated to be D21.7 billion and of the PC3 area, D6.7 billion. Actual resettlement payments amounted to D12.2 billion for 6,960 households in the PC2 area and D2.4 billion for 8,100 households in the PC3 area. The resettlement cost was reduced because network routes were changed to avoid private property and acquisition of land for road expansion by the city authorities before project implementation. However, the PCR Mission noted that the revised resettlement plan has not been submitted to ADB, and ADB review missions have not reviewed it. ADB review missions did not have resettlement specialists as the Project did not have major resettlement impacts. However, an ADB review mission met Bien Hoa city authorities to discuss the problems related to land compensation for compact substation sites.

3. Most households were compensated for the pruning of trees along the MV and LV lines, and a few were compensated for pole foundations and location of compact substations. The project-affected people were extensively consulted and their views taken into account, especially in Bien Hoa, where over 19 transformers were converted to pole-mounted ones because of opposition from landowners. The project-affected people were compensated based on standard rates set by the city authorities. The PCR Mission was informed that the rate of compensation for land was based on the market price.

4. In most of the project areas, local authorities implemented urban plans with new and enlarged roads. As the network is mainly overhead, poles were erected along the pavement on city property. Land acquisition was not needed because the authorities had already done it to implement the urban plans. Compensation was paid only in the few cases when the poles were erected on private property. As all distribution substations were pole-mounted, they occupied only a small area and so private land did not have to be purchased. As the location of the poles to be erected was subject to changes following frequent modifications in urban planning programs, compensation was only paid at the last moment before preparation of the pole foundation to avoid unwarranted compensation payments.

5. The Project has not resulted in relocation of any houses or structures and involved minimum land acquisition for pole foundations (less than 1 m²) and for compact substations (about 5 m²). Ethnic minorities in the rural communes electrified under the Project have greatly benefited and have not encountered any adverse impacts. Land acquisition for LV lines in these communes has been minimal as most of the lines were laid along the commune roads. As the resettlement impacts were insignificant, formal consultations were not held with the people who received compensation. However, project-affected people had been consulted on locating compact substations on high-value commercial land in city centers, and some locations were changed after opposition from the people. There has not been any adverse impact on the socioeconomic well-being or livelihoods of the project-affected people. PC2 and PC3 have

adequately complied with government policies and the resettlement plan approved by the Government. Resettlement was not externally monitored as its impacts were not significant.

6. The compensation paid by PC2 and PC3 to affected household areas is shown in Table A10.1.

Table A10.1: Compensation Costs for PC2 Area

No.	Name of subproject	Estimated		Actual		Note
		No. of AHs	Compensation cost (D)	Cumulated payments (D)	No. of AHs paid	
1	Bien Hoa	93	3,481,922,000	3,564,278,700	73	Completed
2	Can Tho	5,668	10,107,605,188	7,780,599,665	6,409	Completed
3	Da Lat	83	3,629,347,449	418,868,439	28	Completed
4	Thu Dau Mot	314	4,440,691,755	340,671,314	287	In progress
5	Phuoc Khang	89	48,841,000	98,738,974	172	Completed
Total		6,247	21,708,407,392	12,203,157,092	6,969	

AH = affected households.

Source: Power Company No. 2.

Table A10.2: Compensation Cost for PC3 Area

Project Location	Revised Plan by Power Company No. 3	Cumulative as of 28 Feb 2005 (D)	
		Compensation Done	Number of Households Compensated
Dong Hoi	1,100,000,000	223,120,202	580
Dong Ha	450,000,000	197,358,018	808
Quang Tri	900,000,000	127,454,670	929
Hoa Khanh Lien Chieu	400,000,000	115,723,430	183
Tam Ky	220,000,000	299,615,489	1,581
Quang Ngai	350,000,000	444,673,838	1,146
Tinh Khe	62,650,000	57,411,023	410
Vinh Thinh	82,218,000	82,218,300	199
Dien Khanh	600,000,000	342,111,750	656
Pleiku	900,000,000	145,930,847	496
Bien Ho	200,000,000	170,222,625	470
Ya Ma	8,003,000	8,993,000	27
Kon tum	1,400,000,000	212,655,196	612
	6,672,871,000	2,427,488,388	8,097

Source: Power Company No. 3.

B. Environmental Issues

7. Although the summary initial environment assessment proposed that the Project procure equipment for PC2 and PC3 to test for the presence of polychlorinated biphenyl (PCB) in replaced equipment, the loan agreement and the consultants' contracts refer only to the detection and disposal of contaminated equipment. However, PC2 has taken several initiatives on PCB in old transformers:

- (i) An intensive workshop on PCB issues was co-organized on 16 March 2004 by Electricity of Vietnam, PC2 and United States-Asia Environmental Partnership (US-AEP) to introduce theoretical and practical matters to respective stakeholders in PC2, and Ho Chi Minh City Power Company along with the government authorities concerned.
- (ii) PCB testing facilities were then deployed by the Electro-Testing Center/PC2.
- (iii) PC2 signed a contract with the Electro-Testing Center for PCB detection in late July 2004. It was planned to take 244 oil samples from the old equipment—transformers and capacitors that had been mounted on the networks of Bien Hoa, Can Tho, and Da Lat cities. Of the planned number of samples, 199 were tested, of which 20 samples of transformer oil (20/184~10.87%) and 6 samples of capacitor oil (6/15~40.00%) were found to contain PCB concentrations of over 50 ppm; 4 samples of capacitor oil (4/15~26.67%) were found to contain over 500 ppm (828–893 ppm);
- (iv) All the PCB-contaminated equipment is safely stored while waiting for further treatment.

8. However, the PC3 did not employ the procedures for storing, testing, and disposing of PCB in replaced distribution transformers. The PCR Mission found that most of the old transformers have been reused in the new 22 kV network by changing the tap position of the transformer from 15 kV to 22 kV. The small number of 15 kV transformers that were removed from the project cities were installed in other cities where 15 kV networks are still used. Hence, disposing of old transformers has not been an issue. However, the Mission has not independently ascertained whether all the removed transformers and other equipment are safely stored and awaiting testing.

QUANTITATIVE ASSESSMENT OF OVERALL PROJECT PERFORMANCE

Table A11.1: Overall Rating

Criteria	Assessment	Rating (0–3)	Weights (%)	Weighted Rating
Relevance	Highly Relevant	3	20	0.60
Efficacy	Efficacious	2	25	0.50
Efficiency	Efficient	2	20	0.40
Sustainability	Most Likely	3	20	0.60
Institutional Development	Moderate	1	15	0.15
Overall Rating				2.25 (Successful)

Notes:

Relevance: Project objectives and outputs were relevant to strategic objectives of the Government and ADB.

Efficacy: Project achieved its targets and objectives.

Efficiency: Project achieved objectives efficiently.

Sustainability: Project benefits and development impacts are sustainable.

Institutional development: The Project had beneficial impacts on government policy and institutional capacity, and other positive social impacts.

Source: Asian Development Bank estimates.

Table A11.2: Rating System

Rating Value	Relevance	Efficacy	Efficiency	Sustainability	Institutional Development
3	Highly Relevant	Highly Efficacious	Highly Efficient	Most Likely	Substantial
2	Relevant	Efficacious	Efficient	Likely	Significant
1	Partly Relevant	Partly Efficacious	Partly Efficient	Less Likely	Moderate
0	Irrelevant	Inefficacious	Inefficient	Unlikely	Negligible

Notes:

Rating:

> 2.5 = Highly successful, 1.6–2.5 = Successful, 0.6–1.6 = Partly successful, < 0.6 = Unsuccessful.

Source: ADB staff estimates.