



Report and Recommendation of the President to the Board of Directors

Project Number: 37041
September 2006

Proposed Loan Kingdom of Cambodia: Second Power Transmission and Distribution Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 2 August 2006)

Currency Unit – riel/s (KR)

KR1.00 = \$0.00024

\$1.00 = KR4,133

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected person
ASEAN	–	Association of Southeast Asian Nations
DSCR	–	debt service coverage ratio
EA	–	executing agency
EAC	–	Electricity Authority of Cambodia
EDC	–	Electricité du Cambodge
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
FY	–	fiscal year
GMS	–	Greater Mekong Subregion
IEE	–	initial environmental examination
IPP	–	independent power producer
IRC	–	Inter-Ministerial Resettlement Committee
JBIC	–	Japan Bank for International Cooperation
KfW	–	Kreditanstalt für Wiederaufbau
MEF	–	Ministry of Economy and Finance
MIME	–	Ministry of Industry, Mines, and Energy
PIC	–	project implementation consultant
REE	–	rural electricity enterprise
RF	–	resettlement framework
ROW	–	right-of-way
RP	–	resettlement plan
SFR	–	self-financing ratio
TA	–	technical assistance
VAT	–	value-added tax
WACC	–	weighted average cost of capital

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour (1 million kWh)
km	–	kilometer
kV	–	kilovolt (1,000 volts)
kWh	–	kilowatt-hour (the energy of 1 kilowatt of capacity operating for 1 hour)
MW	–	megawatt (1 million watts)

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2000 ends on 31 December 2000.
- (ii) In this report, “\$” refers to US dollars.

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CONTENTS

	Page
LOAN AND PROJECT SUMMARY	i
MAP	v
I. THE PROPOSAL	1
II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES	1
A. Performance Indicators and Analysis	1
B. Analysis of Key Problems and Opportunities	2
III. THE PROPOSED PROJECT	7
A. Impact and Outcome	7
B. Outputs	7
C. Special Features	9
D. Project Investment Plan	9
E. Financing Plan	9
F. Implementation Arrangements	11
IV. PROJECT BENEFITS, IMPACTS, ASSUMPTIONS, AND RISKS	14
A. Economic Analysis	14
B. Financial Analysis	15
C. Environmental Impact Assessment	15
D. Land Acquisition and Resettlement	16
E. Social Impact	16
F. Risks	17
V. ASSURANCES	18
A. Specific Assurances	18
B. Conditions for Loan Effectiveness	19
VI. RECOMMENDATION	20
APPENDIXES	
1. Design and Monitoring Framework	21
2. External Assistance to the Power Sector	23
3. Power Sector Analysis	24
4. Financial Performance and Projections of Electricité du Cambodge	27
5. Detailed Cost Estimates and Financing Plan	31
6. Implementation Schedule	33
7. Procurement Plan	34
8. Outline Terms of Reference for Project Implementation Consultants	36
9. Economic Analysis	39
10. Financial Analysis	44
11. Summary Resettlement Plan and Framework	49
12. Summary Poverty Reduction and Social Strategy	54
SUPPLEMENTARY APPENDIXES (available on request)	
A. Initial Environmental Examination	
B. Resettlement Plan	
C. Detailed Project Cost Estimates	
D. Financial Management Assessment of Electricité du Cambodge	
E. Financial Performance and Projections of Electricité du Cambodge	

LOAN AND PROJECT SUMMARY

Borrower	Kingdom of Cambodia
Classification	Targeting classification: General intervention Sector: Energy Subsector: Transmission and distribution Themes: Sustainable economic growth, capacity development Subthemes: Fostering physical infrastructure development, organizational development
Environment Assessment	Category B–sensitive: An initial environmental examination was made. The summary initial environmental examination was circulated to the Board of Directors of the Asian Development Bank (ADB) on 31 January 2006.
Project Description	Sihanoukville, Cambodia's only deep-sea port, is a fast-growing city with major ongoing developments to (i) expand the port facilities, (ii) upgrade the airport, and (iii) set up an export processing zone, thus making Sihanoukville an import gateway to the southern economic corridor. No power transmission grid connects Sihanoukville to the national grid. The city gets its power from a small, isolated power system based on diesel generators. This mode of power generation is expensive, inefficient, as it does not achieve economies of scale, and cannot meet the demand. The Project will complement previous investments in the transmission and distribution facilities. It will (i) extend the 230 kilovolt (kV) transmission line from Kampot to Sihanoukville, (ii) build associated substations and bulk supply distribution facilities, and (iii) carry out institutional development and capacity building for Electricité du Cambodge (EDC).
Rationale	The power sector in Cambodia is highly fragmented, with 24 isolated power systems centered on the various provincial cities. The lack of an integrated high-voltage transmission system, coupled with the high cost of imported diesel fuel, has made electricity in Cambodia among the costliest in the world. The Government recognizes that the high cost of electricity and inadequate supply significantly limits economic growth and hinder the country from attracting investments and stimulating economic activities. ADB and other development partners are assisting the Government in building 230 kV backbone transmission lines in the southern part of the country, originating at a substation on the border with Viet Nam and passing through Takeo to Kampot and also to Phnom Penh. These facilities will allow EDC to import lower-cost electricity from Viet Nam at \$0.05–\$0.07 per kilowatt-hour (kWh) (at off-peak and peak hours) to meet the power demand in Phnom Penh, Takeo, Kampot, and, ultimately, Sihanoukville.

The transmission lines and distribution facilities to be built under the Project are priority investments in the planned national backbone power grid included in EDC's transmission master plan. By extending the transmission line and distribution systems, the Project will (i) provide reliable, sufficient, and less costly power supply to Sihanoukville and Kampot provinces, including rural areas along the transmission line corridor; (ii) reduce tariffs for consumers; (iii) reduce distribution losses; and (iv) make the commercial and industrial sectors more competitive. The bulk supply distribution component will provide reliable medium- and low-voltage supplies to rural villages along the transmission line.

Impact and Outcome

The Project will (i) extend the 230 kV power grid from Kampot to Sihanoukville and provide reliable supply of electricity at affordable prices to consumers in Sihanoukville and adjacent areas along the transmission corridor, (ii) increase connections, (iii) stimulate economic growth in the southern economic corridor, and (iv) improve EDC's operational efficiency and performance through institutional development and capacity building.

Project Investment Plan

The investment cost of the Project is estimated at \$52.36 million, including taxes and duties of \$8.36 million.

(\$ million)

Financing Plan

Source	Total	%
ADB Loan (Special Fund)	20.00	38.0
JBIC Loan	22.30	43.0
Government Funds	10.06	19.0
Total	52.36	100.0

ADB = Asian Development Bank, JBIC = Japan Bank for International Cooperation.

Source: ADB estimates.

ADB will provide a loan of \$20.00 million from its Special Fund resources. The loan will have a maturity of 32 years, including a grace period of 8 years, an interest rate of 1.0% during the grace period and 1.5% during principal amortization, and other terms and conditions set forth in the draft loan and project agreements.

Allocation and Relending Terms

The Borrower will onlend the entire proceeds of the loan to the Executing Agency for a 20-year term, including a 5-year grace period, at an interest rate of 4.2%. The Executing Agency will bear the exchange risk on the onlent amount.

Period of Utilization

Until 31 December 2010

Estimated Project Completion Date

30 June 2010

Implementation Arrangements	EDC will set up a project management unit to manage the Project. During project implementation, a team of international and national consultants will help prepare the detailed project design and bid documents, evaluate bids, and implement and supervise the Project. Project engineering and construction will be contracted out, and the contracts will be administered by EDC.
Executing Agency	Electricité du Cambodge
Procurement	Goods and services financed from the proposed ADB loan will be procured according to ADB's <i>Procurement Guidelines</i> (2006). The major works for the ADB-financed portion of the Project will be (i) a turnkey contract for the civil works for three substations, and (ii) the improvement of the EDC information system.
Consulting Services	Consulting services will be required during implementation to assist EDC in (i) preparing preliminary designs and bid documents for the bidding of the works; (ii) evaluating bids; (iii) supervising installation and construction; (iv) carrying out final testing and commissioning; (v) performing quality assurance; (vi) implementing the environmental management plan, the resettlement plan, and the land acquisition and compensation program; and (vii) monitoring and evaluating the performance of the Project. About 40 person-months of international and 45 person-months of national consultant inputs will be required. EDC will recruit the consultants through a firm, according to ADB's <i>Guidelines on the Use of Consultants</i> (2006) and other arrangements satisfactory to ADB for the selection and hiring of national consultants.
Project Benefits and Beneficiaries	Adequate and reliable supply of power to industry and commercial consumers will enable the sustainable development of these sectors and promote socioeconomic development in the southern region. The project benefits will be increased revenues to the Government and EDC and reduced costs to consumers, particularly those industrial and commercial consumers using private generation facilities without the Project. In addition, rural households along the transmission line corridor will have access to electricity for the first time. The provision of firm capacity supply will allow the diesel generators to be decommissioned, thus reducing air pollution. The Project's net present value of economic benefits is estimated at \$17.4 million. The economic internal rate of return will be a high 20.9%.

Risks and Assumptions

The financial and economic viability of the proposed project depends largely on the load demand in the region. The key risks are (i) lower-than-expected demand for electricity, (ii) insufficient electricity supply from Viet Nam, (iii) delay in the creation of export processing zone in Sihanoukville, and (iv) high tariff and connection charges, discouraging large-scale consumers from switching from their own generation sources to EDC's grid supply. Economic growth has been strong and is envisaged to continue, resulting in an increased demand for electricity. Viet Nam's power demand is also increasing but the Government is committed in honoring the power purchase agreement it signed with Cambodia. Viet Nam is an active member of the GMS Regional Power Trade Coordinating Committee and supports this power interconnection. By importing lower-priced electricity from Viet Nam, the Project will allow EDC to keep tariffs low to ensure connections by large-scale industrial consumers. In addition, the Government will review tariffs to ensure that proper tariffs and connection charges that reflect best international practices are set.

EDC's weak financial performance is a potential risk. Concrete and achievable financial indicators have been developed and agreed on with the Government. These will be closely monitored during project implementation.

Compensation, resettlement, and income-restoration measures might not be delivered as agreed, thereby impoverishing the affected people and delaying the start of civil works. EDC will hire international and national resettlement specialists to assist in the preparation and implementation of resettlement plans. The Project will ensure that the impact of resettlement is further minimized by carefully locating the towers during detailed design. EDC will hire an independent organization to monitor the resettlement activities throughout.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Kingdom of Cambodia for the Second Power Transmission and Distribution Project.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Performance Indicators and Analysis

2. Cambodia has a small population of about 13 million, of which about one third live in poverty. The country's infrastructure was largely destroyed during decades of civil war and conflict, and its socioeconomic indicators are relatively lower than elsewhere in the region. Since peace and stability has been achieved only in the last few years, the Government of Cambodia (the Government) is taking measures to further improve its economic base and stimulate economic growth. But to achieve this, Cambodia must improve its basic infrastructure.

3. The power sector in Cambodia is both small and highly fragmented, with 24 isolated power systems covering various provincial cities and the capital, Phnom Penh. About 85% of the population lives in the rural areas and most have no access to electricity. Nationwide, less than 17% of the population has access to electricity supply. Electricity consumption per capita is estimated at 55 kilowatt-hours (kWh) in 2004, one of the lowest in the region.¹ In addition, the lack of an integrated high-voltage transmission system, the absence of interconnections with neighboring countries, and the high cost of imported diesel fuel have raised electricity prices in Cambodia to one of the highest in the world after Japan.² Since Cambodia has limited indigenous energy sources,³ it relies primarily on imported diesel, which is expensive for power generation. The lack of adequate and affordable electricity supply is a main constraint on economic growth. Given the importance of electricity in stimulating economic growth, this constraint, if not removed, will significantly limit growth and hinder the country's ability to attract investments that would stimulate economic activities, create employment, and reduce poverty.

4. Cambodia has begun to rehabilitate its infrastructure with support from development partners. Power demand has increased significantly, at 12% per year on average from 2000 to 2005. Increasing access to electricity, especially in provincial and rural areas, is essential to development and poverty reduction. The Government's aggressive plan for infrastructure development gives priority to establishing a national power grid and expanding it to unserved areas.

5. The Government has requested the Asian Development Bank (ADB) to assist it in expanding its power transmission network in the southern part of the country, including constructing a new high-voltage 230 kilovolt (kV) transmission line linking Cambodia and Viet Nam to allow Cambodia to import reliable low-cost power. ADB approved a project preparatory technical assistance (TA)⁴ in January 2003. The first component of this TA entailed a feasibility study of a 230 kV transmission line from the Vietnamese border to Takeo and

¹ In comparison, that same year the Lao People's Democratic Republic consumed 206 kWh per capita, Viet Nam 550 kWh, and Thailand 1,890 kWh.

² Commercial and industrial users are now charged \$0.21/kWh, and residential users \$0.10/kWh. In comparison, the average retail tariffs in the Lao People's Democratic Republic, Thailand, and Viet Nam are around \$0.04/kWh, \$0.07/kWh, and \$0.06/kWh, respectively.

³ Offshore findings of oil and gas have been reported but these will be confirmed in 2007, when ongoing drillings are completed and the results evaluated.

⁴ ADB. 2003. *Technical Assistance to the Kingdom of Cambodia for the Power Distribution and Greater Mekong Subregion Transmission Project*. Manila (TA 4078-CAM).

Phnom Penh. An ADB loan for the Greater Mekong Subregion Transmission Project⁵ was approved in December 2003. The project is now being implemented and the 230 kV transmission line is expected to be commissioned in early 2008. The second component of the TA was a feasibility study of the construction of a 230 kV⁶ transmission line from Kampot to Sihanoukville and the associated distribution system. The TA's findings led to a visit to Cambodia by an ADB fact-finding mission from 22 November to 1 December 2005. This report is based on the agreements reached with the Government during the mission. The design and monitoring framework of the proposed project is in Appendix 1.

B. Analysis of Key Problems and Opportunities

1. Government Strategies

6. The Government has drawn up policies to accelerate pro-poor economic growth in conjunction with its socioeconomic development plans. In 2004, the Government put together its Rectangular Strategy, a comprehensive strategy to guide the country's development with emphasis on agriculture, the private sector, infrastructure, and capacity building. Acknowledging the importance of the power sector in the overall development of the country, the Government made the establishment of a reliable power supply and transmission grid a top priority in the strategy.

7. The Government's power sector development strategy⁷ aims to provide adequate, reliable, and stable power supply at affordable prices throughout the country. The key policy framework consists of (i) intensifying investments in power generation and transmission, (ii) connecting Cambodia's transmission lines to the power grids in neighboring countries to allow Cambodia to import lower-cost electricity and possibly engage in power trading in the future, (iii) establishing a legal and regulatory framework, (iv) promoting private sector participation, and (v) expanding provincial and rural electrification. The Government is also committed to providing reliable and affordable electricity service to 90% of villages and 70% of rural households by 2030. To meet the growing demand for electricity, the Government is developing a nationwide high-voltage transmission system as a backbone to give provincial centers access to electricity from efficient, large-scale power stations, and other low-cost sources of imported power.

2. ADB's Sector Strategy⁸

8. The power sector plays a key role in economic growth and social development in Cambodia. ADB's approach is to assist the Government in achieving its development objectives as stated in the Rectangular Strategy by providing continuing support for power sector development. ADB's development assistance strategy is to focus on (i) expanding the country's backbone power transmission and distribution systems to unserved areas and providing reliable and affordable power supply to consumers, (ii) improving sector performance and operational efficiency through institutional strengthening and capacity building, (iii) promoting tariff reform and adopting sound development strategies and policies to maintain sustainable and efficient

⁵ ADB. 2003. *Report and Recommendation of the President to the Board of Directors to the Kingdom of Cambodia for the Greater Mekong Subregion Transmission Project*. Manila (Loan 2052-CAM [SF]).

⁶ This is the normalized voltage level in Association of Southeast Asian Nations (ASEAN) countries; however, the transmission line will operate at 220 kV at the start to match the system operation requirement in Viet Nam.

⁷ Ministry of Industry, Mines and Energy. 2005. *Cambodia Energy Strategy*. Phnom Penh.

⁸ ADB. 2005. *Cambodia: Country Strategy and Program 2005–2009*. Manila (considered and endorsed on 25 January).

development, and (iv) promoting regional power trading and cooperation in synergy with other energy sector infrastructure projects. Such an integrated approach will reinforce investment projects, thereby maximizing efforts and lowering costs through economies of scale. Thus far, ADB has provided four loans totaling about \$110 million to finance power sector projects in Cambodia. These loans are the Special Rehabilitation Assistance in 1992, Power Rehabilitation Project in 1994, Provincial Power Supply Project in 2000, and GMS Transmission Project in 2003 (refer to para. 17 and Appendix 2).

3. Power Sector Performance and Development Strategies

9. The provision of power is the responsibility of Electricité du Cambodge (EDC), under the overall supervision of the Ministry of Industry, Mines, and Energy (MIME). MIME is responsible for formulating and implementing policies, strategies, and plans, and for setting guidelines and standards. EDC owns and operates small power-generating plants that are fueled by expensive light diesel and heavy fuel oil. EDC also purchases more than 50% of the power it distributes to its customers in Phnom Penh and 13 provincial towns from independent power producers (IPPs) at costs that range from \$0.11/kWh to \$0.17/kWh.

10. Sihanoukville is Cambodia's only deep-sea port and is growing fast. There are major ongoing development projects to (i) expand the existing port infrastructure facilities to handle the increase in container traffic, (ii) establish an export-processing zone with backward linkages that would increase employment, and (iii) upgrade and expand the domestic airport to handle international flights and attract tourists to Sihanoukville's beaches. Sihanoukville is also a part of the Greater Mekong Subregion (GMS) Southern Economic Corridor Project, one of the three core projects of the GMS economic cooperation program.⁹

11. Power supply in Sihanoukville is now based on diesel generators that provide about 20 gigawatt-hours (GWh) with a peak demand of 5 megawatts (MW) for 8,000 consumers (as of 2004). The coverage of the distribution system is limited to the town, beach resorts, and port areas, and some villages along National Road 4. In 1998, ADB assisted EDC in installing a 5 MW diesel generator in Sihanoukville and upgrading the distribution system.¹⁰ However, because of the high growth in power demand, the power system is once again severely constrained and unable to meet the demand. EDC needs to purchase another 5 MW of power from IPPs or add another 5 MW of generating capacity to meet the growing demand of its present customers. Electricity consumers, particularly commercial and industrial consumers, face the problem of high electricity tariffs. Rather than connecting to the power grid, many major consumers choose to generate their own electricity as they can ensure reliability of supply and it is cheaper to generate. Self-generation cost is around \$0.14/kWh including operation and maintenance costs. The present captive energy demand¹¹ in Sihanoukville is estimated to be more than 20 GWh.

12. To ensure reliable electricity supply to meet the growing demand and sustain economic growth, EDC needs to import additional power at lower cost from neighboring countries. ADB,

⁹ An economic corridor is a geographic area in which infrastructure is linked directly with trade, investment, and production opportunities. Three economic corridors—north-south, east-west, and southern—are being implemented as the flagship programs of the Greater Mekong Subregion (GMS) with the endorsement of the GMS country leaders. The GMS countries are Cambodia, People's Republic of China, Lao People's Democratic Republic, Myanmar, Thailand, and Viet Nam.

¹⁰ ADB. 1994. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Power Rehabilitation Project*. Manila (Loan 1345-CAM[SF]).

¹¹ Captive demand refers to the energy consumption by those consumers that currently supply their own needs with diesel generators or have access to private power supply from diesel generators. These consumers will shift to the EDC power grid once it is available.

together with other development partners, is assisting EDC in importing reliable and cheaper power from Viet Nam through the construction of a 230 kV high-voltage bulk transmission line, which is scheduled for commissioning in 2008 (footnote 4). The transmission line comes from a substation at the Vietnamese border through Takeo to Phnom Penh. It will evacuate a total capacity of 200 MW at tariffs lower than the generating cost in Phnom Penh.¹² In parallel, a 230 kV transmission line from Takeo to Kampot will be built under a grant funded by German development cooperation through Kreditanstalt für Wiederaufbau (KfW).¹³ This transmission line will also be commissioned in 2008. This interconnection will relieve the strain on the country's generation capacity and also stimulate economic growth in the southern provinces of Takeo, Kampot, and Sihanoukville.

13. The proposed project will directly complement previous investments in transmission and distribution facilities. It will extend the 230 kV transmission line from Kampot to Sihanoukville, thus providing efficient and economical means to electrify those areas. The Project is identified as a priority project in the Government's current investment plan (2005–2020) (footnote 7). The power sector is analyzed in detail in Appendix 3.

4. Rural Electrification and Private Sector Participation

14. The provision of electricity to rural areas has been recognized as a key to reducing poverty in rural areas. With help from the World Bank, the Government has established the Rural Electrification and Renewable Energy Fund, which will promote private sector participation in rural electrification and renewable energy development.

15. EDC has developed a rural electrification program, which consists of grid extension in the outlying areas of major provincial towns, including Sihanoukville and Kampot, with the aim of achieving about 13,000 new connections in these two areas. The Project will assist EDC in providing electricity supply to these rural areas. This will be done on a least-cost basis, using conventional 22 kV feeders for villages in the vicinity of the provincial towns.

16. Rural electricity enterprises (REEs) provide electricity services in small towns and villages. These private entrepreneurs supply power to a few hundred local residents and small commercial establishments. However, they supply power to end users at a cost that far exceeds EDC's, and for only 4 to 6 hours a day. Supplying bulk electricity power to REEs to enable them to supply the rural areas is the most realistic business model in the absence of a transmission grid. In addition, EDC does not have the capability or the resources to provide electricity to such areas with low customer density. Furthermore, there are about 600 existing REEs that could purchase electricity at the transformer terminal and distribute it to their customers. The Project will therefore assist REEs in expanding their business and connecting more rural customers by building distribution facilities.

¹² A power purchase agreement between EDC and Electricity of Viet Nam was signed in 2004. Tariffs agreed with Viet Nam range from \$0.05/kWh to \$0.07/kWh for off-peak and peak periods. EDC will sell the purchased power to the grid at \$0.08/kWh, which is lower than the cost of captive power generation.

¹³ The financing and project agreement between KfW and the Government was signed in September 2005. The project is being implemented as scheduled.

5. Lessons

17. Of the four ADB-financed projects, two projects have been completed,¹⁴ while two others are still being implemented.¹⁵ The experience from these projects shows EDC's strong commitment and generally satisfactory technical capabilities in implementing power projects. But EDC's institutional capacity to deal with resettlement and environmental management is weak, and poor implementation has delayed resettlement. In addition, deficiencies in resettlement implementation have not been brought to light because of inadequate monitoring. EDC needs better institutional arrangements and more capacity building in resettlement and environmental management. ADB has provided technical assistance under Loan 2052 for social and environmental management, and will continue to do so for this proposed project. EDC is strengthening its Environment and Social Unit. The Inter-Ministerial Resettlement Committee (IRC) is also improving its resettlement management capacity. ADB is providing separate technical assistance to strengthen the Government's resettlement legal framework and institutional arrangements and its capacity for involuntary resettlement.¹⁶

18. The completed projects also highlighted the need to (i) continuously improve the capacity of EDC in project processing and implementation, (ii) increase efficiency and transparency in budget utilization, (iii) formulate and implement anticorruption measures, and (iv) involve local communities and stakeholders in the identification and prioritization of project activities for resettlement and environmental management. These lessons have been incorporated into the proposed project. The Project will further strengthen the operation and maintenance capacity of EDC's provincial branches. A procurement committee consisting of representatives from government agencies concerned will be formed to ensure that all project-related activities, including anticorruption measures, are being carried out as planned (paras. 46–47).

6. Policy Dialogue

19. While the Project will assist EDC in expanding and reinforcing its transmission and distribution facilities, it will also continue the policy dialogue with the energy sector to expedite policy formulation and institutional reform in (i) formulating and adopting a comprehensive energy sector strategy and implementation plan that is costed, (ii) improving EDC's financial and operational efficiency (paras. 23–27), and (iii) carrying out institutional development and capacity building (para. 33).

20. Energy sector development is constrained by a number of related factors including lack of sound sector policy and legal framework, limited access to the capital market for improvements in system operations, high generation costs resulting in high tariffs, and unreliable power supply. The Government recognizes that it must develop a strategic framework to govern the systematic development of the energy sector in Cambodia and lead to the

¹⁴ ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Special Rehabilitation Assistance* (energy sector component). Manila (Loan 1199-CAM[SF]); and ADB. 1994. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Power Rehabilitation Project*. Manila (Loan 1345-CAM[SF]).

¹⁵ ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Provincial Power Supply Project*. Manila (Loan 1794-CAM[SF]); and ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the GMS Transmission Project*. Manila (Loan 2052-CAM[SF]).

¹⁶ ADB. 2004. *Technical Assistance to the Kingdom of Cambodia for Enhancing the Resettlement Legal Framework and Capacity Building*. Manila (TA 4490-CAM).

formulation of a coherent implementation plan. With assistance from its development partners, the Government is carrying out a major exercise—the Energy Sector Strategy Review (ESSR)¹⁷ programmed over a 3-year period from 2005 to 2007. The stakeholders have agreed that a government-owned sector development strategy with the funding agencies' full participation would be the basis for a sector-wide approach to future assistance. The ESSR will assess the performance of the sector, diagnose key deficiencies, and develop appropriate strategies and implementation plans within legal, regulatory, and institutional frameworks, and prioritized investment programs.

21. EDC has not complied satisfactorily with financial covenants under previous loans. By the end of 2005, it was able to meet only the debt-equity ratio covenant, and to reduce its transmission and distribution losses. But it has not complied with the debt service coverage ratio (DSCR), accounts receivable from government agencies, and revenue breakeven covenants.

22. EDC's poor financial performance is due to (i) steep increases in fuel oil price, (ii) depreciation of the local currency, (iii) high price of power purchases from IPPs in the late 1990s, (iv) small (uneconomical) size of diesel generation plants, and (v) high level of duties and taxes levied by the Government on imported fuel and spare parts. EDC's financial performance is also affected by late electricity payments by some line ministries due to insufficient budget or improper use of budget allocation for other purposes. These problems have been further compounded by the lack of timely action from the Government to address the problems, to refund the value-added taxes to EDC, and to introduce automatic tariff adjustments to cover oil price increases and foreign exchange fluctuations that would permit EDC to meet its annual revenue requirements.

23. While EDC has made considerable progress in its operations in the last decade, a number of financial issues still need to be addressed. The Government, recognizing EDC's financial situation, took action in 2005 to increase EDC's tariff in Phnom Penh and Kandal province. Effective 1 July 2005, the Electricity Authority of Cambodia (EAC) revised the tariff category of major consumers in these two service areas of EDC to rationalize tariffs by (i) introducing an automatic foreign exchange adjustment to the cost of EDC's power purchases, (ii) having one tariff level for both industrial and commercial (small and medium) consumers, (iii) rationalizing the lifeline tariffs, and (iv) applying one tariff rate for the entire consumption of residential consumers. A second action on electricity tariffs taken by the Government to further improve the financial position of EDC increased the lifeline tariff and applied automatic adjustments for all industrial and commercial consumers not only in Phnom Penh but also in Kandal and Kampong Speu provinces. The new power tariffs, which also raised the average tariffs by 11%, took effect on 1 November 2005.

24. The Government has increased the budget allocation for electricity payments and settled part of the past-due arrears. The total government arrears were reduced from KR47 billion in 2004 to KR28.8 billion by December 2005, representing about 3 weeks of electricity sales. The Government has helped EDC maintain a satisfactory debt-to-equity ratio by converting debt of around \$60 million to equity. The debt-to-equity ratio improved from 58:42 in 1999 to 48:52 in

¹⁷ The Energy Sector Strategy Review is a major policy review exercise programmed from 2005 to 2007, to create a strategic framework that would govern the systematic development of the energy sector in Cambodia. The exercise will be participatory, with the Government taking the lead and funding agencies including ADB, Department for International Development (DFID) of the United Kingdom, JBIC, Japan International Cooperation Agency (JICA), and the World Bank contributing. Major outputs include an update of the power development master plan, studies on renewable energy strategy and power sector efficiency, a review of infrastructure, a hydropower master plan, a rural electrification master plan, a regulatory framework for the oil and gas industry, and an energy sector strategy and implementation plan.

2005. If total tariff increases are taken into account, EDC's financial performance has improved and should achieve breakeven in revenue terms by 2007.

25. The Government is also committed to taking further measures including (i) renegotiating and purchasing more electricity through competitive bidding from various IPPs and importing lower-cost electricity from neighboring countries, (ii) settling past arrears of line ministries through budget allocation, and (iii) continuously reducing EDC's system losses. The Government has prepared a time-bound action plan, outlining concrete steps to fully reimburse EDC for the past arrears of line ministries as of the end of 2005 and for VAT (para. 74–75). Details of EDC's financial performance and projections are given in Appendix 4.

III. THE PROPOSED PROJECT

A. Impact and Outcome

26. The Project will (i) directly expand the 230 kV power transmission grid from Kampot to Sihanoukville to provide sustainable and reliable electricity supply at affordable prices to consumers in Sihanoukville and adjacent areas along the transmission corridor, and (ii) improve EDC's operational efficiency and performance through institutional development and capacity building.

27. The first outcome will be achieved by facilitating the importation of electricity from Viet Nam through the project transmission lines, thus providing sustainable and reliable electricity supply at a lower cost than any alternative, and improving EDC's financial position. Currently, the EDC tariff in Sihanoukville ranges from \$0.13 to \$0.20 per kWh. In rural towns, REEs supply electricity at tariffs as high as \$0.38–\$0.63/kWh. Through the Project, electricity from Viet Nam will have a delivered electricity price in Sihanoukville of around \$0.08/kWh, including losses, operation and maintenance, and all taxes. This will greatly ease the burden of consumers by enabling them to use the savings for other purposes (education, health, or business), and promote sustainable economic development. Rural villages and communities close to the transmission line that are currently not served will also be supplied with electricity.

28. The Project will also assist the Government in four key areas: (i) reducing electricity cost and formulating sound tariff policies, (ii) enhancing EDC's financial performance, (iii) reducing distribution losses, and (iv) improving the efficiency of EDC's operations.

B. Outputs

29. The Project has two major components. Part A will focus on the infrastructure components, while part B will entail institutional strengthening and capacity building. The Project's infrastructure components were developed following technical, economic, and financial studies that took environmental and social aspects into consideration. The feasibility study (footnote 4) considered various alternatives for power supply to Sihanoukville and involved a least-cost analysis, including comparisons of power supply from diesel generation, transmission line, generators, etc. The study concluded that developing a double-circuit 230 kV transmission line and associated distribution facilities was the most cost-effective option for the supply of electricity in the target areas.

30. Part A comprises five subcomponents:

- (i) **Extension of 230 kV transmission line.** The high-voltage 230 kV double-circuit transmission lines will be extended from Kampot to Sihanoukville, for a total length of about 78 kilometers (km).

- (ii) **Construction of substations.** A new 230 kV grid substation at Veal Renh, a 230 kV/22 kV substation in Sihanoukville, and a 230 kV line bay at Kampot substation will be built.
- (iii) **Construction of medium- and low-voltage distribution system.** The Project will put up conventional medium-voltage 22 kV double-circuit distribution lines in Sihanoukville connecting to the 230 kV substation and the existing 22 kV network, and 22 kV feeders from Sihanoukville and Veal Renh substations serving nearby villages. To serve the villages along the transmission line corridor, 22 kV and 400 V distribution lines will also be erected.
- (iv) **Consulting services** to assist EDC in detailed project design, implementation supervision, and other capacity-building support.
- (v) **Project management and monitoring activities,** including land acquisition, resettlement, environmental mitigation, monitoring, training for EDC staff in environmental management, and resettlement implementation.

31. In part B, the operating efficiency and performance of EDC will be improved. Part B will have the following four subcomponents:

- (i) **Strengthening of EDC's provincial operations.** With the extension of the power grid, EDC's operation and maintenance capacity in Sihanoukville and Kampot provinces will also need to be strengthened. The provincial branches now operate the diesel generators, maintain the distribution system, and collect the electricity charge. When outages occur, EDC sends technical staff from headquarters for system recovery. The Project will strengthen the EDC branches in Sihanoukville and Kampot by providing the necessary vehicles and equipment to detect outage points, thus speeding up system recovery and reducing its cost.
- (ii) **Training in operation and maintenance of the high-voltage transmission system.** Considering the number of staff required to operate the high-voltage transmission system to be developed in the coming decade, EDC staff will need continuous and increasingly more advanced training.
- (iii) **Improvement of EDC's data management system.** EDC's critical statistical data are now scattered in its headquarters and branch offices, hampering centralized activities such as backup, reporting, processing, and management. The Project will support EDC in establishing a consolidated data platform including reliable backup systems and improved communication systems between headquarters and branches, by procuring the necessary hardware and software. EDC can thus efficiently maintain electronic information and improve customer billing, archiving, and services.¹⁸
- (iv) **Training of EDC staff in social, resettlement, and environmental management.** EDC is striving to strengthen its capacity by recruiting more qualified staff and providing on-the-job training. The Project will finance higher-level education for two social and environmental specialists from existing EDC staff at appropriate agencies in ASEAN countries.

¹⁸ This component is an incremental step with a budget of \$500,000 and will supplement EDC's existing programs to centralize and archive customer and billing records. The proposed work involves installing and commissioning the storage and data management system and its tape backup system including hardware and software installation, training, and other customer support services.

C. Special Features

32. The Project has a regional cooperation focus. It forms part of the planned transmission backbone grid: the transmission lines between Cambodia and Viet Nam will be connected to the grid. Through the Project, EDC will be able to provide the southern provinces with reliable and affordable electricity from the lowest-cost source of power. The Project will increase importation of power from Viet Nam by around 50 MW by 2015 and will thus benefit both Viet Nam and Cambodia. The Project will also contribute to the economic development of the GMS Southern Economic Corridor, a flagship program of GMS economic cooperation, by providing basic economic infrastructure.

33. The provision of firm and reliable supply of electricity to Sihanoukville would allow the decommissioning of the low-efficiency and high-cost diesel generating plants (around 5 MW). Large consumers, who now run their own small, low-efficiency diesel generators (estimated at 10 MW), will connect to the EDC power grid when cheap and reliable power becomes available. Thus, EDC, the private sector, and the country as a whole will spend less foreign exchange on fuel imports and also benefit from reduced environmental pollution.

D. Project Investment Plan

34. The total cost of the Project is estimated at \$52.36 million equivalent. The cost estimates are based on 2005 price levels for base costs. Physical contingencies were estimated at 10% of base costs, and price contingencies were calculated using ADB's current rates of inflation for local and foreign goods and services. The cost estimates are summarized in Table 1 and set out in detail in Appendix 5 and Supplementary Appendix C.

E. Financing Plan

35. The Government has requested ADB for a loan of \$20 million from the Asian Development Fund to help finance the Project. The ADB loan will finance 38% of total project costs. The loan will have a 32-year term, including a grace period of 8 years, an interest rate of 1% during the grace period and 1.5% during principal amortization, and such other terms and conditions as are set forth in the draft Loan and Project Agreements.

36. The Government of Japan supports the construction of transmission lines and the expansion of substations to promote stable electric supply through the importation of electricity from neighboring countries. In this context, Japan Bank for International Cooperation (JBIC) is interested in supporting the southern economic growth corridor, which lies between Kampong Cham, Phnom Penh, and Sihanoukville. JBIC will provide parallel cofinancing for a Japanese yen loan of about \$22.3 million equivalent for the transmission and distribution line packages and part of the capacity-building activities, representing 43% of total project cost. The Government will fund \$10.06 million of local project costs, representing 19% of total project costs. If cofinancing does not materialize, the scope of the Project may have to be reconsidered. The financing plan based on these initial assumptions is presented in Table 2.

Table 1: Project Investment Plan
(\$ million)

Item	Total Cost
A. Base Cost ^a	
1. Part A: Infrastructure	
a. 230 kV Transmission Lines	17.20
b. Substations	17.65
c. Medium and Low-Voltage Distribution System	2.71
d. Project Implementation Consulting Services	2.30
e. Project Management and Monitoring	
i. Resettlement and Land Acquisition	0.80
ii. Environmental Management and Monitoring	0.50
iii. Project Management Activities	0.25
2. Part B: Capacity Building	
a. Strengthening of EDC's Operation in Provincial Branches	0.11
b. Improvement of EDC Data Management System	0.50
c. Training in System Operation and Maintenance	0.46
d. Training in Social, Resettlement, and Environmental Management	0.30
Subtotal (A)	42.78
B. Contingencies	
1. Physical	5.71
2. Price	3.54
Subtotal (B)	9.25
C. Interest Charges During Construction	0.33
Total	52.36
Percentage of Total	100%

EDC = Electricité du Cambodge, kV = kilovolt.

^a Including taxes and duties, which will be entirely financed by the Government.

Source: Asian Development Bank estimates.

Table 2: Financing Plan
(\$ million)

Source	Total	% of Total
ADB Loan (Special Fund)	20.00	38.0
JBIC Loan	22.30	43.0
Government Funds	10.06	19.0
Total	52.36	100.0

ADB = Asian Development Bank, JBIC = Japan Bank for International Cooperation.

Source: ADB estimates.

37. The borrower will be the Kingdom of Cambodia, and the entire proceeds of the loan will be relend to EDC through a Subsidiary Loan Agreement with terms and conditions acceptable to ADB. The Ministry of Economy and Finance will relend the ADB loan to EDC for a loan of 20-year maturity, including a 5-year grace period, at an interest rate of 4.2%, and will relend the JBIC loan on the same terms. EDC will bear the Government's foreign exchange risk on the proposed loan.

F. Implementation Arrangements

1. Project Management

38. The Executing Agency (EA) for the Project will be EDC. EDC has implemented two ADB-funded projects in the power sector, and is implementing two other projects (footnote 15), in the process demonstrating that it has adequate capacity to implement similar projects. The Project will be implemented by a project management unit. To ensure continuous improvement of EDC's project management capacity, the project management unit will consist of EDC staff that have been part of previous ADB-financed transmission line projects. During project implementation, EDC will also be assisted by a team of international and national consultants. EDC will assign at least three experienced and qualified engineers full-time to coordinate and work with the consultants. EDC will also appoint two recent graduates in environment and social science to its Environment and Resettlement Unit to gain experience through on-the-job training. The consultants and the seconded EDC staff will ensure that the Project is executed on time and according to international standards.

2. Implementation Period

39. The Project will be implemented over 4 years, from the first quarter of FY2007. The physical works are expected to be completed by the end of 2009. After that, the contractor will train EDC staff for 6 months to operate and maintain the transmission lines. The implementation schedule is shown in Appendix 6.

40. Resettlement work will begin shortly after the appointment of the project implementation consultants (PICs) and independent monitoring organization and after detailed design, with fieldwork for the detailed measurement survey to confirm the number of affected households and the nature and magnitude of impacts, determine compensation rates at replacement cost for all categories of loss, and update and disclose the agreed resettlement plan (RP) for the transmission component. After the detailed design of the distribution component, resettlement planning will be undertaken and an RP will be prepared according to the agreed resettlement

framework (RF). The updated RP for the transmission component and the RP for the distribution system will be agreed on between the Government and ADB, disclosed according to ADB's public communications policy,¹⁹ and implemented satisfactorily according to ADB's policy on involuntary resettlement.²⁰

3. Procurement

41. Goods and services financed from the proposed ADB loan will be procured according to ADB's *Procurement Guidelines* (2006), and those financed by JBIC will be procured according to JBIC guidelines. The contracts for the 230 kV substation package will be awarded on a turnkey basis through international competitive bidding, using a single-stage, two-envelope procedure. To expedite project implementation, ADB has approved advance procurement action for the ADB-financed components. The Government has been advised that approval of advance action for procurement will not commit ADB to subsequently finance the Project. A procurement plan, which sets forth the proposed contracts, method of procurement, and related ADB procedures, is shown in Appendix 7.

4. Consulting Services

42. PICs will be required during implementation to assist EDC in project engineering, procurement, supervision of installation and construction, final testing and commissioning, quality assurance, design and implementation of environmental management and resettlement plans, and other technical inputs. About 40 person-months of international consulting services and about 45 person-months of national consulting services will be required for project supervision. The terms of reference for the PICs are given in Appendix 8.

43. PICs will be recruited through a firm by EDC, according to the *Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers* (2006). A quality- and cost-based selection procedure will be used. The Government has been advised that approval of advance action for consulting services does not commit ADB to subsequently finance the Project.

5. Anticorruption Policy

44. ADB's *Anticorruption Policy* (1998) was explained to and discussed with the Government and EDC. Consistent with its commitment to good governance, accountability, and transparency, ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the Project. To support these efforts, relevant provisions of ADB's *Anticorruption Policy* are included in the loan regulations and the bidding documents for the Project. In particular, all contracts financed by ADB in connection with the Project shall include provisions specifying the right of ADB to audit and examine the records and accounts of the EA and all contractors, suppliers, consultants, and other service providers as they relate to the Project.

45. Attention was drawn to the section on fraud and corruption that was added to ADB's *Procurement Guidelines* and *Guidelines on the Use of Consultants*, particularly the need for bidders, suppliers, contractors, and consultants to observe the highest standards of ethics in the procurement and execution of contracts, and the sanctions imposed on those who violate these standards. Government policy and experience in fighting corruption dictate the use of the

¹⁹ ADB. 2005. *The Public Communications Policy of the Asian Development Bank: Disclosure and Exchange of Information*. Manila.

²⁰ ADB. 1995. *Involuntary Resettlement*. Manila.

following preventive measures: (i) a procurement committee will be formed to supervise the entire procurement process, according to the guidelines prescribed in the Government-approved Procurement Manual; and (ii) the Government will also cause EDC to initiate liaison meetings every 6 months with the National Auditor Office to review and discuss information on corrupt practices.

6. Disbursement Arrangements

46. ADB funds under the proposed project will be disbursed mainly for the construction of substations and for PIC services. ADB's loan disbursement procedures stated in the *Loan Disbursement Handbook* (2001), as amended from time to time, will be followed. An imprest account will be used for local expenditures. At the start, the account will hold the amount of estimated local expenditures for the first 6 months of project implementation, but no more than 10% of the loan amount (i.e., \$2.0 million). Any individual payment to be reimbursed or liquidated under the statement-of-expenditures procedure should not exceed \$100,000.

7. Accounting, Auditing, and Reporting

47. Progress reports for the Project will be prepared by EDC and submitted to ADB every quarter. The reports will include a description of the physical progress, procurement and contractual status, resettlement progress, and highlights of any implementation issues including the number of consumers connected. The progress reports will also contain a summary of project components, including details on the latest project disbursements for incremental expenditures and contract amounts. A project completion report will be submitted to ADB and JBIC within 3 months after the completion of the Project.

48. EDC will maintain separate accounts for the Project. Within 6 months of the close of EDC's fiscal year (31 December), EDC will submit audited annual project accounts (APA) to ADB, describing in detail the sources of funds and the expenditures made. In addition, EDC will submit audited corporate financial statements (CFS) within 6 months of the close of the fiscal year, including statements of income and expenditures, assets and liabilities with notes to the accounts, and cash flows. An auditor acceptable to ADB must audit EDC's CFS and APA, and the audit report together with the memorandum on issues identified during the audit process will also be attached to the respective reports (see details in Supplementary Appendix D: Financial Management Assessment of EDC).

49. According to current practice, EDC will continue to hire external auditors to audit its corporate financial statements and all separate project accounts including resettlement expenditures. International accounting standards will be followed in the preparation of the accounts, and International Auditing Standards in the performance of the audit. The auditors will be required to provide an opinion on EDC's compliance with the Project's financial covenants and indicate the details of the actual calculations for all ratios as defined in the Loan and Project Agreements.

8. Project Performance Monitoring and Evaluation

50. A number of measurable performance targets will be selected during the implementation stage, according to ADB's project performance monitoring and evaluation system. The number of electricity customers and demand in various categories will be monitored using EDC's consumer database, with a separate category for poor consumers (i.e., those consuming up to 50 kWh of electricity a month). Efficiencies in utility operations will be measured by data on

distribution losses, energy sales, employee-customer ratio, and average cost of service. The degree of compliance with financial covenants will provide an indication of EDC's financial performance throughout the implementation period. The monitoring of EDC's Sihanoukville branch will include an assessment of the effectiveness of the demand management and consumer services component of the Project. Within the first year of connections, a baseline survey will be carried out by EDC to monitor connection rates of householders, electricity expenditures, and other relevant indicators. Two years after the baseline survey, an impact survey will be carried out by EDC to monitor the Project's sustainability and development impact.

9. Project Review

51. ADB will review the Project regularly throughout its implementation. In addition, the Government, ADB, and JBIC will also jointly undertake a detailed midterm review of the Project after 2 years of implementation. The midterm review will (i) appraise the project scope, cost estimates, implementation arrangements, number of connections, and compliance with loan covenants; and (ii) identify any issues to be addressed to improve project impact and sustainability.

IV. PROJECT BENEFITS, IMPACTS, ASSUMPTIONS, AND RISKS

52. The project benefits and impacts were assessed along with the potential associated risks. Adequate and reliable supply of power to industry and commercial consumers will enable the sustainable development of these sectors and promote the socioeconomic development of the southern region. The project benefits are increased revenues to the Government and EDC and reduced costs to consumers, particularly the industrial and commercial consumers using private generation facilities without the Project. The provision of firm-capacity supply would allow existing diesel generators to be decommissioned, thus reducing greenhouse gas and other air-polluting emissions. The combined benefits and positive impacts outweigh the costs, and net benefits will accrue to the project area.

A. Economic Analysis

53. The economic analysis of the Project follows ADB's *Guidelines for the Economic Analysis of Projects*. The evaluation is based on a comparison of benefits and costs with and without the Project. The least-cost analysis minimizes the present value of the southern grid expansion cost between 2007 and 2035. All costs are expressed in world prices in constant 2005 dollars and discounted over 30 years using a discount factor of 12%. The base case for the analysis is the with-project construction of the transmission line between Sihanoukville and Kampot in 2010. Without the transmission line project, the feasible least-cost alternative is to add several diesel power plants in Sihanoukville to meet the increasing demand. The with-project scenario would result in lower expansion costs than for the alternative without-project scenario. This shows that the Project is the least-cost option.

54. The financial capital costs are adjusted in the economic analysis to reflect the economic cost of project inputs. The capital costs are classified into tradable goods and services, and non-tradable goods and services. The non-tradable goods and services are converted to the world price numeraire using a standard conversion factor. Costs for operating and maintaining the transmission line are included in the analysis. The project benefits are the cost-savings in the southern transmission grid expansion between the with-project and the without-project scenario. The calculated economic internal rate of return (EIRR) is 20.9 %.

55. Sensitivity and risk analyses have been undertaken for key risk variables to examine the robustness of the economic results. The result shows that the Project is economically worthwhile even under combined extreme adverse conditions (Appendix 9).

B. Financial Analysis

56. The financial benefits are essentially derived from the increase of electricity sales due to load growth, and from savings due to the lower price of energy purchased, and electricity loss reduction in the Project areas. A model was developed to forecast the trend in electricity consumption for the following current customers of EDC: residential, commercial and hotels, industries, and government agencies. The model also includes the forecast of captive demand of large hotels and industries that are currently generating energy for their own consumption.

57. A financial analysis of the Project was carried out according to ADB's *Guidelines for Financial Governance and Management of Investment Projects*. The following projections and assumptions were used: (i) the total system demand in the south is expected to reach 30 MW and 140 GWh in 2010 and 52 MW and 240 GWh in 2014, (ii) annual sales will grow 15% on average from 2006 to 2013, and (iii) average tariff will increase from KR666 in 2006 to KR718 in 2013. Given these assumptions for the benefit and cost analyses, the post-tax evaluation of the financial internal rate of return (FIRR) for the Project was estimated at 13.3% in real terms. The detailed financial analysis is shown in Appendix 10.

58. Sensitivity analysis indicated that the Project was robust for a potential decrease in load growth, increase in construction cost, increase in price of power purchases, and 2 years' delay in completing the Project. Overall, the Project remains financially viable under the various ranges of scenarios.

C. Environmental Impact and Assessment

59. The Project is classified as environment category B—sensitive. An initial environmental examination (IEE) has been conducted. The IEE assessed the likely environmental impact of the proposed project, the anticipated significance of such impact, and proposed mitigation measures and monitoring programs. Special attention was given to the assessment of the project alignment, which may traverse the buffer zone of the Bokor National Park.²¹ The IEE process also included extensive public consultations with stakeholders from the local communities. The IEE concluded that the project will have insignificant environmental impact. The IEE has been circulated to the ADB's Board of Directors and uploaded onto the ADB Web site in February 2006.

60. EDC is committed to providing adequate staff and budget resources to implement the environmental management plan, which was prepared for the IEE, during project implementation and operation. The Government will ensure special care and adequate coordination during the construction of the Project within or adjacent to the Bokor National Park's buffer zone, to minimize its impact on the park.

²¹ Around 20 km of the proposed transmission line route crosses the southern edge of the Bokor National Park buffer zone to avoid the greater net impact from the line that would result from crossing other sections of the coastal plain between the park and the coastline. The main impact on the Park will be the loss of 15 hectares of degraded/regrowth forest and the creation of modest visual impact.

D. Land Acquisition and Resettlement

61. The social analysis undertaken as part of the feasibility study indicated the need for a short RP for the 230 kV transmission line and for the Kampot and Sihanoukville substations because fewer than 200 persons will experience major impact.²² An RP has been prepared, therefore, for the construction of the following: (i) the 78 km 230 kV double-circuit transmission line from Kampot to Sihanoukville, (ii) one 230 kV substation at Veal Renh, and (iii) one 230 kV substation at Sihanoukville. The 230 kV substation at Kampot will be extended within the existing site, and will not entail any land acquisition. For the 230 kV transmission line and two substations, resettlement planning has identified 731 households that will be affected by land acquisition. Of these, it is anticipated that only 12 households would need to move out of the 30 m right-of-way (ROW): 7 could move back on their remaining land outside the ROW, and 5 would relocate within their own villages. Fourteen households would also have to relocate their temporary field huts on their remaining land outside the ROW. Only two households would lose land to the two new substations. Of the rest of the 700 or so households, 220 would be marginally affected by a loss of 100 m² of land for the transmission line towers. A total of 3.92 hectares of land will be permanently acquired. It is also estimated that 3,000 trees would have to be removed to ensure sufficient vertical clearance for the 230 kV line. Except for land required for towers, the land within the ROW can continue to be used for agriculture.

62. Land acquisition may also be required for the 22 kV distribution system, but the location and design of the distribution system will not be known until the detailed design of the transmission line and substations is completed in the third year of the Project implementation. For the distribution system, a hybrid loan²³ approach has been taken, since the impact area cannot be determined before appraisal, because of the undeveloped stage of the technical design. The distribution system will require building poles mainly within existing road ROWs, and this should entail only minor impact, which cannot be identified until after the detailed design of the 230 kV transmission line and substations is finalized. An RF has been prepared for the distribution system to guide the preparation of a short RP during loan implementation. The summary RP and RF is in Appendix 11, and the complete RP and RF are attached as supplementary appendixes.

63. Satisfactory resettlement planning and implementation, to mitigate adverse effects, will be done according to ADB's *Policy on Involuntary Resettlement*, as well as the RP and RF adopted for the Project. The impact will be further reduced through careful location of the transmission line alignment and towers during the detailed design. A gender analysis of the affected households has been included in the summary poverty reduction and social strategy (Appendix 12). Compensation for all lost assets will be provided at replacement cost and at current market value, and socioeconomic rehabilitation measures will be provided to ensure that affected people will be at least as well off as they would have been without the Project. The poorest affected and vulnerable affected people will be assisted in improving their socioeconomic status.

E. Social Impact

64. The social analysis indicates that most of the affected people are Khmer and that 2.4% are of Cham descent but are not socioeconomically more vulnerable than the Khmer people

²² Major impact involves the physical displacement of the affected people from housing or the loss of 10% or more of their productive income-generating assets, or both.

²³ ADB. 2003. Operations Manual. Section F2/OP: *Involuntary Resettlement*. Manila (29 October), para. 40 defines hybrid loans and resettlement planning documentation.

living in the project area. The findings do not set off ADB's *Policy on Indigenous Peoples*. The social and gender strategy in the Summary Poverty Reduction and Social Strategy (Appendix 12) includes capacity building for commune leaders (men and women) and members from relevant agencies. The increased capacity of the commune leaders and affected people will enable the effective implementation of resettlement and livelihood activities. The Project will increase the potential for the spread of HIV/AIDS and other sexually transmitted diseases because of the influx of workers during construction. This potential will be mitigated or minimized through a program to increase awareness and provide preventive measures for the local communities and the workforce.

F. Risks

65. The Project is formulated to minimize potential risks. Tariff and connection charges may not give large-scale consumers enough incentives to switch from their own generation sources to EDC's grid supply. By evacuating imported lower-priced power from Viet Nam, the Project will allow EDC to maintain lower tariffs than would have been the case without the Project. In addition, the Government will carry out a tariff review to ensure that the tariffs and connection charges are properly set.

66. EDC's weak financial performance, particularly the arrears from government agencies, is a potential risk. Concrete and practical financial improvement measures have been developed (see details in Appendix 4) and will be closely monitored during project implementation.

67. Another potential risk is the generation source, i.e., whether the required capacity and energy available will be provided. EDC has entered into a power purchase agreement with Electricity of Viet Nam to ensure that 200 MW of power will be provided to Cambodia from 2008 onward.

68. Compensation, resettlement, and income-restoration measures might not be delivered as agreed, thereby impoverishing the affected people and delaying the start of civil works. EDC will have specialists to assist in preparing and implementing the RPs, with assistance from international and national PIC consultants. The impact of resettlement will be further reduced by careful location of the transmission line alignment and towers during detailed design. The PIC will engage an independent monitoring organization for the duration of the resettlement activities.

V. ASSURANCES

A. Specific Assurances

69. In addition to the standard assurances, the Government has given the following assurances, which are incorporated in the legal documents:

- (i) **Financial matters.** During the course of project implementation the financial covenants herein will be periodically reviewed and, unless otherwise agreed with ADB, EDC will maintain the following financial covenants.
 - (a) A minimum DSCR of 1.3 will be achieved in FY2007 and will be maintained thereafter.
 - (b) A maximum debt-to-equity ratio of 70:30 will be maintained through 2010.
 - (c) Revenue breakeven will be achieved for FY2007 and maintained thereafter, such that total operating revenues are equivalent to or not less than the sum of total operating expenses minus depreciation costs.

- (d) The total accounts receivable of EDC will be maintained at a level that does not exceed the equivalent of 3 months of the average sales revenues.
- (e) The Government will allocate sufficient budget to offset the input VAT owed by EDC to the Government's Customs and Tax Department.
- (f) The Government will ensure that past-due arrears of government agencies with EDC for FY2006 are paid or credited in full by 30 June 2007.
- (g) The Government will credit or directly pay to EDC, from the annual budget allocated to each government agency, institution, and local authority, an estimated amount for each entity's expected electricity consumption for the coming fiscal year.

(ii) **Operational matters**

- (a) EDC will maintain its transmission and distribution system losses at a level not exceeding 16% in FY2006 and thereafter.
- (b) No later than 3 months prior to the commencement of each fiscal year from FY2007, EDC will furnish ADB and JBIC with a draft power development plan that sets forth the EDC power development plans and investment requirements for the next 10 years.

(iii) **Environmental**

- (a) The Government will ensure that the Government's laws and regulations for environmental and social impact assessments, as well as ADB's *Environment Policy* (2002), are followed. If there is any discrepancy between the Government's laws and regulations and ADB's requirements, then ADB's *Environment Policy* (2002) will prevail.

(iv) **Land acquisition and resettlement**

- (a) Prior to the commencement of any resettlement activities including the detailed measurement survey, EDC will engage and mobilize (i) resettlement specialist consultants to assist in preparing and implementing the RPs, and (ii) an independent monitoring organization.
- (b) The Government will cause EDC to ensure that all resettlement activities as specified in the RPs and RF will be carried out promptly and efficiently in accordance with all government laws and regulations, ADB's *Policy on Involuntary Resettlement*, and the approved RP and RF. If there is a discrepancy between the Government's laws and regulations and ADB's requirements, then ADB's *Policy on Involuntary Resettlement* (1995) will prevail.
- (c) EDC will ensure that (i) funds needed for land acquisition and resettlement are allocated and disbursed in a timely manner; (ii) the RP is updated and submitted to ADB after the detailed measurement surveys and detailed design are completed, and approved by ADB before it is implemented; (iii) the updated RP will be disclosed to all affected persons; and (iv) ADB is promptly advised of any changes in the resettlement impact, and if necessary, a revised RP is submitted to ADB for concurrence.

(v) **Others**

- (a) **Social issues.** The Borrower will ensure that EDC includes the following conditions in the civil works contract documents: (i) mandatory provisions on health, sanitation, and appropriate working conditions; (ii) requirements that the contractor comply with all applicable labor laws; (iii) employment targets for women; (iv) appropriate child-care facilities in campsites with women employees; and (v) a dissemination campaign or campaigns, through a qualified nongovernment organization or other appropriate body, on the risks of sexually transmitted diseases (including HIV/AIDS), and on the risks of trafficking women and children, to those employed during project implementation and communities in the project area.
- (b) **Benefit monitoring.** Within the first year of electricity connections, a baseline survey will be carried out by EDC, and two years after the baseline survey an impact survey will be carried out by EDC to monitor the Project's sustainability and development impact. The impact survey needs to include specific indicators, which will be developed in consultation with ADB.
- (c) **Anticorruption.** The Government will establish a procurement committee to supervise the procurement process, in accordance with the relevant ADB and government guidelines. The Procurement Committee will be established by the first quarter of 2007 and chaired by a representative from EDC. The Borrower will ensure that EDC initiates semiannual liaison meetings with the Borrower's National Auditor Office in order to review and discuss information with regard to corrupt practices. The Borrower will ensure that all project staff fully know and comply with the Borrower's and ADB's procedures.

B. Conditions for Loan Effectiveness

70. As a condition for ADB loan effectiveness, the Government will have obtained the approval for cofinancing arrangement from JBIC or made other arrangements satisfactory to ADB for the foreign currency funds, which are anticipated to be provided by JBIC.

71. A subsidiary loan agreement, in a form and substance satisfactory to ADB, has been duly executed and delivered on behalf of the Government and EDC.

72. The Government will submit to the National Assembly for approval an additional budget allocation for MEF to enable MEF to offset all the past-due input VAT owed by EDC to the Government's Customs (about KR43.5 billion) and Tax Department (KR19.7 billion) as of 31 December 2005 and the estimated amount for FY2006.

73. The Government will submit to the National Assembly for approval an additional budget allocation for MEF to enable MEF to offset the arrears of the accounts receivable by EDC from the Government's institutions, agencies, and local authorities, in an amount recorded by EDC at approximately KR22 billion as of 31 December 2005.

VI. RECOMMENDATION

74. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan in various currencies equivalent to Special Drawing Rights 13,519,000 to the Kingdom of Cambodia for the Second Power Transmission and Distribution Project from ADB's Special Funds resources with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board.

LIQUN JIN
Vice President

12 September 2006

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>The national power grid in the region is extended, and provides reliable, adequate, and affordable electricity.</p> <p>The quality of power supply in the southern region improves.</p>	<p>Five years after project completion</p> <ul style="list-style-type: none"> • Electrification ratio by population increases from 17% in 2005 to 30% in 2010 • The average tariff in the Sihanoukville region is reduced from the current \$0.13–0.2/kWh to 0.08/kWh by 2010. • All towns and villages along the transmission line have access to the national power grid. 	<ul style="list-style-type: none"> • Country economic and power sector analysis reports • Socioeconomic statistics of provinces and districts • Project inception, progress, and completion reports • Consultants' survey reports 	<p>Assumptions</p> <ul style="list-style-type: none"> • The Government will implement other committed infrastructure projects as planned. • Electricity supply is available from Viet Nam and large generation sources. • Tariff set for electricity is affordable and financially and economically viable.
<p>Outcome</p> <p>The national backbone 230 kV power grid and associated distribution facilities in the southern region are expanded and strengthened, and EDC's operation efficiency and performance are improved.</p>	<p>After project completion</p> <ul style="list-style-type: none"> • There is an increase in 230 kV transmission lines, substations, and distribution facilities in project area. • EDC energy sales and consumption in the project area increase from 20 GWh to 45 GWh. • About 25,000 people are served by the power grid. • EDC's financial ratios targets are fully met, and distribution loss is kept at less than 16%. 	<ul style="list-style-type: none"> • EDC annual report, financial statements, and project accounts • Project inception and completion reports • Project performance monitoring and evaluation system 	<p>Assumptions</p> <ul style="list-style-type: none"> • Consumers are willing to connect to the power grid and pay the grid connection charges. • Adequate power supply is available from associated generation sources. • EDC has adequate institutional capacity. • The Government comprehensively implements the EDC financial action plan. The cumulative arrears from government agencies are fully paid by the Government, and other sector improvement measures are implemented as committed.
<p>Outputs</p> <p>1. 230 kV transmission lines from Kampot to Sihanoukville are fully operational.</p> <p>2. Three new substations are fully functional.</p>	<ul style="list-style-type: none"> • 230 kV double-circuit transmission lines are extended by 78 km. • New 230 kV substations are erected at Veal Renh, Sihanoukville, and the Kampot substation is expanded. • Medium- and low-voltage distribution facilities are 	<ul style="list-style-type: none"> • EDC annual report, financial statements, and project accounts • Project inception and completion reports • Project administration memorandum • Project progress reports 	<p>Assumption</p> <ul style="list-style-type: none"> • Counterpart funds are available on time. <p>Risks</p> <ul style="list-style-type: none"> • There are delays in the approval of loan documents and procurement. • Implementation of social and environmental

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
	erected in vicinity areas along the transmission corridor.		mitigation measures is delayed.
<p>3. Associated medium- and low-voltage distribution system are established along the 230 kV transmission corridor.</p> <p>4. Capacity building to improve EDC's performance is fully implemented.</p>	<ul style="list-style-type: none"> • All affected households have been compensated, resettled, and rehabilitated according to approved resettlement plans (RPs). • Recommended environmental mitigation measures are well implemented. • The operation and maintenance capacity of EDC's branches at Kampot and Sihanoukville are strengthened. • Training programs for EDC staff are fully implemented. 	<ul style="list-style-type: none"> • Project review missions • Training manuals • Audited financial reports of EDC 	
Activities with Milestones <ol style="list-style-type: none"> 1. Consulting services for project implementation: commenced from January 2007. 2. Detailed design and bidding documents: completed by September 2007. 3. Resettlement implementation: completed by June 2008. 4. Civil works on 230 kV transmission line and substations: contract awarded by March 2008 and works completed by December 2009. 5. Civil works on distribution system: contract awarded by January 2009 and works completed by December 2009. 6. EDC capacity-building activities and training: completed by December 2009. 7. Capacity-building training to improve awareness of social, resettlement, and environmental safeguards: completed by 2007. 8. Awareness training in STD/HIV/AIDS and trafficking among contractors and local communities before contractors are mobilized. 			Inputs <ul style="list-style-type: none"> • ADB loan of \$20 million • Government counterpart funds of \$10.06 million • JBIC loan of \$22.3 million

ADB = Asian Development Bank, EDC = Electricité du Cambodge, GWh = gigawatt-hour, JBIC = Japan Bank for International Cooperation, kV = kilovolt, STD/HIV/AIDS = sexually transmitted disease / human immunodeficiency virus / acquired immunodeficiency syndrome.

EXTERNAL ASSISTANCE TO THE POWER SECTOR

Project	Funding Source	Amount (million)	Approval Year
A. Multilateral and Bilateral Loans			
1. Loan 1199-CAM(SF): Special Rehabilitation Assistance (energy sector component)	ADB	\$18.4	Nov 1992
2. Loan 1345-CAM(SF): Power Rehabilitation Project	ADB	\$28.2	Dec 1994
3. Loan 1794-CAM(SF): Provincial Power Supply Project	ADB	\$18.6	Nov 2000
4. Loan 2052-CAM(SF): Greater Mekong Subregion Transmission Project	ADB	\$44.3	Nov 2003
5. IDA Credit 2550 KH: Emergency Rehabilitation Project	WB	\$6.9	Nov 1993
6. IDA Credit 2782 KH: Phnom Penh Power Rehabilitation Project	WB	\$40.0	Oct 1995
7. IDA Credit 3840-KH: Cambodia Rural Electrification and Transmission Project	WB	\$16.0	Dec 2003
8. NDF Credit: Greater Mekong Subregion Transmission Project	NDF	€10.0	Jan 2004
9. JICA: Rehabilitation and Upgrading of Electricity Supply Facilities for Phnom Penh	JICA	\$31.0	Jun 1996
10. KfW: Transmission Line (Takeo to Kampot) Project	KfW	€12.2	Sep 2005
B. ADB Technical Assistance			
1. TA 0026: Phnom Penh High Voltage Transmission (ADTA)	ADB	\$0.08	Apr 1970
2. TA 2243: Power Sector Manpower Development and Training (ADTA)	ADB	\$0.50	Dec 1994
3. TA 2629: Power Rehabilitation II (PPTA)	ADB	\$0.45	Aug 1996
4. TA 3256: Update of Power Rehabilitation II Project Preparation Study (PPTA)	ADB	\$0.15	Sep 1999
5. TA 3298: Developing the Strategy for ADB's Involvement in Cambodia's Power Sector (ADTA)	ADB	\$0.15	Nov 1999
6. TA 3453: Development of a Strategy for Management of Provincial Power Supply (ADTA)	ADB	\$0.15	Jun 2000
7. TA 4078: Power Distribution and Greater Mekong Subregion Transmission Project (PPTA)	ADB	\$0.73	Jan 2003
8. TA 4169: Capacity Building of Electricity Authority of Cambodia (ADTA)	ADB	\$0.24	Sep 2003

ADB = Asian Development Bank, ADTA = advisory technical assistance, IDA = International Development Association, JBIC = Japan Bank for International Cooperation, JICA = Japan International Cooperation Agency, KfW = Kreditanstalt für Wiederaufbau, kV = kilovolt, NDF = Nordic Development Fund, PPTA = project preparatory technical assistance, TA = technical assistance, WB = World Bank.

Source: ADB estimates.

POWER SECTOR ANALYSIS

A. Overview

1. Cambodia derives its domestic energy primarily from fuel wood, while commercial energy requirements are met mainly by imported petroleum products. The power supply system in Cambodia is dispersed and isolated. Except for Phnom Penh and some towns near the Thailand and Viet Nam borders, the supply typically comprises diesel generators and the associated distribution system. At present, only 17% of the population has access to electricity supply, and electricity consumption was estimated to be 55 kilowatt-hours (kWh) per capita in 2004, the lowest in the Greater Mekong Subregion.

2. The provision of electricity in Cambodia is the responsibility of Electricité du Cambodge (EDC), a government-owned national electricity utility supervised by the Ministry of Industry, Mines and Energy (MIME) and the Ministry of Economy and Finance (MEF). As such, EDC is an autonomous limited-liability company with a consolidated, nonexclusive license from the national regulator to provide full electricity service to the country as a whole. However, at present, EDC operates only the isolated systems of Phnom Penh and five other provincial towns, namely, Sihanoukville, Siem Reap, Battambang, Kampong Cham, and Takeo. Before long, EDC is also expected to take over operational responsibility for seven other provincial towns now under the responsibility of MIME and its provincial offices. EDC is responsible as well for a number of areas where supply is provided by medium-voltage transmission lines from Viet Nam. The rest of the country is supplied by independent power producers (IPPs) in larger towns and rural electricity enterprises (REEs) in small villages and communes.

3. With the passage of the Electricity Law in 2001, the Electricity Authority of Cambodia (EAC) was created as an independent regulatory body mainly responsible for licensing operators; setting tariffs, rates, and charges for electric power services; and approving and enforcing appropriate standards for the construction, operation, and maintenance of electricity systems.

4. According to the Electricity Law, MIME has overall responsibility for setting and administering government policies, strategies, and plans in the power sector, as well as government decisions on such matters as (i) investments in the rehabilitation and development of the power sector, (ii) sector restructuring and private sector participation, (iii) promotion of the use of indigenous energy resources, and (iv) planning and agreements on the export and import of electricity.

B. Power Generation and Supply

5. In the past 5 years, EDC has made tremendous strides in its operation, through the joint efforts of the Government, EDC staff, and development partners like the Asian Development Bank (ADB) and the World Bank. Electricity sales have more than doubled, and now grow about 14% yearly on average. Assets have increased by about 50%. The installed generation capacity in the major provincial towns served by EDC in 2004 is summarized in Table A3 below.

6. Phnom Penh, which has a population of about 1 million, has the only relatively large power system in the country and accounts for 70% of the country's electricity consumption. Following the commissioning of several generation projects and 115 kV transmission lines, and the upgrading of distribution facilities, EDC has increased its generation capacity continuously. EDC's power system in Phnom Penh serves about 151,000 consumers with a peak demand of 122 MW in 2004.

7. The EDC branch in Sihanoukville operates an isolated diesel-based electricity supply system serving about 8,000 consumers with sales of 20.7 GWh in 2004 and a peak demand of 5 MW. The coverage of the distribution system is limited to the town, beach and port areas, and vicinity areas along National Road No. 4 toward Phnom Penh.

Table A3: Installed Generating Capacity

Generation Plant	Location	Installed Capacity (MW)	Ownership
EDC C2	Phnom Penh	12	EDC
EDC C3	Phnom Penh	14	EDC
EDC C5	Phnom Penh	10	EDC
EDC C6	Phnom Penh	18	EDC
EDC multiple units	Sihanoukville	11	EDC
EDC multiple units	Siem Reap	2.5	EDC
EDC Russian units	Battambang	2.6	EDC
Subtotal		70.1	
IPP-1	Phnom Penh	35	CUPL
IPP Caterpillar	Phnom Penh	20	Jupiter Power
IPP Kirirom Hydro	Phnom Penh	30	CETIC
IPP multiple units	Siem Reap	4.7	Newland
IPP Cummings	Battambang	2.9	Newland
IPP multiple units	Kompong Cham	3.6	GTS
IPP Detroit Diesel	Kompong Cham	0.8	Jupiter Power
IPP multiple units	Takeo	0.9	Private
Subtotal		97.9	
Total Capacity		168	

EDC = Electricité du Cambodge, IPP = independent power producer, MW = megawatt.
Source: EDC.

8. An ADB-financed project that included the construction of a new 5 MW diesel power plant and the upgrading of the distribution system for EDC Sihanoukville was completed in 1998. However, because of high growth in power demand, the system is once again severely constrained by a shortage of generating capacity. EDC is negotiating with IPPs to purchase additional power of around 5 MW to supplement its generation capacity.

9. The transmission and distribution networks in Phnom Penh and provincial towns have been rehabilitated and reinforced, and are being further expanded. Distribution losses have therefore been progressively reduced, from 25% in 1999 to 18% in 2004. Power imports from Viet Nam at reasonable cost have begun at medium voltage level in the border areas. Bulk power purchase agreements at high voltage level from Viet Nam and Thailand have been signed. A 230 kV transmission line project from the Viet Nam border to Phnom Penh is now being constructed with financing from ADB, World Bank, and Nordic Development Fund. Other transmission and distribution projects are proposed and will begin around 2010. These projects will allow EDC to import a large amount of energy at an acceptable low tariff from neighboring countries to relieve the strain on domestic generation capacity.

C. Sector Development Policies and Strategies

10. In January 2005, MIME issued the Cambodia Energy Strategy, which included proposed development policies and strategies for the power sector. The power sector development objectives over the next 15 years are to develop an adequate and reliable electric power source and a national power supply network to meet the growing demand. The strategies consist of (i) increasing investment in generation and transmission projects, (ii) establishing

interconnections with neighboring countries, (iii) establishing a regulatory framework for the sector, (iv) commercializing EDC and other state-owned enterprises, (v) encouraging private sector participation, and (vi) promoting an increase in the provincial and rural electrification ratio among households to 70% by 2020.

11. The Power Generation Master Plan and National Transmission System Master Plan were developed in 2003 and updated yearly thereafter. Base generation projects with large installed capacity are planned for Sihanoukville, considering its independent access to imported oil and the need to reduce the amount of oil transported on the Mekong River. Peak generation plants will be developed in Phnom Penh to meet the high growth in peak demand. Small- and medium-sized diesel units will be constructed in the provincial towns as necessary. A least-cost development plan for the national transmission and distribution system was formulated to achieve the overall sector development objectives.

D. Key Deficiencies and Challenges

12. The legal and policy framework for the power sector in Cambodia needs to be strengthened. The lack of transparent and competitive processes in IPP project development has (i) raised electricity costs, (ii) created conflict with the optimum use of the transmission line, and (iii) discouraged private sector investment. With support from the World Bank and ADB, the Government is formulating and will adopt a private sector policy.

13. The technical and financial health of the distribution subsector is critical to the future of power supply development in Cambodia. However, the current policy framework is not conducive to the adequate development of the distribution subsector, and more active policies and measures encouraging private sector participation across all geographic areas of the power market are needed to give the population better access to electricity more rapidly.

14. With the support of major funding agencies including the World Bank and ADB, an energy sector strategy review is being conducted. The review includes (i) an update of the sector development situation, (ii) an assessment of the performance of key sector players, (iii) a review of crucial issues including the long-term sector development strategic framework, and (iv) development of, and agreement with the Government, on strategic plans and priority actions for the short to medium term. It will be critical for the Government to adopt and implement effectively the outputs of the strategic review.

15. While EDC's financial performance has improved significantly in the past 5 years, it is still very weak and precarious, mainly because of (i) escalating costs of fuel and purchased power, which increased by 24% and 29%, respectively, from FY2003 to FY2005, and the inability of EDC to pass on these costs to consumers through tariffs; (ii) large payment arrears especially from government agencies; and (iii) inability of EDC to pass on to consumers (in its electricity bills) the value-added taxes (VAT) it pays on its power purchases, effectively subsidizing consumers at its own expense.

16. EDC continues to struggle with the high power generation costs, which are primarily due to (i) the expensive power purchased from IPPs, as many of the IPP contracts were not awarded through competitive bidding; (ii) the small-scale generation capacity, which makes electricity more expensive as economies of scale are not achieved; and (iii) the limited access to the capital markets.

17. The limited power grid coverage and unreliable power supply have led many large consumers to continue to rely on in-house generation, with its low efficiency and high costs. More investments in generation, transmission, and distribution projects by the Government and the private sector, as well as external assistance, are highly required.

FINANCIAL PERFORMANCE AND PROJECTIONS OF ELECTRICITÉ DU CAMBODGE

A. General Overview

1. Since its creation in fiscal year 1996, Electricité du Cambodge (EDC) has gradually improved its financial performance. Until 2005, it was mostly unable to make a profit, mainly because (i) its costs and revenues are very sensitive to exchange rate and fuel price fluctuations; (ii) tariffs could not cover its operational costs; (iii) it had large amounts of receivables from government departments and local authorities; (iv) its dependence on independent power producers (IPPs) made its power purchases less competitive; and (v) its distribution losses were relatively high. However, its future financial performance seems favorable, as the Government and EDC have been vigorously devising remedial measures to deal with the problems. The more significant remedial measures include (i) adjusting tariffs according to fluctuations in fuel prices and foreign exchange gain or loss, (ii) allowing EDC to purchase from a wider range of sources, (iii) settling past-due government arrears through budget allocation, (iv) converting to equity some loans from international financiers, and (v) continuously improving EDC's transmission and distribution systems to reduce losses.

B. Past Financial Performance

2. Despite an increase in energy sales from 320 gigawatt-hours (GWh) in 2000 to 681 GWh in 2005 (14%–22% annual growth), EDC mostly continued to operate at a loss. Its net loss increased from about KR15 billion in 2000 to KR25 billion in 2005. Although its cash flow improved from about KR4 billion in 2000 to about KR40 billion in 2005, EDC's revenues could not cover its operating expenses. EDC also faced difficulties in its debt service requirement, as the ratios were mostly less than 1. Investments in EDC were not attractive, as its rates of return were below 2%. Overall, EDC's previous financial performance was poor. Details of EDC's financial performance and projections are presented in Supplementary Appendix E.

C. Past Key Financial Issues

3. **Insufficient Tariff.** EDC's weak financial performance was mainly due to low tariffs, as its main sources of income were insufficient to cover its costs. Tariffs in the last 5 years mostly fell short, except in 2001–2002.

4. **Outstanding Government Arrears.** EDC's financial performance has been further adversely affected by the slow collection of accounts receivable from government departments and local authorities. EDC continued to struggle with the collection of government arrears and compliance with the receivables covenant. Accounts receivable in 2004 totaled KR76 billion, of which KR47 billion represented past-due arrears of various government ministries and agencies.

5. **Sensitivity to Exchange Rate and Fuel Price Fluctuations.** More than 75% of EDC's operational costs were dollar-based because EDC's generation was almost exclusively based on imported fuel and IPPs, both payable in dollars. Therefore, EDC was extremely sensitive to fuel cost and exchange rate fluctuations. The riel depreciated from \$1:KR2,600 in 1995 to \$1:KR3,800 in 2002 and about \$1:KR4,000 in 2005. The steady increase in the price of crude oil has also severely affected EDC's financial performance over the years.

6. **Less Competitive IPPs.** As of 2003, about 45% of the EDC generation capacity system was provided by IPPs, and these are likely to continue to have a significant role in providing

generation in towns. The earlier IPP experience was not good, as purchased power prices were high in the absence of competitive selection procedures. EDC had had little experience in negotiating these contracts and had allowed itself to be advised by the investors themselves and by lawyers acting in the investors' behalf.

7. **Distribution Losses.** Some networks suffered from power interruptions because of poor and minimally maintained distribution networks. Although EDC has continuously improved its systems, the average losses were 25% in FY1999 and 11.5% in FY2005.

D. Compliance with Financial Covenants

8. In the first ADB loan for power rehabilitation project,¹ EDC agreed to achieve the following loan covenants (by 2000): (i) 30% minimum self-financing ratio (SFR), (ii) 1.3 debt service coverage ratio (DSCR), (iii) accounts receivable not exceeding 3 months of electricity sales, and (iv) debt-to-equity ratio not to exceed 60:40. The principal financial covenants for another loan project² focused on adjusting tariffs to achieve at least cash breakeven, improving DSCR to 1.2, and reducing the distribution losses to less than 17%. The progress and remedial measures under each covenant are as follows.

9. **Reduced Government Arrears.** The Government has satisfactorily complied with this covenant. In FY2003, the Government took measures to address the long-standing issue in the 2003 financial action plans by offsetting receivables against taxes and duties. The Government has increased its budget allocation for electricity payments and allocated a budget for settling past-due arrears. As shown in Table A4.1, the total government arrears were reduced from KR47 billion in 2004 to KR28.8 billion by December 2005. By the end of that period, the amount owed from government institutions that was more than 3 months overdue represented only around 3 weeks of electricity sales. Furthermore, MEF agreed to implement a government arrears management plan focused on maintaining total accounts receivable at 3 months of EDC's average sales.

Table A4.1: Aged Accounts Receivable, as of 31 March 2005

[THIS INFORMATION WAS DEEMED CONFIDENTIAL ACCORDING TO EXCEPTION #18 OF ADB'S PUBLIC COMMUNICATIONS POLICY].

10. **Lower Debt-to-Equity Ratio.** EDC has satisfactorily complied with this covenant. Despite cumulative losses of KR87 billion in 2002 and KR146 billion in 2004, EDC's financial performance improved because of the Government's conversion to equity of the following funds: (i) \$25 million of the ADB loan, (ii) \$15 million from the Japanese-funded Phnom Penh distribution project, and (iii) additional contributions of about \$20 million in 2002–2003. The debt-to-equity ratio improved from 58:42 in 1999 to 48:52 in 2005.

11. **Reduced Distribution Losses.** EDC has fully complied with the distribution losses covenant, as such losses declined from 25% in 1999 to 11.5% in 2005. EDC will continue to (i) identify and take advantage of loss reduction opportunities in the weakest areas of the system, (ii) require industrial and big commercial customers to install capacitors to maintain the minimum power factors, (iii) set up vigilance squads to conduct surprise checks at costumers' premises to detect energy theft, (iv) introduce energy audit systems, and (v) implement incentive schemes. With such measures, the distribution losses are expected to decrease further.

¹ ADB. 1994. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Power Rehabilitation Project*. Manila (Loan 1345-CAM[SF]).

² ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Cambodia for the Provincial Power Supply Project*. Manila (Loan 1794-CAM[SF]).

12. However, EDC has not fully complied with other covenants (breakeven, DSCR of 1.3, and SFR of 30%) mainly because of its substantial operating losses. EDC still cannot pass on the escalating costs of fuel and purchased power to consumers through tariffs. However, effective 1 July 2005, the Government has rationalized tariffs by (i) introducing an automatic adjustment to the cost of EDC's power purchases in dollar terms, such that the revised tariffs applied to industrial and commercial (medium and large) customers were linked to fuel price fluctuations, foreign exchange gain or loss, and quantity of power purchased from various EDC sources; (ii) having one tariff level for industrial and commercial (small and medium) consumers; and (iii) rationalizing the lifeline tariffs, such that subsidized rates (at KR350/kWh) were charged for consumption not exceeding 50 kWh/month.

13. Rounds of tariff setting took place not only in Phnom Penh and immediate environs but also in all EDC branches to improve EDC's overall financial performance. The Government also acted to rationalize electricity tariffs by changing subsidized tariff rates and applying automatic adjustments to the tariff applicable to small commercial and industrial consumers in Phnom Penh, Kandal, and Kampong Speu provinces. The new power tariffs, which effectively raise the average tariffs of local residential, embassy and foreign residential, and government consumers by 11%, took effect on 1 November 2005. These adjustments will contribute to achieving a tariff surplus, as targeted in Table A4.2.

Table A4.2: EDC's Revenue Requirements and Tariffs, 2005–2010
(KR billion)

Item	2006	2007	2008	2009	2010	2011	2012
Fuel Cost	35	21	27	27	27	27	27
Power Purchase	354	424	481	525	571	614	664
Other Operating Costs	34	34	42	46	50	55	60
Depreciation	40	49	56	59	61	63	66
Total Costs	462	528	605	656	709	759	816
Total Revenue	467	539	642	718	796	870	955
Average Tariff	628	628	628	628	628	628	629
Tariff Surplus (%)	1	2	6	9	11	13	15

Source: Electricité du Cambodge estimates.

14. EDC did not achieve the cash breakeven targets because of its substantial operating losses. EDC continuously struggled with the collection of government arrears, as several ministries either had insufficient resources or assigned a low priority to the payment of electricity bills. For example, total consumption for FY2005 exceeded the KR67 billion budgeted by the Government. In September 2003, the Government decided that input value added taxes (VAT) would be a subsidy to customers with the Government reimbursing EDC for past VAT (calculated at KR40 billion from FY2002). EDC and MEF are preparing a detailed time-bound action plan for potentially offsetting the reimbursement of VAT against the repayment of EDC's loans to MEF (about \$15 million as of December 2005).

E. EDC's Projected Financial Performance

15. Given the remedial measures discussed in paras. 10–14, the following are the main assumptions regarding EDC's future financial performance: (i) sales will grow from 943 GWh in 2006 to 2,181 GWh in 2012, for an average annual growth rate of 15%; (ii) average tariffs will increase from KR666 in 2006 to KR711 in 2012; (iii) the share of power imported from Viet Nam in the total power generated will increase from 0% in 2006 to 49% in 2012; and (iv) the riel will depreciate versus the US dollar from \$1:KR4,126 in 2006 to \$1:KR4,404 in 2012.

16. These assumptions indicate that EDC will make a small profit of about KR4.9 billion in 2006, and then the profit will grow significantly over the rest of the forecast period. There will also be significant improvements in most of EDC's financial ratios as follows: (i) the current operating ratio will always be higher than 1, indicating that cash flow is adequate to cover EDC's expenses; (ii) rate of returns will also be more than 12%, indicating that investments will be profitable; (iii) SFR, starting in 2010, will be more than 30%, indicating adequate self-financing for investments; and (iv) DSCR will be more than 1.5 over the next decade, improving EDC's ability to repay its debts.

F. Proposed Financial Covenants

17. With the Government's decision to adjust average tariffs and implement other remedial measures, EDC can look forward to a better financial performance by FY2007 and beyond. This would allow EDC to continue operating more efficiently and comply with the agreed covenants. During project implementation these financial covenants shall be periodically reviewed. Unless it agrees otherwise with ADB, EDC will be expected to adhere to the following covenants:

- (i) A DSCR of 1.3 shall be achieved by FY2007 and maintained thereafter.
- (ii) A maximum debt-to-equity ratio of 70:30 shall be maintained up to 2010.
- (iii) The revenue breakeven shall be achieved for FY2007. This means that operating revenues are equivalent to or not less than the sum of total operating expenses minus depreciation costs.
- (iv) The total accounts receivable of EDC shall be maintained at a level that does not exceed the equivalent of 3 months of the average sales revenues.
- (v) The Government will allocate sufficient budget to offset the input VAT owed by EDC to the Government's Customs and Tax Department.
- (vi) The Government will ensure that past-due arrears of government agencies with EDC for FY2006 are paid or credited in full by 30 June 2007.

18. The Government will credit or directly pay to EDC, from the annual budget allocated to each government agency, institution, and local authority, an estimated amount for each entity's expected electricity consumption for the coming fiscal year.

DETAILED COST ESTIMATES AND FINANCING PLAN

Table A5.1: Summary of Detailed Cost Estimates

(\$ million)

Item	(\$ million)			(\$ million)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Investment Costs								
1. Equipment								
a. Steel	3,513.2	19,908.00	23,421.20	0.88	4.98	5.86	85	14
b. Conductors	4,202.9	23,578.30	27,781.20	1.05	5.90	6.95	85	16
c. Access	9,527.2	1,732.80	11,260.00	2.38	0.43	2.82	15	7
d. 220 kV Line Bays	8,320.2	19,413.80	27,734.00	2.08	4.85	6.93	70	16
e. Transformer Bays	1,324.5	2,354.70	3,679.20	0.33	0.59	0.92	64	2
f. 220/22 kV Transformers 30/50 MVA	2,852.6	5,071.40	7,924.00	0.71	1.27	1.98	64	5
g. 22 kV Switchgear	1,035.20	1,794.80	2,830.00	0.26	0.45	0.71	63	2
h. Protection Tests and Modification	2,271.00	6,114.10	8,385.10	0.57	1.52	2.10	73	5
i. 22 kV Distribution	5,438.20	1,113.80	6,552.00	1.36	0.28	1.64	17	4
j. 220 kV Bus Coupler	1,324.50	2,354.70	3,679.20	0.33	0.59	0.92	64	2
k. 22 kV Distribution (dc to S'ville)	971.10	198.90	1,170.00	0.24	0.05	0.29	17	1
l. 220 kV Transformer Bay	1,324.50	2,354.70	3,679.20	0.33	0.59	0.92	64	2
Subtotal (A1)	42,105.10	85,990.00	128,095.10	10.53	21.50	32.04	67	75
2. Civil Works								
a. Foundation, Erection and Stringing	13,376.80	3,803.20	17,180.00	3.34	0.95	4.29	22	10
b. Site Establishment	3,629.60	1,342.40	4,972.00	0.91	0.33	1.24	27	3
Subtotal (A2)	17,006.30	5,145.70	22,152.00	4.25	1.28	5.53	23	13
3. Resettlement								
Resettlement	3,187.00	0	3,187.00	0.80	0	0.80	0	2
4. Administration and Consulting Services	4,200.00	13,480.00	17,680.00	1.05	3.37	4.42	76	10
Total Baseline Costs	66,498.30	104,615.70	171,114.10	16.62	26.15	42.78	61	100
Physical Contingencies	8,325.70	14,514.00	22,839.70	2.08	3.63	5.71	64	13
Price Contingencies	8,223.10	5,922.70	14,145.80	2.06	1.48	3.53	42	8
Total Project Costs	83,047.10	125,052.30	208,099.50	20.76	31.26	52.02	60	122
Interest during Implementation	0	1,318.70	1,318.70	0	0.33	0.33	100	1
Total Costs to be Financed	83,047.10	126,371.00	209,418.20	20.76	31.59	52.36	60	122

kV = kilovolt, KR = riel.

Sources: Electricité du Cambodge and Asian Development Bank estimates.

Table A5.2: Detailed Cost Estimates by Financier
(\$ million)

Item	EDC		ADB		JBIC		Total		For. Exch.	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%			
A. Infrastructure Components											
1. Line, Bay Kampot Substation	0.35	13.10	2.32	86.90	0	0	2.67	5.10	2.27	0.05	0.35
2. 220 kV Line, Kampot to Sihanoukville	3.28	14.80	0	0	18.83	85.20	22.12	42.20	14.81	4.03	3.28
3. Substation at Veal Renh	3.30	26.00	9.39	74.00	0	0	12.68	24.20	6.91	2.90	2.87
4. Terminal Substation	1.31	25.30	3.89	74.70	0	0	5.20	9.90	2.83	1.05	1.31
5. MLV Distribution System	0.54	16.00	0	0	2.82	84.00	3.36	6.40	0.63	2.19	0.54
6. Consulting Services	0	0	2.66	100.00	0	0	2.66	5.10	2.32	0.34	0
7. Project Management and Monitoring											
a. Resettlement	0.65	100.00	0	0	0	0	0.65	1.20	0	0.65	0
b. Land Acquisition	0.35	100.00	0	0	0	0	0.34	0.70	0	0.35	0
c. Environmental Management and Monitoring	0	0	0.56	100.00	0	0	0.56	1.10	0	0.56	0
d. Other Monitoring Activities	0.28	100.00	0	0	0	0	0.28	0.50	0	0.28	0
Subtotal (A7)	1.28	69.50	0.56	30.50	0	0	1.84	3.50	0	1.84	0
Subtotal (A)	10.06	19.90	18.82	37.20	21.65	42.90	50.53	96.50	29.77	12.41	8.35
B. Capacity-Building Components											
1. Strengthening of EDC Provincial Branches	0	0	0	0	0.12	100.00	0.13	0.20	0.126	0	0
2. Improvement of EDC Information System	0	0	0.54	100.00	0	0	0.54	1.00	0.542	0	0
3. EDC Training in High-Voltage Systems	0	0	0	0	0.50	100.00	0.50	1.00	0.499	0	0
4. EDC Training in Social, Resettlement, and Environmental Management	0	0	0.36	100.00	0	0	0.32	0.60	0.325	0	0
Subtotal (B)	0	0	0.87	58.10	0.63	41.90	1.49	2.90	1.493	0	0
Total Project Costs	10.06	19.30	19.68	37.80	22.28	42.80	52.03	99.40	31.263	12.41	8.35
Interest during Implementation	0	0	0.33	99.00	0.00	1.00	0.33	0.60	0	0	0
Total Costs to be Financed	10.06	19.30	20.01	38.20	22.28	42.60	52.36	100.00	31.263	12.41	8.35

ADB = Asian Development Bank, EDC = Electricité du Cambodge, JBIC = Japan Bank for International Cooperation, kV = kilovolt.

Sources: EDC and ADB estimates.

IMPLEMENTATION SCHEDULE

ID Task	2006		2007				2008				2009				2010			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A. Loan Approval	◆																	
B. Loan Effectivity		◆																
C. Advance Procurement of Consultants		■	■															
D. Appoint Implementation Consultants			◆															
E. Detailed Design				■														
F. Prepare and Approve Bid Documents				■	■	■												
G. Resettlement Implementation and Monitoring							■	■	■	■	■	■	■	■				
H. Civil Works																		
1. 230 kV transmission line bidding and contract award					■	■	■											
a. RP updated and approval						■	■	■										
b. Construction							■	■	■	■	■	■	■	■				
2. Substations																		
Bidding and contract award						■	■	■										
a. RP updated and approval							■	■	■									
b. Construction								■	■	■	■	■	■	■				
3. 22 kV distribution system											■	■	■	■				
4. Tests/commissioning												■	■	■	■			
5. Completion of installation														◆				
I. Capacity-Building Activities			■	■	■	■	■	■	■	■	■	■	■	■				
J. Loan Closing Date																		◆

kV = kilovolt, Q = quarter, RP = resettlement plan.

Sources: Asian Development Bank and Electricité du Cambodge estimates, 2006.

PROCUREMENT PLAN

Table A7.1: Project Information

Country	Kingdom of Cambodia
Name of Borrower	Kingdom of Cambodia
Project Name	Second Power Transmission and Distribution Project
Loan Reference	To be determined (tbd)
Date of Effectiveness	tbd
Amount (\$)	\$20 million
Of which Committed (\$)	tbd
Executing Agency	Electricité du Cambodge (EDC)
Approval Date of Original Procurement Plan	12 July 2006
Approval of Most Recent Procurement Plan	tbd
Publication of Local Advertisements ^a	tbd
Period Covered by This Plan	18 months from loan approval

EDC = Electricité du Cambodge, Tbd = to be determined.

^a General procurement notice, invitations to prequalify and to bid, calls for expressions of interest.

Source: Asian Development Bank estimates.

Table A7.2: Procurement Thresholds, Goods and Related Services, Works, and Supply and Installation

Procurement Method^a	To Be Used (\$)
International Competitive Bidding (ICB) Works	Above \$1 million
ICB Goods	Above \$500,000
National Competitive Bidding (NCB) Works	Less than \$1 million
NCB Goods	Less than \$500,000
Shopping Works	Less than \$100,000
Shopping Goods	Less than \$100,000

ICB = international competitive bidding, NCB = national competitive bidding.

^a For international competitive bidding (ICB), ADB will conduct prior review of all procurement documents, the bid evaluation report (BER), and award of contract. For national competitive bidding (NCB), the first-draft, English-language version of the procurement documents should be submitted for ADB review and approval regardless of the estimated contract amount. ADB-approved NCB procurement documents should be used as a model for all NCB procurement financed by ADB, and will not be subjected to further review unless required under special arrangements.

Source: Asian Development Bank estimates.

Table A7.3: Procurement Thresholds, Consultant Services

Procurement Method	To be used (\$)
Quality- and Cost-Based Selection (QCBS)	Above \$200,000
Consultants' Qualifications Selection (CQS)	Below \$200,000
Least-Cost Selection (LCS)	Below \$100,000

CQS = Consultants' Qualifications Selection, LCS = least-cost selection, QCBS = quality- and cost-based selection.

Source: Asian Development Bank estimates.

Table A7.4: List of Contract Packages in Excess of \$100,000, Goods, Works, and Consulting Services

Ref	Contract Description	Estimated Cost (\$ million)	Procurement Method	Expected Date of Advertisements	Prior Review Y/N	Comments
1	Turnkey contract for substations	17.65	ICB Works	4th quarter, 2007	Y	Financed by ADB
2	Consultancy services for project implementation	2.30	QCBS	3rd quarter, 2006	Y	Financed by ADB
3	Supply of hardware and software for EDC data management system	0.50	ICB Goods	4th quarter, 2007	Y	Financed by ADB

ADB = Asian Development Bank, CQS = Consultants' Qualifications Selection, EDC = Electricité du Cambodge, ICB = international competitive bidding, LCS = least-cost selection, QCBS = quality- and cost-based selection, Y/N = yes/no.

Sources: EDC and ADB estimates.

Table A7.5: Proposed Contract Packages

Package No.	Item	Procurement Mode	Estimated Contract Value (\$ million)	Financed by
1	Turnkey contract for 230 kV transmission line (including spare parts and training)	ICB Works	17.20	JBIC
2	Turnkey contract for substations at Sihanoukville, Veal Renh, and Kampot extension	ICB Works	17.65	ADB
3	Supply of materials and equipment, and installation of medium-voltage (22 kV) and low-voltage (400 v) distribution system	ICB	2.71	JBIC
4	Consultancy services for project implementation	QCBS	2.30	ADB
5	Supply of hardware and software for EDC information system	ICB Goods	0.50	ADB

ADB = Asian Development Bank, EDC = Electricité du Cambodge, ICB = international competitive bidding, JBIC = Japan Bank for International Cooperation, kV = kilovolt.

Note: The above figures include taxes, but exclude contingencies and interest during construction.

Sources: EDC and ADB estimates.

OUTLINE TERMS OF REFERENCE FOR PROJECT IMPLEMENTATION CONSULTANTS

1. Consulting services will be required during implementation to assist Electricité du Cambodge (EDC) with the procurement, supervision of construction, final testing and commissioning of the works, and resettlement planning and implementation.
2. A consulting firm will be engaged to carry out the following main tasks:
 - (i) Review the existing feasibility studies for the 230 kilovolt (kV) transmission lines from Kampot to Sihanoukville and substations at Veal Renh and Sihanoukville and expansion of Kampot substation, as well as the 22 kV bulk supply distribution system. Prepare preliminary designs, taking into account the design practices used by EDC and current international standards.
 - (ii) Prepare the scope of supply and technical specifications of transmission and substation equipment including spare parts and terms of reference (TOR) for training operation and maintenance.
 - (iii) Consolidate the above into a design report giving project details, costs, implementation schedule, and recommendations to mitigate adverse environmental impact for approval by EDC, the Asian Development Bank (ADB), and the co-financier.
 - (iv) Prepare bidding documents for all equipment and services required to implement the Project, suitable for international competitive bidding, and national competitive bidding procedures as necessary and acceptable to ADB, the co-financier, and EDC.
 - (v) Assist EDC in inviting suitable qualified bidders and evaluating bids, and awarding contracts.
 - (vi) Assist EDC in commissioning surveys to supplement baseline data on the socioeconomic condition of the potential beneficiaries before the implementation of the Project, and, if possible within the time frame of services, conduct a similar survey 1 year after the completion of each subproject to evaluate changes in economic conditions (particularly among the poor). Measure other factors that may contribute to economic growth, including direct impact such as job creation resulting from the Project. Coordinate with EDC to ensure that its routine data on supply and demand (energy sold, losses, fault levels, electrification ratios, etc.) are compiled in such a way as to allow the benefits of the Project to be identified. Assist EDC with data evaluation and report the findings concurrently with the submission of the consultants' project completion report.
 - (vii) Assist EDC in reviewing and approving the contractor's detailed design drawings and technical documents.
 - (viii) Assist EDC in supervising the construction of the project facilities, and provide guidance to the contractors in conforming to the specifications.
 - (ix) Witness commissioning, guarantee, and acceptance tests, and assist EDC in taking over the completed facilities.
 - (x) Assist EDC in reviewing and compiling "as-built" drawings and reviewing the operation and maintenance manuals provided by the contractors, for accuracy and adequacy.
 - (xi) Assist EDC in updating and implementing the approved resettlement plan (RP) and in preparing and implementing subproject RPs, providing capacity-building services to EDC in environmental management and social safeguards, as well as formal and on-the-job training to other agencies implementing resettlement at

- provincial, district, and commune levels, and in hiring and supervising an agency for independent monitoring and evaluation of resettlement implementation. Guide and assist the Social and Environmental Unit of EDC and resettlement committees on the basis of the approved RP for activities including (a) planning and implementing the RP, (b) establishing and implementing procedures to minimize social impact, undertake and complete censuses and detailed measurements of losses, coordinate resettlement activities, undertake participatory needs assessments, track compliance with policies, and implement grievance procedures; (c) designing and implementing income restoration programs; and (d) establishing and implementing liaison and monitoring systems.
- (xii) Assist EDC in implementing the gender strategy (Summary Poverty Reduction and Social Strategy, Appendix 12 of RRP) as part of a detailed operational plan; and train EDC, Inter-Ministerial Resettlement Committee (IRC), resettlement working groups, men and women commune leaders and those from affected persons (AP) households, and district-level women's officials from the Ministry of Women's Affairs. Provide capacity-building training focused on effective consultation, resettlement planning, compensation, and livelihood activities, the main objective being to increase knowledge about resettlement planning and implementation.
 - (xiii) Contract and supervise the independent monitoring organization.
 - (xiv) Assist EDC in developing a detailed environmental management plan leading to an environmental compliance certificate and its implementation according to the laws and regulations of the Royal Government of Cambodia and the policies and guidelines of ADB. This work will include (a) developing an environmental database for the Project, (b) preparing an implementation schedule for mitigation measures based on the project initial environmental examination (IEE), (c) establishing an environmental monitoring and reporting plan, and (d) providing training to relevant government officers in the implementation of detailed environmental management plans.
 - (xv) Prepare and submit an inception report and quarterly progress reports acceptable to ADB and the co-financier, and compile a project completion report in the format prescribed by ADB, providing details of project implementation, problems encountered, solutions adopted, and any variation in project costs and implementation times from the original estimates.
 - (xvi) Monitor and evaluate the performance of the completed project by comparing a number of indicators before and after the completion of the new transmission line. Monitor the impact of the Project on EDC's operations by evaluating data on electrical losses, sales loss through system breakdown, customer-employee ratios, average cost of service, and monthly consumption by consumer category. Evaluate the impact of the bulk supply distribution system. Within the first year of connections, arrange for a benchmark survey to be carried out to monitor (a) connection rates among the poor and the nonpoor, (b) electricity expenditures, (c) up-front charges, (d) affordability of tariffs, and (e) ability of households to sustain monthly payments. Two years after the baseline survey, arrange for an impact survey covering, to the extent possible, the same households.

3. The consultant will perform these tasks to improve the design, project supervision, resettlement, environmental management, and socioeconomic assessment skills of the assigned EDC staff. Each international expert will make formal presentations to the staff of EDC and other relevant organizations (at the start and finish of their respective assignments)

covering a topic relevant to their particular expertise or role in the Project. The consultant is expected to carry out all of the tasks in Cambodia with suitable head-office backup. The consultant will, from time to time, delegate the necessary experts to Cambodia to implement the work according to the project schedule.

A. Social Development and Gender Specialist (5 person-months)

4. One national consultant on gender and development will be recruited to assist the Executing Agency, EDC, in implementing the gender strategy included in the summary poverty and social strategy during the project implementation. The consultant will be required to:

- (i) Assist EDC in implementing the gender strategy (Summary Poverty and Social Assessment, Appendix 12 of the RRP) as part of a detailed action plan.
- (ii) Train EDC, IRC, members of the provincial and district resettlement working groups, selected staff of the district-level Ministry of Women Affairs, and commune leaders on the village- and commune-level consultation process and gender sensitization, for the preparation and implementation of the resettlement plan.
- (iii) Develop capacity-building training modules and conduct training on (a) commune- and village-level consultation process for resettlement and compensation activities; (b) leadership skills; (c) information on government, funding agency, and nongovernment organizations' poverty and rural development programs in the project areas for the affected households and the women and men commune leaders.
- (iv) Ensure that households headed by women, and women from the affected households, are provided with access to socioeconomic support programs or livelihood activities in the resettlement plan.
- (v) Ensure joint registration of land-use rights in the names of both husband and wife in instances where households are allocated alternative agricultural or residential land.
- (vi) Establish appropriate mechanisms for the consultation and grievance process for women from the affected households.
- (vii) Ensure that the HIV/AIDS and trafficking awareness campaign involves the women's union, youth union, health workers, and women community leaders.
- (viii) Ensure that men and women are paid equally for construction work of equal value.
- (ix) Develop disaggregated monitoring indicators by gender.
- (x) Conduct periodic field visits and prepare a report on the implementation of measures dealing with gender and social issues.

ECONOMIC ANALYSIS

A. Introduction

1. The Project, to construct a 230 kV transmission line from Kampot to Sihanoukville, will bring Sihanoukville into the integrated South Electricity Grid. The Project's economic benefits consist of cost savings from the grid system expansion between the with-project and the without-project scenarios over the next 30 years. The economic analysis includes an assessment of the load forecast, a least-cost analysis, and a valuation of project costs and benefits, followed by an assessment of the project economic internal rate of return (EIRR). Risk and sensitivity analyses have been undertaken for key risk variables to examine the robustness of the economic results.

B. Demand Forecasts

1. South Grid System Demand Forecasts

2. The South Electricity Grid (the South Grid) consists of Phnom Penh, Kampong Speu, Takeo, Kampot, and Sihanoukville. The energy demand forecasts updated by Electricité du Cambodge (EDC) in June 2005 are shown in Table A9.1.

Table A9.1: South Grid Energy Demand Forecast (GWh)

Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Phnom Penh	736	844	975	1,163	1,302	1,445	1,585	1,740	1,921	2,118
Kampong Speu	3.0	3.6	4.2	4.7	5.3	5.9	6.6	7.3	8.1	9.0
Takeo	3.8	4.5	5.3	6.1	7.0	7.9	8.9	10.0	11.2	12.5
Kampot	3.9	4.5	5.0	5.6	6.1	6.7	7.4	8.1	8.9	9.7
Sihanoukville	47	56	63	115	189	260	289	318	348	378
Total	794	913	1,053	1,294	1,509	1,726	1,897	2,083	2,297	2,527

Source: EDC, June 2005, (Sihanoukville: ADB estimates.)

3. These cities are not yet connected except Phnom Penh and Kampong Speu. In 2008, Takeo will be connected with Phnom Penh by a 230 kV interconnection line between Viet Nam and Phnom Penh and will be brought into the South Grid. In the same year, Kampot will also be connected with Takeo and will be brought into the grid by a 230 kV transmission line under a project funded by German development cooperation through Kreditanstalt für Wiederaufbau (KfW).

2. Demand Forecast for Sihanoukville

4. For the demand forecast for Sihanoukville, the methodology used a combination of forecasts on the large consumer surveys and information on the Sihanoukville Growth Corridor Development Plan. The load forecast for the city is divided into two parts: (i) the forecast for the EDC system, and (ii) the forecast for captive consumers that generate their own electricity.

5. For the load forecast for the EDC system in Sihanoukville, estimates were developed to forecast electricity demand for four sectors between 2006 and 2035. These sectors are residential, commercial entities, small and large industry, and Government. The key parameters for deriving the demand forecast for the EDC system are population growth, GDP growth, and connection rates. The assumed population growth rate is 3.5%, which is higher than the national average rate of 2.5%, because of the growth potential of Sihanoukville and surrounding areas. The GDP growth rate adopted for the region is 4%, which again is higher than the projected national average rate of 3.5%. Income elasticity of demand was calculated for residential consumption per consumer. Elasticity of 1.21 was obtained on the basis of the data. Rates of

connection to each district in Sihanoukville, and consumption and consumer growth rates adopted for the other sectors, are shown in Table A9.2. A detailed forecast was prepared up to 2015 and projected to 2035 using the assumptions in Table A9.3.

Table A9.2: Energy Demand Forecast Assumptions for EDC System in Sihanoukville

Residential Consumers Connection Rates	
Mittakpheap	51.6% in 2006, increasing 1% per year
Prey Nob	10.0% in 2006, increasing 3% per year for 4 years and 2% per year thereafter
Steung Hav	10.0% in 2006, increasing 3% per year for 4 years and 2% per year thereafter
Nos. of Consumers	
Commercial	9% of resident consumers
Industrial	10% p.a. growth for 2 years, reducing to 5% by 2013
Government	in line with population growth (3.5%)
kWh/Consumer (% p.a. growth)	
Commercial	3.0
Industrial	6.0
Government	1.0

EDC = Electricité du Cambodge, kWh = kilowatt-hour, Nos. = number, p.a. = per annum.
Source: Asian Development Bank estimates.

Table A9.3: Sales Growth Rates of EDC System in Sihanoukville (%) (2016–2035)

Item	2016–2020	2021–2025	2026–2035
Residential	9.0	6.0	4.0
Commercial	8.0	5.0	3.0
Industry	5.0	3.0	2.0
Government	3.5	3.5	3.5

EDC = Electricité du Cambodge.
Source: Asian Development Bank estimates.

6. The energy demand forecast for captive consumers in Sihanoukville includes the following elements: (i) existing major industrial consumers, (ii) international tourist hotels, (iii) Sihanoukville port, and (iv) the planned special economic zone in the city. The forecast assumptions are shown in Table A9.4.

C. Least-Cost Analysis

7. The least-cost analysis minimizes the present value of the South Grid expansion cost from 2007 to 2035. All values are expressed in world prices in constant 2005 dollars and discounted over 30 years using a discount factor of 12%. The analysis has the following assumptions; (i) the dispatching power would be provided by committed independent power producers (IPP) and committed Viet Nam imports, followed by EDC's diesel power plants and diesel oil fuel-type gas power plants, and (iii) 10% reserve margin would be maintained. These EDC power plants are phased such that they would meet the South Grid load demand,

minimizing the generation cost. The base case for the analysis is to construct the transmission line between Sihanoukville and Kampot in 2010.

Table A9.4: Load Forecast Assumptions for Captive Demand in Sihanoukville

Item	Assumption
Shoe factory	5% per year from 2006 to 2009, then constant
Brewery	6% constant
Textile factory (1)	5% per year from 2006 to 2010, then constant
Textile factory (2)	5% per year from 2006 to 2009, then constant
Garment factories	50% in 2006, then constant
Seafood processing	5% per year constant
International hotel	70% occupancy by 2006; 5 % per year from 2007 to 2008, then constant
Other hotels	one other similar development by 2006, 5% growth per year thereafter
SHV Port Authority	40% per year from 2005 to 2009, then 15% per year thereafter
SHV SEZ (1)	200% in 2009, 67% in 2010, then constant
SHV SEZ (2)	100% in 2009, reducing to 14% by 2015

SHV = Sihanoukville, SEZ = Special Economic Zone.

Source: Asian Development Bank estimates.

8. Without the transmission line project, the feasible least-cost alternative is to add several diesel power plants in Sihanoukville to meet the increasing demand. It is assumed that the alternative represents the without-project case. The with-project scenario would result in lower system expansion costs compared with the alternative without-project scenario. This shows that the transmission line is the least-cost option (Table A9.5).

D. Valuation of Project Costs and Benefits

1. Project Costs

9. The financial capital costs are adjusted in the economic analysis to reflect the economic cost of project inputs in terms of the world price numeraire. The capital costs are classified into tradable goods and services, and non-tradable goods and services. The cost of unskilled labor is insignificant in total cost, and no shadow wage rate factor was applied. The non-tradable goods and services are converted to world price numeraire using a standard conversion factor of 0.9. Classification of costs is based on the engineering estimate (Table A9.6). The costs, including physical contingencies but excluding taxes, duties, and price contingency, are estimated to be \$45.2 million at constant 2005 prices. The costs of operating and maintaining the transmission line are included in the analysis; these costs are estimated at 2.0% of the capital cost yearly.

2. Project Benefits

10. The project benefits are the cost savings resulting from the South Grid System expansion between the with-project and the without-project scenario. For the without-project case, the alternative to the Project is to construct several small diesel power plants in Sihanoukville; this requires relatively high investment and operation costs. For the with-project case, the Project will integrate Sihanoukville into the South Grid, and lessen the total system expansion cost, since the large South Grid power plants are more economical than the city's smaller plants.

E. Project Economic Internal Rate of Return

11. The project period of analysis is 30 years, with commissioning in 2010. The Project yields an EIRR of 20.9 % for the base-case scenario. A summary of costs and benefits is presented in Table A9.5.

Table A9.5: The South Grid Expansion Costs
(\$ million)

Year	With-Project					Without-Project					
	Capital Cost	O&M Cost	Power Purchase	Fuel Cost	Total	Capital Cost	O&M Cost	Power Purchase	Fuel Cost	Total	
2007	19.1	1.6	106.6	3.7	131.0	5.5	1.6	106.6	3.7	117.4	
2008	28.3	2.5	120.7	8.8	160.3	10.2	2.5	120.7	8.8	142.2	
2009	23.8	4.0	130.3	16.1	174.3	14.8	4.0	130.3	16.1	165.2	
2010	8.4	3.0	144.9	11.3	167.6	15.1	5.5	138.5	22.9	182.0	
2011	0.9	2.1	158.7	5.3	167.0	5.4	6.1	146.5	25.0	183.0	
2012	11.9	1.2	173.7	-	186.8	8.7	6.8	156.1	27.1	198.7	
2013	0.9	1.7	184.0	2.6	189.2	7.5	7.4	167.3	29.1	211.3	
2014	25.1	2.7	198.2	4.8	230.7	10.4	8.1	181.1	31.0	230.6	
2015	30.6	4.8	191.9	12.4	239.5	27.8	9.6	177.2	34.1	248.7	
2016	33.1	9.1	191.4	31.1	264.7	35.4	11.8	185.0	41.0	273.2	
2017	29.6	13.1	192.4	46.8	281.9	32.9	14.7	188.6	53.4	289.5	
2018	33.3	17.3	193.9	62.1	306.6	35.8	18.8	190.6	70.7	315.8	
2019	37.1	22.5	193.9	81.1	334.5	34.2	23.1	192.7	86.9	336.9	
2020	40.4	28.1	193.9	102.9	365.3	39.9	28.4	193.9	105.9	368.1	
2021	44.1	34.2	193.9	126.2	398.3	42.2	34.4	193.9	128.8	399.2	
2022	46.9	40.7	193.9	151.7	433.2	43.2	40.8	193.9	154.3	432.2	
2023	69.8	50.9	177.3	190.3	488.3	72.6	51.1	177.3	192.9	493.9	
2024	77.7	64.9	139.4	245.0	527.1	77.1	65.1	139.4	248.7	530.3	
2025	69.8	75.2	129.6	284.2	558.7	71.6	75.4	129.6	287.8	564.4	
2026	73.5	84.4	129.6	318.1	605.5	75.2	84.6	129.6	322.5	611.9	
2027	67.6	94.4	129.6	356.1	647.7	65.1	94.5	129.6	360.6	649.8	
2028	76.3	105.3	129.6	397.8	709.0	72.6	105.3	129.6	402.3	709.8	
2029	79.4	117.1	129.6	442.8	768.8	85.0	117.3	129.6	447.2	779.0	
2030	88.6	129.9	129.6	491.9	840.0	85.0	130.1	129.6	496.4	841.0	
2031	103.9	143.9	129.6	544.3	921.7	102.0	144.1	129.6	548.8	924.4	
2032	101.9	159.2	129.6	602.0	992.6	102.0	159.4	129.6	606.4	997.3	
2033	112.1	175.8	129.6	665.1	1,082.6	111.2	176.0	129.6	669.6	1,086.3	
2034	122.9	194.0	129.6	734.1	1,180.5	119.3	194.0	129.6	738.6	1,181.4	
2035	131.1	213.6	129.6	808.8	1,283.2	134.4	213.8	129.6	813.3	1,291.0	
Present Value (@12%)					2,222.1						2,239.5

EIRR = economic internal rate of return, O&M = operation and maintenance.

Note: Capital and O&M cost of with-project includes the transmission line investment and O & M cost.

Economic internal rate of return (EIRR) is 20.9%.

Source: Asian Development Bank estimates.

Table A9.6: Project Economic Costs, 2005
(\$ million)

Item	Tradable	Non-Tradable	Total
	Goods/Services	Goods/Services	
1. 230 kV Transmission line	2.0	0.3	2.3
2. 230/22 kV Substations	20.3	11.0	31.3
3. Distribution System	0.5	2.0	2.5
4. Consulting Services	2.0	0.3	2.3
5. Project Management	0.0	1.4	1.4
6. Contingencies	3.6	1.9	5.5
Total	28.4	16.8	45.2

kV = kilovolt.

Source: Asian Development Bank estimates.

F. Sensitivity Analysis

12. Sensitivity analysis was undertaken for key risk factors and assumptions that could influence the viability of the Project. The sensitivity analysis shows that a 15% investment cost increase would reduce the EIRR to 17.1%. A 20% reduction in the city's load demand would decrease the EIRR to 16.3%. If the investment cost increase of 15% is combined with a 20% reduction in Sihanoukville load demand, the EIRR would fall to 13.1%. None of the risk factors

would undermine the conclusion of the economic viability of the Project. The results of the sensitivity analysis of project risk are shown in Table A9.7.

Table A9.7: Sensitivity Analysis

Item	Change	Economic NPV		EIRR	Sensitivity Indicator	Switching Value
	(% or value)	\$ million	% change			
Base Case		17.4		20.9		
Sensitivity Tests for Individual Variables						
A. Conservative Cost Assumptions						
Investment Cost Increase	15	11.3	(35)	17.1	2.34	43
B. Conservative Demand Assumptions						
SHV Demand Decrease	(20)	8.5	(51)	16.3	2.57	(39)
Sensitivity Tests for Variable Combinations						
C. Conservative Costs and Benefits						
Investment Cost Increase	15					
Gross Demand Decrease	(20)	2.4	(87)	13.1		

EIRR = economic internal rate of return.

Source: Asian Development Bank estimates.

G. Risk Analysis

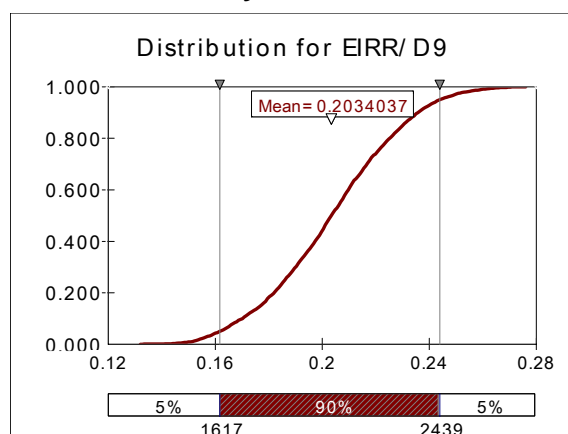
13. A risk analysis was carried out using @Risk. The key risk factors are listed in Table A9.8. The risk analysis was based on 5,000 iterations of a Monte Carlo technique. The cumulative distribution for the EIRR is shown in Figure A9.1. The values of the project EIRR range from a maximum of 27.6% to a minimum of 13.2%, with a mean of 20.3%. The simulations indicate a minimum EIRR above 12% (Figure A9.1).

Table A9.8: Distribution Used in the Risk Analysis

Input	Distribution	Max	Min	Mean	Standard Deviation
Capital Costs	Triangular	1.15	0.85	1	0.06
Load Demand	Triangular	1.20	0.80	1	0.08

Source: Asian Development Bank estimates.

Figure A9.1: Risk Analysis: Distribution of EIRR



EIRR = economic internal rate of return.

Source: Asian Development Bank estimates.

FINANCIAL ANALYSIS

A. Introduction

1. The Project was subjected to financial analysis, on the basis of with- and without-the-Project scenarios, to arrive at the incremental benefits and costs, and compute the financial internal rate of return (FIRR). Project viability was assessed by comparing FIRR with the weighted average cost of capital (WACC). The sensitivity analysis, through sensitivity indicators, assesses the effects of likely changes in the key variables of the Project, such as demand, cost, and revenues, on the base-case FIRR. These show the influence of these variables on the viability of the Project. The switching values are used to determine those variables that are most likely to affect the project financial performance. The following paragraphs explore these assessments.

B. Assumptions of Project Benefits

2. The benefits are essentially derived from the increase in electricity sales due to load growth, and from savings due to electricity loss reduction in the project areas. A model was developed to forecast the trend in electricity consumption for the following current customers of Electricité du Cambodge (EDC): residential, commercial and hotels, industries, and government agencies. The model also includes a forecast of captive demand of large hotels and industries that now generate their own energy needs. For financial analysis, we have adopted the load forecast in Cambodia, presented in the Economic Analysis (Appendix 9), as the scenario for the project area (Sihanoukville), which is considered realistically achievable at prevailing tariff levels.

3. An analysis of the demand forecast revealed that the demand would exceed EDC's generating capacity until the transmission and distribution lines are completed. The Project will help the large hotels and industries gain access to cheaper power, as EDC's tariffs for hotels, commercial entities, and industries (Table A10.1) are much lower than the costs of power generated by the private sector (Table A10.2). It is expected that these industries will gradually shift to EDC's supply since the transmission line from Viet Nam to Phnom Penh will be in service by 2008, and the line from Takeo to Kampot, by 2009.

Table A10.1: EDC Tariffs in Sihanoukville

Customers	Riel/kWh	\$/kWh
Residential	720.00	0.178
Government	760.00	0.188
Hotel and commercial	740.00	0.183
Industrial	670.00	0.166

EDC = Electricité du Cambodge, kWh = kilowatt-hour.

Source: Electricité du Cambodge.

Table A10.2: Costs of Energy Generated from Various Sources
(\$/kWh)

Sources of Energy	Market Price including Taxes	Market Price excluding Taxes
Cost of energy imported from Viet Nam	0.0641	0.0599
Cost of energy from large diesel plant	0.0888	0.0868
Cost of energy from small diesel plant	0.1093	0.1071
Cost of energy from private diesel plant	0.2082	0.0776

\$/kWh = dollar per kilowatt-hour

Source: Electricité du Cambodge, 2005.

4. The benefits from the incremental sales were valued in terms of annual average tariff revenue and the demand forecast and then adjusted to constant 2005 price levels. The computations for each category of customers used prevailing tariff rates in Sihanoukville, as shown in Table A10.1, to arrive at the Project's total financial benefits. It is assumed that the revenue flow for the Project will start in 2010, when the project construction will be completed, and end in 2036, in accordance with the economic life of the transmission and distribution lines.

C. Project Cost Assumptions

5. The total cost of the Project is not segregated by subproject, but was derived from the total cost of the Project in proportion to total sales. The cost of energy purchased is the main source of the project costs. It is more than 60% of the costs. It is valued at either the cost of energy imported from Viet Nam that cannot be used by EDC in Phnom Penh (estimated at \$0.060/kWh), and the additional cost of energy from future large diesel generating plants in Phnom Penh (estimated at \$0.087/kWh). The generation costs of various power producers are presented in Table A10.2.

6. The capital cost of investment is about \$47.3 million, derived from the total project costs after deducting interest during construction and price contingencies, disbursed from 2006 to 2010. The main costs include the cost of the transmission lines plus the associated 22 kV distribution lines, both comprising equipment and civil works. Land acquisition, resettlement, and capacity-building costs are also included.

7. The following are additional costs for the Project: (i) the operation and maintenance costs of the transmission line, estimated at 2% of the capital cost of the line per year; (ii) the operation and maintenance cost of the distribution line in Sihanoukville, estimated at KR15/kWh; (iii) allowance for the capital cost of the distribution system in Sihanoukville required to meet the forecast demand, estimated at \$0.114/kWh of incremental demand; and (iv) allowance for duties and taxes on the capital cost of the Project, plus the cost of imported fuel and other charges.

8. The analysis runs from 2006, when the transmission and distribution lines are assumed to be constructed, until 2036, when the lines are assumed to be at the end of their economic lives. On the basis of the above assumptions for the benefit and cost analysis, the post-tax FIRR for the Project was estimated at 13.2% in real terms, as in Table A10.3.

D. Weighted Average Cost of Capital

9. The Project is funded by ADB, from its Asian Development Fund (ADF), Japan Bank for International Cooperation (JBIC), and the Ministry of Economy and Finance (MEF). The cost of debt between ADB and JBIC is assumed to be the same, with the following terms: (i) interest rate of 1% per year will be applied; and (ii) MEF will relend the loan to EDC for a 20-year term, including a 5-year grace period, at 4.2% interest. EDC will allocate an annual budget as counterpart funds, with the nominal cost of 20.6%. The tax-adjusted cost is the 9% corporate tax rate, the same for the three financiers, Table A10.4 presents the financial parameters used by each financier including the computation of WACC. The resulting WACC was 4.3%, lower than the FIRR of the Project. This indicates that the Project is financially viable.

E. Sensitivity Analysis and Switching Values

10. A risk analysis was undertaken to examine the impact of adverse changes in the following key variables on the financial viability of the Project: (i) a 20% reduction in load growth/demand due to potential economic recession or other factors; (ii) a 2-year delay in the construction of the transmission line resulting in commissioning in 2013, as opposed to 2009 in

the base scenario; (iii) an increase of 20% in the total construction cost of the Project; (iv) 30% arrears in accounts receivable; (v) a 20% reduction in the commercial and industrial tariff rates once the transmission line is completed; (vi) a combination of 25% arrears in accounts receivable and 20% increase of power purchase price; and (vii) a combination of 20% increase in construction cost and 20% decrease in demand. The impact of these changes on FIRR, sensitivity indicators, and the switching value is presented in Table A10.5.

Table A10.3: Financial Analysis of the Project
(\$ million)

Year	Sales Revenue	Cost of Energy Purchased	Transmission O&M	Distribution O&M	Distribution Capital Investment	Capital Investment	Taxes and Charges	Total Outflows	Net Inflow
2007	0.0	0.0	0.0	0.0	0.0	14.0	3.5	17.5	(17.5)
2008	0.0	0.0	0.0	0.0	0.0	18.7	2.2	20.9	(20.9)
2009						9.3	0.2	9.5	(9.5)
2010	10.8	17.7	1.1	0.8	0.5	4.7	0.6	25.3	(14.5)
2011	16.0	19.6	1.1	0.9	0.5	0.0	0.6	22.8	(6.7)
2012	22.1	26.5	1.1	1.2	0.6	0.0	0.8	30.1	(8.0)
2013	27.5	26.8	1.1	1.2	0.6	0.0	0.8	30.6	(3.1)
2014	32.9	27.2	1.1	1.3	0.7	0.0	0.8	31.0	1.9
2015	38.5	27.6	1.1	1.3	0.8	0.0	0.9	31.5	6.9
2016	44.0	27.9	1.1	1.3	0.7	0.0	0.9	31.9	12.1
2017	49.6	30.1	1.1	1.3	0.7	0.0	0.8	34.0	15.6
2018	55.3	31.8	1.1	1.4	0.8	0.0	0.7	35.7	19.6
2019	61.2	32.5	1.1	1.4	0.9	0.0	0.7	36.6	24.6
2020	62.6	33.3	1.1	1.4	0.9	0.0	0.8	37.5	25.1
2021	63.7	33.9	1.1	1.4	0.7	0.0	0.8	37.9	25.8
2022	64.8	34.5	1.1	1.5	0.7	0.0	0.8	38.5	26.2
2023	65.9	35.1	1.1	1.5	0.8	0.0	0.8	39.2	26.7
2024	67.1	35.8	1.1	1.5	0.8	0.0	0.8	40.0	27.1
2025	68.4	36.5	1.1	1.6	0.8	0.0	0.8	40.8	27.6
2026	69.3	37.0	1.1	1.6	0.6	0.0	0.8	41.1	28.2
2027	70.2	37.5	1.1	1.6	0.6	0.0	0.9	41.6	28.6
2028	71.2	38.0	1.1	1.6	0.6	0.0	0.9	42.2	29.0
2029	72.2	38.6	1.1	1.6	0.7	0.0	0.9	42.8	29.4
2030	73.2	39.1	1.1	1.7	0.7	0.0	0.9	43.4	29.8
2031	74.3	39.7	1.1	1.7	0.7	0.0	0.9	44.1	30.2
2032	75.4	40.3	1.1	1.7	0.7	0.0	0.9	44.8	30.6
2033	76.5	40.9	1.1	1.8	0.8	0.0	0.9	45.4	31.0
2034	77.7	41.6	1.1	1.8	0.8	0.0	0.9	46.2	31.5
2035	78.9	42.3	1.1	1.8	0.8	0.0	1.0	46.9	32.0
							Discount Rate	NPV	FIRR
							5.8%	96.3	13.2%

() = negative, FIRR = financial internal rate of return, NPV = net present value.

Source: Asian Development Bank estimates.

Table A10.4: Weighted Average Cost of Capital (WACC)

Item	ADB	JBIC	Government	Total
A. Amount (\$'000)	20,000.00	20,000.00	11,000.00	51,000.00
B. Weighting	39.2%	39.2%	21.6%	1.00%
C. Nominal Costs	4.2%	0.9%	20.6%	
D. Tax Rate*	10.0%	10.0%	9.0%	
E. Tax-Adjusted Nominal Cost ($C*[1-D]$)	3.8%	0.8%	18.7%	
F. Inflation Rate	1.9%	0.0%	3.3%	
G. Real Cost $(1+E)/(1+F)-1$	1.8%	0.8%	15.0%	
H. Weighted Component of WACC	0.7%	0.3%	3.2%	4.3%
WACC	4.3%			

ADB = Asian Development Bank, JBIC = Japan Bank for International Cooperation, WACC = weighted average cost of capital.

Source: ADB estimates.

11. All benefits and costs of the Project were discounted at 4.3%, a rate equivalent to the composite of the WACC. The results of the sensitivity tests for the key variables of the Project indicate that the Project remains financially viable by comfortable margins between the FIRR of most key variables and the discount rate parameter.

Table A10.5: FIRR and Sensitivity Analyses

Item	Change	FIRR (%)	SI	SV
Base case		13.2%	0	0
Lower load growth or demand	20%	6.1%	4.9	20.8%
Delays in project completion	2 years	11.5%	7.6	-
Increase in construction cost	20%	9.1%	2.5	22.9%
30% arrears in accounts receivable	30%	5.2%	4.1	23.9%
Increase in price of power purchased	30%	8.2%	1.34	45.5%
Reduction in commercial and industrial tariffs	20%	7.8%	3.7	28.9%
Arrears in accounts receivable	25%		0	0
and increase in price of power purchased	20%	4.3%		
Increase in construction cost, decrease in demand	20%	7.1%	0	0

FIRR = financial internal rate of return, SI = sensitivity indicators, SV = switching value.

Discount rate: 4.3%.

Source: Asian Development Bank estimates.

12. As shown in Table A10.5, the Project is robust for a potential decrease in load growth, increase in construction cost, increase in the price of power purchases, and 2 years' delay in completing the Project. For example, a 20% increase of the construction cost will reduce FIRR to 9.1%; and a 30% increase in the power purchase price will reduce the FIRR to 8.2%. The 30% arrears in accounts receivable will reduce the FIRR to 5.2%. The changes in these key variables will not adversely affect the Project, as those FIRRs are still above its WACC.

13. The Project, however, is sensitive to the combination of arrears in accounts receivable and an increase in power purchase price. As shown in Table A10.6, the combination of an increase in arrears and in power purchase price will reduce the FIRR to 4.3%, equal to the WACC.

14. The sensitivity indicators indicate that the arrears in accounts receivable, the reduction in load growth, and the reduction in commercial and industrial tariffs are more sensitive than the adverse changes in other key variables. The FIRR will be equal to the WACC of the Project under the following conditions: (i) load growth is reduced to 20.8%, (ii) construction costs increase by about 23%, (iii) arrears in accounts receivable reach 24%, and (iv) commercial and industrial tariffs are reduced by 29%. But overall, the Project remains financially viable under the various ranges of scenarios for its sensitivity.

SUMMARY RESETTLEMENT PLAN AND FRAMEWORK

A. Introduction

1. A resettlement plan (RP) has been prepared for the core project involving a 78 kilometer (km), 230 kilovolt (kV) transmission line between Kampot and Sihanoukville and two substations at Veal Renh and Sihanoukville. The RP is based on agreed objectives, policies, screening, and planning procedures in accordance with the Asian Development Bank's (ADB's) *Policy on Involuntary Resettlement* (1995), and the laws of the Royal Government of Cambodia, principally the Land Law, revised in 2001, and the Electricity Law, 2001.

2. A resettlement framework (RF) has also been prepared to guide the preparation of one or more subproject RPs for the proposed medium- and low-voltage distribution systems. For these systems, little if any land acquisition impact will be caused by the erection of conventional medium-voltage 22 kV double-circuit distribution lines in Sihanoukville connecting the 230 kV substation and the existing 22 kV network, and 22 kV feeders from Sihanoukville and Veal Renh substations serving nearby villages, and the erection of 22 kV and 400 V distribution lines serving the villages along the transmission line corridor, as poles will be constructed mainly along existing road or rail rights-of-way (ROW). The alignment of the distribution systems will be made in consultation with local communities, with the objective of avoiding or minimizing impact wherever possible.

3. Provisions and principles adopted in the RP and RF, and in the RPs that will be prepared subsequently, will supersede the provisions of relevant legislation in force in Cambodia wherever they diverge.

B. Scope of Land Acquisition and Resettlement Impact

4. The RP for the transmission line and substations was prepared on the basis of a feasibility study using line locations on orthophoto maps (1997) and global positioning system location surveys of the transmission alignment. The 230 kV Kampot-to-Sihanoukville transmission line route was aligned to avoid densely populated areas and minimize the resettlement impact. The ROW will be cleared of all structures and trees above 3 meters (m), as use of the ROW during operations will be restricted to crops and trees below this height. Only 12 houses (occupied by 70 people) and 26 structures are located along the transmission line corridor; of the 12 houses, 5 will be moved to new sites within the village and 7 to property adjacent to the ROW and owned by the household. Some 14 temporary sheds on government land in the buffer zone of Bokor National Park may also be moved outside the ROW onto immediately adjacent land. The Project will acquire 3.9 hectares (ha) of agricultural land for the estimated 222 transmission line towers (2.2 ha) and two substation sites (1.7 ha). A total of 731 households are likely to be affected by the ROW. An estimated 2,929 trees, consisting of 2,087 fruit trees (mainly coconut palm, durian, mango, and cashew) and 842 non-fruit trees (mainly sandalwood and acacia), could also be affected. Some of these trees are in plantations held by nonresident owners. The livelihood impact of the loss of trees will be known only after the completion of the detailed design and detailed measurement survey during implementation. No farmers are expected to be severely affected by the loss of land. Compensation at replacement cost will be paid for land under the structures, and an easement fee of 15% of replacement cost for other residential land not under structures. All land within the ROW that is not permanently acquired for towers will continue to be the property of the owner, but with restricted use.

C. Project Resettlement Objectives, Principles, and Entitlement Policy

5. **Resettlement Objectives.** The RP and RF aim to ensure that the losses incurred by affected people are redressed such that affected people are assisted in developing their social

and economic potential to improve or at least restore their incomes and living standards to pre-project levels, and they are not worse off than they would have been without the Project.

6. **Resettlement Principles.** The above objectives will be accomplished through the following resettlement principles adopted for the Project:

- (i) Acquisition of land and other assets, and resettlement of people, will be minimized as much as possible by identifying possible alternative project designs, and appropriate social, economic, operational, and engineering solutions that have the least impact on populations in the project area.
- (ii) The populations affected by the Project are defined as those that may stand to lose, as a consequence of the Project, all or part of their physical and nonphysical assets, including homes, homesteads, productive lands, commercial properties, tenancy, income-earning opportunities, social and cultural activities, and relationships, as well as other losses that may be identified during the resettlement planning.
- (iii) All affected persons (AP) identified in the project-affected areas as of the date of the updated census and inventory of losses after detailed design will be entitled to compensation for their lost assets, incomes, and businesses at full replacement cost and provided with rehabilitation measures sufficient to assist them in improving or at least maintaining their pre-project living standards, income-earning capacity, and production levels.
- (iv) All affected populations will be equally eligible for compensation and rehabilitation assistance, irrespective of tenure status, social or economic standing, and any such factors that may discriminate against achieving the objectives outlined above. Those without legal title to land or structures occupied or used by them will be entitled to various kinds of resettlement assistance, provided they have cultivated or otherwise occupied the land before the eligibility cutoff date. Resettlement assistance to non-titled APs will include compensation for lost assets at replacement cost and restoration of income and living standards.
- (v) The rehabilitation measures to be provided are (a) cash compensation for houses and other structures at replacement cost of materials and labor without deduction for depreciation or salvageable materials; (b) full title to replacement agricultural land for land of equal productive capacity acceptable to the AP, including the cost of landfill if needed, or, at the informed decision of the AP, cash equivalent to replacement cost at the current market value for buying the same; (c) full title to replacement residential and commercial land under structures that must be displaced for safety clearance, replacement land of equal size in the same village, acceptable to the AP, or, at the informed decision of the AP, cash for replacement land at replacement cost at current market value for buying the same; (d) easement fee for residential land not under structures, to be valued at 15% of the replacement cost of the residential land at the current market value for buying the same; (e) cash compensation for crops and trees at replacement cost, including compensation for a minimum of 5 years' lost productivity for trees and perennial crops depending on the tree or crop variety, plus provision of saplings, fertilizer, and extension assistance; (f) assistance to tenants paying rent on houses owned by others by way of 3 months' rent allowance; (g) compensation for lost business and wages; (h) relocation allowances and rehabilitation assistance; (i) cost-of-living allowance for all relocating households and severely affected farmers in cash or in kind, equivalent to 30 kg of rice per family member each month for 6 months;

- (j) relocation costs through cash payment of \$20 per temporary field shelter, \$40 per house relocated on the same plot, and \$60 for houses relocated to another plot in the same village; and (k) priority access to project-related employment for APs.
- (vi) Special measures have been incorporated into the RP and RF for complementary mitigation and enhancement activities to assist, during the transition period, socially and economically vulnerable groups such as households headed by women, children, and elderly people without support structures, people living in extreme poverty, and indigenous and ethnic minorities. In addition to other entitlements and allowances, all poor and vulnerable APs will receive a cash allowance equivalent to 30 kg of rice per family member per month for 6 months and provided with any other necessary support to assist them in improving their socioeconomic status.
- (vii) There will be no deduction in payments for salvage value, depreciation, taxes, stamp duty, fees, or any other payments.
- (viii) Adequate arrangements will be made for the timely conduct of social assessments, inventory of affected assets, socioeconomic surveys, and the preparation and implementation of RPs, including the timely conduct of internal and external monitoring of RP implementation.
- (ix) RPs will be prepared and implemented with the participation of, and in consultation with, affected people, and draft and final RPs are to be disclosed to APs in a form and language that they can understand, in an accessible place.
- (x) Enough time will be allowed for replacement structures to be built before construction begins.
- (xi) Temporarily affected land and communal infrastructure will be restored to pre-project conditions.
- (xii) Any AP's loss due to any acquisition or restriction on access to common resources as a common property will be mitigated by arrangements that will ensure, as a first option, that those APs will have continuing access to an equivalent resource. If this option is not feasible, the alternatives will be identified in consultation with APs.
- (xiii) The compensation and resettlement activities will be satisfactorily completed and rehabilitation measures will be in place and all encumbrances on a contract area removed before the Government and ADB approve the start of civil works for that contract area.
- (xiv) The Executing Agency will see to it that institutional arrangements are in place to ensure effective and timely design, planning, consultation, and implementation of the land acquisition, compensation, resettlement, and rehabilitation program.
- (xv) Cultural and religious practices will be respected and, as far as practical, preserved.
- (xvi) Adequate budgetary support will be fully committed and will be made available to cover the costs of land acquisition and resettlement and rehabilitation within the agreed implementation period.
- (xvii) Grievance procedures will be established and put in place and APs will be informed of them before any resettlement activities begin.
- (xviii) Details of the RP will be distributed to the APs and placed in project and commune offices for the reference of affected people, as well any interested groups.
- (xix) Appropriate reporting, monitoring, and evaluation mechanisms will be identified and set in place as part of the resettlement management system and an external monitor hired before the start of any resettlement activities.

7. The project entitlements (detailed in the Entitlement Matrix in the Supplementary Appendix) are designed to cover compensation, resettlement, and rehabilitation for lost assets; and to restore or enhance the livelihoods of all APs. APs will receive compensation in cash or in kind (e.g., replacement land) at replacement cost for affected assets, as well as various rehabilitation measures.

D. Consultation, Grievance Mechanism, and Disclosure

8. APs and commune leaders were consulted during project preparation to discuss the resettlement impact, availability of replacement land, replacement costs for all categories of lost assets, and rehabilitation measures and assistance to ensure that APs can restore, if not improve, their livelihoods. Further consultation will be carried out before the design is finalized, and will continue during RP updating, preparation, and implementation. A three-step procedure will be established to deal with any resettlement-related issues, concerns, or grievances raised during project implementation and based on preparation and approval of the RP. APs will be exempted from administrative fees associated with resolving the grievances.

9. A public information booklet was prepared and distributed to all APs before appraisal and discussed during commune meetings. Copies of the final translated RP will be placed in the respective district and commune offices. The final version of the agreed and updated RP will also be uploaded onto ADB's Web site. The updated RP and subproject RPs prepared during project implementation will be disclosed to APs before submission to ADB for review and approval; disclosure will include the presentation of the updated public information booklet with compensation unit rates, and discussion in commune meetings. Final RPs and updated RPs will also be disclosed to APs in district and commune offices.

E. Gender, Ethnicity, and Poverty Issues

10. Women, ethnic minorities, and poor households are among the most vulnerable groups affected by resettlement. The socioeconomic survey identified 37% of the sampled population as being below the poverty line or otherwise vulnerable, including 4.7% female-headed households and 7.0% households who were elderly without support or disabled. However, vulnerable households were not found within the households that might consist of project-affected people according to the present level of design. In much of the 230 kV transmission line project area, the number and proportion of poor households is indicated to be negligible or minor. This situation will be reassessed after the detailed design and detailed measurement survey. Resettlement planning and implementation will pay special attention to (i) the role of women's economic activities in restoring living standards; (ii) access to credit and agricultural extension for women, ethnic minorities, and poor households; (iii) joint registration of any land-use rights in the names of both husband and wife where households are allocated alternative agricultural or residential land; (iv) participation and consultation strategies that encourage the involvement of women, ethnic minorities, and poor households in resettlement planning and implementation; (v) complaints and grievances lodged by women, ethnic minorities, and poor households; and (vi) collection of data disaggregated by gender and ethnic minority to support resettlement planning and monitoring. A gender strategy has been prepared for the Project and is included in the Summary Poverty Reduction and Social Strategy (Appendix 12). A national consultant on gender and development will be among the consultants who will assist in developing the gender strategy into an implementation plan. Capacity-building training will be provided to men and women commune leaders and AP households to make resettlement planning and implementation more effective.

F. Implementation Arrangements and Schedule

11. Electricité du Cambodge (EDC), as the Executing Agency, will appoint a full-time resettlement staff to coordinate closely with the involved ministries and other agencies, as well as reassess the actual compensation needs. It will ensure, through its project management organization (PMO), that provincial and district resettlement committee authorities are appointed. The PMO has been established in Phnom Penh and the appointed authorities will operate under the direction of the provincial governors of Kampot and Sihanoukville. In coordination with these relevant agencies, the PMO will manage and supervise the project and will create a social and environment unit (SEU), and will assign appropriate qualified resettlement staff for the periods necessary, with responsibility for social issues, particularly (i) resettlement planning and management, (ii) HIV/AIDS awareness program, (iii) poverty and social impact assessments, and (iv) labor practices. EDC will hire at least one new full-time resettlement staff who is a recent social science graduate, to be trained on the job by project consultants.

12. The project will be implemented over 4 years starting in 2006. The implementation of resettlement and related activities will take place after the mobilization of the project supervision consultant, who will work closely with, and assist, the PMO in all resettlement-related activities. Civil works contractors will not be issued a notice of possession of site for any section of the construction works unless the PMO has (i) completed, in accordance with the approved relevant RP for the 230 kV main transmission line or any subproject, compensation payment and relocation to new sites; and (ii) ensured that the rehabilitation assistance is in place, and the area required for civil works is free of encumbrances.

G. Monitoring and Evaluation

13. The implementing agencies (PMO and provincial resettlement committees) will conduct regular internal monitoring of the RP implementation. The PMO will submit quarterly monitoring reports to ADB. Also, the PMO will engage an independent monitoring organization (IMO) to conduct external scheduled monitoring and evaluation, focusing on the social impact of the project and the ability of APs to improve or at least restore their pre-project living standards, incomes, and productive capacity. A post-project evaluation study will also be carried out by the IMO approximately 1 year after the main 230 KV transmission line is completed.

H. Resettlement Budget and Flow of Funds

14. The Project has budgeted \$1 million for land acquisition and resettlement program costs, to be financed from counterpart funds. The budget includes compensation payments and allowances to APs, relocation costs, mitigation and income restoration measures, administrative costs, and 20% for contingencies. The budget for the transmission line and substation core project is estimated to be \$648,000, and another \$160,000 (25% of the transmission component resettlement costs) is budgeted for the distribution component, which is considered sufficient to cover the marginal impact anticipated. The Inter-Ministerial Resettlement Committee will be responsible for providing funds to the provincial resettlement committees for compensation for land acquisition and resettlement, including payments to APs directly for land, crops, and trees including houses, other structures, and any allowances.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis? <div style="float: right;"> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </div>	Is the sector identified as a national priority in country poverty partnership agreement? <div style="float: right;"> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </div>
<p>Contribution of the sector or subsector to reduce poverty in Cambodia:</p> <p>The population of Cambodia is about 13 million, of whom about one third live in poverty. The country's infrastructure was destroyed significantly during decades of civil war and conflict, and its socioeconomic indicators are considered relatively lower than those of other countries in the region. Poverty in Cambodia is overwhelmingly rural, from a low of 10–15% in Phnom Penh, to 40–45% in rural areas. The incidence of poverty declined only modestly over the last several years. This is due to a range of factors, including the shortage of sources of growth, backward linkages to the domestic economy, and the exclusion of the poor from the mainstream economy. For the economy to develop, the basic structure must improve.</p> <p>The power sector in Cambodia is both small and highly fragmented, with 24 isolated power systems centered on the various provincial cities and the capital, Phnom Penh. About 85% of the population lives in the rural areas and most do not have access to electricity. Nationwide, less than 17% of the population has access to electricity supply. Electricity consumption per capita is estimated to be 55 kWh in 2004, one of the lowest in the region. In addition, the lack of an integrated high-voltage transmission system and interconnections to adjacent countries and the high cost of imported diesel fuel have resulted in electricity production that is among the world's costliest. Since Cambodia has limited indigenous energy sources that have been explored so far, it relies primarily on expensive diesel generation. The lack of adequate and affordable electricity supply is identified as one of the main constraints on economic growth. Given the important role of electricity in providing power for economic growth, this constraint, if not removed, will significantly limit economic growth and hinder the country's ability to attract investments and economic activities.</p> <p>Despite its weak infrastructure, Cambodia has started its process of rehabilitation with support from development partners. Power demand has increased significantly, with an annual growth rate of 12% on average from 2000 to 2004. Increasing access to electricity, especially in provincial and rural areas, is a key factor in the development of those areas. The Government's aggressive plan for infrastructure development gives priority to national power grid expansion in underserved areas. Given that the power sector plays a key role in economic growth and social development, Asian Development Bank's approach is to help the Government achieve its development objective.</p> <p>Sihanoukville, Cambodia's only deep-water port, is a fast-growing city with major ongoing projects to expand the port facilities. The Government is developing Sihanoukville as an export processing zone and expanding its international tourist industry. But currently there is no grid connection between Sihanoukville and the national main grid. The proposed Project will extend the transmission line from Kampot to Sihanoukville. The extension of the transmission line to Sihanoukville will promote the provision of sustainable and reliable electricity supply at affordable prices to industrial, commercial, and residential consumers in Sihanoukville and vicinity areas along the transmission corridor.</p> <p>A reliable supply of electricity is important for economic growth and poverty reduction. Electricity supply promotes alternative sources of income that makes households less likely to fall below the poverty line. Access to electricity has expenditure-reducing effects, which are particularly important for poor households. Reduced expenditure on electricity allows households to spend more on food, education, and health services.</p>	

B. Poverty Analysis**Targeting Classification:** General intervention**What type of poverty analysis is needed?**

The Project is classified as a general intervention; therefore, according to the revised poverty guidelines, no poverty analysis is required. The resettlement plan (RP) includes measures for the affected people.

C. Participation Process

Is there a stakeholder analysis? ☒ Yes ☐ No

Consultations regarding land acquisition and resettlement issues were undertaken with key government officials and the affected people.

Is there a participation strategy? ☒ Yes ☐ No

There is a strategy for further disclosure of the RP to affected people, who will be consulted and will participate in RP updating and implementation and monitoring. To increase the participation of various stakeholders, the Project includes capacity-building training for the affected people, commune leaders, and relevant government department and implementing agencies. Access to information and increased knowledge through capacity-building training would enable the affected households and commune leaders to participate effectively in consultations preceding resettlement activities and in compensation planning. The gender sensitization training would increase awareness among the implementing agencies of the need to create opportunities for participation among men and women from the affected households, as well as men and women commune leaders, in resettlement and livelihood activities.

D. Gender Development**Strategy to maximize impacts on women:**

RP preparation, updating, and implementation will pay special attention to (i) the role of women's economic activities in restoring living standards; (ii) access to credit and agricultural extension for women, ethnic minorities, and poor households; (iii) joint registration of any land-use rights in the names of both husband and wife where households are allocated alternative agricultural or residential land; (iv) participation and consultation strategies that encourage the involvement of women, ethnic minorities, and poor households in resettlement planning and implementation; (v) complaints and grievances lodged by women, ethnic minorities, and poor households; and (vi) collection of data disaggregated by gender and ethnic minority to support resettlement planning and monitoring.

There is increased risk of HIV/AIDS to the project communities because of the influx of construction workers. An HIV/AIDS awareness program for the communities will be developed and implemented during project implementation. Construction contracts will include a budgeted line item requiring contractors to provide awareness and prevention programs for their workers.

Gender strategy:

- (i) At the start of the Project, a capacity-building training program will be designed for the women village leaders from the affected communes. The participants will also include male commune leaders and representatives of mass organizations. The awareness and leadership skills training will enhance women's participation at the commune level in resettlement-related discussions.
- (ii) The provincial and district resettlement working groups will include women representing the interests of women and female-headed affected households. At the commune level, specific resettlement committees will be formed to participate in RP planning and implementation. Specific strategies will be developed to encourage women and poor households to participate in resettlement planning and implementation and monitoring.

- (iii) During the Detailed Measurement Survey, men and women from the affected households will participate in the discussion of inventory and detailed measurement of losses. At the village, hamlet, and commune discussions for the preparation and implementation of the RPs, separate meetings will be held with the women from the affected households and female-headed households to determine (a) the impact on the productive land and loss of other productive assets and income, (b) problems related to relocation of houses, and (c) the additional measures or specific assistance required to address the needs of the households headed by women and women from the affected households.
- (iv) Resettlement working groups and commune leaders will consult separately with the households headed by women and women from households severely affected by displacement and those affected by the loss of 10% or more of productive assets to identify the assistance required in terms of selection of sites for productive land, extension services, training, and capital support to restore their livelihood.
- (v) Specific attention will be paid to (a) restoring the economic activities of the women affected by the loss of productive trees and garden land; (b) providing them with access to agricultural extension assistance, training, and financial services; and (c) establishing links with a marketing facility and relevant technical assistance, as required.
- (vi) The RP will include joint registration of land-use rights in the names of both husband and wife in instances where households are allocated alternative agriculture or residential land.
- (vii) Attention will be paid to complaints and grievances made by women and poor households.
- (viii) The HIV/AIDS and trafficking awareness campaign will involve the women, youth, health workers, and women community leaders.
- (ix) Women, as well as men from severely affected poor households, will be prioritized for employment-related civil works for the transmission lines and substations.
- (x) According to the Labor Code (1997) all employment for the Project will respect government commitments to gender equity including (a) employment targets for women, (b) prohibitions against the use of child labor or trafficked labor, (c) nondiscrimination against the employment of qualified women, and (d) nondiscrimination in the payment of wages or benefits to men and women for work of equal value.
- (xi) Monitoring indicators disaggregated by gender and ethnic group will be developed for the management information system.
- (xii) Gender sensitization training will be held for relevant staff from Electricité du Cambodge and Inter-Ministerial Resettlement Committee, members of the provincial, district resettlement working groups, commune leaders, and the independent monitoring agency.
- (xiii) A national consultant on gender and development will provide consulting assistance in developing the gender strategy into an implementation plan. Capacity-building training will include men and women commune leaders, men and women leaders from the AP households, and district-level women officials from the Ministry of Women's Affairs. The capacity-building training will focus on (a) information on effective consultation, RP activities, compensation, and livelihood activities, to increase knowledge about resettlement planning, compensation, and implementation; (b) information and linkages with poverty and rural development programs supported by funding agencies, government, and nongovernment organizations, so that the affected people can get access to these programs; and (c) impact of the project on livelihood from productive trees.

Has an output been prepared? ☒ Yes ☐ No

A gender strategy has been prepared (see above).

E. Social Safeguards and Other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	<p>An RP has been prepared for the components that have undergone a feasibility study.</p> <p>A resettlement framework has been prepared to guide the preparation of an RP for distribution networks, as they have not undergone a feasibility study.</p>	<input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None
Affordability	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Labor	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	<p>In the construction campsite, labor standards will be maintained and basic facilities will be provided. Appropriate child-care facilities in construction campsites for women will be provided. No trafficked or child labor will be used for construction and maintenance.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No specific plan has been prepared. Gender strategy includes labor issues; construction contract award will include labor mitigation measures.
Indigenous Peoples	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	<p>The majority of the affected people are Khmer and 2.4% are of Cham decent; however, the latter are not socioeconomically more vulnerable than the Khmer people living in the project area. ADB's <i>Policy on Indigenous Peoples</i> is therefore not triggered. The RP pays special attention to ethnic minority issues.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	<p>There is a risk that the displaced might not fully restore their livelihood. The poor and vulnerable households might become more vulnerable during relocation and land acquisition. During project construction, temporary labor camps can increase demand for sex workers for the construction workers, and thus increase the potential for trafficking of girls and women from the surrounding communities. High-risk groups for HIV/AIDS in the project area are traders, seasonal migrants, drug users, and sex workers. The construction period can pose risks for the construction workforce and the communities.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No. Income restoration programs are included in the RP. The Project's civil works contracts will include a requirement and budget for an awareness program on HIV/AIDS and trafficking. The Project will also include an awareness program for project communities.